

Reintroduction of the wolf



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Wolves, having remarkable speed, strength and intelligence, were once abundant predators throughout the North American continent, including at least five species and two million animals (Leonard, Vila, & Wayne, 2005). However, in just a couple of centuries, the wolf population dwindled. By the early to mid-1900's only five percent of the population remained in the contiguous United States, and wolves were completely eradicated from Yellowstone by 1926 (Knight, McCoy, Chase, McCoy, & Holt, 2005).

Park rangers, officers of the law, federal predator control agents, and hunters, by means of trapping, poisoning and shooting, purposefully accomplished the extinction of wolves in Yellowstone. Over the next decade, the focus on Yellowstone as a national park went from being a “ natural freak show” and entertainment to a place of education and a restoration of natural ecosystem (Knight et al. , 2005).

Between 1960 and 1972 ecologists, biologists, and the National Park Service agreed upon and stressed the importance of restoring the park's ecosystem. This included returning the only missing native species, the wolf, which they discovered to be a fundamental part of a salubrious ecosystem (Knight et al. , 2005). In January 1995 thru 1996, the reintroduction of 31 wolves into the Yellowstone basin occurred after their removal from the region for nearly 70 years (Knight et al. , 2005).

Yellowstone has been going through a restructuring of the ecosystem since the reintroduction and is now home to mountain lions, grizzly and black bears, and wolves, all native species of large carnivores (Smith, Peterson, & Houston, 2003). Since the Yellowstone reintroduction, wolves are no longer on the Endangered Species Act of 1973 and there is a shifting paradigm

towards conservation verses restoration (Millspaugh, Kunkel, Kochanny, Peterson, & Licht, 2010). Once people understand how wolves complete an ecosystem, such as Yellowstone's, they can better accept wolves' existence has a worthy predator.

The information found in this research will be helpful in support of the argument that the reintroduction of the wolf as a large carnivore into the greater Yellowstone basin has been advantageous to the reestablishment of a salubrious ecosystem that is beneficial to all as evidenced by increasing food sources for scavengers, an indirect positive effect on vegetation, and control over population, distribution, and behavior of other mammals such as the coyote and elk.

The report, " Resource dispersion and consumer dominance: scavenging at wolf- and hunter-killed carcasses in Greater Yellowstone", published by Ecology Letters, offers credible research on food resource dispersion and scavenger dominance of wolf- verses hunter- killed carcasses. Naturally complete ecosystems are dependent on constant and diversified food resources available throughout the seasons. Food resources are provided largely by carnivores such as wolves and the remains left behind by hunters. Their research shows that wolves more evenly disperse their carnage over a vaster region and it is more available throughout the seasons.

The researchers chose a variety of settings in the northern Yellowstone winter range of the greater Yellowstone ecosystem (GYE) to observe multiple species, the affects of food availability in relation to time, territory, and fluctuations in food quantities, and what effects the aforementioned have on growth and populations of species in the GYE. Yellowstone's ecosystem is of

particular interest, with wolves and hunters being the carnivores and coyotes, golden eagles, bald eagles, ravens, and magpies being the scavengers in order of hierarchy found at a carnage food resource (Wilmers, Crabtree, Smith, Murphy, & Getz, 2003).

The Ecology Letters Report (2003) compares wolf carnage to gut remains left behind by hunters relevant to when and where these food resources are available to scavengers, whom the scavengers are, and how scavengers are able to find food resources based on their superiority, skills of travel, and communication. This study was conducted during winter when the population of ungulate prey is commonly reduced and weakened due to increased snow depth. Consequently, weakening prey gives more opportunity for wolves to make kills and they are more likely to leave carnage behind (Wilmers et al. 2003). On the other hand, hunters leave remains of kills over a short period in a small amount of space due to regulated hunting seasons and territories. Therefore, hunter food resources are limited in both time and space whereas naturally occurring wolf kills are more evenly dispersed over a larger territory and throughout the seasons (Wilmers et al. , 2003).

The distance that scavengers can travel and the time in which it takes them to discover and assimilate a food resource, referred to as their “ relative foraging radii” (Wilmers et al. 2003), is determined by their speed of travel, flying verses land travel, and their social communication skills. Bald eagles and ravens are the most skilled in all areas, followed by coyotes and magpies, with the golden eagle being last because of its introverted and somewhat antisocial personality (Wilmers et al. , 2003). Observations

divulged a wide variety of scavengers found at wolf prey kills, with an occasional grizzly bear coming out of hibernation to get in on the feast (Wilmers et al. , 2003).

The remains of hunter-killed carcasses, in contrast, were dominated by bald eagles and ravens, with no observations of large scavengers such as bears or coyotes (Wilmers et al. , 2003). This may be partly due to the fear coyotes have of humans and partly due to regulated hunting seasons that are over before bear hibernation ends (Wilmers et al. , 2003). The research conducted by the authors was completed in the greater Yellowstone area where there are known high concentrations of prey herds available in winter.

