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# A Comparison Between the Wolves of Brandenburg, Germany and Minnesota, USA: History, Technology, and Culture

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# A COMPARISON BETWEEN THE WOLVES OF BRANDENBURG, GERMANY AND MINNESOTA, USA: HISTORY, TECHNOLOGY, AND CULTURE

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## Introduction

Sometime before November 2012, a male wolf dispersed from its pack in forests of the Lausitz area of Saxony in eastern Germany heading northwest.[1] The pack came to be known as the Milkel pack after a small town nearby in Saxony.[2] Thanks to the meticulous data kept by German researchers in their large database of wolf information, we know this male left a father and a brother in Germany.[3] This dispersal may have been the result of a change in pack leadership, new pups being born and the pack needing to thin its members, or the desire to find a mate; either way, this wolf traveled about 500 miles northwest to Thy National Park in Denmark where it was then found dead and picked up by researchers in November 2012.[4] The wolf in question died of natural causes and was the first wolf to be seen in Denmark in over 200 years.[5] It was pioneer from the forests of eastern Germany, whose population of wolves had only recently arrived about 11 years before.

38 years earlier, in the summer of 1974, male wolf number 5121 traveled nomadically throughout parts of the Beltrami Island State Forest in northwest Minnesota, covering an area of at least 650 kilometers$^2$ in a part of the forest that was on the edge of the wolf range at the time and in an area of the forest where no wolves were thought to be settled.[6] His radio collar signal could not be found on three separate attempts that summer, suggesting that he probably ranged farther than 650 kilometers.[7] Wolf 5121 paired with a non-radio collared female wolf and lived for a few months going in and out of her territory until he was shot by a hunter on

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1. L. W. Andersen et al., “Long-distance dispersal of a wolf, *Canis lupus*, in northwestern Europe,” *Mammal Research* 60, (2015): 163, https://www.researchgate.net/publication/288236345_Long-distance_dispersal_of_a_wolf_Canis_lupus_in_northwestern_Europe_vol_60_pg_163_2015.
2. L. W. Andersen et al., 164.
3. L. W. Andersen et al., 166.
4. L. W. Andersen et al., 164.
5. L. W. Andersen et al., 163.
6. Steven H. Fritts and L. David Mech, "Dynamics, Movements, and Feeding Ecology of a Newly Protected Wolf Population in Northwestern Minnesota," *Wildlife Monographs*, no. 80 (1981): 37, accessed March 14, 2020, www.jstor.org/stable/3830611.
7. Steven H. Fritts and L. David Mech, 37.

the 15th of February, 1975.[8] This was too early to determine whether his pairing with the female had helped to successfully recolonize the area.[9]

In this paper, I will compare and contrast the histories of the wolves in Brandenburg, Germany with the wolves in Minnesota, USA. Through a comparative approach I will show that the difference in time between when both populations were being researched did not affect which methods were used to study them as much as location and culture did. Looking at both German and English sources from the time, I will shed a light on how two cultures dealt with wolves living within their borders and the specific challenges that came with trying to conserve and research them. Analyzing and illustrating the worlds these two wolves inhabited brings forth interesting comparisons of land, culture, method for research and more.

## Why Brandenburg and Minnesota?

The Thy National Park wolf and wolf 5121 come from a different time and different locations, yet their stories are similar, from the researchers who have researched them for years to the wolves themselves and the world around them. The Thy National Park wolf came from a pack in the Lausitz area of eastern Germany, the jumping point for many dispersing German wolves.[10] To get to Thy national park from its pack in Saxony it traveled through densely populated areas, passing around Germany's two largest cities, Berlin and Hamburg, and crossing numerous busy roads and highways. This wolf probably "island hopped"--from protected forests to forested military bases and training areas, for example-- avoiding people as much as it could going into territories where its species had not been seen for more than 200 years.[11] In contrast, Minnesotan wolf 5121 traveled from its pack in the wilderness of

8. Steven H. Fritts and L. David Mech, 37.
9. Steven H. Fritts and L. David Mech, 37.
10. L. W. Andersen et al., 163-168.
11. I. Reinhardt, G. Kluth, C. Nowak, et al., "Military training areas facilitate the recolonization of wolves in Germany," *Conservation Letters* 12, no. 3 (2019), accessed March 14, 2020, https://doi.org/10.1111/conl.12635.

northern Minnesota to another area of the forest where wolves were not thought to live. Unlike in Germany where wolves were completely eradicated from the region, in Minnesota wolves survived in certain corners of the far north of the state like Superior National Forest. These areas were difficult for people to reach on land. This wolf traveled from wilderness to wilderness in a time when its species was expanding its range, but it passed by no large cities and was born into a longer established wolf population rather than a new pioneering one. Unlike the Thy National Park wolf, the nearest this wolf came to a human was when it was first collared and then in the end when it was shot.

A comparative approach allows one to assess the ways that differences in location and time affect how wolves are able to expand their range in a landscape dominated by humans. It allows one to focus in on the wolves, and the people researching them. Researchers said in a paper about Spanish wolves, "In contrast to study sites in North America or Africa with a minor overlap between predators and people, people and wildlife in Central Europe coexist in an anthropogenically modified cultural landscape with a high human population density."[12] Okarma adds that "Europe is a densely populated continent characterized by extensive changes to the natural environment."[13] In fact a major reason wolves were able to be extirpated from almost their whole range in Europe was the loss of their natural prey.[14] Extirpation is the total elimination of an animal in an area of its range, it contrasts to extinction in which every animal of that species around the whole world is eliminated.[15] Between 1965 and 2000 Minnesota's wolf population bounced back from the brink of extirpation, the animal's last holdout in the entire lower 48 states other than Isle Royale in

12. I. Lesniak, et al., "Population expansion and individual age affect endoparasite richness and diversity in a recolonising large carnivore population," *Scientific Reports* **7**, no. 41730 (2017), doi: 10.1038/srep41730.

13. Henryk Okarma, "The trophic ecology of wolves and their predatory role in ungulate communities of forest ecosystems in Europe," *Acta Theriologica* 40, no. 4 (1995): 341, doi: 10.4098/AT.arch. 95-35.

14. Okarma, 341.

15. International Wolf Center, "Glossary," s.v. "Extirpation," accessed March 14, 2020, https://wolf.org/wolf-info/basic-wolf-info/in-depth-resources/glossary/.

Michigan. In Brandenburg where wolves had been totally extirpated, between 1990 and 2020 wolves returned, repopulated, and multiplied in number faster than many expected. The relationship between wolves and people over these two spans of roughly 30-35 years played out differently in Germany than in Brandenburg. Shifting attitudes changed the methods used to study the wolves, and changed landscapes changed how the wolves were able to spread. The two populations have not been intensively compared. The comparison between their two histories will demonstrate the adaptability of the wolf as a species and its ability to recolonize areas where it was previously extirpated, and hopefully allay some of the fears towards the topic of wolf recolonization. Before diving into the history of the wolf in Brandenburg and Minnesota it is first important to define what a gray wolf is in general, how they live socially, what they eat, and what role they play in the ecosystems they inhabit.

