

Extended Essay

Environmental Systems and Societies

The Economic Impact of the 1995 Reintroduction of Grey Wolves to Yellowstone National Park

Word Count- 3876

Topic: Ecotourism

Research Question:

To what extent has the 1995 reintroduction of grey wolves (*Canis lupus*) in Yellowstone National Park affected Ecotourism in the Greater Yellowstone Area?

Thesis:

The return of grey wolves in Yellowstone National Park has stimulated tourism and therefore economic activity because of the wolves charismatic nature, and has had a positive impact on the economy of the greater Yellowstone area.

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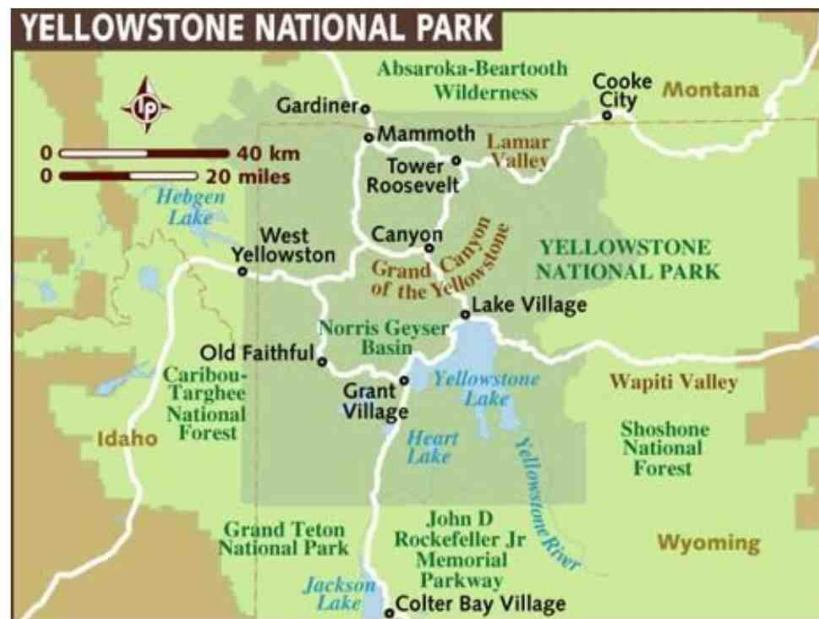
Introduction

Defined by the IUCN, ecotourism is "environmentally responsible travel to natural areas, in order to enjoy and appreciate nature that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples" ("Eco-Trips"). Ecotourism differs from ordinary tourism because it emphasizes conservation, education, traveler responsibility and active community participation. Ecotourism has many benefits; It boosts local economic growth, provides jobs and improves conservation awareness. Yellowstone National Park is one of several parks in the United States that benefits greatly from ecotourism. The U.S. Fish and Wildlife Service began reintroducing grey wolves to Yellowstone National Park in 1995. The restoration of wolves to the Greater Yellowstone Area has been one of the most successful wildlife conservation programs in the history of endangered species conservation. Yellowstone is now considered one of the best places in the world to see wild wolves. "Today's Yellowstone is a different place than 1995's Yellowstone. Biologists and ecologists can see it on the ground. Outdoor educators see it in their businesses. And visitors see it on the roads" ("More Money").

Grey wolves are a very controversial species which have caused many political and social uprisings since their return. On the other hand, grey wolves have restored Yellowstone National Park's great biodiversity and brought many other ecological benefits ("Wolf Reintroduction"). While the ecological response of the reintroduction has been studied countless times, the economic benefits that grey wolves have brought to the greater Yellowstone area has been just as significant and often overlooked. I grew

up spending my summers and winters in the Yellowstone area of Montana. I was always fascinated with the wildlife around the area and have seen the grey wolves countless times in the park. I am also familiar with the small towns surrounding Yellowstone and have seen first hand how local businesses' success are dependent on tourism within the area. Therefore, I decided to focus on how the return of grey wolves have impacted ecotourism and economic behavior in Yellowstone National Park. My thesis is, the return of grey wolves in Yellowstone National Park has stimulated tourism and therefore economic activity, and has had a positive impact on the economy of the greater Yellowstone area.

Figure 1: Map of Yellowstone National Park and surrounding communities:



Source: "Map of Yellowstone National Park." Lonely Planet, www.lonelyplanet.com/maps/north-america/usa/yellowstone-national-park/. Accessed 19 Sept. 2017. Map.

Figure 2: A Grey Wolf inside Yellowstone National Park



Source: Grey Wolf Characteristics. Wikia, Fandom, shamanspack.wikia.com/wiki/Wolf_Information:_Species. Accessed 7 Sept. 2017.

1. Wolves in Yellowstone

1.1 Grey Wolves in Yellowstone National Park: An Overview

Yellowstone National Park is about 3500 square miles spread across Wyoming, Montana, and Idaho (“Main”). The park is home to a diverse range of animal and plant species. Additionally, Yellowstone features 290 waterfalls, more than 10,000 thermal features, and over 300 geysers (“Main”). People come from all around the world to Yellowstone National Park to see the unique landscapes, diverse wildlife, and to partake

in a wide variety of activities such as fly fishing, snowmobiling, camping, and photography (“Main”).