During their studies, accomplished over roughly a three-year period, they collected information by observation and used statistics to prove their hypothesis that a larger variety of local scavengers are more likely at a wolf prey kill than at the remains left behind by hunters (Wilmers et al. , 2003). Their research also proved that it is beneficial to a healthy ecosystem such as Yellowstone's to have year-round food resources available to a wide variety of species over a vast amount of territory in order for balance to naturally occur.

Since the reintroduction of wolves over fifteen years ago, ecologists also found, and research supports, that the strength and ubiquity of trophic cascades are vital to a balanced ecosystem (Knight et al. , 2005). A terrestrial trophic cascade, also described as a top-down process is a three level food chain in an ecosystem involving predators, herbivores and plants (Ripple & Beschta, 2004). Through predator hunting, in this case the wolf, herbivore populations, such as elk, are reduced and controlled.

This allows plants to flourish, affecting their structure, maturity and spatial dissemination, rather than being over grazed by herbivores (Ripple & Beschta, 2004). After the extirpation of the wolf in the late 1800's and early 1900's through hunting, trapping and poisoning, the ungulate population exploded between 1935 and 1945 (Ripple & Beschta, 2004). This ungulate overpopulation led to widespread damage of plants and reduced habitat for nongame species such as songbirds and beavers (Ray, Berger, Redford, & Kent, 2005).

Overgrazing and soil erosion caused by large herds, primarily elk and deer, resulted in the decrease of flora and fauna in the Yellowstone region. Since the reintroduction of the wolf into Yellowstone, there has been a reduction of elk and other ungulate populations due to the increased predation risk. This increased predation risk put upon the elk has changed their grazing behavior and habitat usage (Ripple & Beschta, 2011).

Over the last ten years of wolf presence in Yellowstone and the decrease in elk herd populations, researchers have noticed an increased plant size in willow, aspen, and cottonwood groves, especially around rivers where these plants prefer to grow (Ripple & Beschta, 2011). As a result, wolves have indirectly affected the recovery of the songbird population. With the increase of willow stands and other woody plants, the nesting density of various songbirds has improved (Ray et al. , 2005).

Increased willow groves have also supported the beaver's return to certain areas of Yellowstone, and with the trophic cascade in mind, their return has provided an improved aquatic habitat for other plants and animals (Ray et al, 2005). Therefore, wolves limit and possibly regulate the growth and

abundance of prey such as elk as well as predators such as coyotes. Elk populations have decreased since the return of the wolf and their risk of predation changed their behavior regarding territory usage, watchfulness, movement, and herd size (Wipple et al. 2011). Researchers observe that elk and other ungulate herds are decreasing but the number of animals in a single herd is larger. This benefits prey by triggering more watchfulness by some of the herd, while others have time to graze with less risk of predation (Halofsky & Ripple, 2008). Studies show that wolf kills of ungulates are greater along edges where the landscape changes such as in ravines, or in forests and riparian areas (Halofsky & Ripple, 2008).

Elk have changed their territorial usage and preference due to the density and presence of wolves in these areas (Halofsky & Ripple, 2008). Such behavioral changes have had additional positive effects on the trophic cascade. Wolves and coyotes share common diets of elk, other ungulates, and small animals, which makes them carnivorous competitors (Wilmers et al. , 2003). This forces them to have indirect interactions, as they compete for common resources. Prior to the reintroduction of wolves into Yellowstone, coyotes became over abundant.

Since the reintroduction and up to 1998, population and pack size has been reduced (Switalski, 2003). Coyotes are primarily scavengers and prior to the wolves' return, they relied on elk carcasses caused by harsh winters. Now, with wolves leaving the remains of their hunts year round, coyotes have a steady but risky food source (Wilmers et al. , 2003). Coyotes are known to track and follow wolves to their left over carrion especially in winter. This

food source availability has been critical in coyote litter size increase and pup survival (Wilmsers et al. , 2003).

Complete, strong ecosystems are dependent on constant and diversified food resources as well as availability throughout the seasons. Since the reintroduction of wolves over fifteen years ago into the Yellowstone region, the three general trophic levels of plants, herbivores, and carnivores have slowly been recovering. Wolves limit and possibly regulate the growth and abundance of prey such as elk and predators like coyotes. Since the reintroduction of the wolf to the Yellowstone basin, the reestablishment of a salubrious ecosystem is still occurring and has been beneficial to all.

It is evident that large carnivores play an important role in providing food, keeping the three general trophic levels in check, and regulating the natural behaviors of other species more effectively. New paradigm research proposes continued wolf conservation with a focus on ecosystem recovery (Millspaugh et al. , 2010). Interestingly, new research also shows that wolf presence has beneficial economic and recreational influences on human services including increased park visitation and revenue by providing enhanced visitor experiences (Millspaugh et al. , 2010).