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Because of human-wildlife conflicts, wolves (Canis lupus) were hunted nearly to extinction in North America and Europe during the 20th century. Other factors like habitat loss and increasing human populations have created hurdles for wolf conservation and recovery. However, in the last decade, the wolf population has increased in Europe. To create effective management strategies, wolf-human interactions must be addressed and understood. Throughout different countries in Europe and states in the U.S., governments, and citizens have different opinions on what they would like their wolf-human interactions to look like. Although human populations are denser and closer in proximity in Europe, wolf populations are now double what they are in the U.S. Since wolf populations hit a minimum in Europe, there has been a positive shift in the societal perceptions of wolves, which has allowed their populations to persevere and remain protected.

Wolves are one of the most important apex predators in ecosystems. They play a major role in keeping ecosystems healthy and deer and elk populations under control (Landry et al. 2021). Carcasses left by wolves also play a role in nutrient recycling and provide food for other carnivores. Many primary producers are now able to thrive in the national parks where wolves are present because of the reduction in deer and elk populations. In Wisconsin, some plant communities in wolf pack territories show greater species richness (Callan et al. 2013). Wolves are highly territorial and have direct and indirect defensive strategies that minimize encounters with adjacent packs (San Diego Zoo Wildlife Alliance Library, 2022). Direct encounters with other packs or threats like humans, often result in aggressive behavior like chases, injuries, and death (San Diego Zoo Wildlife Alliance Library, 2022). Territory shifts are seen in exploited populations (e.g., areas with wolf-human interactions), which cause territories to shift as neighboring wolves will move to territories abandoned or vacant by a previous pack (National Park Service, 2021). As wolf populations rise and wolves are reintroduced to old territories across the world, understanding wolf behavioral ecology will become increasingly significant as wolf-human interactions become more common.

Although there has been an increase in wolf populations in Europe and North America, populations have had more success in Europe. Numbers in the wolf population in Europe have surpassed North American populations even with higher human density and less protected areas. Therefore, the greater population of wolves in Europe is caused by the differences in perceptions across countries in Europe and the states in the U.S. as well as the overall higher percentage of private land in the U.S. in Europe.

In North America, wolves have been hunted for hundreds of years but were not always unsustainable. Before Europeans arrived, Native Americans included wolves in their stories and rituals, depicting them as “ferocious warriors in some traditions and thieving spirits in others” (PBS 2008). The persecution and fear that Europeans had against wolves were brought with them when they emigrated to the U.S. Attitudes like John James Audubon, a famous artist and naturalist, illustrated wolves as being aggressive and needing to be abolished because of the threat they are to livestock (Audubon 2022). This outlook on wolves fostered an eradication plan that nearly hunted the gray wolf to extinction in the U.S. by the middle of the twentieth century. As the New World developed and agriculture spread across the eastern U.S., the wolf-human interaction became more frequent. Humans became dependent on livestock like cattle and sheep as food and transportation sources, which were also easy targets for hungry wolves. Between folklore and physical violence, colonists began a fate for wolves that would continue for hundreds of years.

As modern infrastructure expands across our world, the habitat for wolves has drastically decreased. However, despite the rapid increase in urbanization, wolves have made a comeback not only in Europe but also across North America. In Europe, there are around 17,000 wolves whilst 15,000 wolves are across North America (Hall 2022). As wolves have increased across both continents, so have wolf-human interactions. Things like electric fences and guard dogs have protected livestock from predation. However, existing social tensions continue to impact the negative perceptions that accompany wolf existence (de Wolf 2021). In countries in Europe and North America, attitudes are different across groups like hunters, livestock farmers, and conservationists, so wolf-human management approaches alone cannot be the only solution without analyzing the operators of the social conflict among participants. As humans have begun to play the role of the “super predators” of big game, wolf-human conflicts must be addressed.