Grey wolves are one of hundreds of animal species in Yellowstone National Park. Wolves are highly social animals and live in packs (“Wolves”). In Yellowstone, the average pack size is 10 individuals (“Wolves”). The packs consist of a complex social family, with older members and subordinates, each having individual personality traits and roles within the pack (“Wolves”). Packs defend their territory from other invading packs by howling and scent marking (“Wolves”). Life expectancy for wolves is about 4-5 years in the park or 2-3 years outside the park (“Wolves”). The leading cause of death for wolves within the park is death by other wolves. Outside the park, the leading cause of death is human-caused (“Wolves”). Wolves consume a variety of prey, large and small. They can efficiently hunt large prey that other predators cannot usually kill. Elk comprise about 90% of their winter prey, and deer represent 10-15% of their summer prey (“Wolves”).

Wolves are popular among visitors for many reasons. Firstly, they are extremely mysterious and charismatic animals. Additionally, grey wolves are highly visible animals, especially in off seasons which make them very desirable to tourists (“Gray Wolves”). Other large predators in the national park such as bears and mountain lions are much more difficult to see, as bears hibernate in the winter and mountain lions are very reclusive (“Gray Wolves”). Wolves operate in a social group and are very active in open landscapes, so visitors can often observe interaction between individual wolves

("Gray Wolves"). All of these factors make the wolves exceptionally watchable, consequently attracting many tourists.

1.2 Reintroduction of Wolves

1.2.1 Background of the Reintroduction

Grey wolves were once abundant all across North America. Loss of habitat and extermination programs led to their demise across the United States by the early 1900's ("Wolf Restoration"). The absence of a top-level predator in the park resulted in overabundant populations of elk, cascading negative impacts on plant communities, and the loss of biodiversity and ecosystem processes. The biggest threat to the park was the elk population, which grew out of control, exceeding the park's carrying capacity ("Wolf Restoration").

In 1995, 14 grey wolves were reintroduced to Yellowstone National Park. From 1995-1997, 41 wild wolves from Canada and Northwest Montana were released into the park ("Wolf Restoration"). In the first years following the wolf restoration, the wolf population grew rapidly as the newly formed packs spread out to establish territories with sufficient prey ("Wolves"). Twenty years later, wolves now spread out over the Greater Yellowstone Ecosystem and the area is considered one of the best places in the world to watch wild wolves.

When grey wolves were reintroduced to Yellowstone, they had already gained a lot of attention from media coverage. The reintroduction was a big event and was well publicized throughout the US. The mass awareness that wolves were once

again present in the National Park undoubtedly attracted large numbers of tourists to the area. After the return of wolves, businesses in the greater Yellowstone area took advantage of the wolves' rising popularity. Shops added a lot of souvenirs featuring wolves, touring companies added wolf themed tours, and many wolf education programs were created in and around the park ("More Money").

1.2.2 Community Education

The visibility of wolves within the park and public interest in wolves and wolf-based education programs have exceeded initial expectations. Environmental conservation education is extremely important to develop a world population that is aware of, and concerned about, the environment and its associated challenges, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively towards solutions ("Environmental Education"). The reintroduction of grey wolves to Yellowstone National Park created a significant number of opportunities for education programs related to the conservation of species and ecology within the park. "There were fifty-four classes on wolves taught in the first half of 2000 from eleven different organizations. From an educational standpoint, this has just been monstrous in the way it has developed," said Halfpenny ("More Money"). Additionally, because wolves are such a controversial species, they have gained mass media attention, and therefore have caught the eyes of many tourists. Ken Sinay, a professional wolf watching guide in Yellowstone, said, "Wolves are controversial, and they make the news. This brings attention to the region and Yellowstone is always mentioned. This has definitely encouraged visitation to the park" ("Wolf Discussion").

While media coverage may not be the same form of education as programs within the park, it informs the public about conservation and about wolf species in general, and consequently it draws more visitors to the park who are likely to spend money.

1.2.3 Ecology

While the primary purpose of the 1995 reintroduction of grey wolves was to control the excessive elk population, the wolves return altered much more than that. The reintroduction has exceeded expectations said Doug Smith, a wildlife biologist in charge of the Yellowstone Wolf Project, “the reintroduction of wolves continues to astonish biologists with a ripple of direct and indirect consequences throughout the ecosystem” (“Wolf Reintroduction”). Yellowstone wolves are causing a trophic cascade of ecological change (“Wolf Reintroduction”).

