

# COMPREHENSIVE RESOURCE BANK FOR WOLF CONSERVATION PLANNING

A RESOURCE TO ADVANCE SCIENCE, INCLUSIVITY, AND ETHICAL PRACTICES

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# **Chapter 1 ... WOLF FACTS & HISTORICAL OVERVIEW**

# Key Chapter Takeaways:

- Gray wolves once ranged across most of North America but following European contact the wolf population was reduced to near-extinction by the early 1900's in the lower 48 United States due to concerted extermination efforts.
- Following the passage of the federal Endangered Species Act and listing of gray wolves for protection under the Act, federal government recovery efforts led to restoration of wolf populations in limited parts of the country.
- Today there are wolf populations in the Western Great Lakes states, the northern Rocky Mountain states, in the Southwest, and small populations in the West Coast states.
- The gray wolf in the contiguous United States currently occupies around 10-15% of its former historic range and at around 1% of its former numbers.
- 5) Habitat modeling studies conducted to date show that there exists at least 530,000 square miles of habitat suitable for wolves. Wolves currently occupy only around one-third of this area and there is likely even more habitat available than has been currently modeled.
- 6) The U.S. Fish and Wildlife Service never developed a national recovery plan for wolves and has repeatedly stripped wolves of federal protections prematurely. Courts have overturned these actions repeatedly, and a recent federal delisting of wolves is currently being litigated.

# **Recent History of Wolves in the United States**

Gray wolves once occupied the majority of North America. European explorers and colonists arriving in the New World brought with them a worldview of exercising dominance over the natural world. Intensive hunting of wild ungulates and concerted extermination efforts of large carnivores, especially wolves, began right away. The earliest known wolf bounty law was passed in the Massachusetts Bay Colony in 1630. As settlers moved west, the spread of the livestock industry spurred even more intensive efforts to eradicate wolves in the 19th century through the first half of the 20th century. State and local bounties reduced wolf numbers by the hundreds of thousands throughout the lower 48 United States. In the early 1900's the U.S. Congress

appropriated funds for the Biological Survey -- a predecessor to the U.S. Fish and Wildlife Service -- to lend its aid to the states' wolf extermination campaign primarily through the use of traps and poison. By 1967, when wolves were protected under a precursor to the Endangered Species Act, they had already been largely eradicated from the lower 48 United States. Here, the only remnant populations consisted of fewer than 1,000 wolves in northeastern Minnesota and a tiny, isolated population on Isle Royale in Lake Superior (FWS 2009).

In 1974, under the Endangered Species Act, the gray wolf was classified as a federally endangered species. Initially, the gray wolf was protected as four subspecies -- the northern Rockies wolf, eastern wolf, Mexican wolf and Texas wolf. However, the validity of these subspecific designations was uncertain. Recognizing the conservation importance of any surviving gray wolves regardless of subspecies, the U.S. Fish and Wildlife Service (FWS) in 1978 revised the listing to protect the gray wolf at the species level. Throughout most of the conterminous United States the gray wolf was protected as endangered, and the Minnesota population designated as threatened. 43 Fed. Reg. 9607 (March 9, 1978).

Despite being listed for protection throughout the entire Lower 48 United States, FWS never developed a nationwide gray wolf recovery plan. It instead elected to follow through with recovery plans started in 1978 for three of the four purported subspecies, excluding the Texas wolf (which was determined to be extinct). Recovery planning focused only on restoring wolves to three regions of the country -- the northern Rockies, the western Great Lakes and the Southwest. Since there was an existing small population of wolves in Minnesota, wolves did not need to be reintroduced there. In the northern Rockies and Southwest, however, wolf recovery involved reintroducing animals to these regions. In 1995 and 1996, wolves captured in Alberta and British Columbia were reintroduced to Yellowstone National Park in Wyoming and to central Idaho, while natural wolf recolonization from Canada proceeded in Montana. In 1998, Mexican gray wolves from a captive breeding program were reintroduced to Arizona and allowed to also occupy a small area in New Mexico.

With recovery programs in place, wolves began to grow in number and expand their range in the northern Rockies and western Great Lakes states. Mexican wolf numbers were subject to

population downturns and were slower to grow. Since 2003, a series of delisting actions and lawsuits have removed, restored, and again removed Endangered Species Act protections for wolves throughout most of the lower 48 states. Additional litigation to restore protections to wolves is now pending. With the help of conservation efforts, wolves have rebounded in some regions of the U.S., yet at present occupy only around 10-15% of their historic range and at only around 1 % of their historic numbers.

To learn more about the history of wolves in the United States check out the below:

- Pacific Wolf Coalition: <u>http://www.pacificwolves.org/background/</u>
- Earthjustice, Wolves Endangered Timeline: <u>https://earthjustice.org/features/campaigns/wolves-in-danger-timeline-milestones</u>
- Center for Biological Diversity, Making Room for Wolf Recovery: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Making\_Room\_for\_Re</u> <u>covery\_print.pdf</u>
- Related academic research on the recovery challenges of wolves in the Great Lakes region: Beyer D. E. Peterson R. O. Vucetich J. A. Hammill J. H.. 2009. Wolf population changes in Michigan. Pp. 65–86 in *Recovery of gray wolves in the Great Lakes region of the United States: an endangered species success story* (A. P. Wydeven T. R. VanDeelen E. J. Heske, eds.). Springer Press, New York.

# Current Status of Wolves and Their Distribution in the U.S.

States in the lower 48 with established wolf populations include those in the western Great Lakes region (Minnesota, Wisconsin, and Michigan), the Southwest (Arizona and New Mexico), the northern Rocky Mountains (Idaho, Montana and Wyoming) and the Pacific West (Oregon, Washington and one existing pack in California). In addition to Alaska, wolves intermittently appear in other states as lone dispersers. They have shown up in North Dakota, Iowa, Illinois, Missouri, Utah and Nevada, but have not established breeding populations there. Wolf scat was recently detected in Maine. Colorado, in the Southern Rockies, is set to launch a reintroduction of wolves, beginning in 2023 or earlier, in designated lands west of the continental divide in accordance with a state ballot initiative, Proposition 114, which passed in November 2020.

Using 27 existing studies which modeled potential suitable wolf habitat in the lower 48 United States, the Center for Biological Diversity published a report which combines the studies to map total suitable wolf habitat modeled thus far. The resulting map shows approximately 530,000 square miles of suitable wolf habitat, of which roughly 171,000 square miles (30 percent of the total) are currently occupied. The Center's report notes that there is likely additional suitable wolf habitat but not all places in the lower 48 have yet been scientifically evaluated. Of the 27 studies, not all estimate the number of wolves the habitat can support. Those which do suggest that at least another 5,000 wolves could populate the Northeast, southern Rockies, West Coast and Southwest. This will nearly double the existing number of wolves in the Lower 48 United States and create a network of interconnected populations bolstering genetic security.

#### To learn more about distinct population segments see:

 Center for Biological Diversity, HSUS Petition to Maintain Protections for Gray Wolves in the Lower 48 (pp. 27-33): <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf</u>

# Legal Status of Wolves

# **Current Legal Status**

On Oct. 29, 2020, the Trump administration announced the delisting of the gray wolf from the Endangered Species Act in the lower 48 states, turning over management of wolves to states and tribes. The U.S. Fish and Wildlife Service will monitor the species' status for five years post-delisting. The final rule — which excludes Mexican wolves which will remain listed under the Act — was published in the *Federal Register* on Nov. 3, 2020. Its effective date, 60 days after publication, was Jan. 4, 2021.

To learn more about the current legal status of wolves see:

• U.S. Fish and Wildlife Service: <u>https://www.fws.gov/home/wolfrecovery</u>

#### Historical Delisting Actions, Litigation, and Court Rulings

The U.S. Fish and Wildlife Service has, since 2003, attempted multiple times to either reduce or eliminate federal Endangered Species Act protections for the gray wolf. These efforts have

included creating geographic areas known as Distinct Population Segments, in which to delist wolves or down-list them from endangered status to threatened. Efforts in 2003, 2007, 2008 and 2009 were challenged in court and overturned when courts ruled the efforts violated the Endangered Species Act. In 2011, gray wolves were partially delisted through a Congressional rider added to a must-pass omnibus appropriations bill. The rider served to bypass the science-based standards in the Endangered Species Act. It removed protections from wolves in all of Idaho and Montana, the eastern one-third of Washington, eastern one-third of Oregon and a small portion of north-central Utah. The Congressional delisting prohibited the ability to challenge this action in court.

In Wyoming, gray wolves were delisted by the U.S. Fish and Wildlife Service in 2012; ensuing litigation in federal District Court restored protections in Wyoming in 2014, which was then reversed in a final mandate by the U.S. Court of Appeals April 26, 2017. The delisting actions in Idaho, Montana and Wyoming reverted management authority back to the states and initiated a five-year monitoring period by USFWS to ensure wolf numbers in each state did not fall below a specific threshold. In Washington, Oregon and Utah, wolf management authority reverted to the state only within those portions which had been federally delisted; the remainder of wolves in each of these states remained under federal management. In the Great Lakes, gray wolves were delisted in December of 2011 but had protections restored in December of 2014 by a federal court ruling, due in part to "the virtually unregulated killing" of wolves during Minnesota and Wisconsin's wolf hunting and trapping seasons.

To learn more about the legal history of gray wolves see:

- Western Great Lakes States Chronology: https://www.fws.gov/midwest/wolf/history/timeline.html
- Case: Humane Society of the U.S. v. Jewell, Civ.No. 13-00185, 2014 WL 7237702 (at 105-106) (D.D.C. Dec. 19, 2014) <u>https://www.wolf.org/wp-content/uploads/2014/12/greatlakeswolfdecision.pdf</u>
- Northern Rocky Mountain States Chronology: <u>https://www.fws.gov/mountain-prairie/es/grayWolf.php</u>

# **Chapter 2 ... THE SOCIAL SCIENCE ON WOLVES**

# Key Chapter Takeaways:

- Public attitudes towards wildlife are changing and moving away from traditionalist views toward mutualist views. Traditionalists see wildlife as a resource for human use, whereas mutualists see wildlife as part of an extended social network deserving of care and compassion.
- 2. Across a broad sampling of the public, including those who self-identify as conservationists, hunters or animal rights advocates, there is an increasing acknowledgement of wolves, other wildlife (and domestic animals) as having intrinsic value. This contrasts with state wildlife agency personnel who are guided by principles which view wildlife as a resource to be harvested for human use and enjoyment.
- 3. Higher income, urbanization and increased level of education are associated with a higher prevalence of mutualist views towards wildlife.
- 4. Surveys and referendums involving both urban and rural residents show widespread support for wolf restoration and maintaining wolves at current or higher population levels.
- 5. Measurable economic benefits accompany wolf restoration. These range from jobs for locals employed in guiding and outfitting operations to tourism expenditure inputs into local and regional economies as a direct input and with a multiplier effect, to reductions in deer-vehicle collisions yielding an economic benefit 63 times greater than verified livestock losses (which does not even take account the added savings from medical and car insurance bills or lost wages from being hurt in such a collision).
- 6. Because of shifting American values towards wildlife, including a steep decline in the percentage of people who hunt, there is a growing values gap between wildlife agencies and the American public regarding how wildlife should be viewed and stewarded.
- State-sanctioned wolf hunting does not increase social tolerance for wolves. In fact, it can increase wolf poaching, fuel calls for more agency wolf-killing, and encourage the vocal minority to demand more public wolf hunting and trapping.

8. American public opposition is growing to trapping, trophy-hunting and other extreme lethal measures like snaring, use of ATVs, snowmobiles or hounds to hunt wolves, aerial gunning, baiting wolves, gassing pups in dens and the use of poisons.

For successful long-term wolf conservation, it is essential to understand the social science relating to wolves and their management. Public attitudes towards wolves and social tolerance for the species has shifted considerably over the past several decades. This must be factored into ongoing efforts to mitigate human-wolf conflicts and to achieve coexistence between humans and wolves.

Current social science research demonstrates strong public support in the United States for wolf restoration efforts, maintaining wolves at current or higher population levels, and ongoing legal protections for wolves, despite acknowledged risks of occasional wolf predation on livestock. Additional social science indicates the U.S. public increasingly opposes trapping wolves and other wildlife for recreation, commercial trade in furs, and killing wolves and other wildlife in response to livestock conflicts. People in the U.S. favor non-lethal methods be prioritized to address livestock-wolf conflicts. The public is also registering a growing aversion to "trophy hunting" (as distinguished from subsistence hunting) and to hunting native carnivores, including wolves, with dogs. Concurrently, there has been a steady decline in the percentage of the U.S. population that hunts wildlife, from 10% in 1975 down to 4% in 2015 (*see* U.S. Fish and Wildlife Service 2016).

### **Public Attitudes on Wolves**

#### Modern Trends & Changing Attitudes

Attitudes on wolves in the United States depend on a host of demographic variables — especially education, urbanization, and income. In this respect, US attitudes on wolves mirror other value conflicts, including divergent, deeply held views over how public lands should be managed and how changing demographics are impacting traditional values and ways of life.

Social science indicates that members of the public are increasingly shifting their views on wildlife away from a perspective centered on domination of nature, towards a perspective grounded in mutualism. A mutualistic perspective views wildlife as part of one's social network and worthy of care and compassion. There is a shift in focus concerning our relationship with both wild and domestic animals from one of using animals solely to promote human well-being to a growing interest in the well-being of animals.

Further, increasing numbers of members of the public recognize the intrinsic value of wildlife, with acknowledgement and appreciation of wolves as a species and as individuals having sentience, intelligence, and sociality. A recognition that wolves have intrinsic value embraces the concept that wolves, and the species' ability to flourish, hold a value without reference to the species' value to someone or something else. If wildlife management agencies were to also acknowledge the intrinsic value of wolves, this would be reflected in agency policies and actions which give equitable consideration to the species' key ecological contributions and the sentience of individual animals.

This trajectory in changing public views is contributing to a values gap between large segments of the American population and the agency professionals who manage state wildlife programs. Surveys conducted of state wildlife agency personnel indicate that most state wildlife agencies are guided by principles rooted in the idea that only humans possess intrinsic value, and that wildlife is a "resource" to be "harvested" for human use and enjoyment. As societal values continue to shift and embrace wildlife as beings with intrinsic value worthy of care, the public's dissatisfaction with wildlife agencies' priorities and decision-making processes is increasing. This is evidenced by the growing number of ballot initiatives and referenda seeking to protect wild animals from various methods of hunting and trapping and to end wildlife killing contests. These ongoing efforts reflect a rising concern for wildlife professionals out of touch with changing American values (*see Jacobson and Decker 2008*; Bruskotter et al. 2017). These efforts are further evidence that the American public is moving away from a traditionalist mentality to one of mutualism.

Modernization has affected values toward wildlife. Specifically, in industrialized countries like the US, education, income, and urbanization are strongly associated with wildlife value orientations. Higher income, urbanization, and increased level of education were associated with a higher

prevalence of mutualism orientations among state residents. (*see <u>Animal Rights and Conservation:</u> <u>Conflicting or Compatible?</u>)* 

Public expectations of fish and wildlife agencies, and wildlife policy also are shifting, with more members of the public acknowledging the intrinsic value of wildlife. In one study, authors polled more than 1,200 adults and asked them to indicate the extent to which they identified as hunters, conservationists and animal rights advocates. Regardless of their group identities, respondents shared a widespread tendency to acknowledge wildlife's intrinsic value. The authors noted this shared belief to perhaps be a "glimpse of the future of wildlife conservation."

#### To learn more about Americas' changing wildlife values see:

- Colorado State University research project on America's Wildlife Values: Manfredo, M. J., Sullivan, L., Don Carlos, A. W., Dietsch, A. M., Teel, T. L., Bright, A. D., & Bruskotter, J. (2018). <u>https://sites.warnercnr.colostate.edu/wildlifevalues/</u>.
- Scholarly article published in The Society of Conservation Biology on the changing sociocultural context of wildlife values: Manfredo et. al 2020. <u>https://doi.org/10.1111/cobi.13493.</u>
- The relationship between animal welfare and conservation: Bruskotter, J., Vucetich, J., Nelson, M., "Animal Rights and Conservation: Conflicting or Compatible?" July 2017, The Wildlife Professional.

https://www.researchgate.net/publication/318275505\_Animal\_Rights\_and\_Conservation Conflicting\_or\_Compatible

- Intrinsic value of nature: Vucetich, J., Bruskotter, J., Nelson, "Evaluating whether nature's intrinsic value is an axiom of or anathema to conservation, February 2015, <u>https://doi.org/10.1111/cobi.12464;</u>
   https://conbio.onlinelibrary.wiley.com/doi/abs/10.1111/cobi.12464
- Benefits of wolf restoration: Weiss, A.E., Kroeger, T., Haney, J.C. and N. Fascione.
   2007. Social and ecological benefits of restored wolf populations. Transactions of the 72nd North American Wildlife and Natural Resources Conference. Pp. 297-319.<u>https://agris.fao.org/agris-search/search.do?recordID=US201301678406</u>

- Conservation beyond exploitive, anthropocentric interests: Treves, Adrian; Santiago-Ávila, Francisco J.; and Lynn, William S. (2019) Just preservation. *Animal Sentience* 27(1), see <u>https://www.wellbeingintlstudiesrepository.org/animsent/vol4/iss27/1/</u>
- Summary of perspectives on wolf reintroduction in Colorado: <a href="https://extension.colostate.edu/topic-areas/people-predators/public-perspectives-on-wolves-and-wolf-reintroduction-8-004/">https://extension.colostate.edu/topic-areas/people-predators/public-perspectives-on-wolves-and-wolf-reintroduction-8-004/</a>, referencing Niemiec RM. (2020). Report: A Summary of Key Perspectives Shared at the February 2020, Stakeholder Discussion on the Conflict Over Potential Wolf Restoration and Management in Colorado. Fort Collins, CO: Colorado State University, Department of Human Dimensions of Natural Resources.
- Study highlighting differences in American attitudes indicative of growing concern for the welfare of animals – both wild and domestic--and of growing tension between three important societal goals: (1) the need to increase agricultural production to feed growing human populations, (2) the desire to conserve biodiversity for current and future generations, and (3) an apparent expansion in concern for the welfare of wild and domestic animals: George, K. A., Slagle, K. M., Wilson, R. S., Moeller, S. J., & Bruskotter, J.T. (2016). Changes in attitudes toward animals in the United States from 1978 to 2014. *Biological Conservation, 201*, 237-242.<u>https://wolfwatcher.org/wpcontent/uploads/2016/11/Changing-Attitudes-.pdf</u>.
- Human attitudes toward wolves in Wisconsin: Shelley, V.S., Treves, A., Naughton-Treves, L., 2011. Attitudes to wolves and wolf policy among Ojibwe Tribal members and non-tribal residents of Wisconsin's wolf range. Human Dimensions of Wildlife 16, 397-413.
- Historical comparison of predator control attitudes: Slagle, K. et al. (2017) 'Attitudes toward predator control in the United States: 1995 and 2014', Journal of Mammalogy, 98(1), pp. 7–16. doi: 10.1093/jmammal/gyw144.
- Democracy and wildlife management: van Eeden LM, Dickman CR, Ritchie EG, Newsome TM. 2017 Shifting public values and what they mean for increasing democracy in wildlife management decisions. *Biodivers. Conserv.* 26, 2759–2763. (doi:10.1007/s10531-017-1378-9)

- Political affiliation and wolves: van Eeden L, Rabotyagov S, Kather M, Bogezi C, Wirsing A, Marzluff J. 2021 Political affiliation predicts public attitudes toward gray wolf (Canis lupus)
- Politics and wolves: Bruskotter, Jeremy T, Sherry A Enzler, and Adrian Treves. 2011.
   "Rescuing Wolves From Politics: Wildlife as a Public Trust Resource." *Science* 333 (6051): 1828–29.

#### **Demonstrable Widespread Citizen Support for Wolves**

State surveys and referendums of rural and urban residents show widespread support for wolf restoration and maintaining wolves at current or higher population levels. Indeed, the oft-referenced "urban-rural divide" appears to exist far more in the minds of the media and some state legislators than shown by social science surveys.

Wildlife agencies should use sociocultural data to inform wildlife policy and recent a recent study demonstrates how this can be used to inform wolf recovery efforts (*see* Manfredo, Berl, Teel and Bruskotter 2021). In this study, attitudes of humans living in core wolf range are shown as strong indicators of wolf tolerance within a state. Data from states like Minnesota, where humans living in wolf range have a balance between mutualism and domination values, suggests an increase in wolf acceptance.

#### To learn more about national support for wolves see:

Houston, M., Bruskotter, J. T., & Fan, D. P. (2010). Attitudes toward wolves in the United States and Canada: A content analysis of the print news media, 1999-2008. *Human Dimensions of Wildlife, 15*, 389-403.<u>https://www.tandfonline.com/doi/abs/10.1080/10871209.2010.507563</u>

# Summary of Surveys by State

#### Wisconsin Survey - 2014

As stated at the outset by the survey's authors, at the time the poll was conducted, the "two focal points of the Wisconsin Department of Natural Resource's (DNR) wolf management efforts have

been to reduce wolf predations and reduce the number of wolves to a level closer to the population goal of 350 animals."

The survey's respondents, both within and outside wolf range, overall did not favor the DNR's focal points, and instead wanted wolf numbers to remain the same or be allowed to increase:

- Among the survey respondents within wolf range, "maintaining the same number of wolves" was the most frequently selected response (26%) for a statewide wolf population goal;
- Among the survey respondents within wolf range, most people (40%) wanted wolf numbers to be "maintained" at current levels in their county of residence;
- People outside of wolf range favored maintaining current wolf numbers (29%) or increasing wolf numbers (27%) in the state.
- Survey at "Public Attitudes Towards Wolves and Wolf Management in Wisconsin," Wisconsin Department of Natural Resources, August 2014. <u>https://dnr.wi.gov/topic/WildlifeHabitat/wolf/documents/WolfAttitudeSurveyReportDRA</u> <u>FT.pdf</u>

# Washington Survey - 2014

The survey revealed much more support for (70%) than opposition to (15%) maintaining sustainable populations of predators in Washington. The most common reason for support of having sustainable populations of predators is that predators are necessary for the ecosystem. With respect to the recovery of wolves in Washington, the survey registered much more support for (64%) than opposition to (27%) the recovery of wolves in Washington.

 Survey at "Washington Residents Opinions on Bear and Wolf Management and Their Experiences with Wildlife That Cause Problems," Responsive Management, May 2014, <u>https://wdfw.wa.gov/publications/01594</u>

#### Minnesota Survey — 2019

Findings demonstrate a diversity of perspectives regarding stakeholders' attitudes toward wolves, priorities for wolf management, preferences for future wolf populations and distribution,

and support for the establishment of regulated wolf hunting and trapping seasons, among other variables measured. Residents, on average, expressed positive attitudes toward wolves, preferred to maintain current (2019) wolf populations and distribution, and opposed lethal solutions to human-wolf conflict.

 Schroeder, S. A., Landon, A. C., Cornicelli, L., McInenly, L., & Stark, D. (2020). Minnesotans' attitudes toward wolves and wolf management. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology.

https://files.dnr.state.mn.us/fish\_wildlife/wildlife/wolves/attitude\_report\_final.pdf.

#### Colorado Wolf Reintroduction Ballot Measure Survey - 2020

A peer-reviewed <u>study</u> authored by 11 researchers in public opinion, biology and economics at Colorado State University and the U.S. Department of Agriculture showed 84% support among Colorado's public for Proposition 107 to reintroduce gray wolves.

A survey, relying upon an online pool of 734 Coloradans sampled from different regions across the state, examined public beliefs and attitudes related to wolf reintroduction. Adding to the online information, a content analysis of media coverage in 10 major daily Colorado newspapers was also conducted. Findings suggest a high degree of social tolerance or desire for wolf reintroduction in Colorado across geographies, stakeholder groups, and demographics. Media coverage focused only on a few of the many perceived positive and negative impacts of wolf reintroduction identified among the public.

Notwithstanding an intense and deep-pocketed campaign in opposition, the ballot measure prevailed in the November 2020 election, albeit not by the large margin anticipated. Accordingly, the Colorado Parks and Wildlife Commission has been directed to create a plan to reintroduce wolves, hold public hearings to gather input on the plan, and commence reintroduction by the end of 2023. Insight into the surprisingly slim margin can be found in this Grist article, "<u>Colorado voted to bring back wolves. Why was the race so close?</u>"

 Niemiec R, Berl REW, Gonzalez M, Teel T, Camara C, Collins M, Salerno J, Crooks K, Schultz C, Breck S, Hoag D. 2020. Public perspectives and media reporting of wolf reintroduction in Colorado. *PeerJ* 8:e9074 https://doi.org/1.

# Measurable Economic Benefits Accompanying Wolf Restoration

Wolves on the landscape deliver tangible economic benefits, both in terms of tourism money spent and money saved. Regarding the former, the desire to see free ranging large carnivores like wolves in their natural habitat is a driver of tourism in protected areas around the globe, delivering multimillions of dollars annually in tourism expenditures. Given the significant economic benefits accompanying wolf recovery and attendant wolf-viewing opportunities for tourists, state and regional wildlife management policies should consider the tradeoffs of allowing the hunting and trapping of wolves in areas adjacent to protected areas, given ensuing reductions in wolf sightings. In support, a 2016 report from the U.S. Fish and Wildlife Service shows that hunting numbers across the country have declined by 16%, with big game hunters declining by 20% since 2011. In the same period, wildlife watchers increased by 20%, with expenditures spent in 2016 totaling \$75.9 billion. In comparison, hunters in 2016 spent far less — \$26.2 billion.

Regarding significant money saved due to the presence of wolves, a recently published economic study establishes that the average drop of 38 deer-vehicle collisions per year in Wisconsin counties with wolves translates to an estimated \$10.9 million in savings each year across the state. By way of comparison, Wisconsin paid about \$3 million over the last 35 years to compensate for wolf damages. There may be other economic benefits not measured by the study such as reductions in damage to agriculture by deer and in Lyme disease frequency.

#### To learn more about national economic impact studies see:

- HuntingBorg BL, Arthur SM, Bromen NA, Cassidy KA, McIntyre R, Smith DW, et al. (2016) Implications of Harvest on the Boundaries of Protected Areas for Large Carnivore Viewing Opportunities. PLoS ONE 11(4): e0153808.
   <a href="https://doi.org/10.1371/journal.pone.0153808">https://doi.org/10.1371/journal.pone.0153808</a>.
- <u>https://www.sciencenews.org/article/gray-wolves-scare-deer-roads-reduce-car-</u> <u>collisions?utm\_source=email&utm\_medium=email&utm\_campaign=latest-newsletter-</u> <u>v2&utm\_source=Latest\_Headlines&utm\_medium=email&utm\_campaign=Latest\_Headlines.</u>

 U.S. Fish and Wildlife Service, "2016, National Survey of Fishing, Hunting, and Wildlife-Associated Recreation," <u>2016 National Survey of Fishing, Hunting, and</u> <u>Wildlife-Associated Recreation</u>.

#### Northern Rocky Mountains — Economic Benefits

When wolves were reintroduced to Yellowstone National Park and central Idaho, economic projections were a part of the initial environmental impact statement prepared for Congress for the proposed reintroduction. Fourteen years later, the results of a follow-up study regarding the economic impacts of wolf recovery in the Yellowstone National Park area yielded figures that far surpassed the original estimates (Duffield et al. 2006, Stark 2006). Based upon study participants who indicated whether they would have come to Yellowstone National Park if wolves were not present, it was determined that the presence of a restored wolf population has brought an additional, average \$35 million annually in tourism expenditures for the local economies of the three-state region. These expenditures, in turn, multiplied effects as they circled through the regional economy, resulting in an estimated total increase in output of about \$70 million annually (Duffield et al. 2006).

#### For more on the economic impact of wolves in the Northern Rockies see:

- Duffield, John W. 1992. An economic analysis of wolf recovery in Yellowstone: Park visitor attitudes and values. In Wolves for Yellowstone? A report to the United States Congress. Vol. 4, research and analysis, eds. John D. Varley, and Wayne G. Brewster, 2-87. Yellowstone National Park, Wyoming: National Park Service, Yellowstone National Park.
- Duffield, John W., and Chris J. Neher. 1996. Economics of wolf recovery in Yellowstone National Park. North American Wildlife and Natural Resources Conference, eds. Kelly G. Wadsworth, and Richard E. McCabe, 285-92. Washington, DC: Wildlife Management Institute.
- Duffield, Jon. W., D. A. Patterson, and C. J. Neher. 2008. Wolf recovery in Yellowstone Park visitor attitudes, expenditures, and economic impacts. Yellowstone Science. 16(1):20-5.

- Weiss, A., Kroeger, T., Haney, J., Fascione, N., "Social and Ecological Benefits of Restored Wolf Populations, Transactions of the 72." North American Wildlife and Natural Resources Conference. 2007. https://wildlifemanagement.institute/sites/default/files/2016-09/11-Social\_and\_Ecological.pdf
- A 2018 study conducted by the University of Wyoming shows that wildlife watchers spent nearly twice (\$364,965,105) that of big game hunters (\$206,337,652) in Wyoming. <u>https://wgfd.wyo.gov/News/Hunting,-fishing-and-wildlife-viewing-are-economic</u>

#### Minnesota — Economic Benefits

Even though the International Wolf Center chose the remote northeastern Minnesota town of Ely as the location to build a world-class wolf-education facility in 1989, the center's draw of visitors to the region brings an estimated \$3 million annually into the local economy, while stimulating the economic equivalent of 66 full-time jobs.

#### To learn more about the economic impacts of wolves in Minnesota see:

- Schaller, D. T. 1996. The eco-center as tourist attraction: Ely and the International Wolf Center. In Tourism center and center for urban and regional affairs. Minneapolis, Minnesota: University of Minnesota.
- Weiss, A., Kroeger, T., Haney, J., Fascione, N., "Social and Ecological Benefits of Restored Wolf Populations, Transactions of the 72" North American Wildlife and Natural Resources Conference. 2007. https://wildlifemanagement.institute/sites/default/files/2016-09/11-Social\_and\_Ecological.pdf

# Alaska — Economic Benefits

Data from the USFWS show that wildlife watchers outnumber hunters in Alaska by a factor of five (640,000 wildlife watchers vs. 125,000 hunters) and wildlife watchers spend much more money in their pursuits; over \$2 billion vs. \$4.3 million annually (USFWS 2011). Wildlife-watching dollars benefit local economies (Duffield et al. 2008).

To learn more about the economic impact of wolves in Alaska see:

www.wolfplanning.org

- "Open Letter to U.S. Department of the Interior Conserve Alaska's Wildlife on our National Preserves," 2018, <u>https://docplayer.net/192820958-Open-letter-to-u-s-</u> <u>department-of-the-interior-conserve-alaska-s-wildlife-on-our-national-preserves-august-</u> <u>2018.html</u>
- Loomis, J. 2016. Economic values of wolves in Denali National Park and Preserve (DNPP): Concepts, literature synthesis, data gaps and study plan. <u>https://irma.nps.gov/DataStore/DownloadFile/559165</u>.

#### Wisconsin — Economic Benefits

Researchers quantified the effects of wolf restoration by evaluating its influence on deer-vehicle collisions in Wisconsin. For the average county, the entrance of wolves into that county reduced deer-vehicle collisions by 24%, yielding an economic benefit that is 63 times greater than the costs of verified wolf predation on livestock in that county. Most of the reduction is due to the behavioral response of deer to wolf presence, *i.e.*, the "landscape of fear" created by having a predator on the landscape, as opposed to being due to deer population decline from wolf predation. (Raynor et al. 2021). Note: This economic evaluation does not even include an analysis of the added savings from medical and car insurance bills or lost wages from being hurt in such a collision which, in combination, are likely to be significant.

 Raynor, J.L., Grainger, C.A. and D.P. Parker. 2021. Wolves make roadways safer, generating large economic returns to predator conservation. Proceedings of the National Academy of Sciences. <u>DOI: 10.1073/pnas.2023251118</u>

#### **National Park Service - Economic Benefits**

The National Park Service tracks the economic impact of National Park visitation on communities near the Park. No hunting is permissible in National Parks, providing an opportunity to ascertain how much is spent exclusive of hunting.

To learn more on the economic impact of visitors to national parks on local economies:

 <u>Visitor Spending Effects</u> - Economic Contributions of National Park Visitor Spending -<u>Social Science (US National Park Service)</u>

# Demographic and Values Gap Growing between Wildlife Agencies and the American Public

Wildlife agencies typically rely upon and tout their reliance on the North American Model of Wildlife Conservation (NAM). The NAM's seven tenets support a hunter/hunting-focused form of wildlife conservation:

- 1. Wildlife as Public Trust Resources.
- 2. Elimination of Markets for Game.
- 3. Allocation of Wildlife by Law.
- 4. Wildlife Should Only be Killed for a Legitimate Purpose.
- 5. Wildlife is Considered an International Resource.
- 6. Science is the Proper Tool for Discharge of Wildlife Policy.
- 7. Democracy of Hunting.

Wildlife agencies and other proponents of the NAM emphasize the important role of hunters and hunting in conserving wildlife, largely failing to acknowledge significant conservation contributions made by other stakeholders or through other forms of interest in wildlife. Reliance on the NAM by wildlife agencies empowers hunters and marginalizes non-hunting wildlife conservationists in decision making pertaining to wildlife policy. This ultimately hinders the development of a more holistic, progressive form of wildlife conservation.