## A Short Ecology of the Wolf in General

### Taxonomy

The gray wolf's scientific name is *Canis lupus*. The genus *Canidae* includes all doglike animals including wolves, foxes, coyotes, jackals, and the domesticated dog. While considered a pest and even an evil animal for much of the history of Europe and post-colonial America, recently wolves have come to be more appreciated in the public eye. Today the wolf has more average citizen supporters and people willing to fight in state capitals for its right to live than ever before.[16] In his book, *Coyote America* , Dan Flores touches on the wolf's life in the public sphere, noting that a wave of "predator appreciation" that brought the gray wolf to "media and environmental stardom" brought sympathy to its cousin the coyote as well, though adding that "Coyotes have never risen to full gray wolf status as environmental

16. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," in *The Wolves of Minnesota: Howl in the Heartland*, ed. L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 27.

darlings."[17] Nevertheless, today wolves populate only a small portion of their original range, which historically covered every habitat in the Northern Hemisphere where there were hooved animals, or Ungulates, the wolf's preferred and primary prey.[18] Indeed, part of what allows wolves to resettle an area is the prey that lives there.

## Diet

Understanding the wolf's diet is key to understanding the relationship between wolves and people. The wolf is a carnivore. An article from German researchers in 2010 entitled "Die Ruckkehr der Wölfe" or "The Return of the Wolves" provides an overview of the wolf's return to Germany. The authors write that "The feeding habits of the wolves as large carnivores and their influence on wild ungulate populations and livestock farming are at the centre of the tensions between man and wolves."[19] Essentially the fact that wolves are carnivorous is a large part of why people fear and dislike them, for in the past animals a lot like them hunted us for food. The wolf's main prey are animals in the ungulate family, which includes deer, wild boar, moose, and elk. Wolves are extremely adaptable however, and will survive on small animals such as rabbit and beaver if they have to or if it is convenient. If they live near human settlements and they have no wild prey, even garbage and livestock can become important in a wolf's diet.[20]

## Wolf Family Structure

17. Dan L. Flores, *Coyote America: a natural and supernatural history* (New York, New York: Basic Books, 2017), 16-17.

18. Todd K. Fuller, L. David Mech, and Jean Fitts Cochrane, "Wolf Population Dynamics," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 163.

19. C. Wagner, et al., "Wolf (*Canis lupus*) feeding habits during the first eight years of its occurrence in Germany," *Mammalian Biology – Zeitschrift fu Säugertierkund* 77, no. 3 (2012): 196, Accessed March 14, 2020, doi:10.1016/j.mambio.2011.12.004.

20. C. Wagner, et al., 196-197.

Wolves live in family packs.[21] A wolf pack usually consists of a breeding pair and their offspring.[22] Wolf pairs are usually a male and a female wolf just starting out together, trying to carve out territory in the existing fabric of pack territories or traveling to a new area to find a safe and secure territory to raise pups and start a new pack.[23] Females give birth to about 3-6 pups per year and a wolf pack usually contains several years' worth of pups. Wolf pups remain with the pack from around 10 to 54 months before dispersing, and during this time they learn how to hunt and be social.[24] Despite the importance of the pack structure, wolves can spend long periods of time alone and can even hunt larger prey such as moose on their own.[25] The eponymous "Lone Wolf" is often a wolf seeking a mate. A lone wolf may join a pack for a short time and lure a mate away, may travel alone for a year, or may pair up with another wolf for a season and then separate again.[26] Some of the ways and reasons wolves travel are still not understood. It is unclear, for example, what exactly the Thy National Park wolf's goal was in his journey after he left his pack's territory.

## Wolf Territory

Wolf territories have borders that are well marked and defended. The size of territories varies, however, depending on many different competing points.[27] Wolf densities (the number of wolves living per square mile/ kilometer) also vary depending on prey variation, prey biomass, and other factors. Wolf densities are very low compared to that of their prey. The density of white tail deer in an area, for example, is measured in number per square mile,

21. L. David Mech and Luigi Boitani, "Wolf Population Dynamics," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 1.
22. Mech and Boitani, "Wolf Population Dynamics," 1.
23. Mech and Boitani, "Wolf Population Dynamics," 4.
24. Mech and Boitani, "Wolf Population Dynamics," 1-2.
25. Mech and Boitani, "Wolf Population Dynamics," 7.
26. Mech and Boitani, "Wolf Population Dynamics," 16.
27. Mech and Boitani, "Wolf Population Dynamics," 21.

whereas wolves are measured in number per hundred square miles.[28] Maximum densities were recorded in northeastern Minnesota in the 1980s and they came out to 69 wolves per 1000 $km^2$ in the summer and 50 wolves per 1000 $km^2$ in the late winter.[29] The wolves living in Germany and western Poland constitute the same central European wolf population. There, a wolf density of 40 to 60 wolves per 2500 $km^2$ was estimated by counting the number of wolves found dead, along with other evidence.[30]

## History of Wolves in Brandenburg

*Figure 1: A wolf spotted in Brandenburg. From the Landesampt für Umwelt website wolf information portal. https://lfu.brandenburg.de/info/wolf.*

### Extermination and Recovery in Germany

Gray wolves existed in Germany for many thousands of years. They were and are an important part of German culture. Wolf centric names such as “Wolfgang” and “Wolfhard” as

28. L. David Mech, “Wolf Research in Minnesota,” in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 37-38.

29. Todd K. Fuller, L. David Mech, and Jean Fitts Cochrane, “Wolf Population Dynamics,” 170.

30. H. Ansorge, et al., “Die Rückkehr der Wölfe. Das erste Jarhrzehnt,” *Biologie in unserer Zeit* 40, no. 4 (2010): 245, accessed March 14, 2020, doi:10.1002/biuz.201010425.

well as the names of cities like Wolfsburg and Wolfratshausen are common in Germany.[31] From the Middle Ages and beyond, as the human population multiplied and spread, they changed the landscape to build farms and towns and effectively altered what had been for thousands of years the wolf's habitat, eliminating some of the wolf's natural prey.[32] Wolves were the subject of fear for people in Europe for a long time, a fear and cultural history that was carried with European settlers and colonizers as they settled in America. As was the case in other places, in Germany more people meant more pets and farm animals, which meant more wolf attacks. In a time when many farmers had only a few animals, the death of even one could greatly hurt a farmer's livelihood.[33] The Brandenburg Landesamt für Umwelt (LfU) or state conservation office released a 152 page booklet in 2010 on wolves in the state. This booklet's intended audience was the average person living in Brandenburg seeking information about wolves, and covers everything from the general history of the wolf to how to tell a wolf from a Siberian Husky or German Shepard. The booklet states that the hatred for wolves among Germans in medieval times grew to fanatical levels. With the Christian context of the time, wolves became even symbolic enemies.[34] The wolf is referred to negatively in the Bible multiple times, including Matthew 7:15 which states, "Beware of false prophets, who come to you in sheep's clothing but inwardly are ravenous wolves." The wolf as a symbol for evil is seen especially in fairy tales like *The Little Red Riding Hood* which were hugely popular in Germany. In Germany there is even a name for traditional fears of the wolf, *Rotkäppchensyndrom* or *Little Red Riding Hood syndrome*.[35] Demonstrating that mistrust of the wolf lives on to today, in 1993 the minister of the environment in Brandenburg

31. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand,* ed. Jens-Uwe Schade, Gerd Schumann, and Achim Wersin-Sielaff (Potsdam: Brandenburg Ministerium für Umwelt, Gesundheit und Verbraucherschutz, 2010), 11, https://lfu.brandenburg.de/cms/media.php/lbm1.a.3310.de/woelfe.pdf.
32. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 11.
33. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 11.
34. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 12.
35. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 85.

felt obligated to make statement against *Rotkäppchensyndrom*, saying, "We will approach *Rotkäppchensyndrom* with clarity of facts and solid information."[36]

The fear and mistrust of the wolf led to intense hunting that became more efficient as time went on. Traps, poison, and regularly organized wolf hunts soon rid Germany of all of its wolves.[37] Poison is perhaps the most effective wolf killer, as all a hunter has to do is leave a piece of poisoned meat as bait and come back a few days later to pick up the body. Most hunting was done by farmers and average citizens.[38] Farmers still tend to have more negative views of wolves when compared to the views of non-farmers. Indeed the LfU booklet states that Germany only had 50 "wolf free" years, meaning years where no wolves were actively living in Germany, though some still wandered in and out from Poland.[39] Over the years before the wolf was protected, hunters who happened to shoot a lone wolf that wandered into Germany often claimed to have shot the "last wolf in Germany."[40] Coincidentally the last hold out for settled wolves in Germany was in the Muskauer Heide, the same area where the first reproducing wolf pack was seen back in Germany after its period of absence.[41] That first pack was seen in 2000, then in 2005 a second wolf pack was formed nearby, and then in 2006 a third. By 2010, the Lausitz area of Saxony had 6 wolf packs and one pair of wolves without pups living in it.[42] Before wolf numbers could rise in Germany in the early 2000s, however, wolves had to recover their numbers and spread west in Poland.