Tourists come from all over the world to see the grey wolves, but also the beautiful landscapes and diverse wildlife within Yellowstone National Park. When the wolves were completely wiped out of the park in the 1900’s, the ecological systems suffered greatly (“Wolf Reintroduction”). By removing an apex predator from the food web, the ecosystem experienced a very harmful top-down trophic cascade (“Wolf Reintroduction”). Elk populations fluctuated over the decades when wolves were absent and their browsing behavior significantly impacted stream-sides. With no fear of wolves, the elk could graze anywhere they liked and for decades were free to devastate young cottonwoods along streams (“Wolf Reintroduction”). Other stream-side species such as willows and berry-producing shrubs also suffered. That in turn began to disrupt an entire stream-side ecosystem and associated wildlife (“Wolf Reintroduction”). Trees and

shrubs were lost that could have helped control stream erosion. Food webs broke down. The return of the wolves after being gone for 70 years has restored the ecosystems balance and great biodiversity, ultimately contributing to the beauty of the National Park. As wolves returned, the behavior of elk changed; elk became more attentive and were once again forced to stay on the move ("Wolf Reintroduction"). Vulnerable along the rivers and streams, elk now spend more time in denser cover or on higher ground with better views for spotting predators ("Wolf Reintroduction"). Consumption of vegetation by elk is thus restrained, giving many areas a chance to recover. Aspens, willows, cottonwoods, and other vegetation have resumed their natural growth ("Wolf Reintroduction"). Stream banks once picked clear of vegetation and eroded by hooves erupted in wildflowers, which nourished insects, which in turn fed songbirds that nested among the thick willows ("Wolf Reintroduction"). The restoration of the natural beauty to the park helped attract increasing numbers of tourists from all over the world.

1.3 Wolf Related Tourism

The desire to observe iconic, free ranging large carnivores is a driver for wildlife tourism around the globe and may improve the acceptability of their presence by the general public and contribute to conservation goals. Wildlife conservation efforts taking place all over the United States have consistently boosted local economies. For example, the 1987 North Carolina reintroduction of Red Wolves to a certain area generated a 19% increase in tourism ("Wolf Ecotourism"). Additionally, areas in Arizona, New Mexico, and Canada have had similar success stories following their

reintroductions. Defenders of Wildlife, a non-profit conservation organization, states that “ecotourism is quickly coming to the forefront of family recreational activities” (“Wolf Ecotourism”).

The rare opportunity to observe wolves in a wild, natural habitat has stimulated significant economic activity in the Greater Yellowstone Area and similar boosts to other wildlife conservation areas (“Wolf Ecotourism”). According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, wildlife watchers alone have spent \$45.7 billion in the United States (“Wolf Ecotourism”). More and more tourists are seeking vacations where they can enjoy wilderness areas and view rare and predatory wildlife. “It’s obvious that wolves are one of the most charismatic animals in the world and there’s no end to how many people would like to see a wolf in the wild, so Yellowstone is one of the most unique opportunities in the world where an average person can and does have a real excellent chance of having that experience,” said McIntyre (“Wolf Reintroduction”). Yellowstone offers these things and consequently attracts an average of 3,703,825 recreational visitors annually. These visitation rates are on the rise (see Table 2).

1.4 Economics

Like the cascading effect the grey wolves have had on the environment in Yellowstone, they have created a domino affect on the economy of the greater Yellowstone area. “Economically, the story has been extremely bright” (“More Money”). As more and more people from around the world come to see the grey wolves, they are

creating new demand for lodging, restaurants, wolf-related merchandise, wolf-watching tours, and education programs. As a result, millions of dollars have gone into the local economy, fueling an abundance of new jobs and improved livelihoods. "National park tourism is a significant driver in the national economy, returning \$10 for every \$1 invested in the National Park Service, and it's a big factor in our local economy as well. We appreciate the partnership and support of our gateway communities, regional tourism organizations and the states of Idaho, Wyoming and Montana, and are glad to be able to give back by helping to sustain local communities" ("Tourism to Yellowstone"). Wolf oriented ecotourism in Yellowstone National Park is becoming a larger social trend, and visitors to the park rank the grey wolf as one of the primary animals they come to see ("Wolf Ecotourism"). In 2005 alone, about 95,000 visitors came to the park specifically to see or hear wolves and spent approximately \$375 per person, or a total of \$35.5 million across the three states ("Wolf Ecotourism"). In 1992, before wolves were reintroduced into the park, a University of Montana economist named John Duffield co-authored a study called "The Economics of Wolf Recovery in Yellowstone National Park." The study predicted a loss to the hunter/outfitter business of about \$500,000 per year. This would be a direct loss to hunting outfitters due to a declining elk population due to wolves would mean less elk to hunt and fewer clients ("Wolf Reintroduction"). On the flip side, the benefits to tourism dollars, educators, and outfitters specializing in wildlife observation, not hunting, were predicted in the \$7-10 million annual range, a gain many times greater than the loss ("Wolf Reintroduction"). For a motel owner who struggles during the off-season, wolves have been extremely

good news. Motel owner Gerlie Weinstein said, "My business has increased yearly. I came here because I watch wildlife and that's what a lot of my clients do." "The months of April, October, and November can be hard times for motel owners, but with the addition of wolves into the park, businesses like the Alpine Motel don't need to close up shop during these times" ("More Money"). Rick McIntyre, who works for the National Park Service helping to educate wolf watchers states that, "In terms of the economic impact, there's just tremendous potential for local business people. To me that's just a tremendously positive potential, having the wolves here" ("Wolf Reintroduction"). The wolves have been and continue to be a significant source in the growth of the Greater Yellowstone's economy.