For more information on the values gap see summaries and citations below:

- Serfass, T., Brooks, R., Bruskotter, J., North American Model of Wildlife Conservation: Empowerment and Exclusivity Hinder Advances in Wildlife Conservation, CWBM 2018: Volume 7, Number 2; <u>https://wolfwatcher.org/resources/hunting-wolves/north-american-model-of-wildlife-conservation-empowerment-and-exclusivity-hinder-advances-in-wildlife-conservation/</u>
- The importance of wildlife watching in wildlife conservation is growing. Total wildlife watching expenditures were \$76 billion in 2016, three times higher than all hunting

related expenditures. Participation in wildlife watching is now seven times higher than hunting participation. Murray, C.K. (2019). *Trophy hunters of native carnivores benefit from wildlife conservation funded by others*. A report for the Humane Society of the United States. Brisbane, Australia.

https://www.humanesociety.org/sites/default/files/docs/HSUS\_Trophy-Hunting-Economics-2020.pdf

- Governance models that are not in concert with contemporary societal needs or address only limited special interests risk having the wildlife management enterprise lose relevance to society. Organ J.F., V. Geist, S.P. Mahoney, S. Williams, P.R. Krausman, G.R. Batcheller, T.A. Decker, R. Carmichael, P. Nanjappa, R. Regan, R.A. Medellin, R. Cantu, R.E. McCabe, S. Craven, G.M. Vecellio, D.J. Decker. (2012). The North American model of wildlife conservation. *The Wildlife Society Technical Review 12-04*. The Wildlife Society, Bethesda, Maryland, USA. <a href="https://wildlife.org/wp-content/uploads/2014/05/NA-model-summary.pdf">https://wildlife.org/wp-content/uploads/2014/05/NA-model-summary.pdf</a>
- Introduced principles of governance in the context of NAM that propose that good wildlife governance models will "seek and incorporate multiple and diverse perspectives." Decker, D., Smith, C., Forstchen, A., Hare, D., Pomeranz, E., Doyle-Capitman, C., & Organ, J. (2016). Governance principles for wildlife conservation in the 21st century. *Conservation Letters*, 9(4), 290-295.

https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/conl.12211

- The key to engaging more diverse audiences begins with understanding and honoring diverse ideals of human-wildlife relationships. Peterson, M. N., & Nelson, M. P. (2017). Why the North American Model of Wildlife Conservation is problematic for modern wildlife management. *Human Dimensions of Wildlife*, 22(1), 43-54. https://www.tandfonline.com/doi/abs/10.1080/10871209.2016.1234009
- Although federal, state, and local governments are tasked with serving broad constituencies, in practice government resource agencies or the appointed government boards that rule them have traditionally favored narrower constituencies within the public. Bergstrom, B. J. (2017). Carnivore conservation: shifting the paradigm from control to coexistence. *Journal of Mammalogy*, *98*(1), 1-6. DOI:10.1093/jmammal/gyw185

- Hunters and trappers now make up a small minority of the United States population. The future role of hunting in America depends critically on the hunting community being able to explain to nonhunters why hunting and trapping is a value and honor to American culture and conservation. Given these circumstances, one should expect that moving forward with a wolf hunt in Michigan would harm the good honor of hunting and wildlife management and erode trust between citizens and stewards of wildlife. Vucetich, J.A., Bruskotter, J. T., Nelson, M. P., Peterson, R.O., and Bump, J.K. (2017). Evaluating the principles of wildlife conservation: A case study of wolf (*Canis lupus*) hunting in Michigan, United States. *Journal of Mammalogy*, *98*(1). Pages 53–64. https://doi.org/10.1093/jmammal/gyw151.
- U.S. Census Bureau (2018) estimates show that, by 2045, what are now minority populations will in aggregate outnumber white, non-Hispanic populations in the United States. Yet, while diversity continues to grow across the U.S., the wildlife profession continues to be dominated by white (91% in our agency survey) males (72% in our agency survey). Additional findings suggest that the composition and values of agencies do not readily reflect the changing values of the public. Manfredo, M. J., Sullivan, L., Don Carlos, A. W., Dietsch, A. M., Teel, T. L., Bright, A. D., & Bruskotter, J. (2018). *America's wildlife values: The social context of wildlife management in the U.S.* National report from the research project entitled "America's Wildlife Values". Fort Collins, CO: Colorado State University, Department of Human Dimensions of Natural Resources. <a href="https://sites.warnercnr.colostate.edu/wildlifevalues/wp-content/uploads/sites/124/2019/01/AWV-National-Final-Report.pdf">https://sites.warnercnr.colostate.edu/wildlifevalues/wp-content/uploads/sites/124/2019/01/AWV-National-Final-Report.pdf</a>

# State-sanctioned Wolf Killing Fails to Promote Social Acceptance for Wolves

#### Hunting Wolves Does Not Increase Tolerance

Studies and surveys have indicated there is no increased tolerance for wolves in areas that allow wolf-hunting. Wolf hunting and increasing wolf hunting does not buy goodwill for wolves from hunting and livestock/agricultural communities; in fact, evidence indicates that allowance of wolf hunting is associated with a decrease in tolerance for wolves.

#### For more information on hunting and tolerance see summaries and research below:

- Survey data indicate that wolf hunters in Montana were no more tolerant of wolves after the 2011 wolf hunting season than they were before. Lewis, M. S., Pauley, G., Kujala, Q., Gude, J., King, Z., & Skogen, K. (2012). Summary of research: Selected results from four separate surveys of resident Montanans regarding Montana's wolf hunt. *HD Unit Research Summary No. 33*. Montana Fish Wildlife & Parks. Retrieved from: <u>https://fwp.mt.gov/binaries/content/assets/fwp/conservation/wildlife-</u> reports/wolf/final-hd-unit-research-summary-no-33-wolf-surveys.pdf
- No evidence for the claim that allowing higher quotas of legal hunt resulted in reduced rates of poaching. Treves, A. (2009). Hunting for large carnivore conservation. *Journal of Applied Ecology*, *46*(6), 1350-1356.
- Attitudes toward wolves tended to be more negative during a period when legal lethal control had been allowed than when wolves had been fully protected. Treves, A., NAUGHTON-TREVES, L. I. S. A., & Shelley, V. (2013). Longitudinal analysis of attitudes toward wolves. *Conservation Biology*, 27(2), 315-323. https://conbio.onlinelibrary.wiley.com/doi/abs/10.1111/cobi.12009
- Concluding that liberalizing wolf culling did not improve tolerance or change inclinations to poach wolves and was associated with more frequent or vociferous calls for yet more wolf culling and public hunting and trapping. Browne-Nuñez, C., Treves, A., MacFarland, D., Voyles, Z., & Turng, C. (2015). Tolerance of wolves in Wisconsin: a mixed-methods examination of policy effects on attitudes and behavioral inclinations. *Biological Conservation*, *189*, 59-71.
   <u>https://www.sciencedirect.com/science/article/abs/pii/S0006320714004959</u> Molvar,

E. (2019). Social tolerance for wolves (and ranchers). *The Wildlife News*. <u>http://www.thewildlifenews.com/2019/08/01/social-tolerance-for-wolves-and-ranchers/</u>

- Hogberg, J., Treves, A., Shaw, B., & Naughton-Treves, L. (2016). Changes in attitudes toward wolves before and after an inaugural public hunting and trapping season: early evidence from Wisconsin's wolf range. *Environmental Conservation*, 43(1), 45-55. <u>https://www.cambridge.org/core/journals/environmentalconservation/article/changes-in-attitudes-toward-wolves-before-and-after-aninaugural-public-hunting-and-trapping-season-early-evidence-from-wisconsins-wolfrange/D9C2508CBFEDF41E9CE497A574A0CBB
  </u>
- Chapron, G., and Treves, A. (2016). Blood does not buy goodwill: Allowing culling increases poaching of a large carnivore. *Proceedings of the Royal Society B: Biological Sciences, 283*(1830), 20152939.
   https://royalsocietypublishing.org/doi/full/10.1098/rspb.2015.2939.
- Finland study finds that "culling" (permit-based hunting) does not increase social tolerance of wolves even in rural areas, and legal hunts (in an open season) do not reduce the long-term incidence of wolf poaching; the authors concluded that culling instead seems to maintain the social acceptance of aversion towards wolves.
   Laaksonen, M., and Sánchez Molina, F. (2018). Keeping the wolf from the door: Analysis of derogation-based wolf hunting permits in Finland. *Luonto-Liiton susiryhimä/The Wolf Action Group*.

http://www.luontoliitto.fi/susiryhma/greypride/KeepingtheWolffromtheDoorLaakson enLLSR2018UD.pdf

 Santiago-Avila, F., Chappell, R., Treves, A. (2020). Liberalizing the killing of endangered wolves was associated with more disappearances of collared individuals in Wisconsin, USA. *Scientific Reports*, 10(1), 1-14. https://www.nature.com/articles/s41598-020-70837-x

# <u>Social Science Reveals American Public Opposition to Trapping, Trophy Hunting, and</u> <u>Other Extreme Lethal Measures</u>

Surveys and census results nation-wide provide independent and consistent indicators of the increasing disaffection on the part of the American public to trapping, trophy hunting, and other lethal measures directed against wildlife, including wolves.

The following findings and case studies point to a profound and ongoing shift in the values, beliefs, and attitudes informing perspectives and priorities vis-a-vis wildlife in the United States. In a democratic society like the United States, it is incumbent upon state wildlife agencies to support wildlife policies that respect and reflect this change in priorities.

#### To learn more about public opposition of lethal control methods see:

- Surveys of people in the United States consistently reveal public resistance and antipathy to trapping wildlife, including use of snares and leghold traps on canids like wolves. Concerns of this nature are not limited to the United States. In the early 1990s, the European Union implemented a ban on leghold traps and other methods that do not meet agreed-upon humane trapping standards (Council Regulation (EEC) No. 3254/91).
- 85% of respondents stated that they would not be likely to purchase a license to hunt or trap a wolf. Lute, M., Gore, M., Nelson, M., Vucetich, J. (2010). Toward improving the effectiveness of wolf management approaches in Michigan: insights from a 2010 statewide survey. Michigan State University. 9-10. <u>http://news.msu.edu/media/documents/2012/03/0e32cad7-596c-4c87-a843-</u> <u>7d2823ce813d.pdf</u>
- When it comes to taxpayer money in managing wolves and livestock, 59% in ID, 54% in MT, and 58% in WY preferred non-lethal prevention as opposed to trapping and killing. Defenders of Wildlife/ Greater Yellowstone Coalition/ Resource Media Northern Rockies Survey Frequency Questionnaire (2008). Greenberg Quinlan Rosner Research. 14-15.

# STATE SPOTLIGHT: MINNESOTA

Minnesota's 2019 Public Survey of "values, beliefs, and attitudes" towards wolves and wolf management was based on questionnaires distributed to 9,750 individuals, including 5,250 residents, 2,000 deer hunters, and 2,500 livestock producers in wolf range.

Of the Minnesota residents (non-livestock operators, non-deer hunters) surveyed in 2019, 49% of respondents opposed establishing a state regulated wolf hunt, while a far larger proportion (58%) indicated that they opposed a regulated wolf trapping season. In Minnesota, 87% of residents, 66.8% of hunters, and 47.3% of livestock producers agree that maintaining a wolf population in the state is important.

 Schroeder, S. A., Landon, A. C., Cornicelli, L., McInenly, L., & Stark, D. (2020). Minnesotans' attitudes toward wolves and wolf management. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology.

https://www.dnr.state.mn.us/mammals/wolves/attitudes-about-wolves.html

For information on public opposition to certain types of hunting (viewed as antithetical to conservation values and/or humane conduct) see below studies and summaries:

- Shows that a majority of respondents irrespective of age, gender, region or political affiliation opposed trophy hunting and killing animals for their fur. Poll conducted by Research Co. on Animals in the United States Sept. 22, 2020. <u>https://researchco.ca/wp-content/uploads/2020/09/Tables\_Animals\_USA\_22Sep2020.pdf</u>
- According to this 2017 public attitudes study, lethal predator controls such as shooting animals from aircraft (aerial gunning), neck snares, gassing of pups in dens, leg-hold traps, and poisons are unpopular with the American public. K. Slagle et al., "Attitudes toward Predator Control in the United States: 1995 and 2014," Journal of Mammalogy 98, no. 1 (Feb 2017), <u>http://dx.doi.org/10.1093/jmammal/gyw144</u>.

- "Washington Residents Opinions on Bear and Wolf Management and Their Experiences With Wildlife That Cause Problems," Responsive Management, May 2014, <u>https://wdfw.wa.gov/publications/01594</u>
- "Open Letter to U.S. Department of the Interior Conserve Alaska's Wildlife on our National Preserves," 2018, <u>https://docplayer.net/192820958-Open-letter-to-u-s-</u> <u>department-of-the-interior-conserve-alaska-s-wildlife-on-our-national-preserves-august-</u> <u>2018.html</u>
- A majority of the 1,399 statewide Alaskan voters polled by Remington Research Group (2016) from Feb. 24 to Feb. 25, 2016, showed that voters strongly support an end to methods used to kill Alaska wildlife: Voters opposed 1) bear baiting (50% oppose vs. 39% support); 2) the practice of killing wolves, coyotes and bears at den sites when they are with their dependent young (63% oppose vs. 30% support); 3) trapping of bears (58% oppose vs. 37% support); and 4) aerial gunning bears or using aircraft to scout bears from the air and then land and shoot them (59% oppose vs. 35% support) (Remington Research Group 2016). "Alaska Public Opinion Poll," Remington Research Group 2020 <a href="https://www.humanesociety.org/sites/default/files/docs/AK%20PUBLIC%20OPINION%20SURVEY%2008052020.pdf">https://www.humanesociety.org/sites/default/files/docs/AK%20PUBLIC%20OPINION%20SURVEY%2008052020.pdf</a>
- Survey conducted Aug. 3 through Aug. 5, 2020 of 984 likely 2020 General Election voters in Alaska. Public Policy Polling. (May 2019). National survey results. <a href="https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Poll-National-Results-May-2019.pdf">https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Poll-National-Results-May-2019.pdf</a>
- Survey of 555 registered voters in 2019, 58% of respondents opposed allowing more trophy hunting of wolves. With respect to wolf trapping, the majority (63%) of respondents opposed. Oregon Voter Survey, Mason-Dixon Polling & Research, September 2016, commissioned by the Pacific Wolf Coalition.
- Survey of eight hundred (800) registered Oregon voters, 72% of respondents opposed "changing Oregon law to allow trophy hunting of wolves." <u>www.pacificwolves.org/wp-</u> <u>content/uploads/2016/10/OREGON-WOLVES-SURVEY-9-2016-PWC.pdf</u>
- John A. Vucetich, Jeremy T. Bruskotter, Michael Paul Nelson, Rolf O. Peterson, Joseph K. Bump, "Evaluating the principles of wildlife conservation: a case study of wolf (*Canis*)

*lupus*) hunting in Michigan, United States," Journ*al of Mammalogy*, Volume 98, Issue 1, 8 February 2017.

# STATE SPOTLIGHT: MICHIGAN

In the 2014 Michigan general election, Michigan citizens <u>overturned</u> two wolf hunt bills that were on the ballot, demonstrating strong opposition on the part of the state's voters to wolf trophy hunting and trapping. In fact, 606,328 citizens cast ballots opposing a wolf hunting and trapping season in Michigan (Proposal 1) and in opposition to an unelected commission designating the wolf as a game animal (Proposal 2).

During that same period, the Michigan legislature approved a ballot countermeasure to reauthorize a wolf hunt, with the deceptive name of the "Scientific Fish and Wildlife Conservation Act." The measure was supported by the hunting and trapping lobby group Michigan United Conservation Clubs, whose former Executive Director is now the Director of the Michigan Department of Natural Resources. That measure was <u>overturned</u> in late 2016 as unconstitutional by the Michigan Court of Appeals, but was quietly <u>re-passed</u> just one month later by the Michigan legislature—this time without public hearings, to avoid the outrage of the state's citizens who had already rejected two wolf hunting laws.

# **Chapter 3 ...TRIBAL VALUES, RIGHTS & SOVEREIGNTY IN RELATION TO WOLF CONSERVATION**

# Key Chapter Takeaways:

- 1. Recognition of Tribal Sovereignty, Respect for Tribal Rights and Values, and Recognition and Integration of Traditional Ecological Knowledge.
- 2. State elected officials and agency staff must honor the legal requirement of Governmentto-Government Consultation pursuant to Tribal Treaty rights with Tribes in the state. This includes every Tribe in the state that is either within or outside of wolf range with cultural ties to wolves. Tribal treaties vary, but they all require consultation between state and federal entities with the Tribes.
- 3. State wildlife agencies must take into consideration the effect that state wolf plans, and policies, have on the ecosystems on which Tribes rely. In the ceded territories, where Tribes have **usufructuary rights**, their exercise of reserved rights is dependent on the existence of healthy landscapes and waterways. In the Great Lakes region, for example, the presence of wolves (ma'iingan) is essential to the presence of many other species important for subsistence.
- 4. States should respect and coordinate with Tribes' Wildlife Management Plans and consult with Tribes within wolf range on issues such as whether to designate **buffer zones** around reservations that prohibit wolf hunting and trapping to protect reservation wolves.
- States should maintain wolf populations on ceded lands in collaboration with sovereign Tribes at levels that maximize the ecological benefits wolves provide and which protect treaty-reserved rights.
- 6. In addition to required government-to-government consultation on wolf issues, states should afford every Tribe located in the state with the opportunity to participate in the plan decision-making process, such as participation on a public advisory group. No interested Tribe, within the state, should be denied a seat at the table.

# **Overview of Tribal Treaty Rights: Legal Imperative of Sovereign Consultation**

The U.S. Constitution defines treaties as part of the supreme law of the land, with the same legal force as federal statutes. Treaties are to be interpreted in accordance with the federal Indian canons of construction, a set of long-standing principles developed by courts to guide the interpretation of treaties between the U.S. government and Indian tribes. As held by the Supreme Court, treaties should be construed liberally in favor of tribes, giving effect to the treaty terms as tribes would have understood them, with ambiguous provisions interpreted for their benefit.

"For the Ojibwe, Ma'iingan (meaning Gray Wolf in Anishinaabemowin) is not a "resource" to be managed but is considered a brother. Thus, the Board and Task Force strongly object to any action taken by the United States, and the separate states that fails to incorporate the sacred obligation we have as human beings to protect Ma'iingan, promote understanding of its critical role in natural systems and ensure the long-term health of Ma'iingan populations, at their natural carrying capacity and within historic ranges." (*see GLIFWC letter dated July 10, 2019, Opposing Delisting Rule*).

#### For more information on treaties see:

- 1. Minnesota v. Mille Lacs Band of Chippewa, 526 U.S. 172 (1999).
- Resource: Treaties between United States and Native Americans, Yale Law School, Avalon Project: <u>https://avalon.law.yale.edu/subject\_menus/ntreaty.asp.</u>
- 3. This EPA Guidance focuses on consultation in the context of treaties. "For purposes of this Guidance, the treaty rights most likely to be relevant to an EPA action are rights related to the protection or use of natural resources or related to an environmental condition necessary to support the natural resource, that are found in treaties that are in effect." This Guidance provides assistance on consultation with respect to EPA decisions focused on specific geographic areas when tribal treaty rights relating to natural resources may exist in, or treaty-protected resources may rely upon, those areas. For any treaty rights discussion raised during consultation, the tribe may identify particular tribal officials to consult with EPA about treaty rights. It is important that
EPA work to ensure that consultation occurs with the appropriate tribally identified officials. "EPA Guidance on Consultation and Coordination with Indian Tribes" <u>https://www.epa.gov/sites/production/files/2016-</u>02/documents/tribal\_treaty\_rights\_guidance\_for\_discussing\_tribal\_treaty\_rights.pdf.

- 4. National Indian Law Library "How to find Treaties" https://narf.org/nill/triballaw/treaties.html
- 5. McClurken, James, Fish in the Lakes, Wild Rice, and Game in Abundance: Testimony on Behalf of Mille Lacs Band of Ojibwe Hunting and Fishing Rights.
- 6. "Origins" chapter of *Expanding the Circle of Care*, 2020, by Philomena Kebec, Courtney Remacle Aurora Conley, Sean Akerman, and Ana Tochterman.
- 7. <u>https://www.glifwc.org/</u>
- 8. https://www.GLIFWC.org/publications
- 9. Loew, Patty, Thannum, Jim, After the Storm: Ojibwe Treaty Rights Twenty-Five Years After the Voigt Decision, American Indian Quarterly, vol. 25, no 2 (Spring 2011).
- Satz, Ronald. Chippewa Treaty Rights—The Reserved Rights of Wisconsin's Chippewa Indians in Historical Perspective. Madison, WI: Wisconsin Academy of Sciences, Arts and Letters, 1991.
- Zappfe, Carl A. Minnesota's Chippewa Treaty of 1837. Brainerd, MN: Historic Heartland Association, 1994.
- 12. Williamson, C., Ojibwe and Canis Lupus: cultural, historical, and political influences on contemporary wolf management in the Great Lakes region, 2011 Lawrence University. <u>https://lux.lawrence.edu/cgi/viewcontent.cgi?article=1038&context=luhp.</u>

#### Spotlight: Ojibwe Treaty Rights, a Timeline

<u>1820s</u>: representatives of the United States came to Anishinaabe territory ostensibly seeking alliance. The Hereditary Chiefs, weighing their options, determined that forming an alliance was preferable to engaging in war against the United States. In a series of treaties with the United States, the Lake Superior Chippewa gave up control of millions of acres of land in exchange for certain promises: they would receive specific sums of money and supplies (annuity payments), healthcare and education, and would retain use of our traditional lands in perpetuity.

<u>Treaties of 1837, 1842, and 1854:</u> between the United States Government and the Ojibwe, established ceded territory that secured lands for non-native Americans to be used for timber, mining and agricultural purposes. In these treaties, the Ojibwe allowed Americans to use the land, yet they reserved the right to hunt, fish, and gather on the ceded lands. (Satz 1991; Zappfe 1994).

<u>1983 Voigt Decision</u>: the U.S. Court of Appeals for the Seventh Circuit upheld Ojibwe treaty rights and clarified that Ojibwe are entitled to 50% of the allowable harvest of all the resources in ceded areas, excluding timber.

<u>GLIFWC's creation in 1984:</u> The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) was formed to retain the treaty rights reaffirmed in the Voigt Decision. Eleven-member tribes in Wisconsin, Minnesota and Michigan created GLIFWC to assist tribal governments with conservation and management of tribal resources in the ceded territories in the Great Lakes region. GLIFWC works on behalf of the off-reservation interests of its member tribes, to protect the resources in ceded territories so that tribal members can continue to actualize their treaty rights.

<u>Today:</u> Treaty rights remain a powerful legal means for Ojibwe to have a voice with respect to state government policies concerning wildlife within the ceded territory. Under the treaties and the Voigt Decision, Ojibwe are granted the right to provide input on matters relating to land management and wildlife within the ceded territory, including input with respect to states' wolf management policies.

## Tribes' Cultural Values & World View Related to Wildlife

#### **Overview of Indigenous World View**

Many Indigenous peoples see nonhuman animals as purposeful active beings with their own power, knowledge, and relationships. In many Indigenous cultures—like those of the Inuit, Dene, and Ojibwa—people are taught to approach nonhumans with humility and respect and to be thankful to the animals for gifting them with their lives and providing them with sustenance (Asch 1989; Gombay 2014; LaDuke 1999; McPherson and Rabb 2011). Indigenous people's hunter-gatherer lifestyles provided them with an intimate knowledge of their dependency on other life, from predators to prey, providing them with a wealth of knowledge on how to coexist with wolves and other wildlife.

These worldviews are in marked contrast with the Anglo-American viewpoint, expressed within the North American Model of Wildlife Conservation, which conceptualizes the primary relationship between humans and nonhumans as one in which nonhumans are dominant and animals are considered available for human use — for entertainment, food, etc.

#### For more information on indigenous world views see:

- Eichler, L. & Baumeister, D. (2018). Hunting for justice: An indigenous critique of the North American model of wildlife conservation. *Environment and Society*, 9(1). https://doi.org/10.3167/ares.2018.090106.
- Doerfler, J., Sinclair, N. J., & Stark, H. K. (Eds.). (2013). *Centering Anishinaabe studies: Understanding the world through stories*. Michigan State University Press.

#### **Traditional Ecological Knowledge (TEK)**

Studying and considering diverse knowledge systems, including Traditional Ecological Knowledge (TEK), can benefit wildlife professionals in selecting value systems that result in the least harm to ecosystem and indigenous lifeways. (Lynn, 2006) TEK and Western science share commonalities, including focusing on empirical observation, pattern recognition, knowledge organization, cycles, and culturally specific biases, arguments, and explanations (Gartner, 2019). By understanding commonalities and differences, advocates and wildlife agency professionals can

better understand how to draw from both science and TEK to accomplish effective wolf conservation and educational outreach.

While there is no one definition of TEK (Whyte, 2013), TEK most often reflects phenological knowledge that traditional hunters and trappers cultivate from experiences on the land. Hunter-gatherer lifestyles gave many indigenous peoples an intimate knowledge of their dependency on other life, from predators to prey animals (Gartner, 2019).

For example, Anishinaabe have learned skills and morals from animals, including knowledge in coexisting with Ma'iingan (wolves) and other wildlife. In addition to the Anishinaabe creation story of Ma'iingan, various other stories involve Ma'iingan teaching lessons to Anishinaabeg (Benton-Banai, 1988; Usik, 2015). These stories often reflect the environmental values traditionally held by Anishinaabeg and shed light on how they successfully co-inhabited with Ma'iingan over the thousands of years. (Usik, 2015). In marked contrast to Western attitudes of dominance over the natural world, Anishinaabe stories exemplify that humans depend on other members of their ecosystem to survive (Usik, 2015).

Issues including carnivore coexistence are thus best addressed with the combined strengths of Western science in tangible fact-finding and TEK in reaching the necessary value-laden decisions with a strong ethical backing (Lynn, 2006).

## For more information on Traditional Ecological knowledge see:

- Fergus, A. (2020). Building Carnivore Coexistence on Anishinaabe Land: Gold Standard Non-Lethal Deterrent Research and Relationship Building Between Livestock Farmers and the Bad River Band of the Lake Superior Tribe of Chippewa Indians (Master's thesis). University of Wisconsin-Madison. <u>http://www.badriver-nsn.gov/wpcontent/uploads/2021/02/Fergus-Masters-Thesis.pdf</u>.
- Lynn, William S. 2006. "Between Science and Ethics: What Science and the Scientific Method Can and Cannot Contribute to Conservation and Sustainability". In Gaining Ground: In Pursuit of Ecological Sustainability, edited by David Lavigne, 191-205. Limerick, IRL: University of Limerick.

- Gartner, W. (2019, February 22). Traditional Ecological Knowledge. Lecture presented at Natural Resources in Native North America, Madison.
- Whyte, K. P. (2013). On the role of traditional ecological knowledge as a collaborative concept: a philosophical study. Ecological Processes, 2(1). doi: 10.1186/2192-1709-2-7.
- Whyte, K. (2019). Too late for indigenous climate justice: Ecological and relational tipping points. Wiley Interdisciplinary Reviews: Climate Change, 11(1). doi: 10.1002/wcc.603.
- Benton- Benai, E. (1988). The Mishomis book: The voice of the Ojibway Hayward. Hayward, WI: Indian Country Communications.
- Usik, Katherine Anne. "The hunt for Ma'iingan: Ojibwe ecological knowledge and wolf hunting in the Great Lakes." MA (Master of Arts) thesis, University of Iowa, 2015. <u>https://doi.org/10.17077/etd.hxfiyzqg</u>.

## Tribes' Relationship and Cultural Affinity with Wolves

Wolves have played an important role in the heritage of most Native American tribes across the United States, from the Pacific Northwest tribes to the Algonquin tribes on the east coast. The wolf is an important cultural figure and is viewed as being largely a positive animal. The wolf appears throughout tribal origin stories and is usually portrayed as a powerful being mostly possessing admirable qualities such as courage, strength, wisdom, family devotion, and the ability to work cooperatively with his fellow kin.

Many tribes recognize the wolf as the master predator and consequently associate it with war and hunting. Some tribes have warrior and hunting societies named after the wolf whose members receive their powers from the animal. Other tribes recognize the wolf as being a powerful animal spirituality. Thus, shamans and medicine societies often associate themselves with the animal and seek to draw from the wolf's power to heal.

In one example, according to the Anishinaabe (Ojibwa First People) creation story, original man was the last creature that the Creator sent to earth. Original Man was sent his brother, Ma'iingan (Ojibwa name of the wolf) as a companion. They traveled together to visit and name all plants, animals, and places on earth. As they finished their journey, they were instructed by the Creator to walk their separate paths but that they would forever be linked to one another. They were to experience similar social pressure of being feared, respected and misunderstood. What happens to the Anishinaabe will happen to Ma'iingan by the people that would join them on earth (Benton-Banai 2010). Tribal elder Earl Ojiingwaanigan speaks of the wolf as "brothers in fate" and that killing wolves will lead to a similar destructive fate for Ojibwa people. (Ojiingwaanigan 2012).

### For more information on the cultural significance of wolves to tribes see:

- Barry Holstun Lopez, Of Wolves and Men (New York: Charles Scribner's Sons, 1978); (chapters 5 and 6).
- Pavlik, S., "San Carlos and White Mountain Apache Attitudes toward the Reintroduction of the Mexican Wolf to Its Historic Range in the American Southwest, Wicazo Sa Review, Spring, 1999, Vol. 14, No. 1 <u>https://www.jstor.org/stable/1409520</u>
- Keweenaw Bay Indian Community (KBIC) Wolf Pamphlet, <u>http://nrd.kbic-nsn.gov/sites/default/files/Wolf-Pamphlet.pdf</u>
- GLIFWC letter dated July 10, 2019, Opposing Delisting Rule.<u>https://earthjustice.org/sites/default/files/files/GLIFWC%20Comments%20on%20</u> <u>Wolf%20Delisting%20with%20Resolution.pdf</u>

## **Regional Tribal Spotlights**

#### Great Lakes Region: Red Lake Band of Chippewa Indians, Minnesota

The present-day Red Lake Indian Reservation, located in north-central Minnesota, has total land holdings of over 843,000 acres. It is the largest Reservation in the U. S. Bureau of Indian Affairs' (BIA) Midwest Region, accounting for 55% of all Indian land. Holdings are distributed across more than 10,000 square miles, in eight counties.

The wolf represents a Clan of the Red Lake Band of Chippewa and the importance of wolves in Chippewa culture is highlighted in legends and oral history. Tribal Spiritual leaders and elders speak of the parallel fates of wolves and native people. Many believe that if wolves prosper, the people of Red Lake will prosper, and if wolf populations suffer, so will the Red Lake Nation.  See Wolf (Ma'iingan) Management Plan of Red Lake Band of Chippewa Indians, https://www.redlakednr.org/wpcontent/uploads/Wolf Management Plan\_RED\_LAKE\_final\_version.pdf

#### Northern Rockies: Nez Perce Tribe, Idaho

When the Idaho legislature precluded its state fish and game department from cooperating in any manner with federal officials on wolf reintroduction, the Nez Perce tribe exercised its sovereignty. An agreement was reached between the FWS and the Nez Perce for the tribe to assume the responsibility for the management of wolf reintroduction for the entire state.

Cultural considerations played a major role in the case of the Nez Perce tribe's willingness to assume management of Idaho's wolf recovery program. The wolf had historically played a central role in the lives of the Nez Perce people, who admired it and felt a kinship toward the animal.

To the Nez Perce, the return of the wolf symbolizes their own struggle to survive as a people — a powerful icon in a cultural renaissance movement. Jaime Pinkham, a tribal member who serves as the manager of the Nez Perce Department of Natural Resources, noted that the wolf is a kind of a mirror for Indian people: When the non-Indian settled the West, they were obstacles. The Nez Perce people were one of them: They got in the way — and they were removed. The gray wolf suffered a similar fate. Now, man and animal are each struggling to regain their rightful place. Pinkham went on to comment:

"We're not given all the wisdom and strength we need, so we turn to our elders, the animals. We need to concede to Nature's wisdom. We take from the wolf a sense of survival. Look at everything the wolf has had to struggle with. Look at its tenacity. Look at how omegas, the submissive wolves in a pack, are treated. Perhaps there's a lesson here."

Horace Axtell, a tribal elder who performed a blessing ceremony over the wolves upon their return to the Nez Perce country, added this perspective:

"We traveled in bands, they traveled in packs. When people on a journey heard a wolf, they'd get up early and head toward the sound; there was game there. The wolf was telling them where to go. For a long while, wolves were missing. Now they're back. The circle of life is stronger."

- See Pavlik, S., "San Carlos and White Mountain Apache Attitudes toward the Reintroduction of the Mexican Wolf to Its Historic Range in the American Southwest, Wicazo Sa Review, Spring, 1999, Vol. 14, No. 1 <u>https://www.jstor.org/stable/1409520</u>
- *See* Jim Robbins, "Return of the Wolf: A Biological Recovery Becomes a Cultural Victory for the Nez Perce Tribe," Wildlife Conservation, April 1997, 14.