Attitudes towards wolves across the two continents vary. In the Netherlands, wolf preferences are split. According to the country’s Ministry of Agriculture, Nature, and Food Quality shows that 54% of Dutch respondents think that the wolf deserves a presence in the Netherlands and 76% do not see the wolf as a threat to the country’s citizens (Ministerie van Algemene Zaken 2021). Conflicts between livestock farmers and wolves have begun to be managed by subsidies like the installation of electric fencing but these are not available everywhere and can only be installed on wolf territory. The wolf has become the center of social/political issues rather than a wolf-human interaction conflict. Despite extensive wolf habitat and compensation for farmers that lose livestock to wolf predation, wolf-human conflicts within communities should be focused on first. Dedicated conflict management measures have been created in Romania to prevent wolf damage (de Wolf 2021). Sheep are protected either by a sheepdog or electrical fencing. Romanians have co-existed with wolves for centuries. However, “during the Communist era, the animal was portrayed as the 'enemy of the people' and was hunted and poisoned as part of a significant campaign to eradicate wolves” (de Wolf 2021). Even though the wolf became a protected species in the early 1990s, the ban prohibiting wolf hunting wasn’t created until 2016 (de Wolf 2021). Over 17% of the European wolf population is in Romania because of people’s tolerance and attitudes (Euronatur 2021).

In the U.S., wolves have been demonized for centuries. Their persecution brought them nearly to extinction. The historic range of the gray wolf in the U.S. covered over two-thirds of its land. Currently, their populations are in Alaska, Michigan, Wisconsin, Montana, Idaho, Oregon, Wyoming, Arizona, New Mexico, and North Carolina (National Wildlife Federation 2022). The 1973 Endangered Species Act (ESA) increased the number of gray wolves to about 7,500 as of 2020. Since then, the wolf population has expanded tremendously. In early 2021, the U.S. Department of Fish and Wildlife delisted gray wolves from the ESA, which stripped them of federal protection and left management up to each state (U.S. Fish and Wildlife Service, 2021). Even though people’s attitudes towards wolves have steadily become more positive, there is still historical resentment that will require much more time to change. The introduction of wolves to multiple national parks in the western U.S., as well as education, has had a positive impact on American societal perceptions. In 2012, the Wisconsin Department of Natural Resources created a wolf hunting and trapping season, permitting the public harvest of wolves (Hogberg et al. 2016). The main goals of this program were to reduce the wolf population within the state by 350 individuals. In 2013, more than half of respondents in a Wisconsin poll state-wide agreed that “killing wolves is the only way to stop them from threatening farm animals and pets”. Therefore, even if attitudes towards wolves have evolved from what they used to be, people in the U.S. still view wolves as a species that should be contained.

One reason that the population numbers differ in Europe and the U.S. may be because of societal perceptions of wolves. In Europe, people are generally more supportive of wildlife than in the U.S. A survey conducted in Germany analyzing people’s attitudes towards returning wolves suggests that there is a predominance of positive attitudes toward recolonizing wolves (Arbieu et al. 2019). This finding was like similar polls conducted in Italy and Croatia (Glikman et al. 2011). The trends across these polls show that attitudes towards wolves are more neutral or positive in rural areas. It was shown that there was a difference in attitudes between people who lived in wolf country and the people who lived in other areas across the country. Neutral attitudes may be seen as a step towards coexistence in the future. The German poll also showed that direct exposure to wolves did not influence people’s perceptions of wolves. The results of this poll conclude that relationships between humans and wolves are ever-changing and context specific. Things like culture and regional differences are among the factors that change the way people view apex predators. Citizens can push back on policies reintroducing wolves back into their country or state, or it can also cause people to hunt and kill wolves themselves.