2. Method of Investigation

My investigation of the research question was held in the following ways:

1. An analysis of the National Park Service (NPS) Yellowstone Park Reports. I will use secondary data from this page, specifically annual park recreation visitation data from 1995-2016. This data has been collected to see if there is a significant increasing trend in park visitations since the reintroduction of grey wolves in 1995.
2. Collection of secondary data from Yellowstone National Park's grey wolf annual report. This data shows the number of grey wolves in the park every year and outlines any deaths or births in each pack. This data was used to make the connection between the number of visitors annually and the number of wolves.
3. Analysis of different reports from the NPS and official Yellowstone National Park sites to help gather background information such as the timeline and purpose of the reintroduction, ecological reports, economic reports, and basic information about grey wolves contributed to my analysis and conclusion.
4. From all the above information, I constructed charts and graphs to present quantitative data to investigate my thesis and illustrate my conclusions.

The investigation and research was carried out to analyze how the reintroduction of grey wolves affected ecotourism and economic activity in Yellowstone National Park. My findings are solely based on secondary data from official governmental websites.

The secondary data is raw, so there are no previous reports or analyses with the numbers. Therefore, my data is reliable. Also, all my references have been taken from reputable organizations and well-known, trustworthy news sites.

3. Data + Analysis

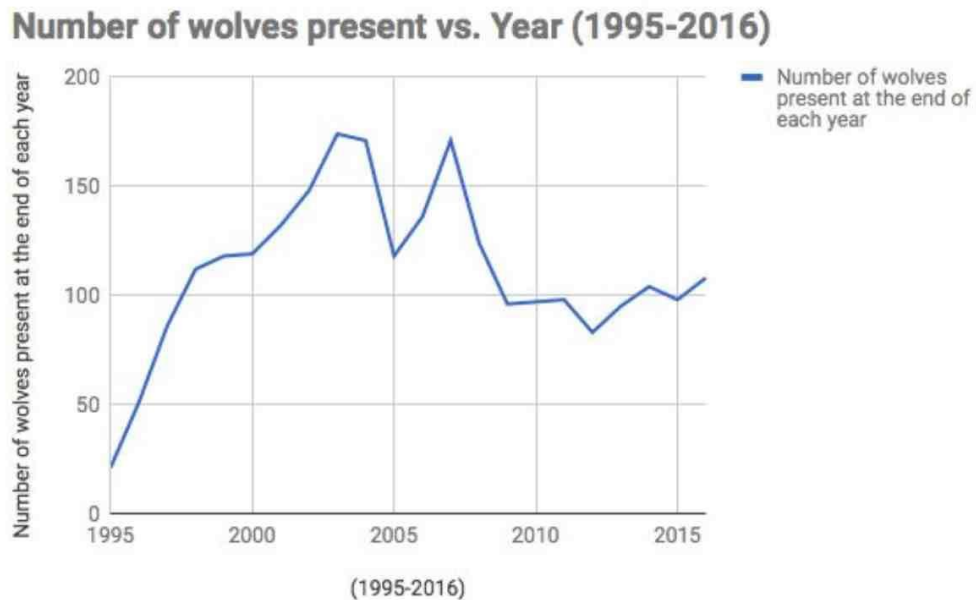
3.1 Wolf Data

Table 1: The total number grey wolves and wolf packs present in Yellowstone National Park (1995-2016)

Year (1995-2016)	Number of grey wolves present	Number of packs of grey wolves present
1995	21	3
1996	51	9
1997	86	9
1998	112	11
1999	118	11
2000	119	8
2001	132	8
2002	148	14
2003	174	14
2004	171	16
2005	118	13
2006	136	16
2007	171	11
2008	124	12
2009	96	14
2010	97	11
2011	98	10
2012	83	10
2013	95	10
2014	104	11
2015	98	10
2016	108	11

Source: National Park Service. "Wolves." National Park Service, www.nps.gov/yell/learn/nature/wolves.htm. Accessed 5 Sept. 2017.

Figure 3: Graph of the number of wolves present annually in Yellowstone NP



Source: National Park Service. "Wolves." National Park Service, www.nps.gov/yell/learn/nature/wolves.htm. Accessed 5 Sept. 2017.

The data above shows the grey wolf population in Yellowstone National park since their reintroduction in 1995. The wolf population grew rapidly in their first decade at the park (See Figure 3). Starting in 2004, the wolf population started to fluctuate more noticeably (See Table 1 or Figure 3). This could be due to food scarcity, wolves killing other wolves, disease, and human-related mortality ("Wolf Restoration"). Disease periodically kills a number of wolf pups and old adults. Outbreaks of canine distemper have occurred in 2005, 2008 and 2009 which definitely affected population numbers (See Figure 3). In 2005, distemper killed two-thirds of the pups within the park ("Wolf Restoration"). The park's wolf population has declined substantially since 2007 when

the count was 171 (See Table 1). Most of the decrease has been due to the decline in the elk population and available territory ("Wolf Restoration"). In addition, factors such as environmental conditions, human interactions, harvest outside the park, and pack immigration and emigration around the park boundaries make predicting the wolf population very difficult ("Wolf Restoration"). In recent years, the number of wolves and packs of wolves have leveled off (See Table 1 and Figure 3). In 2011, the grey wolf was removed from the endangered species list in Idaho and Montana, but is still protected as an endangered species in the state of Wyoming ("Wolf Restoration").