## The Polish Connection

Wolf numbers in Poland decreased in the same manner as wolf populations across all of Europe. Persecution by humans, wolf harvesting, and habitat destruction all played a role.

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36. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 85.
37. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 13-14
38. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 14.
39. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 19.
40. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 19.
41. H. Ansorge, et al., 245.
42. H. Ansorge, et al., 245.

As in Germany, Polish wolves had been hunted rigorously, though unlike Germany there were areas of Poland where wolves were never fully extirpated. While wolves were completely exterminated in the western part of the country, they managed to survive in in eastern Poland and in the Carpathian Mountains in the southeast.[43] Wolves also survived farther east in Belarus and Russia, which helped rejuvenate the Polish population. With the Polish wolf population nearing complete collapse, the Polish people began voicing concern and raising opposition to the hunting and trapping of the animal.[44] The Polish wolf advocates were successful and the poisoning of wolves was outlawed in 1973.[45] The 1970s were a time when awareness about human destruction of nature, and the imminent need to protect it were becoming evident to large numbers of people. Coupled with an interest in saving endangered carnivores, there was also a practical reason wolves were hunted less as Europe modernized. Luigi Boitani, a prominent wolf researcher from Italy, writes that after the 1950s the previously pastoral and rural economies of Europe changed, resulting in fewer livestock, the use of modern animal husbandry techniques, and mountain areas with poor soil becoming uneconomical.[46] This "eliminated the need to persecute the wolf in most of Europe…."[47] By 1975 the wolf was given the legal designation of huntable game. This watershed moment for the wolf established a hunting season, which barred hunters from hunting it outside of it, and which only allowed them to use guns.[48] Poison, trapping, and pup destruction were outlawed, all of which had been extremely effective in culling wolves in large numbers. Wolf numbers in Poland began to rebound in earnest.[49] In 1995, the wolf was completely protected in

43. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.
44. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.
45. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.
46. Luigi Boitani, "Wolf Conservation and Recovery," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 324.
47. Luigi Boitani, "Wolf Conservation and Recovery," 324.
48. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.
49. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.

western Poland, and in 1998 in the whole of Poland.[50] Wolves spread north and west, and importantly for Germany, into the forests in the northwest close to Saxony and Brandenburg. Wolves in Poland are very well monitored. The Polish Association for Nature WOLF (Stowarzyszenie dla Natury WILK) which monitors the wolf in Poland indicates, "In 2002–2012, the wolf population increased from several to approximately 140 wolves living in 30 family groups, with an annual rate of increase of 38%.[51] The area of permanent occurrence increased from 600 to 10,900 $km^2$, with an average density of 1.3 wolves/ 100 $km^2$."[52] Good monitoring of wolves on both sides of the German-Polish border has allowed scientists to accurately track the whole central European wolf population. Of course, to wolves, the Oder river separating northwest Poland and northeast Germany was only a river, a swimmable river. Just as Polish wolves continued to wander into Germany even while they were still being persecuted, so too did Canadian wolves wander in Minnesota.

Wolves traveled in and out of Germany from Poland through the 1980s and 1990s before the first reproducing pair were found, and at least 12 were shot and killed illegally between 1979 and 1991.[53] The wolf was legally protected in West Germany in 1980, although laws in each German state differed and some did allow for hunting.[54] As a part of the Deutsche Demokratische Republik (DDR), Brandenburg was still behind the iron curtain and did not have laws protecting the wolf until East and West Germany were unified in 1990 and "strict environmental protection laws" were implemented federally.[55]

In 1993, The Brandenburg Nature Authority created a wolf management plan in preparation for the inevitable appearance of wolves in Germany, it was shared with the nature

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50. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 31.
51. Stowarzyszenie dla Natury WILK, "Wolves in Western Poland," accessed March 14, 2020. https://www.polskiwilk.org.pl/en/wolf/wolves-in-western-poland.
52. Stowarzyszenie dla Natury WILK, "Wolves in Western Poland."
53. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 33.
54. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 33.
55. H. Ansorge, et al., 245.

authority in Saxony in 1996.[56] Among its many points were detailed financial compensation for wolf-killed livestock and an analysis of wolf acceptance levels among different public groups.[57] Years later the first wolf pair to settle in Germany and produce pups inhabited an active military training area in the Lausitz Muskauer Heide area of eastern Germany in 2000.[58] After that first pack, the next two wolf territories were also established in the Muskauer Heide, whose northern border just touches into the far southern border of Brandenburg.[59] By 2007, dispersing wolves started the second populated area outside of this initial area, though not yet in Brandenburg.[60] Researchers in Brandenburg knew it was only a matter of time before wolves from Saxony would make their way and settle into Brandenburg, and in the wake of the 1993 Wolf Management Plan, the "red carpet" was laid out for the wolves.[61] It remained fairly empty for some time, however.[62]

## The First Wolf Pack in Brandenburg

The first wolf pups seen in Brandenburg since the 19th century were observed in 2009.[63] They were found in the part of the Muskauer Heide that just reaches into Brandenburg. The wolves in the Muskauer Heide were producing pups every year, and between the years 2000 and 2009 an estimated 100 wolves were born.[64] Packs such as the "Welzow" pack which had 6 pups, and a pair of wolves named "Zschorno" lived farther east still in Saxony.[65] After the first pups in Brandenburg were found in 2009, the number of wolves in the state grew exponentially onward. By the 2018/2019 "wolf year" in Brandenburg there were 41 wolf packs, 8 pairs, and 154 wolf pups all living in 49 confirmed

56. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 39.
57. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 39.
58. H. Ansorge, et al., 245.
59. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 39.
60. I. Reinhardt, G. Kluth, C. Nowak, et al., 3.
61. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 41.
62. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 41.
63. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 59.
64. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 59-60.
65. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 60.

territories.[66] Data was meticulously collected and recorded by researchers and workers, all made accessible on the LfU website and the "Dokumentations und Beratungsstelle des Bundes zum Thema Wolf" (DBBW) online archive. New and old technology and wolf monitoring methods enabled collection of this data. Although it did not seem possible a few decades ago today in Brandenburg wolves are doing well and are expected to keep growing in number. It is illegal now to kill a wolf for any reason in Germany, though sometimes illegal killings do occur. One illegally killed wolf was found in 2007 and NABU (a large conservation organization in Germany) made a statement against illegal wolf killings, which rarely result in a conviction.[67]

**The Last Wolves in Minnesota (and their Revival)**

*Figure 2: A Minnesotan wolf at Voyageurs National Park. From the Voyageurs Wolf Project website. https://www.voyageurswolfproject.org/photos?lightbox=dataIte.*

Last Holdouts and Expansion

66. Landesamt für Umwelt Brandenburg, "Entwicklung des Wolfsbestands im Land Brandenburg," last modified June 10, 2020, https://lfu.brandenburg.de/info/wolf.

