

*What can we learn from past wolf reintroduction's ecological, social  
and economic impacts in order to improve the process for the  
Proposition 114 Colorado reintroduction?*

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**Abstract**

This paper will look at previous wolf studies and reintroductions and examine the ecological, social/political, and economic impacts of those previous programs, and compare those outcomes with the proposed Colorado Proposition 114: Reintroduction and Management of Gray Wolves, which was voted on and approved by the Colorado voters in November of 2020. Wolf reintroductions in Idaho/Wyoming and North Carolina are subject studies for my assessment of Proposition 114. Each program had similar criteria but very different results. My thesis considers Proposition 114 must be a non-political issue, and that with considerate project planning and management continuity, can implement and create a successful program that conserves and populates a struggling species through community understanding.

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## **Introduction**

The Northern Rocky Mountain gray wolf was hunted to local extinction by the mid-1930s. For the next several decades, Colorado was missing one of the apex predators in the local ecosystem (ScienceBase). The gray wolf (*Canis lupus*) was a keystone species in the western United States. This means that the absence of this predator can change the local ecosystem drastically. From the late 20th century, the gray wolf has been delisted and relisted from the Endangered Species Act (ESA) multiple times depending on the political climate and the general opinion towards animal conservation at the time. The effort to bring wolves back to a stable population has been a goal from different conservation organizations and political parties.

In late October of 2020, the Trump Administration decided to delist gray wolves from the ESA in the lower 48 states (Earth Island Journal, 1). If the species no longer falls under ESA, it is then up to the State Management to conserve the species in question. This was shown in the 2020 November ballot, where Proposition 114 would direct Colorado Parks and Wildlife to have a plan to reintroduce gray wolves by Dec, 31st 2023. After the state elections were closed, it was fascinating to see how controversial the bill was – it only passed by half of one percent! The narrow margin showed the divide of opinion on the issue. This divide is due to the information that people know about wolves. The purpose of this thesis is to inform a person about Proposition 114 and the ecological, social, and economic impacts of wolf reintroduction. This paper also aims to prove that Proposition 114 must be a non-political issue, and that with considerate project planning and management continuity, can implement and create a successful program that conserves and populates a struggling species through community understanding.

## **Part II: Historical Context/Background Knowledge**

Wolf reintroduction has happened several times in the past with varying degrees of success. The gray wolf was historically common in the Rocky Mountains before 1870, but with the human settlement reducing habitat range, land development and loss of habitat and direct conflict with domestic livestock resulting in poisoning, trapping, and hunting, by the 1930s the gray wolf had all but disappeared from the western United States. In 1967 the endangered species act had listed the gray wolf as an endangered species (Alexander, 3-7).

The Gray Wolf's presence benefits herbivores and ungulates. It is not necessarily that wolves give them a helping hand, but they are forced to survive against this apex predator, and with that behavioral difference, the environment thrives. When large predators are readily available in the environment, movement is key to the larger herbivores' survival. As seen in multiple reintroductions, the revival of predators forces herds to move around much more frequently, which has several unintended benefits. First, because of the excess movement, the vegetation is much less affected by the herbivores and can therefore lose less foliage and can regenerate the loss faster. This helps support the smaller herbivores that feed off the vegetation regularly. With the increased food, these populations thrived, creating more prey for the smaller predators, which become more prevalent in the area. As these predators hunt, they provide carion on which the other scavengers feed. This process is called trophic cascade. The introduction of a keystone species can completely change an ecosystem's ecology just by its presence. The value of this process is immeasurable and can truly save an area from a struggling environment.

The second benefit of having a keystone predator in an ecosystem is simply for the sake of Darwin's Theory. As the wolfpack hunts, it will consistently push herds of ungulates as they chase them, making it so the diseased, old, and physically weak members of the group will be the

ones culled, providing food for the gray wolves and genetic strength to the herd. This reduction of the weak can be seen in any population with an increase in predators and is a crucial part of the life cycle and the environment.

When a predator is absent, herbivores tend to stay in places longer, stressing the environment and overgrazing the local flora. Due to this sedative lifestyle, the populations of the larger herbivores boom, creating even more mouths to feed off the environment. They start to move only out of necessity to form new grazing areas with fresh food for the herd. The overgrazed environment left behind is much more detrimental to the smaller herbivores that have a sedentary lifestyle in that environment, making food scarce and competition fierce for the smaller animals. This overgrazing causes the area's biodiversity to decrease and the environment to be less robust simply because of the lack of predators. Preserving the top predators as part of a healthy ecosystem is essential, and this will need to be fixed by the species who caused this problem in the first place — human beings.