### **Other Tribes with Cultural Affinity for Wolves**

- The Tsistsistas, or Cheyenne as they are more commonly known, possess a special relationship to wolves. Tsistsistas tribal members were known to fashion their identity and behavior after the wolf an animal who often selected that human individual with which to form a bond.
- White Earth Tribe, lead the initiative to create Ma'iingan sanctuaries.
- Grand Portage Tribe, participates in Isle Royale Ma'iingan work.
- White Mountain Apache Tribe, hosted the wolf reintroduction on the Fort Apache Indian Reservation.

#### **Recognize Tribes without Cultural Affinity for Wolves**

- Confederated Tribes of the Colville Indian Reservation: <u>https://www.seattletimes.com/seattle-news/northwest/colville-tribes-to-open-hunt-on-wolves-near-canadian-border/</u>
- San Carlos Apache Tribe: The San Carlos Apache Tribe has a policy of demanding removal of all wolves on their reservation.

# Wolf Conservation Planning & Policy should be Respectful and Inclusive of Tribes' Cultural Views and Must Abide by Tribe's Sovereign Rights Indigenous Perspectives on Conservation and Management

Indigenous management philosophies focus on relationships and common interests among species. Instead of considering human beings as the species "in charge," more often human beings are contemplated as dependent on, and benefitting from, the benevolence of other beings who can choose to help humans, or not. To survive, human beings are obliged to conduct themselves respectfully in the world and offer their gratitude for the gifts they receive. (*See* Kimmerer, R. W. (2016). **Braiding sweetgrass**: indigenous wisdom, scientific knowledge and the teachings of plants. Unabridged)

"In order to be involved with wolf conservation, the State and Federal government need to understand how to take care of wolves. That's what the Anishinaabe have done for years by observing and learning. Conservation of wolves is a part of our history. If we allow them to be killed, we allow ourselves to be killed." – Mashkiiziibii Elder Edith Leoso, 2017. (*See* Fergus, A. (2020). *Building Carnivore Coexistence on Anishinaabe Land: Gold Standard Non-Lethal Deterrent Research and Relationship Building Between Livestock Farmers and the Bad River Band of the Lake Superior Tribe of Chippewa Indians* (Master's thesis). University of Wisconsin-Madison.<u>http://www.badriver-nsn.gov/wp-content/uploads/2021/02/Fergus-Masters-Thesis.pdf</u>).

# Improve Upon Failings of the North American Model of Wildlife Conservation

## NAM is Grounded in Values and Ideology of Settler Colonialism

Among both proponents and critics of the North American Model, the interests and views of Native Americans and First Nations have been ignored. The North American Model contributes to environmental injustice via its legitimization of settler colonialism. Rooted in Western conceptions of property, human-animal relations, and science, the North American Model articulates the ideology that is used in conservation and hunting policies that inhibit Native Americans from "achieving a level of environmental quality adequate for indigenous peoples to practice and maintain their self-defined cultural relation to the land and natural environment" (Grijalva 2012: 26). Building on the work of scholars who have argued that such state-based wildlife management programs are colonial (Asch 1989; Egan and Place 2012; Gombay 2014; Kulchyski and Tester 2007; Sandlos 2007; Schneider 2013), authors contend that the principles of the NAM are antithetical to American Indian views of property, nonhuman personhood, and knowledge and limit indigenous sovereignty.

See Grijalva, J. M. (2012). Control and accountability: The twin dimensions of tribal sovereignty necessary to achieve environmental justice for Native America. In S. Krakoff & E. Rosser (Eds.), *Tribes, land, and the environment* (pp. 25-42). Routledge.

### NAM Denigrates and Ignores Tribal Hunting Practices

The fourth principle of the NAM states that "wildlife can only be killed for a legitimate purpose." The authors of the model narrowly define "legitimate purpose" as hunting for sport. Eichler and Baumeister emphasize in their publication that by valorizing sport hunting, the NAM denigrates the practices of subsistence hunting and fishing, which are integral to the livelihood and identity of many Native American cultures.

Native Americans and First Nations, and their perspectives on hunting, appear to be almost totally absent from the scholarly conversations. Native American positions on hunting tend to fall outside the field of established positions, aligning with neither the NAM's defenders nor critics of hunting.

 See L. Eichler, D Baumeister, "Hunting for justice: an indigenous critique of the North American model of wildlife conservation," Environment and Society, Volume 9, Issue 1, 2018, <u>https://doi.org/10.3167/ares.2018.090106</u>.

## <u>States should accede to Tribes' on-reservation wolf management priorities and requests for</u> <u>"Buffer Zones."</u>

It is critical to acknowledge Tribes' Requests for Conservation Co-Management. Where comanagement has occurred between the Great Lakes States and Anishinaabe Bands, wildlife populations have been better off (*See* Busiahn, T., Gilbert, J Gilbert. 2009. *The Role Of Ojibwe Tribes In The Co-management Of Natural Resource In The Upper Great Lakes Region: A Success Story.* GLIFWC, www.glifwc.org/minwaajimo/Papers/Co-management Paper Busiahn By contrast, in Wisconsin under Governor Walker's administration (2011-2018), the Wisconsin DNR ignored multiple Tribes' assertions of Buffer Zones on ceded territory around reservations in which wolves (Ma'iingan) could not be hunted on ceded territory around Reservations (to protect reservations' wolves).

In response to the 2012 written request by the Bad River Band that wolves be protected from planned wolf hunts within a 6-mile buffer zone beyond Reservation boundaries, the Wisconsin DNR issued a denial, responding that "the tribal usufructuary right is 'a resource harvesting right, not a resource preservation or enhancement right infringing on the State's management authority."

• See Sanders, J. (2013). Wolves, Lone and Pack: Ojibwe Treaty Rights and the Wisconsin Wolf Hunt. SSRN Electronic Journal. doi:10.2139/ssrn.2349010.

#### Honor Tribe's Wolf Conservation Plans and Opposition to Wolf Hunting

#### Keweenaw Bay Indian Community (KBIC) Nation, U.P. MI

"In the event that legislation is enacted for a wolf hunt, KBIC designates the home territory of the 1842 Treaty as Wolf Sanctuary where sport hunting and/or trapping will not be allowed. In addition, KBIC will not provide Tribal wolf hunting permits to community members. These measures help to protect wolves and maintain a strong culturally based stance against the killing of wolves. KBIC Natural Resource Department will also participate in and maintain close communication with those involved in wolf monitoring and control of human-wolf conflicts. As funding allows, we intend to increase monitoring of wolves on and near the Reservation preferably with tracking of radio collared wolves to keep tabs on any changing status of wolf packs."

The wolf remains protected within the KBIC Tribal Code under Endangered Species and Protected Animals Tribal Code 10.531. (*See* KBIC Natural Resources Department pamphlet: <u>http://nrd.kbic-nsn.gov/sites/default/files/Wolf-Pamphlet.pdf)</u>.

## **Bad River Band of Lake Superior Chippewa Indians (Mashkiiziibing)'s 2019 Ma'iingan** (Wolf) Relationship Plan

Within Mashkiiziibing (Bad River Indian Reservation), including tribal lands on Mooninwaane'akaaning Minis (Madeline Island), Ma'iinganag is listed as a "Tribally Protected Species."

The Mashkiiziibii Wildlife Program honors Ma'iinganag and guides its actions based on Traditional Ecological Knowledge and scientific knowledge.

The Mashkiiziibii Wildlife Program will not manage Ma'iingan at a specific number but will work with humans in a way that fosters human-wildlife coexistence on and around Mashkiiziibing. MWP has set a minimum Ma'iingan population goal: at least three packs within Mashkiiziibing, as has historically been the case.

The Mashkiiziibii Wildlife Program will continue to coordinate Ma'iingan conservation activities with tribal, state, and federal agencies as well as private landowners, to ensure the future of Ma'iinganag in Mashkiiziibing, in the state of Wisconsin, and in the Great Lakes Region.

- See https://www.wausaudailyherald.com/story/news/2020/09/01/wisconsin-wolvestribes-conservationists-want-say-management/3444086001/?fbclid=IwAR2xZc-RnEUO2apFDBtVMor31c4ns\_VegsUBN46i6VNbIRIi5EFrBQveJQo
- See <u>http://www.badriver-nsn.gov/wp-</u> content/uploads/2020/01/NRD\_MaiinganPlan\_2019.pdfm

## Invite Representatives from Tribes to Participate in State Wolf Stakeholder Groups

It is critical to wolf planning to understand the value in tribal members participating in advisory committee process. It is a good opportunity for tribes to hear and understand other members' perspectives, and vice versa. This is separate and distinct from Tribes' immutable Sovereign Consultation rights. Substantive policy recommendations are often developed and vetted at the advisory committee level, where tribal input is invaluable.

# **Chapter 4 ... PROCESS, ETHICAL & CONSERVATION TENETS FUNDAMENTAL TO WOLF CONSERVATION PLANNING**

## Key Chapter Takeaways:

- 1. States should provide a fair, democratic, and transparent process in decisions pertaining to wolves and wildlife.
- Wolf conservation planning should be informed by best-available science, including Traditional Ecological Knowledge.
- Wolf planning should address the important role of ethics in wolf conservation and management, including facilitation of ethics discussions among agency professionals and public advisory committee members.
- Wolf conservation planning should apply guidance from the Precautionary Principle, Tribal perspectives, and coexistence values.
- 5. A commitment to adaptive management is critical to wolf conservation planning.

This chapter describes obligations of the state in the realm of wolf and wildlife conservation. Essential in these obligations are the integral democratic underpinnings of the process owed to the public at large in a modern democracy. State and wildlife agency decision-making regarding all components of wolf conservation (including but not limited to conservation plan development, approach to prevention of livestock-wolf conflicts, whether wolves will be designated as species which may be hunted or trapped via state-sanctioned seasons), must be based, primarily, on best available science and adhere to principles of democracy and fair process. This chapter further identifies other conservation tenets and ethics considerations critical to state wolf conservation, including the Precautionary Principle, adaptive management, coexistence values, and Tribal guidance.

## **States Should Provide a Fair Process**

#### **Importance of Fair Process**

State decisions pertaining to wolves, including conservation plans, and livestock-wolf conflict prevention measures (as well as state-authorized hunting and trapping seasons, if any [see Chapter 7] for critical recommendations against wolf hunting and trapping), must be the product of a democratic and transparent process. Such a process is mandatory to ensure that a range of representative viewpoints are recognized and can contribute productively to the state's efforts to restore and sustain a viable wolf population in keeping with best science, accompanied by state policies which support coexistence.

#### For additional information on fair process see the below citations and summaries:

 Wolf Conservation Planning requires that state wildlife agencies enlist diverse and broadly representative advisory committee members to inform development of the state's wolf plan, including participation of "non-consumptive users" of wildlife to offset minority-dominated wildlife advisory committees and governance. *See* AFWA' "Relevancy Roadmap:

https://www.fishwildlife.org/application/files/2515/7547/9977/Fish\_Wildlife\_Relevancy\_ Roadmap\_\_Final\_12-04-19-lowres.pdf

Paper on wildlife governance by Decker et al. 2015, discusses the changes needed for wildlife agencies to be more transparent and broaden their base of stakeholders. Authors combine elements of public trust thinking and good governance to produce a broad set of wildlife governance principles, representing guidance for ecologically and socially responsible wildlife conservation. They address persistent, systemic problems and propose principles which, if adopted, will bring the institution into line with modern expectations for governance of public natural resources. *See* Daniel Decker1, Christian Smith2, Ann Forstchen3, Darragh Hare1, Emily Pomeranz1, Catherine Doyle-Capitman1, Krysten Schuler1, & John Organ, Governance Principles for Wildlife Conservation in the 21st Century, 2015,Conservation Letters July/August 2016, 9(4), 290–295, doi:

10.1111/conl.12211 https://conbio.onlinelibrary.wiley.com/doi/pdf/10.1111/conl.12211

• National and state surveys showing demographic trends and dollars strongly moving in the direction of non-consumptive enjoyment of natural resources and importance of wildlife managers considering non-consumptive uses such as wildlife viewing, hiking, camping, and ecotourism. *See* 

https://www.census.gov/library/visualizations/2016/demo/fhw-16-nat.html; https://www.f/wsfrprograms/subpages/nationalsurvey/nat\_survey2016.pdf

"As such, democratic principles have a proper and significant role in determining whether we should allow wolf hunting and why. Those principles seem uncomfortably juxtaposed to circumstances in Michigan. Government officials supported wolf hunting while citizens opposed wolf hunting." And, "By advancing a wolf hunt while democratic processes opposed to wolf hunting were still in play, these officials seem to implicitly acknowledge that democratic principles were less important in this particular case than officials' portrayal of the science." John A. Vucetich, Jeremy T. Bruskotter, Michael Paul Nelson, Rolf O. Peterson, Joseph K. Bump," Evaluating the principles of wildlife conservation: a case study of wolf (*Canis lupus*) hunting in Michigan, United States," Journal of Mammalogy, Volume 98, Issue 1, 8 February 2017, Pages 53–64. https://doi.org/10.1093/jmammal/gyw151.

## **Ethical Process**

To encompass best available science and democratic process, it is essential the states not simply establish a Public Advisory group (sometimes called a stakeholder group) but to instead create two separate advisory committees to guide wolf conservation decisions: a Science and Technical Advisory Committee and a Public Advisory Group.

While the Science and Technical Advisory Committee, composed of experts in wolf biology, ecology, social science and ethics, may provide guidance to the public advisory group or seek input therefrom, the recommendations of the science committee and of the public advisory group should be considered separately by agency decision-makers, with greater weight afforded to best available science. Critical to the process:

- Wolf Conservation Planning requires consultation and involvement of the Tribes in states' wolf planning and advisory committee representation. [See Chapter 4]
- Wolf Conservation Planning requires that the public advisory group include members who represent a diverse array of interests and viewpoints held by members of the public, and that members all support the state's commitment to and goal of achieving sustainable wolf recovery and coexistence.
- "Diverse and inclusive" wolf public advisory groups generate less polarized findings and receive greater support from the public at large.
  - Wolf public advisory groups with limited representation, lacking in diversity, lead to recommendations and outcomes disadvantageous to wolf conservation and lack the public support essential for engendering any public trust in agency wolf policymaking.
- Facilitated and decision-making processes in the public advisory group which are more likely to achieve optimal conservation success for wolves are processes based on argument analysis, rather than the consensus-based models so frequently relied upon by agencies.

#### Argument Analysis vs. Consensus-based Decision-making

Peer-reviewed social science reveals that consensus-based approaches may "unwittingly incorporate power asymmetries and un-democratic exclusions" through favoring "influential interest groups, who are usually local or regional only, and economically interested." This research highlighted large carnivore management as particularly susceptible to such pressure by narrow interests (Lopez-Baoa et al. 2017). Other social science researchers noted that consensus processes can run philosophically counter to science, conservation, and democracy itself. They proposed instead "an argument-based model grounded in ecology as a fundamental component of environmental decision-making," explaining how an alternative process can be both more democratic and more scientific: "A decision-making model that emphasizes argumentation rather than consensus provides a practical means for involving the public in environmental policy without giving up on science." (Peterson et al. 2005.) Argument analysis can provide clarity, precision and transparency that is not achievable through consensus-based decision-making and reveals insights that might otherwise be overlooked during public discourse on complicated conservation decisions (Vucetich et al. 2019).

#### For more information on the pitfalls of the consensus model see:

- Lopez-Baoa, J.V., G. Chapron and A. Treves. 2017. The Achilles heel of participatory conservation. Biological Conservation 212:139-143; p. 141.
- Peterson, M.N., M.J. Peterson and T.R. Peterson. 2005. Conservation and the myth of consensus. 19(3): 762-767; pp. 763, 765.
- Vucetich, J.A., Burnham, D., Johnson, P.J., Loveridge, A.J., Nelson, M.P., Bruskotter, J.T., and Macdonald, D.W. 2019. The value of argument analysis for understanding ethical considerations pertaining to trophy hunting and lion conservation. Biological Conservation. 235: 260-272.

## **Best Available Science Must Inform Wolf Conservation**

States' reliance upon measurable, replicable, peer-reviewed science in wolf conservation planning is essential. Wolf "management" policies adopted by agencies frequently are designed to respond to and appease those who oppose wolf recovery. Opposition to coexistence with wolves is due to long-standing, ongoing fear, hatred and ignorance regarding wolves and cannot continue to be the basis for state policies, if wolf recovery and conservation are the goals. The biological science of wolf behavior, biology, ecology, and livestock-wolf conflict prevention, and the social science research regarding human willingness to coexist with wolves all continue to evolve. And, disagreement exists among scientists, agency staff and academicians over what is "best available science." Yet, the following criteria should be considered:

#### **Best Available Science Criteria:**

- 1. Measurable objectives
- 2. Evidence
- 3. Transparency
- 4. Independent review
- 5. Consistent standards in experimental evaluations
- 6. Use of randomized case-control design, combined with systematic reviewing to evaluate the evidence
- 7. Elimination of bias in experiment design, data collection and data analysis

## **Transparency about Values and Assertions of Fact in Natural Resource**

## Management

It is essential that wildlife managers and policy makers honestly acknowledge their value orientation. This is crucial because it is all too often the case that numbers set by agencies and policy makers regarding goals for wolf recovery, population objectives, and management thresholds, as well as numbers established as quotas set for wolf hunting and trapping, are offered up as being science-based when in fact they have been derived from personal and organizational value judgments. This lack of transparency the world over in natural resource management results in use of wildlife that is not sustainable despite claims of using best sustainability science. This in turn threatens many ecosystems; the planet is currently experiencing a Sixth Mass Extinction Crisis due, in large part, to unsustainable extraction of natural resources including wildlife itself.

It is incumbent upon wildlife managers to distinguish between value judgments, fact-claims, and scientifically verified facts. While science describes how nature works and can predict the likely outcomes of our actions, values influence which actions or objectives society ought to pursue. (*See* Treves, A., Paquet, P.C., Artelle, K.A., Cornman, A.M., Krofel, M. and Darimont. C.T. 2021. Transparency about values and assertions of fact in natural resource management. Frontiers in Conservation Science: Human-Wildlife Dynamics, 2:e631998, doc 10.3389/fcosc.2021.631998).

## **Evidence-based Wolf Conservation**

With respect to any wolf conservation efforts that will rely upon large-scale public funding — *e.g.*, livestock predation compensation funds, cost-sharing between agencies and livestock owners for acquiring and/or implementing non-lethal conflict prevention coexistence measures, contracted services with USDA-Wildlife Services — states must demonstrate conformance with evidence-based wolf conservation and management, including assessment of the efficacy of the initiatives being pursued in accordance with science [*See* Chapter 6 Recommendations]

Studying and considering diverse knowledge systems, including Traditional Ecological Knowledge (TEK), can benefit wildlife professionals in selecting value systems that result in the least harm to ecosystem and indigenous lifeways. (Lynn, 2006) TEK and Western science share commonalities, including focusing on empirical observation, pattern recognition, knowledge organization, cycles, and culturally specific biases, arguments, and explanations (Gartner, 2019). By understanding commonalities and differences, advocates and wildlife agency professionals can

better understand how to draw from both science and TEK to accomplish effective wolf conservation and educational outreach.

While there is no one definition of TEK (Whyte, 2013), TEK most often reflects phenological knowledge that traditional hunters and trappers cultivate from experiences on the land. Hunter-gatherer lifestyles gave many indigenous peoples an intimate knowledge of their dependency on other life, from predators to prey animals (Gartner, 2019).

For example, Anishinaabeg have learned skills and morals from animals, including knowledge in coexisting with Ma'iingan (wolves) and other wildlife. In addition to the Anishinaabe creation story of Ma'iingan, various other stories involve Ma'iingan teaching lessons to Anishinaabeg (Benton-Banai, 1988; Usik, 2015). These stories often reflect the environmental values traditionally held by Anishinaabeg and shed light on how they successfully co-inhabited with Ma'iingan over the thousands of years. (Usik, 2015). In marked contrast to Western attitudes of dominance over the natural world, Anishinaabe stories exemplify that humans depend on other members of their ecosystem to survive (Usik, 2015).

Issues including carnivore coexistence are thus best addressed with the combined strengths of Western science in tangible fact-finding and TEK in reaching the necessary value-laden decisions with a strong ethical backing (Lynn, 2006).

For more information on science and ethics see:

- Fergus, A. (2020). Building Carnivore Coexistence on Anishinaabe Land: Gold Standard Non-Lethal Deterrent Research and Relationship Building Between Livestock Farmers and the Bad River Band of the Lake Superior Tribe of Chippewa Indians (Master's thesis). University of Wisconsin-Madison. <u>http://www.badriver-nsn.gov/wpcontent/uploads/2021/02/Fergus-Masters-Thesis.pdf</u>.
- Lynn, William S. 2006. "Between Science and Ethics: What Science and the Scientific Method Can and Cannot Contribute to Conservation and Sustainability". In Gaining Ground: In Pursuit of Ecological Sustainability, edited by David Lavigne, 191-205. Limerick, IRL: University of Limerick.

- Gartner, W. (2019, February 22). Traditional Ecological Knowledge. Lecture presented at Natural Resources in Native North America, Madison.
- Whyte, K. P. (2013). On the role of traditional ecological knowledge as a collaborative concept: a philosophical study. Ecological Processes, 2(1). doi: 10.1186/2192-1709-2-7.
- Whyte, K. (2019). Too late for indigenous climate justice: Ecological and relational tipping points. Wiley Interdisciplinary Reviews: Climate Change, 11(1). doi: 10.1002/wcc.603.
- Benton- Benai, E. (1988). The Mishomis book: The voice of the Ojibway Hayward. Hayward, WI: Indian Country Communications.
- Usik, Katherine Anne. "The hunt for Ma'iingan: Ojibwe ecological knowledge and wolf hunting in the Great Lakes." MA (Master of Arts) thesis, University of Iowa, 2015. <u>https://doi.org/10.17077/etd.hxfiyzqg</u>.

### **Ethical Considerations**

Wolf conservation planning calls for the ongoing integration of published, peer-reviewed literature, together with experts' contributions from the natural and social sciences and humanities, on the ethics issues surrounding wolf conservation and management. [See Chapter 5--Ethical Considerations in Wolf Conservation]

# Wolf Conservation Planning Should Apply Guidance from Precautionary Principle, Tribal perspectives, and Coexistence Values

The Precautionary Principle, together with guidance from Tribal perspectives and conservation values, should guide wolf conservation planning, particularly in the absence of conclusive science and/or scientific agreement regarding a matter critical to wolf conservation.

## Key Elements of the Precautionary Principle

The precautionary principle, proposed as a new guideline in environmental decision making, has four central components:

- 1. taking preventive action in the face of uncertainty;
- 2. shifting the burden of proof to the proponents of an activity;
- 3. exploring a wide range of alternatives to possibly harmful actions;
- 4. and increasing public participation in decision making

We argue that a shift to more precautionary policies creates opportunities and challenges for scientists to think differently about the ways they conduct studies and communicate results. There is a complicated feedback relation between the discoveries of science and the setting of policy. While maintaining their objectivity and focus on understanding the world, environmental scientists should be aware of the policy uses of their work and of their social responsibility to do science that protects the environment. The precautionary principle highlights this challenging linkage between science and policy.

#### **Application of Precautionary Principle to Wildlife Conservation**

The Precautionary Principle is of particular relevance and importance in the context of conservation and sustainable use of biodiversity and living natural resources. Species (as well as populations and subspecies) are genetically unique and irreplaceable — their loss is irreversible. Ecosystems vary across a vast range of parameters, and similar ecosystems (whether wetlands, forests, coastal reserves, etc.) cannot be presumed to be interchangeable, such that the loss of one can be compensated by protection or restoration of another.

*See* Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resources Management, as approved by the 67th meeting of the IUCN Council 14-16 May 2007 https://www.iucn.org/sites/dev/files/import/downloads/ln250507\_ppguidelines,

## Additional Guidance: Tribal Wisdom and Coexistence Values

Evaluating the quality of any wildlife management plan or action based on its ability to answer three questions:

- 1. What is the purpose or goal of a management action or plan?
- 2. How will the management actions meet the purpose or goal of the actions and how will success or failure in meeting the purpose and goal be judged?
- 3. Why are the purpose and goals appropriate, and why are the actions an appropriate means of achieving those goals and purposes?

The first two questions represent the most basic principles for any kind of management (Daft and Marcic 2012). The third question is important so long as a goal or purpose could conceivably be inappropriate or unjustified (Sen 2009). Here, we use that set of questions — What? How? Why?

— and the seven principles of The North American Model of Wildlife Management to evaluate the recent efforts to establish a public hunt of wolves in Michigan. *This kind of evaluation is no less than an evaluation of the fundamental nature of wildlife management.* 

#### For more guidance on the application of this section see the below citations and summaries:

- Tribal wolf conservation plans and cultural perspectives [See Chapter 3, B.]
- John A. Vucetich, Jeremy T. Bruskotter, Michael Paul Nelson, Rolf O. Peterson, Joseph K. Bump, "Evaluating the principles of wildlife conservation: a case study of wolf (*Canis lupus*) hunting in Michigan, United States," Journal of Mammalogy, Volume 98, Issue 1, 8 February 2017, Pages 53–64. https://doi.org/10.1093/jmammal/gyw151.
- Daft, R.L., and D. Marcic. 2012. Understanding management. 8th ed. Cengage Learning, mason, Ohio. Google Scholar.
- Sen, A. 2009. The idea of justice. Belknap/Harvard, Cambridge, Massachusetts.
- If something possesses intrinsic value it means essentially that you have an obligation to treat it fairly or with respect and with at least some concern for its wellbeing or interests (Vucetich et al., 2015; see also Batavia and Nelson, 2017). As such, it is wrong to infringe on the wellbeing of an intrinsically valuable agent without an adequate reason for doing so. Understanding what counts as an adequate reason would be greatly aided through the development of robust and substantive principles of just conservation. Vucetich JA, Burnham D, Macdonald EA, Bruskotter JT, Marchini S, Zimmermann A, Macdonald DW. (2018). Just conservation: What is it and should we pursue it? Biological Conservation, 221, 23-33, https://doi.org/10.1016/j.biocon.2018.02.022
- Vucetich, J.A., Bruskotter, J.T., and Nelson, M.P. 2015. Evaluating whether nature's intrinsic value is an axiom of or anathema to conservation. Conserv. Biol. 29: 321-332. <u>https://doi.org/10.1111/cobi.12464</u>
- Batavia, C., and Nelson, M.P. 2017. For goodness sake! What is intrinsic value and why should we care? Biol. Conserv. 209: 366-376. https://www.sciencedirect.com/science/article/abs/pii/S0006320716307522

## **Adaptive Management**

A commitment to adaptive management is critical to wolf conservation planning.

#### **Core Elements of Adaptive Management**

- 1. Wolf conservation plans require updating every five years with newly available science and ethics discourse pertaining to state-specific data relating to threats to wolves, precautionary responses needed, and other management concerns, in accord with best available science and monitoring criteria.
- 2. Plans should be modified to reflect new understandings, including increased threats to wolves in relation to problems of climate change, mass extinctions, and loss of habitat.
- 3. Updates and modifications are to be accomplished by means of a clearly stated and transparent process.
- 4. Adapting strategies and practices should be based on research, data and on-the-ground facts, not in response to pressure from coexistence opponents seeking to make it easier to kill wolves.
- 5. New science, data, modifications should be made available to the public.
- 6. Foster Feedback Loop between Precautionary Principle and Adaptive Management: Any new information gained through monitoring and further research or information gathering can then be fed back to inform further management and decision-making. Critically important to base decision-making on best available information, including that relating to human-caused threats and Traditional Ecological Knowledge. *See* GUIDELINES FOR APPLYING THE PRECAUTIONARY PRINCIPLE TO BIODIVERSITY CONSERVATION AND NATURAL RESOURCE MANAGEMENT As approved by the 67th meeting of the IUCN Council 14-16 May 2007 https://www.iucn.org/sites/dev/files/import/downloads/ln250507\_ppguidelines.pdf

## **Develop Phased Wolf Conservation Benchmarks and Initiatives**

Phased benchmarks (i.e., Phase I, Phase II, etc.) based on:

- 1. Best available science, not public advisory group compromises, for example, between highest and lowest proposed threshold;
- 2. Ensure plan retains flexibility to change thresholds as needed, if previous benchmarks found to be inadequately protective of wolves to achieve recovery and conservation of the species.

## **Chapter 5 ... ETHICAL CONSIDERATIONS IN WOLF CONSERVATION**

## Key Chapter Takeaways:

- Wolf-related conferences that jointly include presentations by agency staff, NGO's and academics rarely include discussions of ethics issues in the conservation, recovery and management of wolves. The dearth of ethics discussions has failed to keep pace with the evolution of public views on wolves which have moved away from traditionalist to mutualistic views acknowledging wildlife as part of our social network and possessing intrinsic value [See Chapter 2 – The Social Science on Wolves].
- Discussions of ethics in wolf conservation, recovery and management is absent from state and federal wolf plans yet is a critical subject which must be included for a holistic analysis of what should go into a wolf plan, crafting wolf policies and decision-making for actions undertaken.
- 3. "Ground Rules" for ethical decision-making about wild lives include: acknowledging their intrinsic value; this acknowledgement gives rise to duties on our part; ethics is complimentary with science; public policy includes disputes with no quick solutions over ethics, values and world views and ethics provides a tool to discuss those values; that ethics reviews as well as science reviews are necessary; and that all parties to wolf conservation planning require ethics training.
- 4. Ethics issues in wolf planning include but are not limited to: wolf hunting and trapping; livestock-wolf conflicts; capture, handling and monitoring of wolves; policymaking; animal welfare and wellbeing; animal ethics, generally; and ethics in science, generally.

Wolf recovery efforts by the U.S. Fish and Wildlife Service in the lower 48 United States spurred wolf conferences jointly convened by federal and state agencies, non-governmental conservation organizations (NGO's), wolf education centers, and academics. For example, the *North American Wolf Recovery Conference* was held in the northern Rockies annually from the mid-1980's through 2006. Also, between 2000-2018, the International Wolf Center (IWC) has held four conferences.

While each conference provided a forum to present and learn about research results on wolf biology, ecology, genetics, interactions with wild ungulates and livestock, hunting of wolves, measures to deter livestock-wolf conflicts and wolf-human coexistence, few included any presentations on ethics as applied to wolf recovery, conservation, and management. For example, of the *North American Wolf Recovery Conferences*, whose annual lineup averaged 28 presentations per conference, at only two of its conferences did any speakers present on ethics – one talk was included at the 2002 conference and one at the 2004 conference.

In 2003, the World Wolf Congress was convened in Banff, Alberta, Canada. Over the course of four days, 18 presentations and six plenary sessions took place. Of these, 16 percent (three) of the presentations and one plenary keynote addressed the subject of ethics on an equal footing with the natural sciences and politics in wolf conservation and recovery. Not since that time has any wolf conference convened jointly by agencies, NGOs and academics devoted even this degree of attention to ethics issues surrounding wolves and human stewardship of wolves. Rather, there has been a steep decline in the discussion of ethics at wolf conferences. This is readily apparent from the IWC conferences. The 2005 IWC conference had 116 oral presentations and multiple keynote speakers and roundtable discussions. Of these, only five percent (six) of the oral presentations and one roundtable discussion addressed ethics. At the 2013 IWC conference, there were 108 oral presentations and several keynote and plenary sessions. Of these, only two percent (two) of the oral presentations addressed ethics/wolf stewardship (from an indigenous perspective) and in only one of the plenary sessions – a debate on wolf hunting and trapping – was there a panelist who raised ethics issues. In the most recent IWC conference, held in 2018, there were 86 oral presentations, 7 plenary sessions, and a keynote address. Yet, of these, no plenary sessions nor the keynote talk addressed ethics and only one of the 86 presentations, on "The Future of Wolf Poisoning Programs in Canada," raised ethics issues.

To our knowledge, no federal wolf recovery plan has addressed the subject of ethics in wolf recovery, conservation and management, and no state wolf conservation or recovery plan has addressed this subject. But wolf conservation planning calls for more than biological science about wolves. It calls for the ongoing integration of published, peer-reviewed literature, together with experts' contributions from the natural and social sciences and humanities, on the ethics issues surrounding wolf conservation, recovery and management.

Because ethics is an essential subject which has been missing from key conversations and formal federal and state wolf plans, this chapter includes abundant literature citations to provide foundational information and concepts on which to base critical conversations going forward.

### **Rules of Ethical Engagement**

To jump-start and inform this ethical discourse, we offer the following recommendations developed by ethicist and thought leader, William Lynn, Research Scientist at the Marsh Institute of Clark University, and founder of the think tank <u>PAN Works</u>.

#### **Rules for Ethical Decision-making about Wild Lives**

1. One must first acknowledge the intrinsic value of wild lives and acknowledge that some wild lives have such a degree of sentience (awareness, feeling), sapience (self-awareness, thinking) and sociality (families, cultures) that these animals are nonhuman persons, not simply private or state property.

2. One therefore has direct duties to creatures like wolves, with the consequence that all management is ethically required to not only seek harm reduction but also wellbeing. This is more than the use of nonlethal interventions first. It is management that helps create the conditions for wolves to thrive as individuals and flourish as packs in the broader community of life.