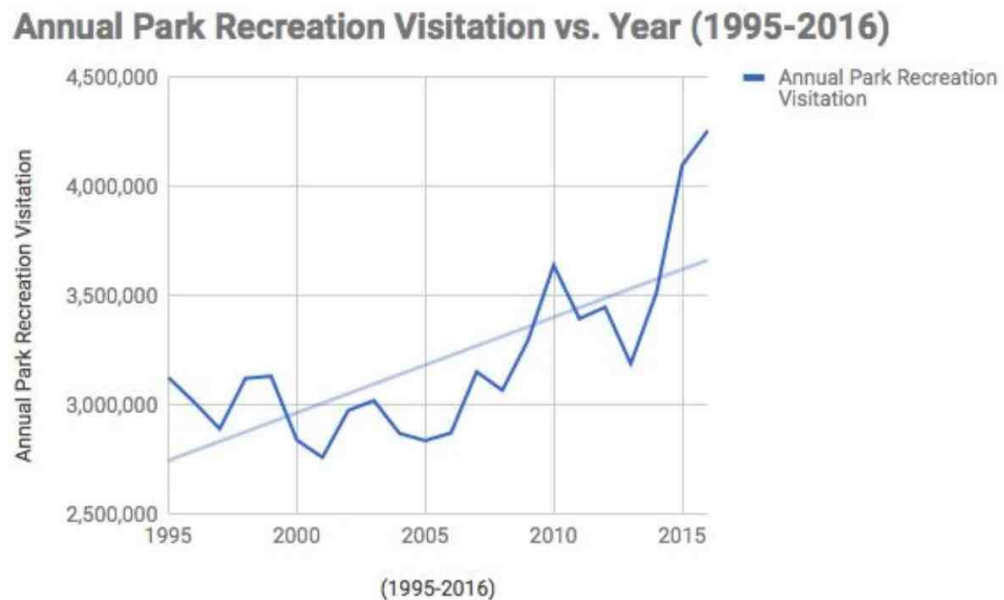
3.2 National Park Visitors

Table 2: The total number of annual recreation visitors (measure of ecotourism) to Yellowstone National Park (1995-2016)

Year (1995-2016)	Annual Park Recreation Visitation
1995	3,125,285
1996	3,012,171
1997	2,889,513
1998	3,120,830
1999	3,131,381
2000	2,838,233
2001	2,758,526
2002	2,973,677
2003	3,019,375
2004	2,868,317
2005	2,835,651
2006	2,870,295
2007	3,151,343
2008	3,066,580
2009	3,295,187
2010	3,640,185
2011	3,394,326
2012	3,447,729
2013	3,188,030
2014	3,513,484
2015	4,097,710
2016	4,257,177

Source: "Yellowstone NP." National Park Service STATS, [irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20\(1904%20-%20Last%20Calendar%20Year\)?Park=YELL](http://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=YELL). Accessed 7 Sept. 2017.

Figure 4: Graph of the number of annual park visitors to Yellowstone NP



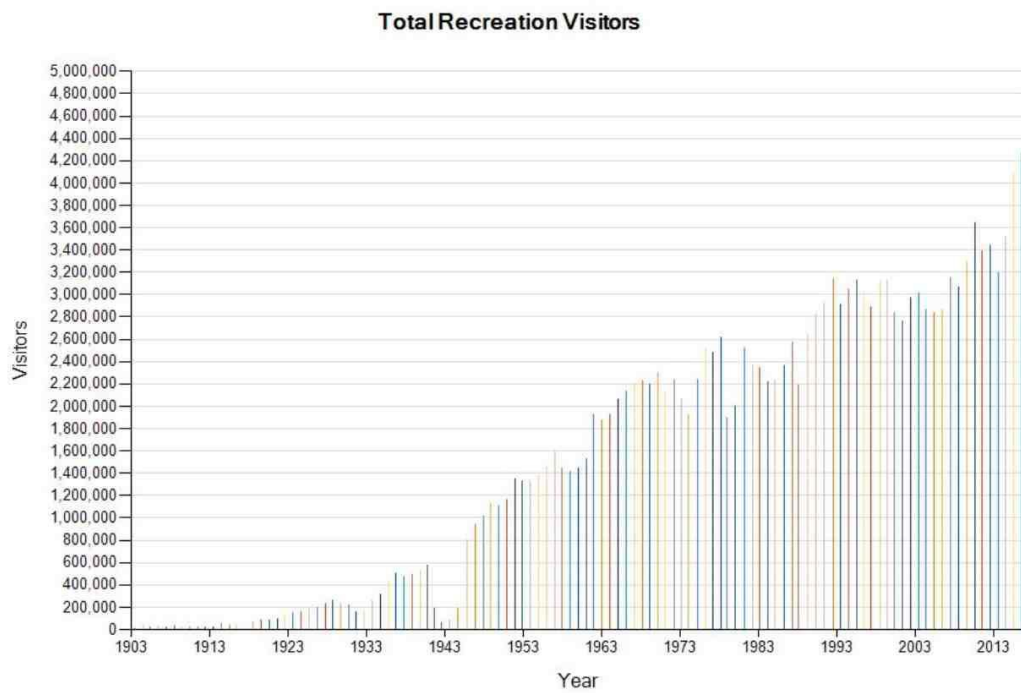
Source: "Yellowstone NP." National Park Service STATS, [irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20\(1904%20-%20Last%20Calendar%20Year\)?Park=YELL](http://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=YELL). Accessed 7 Sept. 2017.