67. Naturschutzbund (NABU) Niedersachsen, "Null Toleranz für Wolfs-Wilderei: NABU verurteilt illegalen Abschuss des Wolfes im Ammerland," accessed March 14, 2020. https://niedersachsen.nabu.de/tiere-und-pflanzen/saeugetiere/wolf/getoetete/23248.html.

Before European settlers/ colonizers arrived in North America, native inhabitants respected and valued the wolf. The Ojibwe people who lived in what is today Minnesota viewed the wolf as a guide and a partner in life.[68] The wolf was hunted, though only in small number and never with the goal of complete extinction. European settlement brought with it many of the same prejudices against the wolf seen in Germany. While Minnesota may have had between 4,000 to 8,000 wolves at its height, in 1963 it was estimated that there were around 350 to 700 wolves still living in the state.[69] More European settlers, hunting, poisoning, and pup destruction aided by bounties and aerial hunting helped people kill wolves quickly and efficiently. Around 300 to 400 wolves per year were killed by people from 1945 and 1962 and then 190 per year after 1952, eradicating a full third of the wolf population per year.[70]

The year 1965 was the first turning point for the wolf in Minnesota. The bounty on wolves was removed, meaning hunters could no longer legally make money off of wolf pelts.[71] The $35 bounty per wolf pelt ($289 in today's dollars) provided a huge incentive to kill wolves. The bounty's removal meant wolf numbers would not decrease enormously per year.[72] This gave wolves who lived in the wilderness unreachable by humans--in places like the Superior National Forest and across the border in Canada--the chance to expand their borders. They spread throughout Minnesota and even began populations in Wisconsin and Michigan's upper peninsula over time.

The 1960s through to the 1980s were a time of new environmental movements and renewed interest in saving and preserving the environment. Rachel Carson's *Silent Spring*

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68. Charlie Rasmussen, "Culture, prophecy bind Ojibwe people and wolves," *Northern Wilds Magazine* (August 28, 2017), https://northernwilds.com/culture-prophecy-bind-ojibwe-people-wolves/.
69. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 15-16.
70. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 16.
71. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 16.
72. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 16.

was published in 1963, members of Greenpeace first set sail 1971, and importantly for the wolf, the first federal Endangered Species act was enacted in 1966.[73] Concern for the wolf had risen, and in 1967 under the 1966 federal act, the wolf in Minnesota was listed as endangered by the Minnesota DNR.[74] Wolves were still trapped and killed, but only by local conservation officers in approved trappings around farms, a measure that kept wolves in the forests and the more uninhabited parts of the state. Wolves were still killed illegally either on purpose or when accidentally caught in a trap meant for a coyote. In the late 1960s one wolf radio collared by L. D. Mech, a prominent wolf researcher in Minnesota, was killed illegally in the Superior National Forest and sold to a fur trader.[75] The fur trader claimed the wolf was killed on a farm but then forgot to remove the wolf's ear tags and was convicted.[76] Unlike Germany, whose smaller population of wolves is more adversely affected by illegal killings, Minnesota's larger population means a small number of illegal killings does not have an effect on the population as a whole.

While the federal Endangered Species Act of 1966 brought attention to endangered species, it did not force states to protect them. The 1973 Endangered Species Act brought full protection to wolves in the lower 48 states by 1974.[77] This full protection allowed the wolf to spread unfettered, and by the winter of 1997-1998 the Minnesota DNR estimated there were 2,500 wolves in Minnesota with their range expanding 4.5% each year.[78] This expansion of the wolves' range is what drives their numbers to increase.[79] By the late 1990s the wolf was nearing the date it would be delisted from the Federal Endangered Species Act, an act that would require a management plan for the animal.[80] In 1998, the Minnesota DNR held a series

73. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 17.
74. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 17.
75. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 18-19.
76. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 18-19.
77. Luigi Boitani, "Wolf Conservation and Recovery," 320.
78. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 23.
79. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 16.
80. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 27.

of public meetings to decide how to manage the wolf after delisting. This was followed by a meeting for specific interest groups such as wildlife conservation and hunting groups.[81] The plan that came from these meeting was never ratified by the state legislature, though in 2001 a plan was accepted and is currently on the Minnesota DNR website, and there are plans to update the wolf management plan in 2020.[82] In response to the wolf being delisted from endangered in Minnesota, the Minnesota DNR released a statement in 2019 saying, "Without expressing an opinion on the status of gray wolves outside its borders, the Minnesota DNR recognizes that the recovery of gray wolves in Minnesota has been an over fifty-year process requiring the commitment of extensive federal, state, and tribal resources."[83] The Minnesota DNR believes that the wolf has recolonized successfully all of the areas in the state that it should be allowed to. Effective methods for research are required to understand how successful a species like the wolf is recolonizing an area.

**Wolves, Researchers, and Attitudes**

*Figure 3: Dr. Ilka Reinhardt and Dr. Gesa Kluth holding up a radio telemetric receiver to track wolves. Sometime between 2000 and 2009. Found in the 152 informational booklet from Landesamt der Umwelt Brandenburg.*

81. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 27.
82. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 27.
83. Strommen, Sarah. *Re: Minnesota Department of Natural Resources Comments on the U.S. Fish and Wildlife Service's Proposed Rule…* Minnesota Department of Natural Resources, July 15, 2019, https://files.dnr.state.mn.us/fish_wildlife/wildlife/wolves/wolf_comments19.pdf.

*Figure 4: Dr. L. David Mech and a grad student hold up a radio telemetric receiver to look for wolves. Photo taken by Layne Kennedy for The Wolves of Minnesota: Howl in the Heartland page 47.*

## Technology

### *Minnesota*

New technology and cultural differences both played a role in the methods used to study the wolves in Minnesota and Brandenburg respectively. Before the 1960s extensive research was done by legendary researchers such as Sigurd Olson ,who did extensive research tracking wolves through the snow wearing snowshoes because these were some of the only ways to research wolves in the past.[84] Into the 1960s and beyond however, new methods for research, many of which revolutionized the field, were often first tried out on Minnesotan wolves. Milton H. Stenlund in the 1960s was one of the first researchers to use airplanes to research wolves and did so in Minnesota, where he was often flown by former wolf hunters.[85] Minnesota in the late 1960s was also on the cutting edge of using radio telemetry to track wolves. Radio telemetric collars are specially fitted collars with radio transmitters bolted on

84. L. David Mech, "Wolf Research in Minnesota," 38.
85. L. David Mech, "Wolf Research in Minnesota," 40.

to them, allowing researchers to pick up the signal on handheld receivers and locate a wolf's exact position.[86] In 1968 researchers first used radio telemetric collars on the wolves in northern Minnesota.[87] The use of radio telemetric collars was a breakthrough in the study of wolves as it gave researchers exact locations of packs whenever a researcher found the signal of a collar. In Minnesota, between 1968 and 2000, researcher L. D. Mech and his associates had already radio collared more than 600 wolves, and tried to keep at least a dozen wolf packs "radio-tagged (consistently) from year to year."[88] Later in the year 2007 Minnesotan researchers were also some of the first testers for GPS telemetric collars.[89] These collars were convenient as they sent data to devices as small as a phone, and allowed researchers to follow the daily movements of wolves.[90] This is more efficient than a radio collar which required researchers to pick up a signal on a handheld receiver from two separate locations, a task which could be difficult and at times impossible.[91] Radio collars could only pick up a signal from about a mile away on the ground, which made receivers mounted onto airplanes the only efficient option for researchers in Minnesota.[92]