3. Ethics is not an add-on to science. Science and ethics are complementary. Science helps keep our facts accountable and explains how ecological, ethological and social systems work. Ethics helps keep our values accountable and explain what we ought to do. Together they triangulate on better versus worse public policies. So we need more people at the table willing and able to talk about ethics with scientists and others.

4. Public policy is wicked, characterized by disputes over values, ethics and worldviews that defy quick, permanent, technical or expert solutions (i.e., a technocratic approach to policy). Wicked policy problems exist because value-laden debates drive public policy, not the science. This is not an aspiration for social change, but an empirical fact well known in the policy literature. We don't resolve public policy debates using science. Science can

inform us of options, etc. Rather we resolve those debates by addressing the values directly. Ethics has the tools to discuss those values, and if you do not address the values directly, you end up in 'values gridlock'.

5. Because of the wickedness of public policy, one needs to complement scientific reviews with ethics reviews. Without this balance of science and ethics, one has not engaged in the strict ethical and scientific scrutiny needed to understand issues of wolf conservation and management.

6. Alongside indispensable requirements for transparent, inclusive and truly diverse representation, all parties to wolf conservation planning - agencies, conservationists, scientists, animal advocates, etc. - require ethics training. This is not about teaching people what to think, but rather helping them to understand their own ethical points of view, recognize what the ethical issues are about wolves, and learn how to talk with others about ethics. And this is never so important as when people disagree.

## **Recommended Ethics-related Resources and References for Consideration**

#### Ethical issues related to wolf hunting and trapping seasons. [See also, Ch. 7]

 Browne-Nuñez, C. et al. (2015) 'Tolerance of wolves in Wisconsin: A mixed-methods examination of policy effects on attitudes and behavioral inclinations', Biological Conservation, 189, pp. 59–71. doi: 10.1016/j.biocon.2014.12.016. https://www.sciencedirect.com/science/article/abs/pii/S0006320714004959

Focus groups and questionnaires conducted among farmers and hunters in Wisconsin's wolf range sought to gain a more in-depth understanding of attitudes towards wolves and inclinations to poach wolves preceding and following federal delisting of the Western Great Lakes wolf population in January 2012 and Wisconsin's first legalized wolf-harvest season in October 2012 and implementation of lethal-predation control. Pre- and post-survey results showed no decrease in inclination to poach, suggesting lethal-control measures, in the short term, may be ineffective for increasing tolerance. Focus group discussions revealed elements of positivity toward wolves not revealed by questionnaires

that may inform the development of interventions designed to increase tolerance of wolves and other controversial species.

 Haber, G. C. (1996) 'Biological, Conservation, and Ethical Implications of Exploiting and Controlling Wolves', Conservation Biology, 10(4), pp. 1068–1081. doi: 10.1046/j.15231739.1996.10041068.x.

The widespread claim that wolf populations can withstand 25-50% or greater annual reductions without major biological consequences is based primarily on the observation that populations often maintain their size from year to year as harvest or control continues or recover within a few years afterward. This emphasis on numerical status overlooks the likelihood of major, lingering impacts on the size, number, stability, and persistence of family-group social units, on reproductive, hunting, and territorial behavior, on the role of learning and related traditions, within-and-between-group patterns of genetic variation, and on overall mortality rates. Sustained yield management requires more emphasis on qualitative biological features especially considering the highly social nature of wolves. Government-sponsored predator control programs, including government wolf-kill actions and state-sanctioned wolf hunting and trapping seasons, based on questionable claims about livestock or wild ungulate problems, have not adequately considered the potential biological costs (especially to the target wolf populations). The high sentience, intelligence and social nature of wolves justifies overlapping biological-ethical concerns about such programs and especially about the heavy, indiscriminate, deceptively reported public hunting and trapping of wolves that is currently permitted throughout most of Alaska including in national parks.

 Peterson, M. N. (2014) 'How Wildlife Management Agencies and Hunting Organizations Frame Ethical Hunting in the United States', Human Dimensions of Wildlife, 19(6), pp. 523– 531. doi:10.1080/10871209.2014.928762.

> This article explores the paucity of scholarly work addressing wildlife ethics in the United States, despite persistent calls for discussion of moral aspects of hunting and the broad geographic, ecological, and historic impacts of hunting on wildlife conservation. An analysis of hunter education manuals and official statements of

> > www.wolfplanning.org

hunting nongovernmental organizations (NGOs) was conducting, revealing varying degrees of emphasis placed on fair chase, law abidance, skill, and respect for property owner interests but little attention paid to how hunting impacts biodiversity and humane treatment of animals.

 Santiago-Ávila, F. J., Lynn, W. S. and Treves, A. (2018) 'Inappropriate consideration of animal interests in predator management: Towards a comprehensive moral code', in Hovardas, T. (ed.) Large Carnivore Conservation and Management: Human Dimensions and Governance. New York: Routledge, pp. 227–251.

Humans are not the only beings to whom ethics apply. Peer-reviewed scientific studies from various disciplines have gathered decades of evidence confirming that many animals are sentient and sapient, aware and self-aware beings with rich emotional and cognitive lives. Yet wildlife managers frequently intervene in the lives of animals (kill, relocate, or condition them), based on science without exploring whether said interventions are ethically appropriate. This chapter provides a brief introduction to ethics, explaining why the ethical consideration of carnivores is crucial for ethical wildlife management and demonstrating how various actors at different levels of government are primarily responsible for deciding the scale and scope of lethal interventions into the lives of carnivores. Using Wisconsin as an example during the period in which federal protections for wolves were removed (2012–2014), laws and regulations, driven by powerful interest groups, were shown to lack appropriate consideration of animal ethics when intervening in the lives of grey wolves.

#### Ethical issues related to livestock-wolf conflicts. [See also Ch. 6]

- Browne-Nuñez, C. et al. (2015) 'Tolerance of wolves in Wisconsin: A mixed-methods examination of policy effects on attitudes and behavioral inclinations', Biological Conservation, 189, pp. 59–71. doi: 10.1016/j.biocon.2014.12.016.
  - a) Humans are not the only beings to whom ethics apply. Peer-reviewed scientific studies from various disciplines have gathered decades of evidence confirming that many

animals are sentient and sapient, aware and self-aware beings with rich emotional and cognitive lives. Yet, wildlife managers frequently intervene in the lives of animals (kill, relocate, or condition them), based on science without exploring whether said interventions are ethically appropriate. This chapter provides a brief introduction to ethics, explaining why the ethical consideration of carnivores is crucial for ethical wildlife management and demonstrating how various actors at different levels of government are primarily responsible for deciding the scale and scope of lethal interventions into the lives of carnivores. Using Wisconsin as an example during the period in which federal protections for wolves were removed (2012–2014), laws and regulations, driven by powerful interest groups, were shown to lack appropriate consideration of animal ethics when intervening in the lives of grey wolves.

- Focus Groups and Questionnaires from Wisconsin. https://www.sciencedirect.com/science/article/abs/pii/S0006320714004959
  - a) Focus groups and questionnaires conducted among farmers and hunters in Wisconsin's wolf range sought to gain a more in-depth understanding of attitudes towards wolves and inclinations to poach wolves preceding and following federal delisting of the Western Great Lakes wolf population in January 2012 and Wisconsin's first legalized wolf-harvest season in October 2012 and implementation of lethal control. Pre- and post-survey results showed no decrease in inclination to poach, suggesting lethal-control measures, in the short term, may be ineffective for increasing tolerance. Focus group discussions revealed elements of positivity toward wolves not revealed by questionnaires that may inform the development of interventions designed to increase tolerance of wolves and other controversial species.
- Haber, G. C. (1996) 'Biological, Conservation, and Ethical Implications of Exploiting and Controlling Wolves', Conservation Biology, 10(4), pp. 1068–1081. doi: 10.1046/j.15231739.1996.10041068.x.
  - a) The widespread claim that wolf populations can withstand 25-50% or greater annual reductions without major biological consequences is based primarily on the observation that populations often maintain their size from year to year as harvest or control continues

or recover within a few years afterward. This emphasis on numerical status overlooks the likelihood of major, lingering impacts on the size, number, stability, and persistence of family-group social units, on reproductive, hunting, and territorial behavior, on the role of learning and related traditions, within-and-between-group patterns of genetic variation, and on overall mortality rates. Sustained yield management requires more emphasis on qualitative biological features especially considering the highly social nature of wolves. Government-sponsored predator control programs, including government wolf-kill actions and state-sanctioned wolf hunting and trapping seasons, based on questionable claims about livestock or wild ungulate problems, have not adequately considered the potential biological costs (especially to the target wolf populations). The high sentience, intelligence and social nature of wolves justifies overlapping biological-ethical concerns about such programs and especially about the heavy, indiscriminate, deceptively reported public hunting and trapping of wolves that is currently permitted throughout most of Alaska including in national parks.

- 4) Hogberg, J. et al. (2015) 'Changes in attitudes toward wolves before and after an inaugural public hunting and trapping season: early evidence from Wisconsin's wolf range', Environmental Conservation, 43(1), pp. 45–55. doi: 10.1017/s037689291500017x.
  - a) Wildlife managers turn to hunting and trapping programs to increase public acceptance of wolves and other predators. This longitudinal study, which examined attitudes measured before and after a hunting and trapping season in Wisconsin, found a negative trend in attitudes among male respondents and hunters living in wolf range both before and after the state of Wisconsin's first legal wolf hunt, and stable tolerance levels among female respondents throughout the study period. These results suggest that hunting was not associated with increased tolerance for wolves after one year.
- Lynn, W. S. (2002) 'Canis lupus cosmopolis: wolves in a cosmopolitan worldview', Worldviews: Global Religions, Culture, and Ecology, vol 6, no 3, pp 300-327
  - a) The subject of wolf recovery in North America sparks heated controversy, both for and against. This paper explores how this subject is informed by cosmopolitan worldviews. These worldviews pull nature and culture into a common orbit of ethical meaning, with

implications for the normative relationships that ought to pertain in landscapes shared by people and wolves. This theoretical outlook is illustrated using the controversy over wolves in the northeastern region of the United States. I conclude with a set of reflections on theorizing the cosmopolis, the interpretation of cosmopolitan landscapes, and living with cosmopolitan wolves.

- 6) Santiago-Ávila FJ. An interdisciplinary evaluation of large carnivore management: the grey wolf in the Western Grey Lakes [PhD dissertation]. University of Wisconsin-Madison; 2019. Copy of dissertation available by contacting the author at <u>santiagoavil@wisc.edu</u>
  - a) The interventions, policies and assumptions analyzed in this dissertation relate to the use of lethal management against nonhumans as a tool to improve human-nonhuman coexistence, through an evaluation of gray wolf management in the Western Great Lakes. We find lethal interventions lacking in functional effectiveness relative to non-lethal ones in preventing future conflicts, plus lethal interventions may even be counter-productive by increasing the risk of conflicts in nearby areas. Moreover, we present evidence suggesting the liberalized killing policy periods (which sanction said lethal interventions) may increase the cumulative incidence of wolf poaching over time as much as that of legal killing. We proceed to analyze the text of statutes and regulations governing wolf management in Wisconsin. We evaluate if the considerations taken (or not) in accounting for the interests of gray wolves are ethically appropriate through an interpretive take on the concept of 'equitable consideration'. Lastly, we address multispecies justice in conservation practice more broadly, and propose that acknowledgment of ethical values beyond compassion towards individual animals, especially those concerning justice, and the politics and codification of animal claims, are indispensable for any conservation paradigm that strives to provide explicit guidance for ethical coexistence in our mixedmoral community.
- Santiago-Ávila, F. J., Lynn, W. S. and Treves, A. (2018) 'Inappropriate consideration of animal interests in predator management: Towards a comprehensive moral code', in Hovardas, T. (ed.) Large Carnivore Conservation and Management: Human Dimensions and Governance. New York: Routledge, pp. 227–251.

- a) Humans are not the only beings to whom ethics apply. Peer-reviewed scientific studies from various disciplines have gathered decades of evidence confirming that many animals are sentient and sapient, aware and self-aware beings with rich emotional and cognitive lives. Yet wildlife managers frequently intervene in the lives of animals (kill, relocate, or condition them), based on science without exploring whether said interventions are ethically appropriate. This chapter provides a brief introduction to ethics, explaining why the ethical consideration of carnivores is crucial for ethical wildlife management and demonstrating how various actors at different levels of government are primarily responsible for deciding the scale and scope of lethal interventions into the lives of carnivores. Using Wisconsin as an example during the period in which federal protections for wolves were removed (2012–2014), laws and regulations, driven by powerful interest groups, were shown to lack appropriate consideration of animal ethics when intervening in the lives of grey wolves.
- Vucetich J, Nelson MP. 2014 Wolf Hunting and the Ethics of Predator Control. (doi:10.1093/oxfordhb/9780199927142.013.007)
  - a) A basic tool of scholarly ethics is argument analysis—the process of evaluating the soundness of the premises and the validity of arguments that underlie a particular ethical claim. We apply that technique to the controversial concern about the appropriateness of hunting wolves. Advocates of wolf hunting offer a variety of reasons that it is appropriate. We inspect the quality of these reasons using the principles of argument analysis. Our application of this technique indicates that wolf hunting in the coterminous United States is inappropriate. A value of argument analysis for public discourse is its transparency. If we have misapplied the principles of argument analysis, critics will readily be able to identify our error. While this application of argument analysis is contingent on details particular to wolves and the desire to hunt them, this essay has the additional value of illustrating one of the basic tools used in scholarly ethics.
- Wallach, A.D., Bekoff, M., Nelson, M.P., Ramp, D., 2015. Promoting predators and compassionate conservation. Conserv. Biol. 29, 1481–1484

Predators are at the forefront of a compassionate revolution in conservation. Promoting predators for conservation has deep roots and the reintroduction of wolves (Canis lupus) to Yellowstone National Park in 1995 simultaneously enhanced wolf conservation and restored landscapes by suppressing over-abundant deer. It is now widely acknowledged that apex predators provide crucial ecological functions as suppressors of population irruptions, and their recovery is revolutionizing conservation. However, this success stands in stark contrast to conservation practices premised on killing animals to control populations. Conservation has a long history of striving to save species by killing members of other species. Although death is part of nature, it is becoming apparent that the belief that human-mediated killing can right human-caused disturbance is fallible. For example, an intensive 9-year wolf cull to save declining woodland caribou (Rangifer tarandus caribou) in Canada did not provide a long-term solution. Using insights from Australian conservation, we argue that a 3-tiered conservation ethic that encompasses the welfare of individuals, populations, and ecosystems be used to guide decision making for improved conservation and animal welfare outcomes.

#### Ethical Issues Related to the Capture, Handling, Monitoring of Wolves

- Brook, R. K., Cattet, M., Darimont, C. T., Paquet, P. C., & Proulx, G. (2015). Maintaining ethical standards during conservation crises. Canadian Wil. https://www.wellbeingintlstudiesrepository.org/ethcbio/3/
  - a) Experiments that involve the intentional inhumane killing of animals violate the fundamental principles of ethical science and rightfully endanger the reputation of science and scientists, as well as the journals willing to publish them.
- Ramp, D. and Bekoff, M., Compassion as a Practical and Evolved Ethic for Conservation. (2015), BioScience, Vol. 65 No. 3: 323–327. <u>https://doi.org/10.1093/biosci/biu223</u>. and https://academic.oup.com/bioscience/article/65/3/323/236866
  - a) The ethical position underpinning decision making is an important concern for conservation biologists when setting priorities for interventions. "Compassionate

conservation" reflects an evolved ethic for sharing space with nature and is a major step forward for conservation.

- 3) Paquet, P.C. and Darimont, C.T. (2010). Wildlife conservation and animal welfare: two sides of the same coin?, Animal Welfare 2010, 19: 177-190 ISSN 0962-7286. <u>https://www.researchgate.net/profile/Paul-Paquet-2/publication/228621252</u> Wildlife conservation and animal welfare Two sides of the same coin/links/0046351d0905ddecd4000000/Wildlife-conservation-and-animal-welfare-Twosides-of-the-same-coin.pdf
  - a) Including a case study on gray wolves living amid human-dominated landscapes, authors conclude that the suffering wildlife endures because of humans is a collective responsibility that presents a moral imperative for animal welfarists and conservationists alike. Because habitat destruction deprives species of life requisites, causing prolonged suffering and death, authors suggest a shared doctrine of animal welfare principles is needed, such as a modified version of the internationally recognized Five Freedoms; in essence, an ethical affirmation for conservationists and animal welfarists.
- Darimont, C. T., Reimchen, T. E., Bryan, H. M., & Paquet, P. C. (2008). Faecal-centric approaches to wildlife ecology and conservation; methods, data and ethics. Wildlife Biology in Practice, 4(2), 73-87.<u>https://www.wellbeingintlstudiesrepository.org/ethcbio/4/</u>
  - a) Authors review the opportunities and challenges of faecal-centric approaches to address ecological and conservation questions using wolves of coastal British Columbia, Canada, as a case system. Contrasting non-invasive scatology with radio-collaring in an ethics framework, authors contend that when the two methods are equally efficacious in answering required research questions, scatology becomes the only ethical option.
#### Wildlife Ethics and Policymaking

 Artelle, K. A. et al. (2018) 'Hallmarks of science missing from North American wildlife management', Science Advances, 4(3). Available at: http://advances.sciencemag.org/content/4/3/eaao0167.abstract.

a) Although resource management agencies commonly defend controversial policy by claiming adherence to science-based approaches, what that means is rarely defined. Authors propose a framework that identifies four fundamental hallmarks of science relevant to natural resource management (measurable objectives, evidence, transparency, and independent review) and test for their presence in hunt management plans created by 62 U.S. state and Canadian provincial and territorial agencies across 667 management systems (species-jurisdictions). Author's assessment found that most (60%) systems contained fewer than half of the indicator criteria assessed, raising doubts about the purported scientific basis of hunt management across the United States and Canada.

- Gray, Joe, Anna Wienhues, Helen Kopnina, and Jennifer DeMoss. 2020. "Ecodemocracy: Operationalizing Ecocentrism Through Political Representation for Non-Humans." *The Ecological Citizen* 3 166–77.
  - a) The authors present a general argument for the political representation of non-humans that sits under the broad umbrella of ecocentrism but that does not rely on one specific non-anthropocentric ethical theory.
- Layzer, Judith. 2006. *The Environmental Case: Translating Values Into Policy*. Washington, D.C.: Congressional Quarterly Press. & Lynn, William S. 2010. "Discourse and Wolves: Science, Society and Ethics." *Society & Animals* 18 (1): 75–92.
  - a) Scientific discourse is frequently privileged when it comes to wolves, on the assumption that the primary knowledge requirements are matters of ecology, cognitive ethology, and allied disciplines. Social discourse about wolves implicitly challenges this privilege and provides a rich array of social perspectives on human-wolf relations. Ethical discourse has until recently lagged the other two. So too, ethicists are increasingly challenging the adequacy of scientific and social discourse. They do so by calling attention to the value-

laden character of all discourse, and the unavoidable ethical questions that confront us as we learn to share the landscape with large predators like wolves.

- 4) Lynn, William S. 2018. "Bringing Ethics to Wild Lives: Shaping Public Policy for Barred and Northern Spotted Owl." *Society & Animals: Special Issue on Wildlife* 26 (2): 217–38.
  - a) A proposed lethal experiment to remove barred owls raised ethical concerns among wildlife agencies, citizens, and advocacy groups. Seeking to better understand these concerns, the US Fish and Wildlife Service conducted an ethics review by means of the Barred Owl Stakeholder Group. Using an innovative method and instrument in the form of an ethics-based policy dialogue and an ethics brief, the stakeholder group explored the ethical dimensions of the removal experiment. This process holds lessons for how public policy can bring ethics to bear on wild lives.
- 5) Midgley, Mary. 2001. "The Problem of Living With Wildness." In Wolves and Human Communities: Biology, Politics, and Ethics, edited by Virginia A Sharpe, Strachan Donnelley, and Bryan Norton, 179–90. Washington, DC: Island Press. & Nelson, Michael P, John A Vucetich, Paul C Paquet, and Joseph K Bump. 2011. "An Inadequate Construct." North American model: what's flawed, what's missing, what's needed. The Wildlife Professional 5 58–60.

https://isleroyalewolf.org/sites/default/files/Nelson%20et%20al%202011-An%20Inadequate%20Construct.pdf

a) While the North American Model of Wildlife Conservation's selective historical narrative serves the conclusion that recreational hunting is (or at least was) necessary for conservation, a more complete historical narrative fails to support that conclusion. The authors further convey that the North American Model represents inadequate ethical reasoning and a misguided prescription for the future of conservation. The Model highlights the need to explore whether wildlife management and conservation are the same, as implied by Model advocates, or whether the two disciplines represent different, occasionally conflicting, ambitions.

- Treves, A., Santiago-Ávila, F. J. and Lynn, W. S. (2018) 'Just preservation', Biological Conservation, 229, pp. 134–141 <u>http://www.williamlynn.net/pdf/treves-etal-2018-just-preservation.pdf</u>.
  - a) Authors argue that the interests and well-being of non-humans, youth, and future generations of both human and non-human beings (futurity) have too long been ignored in consensus-based, anthropocentric conservation. Consensus-based stakeholder-driven processes disadvantage those absent or without a voice and allow current adult humans and narrow, exploitative interests to dominate decisions about the use of nature over its preservation for futurity of all life. We propose that authentically non-anthropocentric worldviews that incorporate multispecies justice are needed for a legitimate, deliberative, and truly democratic process of adjudication between competing interests in balancing the preservation and use of nature.
- Wallach, A.D., Bekoff, M., Nelson, M.P., Ramp, D., 2015. Promoting predators and compassionate conservation. Conserv. Biol. 29, 1481–1484.
  - a) Predators are at the forefront of a compassionate revolution in conservation. Promoting predators for conservation has deep roots and the reintroduction of wolves (Canis lupus) to Yellowstone National Park in 1995 simultaneously enhanced wolf conservation and restored landscapes by suppressing over-abundant deer. It is now widely acknowledged that apex predators provide crucial ecological functions as suppressors of population irruptions, and their recovery is revolutionizing conservation. However, this success stands in stark contrast to conservation practices premised on killing animals to control populations. Conservation has a long history of striving to save species by killing members of other species. Although death is part of nature, it is becoming apparent that the belief that human-mediated killing can right human-caused disturbance is fallible. For example, an intensive 9-year wolf cull to save declining woodland caribou (Rangifer tarandus caribou) in Canada did not provide a long-term solution. Using insights from Australian conservation, we argue that a 3-tiered conservation ethic that encompasses the welfare of individuals, populations, and ecosystems be used to guide decision making for improved conservation and animal welfare outcomes.

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- 4) Dawkins, Marian Stamp. 2012. *Why Animals Matter: Animal Consciousness, Animal Welfare, and Human Well-Being.* Oxford, UK: Oxford University Press.
- 5) Dawkins, Marian Stamp. 2021. *The Science of Animal Welfare: Understanding What Animals Want*. Oxford, UK: Oxford University Press.
- 6) Fraser, David. 2008. Understanding Animal Welfare: The Science in Its Cultural Context. Oxford, UK: Blackwell.
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# **Chapter 6 ...LIVESTOCK-WOLF CONFLICT MITIGATION**

## Key Chapter Takeaways:

- 1. Establish a state scientific and technical advisory committee.
  - a. The state scientific and technical advisory committee should be composed of experts in the biological, social science and ethics disciplines, charged with the following adaptive assessment and oversight responsibilities over the state's livestock-wolf conflict deterrence program (in addition to other wolf management research, assessment and oversight functions);
  - b. The panel should evaluate and predict, through modeling and reliance on data, the areas in the state with no or low likelihood of livestock-wolf conflict versus those with a greater likelihood;
  - c. The panel should evaluate the effectiveness of non-lethal measures to limit ongoing predation in the identified areas of the state;
  - d. The panel should identify prime wolf habitat in the state, and the ecological benefits imparted by wolves, *e.g.*, on the state's wild ungulate herds, forest systems, and biodiversity.
  - e. If a state resident public advisory group is also established by the state, the findings of the scientific and technical advisory committee should be provided to the wolf advisory committee and available to the public to help guide development of the state's wolf plan.
  - f. The panel should preview and report on state's Livestock Predation Compensation Program.
- 2. Fully fund and staff an outreach and education program.
  - a. Provide information to owners and rural citizenry on value of proactive non-lethal conflict deterrence practices.
  - b. Hire one or more wildlife professionals trained in non-lethal predation control methods (like Minnesota, Montana and Oregon have done) to oversee outreach efforts with livestock owners and to support long-term solutions to livestock-wolf conflicts.

- c. Implement and enforce requirements/standards for use of non-lethal conflict deterrence measures by livestock operators with grazing leases on BLM and other federal and state- controlled public lands (*e.g.*, carcass removal).
- d. Assess whether non-lethal measures were implemented prior to predation and, if so, to what extent?
- Incentivize livestock operators on private lands to use non-lethal conflict deterrence measures by:
  - a. Conditioning any compensation payments on verified implementation of nonlethal measures (*i.e.*, if producer refuses to implement non-lethal, then no compensation);
  - b. Paying "fall" market value, rather than "fair" market value at the time of the loss, if specified non-lethal measures have been implemented (*e.g.*, adequate fencing, proper carcass disposal) and/or withholding authorization of killing wolves if non-lethal measures are not implemented.
  - c. Designation of a compensation liaison, who can coordinate with state and insurance companies to streamline process and give producers a point person following a predation.
  - d. Identify verification and reporting shortfalls.
  - e. Develop recommendations to improve livestock owners' compliance with required non-lethal measures and to reduce ongoing ill will and potential for illegal killing.
  - f. While all of the public has an interest in publicly held wildlife, the public should not pay the cost of doing business for the livestock industry. Asset inventory, including assessment of stockgrower losses, should be covered by business insurance.
  - g. Agencies and stakeholders should work with private insurance companies to address livestock loss compensation issues.

- 4. Look to Tribes' approach to wolf predation of livestock and pets for guidance.
  - a. Example: Wolf (Ma'iingan) Management Plan of Red Lake Band of Chippewa Indians: <u>https://www.redlakednr.org/wp-</u> content/uploads/Wolf\_Management\_Plan\_RED\_LAKE\_final\_version.pdf
  - b. Tribal members may protect their livestock and pets from wolf predation, but all reasonable efforts should be made to deter wolves using non-lethal means.
- 5. Develop and integrate predictive models related to livestock losses into state plans.
  - a. Data on seasonality of wolf predation and on reoccurrence of seasonal patterns across years suggest wolf attacks on livestock are temporally predictable.
  - b. Ranchers and managers can use data for predicting wolf predation risk and for planning in advance investment of resources to prevent predation increases.
- 6. Maintain an accessible database:
  - a. Current data on livestock predation;
  - b. Compensation paid to livestock producers;
  - c. Information on value of non-lethal predator deterrence practices;
  - d. Information bearing on de minimis incidence of livestock predation compared to livestock numbers/livestock mortality unrelated to predators;
  - e. Database on livestock producers utilizing non-lethal conflict deterrence measures vs. not utilizing non-lethal methods.
- 7. Require Carcass Removal on the part of livestock operators.
  - a. States should require that livestock owners remove dead livestock as a cost of doing business. Businesses across industries have their waste regulated and must dispose of waste properly. If disposal cannot be done immediately, deceased animals should be secured from wolves and other animals.
  - b. States should enforce livestock removal laws with fines and citations.
- Commit to rule-making process to create enforceable law.
  Codifying administrative rule language provides state agencies and the public with

greater certainty, accountability and transparency and creates enforceable law. The rulemaking process exists to increase the accountability of public agencies and to allow for the public to have a say in governing laws. Administrative rules, once established, create enforceable requirements in important respects, including requirements bearing on livestock operators' use of non-lethal conflict-deterrent measures, adaptive implementation, and state wolf kill decisions/orders.

See May 11, 2020 Petition to amend the Washington Administrative Code directed to Washington Department of Fish and Wildlife, submitted by Center for Biological Diversity, Wild Earth Guardians, Cascadia Wildland, Western Watersheds Project, and the Lands Council.

https://www.biologicaldiversity.org/campaigns/wolves\_on\_the\_west\_coast/pdfs/Washing ton-Wolf-Rulemaking-Petition.pdf

# States Should Prioritize, Incentivize and Require Livestock Owners to Protect Their Animals with Non-Lethal Deterrents to Prevent Livestock-Wolf Conflicts

Livestock-wolf conflicts, and how agencies respond to these conflicts, are a prime example of an issue around which agencies and advocates often clash. Historically, conflicts between livestock and wolves were used as justification for efforts by settlers and then by the federal government to exterminate wolves nation-wide. Today, only a miniscule number of livestock deaths are traceable to predators overall and even less to wolves, specifically. Yet hundreds of wolves are still killed each year in the United States in the name of livestock predation control.

In most states, efforts to reduce the occurrence of livestock-wolf conflicts encompass both nonlethal and killing wolves. Non-lethal conflict-deterrence measures include but are not limited to barriers, enclosures, guardian animals, visual or auditory deterrents, human presence, and range riding. These methods aim to deter and prevent livestock predation on a long-term basis, with a proactive focus on animal husbandry and coexistence often supported by state-funded compensation and prevention programs. However, as demonstrated by annual wolf mortality numbers in Idaho, Montana, Wyoming, Washington and Minnesota, states continue to rely heavily on killing wolves as a conflict-deterrence measure. These often entail the killing of nearby wolves following predation events, although some states also attempt to justify substantial annual wolf kills in public hunting and trapping seasons (not proximate in time or place to specific predation events) as a means to reduce livestock-wolf conflicts.

Despite how few livestock losses are caused by wolves compared to other loss sources, this issue remains a political flashpoint in every state with wolves. This means that minimizing livestock predations by wolves will remain key priorities for states with recovering wolf populations. As wolves return to other portions of the U.S. these states too will face familiar challenges surrounding coexistence values and predation mitigation. The relative efficacy of non-lethal conflict-deterrence measures versus the killing of wolves to address conflicts is a hotly contested topic in scientific and academic circles. However, the lack of scientific consensus and ongoing uncertainty of the efficacy of killing wolves as a means to deter conflicts requires states to move instead toward non-lethal deterrence measures. This is in keeping with the wisdom of the Precautionary Principle and mindful of changing public values and longstanding conservation tenets.

For the reasons stated below, state wildlife managers and policymakers would be wise to refrain from applying state funds and efforts to recurrent short-term wolf kill orders and actions as "fixes". The optimal approach is to instead invest in, incentivize and mandate long-term, proactive nonlethal solutions that favor coexistence.

## **Causes of Livestock Mortality in the United States**

USDA data show that nine times more cattle and sheep (3,990,035) died from maladies such as illness, birthing problems, weather, and poisoning, or were lost due to theft, than died due to predation by all mammalian or avian predators together (474,965). Of the 119 million cattle and sheep inventoried in the U.S. in 2014 and 2015, fewer than one percent (0.4 percent) died from all mammalian and avian predators combined.

See "Government data confirm that wolves have a negligible effect on U.S. cattle & sheep industries," HSUS, March 2019.
 <a href="https://www.humanesociety.org/sites/default/files/docs/HSUS-Wolf-Livestock-6.Mar\_.19Final.pdf">https://www.humanesociety.org/sites/default/files/docs/HSUS-Wolf-Livestock-6.Mar\_.19Final.pdf</a>

### **De Minimis Incidence of Wolf Predation on Livestock**

In 2015 the USDA inventoried 112.2 million cattle in the U.S. Of that number, 4.5 million died from all unwanted causes. Most of those deaths, 3.6 million (3.2% of U.S. cattle inventory) stemmed from health-related maladies, weather, and theft. Mortalities from all predators amounted to 280,570 cattle deaths, representing a mere 0.3 percent of U.S. cattle inventory—with wolves taking 0.009% of the U.S. cattle inventory.

The number of wolves killed nationwide are not proportional with the nominal losses of livestock caused by wolves, as starkly demonstrated by the IWC tabulation here: "Government data confirm that wolves have a negligible effect on U.S. cattle & sheep industries," HSUS, March 2019. <u>https://www.humanesociety.org/sites/default/files/docs/HSUS-Wolf-Livestock-</u>

6.Mar\_.19Final.pdf.

# **Conservation Considerations and Rationales Favor Nonlethal Means of** Wildlife Conflict Resolution

## **Ecological Costs of Killing Predators**

Conservation biologists should endeavor to guide governments toward replacing localized killing of predators with nonlethal means of wildlife conflict resolution in consideration of: 1) loss of ecosystem resilience and biodiversity resulting from lethal removal; 2) "bycatch" or unnecessary killing of nontarget species of mammals and other wildlife that occurs with nonselective methods of predator killing; 3) population reduction of certain species of native wildlife valued by many parts of society for the benefit of one favored interest group, the livestock industry; 4) ineffectiveness of killing predators in reducing livestock predation over the long term; and 5)

ethical considerations about both the intrinsic value of carnivores and the humaneness of the methods used to kill them.