The data above shows the total number of annual recreation visitors (measure of ecotourism) to Yellowstone National Park since the return of grey wolves to the park (See Table 2 and Figure 4). Despite fluctuations, the trend line shows a general increase in visitors since 1995 (See Figure 4). The fluctuations could be a result of forest fires shutting down parts of the park, government shutdowns, and other social or environmental factors. When examining the wolf population data and recreation visitor data side by side (See Table 1 and 2), there is no visible correlation between the stats. For example, when the wolf population was increasing in the first years of their reintroduction, the visitor numbers dropped slightly. Therefore, I cannot conclude that

the general rise in tourism was as a result of the reintroduction of wolves based solely on the above data.

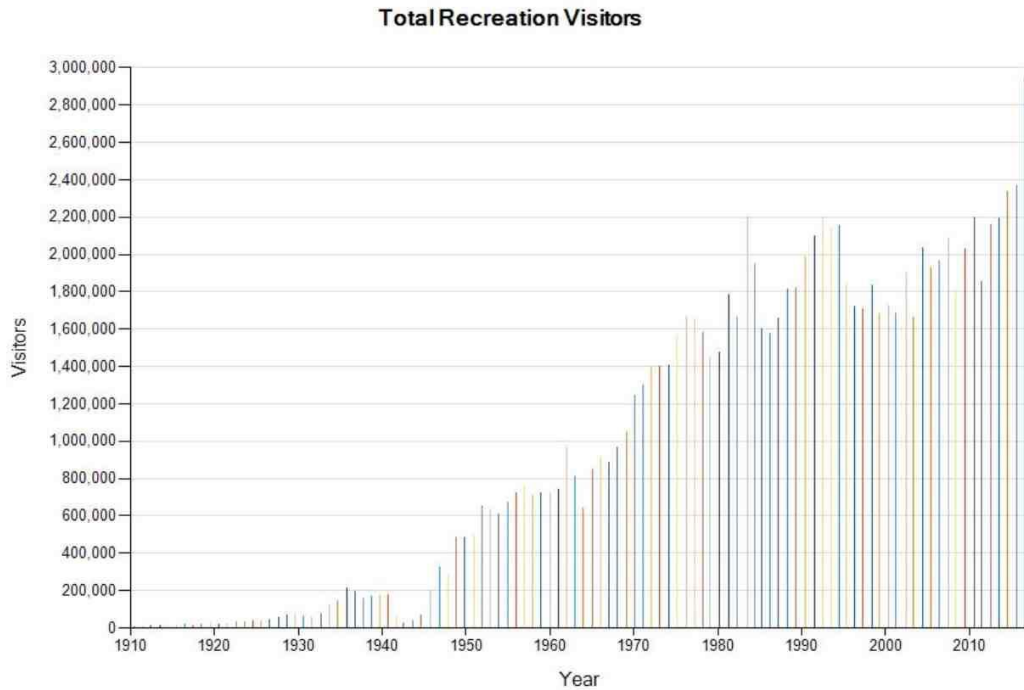
3.3 Comparison of National Parks

Figure 5: Graph of the total recreation visitors in Yellowstone NP from 1903-2016



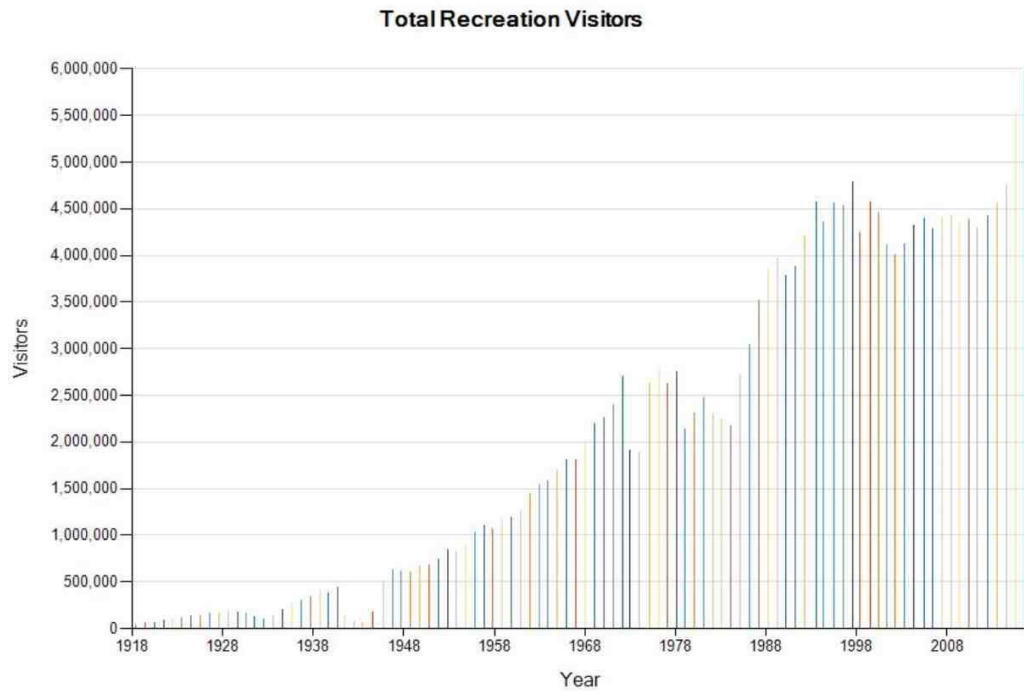
Source: "Yellowstone NP." *National Park Service*, U.S. Department of the Interior, [irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20\(1904%20-%20Last%20Calendar%20Year\)?Park=YELL](http://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20(1904%20-%20Last%20Calendar%20Year)?Park=YELL). Chart.