Genetic studies, which were relatively new at the time, started to be done in large numbers on wolves in the 1990s. The book *Wolves: Behavior, Ecology, and Conservation* published in 2003 has a chapter on molecular studies in wolves. It says, "Beginning in the late 1980s, the advent of the polymerase chain reaction (PCR) technique, which allowed the enzymatic amplification of DNA, in combination with new DNA sequencing methods, made

86. L. David Mech, "Wolf Research in Minnesota," 42.
87. Robert R. Ream, "Minnesota Wolf Range: Past, Present, and Future," in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 29.
88. L. David Mech, "Wolf Research in Minnesota," 46.
89. Robert R. Ream, "Minnesota Wolf Range: Past, Present, and Future," 29.
90. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 61.
91. L. David Mech, "Wolf Research in Minnesota," 46.
92. L. David Mech, "Wolf Research in Minnesota," 46.

population- level sequencing studies feasible."[93] Almost every method available to study wolves was tried and tested in Minnesota. As a result, the population of wolves there became the most studied wolves in the world, and according to L. David Mech provided a training ground for many wolf biologists.[94]

*Brandenburg*

3 years before the first wolf pack settled in Brandenburg, Brandenburg's minister for the environment--together with the International Fund for Animal Welfare--set aside around 21,470 Euros for the purpose of better wolf monitoring and research in Brandenburg.[95] This was a huge step in establishing a strong base for research and monitoring. This allowed people like wolf expert Jens Teubner and his team to set up camera traps and other infrastructure for monitoring the wolves.[96] Wolves are difficult to track and the researchers in Brandenburg were well prepared and waiting before the first pack with pups in 2009 was discovered. The LfU booklet states that "the knowledge about the wolf in Brandenburg is like a puzzle."[97] Meaning that it takes information from many different methods and sources to put together a working picture or understanding of the wolves in Brandenburg.

Researchers Dr. Ilka Reinhardt and Gesa Kluth have done possibly the most research on the German wolves while working at the LUPUS institute for wolf monitoring and research in Germany. Dr. Reinhardt wrote in email correspondence to me that German wolf researchers use a combination of old and new methods to research the wolves.[98] German wolf researchers also use radio and GPS telemetric collars on wolves. In 2009, three German wolves were fitted with a GPS collar, the first three wolves ever to be fitted with GPS collars

93. Robert K. Wayne and Carles Vilà, "Molecular Genetic Studies of Wolves," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 219.
94. L. David Mech, "Wolf Research in Minnesota," 47-49.
95. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 54.
96. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 54.
97. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 55.
98. Ilka Reinhardt, email message to author, June 2, 2020.

in Germany.[99] This is where wolf monitoring in Minnesota and Germany differ sharply however, there is far less collaring of wolves in Germany then in Minnesota. Dr. Reinhardt said that GPS collaring is not done in large numbers as it is very difficult to capture wolves and animal welfare regulations in Germany are very strict.[100]

The basis for monitoring the wolves in Germany is a presence sign survey, combined with camera traps and genetic analysis. The presence sign survey consists mostly of finding wolf scats.[101] When a wolf researcher finds a scat they can analyze it to check the wolf's diet, set up a camera trap in the area to take pictures, and even analyze the wolf's genes.[102] Dr. Gesa Kluth added that looking for tracks, scats, and kills along with an expertise in tracking actual tracks in sand or snow are methods often used.[103] Wildlife detection dogs are also used, which can pick up a wolf's scent from their urine or scats among other things.[104] I have not seen mention of wildlife detection dogs in Minnesotan wolf research.

Animal welfare and wolf trapping and collaring suggests a cultural difference between the methods of study on the wolves in Germany versus in Minnesota. Perhaps, the history of the wolf as a "pest" in Minnesota, along with the fact that there was never a period when there were no wolves at all, have resulted in softer views towards trapping and collaring and its relationship to animal welfare. In northern Minnesota trapping and hunting animals was a way of life for a very long time, people may have gotten used to the idea of wolves being trapped in the wild. Minnesotan researchers on social media and in articles often point out that the collaring of wolves is done in a humane way, though animal welfare is a concept that can be interpreted differently across cultures. There were no wolf packs living in Germany

99. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 61.
100. Ilka Reinhardt, email message to author, June 2, 2020.
101. Ilka Reinhardt, email message to author, June 2, 2020.
102. Gesa Kluth, email message to author, June 9, 2020.
103. Gesa Kluth, email message to author, June 9, 2020.
104. Gesa Kluth, email message to author, June 9, 2020.

for many decades, and in this time animal welfare and environmental protection movements gained large followings. The movement grew during a time when there were no wolves living in Germany, meaning that wolves were not a constant issue or threat in the minds of these Germans. When the wolves finally returned they came into a culture that held animal welfare in high regard, even the welfare of wild carnivores. My own experience supports the claim that animal welfare regulations are strong in Germany, as I spent 6 months living in Munich, Germany and the rules for both volunteering and adopting animals from a shelter were both stricter than they are in America. The Deutscher Tierschutzbund or German Animal Welfare League has a page on their website on wolves and how they are committed to making sure they are treated humanely as they recolonize Germany.[105]

## Climate Change

Climate change has affected the methods used to monitor wolves. One of the only early methods for wolf research, snow tracking, is still used by Minnesotan researchers today. In contrast, as Dr. Reinhardt informed me, because of lack of snow in the last years, tracking by snow prints in Germany has not been feasible.[106] This concurs with Peterson and Ciucci who wrote that, in locations with no snow, there is a heavy reliance on scat studies.[107] Wolves have been able to survive in forests because they are one of the only places where it is still possible for them to avoid humans. Prior to dense settlement by humans, in places like Minnesota wolves used to live quite happily on long-grass prairie. Further research into how climate change affects research methods would be interesting. I expect climate change will have a profound effect on what methods are used to study wolves in the future.

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105. Deutscher Tierschutzbund, "Wölfe," accessed March 14, 2020. https://www.tierschutzbund.de/information/hintergrund/artenschutz/woelfe/.

106. Ilka Reinhardt, email message to author, June 2, 2020.

107. Rolf O. Peterson and Paolo Ciucci, "The Wolf as a Carnivore," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 104.

Genetic analysis has also been helpful in discovering the genetic makeup of the different European wolf populations. Through genetic analysis, researchers were able to find out that Central Poland is a melting pot for wolves in surrounding areas such as the Baltics and Belarus.[108] They also found that the western Polish population that created the German wolf population is a genetically distinct unit separate from the Baltic wolf population.[109] The German and Polish population together belong to the Central European wolf population.[110] A population that survives on wild ungulates.

## Diet

Understanding the diet of wolves helps separate fact from fiction and dispel many myths that villainize the wolf. By percent of biomass, the mass of the animal's meat or material used for energy by a wolf, German wolves eat mostly roe deer (Reh in German), which make up a staggering 54.0 percent of their consumed biomass. The Roe Deer is followed by the larger red deer (Rothirsch) at about 22.0 percent of their biomass, closely followed by wild pigs (Wildschwein) at 18.0 percent.[111] German wolves also eat small mammals like mice and rabbits, which comprise a very small percentage of their overall biomass eaten. Only 0.6 percent of a German wolf's diet is pets and farm animals.[112] Researchers in Brandenburg have concluded that German wolves are just like their European neighbors and their American cousins: their diet is dominated by ungulates.[113] They also found by looking at neighboring Polish wolves, that wolves prefer to eat generally the largest ungulate prey species in the location they live in.[114]

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108. M. Szewczyk, et al., "Dynamic range expansion leads to establishment of a new, genetically distinct wolf population in Central Europe," *Scientific Reports* 9, no. 19003 (2019): 1, https://doi.org/10.1038/s41598-019-55273-w.
109. M. Szewczyk, et al., 1.
110. M. Szewczyk, et al., 1.
111. H. Ansorge, et al., 248.
112. H. Ansorge, et al., 248.
113. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 247.
114. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 247.