### For more information on the ecological costs of killing wolves see:

- Bergstrom, B., "Carnivore conservation: shifting the paradigm from control to Coexistence," Journal of Mammalogy, 98(1):1–6, 2017, DOI:10.1093/jmammal/gyw185; <u>https://drive.google.com/drive/u/0/my-drive</u>. [See Chapter 2, ecological Impact of killing of apex predators].
- Minimizing wolf predation conflicts could save resources, political goodwill, and rare or otherwise valuable carnivores, but effective reduction of predations depends on anticipating the parties involved and the timing and location of conflicts. *See* Wydeven, A., Treves, A., Brost, B., & Wiedenhoeft, J. (2004). Characteristics of Wolf Packs in Wisconsin: Identification of Traits Influencing Depredation. In *People and Predators: From Conflict To Coexistence* (pp. 29-49). Island Press. Retrieved 2004.

## <u>Proponents of Killing Predators Fail to Account for Limited Short-term Effects and</u> <u>Ongoing Long-term Costs</u>

## Studies relied upon in support of killing predators:

- Bradley, E. H., H. S. Robinson, E. E. Bangs, K. Kunkel, M. D. Jimenez, J. A. Gude, and T. Grimm. 2015. Effects of wolf removal on livestock depredation recurrence and wolf recovery in Montana, Idaho, and Wyoming. Journal of Wildlife Management 79:1337–1346.
  - a) This study, which state and federal agents cite to in support of killing wolves, found that recurring predations were typically made by the next pack to occupy the vacant territory within 2 years.
- DeCesare, N., et al., "Wolf-Livestock Conflict and the Effects of Wolf Management," The Journal of Wildlife Management 82(4):711–722; 2018; DOI: 10.1002/jwmg.21419.
  - a) Killing <u>wolves has little to no long-term effect</u> (*i.e.* beyond limited time duration that wolves are absent) and may pose adverse effects on predation of livestock.
  - b) <u>Vacant territories are quickly recolonized</u> even if entire wolf packs are extirpated through control actions, neighboring or dispersing individuals readily fill vacancies.

- Treves and Naughton-Treves 2005. Evaluating lethal control in the management of humanwildlife conflict. *Conservation Biology Series-Cambridge*, 9, pp 86. <u>https://faculty.nelson.wisc.edu/treves/pubs/Lethal\_control\_2005.pdf</u>
- Marco Musiani, M., Muhly, T., Gates, C., Callaghan, C., Smith, M., Tosoni, E., "Seasonality and reoccurrence of depredation and wolf control in western North America, Wildlife Society Bulletin, 2005.

http://people.ucalgary.ca/~mmusiani/lab/\_assets/muhlyArticles/Musiani%20et%20al%20200 5.pdf

- a) In study area, even if entire wolf packs are extirpated through control actions, neighboring or dispersing individuals may readily fill home range vacancies. Lethal wolf control is not designed to decrease wolf predation at a regional scale or in the long term. We see the greatest promise for reducing wolf predation by improving animal husbandry, especially in high-risk seasons.
- Moreira-Arce, D., Ugarte, C. S., Zorondo-Rodríguez, F., & Simonetti, J. A. (2018). Management tools to reduce carnivore-livestock conflicts: current gap and future challenges. *Rangeland Ecology & Management*, 71(3), 389-394.
- Stone, S., Breck, S., Timberlake, J., Haswell, P., Najera, F, Bean, B., Thornhill, D., "Adaptive use of nonlethal strategies for minimizing wolf-sheep conflict in Idaho," Journal of Mammalogy, 98(1):33–44, 2017, DOI:10.1093/jmammal/gyw188;
- Sacks, B. N., Jaeger, M. M., Neale, J. C. C., & McCullough, D. R. (1999). Territoriality and breeding status of coyotes relative to sheep predation. *Journal of Wildlife Management*, 63, 593-605.
  - a) Immigration rate of breeding pairs can increase into the area where other wolves are being killed.
- Bergstrom, B., "Carnivore conservation: shifting the paradigm from control to Coexistence," Journal of Mammalogy, 98(1):1–6, 2017, DOI:10.1093/jmammal/gyw185; <u>https://drive.google.com/drive/u/0/my-drive</u>

- 9) Peebles, K., Wielgus, R. B., Maletzke, B. T., and Swanson, M. D. (2013). Effects of remedial sport hunting on cougar complaints and livestock depredations. *PloS One*, 8: e79713.
  - a) Wolves immigrating in to recolonize vacant territories are more likely to be subadults, which have a greater propensity for livestock depredation than older adults.

### High Economic Costs of Measures Used to Kill Wolves

Wolf kill operations are expensive and ongoing. For example, killing the Profanity Peak Pack in Washington cost the state \$137,000 dollars.

#### For more information on the economic cost of killing wolves see:

- McManus, J.S., Dickman, A.J., Gaynor, D., Smuts, B.H., "Dead or alive? Comparing costs and benefits of lethal and non-lethal human–wildlife conflict mitigation on livestock farms," 2014. DOI: https://doi.org/10.1017/S0030605313001610
- 2) <u>https://www.spokesman.com/stories/2017/jan/17/profanity-peak-pack-removal-cost-state-135k/</u>
- 3) <u>https://www.hcn.org/issues/50.12/wolves-when-cattle-go-missing-in-wolf-territory-who-should-pay-the-price</u>.
- 4) https://www.cbc.ca/news/canada/north/nwt-wolf-cull-follow-1.5799342

## Who kills wolves for livestock-wolf conflicts?

- State agency staff often take on the role of killing wolves following predations, especially in instances where USDA Wildlife Services cannot be contracted.
- 2) Depending on state laws and rules, livestock owners can sometimes kill wolves under various circumstances, or be issued a permit to kill wolves following predation instances.
- 3) In some instances, livestock owner will hire independent trappers to kill wolves.
- USDA-Wildlife Services is a taxpayer funded <u>federal wildlife killing program</u> housed within the USDA. Wildlife Services kills wolves, and other wild animals, through federally subsidized contracts annually.

## **State and Federal Livestock Predation Compensation Programs**

## **Oregon's Compensation Program**

Investigative report identifies a pattern of questionable payments on the part of the state of Oregon that contradicts established knowledge of the state's wolf population. Investigation also found state and county officials fail to take the necessary steps to confirm claims of missing livestock and ensure a limited money pool flows toward legitimate claims of wolf kills.

• See <u>https://www.opb.org/news/article/questionable-payments-oregon-ranchers-wolves-</u> cattle/

#### Minnesota Reimbursement of Wolf Predation Claims

Even with the state's wolf population increasing and the wolf range in Minnesota at approximately 43,496 square miles, only a small portion of Minnesota farmers are affected by wolf predations on livestock. In 2013, a total of 65 farms out of 74,400 farms experienced verified livestock predations, and these livestock-raisers are eligible for compensation of fair market value per animal by the Minnesota Department of Agriculture. Minnesota's wolf predation claims have remained stable with a <u>five-year average</u> of 70 verified complaints annually.

Minnesota Department of Agriculture (MDA) receives an appropriation of \$350,000 each biennium to reimburse wolf predation claims made by livestock producers. Over the last 10 years, the MDA has paid between claims worth approximately \$100,000 - \$250,000 per year.

• See <a href="https://wolf.org/wolf-info/basic-wolf-info/wolves-and-humans/wolf-depredation/">https://wolf.org/wolf-info/basic-wolf-info/wolves-and-humans/wolf-depredation/</a>

## Social Science Relating to Wolf Livestock Predation and Livestock Industry

Prominent early American Society of Mammologists (ASM) members including Aldo Leopold individually published letters stating that killing large carnivores, particularly in the western United States, was driven by politics rather than science and was excessive in its direct effects on targeted as well as non-targeted species of native mammals (Bergstrom et al. 2014).

While social science research indicates broader public support for nonlethal methods of predator control than for killing predators, many livestock owners maintain skepticism concerning the anticipated effectiveness of nonlethal methods and the costs to implement them. (Stone 2017).

This continuing reluctance by livestock owners and state wolf managers underscores the importance of agency staff keeping up to date on studies around the globe comparing efficacy of nonlethal methods of conflict-prevention with that of killing predators, and to share these results with the livestock-owner communities with which they work.

See Stone, S., Breck, S., Timberlake, J., Haswell, P., Najera, F, Bean, B., Thornhill, D. (2017). Adaptive use of nonlethal strategies for minimizing wolf–sheep conflict in Idaho. *Journal of Mammalogy*, 98(1):33–44, 2017, DOI:10.1093/jmammal/gyw188

## State Spotlight: Idaho's Wolf Depredation Control Board

Created in 2014 within the Office of the Governor and funded by a mix of contributions from livestock owners, Idaho Department of Fish and Game fees, and the state's general funds, the Idaho Wolf Depredation Control Board's purpose is to direct and manage funds for the purpose of wolf predation control within the State of Idaho. In March 2020, the Idaho state senate voted 26-4 in favor of providing the Idaho Wolf Depredation Control Board with an additional \$400,000 in state funding to kill wolves that attack livestock. Governor Brad Little signed off on the bill, which taps money from the state's general fund.

Around the same time, a 7-year study undertaken and co-published by USDA Wildlife Services demonstrated the remarkable efficacy of nonlethal predator deterrents deployed on public grazing lands in Idaho. Over the 7-year period, sheep predation losses to wolves were 3.5 times higher in the Nonprotected Area (NPA) than in the Protected Area (PA). Furthermore, sheep predation losses to wolves were just 0.02% of the total number of sheep present, the lowest loss rate among sheep-grazing areas in wolf range statewide, and no wolves were killed for livestock conflicts in the NPA.

- Stone, S., Breck, S., Timberlake, J., Haswell, P., Najera, F, Bean, B., Thornhill, D., "Adaptive use of nonlethal strategies for minimizing wolf-sheep conflict in Idaho," Journal of Mammalogy, 98(1):33–44, 2017, DOI:10.1093/jmammal/gyw188.
- <u>https://wolfboard.idaho.gov/</u>
- https://www.ktvb.com/article/news/local/capitol-watch/idaho-governor-brad-littlesigns-bill-appropriate-money-to-kill-problem-wolves/277-9a10573c-0ec9-4d84-bc88-8b7775d573ce

## Non-Lethal Measures for Wolf- Livestock Coexistence

While livestock losses to wolves represent a small fraction of overall livestock mortality, the response to these predations have led to significant levels of wolf killing (trapping, poisoning, shooting wolves) by state and federal agents. As a result, over recent decades in the U.S., thousands of wolves have been killed and millions of dollars spent to kill wolves as a means of predation control.

Killing of wolves continues despite scientific studies showing that killing predating wolves without addressing the underlying causes of predation only temporarily eliminates predation attacks on livestock (Fritts et al. 1992; Gehring et al. 2003; Musiani et al. 2005; Bradley et al. 2015). For example, Bradley et al. (2015) found that recurring predations were typically made by the next pack to occupy the vacant territory within 2 years, yet, in the Northern Rockies region, costs for investigations into livestock predation, killing wolves, and compensation for livestock losses exceeded \$1.5 million in 2010 alone.

As an alternative to the waste of life and dollars, a variety of nonlethal methods have proven effective in reducing livestock losses to wolves both in small-scale operations and large-scale, open-range grazing operations, especially when employed in an adaptive manner (see Stone et al. 2017. IWC, <u>https://wolf.org/wow/depredation2/</u>. These nonlethal methods include the following:

- 1. Human Presence
  - a. When human presence occurs in an area of simultaneous use by wolves and livestock, wolves typically move away, and livestock stay alive. Regular or planned presence using range riders, hazers, herders, or other human guarding of livestock function as conflict deterrents. So, too, does responsiveness to observations of wolf predation activity, abnormal livestock behavior, and/or during times when livestock are particularly susceptible to predation. Though increased human presence may not prevent all livestock-wolf conflicts, it can be conducted in a manner which would reasonably be expected to deter such conflicts based on frequency of wolf use in the area, predation patterns (*e.g.*, predation around calving areas), and seasonal patterns.

## 2. Range Riders

a. Range riding on the open range on a consistent basis to monitor cattle health, behavior and locations. Additional human presence can be a supplemental measure, but not a replacement for range riding. Range riding requires constant presence around livestock to make wolves aware and wary of the presence of humans. It requires time spent in the forest, off roads, near to the animals themselves with a deep knowledge of where livestock are present as well as where wolves are present. The key responsibility of range riders to have the most likelihood of success is to monitor the cattle to keep them bunched up and in sight; it is not effective and in fact counter-productive to instead be simply monitoring wolf radio-collar data.

## 3. Shepherds for Sheep

a. Large sheep herds often are broken into several bands. Ideal human presence with sheep includes at least one or more shepherds with each band and multiple livestock guardian dogs per band.

## 4. Livestock Guard Dogs

- a. Breeds such as Pyrenees, Anatolian, Akbash, or other established guarding breeds are normally used as livestock protection dogs in conjunction with herded livestock such as sheep but may be used in some situations for cattle or other livestock species. Multiple trained adult dogs are usually recommended, but the number of dogs needed may depend on the level of wolf activity in the area, size of grazing area, and behavioral characteristics of the dogs.
- b. Some guarding breeds used in the United States selected decades ago to protect livestock from coyote predation may not be as successful at protecting livestock from wolves. Preliminary findings by the National Wildlife Research Center (NWRC), part of Wildlife Services, have found additional breeds of large guarding dogs that show promise in their ability to deter wolves. Consultation with Wildlife Services or other professionals may be necessary to evaluate the most effective guard dog strategy.
- c. Other animals may be used to alert herders of wolf presence, including nonguarding dog breeds but these dogs must be protected from wolf attack and are only effective if accompanied by human presence. Other aggressive breeds of animals (*i.e.*, donkeys, etc.) may help protect against wolves but should be considered experimental.

- d. For more information on livestock guardian animals see:
  - i. <u>http://www.tamaracksheep.com/uncategorized/history-of-livestock-guard-dogs-at-tamarack-lamb-wool/</u>
  - ii. https://www.lovetreefarmstead.com/dogs.htm
  - iii. https://www.farmshow.com/a\_article.php?aid=18992

## 5. Carcass Removal

- a. Wolves and many predators are attracted to dead animals and the presence of a single carcass can have the effect of attracting and keeping wolves in areas of livestock. Dispersing radio-collared wolves often travel long distances only to stop once they have found a bone pile (which frequently still have flesh of the deceased animal attached) or carcass. Carcasses and bone piles should be removed wherever wolves roam and, in fact, removal may be the single best action livestock owners can take to keep from attracting wolves to areas of livestock. Some states require the removal of carcasses by law, such as Michigan's Bodies of Dead Animals Act. Yet, even in the absence of legal directives, carcasses (and any existing old bone piles) should be removed whenever possible.
- b. The physical removal or treatment of dead livestock carcasses is most important in areas where livestock are concentrated in medium-sized wintering and birthing pastures or in open range situations near ponds, salt licks, or bedding areas. Removal may occur by hauling carcasses to disposal in a landfill or other appropriate location, or by burying in some situations. In situations where removal or burying is not an option, treatment of carcasses may include accelerating decomposition through applying lime or dousing with kerosene or burning. If these methods are not permitted (*e.g.*, due to potential prohibitions of such on some federally owned grazing allotments), other options can include covering or protecting the carcass from wolves with fladry or temporary fences. In California, county officials in the northern part of the state are exploring an option of composting livestock carcasses.
- 6. Fladry and/or Electrified Fladry
  - a. A rope or electric wire with evenly spaced red flags that hang down. Highly portable and can be installed relatively quickly, fladry can be used for a variety of livestock operations –sheep night penning, and some calving areas. It may be applied to certain open range situations but is best used as mobile protection on a short-term basis.

- b. Producers are encouraged to work with biologists to determine if fladry is appropriate. Fladry requires regular maintenance for effective use. In general, fladry is not intended for use over long periods of time in the same location because wolves may become habituated, and thereby reduce effectiveness.
- c. Experimental use of fladry in attempts to document the length of its effectiveness have generally found it to be effective for around two months, at which point wolves may become habituated to this particular tool.

## 7. Fencing

- a. Fencing is considered when attempting to protect livestock in a small pasture, enclosure, or when stock is gathered in a reasonably protectable area. It is generally not applied to larger or dispersed grazing operations. The type of barriers used is highly dependent on the type of livestock and conditions.
- b. Fencing may be effective and is often a good option for small numbers of livestock and/or small acreages or pens.
- c. Types of fencing vary and may include multiple-strand electric or electric mesh, woven wire mesh, panels, or other hard barriers.
- 8. <u>Hazing/harassment</u>, *e.g.* flashing lights, motion-activated noise
  - a. Harassment of wolves to actively scare wolves away from livestock may include a variety of lighting devices, like Fox Lights<sup>TM</sup> or spotlights, the use of loud noises, including air horns, music players, and other motion-activated noise, and non-lethal projectiles.
  - b. Varying the sounds and frequently changing positions of the device will increase effectiveness and reduce the chance that wolves become habituated.
- 9. Enhanced Animal Husbandry Practices
  - a. Specific husbandry practices may include but is not limited to management of livestock to avoid high risk areas or seasons, evening feedings, replacing vulnerable stock, adjusting calving seasons and location, confining animals at night, not removing horns from cattle, and prompt disposal of carcasses.
  - b. Operators may wait to put calves in forested pastures and allotments until after the elk and deer have produced their young for the year, greatly increasing the wolf's natural food sources.

For more information on non-lethal conflict deterrence see:

- Oregon Department of Fish and Wildlife, Non-Lethal Measures to Minimize Wolf-Livestock Conflict, May 2019. <u>https://www.dfw.state.or.us/Wolves/docs/ODFW\_Nonlethal\_Measures.pdf</u>
- Stone, S., Breck, S., Timberlake, J., Haswell, P., Najera, F, Bean, B., Thornhill, D., "Adaptive use of nonlethal strategies for minimizing wolf–sheep conflict in Idaho Suzanne A. Stone," Journal of Mammalogy, 98(1):33–44, 2017, DOI:10.1093/jmammal/gyw188;
  - Over a 7-year pilot project in prime wolf habitat in Idaho, the adaptive use of a suite of non-lethal deterrent strategies reduced sheep predation by more than 3-fold compared to sheep allotments in Idaho that used lethal controls over the same period.
- Ciucci, P., Mancinelli, S., Boitani, L., Gallo, O., Grottoli, L., Anthropogenic food subsidies hinder the ecological role of wolves: Insights for conservation of apex predators in human-modified landscapes, Global Ecology and Conservation (2019), doi: https://doi.org/10.1016/ j.gecco.2019.e00841.
  - Authors call for stricter regulations to govern livestock management practices based on study of wolves' access to livestock carrion subsidies, which depress predatory behavior in wolves, despite the occurrence of an abundant wild prey community, and have ecological, evolutionary and management implications.
- People and Carnivores. <u>https://peopleandcarnivores.org.</u>
- Information and resources regarding Wood River Wolf Project at <u>https://www.woodriverwolfproject.org/tools</u>
- Janeiro-Oteroa, A., Newsome, T., Van Eeden L., Ripple W., Dormann, C., "Grey wolf (Canis lupus) predation on livestock in relation to prey availability," Biological Conservation, 2020, <u>https://doi.org/10.1016/j.biocon.2020.108433</u> &

https://wolfwatcher.org/wp-content/uploads/2020/03/Otero-et-al-Biological-Conservation-Issue-243-2020.pdf.

> Results confirm that leaving animals unattended significantly increase livestock predation in any situation, with predation increasing up to 78% in herds without any type of protection.

## Predator Control Measures Must Rely Upon Best Available Science

Reliance upon Best Available Science for wolf conservation planning, particularly in the context of livestock-wolf conflicts, is imperative to counter long-standing fear, hatred and ignorance surrounding wolves.

## Fact Check — Livestock Predation & Wolves

The Humane Society of the United States created a report which provides context to actual losses of sheep and cattle to wolves. The report includes visually compelling graphs, created with data directly from USDA. *See <u>https://www.humanesociety.org/sites/default/files/docs/HSUS-Wolf-Livestock-6.Mar\_.19Final.pdf.</u>* 

## <u>Conservation Challenge: Scientific Evidence Inconclusive on Efficacy of Predation Control</u> <u>Methods</u>

To date, strong inferences about effectiveness of predation control methods are prevented by absence of rigorous scientific evidence proving interventions' effectiveness in preventing predation on livestock:

- 1) Paucity of rigorous evaluation
- 2) Scarce quantitative comparisons of interventions
- 3) Poor comparisons against experimental controls
- 4) Experimental designs inadequate to avoid biases in sampling, treatment, measurement, or reporting.

#### For more information see:

See van Eeden LM, Eklund A, Miller JRB, López-Bao JV, Chapron G, Cejtin MR, et al. (2018) "Carnivore conservation needs evidence-based livestock protection." PLoS Biol 16(9): e2005577. <u>https://doi.org/10.1371/journal.pbio.2005577;</u>

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2005577

Abstract: "...Between 2016 and 2018, four independent reviews evaluated >40 years of research on lethal and nonlethal interventions for reducing predation on livestock. From 114 studies, we find a striking conclusion: scarce quantitative comparisons of interventions and scarce comparisons against experimental controls preclude strong inference about the effectiveness of methods. For wise investment of public resources in protecting livestock and carnivores, evidence of effectiveness should be a prerequisite to policy making or large-scale funding of any method or, at a minimum, should be measured during implementation. An appropriate evidence base is needed, and we recommend a coalition of scientists and managers be formed to establish and encourage use of consistent standards in future experimental evaluations.

Balancing the goals of nature preservation, livelihood protection, and welfare of carnivores and domestic animals depends on policies that foster coexistence between humans and carnivores in multiuse landscapes. Central to this aim is a need for rigorous scientific evidence that interventions are effective in preventing predation on livestock. Such policies should be based on strong inference, otherwise, we risk wasting resources on ineffective interventions that might harm all involved.

We suspect that the striking paucity of rigorous evaluation is due to the tendency for decisions about predator control to depend on factors other than evidence-based evaluation of whether a given intervention effectively protects livestock. However, objective scientific evidence of an intervention's functional effectiveness must remain a foundational prerequisite on which subjective inquiries later build. The lack of scientific synthesis and consensus about functional effectiveness has allowed more subjective factors to dominate decision-making about predator control and likely wasted time and money on interventions that do not optimally protect livestock.

 Treves, A., Krofel, M., Ohrens, O., Van Eeden, L.M., 2019. Predator control needs a standard of unbiased randomized experiments with cross-over design, Frontiers in Ecology and Evolution 7, 402-413.

https://www.frontiersin.org/articles/10.3389/fevo.2019.00462/full.

- Treves, A., Martin K.A., Wydeven, A.P., Wiedenhoeft, J.E. 2011. Forecasting Environmental Hazards and the Application of Risk Maps to Predator Attacks on Livestock. Bioscience 61(6): 451-458.
- Developed a predictive spatial model, or risk map, for gray wolf attacks on livestock in Wisconsin between 1999 and 2006 that correctly identified risk in 88% of subsequent attack sites from 2007 to 2009.
- Musiani et al. 2005, Seasonality and recurrence of depredation and wolf control in Western North America <u>https://drive.google.com/drive/u/0/folders/16Ma-</u> <u>4ZRjmXmQ8RLWk9HAo-Fs1zgl0kFo;</u>
- Khorozyan, I., Waltert, M., 2019. How long do anti-predator interventions remain effective? Patterns, thresholds and uncertainty. Royal Society Open Science 6. <u>https://royalsocietypublishing.org/doi/10.1098/rsos.190826</u>.
- Eklund, A., López-Bao, J., Tourani, M. *et al.* Limited evidence on the effectiveness of interventions to reduce livestock predation by large carnivores. *Sci Rep* 7, 2097 (2017). <u>https://doi.org/10.1038/s41598-017-02323-w</u>
  - Abstract: Successful coexistence between large carnivores and humans is conditional upon effective mitigation of the impact of these species on humans, such as through livestock depredation. It is therefore essential for conservation practitioners, carnivore managing authorities, or livestock owners to know the effectiveness of interventions intended to reduce livestock predation by large carnivores. We reviewed the scientific literature (1990–2016), searching for

evidence of the effectiveness of interventions...We urge managers and stakeholders to move towards an evidence-based large carnivore management practice and researchers to conduct studies of intervention effectiveness with a randomized case-control design combined with systematic reviewing to evaluate the evidence.

- Sutherland, W., Pullin, A., Dolman, A., Knight, T., "The Need for evidence-based conservation," 2004, DOI: <u>https://doi.org/10.1016/j.tree.2004.03.018.</u>
  - Much of current conservation practice is based upon anecdote and myth rather than upon the systematic appraisal of the evidence, including experience of others who have tackled the same problem. We suggest that this is a major problem for conservationists and requires a rethinking of the way conservation operates. There is an urgent need for mechanisms that review available information and make recommendations to practitioners. We suggest a format for web-based databases that could provide the required information in accessible form.
- Lennox, R., Gallagher A., Ritchie, E., Cooke, S., (2018), "Evaluating the efficacy of predator removal in a conflict-prone world, "2018, <u>https://euanritchie.files.wordpress.com/2018/06/1-s2-0-s0006320717310418-main.pdf.</u>
  - Abstract: Predators shape ecosystem structure and function through their direct and indirect effects on prey, which permeate through ecological communities. Predator removal persists as a management strategy but requires scientific evaluation to assess the impacts of these actions, and to develop a way forward in a world where human-predator conflict may intensify due to predator reintroduction and rewilding, alongside an expanding human population.

We reviewed literature investigating predator removal and focused on identifying instances of successes and failures. Research tended to be retrospective and correlative and <u>there</u> were few controlled experimental approaches that evaluated whether predator removal met our definition of success, making formal meta-analysis impossible. <u>Predator removal appeared to only be effective for the short-</u>

term, failing in the absence of sustained predator suppression. This means predator removal was typically an ineffective and costly approach to conflicts between humans and predators. Management must consider the role of the predator within the ecosystem and the potential consequences of removal on competitors and prey.

## Lack of scientific agreement & conclusive science recommends reliance on Precautionary Principle and other conservation tenets in favor of non-lethal deterrents

State wildlife agencies and wolf policy stakeholders should rely on the Precautionary Principle, together with adaptive management, Tribal guidance, and conservation values, to support prioritization, incentivization and requiring the use of non-lethal deterrents for livestock-wolf predation. [See Chapter 4.D].

# **Chapter 7 ... WOLF HUNTING & TRAPPING SEASONS**

## Key Chapter Takeaways:

- 1. State-authorized wolf hunting and trapping seasons put wildlife agencies at odds with state regulatory or legislative mandates to conserve and manage wolves for the public at large, including future generations. While state wildlife agencies historically have had more interaction with, and realized more direct opportunities for funding from, hunters and trappers than with members of the public enjoying wildlife through hiking, photography, camping, and other non-consumptive activities, times are changing. Wildlife agencies are faced with a smaller, ever shrinking constituency of hunters and trappers and a growing majority of state residents whose values towards wildlife, as evidenced by social science, favor neither hunting nor trapping of wolves. Present times thus require that wildlife agencies closely examine their rationales in favor of wolf hunting and trapping in keeping with the agency's legal and democratic obligations.
- 2. State agencies in the United States tend to use the North American Model of Wildlife Conservation (NAM) as an overarching perspective on how wildlife should be managed. Conservation groups, Tribal representatives and academicians have found significant reasons to critique the NAM and have noted its fundamental flaws. And state agencies which claim they follow the NAM's seven principles may, in fact, selectively follow some but not others. For instance, one of the central tenets of the North American Model of Wildlife Conservation (NAM) provides that wildlife can be killed only for a "legitimate purpose." Yet, as outlined below, wildlife conservationists, wolf scientists, and researchers confirm that no good reason exists in support of state wolf hunting and trapping seasons.
- 3. As a keystone species, wolves provide far-reaching ecological benefits; and the species self-regulates its own population numbers based on prey availability and other factors. Science confirms there is no need to kill wolves to control wolf populations. Moreover, no economic justification exists for hunting wolves. In fact, economic considerations, including the high cost of implementing an annual season and the economic harm to more lucrative wildlife-watching tourism trade, counsel against hunting and trapping seasons.

- 4. Wolf hunting and trapping seasons serve little-to-no livestock predation deterrence purpose, nor do they reduce conflicts or improve wolf tolerance. Further, wolf hunting and trapping seasons threaten wolves' long-term recovery through additive mortality. Arbitrary wolf killing interrupts the necessary multi-generational social structure of wolf packs, compromises pup survival, and limits wolf dispersal.
- 5. For these reasons, state officials and wildlife agencies should be encouraged to reevaluate underlying rationales, economic downsides, and the risks of alienating much of their citizenry and put an end to recreational wolf hunting and trapping in their states.

# Wolf Hunting and Trapping Seasons Lack Economic and Ecological Justification & Threaten Wolf Recovery

### Best Science demonstrates wolf hunting and trapping seasons serve no legitimate purpose

State hunting and trapping seasons involving random and arbitrary kills of wolves across designated Harvest Zones (often in geography far from livestock operations) cannot target specific predating wolves and has shown no long-term resolution of wolf conflicts with livestock. State hunting seasons in the Fall and Winter do not resolve the predation problem experienced in the Spring or Summer.

Moreover, wolf hunting seasons serve no purpose with respect to ungulate populations. As plainly stated by Yukon wolf biologist Bob Hayes, "I spent 18 years studying the effects of lethal wolf control on prey populations. The science clearly shows killing wolves is biologically wrong."

For more information on how wolf hunting and trapping serves no biological purpose see:

- Bob Hayes. 2010. Wolves of the Yukon ISBN: 978-09867376-0-2; bobhayes@wolvesoftheyukon.ca; http://www.wolvesoftheyukon.ca
- DeCesare, N., et al., "Wolf-Livestock Conflict and the Effects of Wolf Management," The Journal of Wildlife Management 82(4):711–722; 2018; DOI: 10.1002/jwmg.21419.
  - Concluding that public harvest did not significantly reduce the recurrent presence of predations, based upon study of wolf predations of livestock in Montana from 2005–2015 and evaluations of targeted control efforts and public harvest as potential means to reduce predations.
  - "...hunter harvest did not significantly reduce the probability of repeated depredations. When restricting analyses to a subset of years following public harvest of wolves by hunting or trapping, there was no evidence that spatial variation in either the presence of public harvest (P ¼ 0.874) nor the number of wolves harvested (P ¼ 0.515) had significant effects on the probability of repeated depredations within districts."

- <u>https://www.humanesociety.org/sites/default/files/docs/HSUS-Wolf-Livestock-6.Mar\_.19Final.pdf</u>
  - Wolf Hunting Seasons do not remedy localized livestock predation problems.

# No Ecological Purpose or Economic Benefit Served by Hunting and Trapping Seasons on Wolves

Wolves self-regulate their own population numbers based on availability of prey and other factors, including disease, pack stability and territoriality; state hunting seasons are not necessary to cull population.

Further, state hunting and trapping seasons lack economic justification, given resultant economic harm to wildlife watching tourism trade and lack of nexus between hunting seasons and reduction in livestock-wolf conflicts.

For more information on wolf hunting and trapping economics and ecology see:

- Wallach, A., <u>Izhak, I.</u> Toms, J., Ripple, W., <u>Shanas</u>, U., What is an Apex Predator, OIKOS Synthesising Ecology, V<u>olume124</u>, <u>Issue11</u>, November 2015, <u>https://doi.org/10.1111/oik.01977</u>
- Carriappa, C., Oakleaf, J., Ballard, W., A Reappraisal of the Evidence for Regulation of Wolf Populations, Breck, S., The Journal of Wildlife Management 75(3):726–730; 2011; DOI: 10.1002/jwmg.74
- Borg BL, Arthur SM, Bromen NA, Cassidy KA, McIntyre R, Smith DW, et al. (2016) Implications of Harvest on the Boundaries of Protected Areas for Large Carnivore Viewing Opportunities. PLoS ONE 11(4): e0153808. https://doi.org/10.1371/journal.pone.0153808

# Additive Mortality: Hunting and Trapping Seasons Threaten Pack Stability, Increase Pup Mortality, and Limit Dispersal

Due to wolves' social structure, trophy hunting and trapping seasons lead to a cascade of adverse effects resulting in disruption and death beyond that individual, described as "additive" and "super additive" mortality. Hunting and trapping seasons result in arbitrary kills, which destabilize functional pack structures, which in turn may lead to sub-functional packs or dissolution of the pack, limiting wolves' ability to hunt natural prey and to breed and raise pups. Moreover, studies show that state-sanctioned culling of wolves leads to increased rates of poaching and illegal killing of wolves. Chapron and Treves 2016.

Recent studies demonstrate additive and super-additive effects on wolf mortality as a consequence of the additional loss of dependent offspring or pack structure disruption caused by hunting and trapping kills. (Murray et al. 2010; Creel and Rotella 2010; Ausband et al. 2015; Borg et al. 2015). Brainerd et al. (2008) addressed the issue of breeder loss in wolf packs through an analysis of pooled data, finding among other consequences that the loss of one or more breeders led to dissolution of groups and territory abandonment in 38 percent of cases. Further, Rutledge et al. (2010) concluded that human predation could affect evolutionarily important social patterns in wolves and that intense exploitation appeared to increase the adoption of unrelated wolves into disrupted packs. Hochard and Finnoff (2014) found that the effects of wolf hunting depend in part on the resulting change in wolf pack size.

Similarly, Bryan et al. (2015) found that hunting wolves can change their reproductive and breeding strategies as well as create chronic stress for them, with potentially detrimental effects on the fitness of individuals, changes to packs' evolutionary potential, and increased risk for population extinction (see also Rick et al. 2017). Ausband et al. (2017) found that breeder turnover had marked effects on the breeding opportunities of subordinates and the number and sex ratios of subsequent litters of pups. The wolf researchers concluded that seemingly subtle changes to groups, such as the loss of one individual, can greatly affect group composition, genetic content, and short-term population growth when the individual lost is a breeder.