Figure 6: Graph of the total recreation visitors in Glacier NP from 1910-2016



Source: "Glacier NP." *National Park Service*, U.S. Department of the Interior, [irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20\(1904%20-%20Last%20Calendar%20Year\)?Park=GLAC](http://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20(1904%20-%20Last%20Calendar%20Year)?Park=GLAC). Accessed 15 Oct. 2017. Chart.

Figure 7: Graph of the total recreation visitors in Grand Canyon NP from 1918-2016



Source: "Grand Canyon NP." *National Park Service*, U.S. Department of the Interior, [irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20\(1904%20-%20Last%20Calendar%20Year\)?Park=GRCA](http://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20(1904%20-%20Last%20Calendar%20Year)?Park=GRCA). Accessed 15 Oct. 2017. Chart.

The three graphs above show the total annual number of recreation visitors to Yellowstone, Glacier, and Grand Canyon National Park. There has been a general increase in tourists to each park since the early 1900's (See Figures 5, 6, and 7). In 1916, President Woodrow Wilson signed the act creating the National Park Service, a new federal bureau in the Department of the Interior responsible for protecting the 35 national parks and monuments then managed by the department and those yet to be established ("History"). This "Organic Act" states that "the Service thus established shall

promote and regulate the use of the Federal areas known as national parks, monuments and reservations” (“History”). After this act was signed, National Parks across the US, including the three shown above (See Figures 5, 6, and 7), saw an increase in tourists. Ecotourism has been on the rise and is still a fast growing industry, and National Parks have gained popularity as a result. Consequently, I can conclude that the the rise in visitors that Yellowstone was experiencing after the reintroduction of grey wolves (See Figure 4) wasn’t necessarily because of the return of the wolves, but because the park was already benefiting from the rising trend (See Figure 5) of the general popularity of ecotourism. Moreover, the fact that both Glacier and Grand Canyon National Park have experienced this same increase in visitors (See Figures 6 and 7) without reintroducing any species is additional evidence that rising popularity of ecotourism is attracting more and more visitors annually.

Table 3: Total number of annual recreation visitors to Yellowstone, Glacier, and Grand Canyon National Park in 1960 and 2010

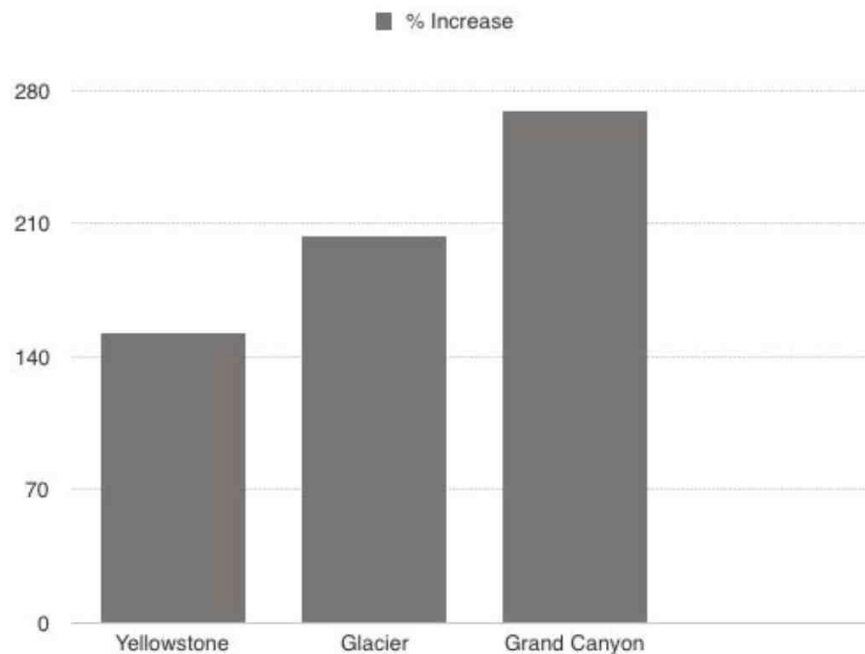
Year	Yellowstone	Glacier	Grand Canyon
1960	1,443,300	724,500	1,187,700
2010	3,640,185	2,200,048	4,388,386

Source: "National Reports." NPS Stats, National Park Service, irma.nps.gov/Stats/. Accessed 16 Sept. 2017.