In the late 1990s and early 2000s about 95% of Minnesotan wolves' prey was deer, though this percentage fluctuates.[115] In 1989 the wolves of Minnesota moved from a 90% reliance on deer in the winter to only 68% in the summer, when beaver and rabbits become more important prey and deer are in their prime physicality.[116] In the winter Moose become an especially important source of food for the wolves, as the deer herds move farther south in the state where it is warmer and there is less deep snow.[117] Wolves target animals that are weak, often targeting the especially old or especially young, or sick.[118] German wolves do not have any truly large prey like moose or elk available to them.

Setting/ Location/ Expansion of Territory/ Dispersal

According to a 2015 paper on the monitoring of wolves, lynx, and bear in Germany, the German wolf population belongs to the Central-European-Plains wolf population.[119] This Central-European-Plains population is a melting pot for wolves from all over central Europe, similar to how Minnesota is a melting pot for wolves that live around the Great Lakes and wolves coming from Canada. The Minnesotan wolf used to be considered its own unique sub-species of wolf, the Timber wolf, though in 2000 it was designated as a Great-Plains wolf which still stands today.[120] Wolves in Germany spread in a way that is distinct from the way Minnesotan wolves spread, which is due to the specific way humans have altered the land they are dispersing into. Wolves in Germany travel from "islands" of protected forests and military training areas, crossing through densely populated areas to get there (see the

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115. L. David Mech, "Minnesota Wolf Predation," In *The Wolves of Minnesota: Howl in the Heartland*, in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 83.

116. Rolf O. Peterson and Paolo Ciucci, "The Wolf as a Carnivore," in *Wolves: Behavior, Ecology, and Conservation*, ed. L. David Mech and Luigi Boitani (Chicago, Illinois: The University of Chicago Press, 2006), 111. Data taken from a study by Fuller in 1989.

117. L. David Mech, "Minnesota Wolf Predation," 85.

118. H. Ansorge, et al., 248.

119. R., Ilka, Kaczensky, P., Knauer, F., Rauer, G., et al., *Monitoring von Wolf, Luchs und Bär in Deutschland*, (Bonn, Germany: Bundesamt für Naturschutz, 2015), 4.

120. L. David Mech, "The Minnesota Wolf," in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 51.

population density map, figure 5).[121] Their use of military bases might be a product of there being less human related mortality of wolves there versus other nature areas.[122] Wolves living on military bases have a smaller chance of crossing a road and being hit by a car, which are a constant threat for wolves living in more populated regions. Of the states in Germany with wolves, Brandenburg has the highest number of wolves found dead, 176 wolves were found between 1990-2020 in Brandenburg followed by 112 in Saxony and 88 in Lower Saxony.[123] Since 1990 75.5% of all dead wolves found in Germany were caused by road accidents.[124] Figure 2 shows the most up to date map of where each recorded wolf pack and pair are in Germany, when comparing that to the human population density map it is easy to see how closely wolves and humans live in Germany, and why they might feel more comfortable in a military training area where there is less foot and road traffic. Minnesota did not keep data on exactly how many wolves were killed in car accidents over the 30 year period I cover, though I hypothesize it is less than in Brandenburg.

In Germany joggers and people walking their dog will run into wolves.[125] This contrasts sharply to Minnesota where in the 1990s most wolves lived in counties with only 1-12 people living in them, with the edge of their range just touching the counties surrounding the Twin Cities.[126] It would have been extremely unlikely for a person to see a wolf at that time if that person were out hiking or driving. In 1981 wolves only inhabited around 1% of

121. I. Reinhardt, G. Kluth, C. Nowak, et al., 3.

122. I. Reinhardt, G. Kluth, C. Nowak, et al., 5.

123. Dokumentations- und Beratungsstelle des Bundes zum Thema Wolf, "Totfunde von Wölfen – Zusammenfassung nach Bundesländern," last modified August 12, 2020, https://dbb-wolf.de/totfunde/totfunde-nach-bundeslaendern.

124. Dokumentations- und Beratungsstelle des Bundes zum Thema Wolf, "Totfunde von Wölfen – Statistik der Todesursachen," last modified August 12, 2020, https://dbb-wolf.de/totfunde/statistik-der-todesursachen.

125. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 61.

126. Stephen H. Fritts, "Wolf Management in Minnesota," in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 92.

their historic range in the lower 48 states, with most of that 1% being northern Minnesota.[127] When wolves did start to repopulate the more human dense areas of Minnesota they ran into the same problems the German wolves did. L. David Mech said that as the wolves repopulated areas they used to live in, especially farther south outside of the state's wilderness areas, "bison and elk were supplanted by cattle and sheep. Wagon trails became highways, and sparse farmsteads multiplied by orders of magnitude."[128] The landscape of a hundred years before had become dense with people and infrastructure made by people. The prairie with its bison was gone, there were fewer forests, and with farmers protecting their cattle there were more dangers from humans.

Minnesotan forests and Brandenburg forests vary not only in prey types, but also in size and who owns or manages them. The Beltrami Island State Forest where wolf 5121 lived in was 2,700 $km^2$ in 1981.[129] It supported a high prey density and was managed by shared ownership. Most of the forest was state owned as part of the Red Lake Wildlife Management Area, though some parts of the forest were also owned by the Red Lake Indian Tribe as reservation land.[130] The forest was bordered on 3 sides by farms.[131] In comparison, the combined territory of all of the 40-60 wolves living in Germany in 2010 was around 2500 $km^2$.[132] German wolves have considerably less land to live on. The plots of German land also tend to be owned by only 1 entity, such as the state of Brandenburg or the military.

## People and Wolves

The primary goals of most wolf advocacy movements are in line with what the Minnesota DNR stated as their mission with the wolf back in 1998: "The Minnesota

127. Steven H. Fritts and L. David Mech, "Dynamics, Movements, and Feeding Ecology of a Newly Protected Wolf Population in Northwestern Minnesota," 6.
128. Robert R. Ream, 34.
129. Steven H. Fritts and L. David Mech, 6-7.
130. Steven H. Fritts and L. David Mech, 6-7.
131. Steven H. Fritts and L. David Mech, 6.
132. H. Ansorge, et al., 245.

Department of Natural Resources is committed to ensuring the long-term survival of the wolf [in Minnesota], and also to resolving conflicts between wolves and humans."[133] Keeping conflicts to a minimum between wolves and humans keeps both groups safer. By this point, wolves in Minnesota had expanded their range so far south into the middle of Minnesota that in 1997 a pair "inhabited the Elk River area just northwest of the Twin Cities [Minneapolis and Saint Paul]."[134] Wolves also live near big cities in Brandenburg, as can be seen by the two wolf packs living just southeast of Berlin on the map for the 2018/19 season released by Brandenburg's LfU, a map that is updated yearly with information on new packs and their location (See the map on page 33).

Minnesotan wolves had expanded their range back into the forests of the state and even made it down to near the Twin Cities, while thousands of miles away in central Europe that process was just beginning. Belarusian wolves and Polish wolves were making their way west from their last European holdout locations in the east and in the Carpathian Mountains. The old hatred for wolves in both Minnesota and Germany had diminished, and the modern environmental movement blossomed in the 1980s, as ordinary citizens became spokespeople for the wolves that had been hunted to near extermination.