Further, wolf hunting and trapping contributed to increased wolf pup mortality, because it compromised wolf pack size and thereby pup survival. Most harmful, wolf hunting and trapping seasons that overlap wolf breeding season for extended periods compound breeder loss, which has been shown to have a strong negative effect on pup survival. (Ausband et al., 2017).

## For more information on additive mortality see:

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- Ausband, D., Mitchell, M., Stansbury, C., Stenglein, J., Waits, L. (2017). Harvest and group effects on pup survival in a cooperative breeder. *Proceedings of the Royal Society B: Biological Sciences, 284*(1855), 20170580. Doi: <u>10.1098/rspb.2017.0580</u>
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## States Currently Authorizing Wolf "Hunting<sup>1</sup>"

### Wisconsin Wolf Hunt

During the last week of February 2021, the State of Wisconsin allowed public hunting and trapping of wolves for the first time since 2014. In less than three days, hunters reported killing 218 wolves — exceeding the statewide quota by 82%. The unprecedented hunt took place during the wolf breeding season, killing pregnant females and disrupting family packs at a time critical to pup survival. A full accounting of the hunt's biological toll is impossible, as the state declined to inspect carcasses. Most wolves (nearly 90%) were killed by hound hunters, relying upon GPS technology, snowmobiles, and successive packs of dogs used to pursue wolves for miles and hours on end. The rapid death toll of wolves was attributable to the high number of permits issued and the large groups of hound hunters, deploying packs of dogs, during a period when wolf packs were breeding. Any of the usual sporting ethics of fair chase were absent from this event, as it may have been the first hunt in Wisconsin's history where the number of hunters was greater than the number of animals being hunted.

A staff member at the Wisconsin Department of Natural Resources called the hunt a "(expletive") abomination."

#### For more information on the Wisconsin wolf hunt see:

 "The February 2021 Wisconsin Wolf Hunt: A Preliminary Assessment," Wisconsin's Green Fire Conservation Bulletin. <u>https://wigreenfire.org/2019/wp-</u> <u>content/uploads/2021/04/WGF-Cons-Bulletin-Feb-Wolf-Hunt-04-28-2021.pdf</u>

<sup>&</sup>lt;sup>1</sup> The states listed within this section indicate a tragic and violent trend in state wolf management. Rather than observing the ethics of fair chase hunting and applying scientific, sustainable wildlife management principles, these states have mounted and/or conceded to politically fueled campaigns to massacre wolves. Regulations and legislation in these states have been enacted to enormously expand when, where, and how wolves can be killed. The results from these political wolf policies are not hunting. This is not an anti-hunting resource; however, the below can only be described as brutal, horrific and unacceptable.
- Smith, P., "Wolf season results demand truthful analysis," *Milwaukee Journal Sentinel*, March 6, 2021, <u>https://www.jsonline.com/story/sports/columnists/paul-</u> <u>smith/2021/03/06/state-licensed-quota-exceeded-82/4594804001/</u>.
- <u>https://www.washingtonpost.com/opinions/2021/03/15/wisconsin-brutal-wolf-hunt-conservation-policy/</u>
- <u>WI Hunters Turn to Highway Signs in Effort to Protect Wolves / Public News Service</u>

## **Idaho Wolf Hunting**

Records from Idaho Department of Fish and Game (IDFG) reveal that recreational hunters, trappers, and state and federal agents killed at least 583 wolves in Idaho during a 12-month period from July 1, 2019 to June 30, 2020. Of those 583 wolves, 460 individuals were killed by trophy hunters and trappers, 95 were killed by USDA Wildlife Services, and 28 were killed via predator control, poaching, through vehicle collisions and other human-caused methods. Included in the mortality are at least 35 wolf pups, some weighing under 16 pounds and likely only 4 to 6 weeks old. Some of the wolves shattered teeth trying to bite their way out of traps, others died of hyperthermia in traps set by the USDA's Wildlife Services, and more were gunned down from the air. The total mortality during this period represented nearly 60% of the 2019 year-end estimated Idaho wolf population.

About 400 wolves have been killed each year in Idaho for the past several years. With only about 900-1,556 wolves in the state, a large percentage of the wolf population is killed each year. The 583 wolves killed in 2019-2020 is record-breaking, a likely result of Idaho Department of Fish and Game's incentivization of wolf-killing. The Idaho Department of Fish and Game announced in 2020 that it had awarded approximately \$21,000 in "challenge grants" to the north Idaho-based Foundation 4 Wildlife Management, which reimburses wolf trappers a bounty up to \$1,000 per wolf killed. The Foundation also has received funding for wolf bounties from the Rocky Mountain Elk Foundation. At its Jan. 23, 2020 meeting, the Idaho Fish and Game Commission increased the number of wolves a single individual may kill to 30, an increase from the 20 wolves previously allowed.

In May 2021, Governor Little signed a bill (S. 1211) into law that will drastically increase the already high number of wolves killed in Idaho each year. Among other provisions, the act aims to kill up to 90% of Idaho's wolves and reduce the population to 150 individuals or 15 packs. The act also allows hunters and trappers to kill an unlimited number of wolves, extends the trapping season to year-round on private lands, and allows nearly any method to be used to kill wolves--including poison, snaring, and shooting mothers and pups in their dens. This new law goes into effect on July 1, 2021.

## For more information on Idaho wolf hunting and trapping see:

- Pearson, B. (2020). F&G Commission increases number of wolf tags hunters and trappers can purchase. <u>https://idfg.idaho.gov/press/fg-commission-increases-number-wolf-tagshunters-and-trappers-can-purchase</u>
- Phillips, R. (2021). Idaho wolf populations remain stable between 2019 and 2020 despite higher mortality. <u>https://idfg.idaho.gov/press/idaho-wolf-populations-remains-stable-</u> <u>between-2019-and-2020-despite-higher-mortality</u>
- https://legislature.idaho.gov/sessioninfo/2021/legislation/s1211/
- <u>https://www.westernwatersheds.org/2020/09/slaughtered-pups-and-maimed-wolves-in-idaho-demonstrate-the-effects-of-federal-delisting/</u>
- https://www.nationalgeographic.com/animals/article/idaho-bill-90-percent-of-wolves-tobekilled#:~:text=The%20act%2C%20SB1211%2C%20was%20signed,around%201%2C50

<u>0%20at%20last%20count</u>.

## Wyoming Wolf Hunting and Trapping

In Wyoming, the Department of Game and Fish manages wolves with dual classifications of trophy game and predatory animals (Wyoming Game and Fish Dept. 2012). State managers allow

unrestricted wolf killing (no limit on numbers of wolves taken, no specificity as to the methods of take, and no requirement to obtain a hunting license) in over 80% of the state where wolves are classified as predatory animals. W.S. § 23-1-101(a)(viii)(B). It is permissible to chase wolves and other animals designated as predatory animals, such as coyotes, to exhaustion with snowmobiles, then run them over. Even wolves in the Wolf Trophy Game Management Area (WTGMA) face high levels of exploitation. In 2020, the state instituted a wolf hunting season with the biological objective to stabilize the wolf population in the WTGMA at 160 wolves. At the end of 2020, there were only a minimum of 147 wolves in the WTGMA and a minimum of 36 wolves in the rest of the state where wolves are classified as predatory animals.

During the 2020 wolf hunting season, 31 wolves were killed by hunters in the WTGMA and another 22 were killed as predatory animals in the rest of the state. Additionally, 43 wolves were killed by agencies or members of the public in a misguided effort to reduce conflicts with livestock. *For more information on Wyoming wolf hunting and trapping see:* 

- Wyoming Game and Fish Department, U.S. Fish and Wildlife Service, National Park Service, USDA-APHIS-Wildlife Services, and Eastern Shoshone and Northern Arapahoe Tribal Fish and Game Department. 2021. Wyoming Gray Wolf Monitoring and Management 2020 Annual Report. K.J. Mills and Z. Gregory, eds. Wyoming Game and Fish Department, 5400 Bishop Blvd. Cheyenne, WY 82006. <u>https://wgfd.wyo.gov/WGFD/media/content/Wildlife/Large%20Carnivore/WYWOLF\_A</u> <u>NNUALREPORT\_2020.pdf</u>
- <u>Bill to ban snowmobile coyote whacking is run down | Environmental |</u> <u>jhnewsandguide.com</u>

#### Montana Wolf Hunting and Trapping

In Montana, there is no statewide limit on the number of wolves that can be killed by hunters and trappers in a season (there are limits in three small Wolf Management Units that border Yellowstone and Glacier National Parks). During the 2019-2020 season alone, 293 wolves were killed by hunters and trappers, including 130 who were trapped (Inman et al., 2020). This total

represents 35% of Montana's estimated wolf population and is just two wolves shy of the 2018-2019 record high of 295 wolves killed during a single season.

In addition to the 293 wolves killed by hunters and trappers, 72 wolves were killed during calendar year 2019 in a misguided effort to reduce livestock-wolf conflict.

During the 2021 legislative session, a raft of bills made their way through the Montana state legislature that will drastically expand wolf hunting and trapping. At the time of this writing, new laws signed by the Governor would allow the state to permit hunters and trappers to use snares, kill an unlimited number of wolves, use bait, hunt wolves at night, extend the wolf trapping season by 30 days and allow wolf hunters and trappers to be reimbursed for their expenses (essentially a wolf bounty).

## For more information on wolf hunting and trapping see:

- <u>https://fwp.mt.gov/hunt/regulations/wolf</u>
- Inman, B., Podruzny, K., Nelson, A., Boyd, D., Parks, T., Smucker, T., Ross, M., Lance, N., Cole, W., Parks, M., and Wells, S. (2020). Montana gray wolf conservation and management 2019 annual report. Montana Fish, Wildlife & Parks. Helena, Montana.
- <u>https://www.nationalgeographic.com/animals/article/efforts-to-make-wolf-hunting-</u> easier-upset-hunters

#### Alaska Wolf Hunting and Trapping

During the 2019-2020 trapping and hunting season, Alaska Department of Fish and Game eliminated trapping limits and in-season monitoring of trapping mortality relating to the Alexander Archipelago wolf on Prince of Wales Island. As a result, an unprecedented 165 wolves of the 170 wolves living on the island were killed during the two-month trapping season, not including any wolves illegally killed and unreported.

#### For more information on the Alexander Archipelago wolf hunt see:

• <u>https://biologicaldiversity.org/w/news/press-releases/alexander-archipelago-wolves-need-urgent-help-following-record-killings-in-alaskas-tongass-national-forest-2020-04-15/</u>

• https://www.newsweek.com/almost-all-wolves-alaskan-island-trappers-winter-1498289

## **Retrospective: Great Lakes States 2012-2014 Wolf Hunting & Trapping Seasons**

#### Wisconsin Retrospective

Pursuant to its wolf hunting statute, Act 169, which mandated an expansive state wolf hunting and trapping season once wolves were delisted, and reliance on a 1999 management plan's outdated population goal, Wisconsin pursued a plan to allow the reduction of its wolf numbers from approximately 800 down to 350.

In Wisconsin's 2013-14 hunting season, the Department of Natural Resources set a hunting and trapping quota amounting to one-third of the state's total wolf population; hunters and trappers proceeded to kill 31% of the state's wolf population (257 out of 822 wolves) in a single season. [See Wisconsin Department of Natural Resources, Natural Resources Board Agenda Item 3.B.2. (June 13, 2014).

This extreme hunting season single-handedly exceeded the 30% threshold, before even accounting for other sources of human-caused mortality including livestock predation removals, illegal poaching and wolves killed by accidents (which together totaled 13.6% of the population that year). In total, Wisconsin permitted 43.6% of the state's entire wolf population to be killed by humans <u>in a single year</u> (a figure that does not include the additive and super-additive mortality caused by hunter kills, or wolf deaths by natural causes).

In total, the three hunting and trapping seasons of 2012-2013; 2013-2014 and 2014-2015 resulted in the killing of 528 wolves, primarily by means of trapping (61% trapped and killed 2012-13; 70% trapped and killed 2013-14; and 80% trapped and killed 2014-15 respectively), a cruel method that even amongst professional wildlife managers is highly unpopular.

In addition, in 2013 and 2014, wolf hunting with the use of dogs was allowed in Wisconsin. Wisconsin is the only state in the United States (or in the civilized world) that allows this controversial method to hunt wolves, one wolf biologists maintain is certain to result in deadly and inhumane confrontations between wolves and dogs.

## For more on historic Wisconsin hunts see:

Stenglein, et al. "An individual-based model for southern Lake Superior wolves: A tool to explore the effect of human-caused mortality on a landscape of risk," 302 Ecological Modeling 13-14 (April 2015).

("A 30% harvest rate across the simulation on average reduced the populations by 65% after 20 years with some populations going extinct before 100 years).

- HSUS Wolf Kill Statistics: <u>https://www.humanesociety.org/sites/default/files/docs/wolf-kill-stats.pdf</u>
- Muth, RM; Zwick, RR; Mather, ME; Organ, JF; Daigle, JJ; and Jonker, SA, "Unnecessary source of pain and suffering or necessary management tool: Attitudes of conservation professionals toward outlawing leghold traps" (2006). WILDLIFE SOCIETY BULLETIN. 332. 10.2193/0091-7648(2006)34[706:USOPAS]2.0.CO;<u>https://scholarworks.umass.edu/nrc\_faculty\_pubs/3</u> 32/

#### Minnesota Retrospective

In Minnesota, the state had promised in its state wolf plan that there would be no hunting or trapping of wolves for five years post delisting, but instead instituted wolf hunting and trapping immediately following delisting. At least 870 wolves were killed and the state's total wolf population declined by 25% between 2008-2012.

• See https://www.humanesociety.org/sites/default/files/docs/wolf-kill-stats.pdf

#### Michigan Retrospective

Michigan's governor in 2013 signed a bill allowing its state department of natural resources to institute hunting of wolves despite citizens having collected over 250,000 signatures to place a no-wolf-hunting measure on the election-season ballot; a second "Keep Michigan Wolves Protected" ballot measure placed law authorizing wolf hunt on hold until 2014 general election. Michigan's only wolf hunt transpired in 2013, which resulted in a total of 22 wolves killed.

## Social Science Bearing on State Wolf Hunting and Trapping Seasons

Only minority interests are served by wolf hunting and trapping seasons, as American public opinion registers growing opposition to trapping wolves and trophy hunting [See Chapter 3, B].

State wolf hunting and trapping seasons run counter to established conservation principles, including the North American Model of Wildlife Conservation, as hunting wolves serves "no legitimate purpose."

## State Spotlight: Michigan Wolf Hunt

In Michigan, after wolves were removed from the list of United States endangered species in December 2011, plans had been finalized to begin hunting wolves in fall 2013. According to these plans, a purpose of the hunt was to reduce wolf abundance in particular regions of Michigan to reduce threats to livestock and human safety.

Evaluating the principles of wildlife conservation: a case study of wolf (Canis lupus) hunting in Michigan, United States evaluated Michigan's wolf hunting plans using 2 basic tenets of wildlife management:

<u>The 1st tenet is the North American Model of Wildlife Conservation</u>, a central component of which is a set of 7 principles, including wildlife is held in the public trust, management should be based on principles of democracy and best-available science, and wildlife should only be killed for a legitimate purpose.

<u>The 2nd tenet pertains to the ability to answer three fundamental questions</u>: What is the purpose or goal of a management action? How will the management action meet the purpose or goal of the actions? Why are the purpose and goals appropriate?

In reaching the conclusion that Michigan's plans for hunting wolves fails to meet the principles of both tenets, authors emphasized the North American Model of Wildlife Conservation principle that wildlife should not be killed for "frivolous use" — that is, hunters should not kill a living creature without an adequate reason — a standard deemed critical for differentiating simple killing from the honorable tradition of hunting (Peterson 1997; Ortega y Gassett 2007). In the case of Michigan, because a wolf hunt would not remedy wolf livestock predation concerns (as the hunt would take place months after most livestock losses occur), recreational hunting is tantamount to killing without an adequate reason.

This case study raised other important ideas germane to wolf management: "...[T]here is no science, by itself, that can conclude it is *necessary* or even appropriate to hunt wolves in Michigan. As such, democratic principles have a proper and significant role in determining whether we should allow wolf hunting and why." Wildlife professionals sometimes disparage wildlife management by referenda (Mech 1996) on grounds that the public is not adequately qualified to make technical decisions associated with wildlife management. "However, judging whether it would be good or right to allow wolf hunting is, for the most part, a value judgment, not a scientific judgment."

## Wolf Trapping Seasons: Inhumane and Lacking Public Support

#### **Overview of Trapping and Resultant Injuries**

Trapping leaves animals caught in the trap to suffer in pain for hours, days or even longer, especially in view of lax regulations regarding trapping check times and inadequate enforcement. Many trapped animals will violently struggle when restrained, which results in broken teeth and gum damage from biting at the device in addition to the damage to the captured limb including lacerations, strained/torn tendons/ligaments, extreme swelling, and broken bones. Pain and suffering caused by trapping is also exacerbated in different seasons: in the summer heat, many animals cannot survive for long without water and in harsh winter conditions, animals can lose a limb and/or freeze to death after being caught in a trap. At other times of the year, prolonged constriction of a limb in a trap can cut off blood supply to the affected appendage potentially causing the appendage to be lost due to gangrene.

Veterinarians and scientists have assessed the types of injuries sustained in traps as follows: (1) mild trauma, such as claw loss, swelling or hemorrhage, minor cutaneous laceration, minor subcutaneous soft tissue maceration or erosion, major cutaneous laceration, except on footpads or tongue, and minor periosteal abrasion; (2) moderate trauma, such as severance of minor tendon or ligament, amputation of one digit, permanent tooth fracture exposing pulp cavity, major subcutaneous soft tissue laceration or erosion, major laceration on footpads or tongues, severe joint hemorrhage, joint luxation at or below the carpus or tarsus, major periosteal abrasion, simple rib fracture, eye lacerations, and minor skeletal degeneration; (3) moderately severe trauma, including simple fracture at or below the carpus or tarsus, compression fracture, comminuted rib fracture, amputation of two digits, major skeletal degeneration, and limb ischemia; and (4) severe trauma, including amputation of three or more digits, any fracture or joint luxation on limb above the carpus or tarsus, any amputation above the digits, spinal cord injury, severe internal organ damage (internal bleeding), compound or comminuted fracture at or below the carpus or tarsus; severance of a major tendon or ligament, compound or rib fractures, ocular injury resulting in blindness of an eye, myocardial degeneration, and death. Such injuries, particularly those included in the moderate trauma, moderately severe trauma, and the severe trauma categories, cannot be considered acceptable or humane.

In the United States, different traps are allowed in different states, as are different trap check/ snare check times in each state; for a description of the traps and snares commonly used on wolves in the U.S., see here: <u>http://www.wolfmatters.org/other-trapping.html</u>.

 See Iossa, G., Soulsbury, C.D., and Harris, S. 2007. Mammal trapping: a review of animal welfare standards of killing and restraining traps. Animal Welfare 2007, 16: 335-352.

#### Use of Snares for Trapping Wolves is Unjustifiable

The use of snares to capture canids, like wolves, cannot be justified as a trapping and predator control method in view of the extreme animal welfare consequences of their use given canid physiology and resultant, protracted suffering.

Prouix et al. 2015 documented significant welfare concerns associated with the use of neck snares. Their findings included that killing neck snares did not consistently and quickly render canids unconscious, were non-selective, and did not routinely capture animals by the neck. In their assessment of the literature evaluating the welfare implications of using snares to capture animals, Rochlitz et al. (2010) concluded that "some pest control methods have such extreme effects on an animal's welfare that, regardless of the potential benefits, their use is never justified (Sandøe et al 1997, Broom 1999)" and determined that "snaring is such a method.

Most telling, when a canid is snared, the thick musculature around the animal's neck allows the carotid artery to continue to supply blood to the brain, but the jugular vein is constricted, cutting off blood back down to the heart. A telltale sign is the grotesquely swollen heads of the snare's victims (which trappers refer to as "jellyheads"). Canids caught in neck snares will take hours, if not days, to die (Proulx, G, 2018).

#### For more information on the cruelty of snares see:

• Rochlitz, I., Pearce, G.P., and Broom, D.M. 2010. The Impact of Snares on Animal Welfare. Report for OneKind.University of Cambridge, Centre for Animal Welfare and Anthrozoology, Department of Veterinary Medicine.

- In their assessment of the literature evaluating the welfare implications of using snares to capture animals, Rochlitz et al. (2010) concluded that "some pest control methods have such extreme effects on an animal's welfare that, regardless of the potential benefits, their use is never justified (Sandøe et al 1997, Broom 1999)" and determined that "snaring is such a method.
- Proulx, G., Rodtka, D., Barrett, M.W., Cattet, M., Dekkers, D., Moffatt, E., and Powell, R.2015. Humaneness and Selectivity of Killing Neck Snares Used to Capture Canids in Canada: A Review. Canadian Wildlife Biology and Management, 4(1): 55-65.
- Proulx, G, 2018. Intolerable Cruelty: The Truth Behind Killing Neck Snares and Strychnine, Alpha Wildlife Research and Management Limited.

## <u>Restraining Traps, including Foothold and Leghold Traps, are Inhumane and</u> <u>Indiscriminate</u>

Restraining traps such as foothold or leghold traps are known to be inhumane given the potential for causing severe or major injuries, self-amputations, and mortality. Iossa et al. (2007) provided an extensive review of the injury rates associated with multiple trap types including padded, off-set, enclosed, and unpadded leghold traps. Recent records from Idaho Department of Fish and Game (IDFG) corroborate the brutal effects of wolf trapping. One trapped wolf had only three legs with a trap still stuck on one leg. Two wolves had cracked teeth to the bone or shattered teeth trying to bite traps, while another wolf trapped by Wildlife Services died of hyperthermia in July. Importantly, state wildlife conservation professionals share these concerns. A survey conducted to explore the attitudes and values of conservation professionals regarding a variety of conservation-related issues revealed that 46% of respondents favored outlawing the use of the leghold traps believed they cause unnecessary animal pain, may harm non-targets, and are not a necessary management tool. (*see* Muth et al. 2006).

For these and other animal welfare reasons, according to the Library of Congress, steel-jaw leg hold traps are banned in over 100 countries including China, but notably not the US.

#### For more information on leghold traps see:

- Iossa, G., Soulsbury, C.D., and Harris, S.2007. Mammal trapping: a review of animal welfare standards of killing and restraining traps. Animal Welfare 2007, 16: 335-352. See Tables 4 and 5.
- Andreasen, A.M., Stewart, K.M., Sedinger, J.S., Lackey, C.W., and Beckman, J.P. 2018, Survival of Cougars Caught in Non-Target Foothold Traps and Snares. The Journal of Wildlife Management. DOI: 10.1002/jwmg.21445
   Andreasen et al. examined cause-specific mortality in mountain lions unintentionally caught in foothold traps set for bobcats from 2009 through 2015 in their study site in Nevada.
- Muth, RM; Zwick, RR; Mather, ME; Organ, JF; Daigle, JJ; and Jonker, SA, "Unnecessary source of pain and suffering or necessary management tool: Attitudes of conservation professionals toward outlawing leghold traps" (2006). WILDLIFE SOCIETY BULLETIN. 332.10.2193/0091-7648(2006)34[706:USOPAS]2.0.CO. https://scholarworks.umass.edu/nrc\_faculty\_pubs/332/
- <u>https://www.loc.gov/law/help/leg-hold-traps/index.php</u>
- <u>https://www.loc.gov/law/help/leg-hold-traps/leg-hold-traps.pdf</u>
- <u>https://www.westernwatersheds.org/2020/09/slaughtered-pups-and-maimed-wolves-in-idaho-demonstrate-the-effects-of-federal-delisting/</u>

#### Need for Regulation of Trap Check Times

Longer trap check times for footholds, snares, and quick-kill body gripping traps are inherently inhumane because trapped animals (including animals injured but not killed in body gripping traps) experience suffering from their injuries along with thirst, hunger, predation, and exposure over several days.

Based on these considerations, USDA APHIS Wildlife Services has agreed to a 24-hour trap check requirement in several states, including Oregon and Washington. However, other states do not impose a comparable legal mandate as an ethical baseline for trapping operations; for example, the state of Idaho currently maintains a 72-hour trap check.

In Michigan, a trapper is only required to report a non-incidental species caught in a trap if it is an out of season species or a protected or non-game species if the animal is dead or dies during release. They are not required to report any species that is released, even if injured. Further, a trapper is only required to check traps, in wolf territories, once every 48 hours.

Lack of regulatory oversight and enforcement remain an overarching shortfall regardless, for even inadequate trap check time regulations rely solely on trappers self-reporting and compliance.

## **Chapter 8 ... THE BIOLOGY OF WOLVES**

## Key Chapter Takeaways:

- 1. Human-caused mortality is *the* primary threat to wolves' long-term survival, with the killing of wolves as a response to or as a preemptive measure to prevent livestock conflicts being one of the primary human-caused sources of wolf mortality. Killing of wolves in state-sanctioned hunting / trapping /snaring seasons is also one of the primary human-caused sources of wolf mortality. There must be enforced protection from human-caused mortality.
- Additive mortality (including "super-additive" effect), underscores human-caused threats to wolves' long-term survival. This makes population monitoring — to track wolf health, disease, mortality, and dispersal potential — critical.
- 3. Habitat protection is essential; this includes intact dispersal corridors and sufficient levels of natural prey. Threats to wolves' survival and wolf restoration are heavily dependent on preservation of habitat, including areas with low road and trail density, low agricultural land density, and high-density forested areas.
- 4. Threats to wolf species are part of a far larger problem of mass extinctions and threats to biodiversity worldwide.

## **Wolf Biology**

This Chapter's discussion of the biology and ecology of wolves includes physical characteristics, pack size, reproduction, food habits, movements and territories, dispersal, mortality, genetics, and population growth. Undoubtedly, a significant number of papers and books have been written on these subjects, spanning decades of research and scientific study. Accordingly, for brevity's sake, this chapter includes a series of excerpts providing summaries of these topics taken from the *Petition to Maintain Protections for Gray Wolves* authored by the Center for Biological Diversity and Humane Society of the United States, in addition to an extensive compilation of other related studies and resources.

#### **Diet and Natural Prey**

Wolves are carnivores that prey on a variety of wildlife species, and switch species on a seasonal and geographic basis. Wolves' primary prey consists of ungulates; for example, white-tailed deer in the Great Lakes region and elk in the Rocky Mountains. Though wolves rely on large prey species, they also eat smaller mammals, especially beavers and rabbits, and they scavenge on already dead animals. Wolves studied in Voyageurs National Park in northern Minnesota since 2012 demonstrate a surprisingly varied diet, encompassing fish, berries, deer, river otter, and beavers. In Oregon in 2019, researchers discovered a localized area where wolves ate vast quantities of grasshoppers.

#### For more information on wolf diet see:

 Center for Biological Diversity, Humane Society of the United States, Petition to Maintain Protections for Gray Wolves (Canis lupus) in the Lower 48 States as Endangered or Threatened "Distinct Population Segments" Under the Endangered Species Act, 2018.

https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf

- Gable, T. D., S. K. Windels, M. C. Romanski, and F. Rosell. 2018. The forgotten prey of an iconic predator: a review of interactions between grey wolves *Canis lupus* and beavers *Castor* spp. Mammal Review 48:123–138. <u>https://wolfwatcher.org/wpcontent/uploads/2018/03/Gable.pdf</u>.
- Voyageurs Wolf Project, Articles in Peer Reviewed Journals. <u>https://www.voyageurswolfproject.org/peer-reviewed.</u>
- MSU researchers make surprising wolf diet discovery, highlighting ecosystem complexities. <u>https://www.msstate.edu/newsroom/article/2019/10/msu-researchers-make-</u> <u>surprising-wolf-diet-discovery-highlight-ecosystem</u>

## Social Dynamics: Pack Structure

Gray wolves are territorial and social animals that exhibit group hunting and opportunistic scavenging behavior, normally living in packs of four to seven animals (Mech and Boitani 2003; Stahler et al. 2006; Vucetich et al. 2012). In the Great Lakes, estimates of average pack size in Minnesota were 4 (mean 4.4) and in Wisconsin mean  $\leq$ 4.5 (Wydeven et al. 2012). Typically, only the top-ranking female and male wolves in each pack will breed and reproduce (Mech and Boitani 2003). Wolves are usually, but not always, monogamous, with about 25% of packs evidencing multiple breeding pairs under polygamous matings in Yellowstone. They become fertile as 2-year-olds and breeding females usually give birth once each spring to a litter of 2-5 pups and may continue to produce offspring annually until they are over 10 years old (Mech 1970; Fuller et al. 2003). Offspring usually remain with their parents for 10 to 54 months, meaning that packs may include the offspring from up to 4 breeding seasons (Mech and Boitani 2003).

Wolves establish home territories through urinary scent marking and howling, and by defending their territories from other wolves. Packs typically occupy and defend a territory of 33 to more than 2,600 square kilometers, with territories tending to be smaller at lower latitudes (Mech and Boitani 2003; Fuller et al. 2003). Territory size varies depending on prey availability and density. A wolf pack will generally maintain its territory, even as individual wolves occasionally disperse to form new packs, if the breeding pair is not killed (Mech and Boitani 2003).

However, if one or both members of the breeding pair are killed, the remaining members of the pack may disperse, starve, or remain in the territory until an unrelated dispersing wolf arrives and mates with one of the remaining pack members to begin a new pack (Mech and Boitani 2003; Brainerd et al. 2008).

Wolf populations are self-regulating — their populations are generally limited by prey availability, but when prey availability is unusually high wolf populations are limited by density dependent factors, such as disease, and pack stability and territoriality (Carriappa et al. 2011; Hatton et al. 2015; Lake et al. 2015).

## For more on wolf pack structure and social dynamics see:

- Center for Biological Diversity, Humane Society of the United States, Petition to Maintain Protections for Gray Wolves (Canis lupus) in the Lower 48 States as Endangered or Threatened "Distinct Population Segments" Under the Endangered Species Act, 2018.
   <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf</u>
- Yellowstone Wolf Project Reports Yellowstone National Park (U.S. National Park Service) (nps.gov)
- Michigan Wolf Management Plan, 2015. https://www.michigan.gov/documents/dnr/wolf\_management\_plan\_492568\_7.pdf

#### <u>Habitat</u>

Wolves are habitat generalists, as they occupy virtually every habitat type in the Northern Hemisphere except for the tropics. Some literature has indicated that wolves also don't inhabit extreme desert environments, however, Mexican gray wolves are known to have inhabited both the Chihuahuan and Sonoran deserts. Wolves survive and thrive in habitats having abundant natural prey and areas with low road density and reduced human activity.

For more information on wolf habitat see:

- Bump, J., Vucetich, J., Beyer, D., Hoy, S., "Territoriality drives preemptive habitat selection in recovering wolves: Implications for carnivore conservation," Journal of Animal Ecology, February 2020, DOI: 10.1111/1365-2656.13199 Here is a link to this publication (the original source has a fee) <u>Territoriality drives preemptive habitat selection in recovering wolves: Implications for carnivore conservation (wolfwatcher.org)</u>
- Jesse Whittington, Colleen Cassady St. Clair, and George Mercer. "Spatial Responses of Wolves to Roads and Trails in Mountain Valleys." *Ecological Applications* 15, no. 2 (2005): 543-53. Accessed November 6, 2020. <u>http://www.jstor.org/stable/4543373</u>

## **Wolf Dispersal**

Most wolves disperse because individual wolves rarely assume a breeding position within their natal packs (Mech and Boitani, 2003a). Dispersal rates vary geographically and temporally with no clear differences between sexes (Mech and Boitani 2003a). Wolves can travel long distances. Movements greater than 500 miles (800 km) have been reported (Ballard et al.1983, Fritts 1983, Boyd et al. 1995). An Oregon wolf, named OR-7, dispersed from his pack in late 2011 and traveled more than 4,000 miles in Oregon and California before settling down with a mate in Oregon in 2014. One of his offspring, OR-54, also dispersed, covering nearly 9,000 miles, mostly in California, for two years before being found dead.

Long-distance movements and gene flow help preserve and/or enhance genetic diversity within populations and help mitigate the effects of detrimental demographic fluctuations due to environmental catastrophes (Simberloff and Cox 1987, Boitani 2000). Dispersing wolves remain nomadic until they join an existing pack or locate members of the opposite sex and move to suitable unoccupied habitats to establish new packs and claim new territories (Mech 1970; Mech and Boitani 2003).

For more information on wolf dispersal see:

 Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-</u> <u>2018.pdf</u>

- <u>Unexplained patterns of grey wolf Canis lupus natal dispersal</u>
- Gable, T., Homkes, A., Windel, S., and Bump, J., Is there a Mechanism That Causes Wolves from Same Area to Disperse Long-distances in Same Direction?, CWBM 2019, Vol. 8, No. 2. <u>https://fbe3a0d9-7a58-4187-a648-</u> 860a5fe57fa2.filesusr.com/ugd/7cb5d7\_90966fa10ecb4696a2fa2a9a670f7ee3.pdf

#### **Diseases**

Disease has long been a serious threat to the gray wolf, including canine parvovirus, canine distemper virus, mange, blastomycosis, Lyme disease, anaplasmosis, canine ehrlichiosis and heartworm. In the lower 48 states, disease incidence has at times been of serious concern for the populations in the western Great Lakes states and in Yellowstone National Park.