Table 4: Calculations of percent increase in visitors in Yellowstone, Glacier, and Grand Canyon National Park between 1960-2010

National Park	2010 # of visitors - 1960 # of visitors = increase	increase / original # (x100)	Percent Increase in visitors
Yellowstone	3,640,185 - 1,443,300 = 2196885	2196885 / 1,443,300 (x100)	152.2%
Glacier	2,200,048 - 724,500 = 1475548	1475548 / 724,500 (x100)	203.7%
Grand Canyon	4,388,386 - 1,187,700 = 3200686	3200686 / 1,187,700 (x100)	269.5%

Figure 8: Graph showing the percent increase in visitors to the national parks between 1960-2010



Source: Source: "National Reports." NPS Stats, National Park Service, irma.nps.gov/Stats/. Accessed 16 Sept. 2017.

To further prove that the reintroduction of grey wolves is not responsible for the increase in tourism to Yellowstone National Park, I conducted a percent change calculation showing that Glacier and Grand Canyon National Park also experienced a high increase in tourists. I took annual recreation visitation data between 1960-2010 and calculated the percent increase of visitors to each park (See Table 4). Then, I graphed the results (See Figure 8), revealing that all three national parks have seen a high increase in tourists. Therefore, while it is possible that the reintroduction of grey wolves has attracted tourists to Yellowstone, the general rising trend of tourists to the park was

already established. As a result, I cannot conclude that the rising trend following the reintroduction is solely because of the return of grey wolves to the park.

3.4 Economic Data

Table 5: Estimated three-state direct expenditure impact associated with wolf presence in Yellowstone National Park based on a study in 2005

Statistic	Spring	Summer	Fall	Winter
Total recreational visitation to Yellowstone	382,598	1,819,798	547,777	85,478
% of visitors from outside the three-state area	70.5%	83.68%	67.59%	82.2%
% of visitors who would not have visited without the presence of wolves	1.93%	4.78%	3.45%	3.66%
Total estimated annual visitor spending in the three states attributable to wolves	\$35,520,929			

Source: Duffield, J. "Wolf Ecotourism." *Defenders of Wildlife*, 2006, www.defenders.org/sites/default/files/publications/wolf_ecotourism__conserving_wildlife_and_boosting_local_economies.pdf. Accessed 5 Sept. 2017.

A key measure of the economic significance of a resource such as Yellowstone to the local economy is the amount of money visitors from outside the three-state area

of Montana, Idaho, and Wyoming spend during their trip (“Wolf Ecotourism”). The data above (See Table 5) shows part of the results from a survey questionnaire done in 2005 conducted by Duffield who tried to measure the grey wolves’ impact on the Greater Yellowstone Area’s economy (“Wolf Discussion”). The results show that about \$35 million from visitor spending is attributable to the wolves’ presence (See Table 5). Additionally, the data shows that on average 3.5% of the recreational visitors would not have come to Yellowstone if wolves were not present. While 3.5% may seem like an insignificant number of visitors, in 2005, this would account for almost 100,000 out of the 2,835,651 tourists that year (See Table 2). Furthermore, this survey was taken in 2005, and visitor numbers to Yellowstone have drastically increased since then (See Table 2), as well as the desire to see wolves in the park. As a result, it can be concluded from the data and information above that wolves have boosted the economy of the Greater Yellowstone Area and have positively impacted ecotourism within the park.

4. Conclusion and Application

The general idea of ecotourism is luring more and more visitors to natural areas such as Yellowstone National Park. Additionally, the desire to see iconic, free ranging large carnivores is a driver for wildlife tourism around the globe and may improve the acceptability of their presence by the general public and contribute to conservation goals. Yellowstone National Park offers its visitors a chance to see a desirable species, and this has undoubtedly attracted many tourists. I hypothesized that the return of grey wolves in Yellowstone National Park stimulated tourism and therefore economic activity, having a positive impact on the economy of the Greater Yellowstone Area. This thesis is proven to be true throughout this investigation. The return of the wolves has sparked the demand for education programs, more wildlife watching tours, wolf-related merchandise, in addition to lodging and dining. This has consequently boosted local economic activity as more jobs have been created and a significant amount of money has been added to the economy.

Moreover, the reintroduction of grey wolves to Yellowstone serves as a successful example and guide as to how to promote the conservation of endangered species worldwide. The return of grey wolves has not only benefited the economy of the area, but has played a vital role in the restoration of Yellowstone's ecosystem. Unfortunately, it took the absence of the grey wolf in Yellowstone to generate recognition as to how vital they were to the ecosystem. Therefore, education and

scientific research surrounding the wolves' restoration not only provides insight to the species, but also to the entire ecosystem of the National Park. This is extremely relevant as our global biodiversity is decreasing rapidly due to human activity, and we must find a way to balance exploitation and sustainable development in order to protect our world's remaining species. Conservation aims to protect habitats and ecosystems, and hence species from human-made disturbances, such as habitat destruction and overhunting. Ecotourism is a way of providing ongoing income without destroying natural capital and Yellowstone National Park represents a perfect example of this to the rest of the world. I would be interested in further investigating the political and social controversies regarding the reintroduction of wolves, such as the effects on farmers livelihoods and hunting outfitters in the Greater Yellowstone Area. It would be interesting to analyze the differences in the debate prior to the reintroduction and twenty years following the return of grey wolves to Yellowstone.

5. Works Cited

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