In the U.S., people’s perceptions of wolves are mostly negative. Anthropogenic mortality is the biggest threat to the survival of the red and gray wolf populations (Agan et al. 2021). Like the study in Germany (Arbieu et al. 2019), people who live in a less urban environment are more prone to being supportive of wolves being reintroduced to their regions. In a 2008 study on wildlife attitudes in the U.S., 70.8% of Coloradoans living in urban areas said ‘yes’ to the reintroduction of wolves in their state (Manfredo 2008). However, people surveyed in Wisconsin seem more hesitant to increase the wolf population within their local areas (Manfredo 2008). Research has shown that perceptions of wolves in Wisconsin have changed from positive to negative over the last few years (Browne-Nuñez et al. 2015). After this switch in public perception, wolf killings began increasing rapidly. In this study, people claimed that they would kill wolves if they “came too close to my home” and “did not run away from me when I was on foot” (Browne-Nuñez et al. 2015). Some respondents said that they would be against wolf killing because it’s against the law or because they would be fined. People that live in places with more public land may have a different interaction with wolves than in more densely populated states. Although Europe has higher human densities, wolves may also be more accustomed to humans because of a long history of higher human density in Europe. Almost 15,000 years ago wolves encountered humans for the first time. Wolves slowly learned that their proximity to humans could benefit them by the way of scavenging for food instead of hunting (Foden 2017). Even when wolves were decimated across Europe, they still had more time to adapt to human presence than in the U.S. due to a long history of developed communities (O. Couriot pers. Comm. 2022). Because of such negative views of wolves within agriculture-oriented states in the U.S., could be a factor in reducing their populations to less than the wolf populations in Europe.

Another factor that can potentially influence the difference in wolf populations in the U.S. and Europe is because of the differences in land ownership. In the U.S. about 60.2% of the land is privately owned (Vivid Maps 2021). As of 2019, 60% of Europe is private land ownership (Tabas 2019). It’s estimated that there is 82% privately owned land in Wisconsin, 78% in Michigan, and 57% in Colorado (Rasker 2019). These are states with wolf packs. The greater amount of private land ownership in the U.S. could influence the wolf population. Private land implies that there are no wildlife rangers to monitor wolf hunters or killings. Without rangers on private land, people may be illegally hunting or poaching wolves without documentation. In Poland, illegal killings have increased compared to previous years (Nowak et al. 2021). In E.U. countries with less private land ownership like Poland, Romania, and Sweden, wolf populations have increased within the last decade (Henley, 2022). However, in places like the U.S. and the U.K. with higher private land ownership, wolf numbers are not increasing as quickly. Less public land can also indicate that there will be more wolf-human encounters. The higher chances of wolf-human interactions can promote fear in local communities, causing people to demand management (Carricondo-Sanchez et al. 2020). In a study conducted in Belovezhskaya Pushcha National Park in Belarus, wolves preferred areas of higher levels of protection like the core area of the park rather than border areas and outside of the park (Smith et al. 2022). Other zones within the park included tourism activities which proved to be a disturbance to the wolves. The results of this study proved that wolves optimize their territories to avoid human interaction and disturbance, and that wolves become more active when humans are inactive. To reduce violent wolf-human interactions, lower disturbance areas are significant for wolf populations to thrive (Smith et al. 2022). To accomplish this, limiting excessive development and allocation of more protected wildlife areas could lead to an age of coexistence between wolves and humans. Since studies have shown human avoidance as the strongest wolf preference (Carricondo-Sanchez et al. 2020), it should be considered when creating wolf management strategies.

Overall, anthropogenic mortality is the largest threat to wolf populations. Because of their large territories and ability to move over long distances, they will intersect human economic and social interests. Fortunately, management strategies have been created to support coexistence further. Without humans encouraging their growth, it is nearly impossible for their populations to thrive because of oppression by humans and habitat destruction. Without stable wolf populations, deer and elk numbers will continue to rise as they have no other natural predators. To increase wolf populations, it is essential to increase protected public land spaces and educate people on the benefits of wolves. Education is the most valuable tool in conservation and will become increasingly important as resources are dwindling and the effects of climate change are becoming more apparent.

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