Congress passed the Endangered Species Preservation Act in 1966, providing a means for listing native animal species as endangered and giving them limited protection. The Departments of Interior, Agriculture, and Defense were to seek to protect listed species and, insofar as consistent with their primary purposes, preserve such species' habitats. The Act also authorized the Service to acquire land as a habitat for endangered species. In 1969, Congress amended the Act to provide additional protection to species in danger of "worldwide extinction" by prohibiting their importation and subsequent sale in the United States. This Act called for an international meeting to adopt a convention to conserve endangered species.

As ESA continued to support the conservation and protection of threatened and endangered species, Congress realized the immense biological impact of the absence of these

keystone species was detrimental to the local environment and decided they must do something.

So in 1991, Congress directed the United States Fish and Wildlife Service (USFWS) to start planning a wolf reintroduction in Yellowstone National Park and Central Idaho, covering a broad range of alternatives. In 1992 congress decided that they must complete this plan by 1994 (Alexander).

After much planning, USFWS decided to reintroduce gray wolves into Yellowstone National Park and central Idaho. Beginning in Oct of 1994, 30 wolves were captured and released into planned areas of Wyoming, Montana, and Idaho, planning to have breeding adults and pups within 15 years. Initially the young wolves would be held in captivity for the first year of their life and then released to help promote pack formation and natural dispersal of wolf populations. As the project continued, they observed the impact that keystone species can have on the ecology in the area (ScienceBase).

Another wolf reintroduction project was on the east coast of North Carolina, home to one of the rarest wolves on the planet, *Canis rufus*, or the red wolf. Archaeological evidence indicates that the red wolf inhabited the coast for nearly the past 10,000 years but is now on the edge of extinction. The last 17 wolves were captured in the 1970s to try to save this failing species. In the 1990s, the captive-breeding descendants were released into the wild (Nash, 1). The remnants of the red wolf population are the result of millions of dollars of work. This project had high aspirations and ample funding for several years, and it looked to be a success. But political and socioeconomic negativity directed attention away from the benefits of reintroduction, and without active research and reintroduction on the project, it slowly started failing. The local Fish and Wildlife Service neglected the reintroduction's needs by actively allowing disgruntled landowners to shoot the endangered wolves. The project slowly ground to a

halt.

In October 2020, the Trump Administration decided to delist the gray wolf from the Endangered Species Act. Proposition 114 proposed amending the Colorado statutes to require the state to reintroduce and manage gray wolves in Colorado by December 31, 2023. This program's goals were to hold statewide hearings about the impact of the reintroduction and how it could affect scientific, economic, and social environments. They must also involve citizen opinions, change the plan according to approved considerations, and finally develop a just and efficient way of compensating livestock losses attributed to the gray wolf. In Colorado, it was decided to implement this proposition so that the people of Colorado could determine whether or not they wanted to reintroduce wolves into their local area. The proposition passed, but only by half of one percent, coming down to a few hundred votes, showing that it was a very divided issue in the region. On the one hand, people in favor of the introduction believe wolves are a keystone predator, and can boost the local area's ecology, creating a more stable ecological environment. There have been no significant confirmed populations since the 1930s or 1940s(ScienceBase). On the other hand, opponents to Proposition 114 believe that the reintroduction does not need to happen because there have been gray wolves spotted in Colorado. The introduction of more wolves could very easily threaten the local ungulate population, whether that be wild elk and deer or the large amount of livestock that graze in the regional area, high countries and valleys. Opponents also have concerns that the wolf reintroduction could threaten their livestock, finances, and safety. Clearly, there are two polarized sides to this issue. The goal for this paper is to give you the reader enough information to decide how this process should be done, so that it may benefit everyone who will be affected by this issue.

A wolf reintroduction can be a success or a failure based upon a myriad of factors, from

environment to ranching to politics. Even though reintroduction is a complex process that takes much effort, United States Fish and Wildlife Service and Colorado citizens can implement a program to be a success which could benefit Southwest Colorado's environment forever.



### **Part III: Research and Analysis**

Various examples of wolf reintroduction will be presented and critiqued to show outcomes of the projects, illustrating what may have been wrong with the reintroductions and what could have improved it.