Unlike in Saxony where bad press coverage in the 1990s of a wolf that had attacked livestock stoked fear and anger, a wolf in Brandenburg would become famous and capture the hearts of many.[135] This wolf stoked sympathy in people that otherwise might not have cared about the returning wolves, or at least had a more negative opinion about them. This wolf was named Naum and had only three legs, the fourth having been lost in an illegal trap.[136] He was

133. Minnesota Department of Natural Resources Division of Wildlife, "Minnesota Wolf Management Plan," in consultation with the Minnesota Department of Agriculture (Febraury 2001), 9. https://www.dnr.state.mn.us/mammals/wolves/mgmt.html.

134. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 23.

135. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 45.

136. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 45.

seen by someone walking their dog in January of 2000, and became a public sensation.[137] He was drugged and first transported to a Zoological garden, where he then seemed to be acting depressed and so was moved to a nature preserve that gave Naum a larger home that was more remote.[138] Naum elicited sympathy for wolves from the German people, though it has been a constant battle between the old fears of the wolf and accurate information. Several outreach and information campaigns have been created to dispel the old fears of the wolf that come with *Rotkäppchensyndrom*.

The wolf booklet released by LfU Brandenburg contains a section directed at *Rotkäppchensyndrom* and overcoming the "old primal fears" of the people towards wolves.[139] It explains that in 2002 a cooperative study between 18 different countries showed that the chance of a wolf attack on a human in North America and Europe was close to zero.[140] The booklet spends many of its pages dispelling old myths and fears of the wolf, and this tactic has been effective. This use of facts and information to support more positive attitudes towards wolves is supported by resent research done in Germany. Like in Minnesota, researchers in Germany found that "people with higher knowledge about wolves, feeling well informed and getting information from books and films, were more tolerant towards wolves."[141] In comparisons between people living in wolf regions and people living in greater Germany, people in the wolf region were found to be more knowledgeable about the wolf and to have more neutral attitudes towards them when compared to people in greater Germany.[142] The source of the information matters as well, with information coming from books and wolf information centers leading to more positive views on wolves than TV

137. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 45.
138. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 47.
139. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 85.
140. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 86.
141. Ugo Arbieu, et al., "Attitudes towards returning wolves (*Canis lupus*) in Germany: Exposure, information sources and trust matter," *Biological Conservation*, no. 234 (2019): 205, accessed March 14, 2020, https://doi-org/10.1016/j.biocon.2019.03.027.
142. Ugo Arbieu, et al., 205.

news.[143] Part of the reason LfU Brandenburg released their wolf information booklet was to chip away at the years-old image of the wolf as a villain in German culture, to fight misinformation and myth with hard facts.

In Minnesota the International Wolf Center plays the role of Information distributer. It was set up with the same idea in mind that a more informed public would be more tolerant of wolves. This meant reaching out to different competing groups of people. Farmers, northerners, and non-northerners all had differing opinions on the wolf according to a survey done in 1999. For example, farmers tended to be more knowledgeable about wolves then non-farmers, more farmers, 70%, answered that wolves should not be allowed to spread throughout Minnesota in a survey done in 1999.[144] Non-northerners were less for the hunting and trapping of wolves then northerners and farmers, however even the group with the most negative answers towards hunting, non-northerners, still answered 46% yes on the question "If Minnesota wolves are abundant and well managed, should people be allowed to hunt or trap them?"[145] In Germany there would be less people who would agree that the wolf should be allowed to be hunted even if it were well managed and abundant. The status of the wolf in Minnesota and Germany was very different at the times these attitude surveys were conducted. In Minnesota at the time of the attitude survey (1999) wolf numbers had already surpassed the stated goal of 1,250 wolves, whereas in Germany the wolf is still in smaller numbers.[146] Perhaps living in a state where wolves number in the thousands versus in a state where wolves number only in the hundreds has an effect on attitudes. In the end, attitudes

143. Ugo Arbieu, et al., 205.

144. L. David Mech, "Attitudes of Minnesotans About Wolves," in *The Wolves of Minnesota: Howl in the Heartland*, edited by L. David Mech (Stillwater, Minnesota: Voyageur Press, Inc, 2000), 102-103. Data from a survey done in 1999 from Dr. Stephen R. Kellert.

145. L. David Mech, "Attitudes of Minnesotans About Wolves," in *The Wolves of Minnesota: Howl in the Heartland*, 103. Data from a survey done in 1999 from Dr. Stephen R. Kellert.

146. L. David Mech, "Historical Overview of Minnesota Wolf Recovery," 27.

towards the wolf are more positive today than they were in the times when they were persecuted, a trend that may continue.

## Conclusions

Wolves are adaptable animals. In this study, we see it was not so much the difference in time that changed the methods used to study the wolves, but rather differences in culture and location. Lack of snow and views on animal welfare played a larger role in Germany then new technology such as GPS collars, though they were still used. This supports the fact that international cooperation is beneficial to the study of an animal. Comparing both populations of wolves also demonstrates how quickly wolves can repopulate an area, whether or not it is densely populated with people. The wolves surprised both the Minnesotans and the Germans with how fast they were able to recolonize. Minnesota went through different grades of protection as the wolf came back while the Germans always had a no kill policy on them, though both populations came back fast and strong compared to what people believed was possible. The wolf was systematically hunted in Germany and Minnesota for many years into the mid-20th Century. In the late 20th century and the early 21st century wolves then became perhaps the most important posterchild for the fight to bring back wildlife and wildness to America and Germany. In the end it was outcries from people that convinced lawmakers to protect wolves with legislation, though there are numerous perspectives on how the wolf should repopulate its range.

Wolf numbers worldwide are on the increase. Germany itself has wolves in the east, but wolves from the French/ Italian population in the southwest and the Balkans population in the southeast also have the potential to expand into Germany.[147] The wolf's position is far from safe however as climate change and other factors make every wild animal's life on earth

147. *Wölfe in Brandenburg- Eine Spurensuche im märkischen Sand*, 30.

precarious. Worldwide cooperation on wolf research and conservation exists with symposiums planned in both America and Scandinavia in the near future. Organizations such as the International Wolf Center located in Ely Minnesota and the DBBW and the LUPUS Lausitz center in Germany will need to continue to monitor wolf populations.

As the author of this paper I have learned that there is much more to learn about the wolf. Further avenues into wolf research I would like to follow are a more detailed look into how the country of origin of a study effects that study, how different sources of information affect the attitudes of those consuming the information towards wolves, and a more detailed look into the relationship of a wolf pairing. I've learned how time, culture, and location can have a huge effect on an animals' ability to recolonize a place. This project is relevant to today because wolf conservation is an everyday job. There is also more research that can and should be done with the wolf. In the future as I apply to Veterinary Universities, I will pursue research opportunities with wildlife, and wolves will be on the top of my list of animals to study. I also live in a state that has a sizable wolf population, Michigan. The possible reintroduction of wolves into the Lower Peninsula of Michigan will surely be a contentious event. Comparing wolves from different parts of the world helps us understand the different roads we can take to protect the wolf, and how have better relationship with it as a species as it expands its range.