[See Natural Threats to Wolves below]

## Value of Wolves at the Ecosystem Level

Wolves play an important ecological role as top carnivores, contributing to cascading effects throughout the food web. Within the United States, studies of gray wolves in Yellowstone National Park and elsewhere demonstrate that wolves significantly shape their ecosystems, <u>promoting biodiversity and overall ecosystem health.</u> Wolves 'potentially act as a buffer to the effects of climate change by creating more carrion for scavengers and making it available year-round, to the advantage of bald and golden eagles, brown bears, ravens, magpies, and coyotes (Wilmers and Getz 2005, Stahler et al. 2006, Constible et al. 2008).

Prey animals modify their behavior, distribution, and movements in response to wolves (Ripple and Beschta 2004; White and Garrott 2005). By example, gray wolves limit overgrazing of saplings by elk in sensitive riparian environments and thereby permit other species, such as bison, beavers, birds, fish, and amphibians to thrive by stabilizing riparian areas (Ripple and Beschta 2003; Chadwick 2010). Native carnivores hold prey numbers at lower levels so that they do not irrupt and then subsequently die from starvation, weather, or other stochastic events (Vucetich et al. 2005; Wright et al. 2006; Mitchell et al. 2015).

Wolves also have a controlling effect on other carnivore species, such as coyotes (Bergstrom 2017, Lennox et al. 2018), which indirectly benefits pronghorn and lynx (Berger and Gese 2007; Smith et al. 2003; Berger et al. 2008; Ripple et al. 2011). The trophic cascade of benefits provided by wolves has been documented as producing measurable positive effects for riparian vitality, aspen recruitment — even down to the microbes in soil (Wilmers et al. 2005; Chadwick 2010; Estes et al. 2011; Ripple et al. 2014; Darimont et al. 2015; Boyce 2018). In short, there is strong evidence that wolves make ecosystems biologically richer and more functional.

While evidence suggests that wolves create a trophic cascade, there are many additional factors that must be considered. As explained in the article, "The Big Scientific Debate: Tropic Cascades" <u>The Big Scientific Debate: Trophic Cascades (U.S. National Park Service) (nps.gov)</u> was the aspen and willow growth the result of fewer elk, weather, climate change or other factors? This demonstrates the need for additional research.

 Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-</u> <u>2018.pdf</u>

#### Apex Predators and Keystone Species

Wolves are considered a keystone species and fill a crucial niche within the ecosystems in which they live. Apex predators are distinguishable by a capacity to limit their own population densities (self-regulation). Large carnivores share slow reproductive rates and development, extended parental care, sparsely populated territories, and a propensity towards infanticide, reproductive suppression, alloparental care and cooperative hunting. Self-regulation in large carnivores may ensure that the largest and the fiercest do not overexploit their resources.

Although wolves have a relatively minor impact on ungulate population numbers, they significantly alter the habits of deer and other prey species by reducing their tendency to concentrate in favorable areas and increasing their seasonal movements. This effect is generally associated with increases in forest habitat and biodiversity across the landscape and with reduction

in the well-documented, destructive impacts of deer browsing on forest regeneration and vegetation (Bouchard et al. 2013, Callan et al. 2013, Levi and Wilmer 2012, Flagel et al. 2016).

In this fashion, wolves greatly influence their environment, exerting both direct and indirect effects on their ecosystems by influencing their prey, which in turn influence plant and other animal species. The cumulative effects of wolves on other wildlife and plants can lead to profound changes that promote biodiversity and ecosystem health.

The overabundance of deer herds has been shown to be a key determinant of understory plant species composition in many parts of eastern North America over the last century. The primary, direct effect of chronic over browsing is the reduction in growth and survival of browse-intolerant plant species which ultimately shifts species composition towards a few highly browse-tolerant or unpalatable species. <u>Deer impacts: primary, secondary (interfering plants), tertiary (facilitated seed predation) - Sustaining Forests - Northern Research Station - USDA Forest Service (fs.fed.us).</u>

Wolves also influence herbivore prey communities, like ungulates, through direct predation; for example, recent research suggests that wolves could substantially reduce the prevalence of chronic wasting disease (CWD) in deer and elk populations. Research has also shown how reintroduced carnivores like wolves provide a year-round source of food for scavengers and reduce populations of mesocarnivores such as coyotes (*Canis latrans*) (Smith et al. 2003). In addition, vegetation communities can be profoundly altered by herbivores when top predators are removed from ecosystems, because of effects that cascade through successively lower trophic levels (Estes et al. 2001). The absence of highly interactive carnivore species, such as wolves, can thus lead to simplified or degraded ecosystems (Soulé et al. 2003).

For further information on the value of wolves at the ecosystem level see:

 "Ecological Effects of Wolves" information sheet, Colorado State University Extension. <u>https://extension.colostate.edu/topic-areas/people-predators/ecological-effects-of-wolves-</u> <u>8-005/</u>

- Packer, Craig, Robert D. Holt, Peter J. Hudson, Kevin D. Lafferty, and Andrew P. Dobson. 2003. Keeping the herds healthy and alert: implications of predator control for infectious disease. <u>https://doi.org/10.1046/j.1461-0248.2003.00500.x</u>
- Prugh, Laura R., and Kelly J. Sivy. 2020. Enemies with benefits: Integrating positive and negative interactions among terrestrial carnivores. Ecology Letters 23: 902-918. doi:10.1111/ele.13489. <u>https://onlinelibrary.wiley.com/doi/full/10.1111/ele.13489</u>.
- Prugh, Laura R., Chantal J. Stoner, Clinton W. Epps, William T. Bean, William J. Ripple, Andrea S. Laliberte, Justin S. Brashares. 2009. The Rise of the Mesopredator BioScience 59(9):779-791. October. <u>https://nature.berkeley.edu/BrasharesGroup/wp-</u> <u>content/uploads/2015/06/Prugh-et-al.-2009-Rise-of-the-Mesopredator1.pdf</u>.
- Soule, Michael E., Estes, James A., Berger, J., and Martinez Del Rio, C., 2003. Ecological Effectiveness: Conservation Goals for Interactive Species. Conservation Biology, Pages 1238–1250 Volume 17, No. 5, October, 2003. <u>https://wildlandsnetwork.org/sites/default/files/Soule\_Ecological%20Effectiveness.pdf</u>.
- Wilkinson, Todd. 2018. Wildlife Managers Want National Call To Action In Fighting Chronic Wasting Disease. Mountain Journal August 22, 2018. <u>https://mountainjournal.org/experts-demand-call-to-action-in-fighting-chronic-wastingdisease.</u>
- Bergstrom, B., Carnivore conservation: shifting the paradigm from control to coexistence, Journal of Mammalogy, 98(1):1–6, 2017, DOI:10.1093/mammal/gyw185.
   <u>https://academic.oup.com/jmammal/article/98/1/1/2977253.</u>
- Ripple, W., Beschta, R., Wolves and the Ecology of Fear: Can Predation Risk Structure Ecosystems?, BioScience, Volume 54, Issue 8, August 2004 https://doi.org/10.1641/0006-3568(2004)054[0755:WATEOF]2.0.CO https://academic.oup.com/bioscience/article/54/8/755/238242

- Robbins, J. Using Wolves as First Responders Against a Deadly Brain Disease, *The New York Times*, November 12, 2020, <u>https://www.nytimes.com/2020/11/12/science/wolves-chronic-wasting-disease.html</u>
- Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf.</u>

## **<u>Climate Change Buffering Effects of Wolves</u>**

Wolves buffer the effects of climate change on carrion availability, which allows scavengers to adapt to a changing environment over a longer time scale. This stabilization has important implications for land management and maintenance of intact food chains in the face of large-scale environmental perturbations as global climate patterns change.

Wolves also contribute to climate stability as functional ecosystems store more carbon, see e.g., <u>https://extension.psu.edu/how-forests-store-carbon</u>

For more information on wolves and climate see:

- Wilmers CC, Getz WM (2005) Gray wolves as climate change buffers in Yellowstone.
   PLoS Biol 3(4): e92.
   <a href="https://www.researchgate.net/publication/307841748\_Gray\_Wolves\_as\_Climate\_Change\_Buffers\_in\_Yellowstone">https://www.researchgate.net/publication/307841748\_Gray\_Wolves\_as\_Climate\_Change\_Buffers\_in\_Yellowstone</a>.
- Walker, L., Marzluff, J., Metz, M., Wirsing, A., Moskal, M., Stahler, D., Smith, D., "Population responses of common ravens to reintroduced gray wolves," <u>Ecol Evol</u>. 2018, doi: <u>10.1002/ece3.4583</u>. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6262918/</u>

## **Natural Threats to Wolves**

#### **Wolf Diseases**

Disease has long been a serious threat to the gray wolf (Mech 2009). Wolf pathogens include canine parvovirus, canine distemper virus, mange, blastomycosis, Lyme disease, anaplasmosis, canine ehrlichiosis and heartworm (Stenglein and Van Deelen 2016). Canine parvo virus has affected wolf recovery, killing between 40 and 60 percent of wolf pups in Minnesota (Mech et al. 2008). And because it is young wolves that disperse, reduced pup survival may cause reduced recolonization of unoccupied but suitable habitat (id.).

Sarcoptic mange has also slowed recovery in Michigan and Wisconsin, and the Service recognizes it as a continuing issue. Mange may increase wolf susceptibility to other diseases, and for example, oral papillomatosis was diagnosed in a Minnesota gray wolf with sarcoptic mange (Knowles et al. 2017). Jara et al. (2016) found a high proportion of Wisconsin wolves were exposed to the agents that cause Lyme disease (65.6%) and anaplasma (47.7%), with a smaller proportion to ehrlichiosis (5.7%) and infected with heartworm (9.2%).

In studies of disease in wolves in Yellowstone National Park, canine distemper virus (CDV) outbreaks and the presence and prevalence of mange are correlated with reduced pack growth rates. One has acute impacts on pup survival, while the other is linked to reduced pup survival and increased adult morbidity and mortality.

<u>Transmissibility to humans</u>: Wolf recovery efforts have, at various times, spawned concern by members of the public that diseases carried by wolves may be transmissible to humans, like Neospora caninium (a protozoan parasite) or Echinococcus granulosis (a tapeworm). However, research has shown that risk of transmission to humans and domestic animals remains low and that fears stem from misinformation regarding these diseases.

#### For more information on wolf disease see:

• See Extensive Examination of Wolf Diseases in California Department of Fish and Wildlife Conservation Plan for Gray Wolves Part II, December 2016, Chapter 2, Disease

and Wolves, at pp. 31-41. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=112630&inline.

- Almberg, E., Cross, P., Hudson, P., Dobson, A., Smith, D., Stahler, D., "Infectious Diseases of Wolves in Yellowstone," 2015. <u>https://www.nps.gov/articles/infectiousdiseases-of-wolves-in-</u> yellowstone.htm#:~:text=Some%20of%20the%20wolves%20carry%20Neospora%20can inium%20and,been%20the%20subject%20of%20much%20controversy%20and%20misi <u>nformation</u>.
- See Parasitic Tapeworm (Echinococcus granulosus) <u>https://wolfwatcher.org/wp-content/uploads/2019/05/ODFW-ParasiteFlyer.pdf</u>
- Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-</u> <u>2018.pdf</u>
- DeCandia et al "Sarcoptic mange severity is associated with reduced genomic variation and evidence of selection in Yellowstone National Park wolves (Canis lupus)" <u>https://wolfwatcher.org/wp-content/uploads/2021/01/eva.13127-1.pdf</u>
- Stenglein, J.L. and T.R. Van Deelen. 2016. Demographic and Component Allee Effects in Southern Lake Superior Gray Wolves. PLoS ONE 11(3): e0150535; https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0150535.

#### **Starvation**

Starvation in wolves is often related to weather and prey density fluctuations.

• Minnesota DNR. https://www.dnr.state.mn.us/wolves/population.html.

## Life Expectancy and Incidence of Pup Mortality

In the wild, wolf life expectancy is highly variable, with an average lifespan between 5 to 6 years. However, with the incidence of poaching, car collisions, trapping and other human-caused mortality, wolves' brief lifespans are further diminished. Pup mortality rates are highly variable. Up to 60% of pups may die from disease and malnutrition during their first 6 months of life. Mortality rates approximate 45% from six months to one year, and 20% between years one and two. (See threats for more data)

Apex predators are distinguishable by a capacity to limit their own population densities (self-regulation). Large carnivores share slow reproductive rates and development, extended parental care, sparsely populated territories, and a propensity towards infanticide, reproductive suppression, alloparent care and cooperative hunting. Self-regulation in large carnivores may ensure that the largest and the fiercest do not overexploit their resources.

## For more information on wolf life expectancy:

- Michigan Department of Natural Resources State Management Plan Updated 2015 (citing Pimlott et al. 1969, Mech 1970, Mech and Frenzel 1971, Van Ballenberghe et al. 1975, Fritts and Mech 1981)
   <a href="https://www.michigan.gov/documents/dnr/wolf\_management\_plan\_492568\_7.pdf">https://www.michigan.gov/documents/dnr/wolf\_management\_plan\_492568\_7.pdf</a>.
- Smith, D.W., Bangs, E.E., Oakleaf, J.K., Mack, C., Fontaine, J., Boyd, D., Jimenez, M., Pletscher, D.H., Niemeyer, C.C., Meier, T.J. and Stahler, D.R., 2010. Survival of colonizing wolves in the northern Rocky Mountains of the United States, 1982–2004. The Journal of Wildlife Management, 74(4), pp.620-634. <u>https://doi.org/10.2193/2008-584</u>.
- Wallach, A., Izhaki, I., Toms, J., Ripple, W., Shanas, U., <u>What is an apex predator?" Feb.</u> 2015 - https://onlinelibrary.wiley.com/doi/abs/10.1111/oik.01977

## **Inter-Species Strife / Territoriality**

Wolves are extremely competitive even within litters and with close relatives, resulting in conflict and mortality. Such intraspecific strife is common among territorial mammals (references in Cassidy et al. 2015) and could function not just as territorial defense, as indicated by the locations of adult killings along and outside territory edges (Mech 1994; Mech et al. 1998), but also as genetic and breeding competition and competition for resources. There can also be wolf predation by other carnivores within wolf ecosystem like grizzly bears and cougars.  <u>https://academic.oup.com/jmammal/article/98/6/1538/4160380 & Wolf Turf: A Glimpse</u> <u>at 20 Years of Wolf Spatial Ecology in Yellowstone (U.S. National Park Service) (nps.gov)</u>

## **Human Threats to Wolves**

The predominant hazards facing wolves are those human-caused or related. The federal government exterminated wolves on behalf of the livestock industry throughout the lower 48 United States during the first part of the 20th century. It continued to do so in the northern Rocky Mountains, even when wolves were federally listed under the Endangered Species Act, by designating wolves there as an "experimental, nonessential population." In states where federal protections have been lifted, state agencies kill wolves on behalf of the livestock industry and many of these states have enacted wolf hunting and trapping seasons. Wolves also are killed by humans via poaching, vehicle strikes, and other factors like incidental trapping (O'Neil, 2017). Records of known mortality sources indicate human mortality causes outnumber other causes by over two to one. Wolves studied in Banff National Park experience similar mortality causes to wolves studied in the U.S., with human-caused mortality dominating known mortality both inside and outside BNP (90% of all known mortality).

Moreover, human-caused killing of wolves results in a "super-additive" effect, which ensues because human killing of wolves leads to an increase in total wolf mortality over and above what would occur in nature. When humans kill wolves, the resultant pack disruption and/or loss of breeders creates a multiplier effect, which leads to increased infanticide and decreased pup recruitment. The impact of breeder loss on social group persistence, reproduction and population growth (pup survival) may be greatest when average group sizes are small and mortality occurs during the breeding season, for example, in the Great Lakes region, where wolf packs are smaller, and hunting was extended into the winter months.

Researchers also found little evidence to support a hypothesis that immigration by dispersing wolves compensates for mortality due to hunting and trapping in groups of wolves in the Rocky Mountains, and postulate this may be due in part to the complex social behaviors of wolves (Bassing et al. 2020).

Importantly, consideration of human development and impact upon wolf habitat and natural areas is important to any analysis of human-caused threats, as areas with high road and trail density result in greater incidence of wolf deaths by car collisions and illegal poaching.

## For more information on human threats to wolves see:

- Center for Biological Diversity, HSUS 2018 Gray Wolf Petition.
   <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf</u>.
- Bassing et al. "Immigration does not offset harvest mortality in groups of a cooperatively breeding carnivore." Animal Conservation, December 2020, no. 23 (6): 750-761.
   <a href="https://zslpublications.onlinelibrary.wiley.com/doi/abs/10.1111/acv.12593">https://zslpublications.onlinelibrary.wiley.com/doi/abs/10.1111/acv.12593</a>.
- Ausband, D., Mitchell, M., Stansbury, C., Stenglein, J., Waits, L., "Harvest and group effects on pup survival in a cooperative breeder," <u>Proc Biol Sci.</u> May 2017. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5454274/</u>
- O'Neil, S., Bump, J., Beyer, D., "Spatially varying density dependence drives a shifting mosaic of survival in a recovering apex predator (Canis lupus)" 2017, Ecology and Evolution. 2017;7:9518–9530.DOI: 10.1002/ece3.3463.
   https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.3463.
- Borg, B., Brainerd, S., Meier, T., Prugh, L., "Impacts of breeder loss on social structure, reproduction and population growth in a social canid," Journal of Animal Ecology, 2014. <u>https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-</u> <u>2656.12256#:~:text=Harvest%20of%20breeding%20wolves%20is%20a%20highly%20c</u> <u>ontentious,breeders%20were%20lost%20and%20pack%20size%20was%20small</u>.
- Chris T. Darimont et al., "The Unique Ecology of Human Predators," Science 349, no. 6250 (2015). <u>https://science.sciencemag.org/content/349/6250/858</u>.
- Scott Creel and Jay Rotella, "Meta-Analysis of Relationships between Human Offtake, Total Mortality and Population Dynamics of Gray Wolves (Canis Lupus)," PLoS ONE 5, no. 9 (2010). <u>https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0012918</u>.
- Michigan DNR Data at Great Lakes Wolf Symposium, 2020: 61% of all wolf deaths from 2009 2019 were human-caused.

- Hebblewhite, M., Whittington, J., "Wolves without borders: Transboundary survival of wolves in Banff National Park over three decades," December 2020. <u>https://doi.org/10.1016/j.gecco.2020.e01293</u>
- Mladenoff, D., Clayton, M., Pratt, S., Sickley, T., Wydeven, A., "Change in Occupied Wolf Habitat in the Northern Great Lakes Region," Recovery of Gray Wolves in the Great Lakes. 2009.

https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.669.7251&rep=rep1&type=pd f.

• See <u>https://wildearthguardians.org/wildlife-conservation/end-the-war-on-wildlife/</u>

## Poaching: Illegal Killing of Wolves

Studies in both the United States and Europe have concluded that most poaching is cryptic and that for every poached wolf discovered, one to two additional wolves have been poached but not discovered. Research also suggests that wildlife agencies have underestimated incidence of poaching when conducting population status review of wolves in their regions. According to Michigan Department of Natural Resources, illegal killing of wolves in Michigan accounted for 41% of radio-collared wolf mortality from 1999 through 2014. When vehicle strikes, depredation-control activities, harvest and other human-caused trauma are included, 66% of the radio-collared wolf mortality was directly attributable to humans (B. Roell, Michigan DNR, unpublished data).

For more information on poaching see:

 Chapron, G., and Treves, A., "Blood Does not Buy Goodwill: Allowing Culling Increases Poaching of a Large Carnivore," May 2016, <u>Proceedings of the Royal Society B:</u> <u>Biological Sciences</u>, DOI:<u>10.1098/rspb.2015.2939</u>; <u>https://www.researchgate.net/publication/302978817\_Blood\_does\_not\_buy\_goodwill\_Al</u>

lowing culling increases poaching of a large carnivore.

 Laaksonen, "Keeping the Wolf from the Door: Analysis of derogation-based hunting permits in Finland, 2018." <u>http://www.luontoliitto.fi/susiryhma/greypride/KeepingtheWolffromtheDoorLaaksonenL</u> <u>LSR2018UD.pdf</u>

- Santiago-Avila, F., Chappell, R, Treves, A., "Liberalizing the killing of endangered wolves was associated with more disappearances of collared individuals in Wisconsin, USA," <u>Scientific Reports</u> volume 10, 2020, <u>https://www.nature.com/articles/s41598-020-70837-x.
  </u>
- Michigan Department of Natural Resources State Management Plan Updated 2015. <u>https://www.michigan.gov/documents/dnr/wolf\_management\_plan\_492568\_7.pdf</u>.

#### Habitat Loss Caused by Human Development

Loss of wolf habitat and decline of natural prey, due to human development and increased presence, pose tremendous threats to wolf survival.

## Habitat Threat Spotlight: Alexander Archipelago Wolf: Southeast Alaska

The Center for Biological Diversity's petition identifies past and ongoing industrial clear-cut logging on the Tongass National Forest, as well as state and private lands, as a principal threat. Intensive clear-cut logging degrades and fragments essential wolf habitat and reduces long-term carrying capacity for deer, the wolves' primary prey, while injuring salmon runs that provide an important seasonal food source. Logging-associated road development also increases wolf mortality by facilitating access for trappers and hunters.

Alexander Archipelago wolves in Southeast Alaska face immediate, high-magnitude threats from habitat destruction and degradation resulting from past and ongoing intensive logging and road construction, perpetuated by the 2016 Tongass Land and Resource Management Plan ("2016 Tongass Forest Plan") which authorizes intensive ongoing old-growth and second-growth logging and road-building concentrated in essential wolf habitat, in addition to intensive clear-cut logging of wolf habitat on state and private lands; a series of massive timber sales with high levels of old-growth logging and road-building authorized under the 2016 Forest Plan concentrated in prime wolf habitat; the Forest Service's proposed elimination of Roadless Rule protections on the Tongass National Forest.

For more information see:

- <u>https://www.biologicaldiversity.org/species/mammals/Alexander\_Archipelago\_wolf/pdfs/2</u>
   <u>0-07-15-Petition-to-list-the-Alexander-Archipelago-wolf-in-Southeast-Alaska-under-the-ESA.pdf</u>
- O'Neil, S., Bump, J., Beyer, D., "Spatially varying density dependence drives a shifting mosaic of survival in a recovering apex predator (Canis lupus)" 2017, Ecology and Evolution. 2017;7:9518–9530.DOI: 10.1002/ece3.3463.

## Lack of Genetic Diversity / Inadequacy of Dispersal Corridors

Isolation and small population size are threats facing recolonizing wolves. Leonard (2014) concluded that cycles of repeated isolation and extinction has led to the observed low level of genetic diversity for gray wolves. Impacts of isolation and small population size can be compounded when those populations face other threats, like disease. Stenglein and Van Deelen (2016) found that a population also affected by 27 pathogens may be more prone to extinction than a population suffering from effects of a small population alone, and that these effects can be more pronounced in social species, like wolves.

Moreover, existing wolf populations in the U.S. are below what scientists consider to be viable. For example, Traill et al. (2007) (see citation below) standardized estimates of minimum viable population ("MVP") size for 212 species, including the gray wolf, and documented a median MVP of 4,169 individuals with a 95 percent confidence interval of 2,261 to 5,095. Likewise, Reed et al. (2003) used population viability analysis to estimate MVPs for 102 species, including the gray wolf, and found mean and median MVPs of 7,316 and 5,816, respectively. No region of the U.S. has wolf populations of that size. Wolves remain at risk until existing populations are connected through dispersal and satisfy the conservation biology principles of representation, resiliency, and redundancy — the three Rs — for reducing extinction risk and maintaining self-sustaining populations (Shaffer et al. 2000).

## For more information on wolf corridors and genetic diversity see:

- Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: <u>https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-</u> <u>2018.pdf</u>.
- Traill, L., Bradshaw, C., Brook, B., 2007. Minimum Viable Population Size: a metaanalysis of 30 years of published estimates, Biological Connection 139. <u>https://coreybradshaw.files.wordpress.com/2011/03/traill-et-al-2007-biol-conserv.pdf</u>.
- Oakleaf, J., Murray, J., Bangs, E., Mack, C., Smith, D., Fontaine, M., Jimenez, M. Meier, T., Habitat Selection by Recolonizing Wolves in the Northern Rocky Mountains of the United States, 2010. <u>https://wildlife.onlinelibrary.wiley.com/doi/abs/10.2193/0022-</u> <u>541X(2006)70[554:HSBRWI]2.0.CO;2</u>

 Carroll, C., Rohlf, D., vonHoldt, B., Treves, A., Hendricks, S., "Wolf Delisting Challenges Demonstrate Need for an Improved Framework for Conserving Intraspecific Variation under the Endangered Species Act." *BioScience*, October 2020 <u>https://academic.oup.com/bioscience/advance-rticle/doi/10.1093/biosci/biaa125/5941853j</u>

## **Vehicle Collisions**

Human-caused mortality by roadkill is hard to quantify but may be higher than commonly assumed.

## **Examples:**

- In Michigan from 2009 to 2019, 13% of known mortalities of radio-collared wolves were from car collisions (DNR records).
- DNR records from Wisconsin showed that in one year (April 2019-April 2020) 21 wolves were killed by vehicles, representing 40% of known mortalities.
- Hebblewhite, M., Whittington, J., "Wolves without borders: Transboundary survival of wolves in Banff National Park over three decades," 2020, https://www.sciencedirect.com/science/article/pii/S2351989420308349?via%3Dihub
- Canadian study identified car/road killings in top three causes of wolf mortality: Importance of Wildlife Crossings <u>https://www.conteches.com/knowledge-center/pdh-article-series/design-considerations-for-wildlife-crossings#:~:text=When%20wildlife%20habitats%20can't,property%20damage%20and%20wildlife%20mortality.
  </u>

## **Climate Change**

Global warming is projected to increase the risks of disease outbreaks and parasites affecting wolves and other wildlife. (Harvell et al. 2002). Studies reveal that warming temperatures can increase pathogen development, survival rates, and disease spread. (Wilmers et al. 2006; USGS 2010). Parasites, such as the parasites that cause mange, may increase in many places, affecting many species, including wolves.

Escalating threats to wolves from anthropogenic climate change include harms to key prey species, as in the case of the Alexander Archipelago wolf. For the Archipelago wolf, climate change may result in increased frequency of severe winter storm events that adversely affect the wolf's primary prey species, the Sitka black-tailed deer, and threatens salmon—an important seasonal food sources for wolves—by increasing water temperatures, decreasing summer stream flows, increasing sea levels, and the increasing frequency, intensity and duration of marine heat waves.

#### For more information on wolves and climate change see:

- Center for Biological Diversity, HSUS 2018 Gray Wolf Petition: https://www.biologicaldiversity.org/campaigns/gray\_wolves/pdfs/Wolf-Petition-12-17-2018.pdf.
- Petition to List the Alexander Archipelago Wolf in Southeast Alaska as Threatened or Endangered Under the U.S. Endangered Species Act, July 2020. <u>https://www.biologicaldiversity.org/species/mammals/Alexander\_Archipelago\_wolf/</u> <u>pdfs/20-07-15-Petition-to-list-the-Alexander-Archipelago-wolf-in-Southeast-Alaska-under-the-ESA.pdf.</u>
- Brown, E., "Widely misinterpreted report still shows catastrophic animal decline," National Geographic (Nov.1 2018), <u>https://www.nationalgeographic.com/animals/2018/11/animal-decline-living-planet-report-conservation-news/</u>.

# **Chapter 9 ... THE SCIENCE ON WOLF INTERACTIONS WITH UNGULATES**

## Key Chapter Takeaways:

- 1) Wolves predominantly prey on large and medium-sized wild ungulates but also nonungulate prey such as salmon, hares and beaver.
- 2) Wolf presence and predation impacts ungulate populations and behavior. Wolves focus on herd members which are more vulnerable due to age, disease or injury. Wolf presence also creates what some scientists term "a landscape of fear" which keeps ungulates on the move.
- 3) Interactions between wolves and ungulates can provide ecological benefits for ungulate health itself, human health and safety, and other plant and animal species.
- 4) Wolf predation on ungulates may help stem the spread of Chronic Wasting Disease (CWD), a brain prion disease of wild ungulates equivalent to Mad Cow Disease in cattle. This ultimately will contribute to improved health of ungulate herds and decreased risk to humans who hunt and consume deer and elk.
- 5) In most states with wolf populations, wolf presence is associated with robust numbers of deer and elk, with wild ungulate populations at or above management unit objective in most management units. In places or years when wild ungulates have shown a population decline, poor habitat conditions and/or severe winters have been the largest contributing factor. Hunting of elk and deer is the largest contributor to mortality of these ungulate species, while disease is the main source of mortality in Minnesota's moose population.

## The Relationship between Wolves and Prey Populations

Essential to wolf conservation and management is a scientific understanding of wolf behavior and preferences regarding natural prey and the importance of conserving large herbivores in sufficient numbers.

## **Wolf Prey Preference for Wild Ungulates**

In North America, wolves predominantly prey on large and medium-sized wild ungulates, primarily deer, moose, elk, and caribou, but also other hoofed mammals including Pronghorn, bighorn sheep, and wild boar. (Janeiro-Otero et al., 2020; Newsome et al., 2016).

While wolves mostly subsist on ungulates, they also use non-ungulate prey when they are seasonal, such as salmon, flightless molting birds and hares (Gable et al., 2018; Newsome et al., 2016). '

For more information on wolf prey preference see:

- Gable, T. D., Windels, S. K., Romanski, M. C., & Rosell, F. (2018). The forgotten
  prey of an iconic predator: A review of interactions between grey wolves *Canis lupus*and beavers *Castor* spp. *Mammal Review*, 48(2), 123-138.
  https://wolfwatcher.org/wp-content/uploads/2018/03/Gable.pdf
- Janeiro-Otero, A., Newsome, T. M., Van Eeden, L. M., Ripple, W. J., & Dormann, C. F. (2020). Grey wolf (Canis lupus) predation on livestock in relation to prey availability. *Biological Conservation*, *243*, 108433. <u>https://wolfwatcher.org/wp-content/uploads/2020/03/Otero-et-al-Biological-Conservation-Issue-243-2020.pdf</u>
- Newsome, T. M., Boitani, L., Chapron, G., Ciucci, P., Dickman, C. R., Dellinger, J. A., & Ripple, W. J. (2016). Food habits of the world's grey wolves. *Mammal Review*, 46(4), 255-269. <u>https://onlinelibrary.wiley.com/doi/abs/10.1111/mam.12067</u>

## The Effect of Wolves on Ungulate Populations

Aldo Leopold was one of the first biologists to argue that mammalian predators played an indispensable role in controlling ungulate prey, thus preventing depletion of their resources (Leopold 1943). Scientific studies since then have shown that prey animals, including deer, elk, and moose modify their behavior, distribution and movements in response to wolves (Ripple and Beschta 2012).

In turn, wolf predation on wild ungulates — reducing ungulate numbers, lowering increases in them or changing ungulate behavior — provides important ecological, economic, and health benefits. These include valuable forestry and ecosystem impacts, reduction in deer related traffic accidents, and decreases in human diseases like Lyme disease (ungulates are blood hosts of ticks) (Patton et al., 2018; Ripple & Beschta, 2012).

For more information on wolf and ungulate population dynamics see:

• Leopold A. (1943). Deer irruptions. *Transactions of the Wisconsin Academy of Sciences*, *Arts, and Letters*, 35, 351-366.
- Patton, S. R., Russell, M. B., Windmuller-Campione, M. A., & Frelich, L. E. (2018). Quantifying impacts of white-tailed deer (Odocoileus virginianus Zimmerman) browse using forest inventory and socio-environmental datasets. *PloS one*, *13*(8), e0201334. <u>https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0201334</u>
- Ripple, W. J., & Beschta, R. L. (2012). Trophic cascades in Yellowstone: the first 15 years after wolf reintroduction. *Biological Conservation*, 145(1), 205-213. <u>https://www.sciencedirect.com/science/article/abs/pii/S0006320711004046</u>
- Raynor, J.L., Grainger, C.A. and D.P. Parker. 2021. Wolves make roadways safer, generating large economic returns to predator conservation. Proceedings of the National Academy of Sciences. <u>DOI: 10.1073/pnas.2023251118</u>

#### Wolves' Impact on Ungulate Health and Disease Mitigation

Wolves impact ungulate health and wellbeing by holding deer and elk numbers at lower levels, so they do not irrupt and then subsequently die from starvation, weather or other stochastic events. (Mitchell, 2015). Because wolves prey on wild ungulates that are most vulnerable due to factors such as age, injury or ill-health, wolves enable greater numbers of healthier, more robust, and more alert animals to survive and pass on their genes (Stahler et al, 2006).

Wolves and other native carnivores also play a critical role in suppressing and limiting the prevalence of disease in prey species, including chronic wasting disease (CWD), an epidemic plaguing cervids that continues to spread across North America (Hobbs, 2006; Wild, 2011). CWD is an inevitably fatal, infectious neurodegenerative prion disease affecting mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*wapiti, Cervus canadensis*), and moose (*Alces alces*) (Saunders et al., 2012).