In 1995 and 1996, gray wolves were reintroduced into the Rocky Mountains in Yellowstone National Park and central Idaho. First, the Yellowstone area was approximately 25,000 square miles with a healthy population of about 95,000 ungulates and a livestock population of around 412,000. Secondly, the central Idaho reintroduction area was a slightly smaller area of 20,700 square miles, but with a much larger ungulate population of 241,000 and a smaller livestock population of 306,525. With an initial population of only 30 gray wolves, this introduction was a small start to an excellent project. As they monitored this project closely, they saw the wolf populations thrive in this wilderness composed mainly of national park or national forest land. The experimental impact slowly became more significant over the years, creating a trophic cascade of the area, reinvigorating much of Yellowstone's wilderness. The plant growth in the area showed gains of 6" - 8" of extra foliage due to the ungulate population's increased movement, with an increased presence of smaller herbivores and rodents (ScienceBase).

The reintroduction of wolves into Yellowstone National Park in Wyoming and central Idaho in 1995 was highly successful. By the end of 2012, there were at least 625 wolves in Montana, 683 in Idaho, and 277 in Wyoming. Overall, the Yellowstone National Park and central Idaho examples were exemplary reintroductions (Service, 2).

The North Carolina reintroduction was an impressive scientific project that had a strong start for 25 years. During its peak, the introduction counted as many as 150 thriving wolves living in the wild. But in 2012, there was a political change of heart. Initially the project, led by

enthusiastic environmental scientists, started strong, but then it seemed to be continually deprioritized by the USFWS and was replaced by other projects by managers who deemed endangered species to be a nuisance. The project declined steadily from 2012 through 2020 (Nash, 2). The first signs of the reintroduction becoming politically corrupted were through the local area. Fish and Wildlife workers were observed giving locals permits to kill the endangered wolves on their property, even if the wolves have not been shown to cause harm. Then the reintroductions stopped altogether. In 2018, the Fish and Wildlife Service proposed cutting the reintroduction area by 90%. In the article *Red Alert* it was even stated that:

In a 2019 survey of Fish and Wildlife Service employees conducted by the Union of Concerned Scientists, a quarter said they were asked or told to avoid work on topics deemed politically contentious. More than half reported the diversion of funds or staff time away from work viewed as politically contentious. More than two-thirds said political interests are a burden to science-based decision-making at the agency (Nash 2).

By late 2020 only seven radio-collared wolves, and several others remained. No pups have been born over the last two years — the only time no births have occurred since the 1980s. It was clear that the project had failed due to a changing political climate. Given the meager numbers — three breeding pairs — extirpation will likely occur soon. Considering the probability of local extinction and the lack of program integrity throughout the process, this reintroduction was a failure.

In 1982, USFWS started a lobo study (with a revision in 2017). The lobo population (*Canis lupus baileyi*) has been a protected subspecies of the gray wolf since 1976. This bi-national program involving Mexico and the United States budgeted \$38M in the first five years of its reintroduction program. Just three Mexican wolves started the captive breeding

program in 1977. In 1995, the program expanded to include seven additional breeding wolves to promote genetic diversity. As of July 2017, the program had grown to 281 wolves. Overall, this was another quite successful program. But they are currently struggling with genetic diversity. Starting with only seven wolves, there is bound to be limited genetic diversity. Currently, with the larger population living in separate packs spread across the southern U.S. and Mexico, the problem seems to be getting worse. USFWS has been essentially swapping wolves into different packs to promote genetic diversity and a healthy lobo population. Even though this project could be easily considered a success, there is still much worry about the amount of genetic diversity that could become a problem in the future.

The implementation of Proposition 114: Reintroduction of gray wolves into Colorado, can benefit from the strengths and weaknesses of past reintroductions. It is vital to know what problems might need to be addressed with future reintroduction. The ecological, economic, political/social impacts of each study will be assessed.

First, from the Yellowstone introduction, there can be massive ecological impacts from a keystone species such as gray wolves being reintroduced. It can go exceptionally well and boost the ecology of the area by increasing natural migrations of the ungulates and creating a trophic cascade that can affect and improve the ecology of the locale. But as much as there can be a positive effect, there can also be negative effects caused by a species' reintroduction. For instance, the natural ungulate population will decrease as wolves become more prominent in a region. And if the ungulate populations are struggling, this could be a hard blow to their herds. Even though this is a valid reason to be concerned, this will be for the best of the ungulates' genetic health, creating a more robust genetic population by culling the weaker and the older as prey to the wolves.