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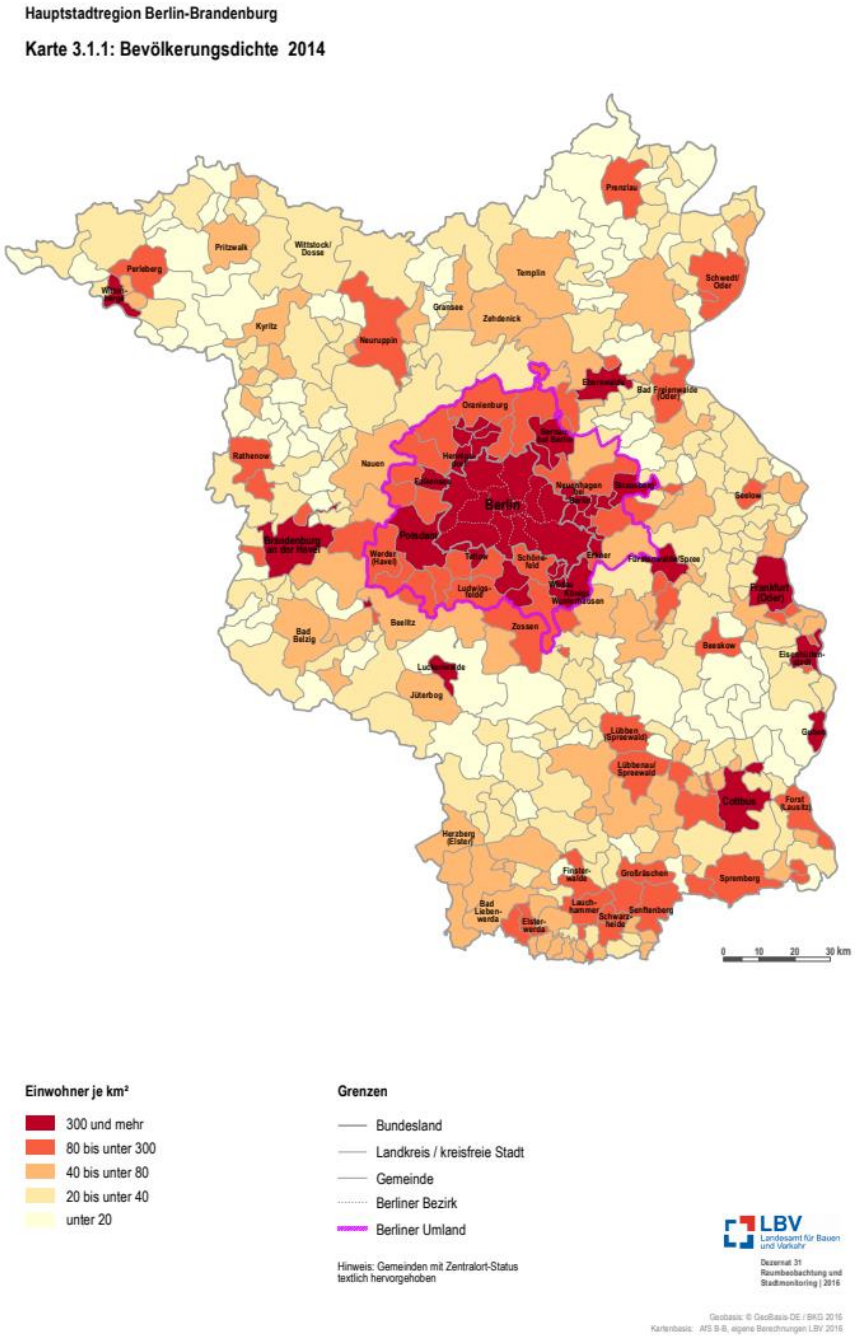


*Figure 5: Population density map of Brandenburg in 2014. The darker red indicates a more densely populated area. From the Brandenburg Landesamt für Bauen und Verkehr website. https://lbv.brandenburg.de/dateien/stadt_wohnen/RSET_Kapitel_3_Flaechennutzung_Bauen_Wohnen.pdf.*

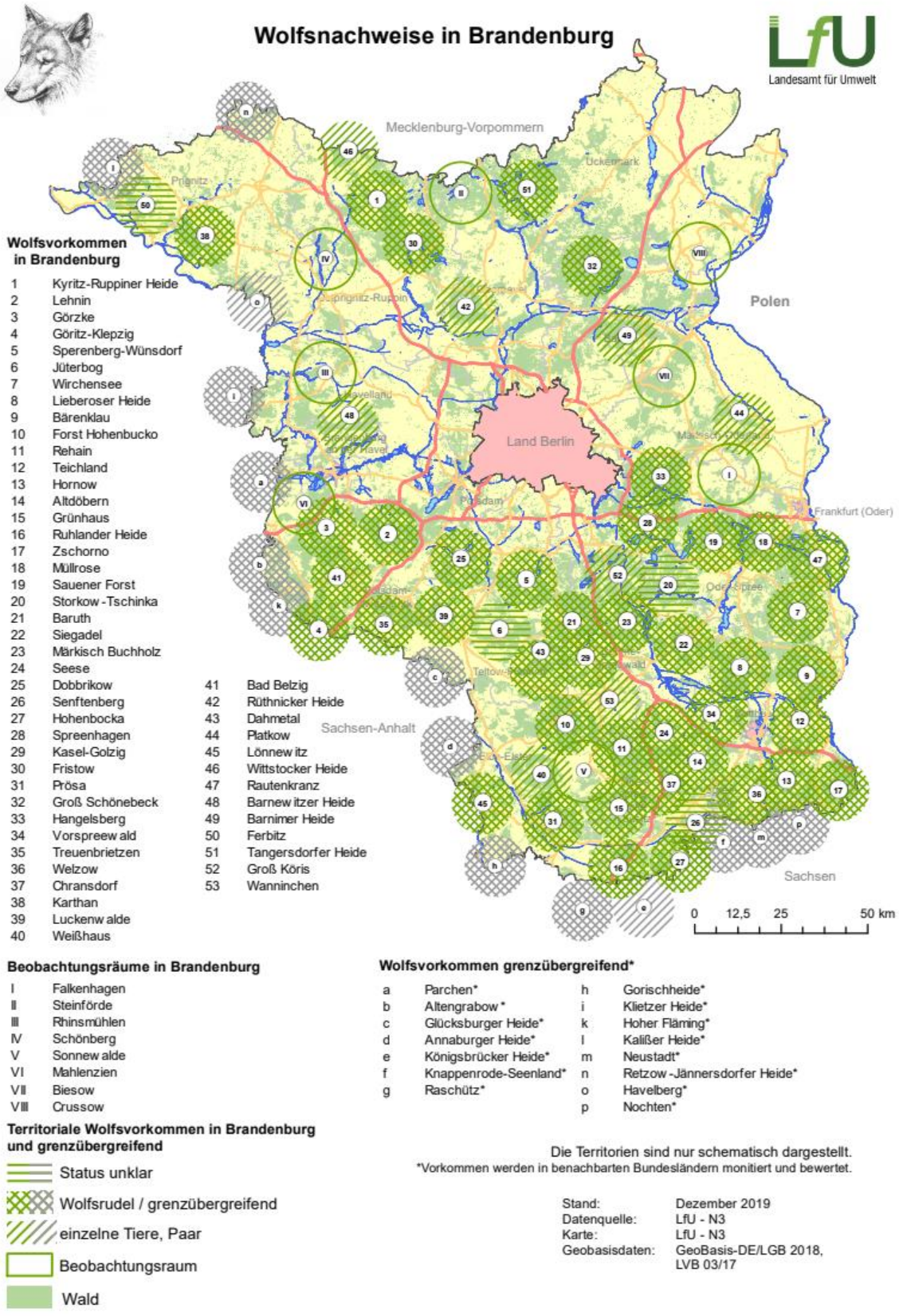


*Figure 6: The most recent map of wolf packs, pairs, and individuals in Brandenburg. From the Brandenburg Landesampt für Umwelt website, new maps are released yearly. They can be found here: https://lfu.brandenburg.de/info/wolf.*

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