Wolf predation can limit or even prevent transmission of CWD and other diseases in prey species by reducing host densities and contact rates or by lowering the total number of infected individuals in a host population (Wild, 2011). Moreover, research indicates that coursing predators like wolves and coyotes select prey disproportionately if they appear impaired by malnutrition, age or disease (Krumm et al., 2010). Although much of this "selection" may be attributed to infected mule deer being less vigilant or fit and thus relatively vulnerable to "attack" of one kind or another, carnivores may also learn to recognize and more actively target diseased deer (Krumm et al., 2010). Furthermore, wolves help eliminate CWD as an environmental contaminant by scavenging on infected carcasses, preventing disease spread through soils and other means of dispersal (Miller & Wild, 2004).

Studies found that wolf predation significantly reduces CWD prevalence, and even eliminates the disease in a closed system; it could prevent its emergence in new locations (Hobbs, 2006). Moreover, Wild et al. (2011) state that the loss of large carnivores, in combination with human-assisted movement of infected cervids and land use alterations, over much of their native range has likely contributed to the distribution and prevalence of CWD across much of the U.S. However, the extent of wolves' reduction of CWD prevalence in deer and elk populations remains to be seen, as research to date has been based on results of simulation modeling, due to the current lack of overlap between CWD and occupied wolf habitat. A research project is underway by the US Geological Survey to model the role of predation in CWD dynamics in the Greater Yellowstone Ecosystem.

#### For more information on wolves and ungulate health see:

• Hobbs, N. T. (2006). A model analysis of effects of wolf predation on prevalence of chronic wasting disease in elk populations of Rocky Mountain National Park. *Report submitted to the National Park Service*.

http://files.cfc.umt.edu/cesu/NPS/CSU/2005/Hobbs\_wolf%20cwd%20report.pdf

- Krumm, C. E., Conner, M. M., Hobbs, N. T., Hunter, D. O., & Miller, M. W. (2010). Mountain lions prey selectively on prion-infected mule deer. *Biology Letters*, 6(2), 209-211. <u>https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2009.0742</u>
- Miller, M. W., & Wild, M. A. (2004). Epidemiology of chronic wasting disease in captive white-tailed and mule deer. *Journal of wildlife diseases*, 40(2), 320-327. <u>https://bioone.org/journals/journal-of-wildlife-diseases/volume-40/issue-2/0090-3558-40.2.320/Epidemiology-of-Chronic-Wasting-Disease-in-Captive-White-Tailed-and/10.7589/0090-3558-40.2.320.pdf
  </u>

- Mitchell, C. D., Chaney, R., Aho, K., Kie, J. G., & Bowyer, R. T. (2015). Population density of Dall's sheep in Alaska: effects of predator harvest?. *Mammal Research*, 60(1), 21-28. <u>https://www.researchgate.net/profile/R-Bowyer/publication/272681731\_Population\_density\_of\_Dall%27s\_sheep\_in\_Alaska\_effects\_of\_predator\_harvest/links/54eba3f00cf2a0305194692f/Population-density\_of-Dalls-sheep-in-Alaska-effects-of-predator-harvest.pdf
  </u>
- Saunders, S. E., Bartelt-Hunt, S. L., & Bartz, J. C. (2012). Occurrence, transmission, and zoonotic potential of chronic wasting disease. *Emerging infectious diseases*, 18(3), 369.
- Stahler, D. R., Smith, D. W., and Guernsey, D. S. 2006. Foraging and feeding ecology of the gray wolf (Canis lupus): Lessons from Yellowstone National Park, Wyoming, USA. Journal of Nutrition. 136: 1,923s-1,926s. <a href="https://academic.oup.com/jn/article/136/7/1923S/4664711">https://academic.oup.com/jn/article/136/7/1923S/4664711</a>
- Wild, M. A., Hobbs, N. T., Graham, M. S., & Miller, M. W. (2011). The role of predation in disease control: a comparison of selective and nonselective removal on prion disease dynamics in deer. *Journal of Wildlife Diseases*, 47(1), 78-93. <u>http://wolfwatcher.org/wp-content/uploads/2015/01/jwd-reprint-Wild-et-al-2011.pdf</u>

#### Studied Impacts of Wolves on Ungulates by Region

While wolf predation poses inconsequential risk to the availability and abundance of state's' ungulate populations, the role wolves play in controlling ungulate numbers is value- added given sustained and ongoing declines in hunter numbers.

#### **Great Lakes - Deer, Elk and Moose**

#### Michigan's Deer and Elk Herds

In Michigan, the state's Upper Peninsula (UP) wolf population is showing no adverse effect on deer or elk numbers. The state Department of Natural Resources' (DNR) <u>2020 Michigan Deer</u> <u>Season Preview</u> reported that the state's UP deer herd was doing well, and that statewide the deer

population is "abundant and resilient" and continuing to grow, while "Michigan is experiencing tremendous declines in hunter numbers."

In 1998, 837,000 deer hunters participated in Michigan's deer season and killed 598,000 deer. In 2018, 554,000 deer hunters participated in Michigan's deer season and killed 361,000 deer. The State DNR anticipates the number of deer hunters will decline by another 100,000 over the next decade.

The Michigan Elk Management Plan states a goal of having 500-900 elk in Michigan. The population estimate has consistently exceeded this goal in recent years. In 2019, the population estimate was 1,196 elk; in 2018 it was 1,173 elk; and in 2017 it was 1,158 elk. Furthermore, at the April 16, 2020 meeting of the Natural Resources Commission, Michigan's Deer and Elk Management Specialist <u>said</u>, "By all indications we have a stable elk population here in Michigan, albeit above goal," pointing as well to the high hunter success rates for elk hunters in Michigan.

Of note, Michigan's elk were reintroduced in the northern Lower Peninsula, where there has been <u>only one confirmed wolf sighting</u> in the past decade (Kruth, 2015). Elk were not reintroduced in the Upper Peninsula (U.P.) of Michigan, where almost all of Michigan's wolves live.

#### Minnesota Ungulate Populations Stable and Flourishing within Wolf Range

The 2019-2028 Minnesota White-Tailed Deer Management Plan provides, "Hunting by humans has the greatest impact on deer numbers statewide, as can easily be seen from annual harvest statistics. However, winter severity is commonly the primary cause of natural deer mortality, with substantial population impacts most frequently observed in northeastern Minnesota. In local cases, wolf predation can be the primary cause of natural deer mortality." It goes on to say, "Most deer mortality by wolves occurs in late winter, is directly related to winter severity, and much of it is compensatory, particularly during the more severe winters. Specifically, vulnerable deer are already dying from other causes (e.g., starvation) when preyed upon."

Additionally, the <u>2019 Minnesota Wolf Population Update</u> states, "Although local variability occurred, from spring 2018 to spring 2019 the overall average deer density within wolf range remained stable. Over the past 5 years, wolf population estimates have been positively correlated

with average deer density within wolf range." The Minnesota DNR's website further <u>states</u>, "The wolf population in Minnesota is linked closely to the populations of deer and moose. In the last several decades, since the wolf population has become relatively stable, changes in wolf numbers have fluctuated primarily in response to the abundance of white-tailed deer. In the very simplest explanation, fewer deer equates to fewer wolves and more deer equates to more wolves."

In a May 13, 2020 press release, the DNR stated that two of the three recognized elk herds in Minnesota had higher population counts this year, "continuing an upward population trend." The third herd doesn't seem to have been counted this year.

In northeastern Minnesota, there is particular concern about the moose population. The DNR <u>states</u> that this steep decline is primarily due to lower moose survival rates and a decreasing number of breeding-age females whose offspring contribute to the population. They go on to say that health-related causes account for two-thirds of adult mortality and brain worm is the leading cause of health-related fatalities. The DNR additionally states that the second major moose mortality factor is wolf predation. However, a <u>2017 DNR study</u> looking at the causes of non-hunting moose mortality in northeastern Minnesota found that at least 40% of the moose killed by wolves had other serious health issues that may have predisposed them to predation. Additionally, a <u>2019 study</u> noted that the "overall poor health of the northeastern Minnesota moose population could potentially explain the high number of capture-induced abandonments observed and the high rates of predation on calves."

#### **Isle Royale Moose:**

Isle Royale provides a unique opportunity to study predator-prey relationships between wolves and other species, especially moose. Here, the National Park Service and Michigan Technological University have partnered to conduct the longest consecutive predator-prey study that focuses on the relationship between wolves, moose, beaver, and vegetation.

As the wolf population sharply declined to just two related individuals, the moose population drastically increased to the detriment of the forest and vegetation. In 2018, the National Park Service announced it would augment the population with 20-30 individuals within 3 years to

restore the predator-prey dynamic and ecological balance. From September 2018-2019, 19 wolves were translated to Isle Royale. As of April 2020, researchers estimated there are 14 wolves present.

#### Additional Great Lakes regional wolf and ungulate information:

- Romanski, M. C., Orning, E. K., Kellner, K. F., Beyer Jr., D. E., Brzeski, K. E., Hart, J., Lonsway Jr., D. H., McLaren, A.A.D., Moore, S. A., Patterson, B. R., Potvin, L. R., Verant, M. L., Wolf, T. M., and Belant, J. (2020). Wolves and the Isle Royale environment: Restoring an island ecosystem 2018-2020. <u>https://www.nps.gov/isro/learn/nature/upload/NPS-SUNY-ISRO\_Web\_Accessible\_Isle-Royale-Wolf-Summary-Report-2018-2020\_Compressed.pdf</u>
- National Park Service <u>https://www.nps.gov/isro/learn/nature/wolves.htm</u>
- <u>https://isleroyalewolf.org/</u>

#### Western Coastal Region Elk, Deer, Moose and Bighorn Sheep

#### Washington State

According to the Washington Department of Fish and Wildlife (WDFW), Washington's growing population of wolves is not harming that state's populations of elk, deer, moose or bighorn sheep. WDFW studied ungulate populations from 2015-2017 and found that none showed clear signs of being limited by predation. The WDFW assessment shows that Washington's elk herds are generally meeting population objectives (and for some herds exceeding population objectives) despite the expansion of wolves, and that the majority of mortality to elk in Washington state is human-caused. The WDFW report also reveals that human disturbance, forest management practices and severe winters are key factors affecting elk population dynamics.

• *See* Washington Department of Fish and Wildlife. 2017. Wildlife Program 2015-2017 Ungulate Assessment.

https://wdfw.wa.gov/sites/default/files/publications/01948/wdfw01948.pdf

#### Oregon

In Oregon, the Oregon Department of Fish and Wildlife has been undertaking a multiyear study on elk and mule deer in the Starkey Management Unit. Started in the winter of 2013-2014 and concluding in the winter of 2017-2018, the research includes examinations of effects of roads, timber harvest, ATV presence and hunter effects on elk and mule deer; cattle/elk/deer interactions; and predation by cougars and wolves. Data which has undergone analysis so far concludes that: (1) elk avoid/are displaced by cattle and mule deer avoid elk and thus are displaced by both elk and cattle;

(2) density of archery hunting in combination with nutritional conditions can influence ungulate pregnancy rates;

(3) human disturbance can influence movement and distribution of elk which could translate into population consequences for elk;

(4) cougars selectively prey on elk calves which results in decreased survival and recruitment into the adult elk population, but cougar diets are dominated by deer;

(5) the recent reestablishment of wolves may reshape Oregon predator/prey dynamics.

A compilation of summaries of the research and data results so far was prepared by ODFW as a packet for the Oregon Fish and Wildlife Commission Oct. 6, 2016 meeting. In section 5 of the packet, ODFW notes, "Ultimately, ungulate populations are regulated by the amount and quality of forage available" but study results analyzed thus far demonstrate that human activities and disturbance and displacement from habitat by cattle also factor into and have impacts on elk population dynamics and adult: juvenile ratios.

• *See* Oregon Department of Fish and Wildlife. October 6, 2016. Oregon Fish and Wildlife Commission Tour Packet.

#### **Northern Rocky Mountains**

In the Northern Rocky Mountain states, elk numbers and the number of elk killed by hunters have been at all-time highs since at least 2012, despite the reintroduction of wolves in the region in 1995-1996 and a population that now stands at around 2,700 wolves. Information from the Idaho, Montana, and Wyoming state wildlife management agencies also indicate that elk populations are at or above management unit objectives in the majority of units.

For more information on wolf and ungulate dynamics in the Northern Rockies see:

- Phillips, R. (2021). Idaho wolf population remains stable between 2019 and 2020 despite higher mortality. *Idaho Department of Fish and Game*. <u>https://idfg.idaho.gov/press/idaho-wolf-populations-remains-stable-between-2019-and-2020-despite-higher-mortality</u>
- Inman, B., Podruzny, K., Nelson, A., Boyd, D., Parks, T., Smucker, T., Ross, M., Lance, N., Cole, W., Parks, M., and Wells, S. (2020). Montana Gray Wolf Conservation and Management 2019 Annual Report. *Montana Fish, Wildlife & Parks*. Helena, Montana. 106 pages. <u>https://fwp.mt.gov/binaries/content/assets/fwp/conservation/wildlife-reports/wolf/2019-mt-wolf-annual-report-final-9.9.2020all.pdf</u>
- Wyoming Game and Fish Department, U.S. Fish and Wildlife Service, National Park Service, USDA-APHIS-Wildlife Services, and Eastern Shoshone and Northern Arapahoe Tribal Fish and Game Department. 2021. Wyoming Gray Wolf Monitoring and Management 2020 Annual Report. K.J. Mills and Z. Gregory, eds. Wyoming Game and Fish Department, 5400 Bishop Blvd. Cheyenne, WY 82006. <u>https://wgfd.wyo.gov/WGFD/media/content/Wildlife/Large%20Carnivore/WYWOLF\_A NNUALREPORT\_2020.pdf</u>

#### Idaho Deer and Elk:

In a press release about the big game hunting outlook for 2020, Idaho Fish and Game (IDFG) predicted that "deer and elk hunters should see plenty of game in Idaho during fall hunts as mild winters have helped rebound mule deer herds hit hard in recent years, and Idaho's elk herds continue to soar and harvests have come roaring back over the last six years," — despite the existence of a wolf population that grew from zero animals in 1995 when wolves were reintroduced in central Idaho to a summer population of around 1,556 wolves in the state today.

• See Pearson, B. (2020). 2020 big game hunting outlook. Idaho Department of Fish and Game. <u>https://idfg.idaho.gov/press/2020-big-game-hunting-outlook</u>

#### Montana Elk and Mule Deer

In Montana, elk and mule deer populations remain consistently high despite a wolf population of an estimated 833 individual wolves in 2019.

Across the state elk populations are reported to be at or above objective. In fact, in the 2020 Big Game Hunting Forecast, Montana Fish, Wildlife, and Parks (FWP) reported that, "These are good times for elk hunters, as Montana elk populations continue to be strong across most of the state." In 2020, 136,151 elk were observed in the state, 48% over the state's Elk Plan Objective of 92,138 elk. In fact, Montana's elk population has exceeded the state's Elk Plan Objective since at least 2008, the most recent year for which data are available.

Similarly, the mule deer population in Montana remains high. In 2020 FWP estimated the mule deer population to be 328,313 — 11% over the previous 10-year average.

#### For more information on wolves and Montana elk and deer see:

- https://fwp-brm.mt.gov/buy-and-apply/news/2020-big-game-hunting-forecast
- Montana Fish, Wildlife and Parks. (2020). Montana 2020 elk counts. https://fwp.mt.gov/conservation/species/elk/population-and-distribution
- Montana Fish, Wildlife and Parks. (2020). 2020 Mule deer population report. <u>https://fwp.mt.gov/binaries/content/assets/fwp/conservation/wildlife-</u> <u>reports/deer/2020-mule-deer-population-chart.pdf</u>

#### Wyoming Elk:

According to the Wyoming Department of Game and Fish (WGFD), the state's wolf minimum population count in 2019 was 327. While under state law, WGFD may kill wolves when it is determined that "wolf predation is causing an unacceptable impact on a wild ungulate population or herd," there have been no such actions taken during at least the last four years, as "there was no definitive documentation of unacceptable impacts to ungulates or elk feedgrounds caused by wolves."

Furthermore, at the April 2021 Game and Fish Commission meeting, agency personnel said that WGFD estimates there are about 110,000 elk in the state, and they continue to see hunter success and hunter harvest doing well. They also stated that the number of elk hunted has remained fairly stable over the last 10 years, although there was a slight increase in 2020 and likely will be again in 2021.

For more information on wolves and ungulates in Wyoming see:

- Wyoming Game and Fish Department. Wolves in Wyoming. See annual reports here: <u>https://wgfd.wyo.gov/wildlife-in-wyoming/more-wildlife/large-carnivore/wolves-in-wyoming</u>
- Wyoming Game and Fish Department. 2016 https://www.youtube.com/watch?v=dFQ0a1NZEYo

## **Chapter 10 ...SCIENCE ON WOLF INTERACTIONS WITH OTHER WILDLIFE SPECIES**

#### Key Chapter Takeaways:

- 1) In every ecological setting, wolves interact with other wildlife species. The mere presence of wolves and their actions can impact other species both directly and indirectly.
- 2) Examples of impacts include predation by wolves on other predators and vice versa, a release of mesopredators, climate buffering effects that benefit scavengers, and vegetative impacts which benefit birds, amphibians and fish.

#### **Wolves and Other Carnivores**

Wolves have a controlling effect on other predator species, such as coyotes, which indirectly benefits other species and may reduce the number of livestock predations by coyotes. The interactions of wolves and mountain lions (cougars) are variable. While the majority of published scientific literature points to wolves dominating cougars, recent information from Washington, Idaho and Montana indicates that mountain lions will kill solitary wolves in some instances.

For more information on wolves and other carnivores see:

- Murray Berger, K., Gese, E., Does Interference competition with wolves limit the distribution and abundance of coyotes?, 2007, https://doi.org/10.1111/j.1365-2656.2007.01287;
- https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2656.2007.0128
- Crabtree, R. L., and J. W. Sheldon. 1999. Coyotes and canid coexistence. In
- Carnivores in ecosystems: The Yellowstone experience, eds. T. W. Clark, A. P. Curlee,
   S. C. Minta, and P. M. Kareiva, 127-63. New Haven, Connecticut: Yale University Press.
- Smith, Douglas W., R. 0. Peterson, and D. B. Houston. 2003. Yellowstone after wolves. Bioscience. 53(4):330-40.
- Weiss, A., Kroeger, T., Haney, J., Fascione, N., "Social and Ecological Benefits of Restored Wolf Populations, Transactions of the 72" North American Wildlife and Natural Resources Conference.
- Flagel, D., et al. (2016). Fear and loathing in a Great Lakes forest: Cascading effects of competition between wolves and coyotes. *Journal of Mammalogy*, *98*(1).

www.wolfplanning.org

- Newsome et al. (2017). Top predators constrain mesopredator distributions. *Nature Communications*, 8: 15469.
- Ritchie, E. G. & Johnson, C. N. (2009). Predator interactions, mesopredator release and biodiversity conservation. *Ecology Letters*, *12*: 982-998.
- Elbroch LM, Ferguson JM, Quigley H, Craighead D, Thompson DJ, Wittmer HU. 2020. Reintroduced wolves and hunting limit the abundance of a subordinate apex predator in a multi-use landscape. Proc. R. Soc. B 287: 20202202. <u>http://dx.doi.org/10.1098/rspb.2020.2202</u>
- WDFW 2014; D. Martorello pers. comm. June 2014, Chapter 5 of California Wolf Plan.
- Hebblewhite and Smith (2010)
- Kortello et al. (2007)

#### **Wolves and Scavengers**

Wolves act as a buffer to the effects of climate change by creating more carrion for scavengers and making it available year-round, to the advantage of bald and golden eagles, brown bears, ravens, magpies, and coyotes (Wilmers and Getz 2005, Stahler et al. 2006, Constible et al. 2008).

#### For more information on wolves and scavengers see:

- https://www.isleroyalewolf.org/sites/default/files/tech\_pubs\_files/V%20et%20al%20200
   4%20raven.pdf
- <u>https://drive.google.com/drive/u/0/folders/10wp6gmilTNhtoEfTmrrLsQCZF7rIgOEo</u>
- Walker et al. (2018). Population responses of common ravens to reintroduced gray wolves. *Ecology and Evolution, 8*: 11158-11168.

#### Wolves and Small Mammals and Special Status Species

Wolves limit overgrazing of saplings by elk in sensitive riparian environments and thereby permit other species, such as beavers, birds, fish and amphibians to thrive by stabilizing riparian areas (Ripple and Beschta 2003; Chadwick 2010).

Wolves and Other Endangered or Threatened Species *see* W.J. Ripple et al., "Can Restoring Wolves Aid in Lynx Recovery?," Wildlife Society Bulletin 35, no. 4 (2011).

## **Chapter 11 ... OTHER HUMAN INTERACTIONS WITH WOLVES**

#### Key Chapter Takeaways:

- 1) Threats to human safety by wolves are exceedingly rare.
- 2) There are suggested steps to take to keep your dog safe while in wolf country.

#### **Wolves and Human Safety**

#### Science on Wolves and Human Safety

Science unequivocally establishes that threats to human safety by wolves are exceedingly rare.

See:

- Linnell J. D. C. et al. 2002. The fear of wolves: a review of wolf attacks on people. *NINA Oppdragsmelding* 731:1–65. http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1026&context=wolfrecovery.
- Linnell, J. D., & Alleau, J. (2016). Predators that kill humans: myth, reality, context and the politics of wolf attacks on people. In *Problematic wildlife* (pp. 357-371). Springer, Cham. <u>https://www.researchgate.net/profile/John-</u> <u>Linnell/publication/301267098 Predators That Kill Humans Myth Reality Context a</u> <u>nd the Politics of Wolf Attacks on People/links/5a0020490f7e9b9968c77cc5/Predato</u> <u>rs-That-Kill-Humans-Myth-Reality-Context-and-the-Politics-of-Wolf-Attacks-on-People.pdf</u>

#### **Wolf Encounters**

On the rare occasion that a human does encounter a wolf, there are easy and effective ways to minimize risks:

- 1. Keep any food, trash, or other attractants secured
- 2. Do not feed wolves
- 3. Do not run
- 4. Stay calm and keep children and pets close
- 5. Make sure the wolf has an escape route
- 6. If you feel threatened, stand tall and shout, wave your arms, and clap your hands

For more information on wolf encounters see:

- Conservation Northwest: Tips for hiking in wolf country: <u>https://www.conservationnw.org/tips-for-hiking-in-wolf-country/</u>
- Alaska Department of Fish and Game- Division of Wildlife Conservation. 2008. Wolf safety in Alaska: Living safely in wolf country. <u>https://www.adfg.alaska.gov/static/species/livingwithwildlife/pdfs/living\_in\_wolf\_country.pdf</u>

#### **Companion Dog Safety and Means to Minimize Risks**

- 1. Walk dogs on leash
- 2. Keep dogs under control
- 3. Turn on outside lights
- 4. Learn wolf sign/avoid walking in areas of fresh wolf sign
- 5. Carry a whistle to use when encountering any wildlife
- 6. Do not run from a predator, make noise

For more information for hiking with dogs in wolf country see:

- Washington Department of Fish and Wildlife, "Recreating with your dog in wolf country," May 2019. <u>https://wdfw.medium.com/recreating-with-your-dog-in-wolfcountry-509cc0e8bffa</u>
- <u>Keeping your Dog Safe in Wolf Country</u>

## **Chapter 12 ... PUBLIC EDUCATION & OUTREACH**

#### Key Chapter Takeaways:

- 1. Educating the public regarding wolves is paramount to achieving human-wolf coexistence, yet among agencies this crucial endeavor is always underfunded and understaffed.
- 2. It is essential that agencies immediately counter falsehoods and misperceptions about wolves and provide facts based on best available science.
- 3. A wolf facts media campaign can encompass many issues through a vast array of modern media platforms.
- 4. Educational outreach should be designed to target many different types of audiences, from the general public to specific interested industries, to elected and appointed policy decision-makers.
- 5. Education programs, campaigns and materials can be created jointly with strategic partners, which can also optimize funding opportunities around education.

#### **Educational Priorities**

Coexistence between humans and wolves can only happen if agencies actually fund and enact massive, sophisticated education and outreach efforts to interrupt the default of ignorance about and fear of wolves. All agencies working on wolves note the importance of wolf education and outreach, but none sufficiently fund or enact such programs.

It is of paramount importance for agencies to take on entrenched falsehoods and misperceptions concerning wolves, relaying in their stead facts supported by best available science. Agency staff must set aside fears that providing scientific facts will anger politicians or specific stakeholders; mistruths left uncorrected allow for social non-tolerance for wolves to continue and to spread. Whether at a public presentation, a legislative or commission meeting or during a public advisory group meeting, if false or inaccurate information is raised regarding wolves, livestock-wolf conflicts, wild ungulate-wolf interactions, wolf-human safety concerns or other wolf-related issue, this is a teachable moment agency staff must seize upon to provide science-based factual information to the entire audience in that setting.

#### For example:

- 1. Wolves kill extraordinarily few numbers of cattle, sheep and other livestock.
- 2. Wolves contribute to the health and well-being of deer and elk, culling diseased animals including possibly those with Chronic Wasting Disease, while at the same time improving forest health and biodiversity.
- 3. State wolf trophy hunting and trapping seasons are poorly supported by the American public, run counter to established conservation principles, and are cruel due to lengthy trap check times and use of hounds.
- 4. The Precautionary Principle and adaptive management support use of non-lethal measures to deter livestock-wolf predations.
- 5. Killing wolves destabilizes wolf pack dynamics, limiting the ability of the pack to hunt natural prey, increasing the possibility of livestock predation, and jeopardizing wolf population numbers.

#### Develop "Wolf Facts" Media Campaign

An informed public is important for successful wolf conservation and management. Most wolf biologists believe that an objective portrayal of the wolf is needed to sustain wolf recovery. (Fritts et al. 2003).

#### A successful fact-based campaign should:

- Address actual and perceived threats by wolves
- Avoid attracting wolves to residential areas through ungulate feeding/baiting
- Discourage ownership of hybrids
- Promote the positive aspects of wolves
- Maintain current information on State DNR websites regarding populations and predation statistics.
- Establish avoidance zones for those hunting with dogs
- Provide prompt response to information requests
- Provide opportunities to the public to experience positive interactions, such as howling.

*See also*: Fritts, Steven H.; Stephenson, Robert O.; Hayes, Robert D.; and Boitani, Luigi, "Wolves and Humans" (2003). USGS Northern Prairie Wildlife Research Center. 317. <u>https://digitalcommons.unl.edu/usgsnpwrc/317https://core.ac.uk/download/pdf/188128261.pdf</u>

#### **Educational Outreach Goals and Target Audiences**

- Agricultural interests, including dairy and livestock operations;
- Environmental and Conservation organizations to maintain cooperative relationships with NGOs interested in providing education regarding the biological, ecological and social issues regarding wolves;
- Natural Resource professionals, agency-wide;
- Local law enforcement;
- Legislators and other local and state policymakers.

#### **Other Important Education Considerations:**

- Identification of Strategic Partners [See Ch. 13]
- Coordinate and Optimize Funding Opportunities [See Ch. 14]

# **Chapter 13 CHAPTER 13: AN OUTLINE OF COORDINATION WITH OTHER STATES & FEDERAL AGENCIES**

#### Key Chapter Takeaways:

At the federal, state and local level there are multiple agencies and agency-type bodies with wildlife authority that can and should coordinate efforts in wolf stewardship. They should all be considered by states for wolf planning purposes.

### **Detailed List of Wolf Plan Partner Considerations**

- 1) Federal level
  - a) USFWS (leading agency, while ESA protections intact and to meet state oversight requirement during 5 year post-delisting period)
  - b) Department of the Interior
    - (1) BLM (grazing policy)
  - c) Designated Wilderness Areas
  - d) National Monuments
  - e) National Park Service
  - f) National Forest Service
    - (1) AOP's/ AMP's for allotments (grazing policy)
    - (2) Regional Directors for Forest Planning and policy
  - g) Tribal Considerations [see Chapter 5]
- 2) State Level
  - a) State Legislature--to identify and address conservation roadblocks & opportunities
  - b) State Livestock Board--to streamline predation investigations and compensation
  - c) Transit Authority--to address corridor connectivity priority & vehicular threats
  - d) Tribal Considerations [see Chapter 5]
- 3) Local Level
  - a) NGOs and local advocates--work with champions on the ground to establish and legitimize local response to conflict, especially in rural areas
  - b) Local elected officials--identify and work with local officials, including County Commissioners and Town Councils
  - c) Proactive outreach--provide information to those who may experience conflicts with wolves in advance, such as Conservation Districts with deep community ties, which can disseminate facts to stockgrowers quickly. (An ounce of prevention legwork is worth a pound of intervention.)

## **Chapter 14 ... FUNDING NEEDS, OPPORTUNITIES & CHALLENGES**

#### Key Chapter Takeaways:

- 1. Funding for wolf conservation programs should prioritize an annual management budget based on conclusions of best available science, focus on proactive non-lethal conflict prevention tools, methods and strategies; and funding for scientific research and public education.
- 2. Existing funding sources include federal funds for listed species recovery and Pittman-Robertson Act funds, grants and appropriations, NGO contributions, taxes and things like license plate fees.
- 3. Explore potential new funding opportunities based on changing values and identify funding sinks to discontinue.

#### Annual Management Expenditures

- 1. Conflict management: supplies for coexistence solutions, should the state cover the cost for the livestock industry
- Staff: Wolf Biology Specialist, Nonlethal Conflict Specialist, Outreach and Education Director etc.
- 3. Educational events: technical assistance demonstrations, rural outreach events etc.
- 4. Equipment: monitoring equipment, software, tools, uniforms, education supplies etc.
- 5. Research studies (opportunity for university partnership/ match)
- 6. Consider costs of new programs: *See*, e.g., <u>cost estimates for Colorado wolf</u> <u>reintroduction</u>.

#### **Annual Management Income**

- 1. Species recovery funds with ESA protections intact.
- 2. Pittman-Robertson funds with ESA protections intact.
- 3. Grants and appropriations:
  - a. See, e.g., Federal ACE ACT congressional appropriation: https://www.congress.gov/bill/116th-congress/senate-bill/3051/text?r=5&s=1
  - b. See, e.g., Montana project: <u>https://www.mtpr.org/post/grant-aims-re,mk.,/duce-</u> <u>conflicts-between-predators-and-people.</u>
- 4. NGO contributions to programs and staffing.

- 5. State tax income.
- 6. Other funding sources:
  - a. License plates (<u>https://wdfw.wa.gov/licenses/license-plates#:~:text=In%20addition%2C%20%2410%20per%20personalized,for%20losses%20from%20wolf%20kills.</u>)
  - b. Recreation funds: <u>https://www.dfw.state.or.us/conservationstrategy/OCRF/</u>
  - (iii) Lottery funds: https://goco.org/about-us/colorado-parks-wildlife

#### Funding Opportunities and "Sinks"

- 1. <u>Opportunity:</u> Inventory NGO assets to fill funding and staffing gaps. Many nonprofits offer technical assistance, funding and other resources for wolves.
- 2. <u>Opportunity:</u> Support efforts to amend the Pittman-Robertson Wildlife Restoration Act (it was amended in the past) to include a tax on equipment used by non-hunters and silent sport users, such as canoes, kayaks, snowshoes, skiing, spotting scopes, binoculars, rock climbing, etc. In addition to giving non-consumptive users a greater voice in wildlife management, this would lead to increased revenue for states affected by declining Pittman-Roberson funds due to ongoing declines in hunting licenses across the country\*. <u>Pittman-Robertson Wildlife Restoration Act: Understanding Apportionments for States and Territories</u>.
  - Documented declines in hunting: <u>https://www.npr.org/2018/03/20/593001800/decline-in-hunters-</u> <u>threatens-how-u-s-pays-for-conservation</u>
  - Murray, C.K. (2019) Trophy hunters of native carnivores benefit from wildlife conservation funded by others. <u>https://www.humanesociety.org/sites/default/files/docs/HSUS\_Troph</u> <u>y-Hunting-Economics-2020.pdf</u>
- 3. <u>Sink</u>: Livestock loss compensation expensive. <u>https://www.hcn.org/issues/50.12/wolves-when-cattle-go-missing-in-wolf-territory-who-should-pay-the-price</u>.
- 4. <u>Sink</u>: Lethal removal; it is counter to science, public values and cost-prohibitive [see Chapters 2, 9].
  - a. Wolf kill operations are expensive, killing the Profanity Peak Pack <u>cost \$137,000</u> <u>dollars in Washington</u>.
    - i. *See* McManus, J.S., Dickman, A.J., Gaynor, D., Smuts, B.H., "Dead or alive? Comparing costs and benefits of lethal and non-lethal human–

wildlife conflict mitigation on livestock farms," 2014. DOI: <a href="https://doi.org/10.1017/S0030605313001610">https://doi.org/10.1017/S0030605313001610</a>

For additional information on budget particulars see:

• Wolf recovery expenses: <u>https://billingsgazette.com/lifestyles/recreation/states-\_\_\_spending-millions-on-wolf-recovery/article\_19ccc365-0b91-5a81-abb8-\_\_\_62d1fe0c2901.html</u>