The economic effects of reintroduction can be almost as complex as the reintroduction itself. But, just like reintroduction, the payoff can be huge. The expected cost of wolf introduction and management would be around \$480,000 per year. While this seems like a lot of money, the payoff for having wolves reintroduced in an area can raise tourism expenditures massively. It was expected that visitor expenditures would increase by \$23,000,000 each year. But for this massive gain, there are still some losses that must be considered. Outdoor recreation in any geographical area is a crucial part of its local culture. Hunting and ranching are two of the most economically beneficial practices in the Yellowstone area and are deeply intertwined in the region's social/political sphere. The expected loss of hunting benefits and expenditures could lose anywhere from \$394,000 to \$879,000 annually, as well as livestock losses costing anywhere from \$1,888 to \$30,470 every year (U.S. Dept. Interior, FWS 21). Even though these losses of recreation and ranching are unfortunate, looking at the numbers, introducing wolves is still a massive improvement to the local economy of the area and will provide an economic boost to any location that promotes sound ecology.

In the instance of North Carolina, the loss of the red wolf as a keystone species is devastating to the local ecology, mainly because thoughtful reintroduction could have prevented it. One never knows the full impact of a lost species, but the lack of future biodiversity in birds, and plants, the negative effect on smaller herbivores could be substantial. This ecological and economic loss from the absence of this species in their environment, caused by the lack of a followed-through plan and sufficient funding, essentially wasted millions of dollars from government funding. Maintaining a consistent level of oversight to see the project through to fruition could have prevented this economic loss. Because of this financial casualty, the public funds spent on the reintroduction even worsened public opinion. Economic failure could have

been avoided if the project had a fair compensation program to repair damage done by the wolves in areas close to the reintroduction area. This could have improved public opinion of the issue so that there might be less opposition. This was an unfortunate way to learn a hard lesson — that these projects take careful consideration, planning, and execution to improve the success of the wolves and keep the public informed and supportive of the project.

Finally, the Mexican lobo reintroduction showed that there is a moral responsibility to ensure a reintroduced population's genetic biodiversity through adequate numbers of wolf breeding pairs. The wolves' gene pool should be large enough to keep all wolves genetically fit and produce healthy pups. This was the unfortunate downfall of this program, even though it had a successful, planned start. The United States and Mexico created a thoughtful and thorough plan to implement and manage the Mexican wolf reintroduction and its effect on this program's ecology, economic, and political/social impacts.

We will employ management actions to work to reduce wolf-livestock and wolf-human conflict through the implementation of pro-active measures to avoid and minimize depredation; facilitate the provision of compensation for the economic impact of wolves on rural ranching communities; and employ a phased management approach in Arizona to minimize or avoid possible adverse impacts to wild ungulate populations (specifically elk) (Mexican Wolf, 27).

## **Conclusion**

In conclusion, the Colorado wolf reintroduction Proposition 114 must have a clear plan, defined procedures, management continuity and sufficient funding to see the project through to fruition. The planning process of Proposition 114 can push through the politics and create boundaries to make sure the wolf reintroduction is as socially responsible, as environmentally conscious and as publicly supported as possible.

“The plan will identify gray wolves to be reintroduced in Colorado, as well as the locations, methods, and timing for reintroduction. The plan will also determine how to establish and maintain a self-sustaining population and the criteria for removing the gray wolf from the state’s threatened and endangered species list. The reintroduction may be subject to federal approval. The commission is prohibited from imposing any land, water, or resource use restrictions on private landowners.” (Proposition 114 ballot)

The wolf reintroduction will positively impact Colorado ecologically, socially, and economically. Ecologically, insightful project planning can successfully conserve and populate a struggling species through the implementation of adequate genetic diversity, population size, and reintroduction area. The relationship between a healthy ecosystem and wolf reintroduction goes hand-in-hand, as wolves can encourage ecological prosperity. Socially, reintroductions should be a non-political issue that educates the public about the benefits of reintroduction. Economically, adequate budgets must be implemented to the project’s fullest extent, and should anticipate unforeseen problems. The ethical reimbursement of ranchers would create a positive local opinion of the reintroduced wolves. Although there is hesitancy in some social arenas about reintroduction costs, reintroduction can be a tremendous economic investment with a robust, long-term plan for a wolf reintroduction to create a healthier ecology, economy, and better

Colorado.

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