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Sustaining A Conservation Legacy? An In Depth Perspective On the Interagency Bison Management Plan and the Potential for Collaboration

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SUSTAINING A CONSERVATION LEGACY?

AN IN DEPTH PERSPECTIVE ON THE INTERAGENCY BISON MANAGEMENT PLAN AND THE POTENTIAL FOR COLLABORATION

BY

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Chapter One

Introduction

Bison management within Yellowstone National Park (YNP), and the later recognized Greater Yellowstone Ecosystem (GYE), has been a contentious issue since the mid-1900s. At the same time the efforts of Congress and the National Park Service to literally bring the bison back from the brink of extinction qualifies the Yellowstone herd as a symbol of western heritage and culture, the wilderness standard, and one of the greatest victories of the early conservation movement in the United States (Schullery 1986). Currently, there are more than 150,000 bison in the United States, mostly contained in heavily managed reserves or on private ranches. Within the contiguous United States the least restricted populations are in the Henry Mountains of Utah and two within the GYE, with one in Yellowstone Park and the other in Grand Teton National Park (Van Vuren 1983, Meagher et al. 1997). With this success surrounding bison populations the push for brucellosis eradication in livestock over the past several decades has met overall success as well. As a result of this accomplishment new sights are being set on eradication within certain species of ungulates, such as elk and bison.

The brucellosis eradication issue brings us to the current debate involving the implementation of the Interagency Bison Management Plan (IBMP), which established interagency bison management coordination and cooperation between state and federal agencies that have management jurisdiction within the GYE. The agencies involved in the effort include the United States Department of Interior-National Park Service (NPS), the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), the United States

Department of Agriculture-Forest Service (USFS), the Montana Department of Livestock (DOL), and Montana Fish, Wildlife, and Parks (FWP). The IBMP was developed in a coordinated effort between these agencies, and was finally implemented after a lengthy Environmental Impact Statement (EIS) process in the winter of 2000.

This process developed after ten years of negotiations, and more than 67,000 public comments which were received and considered during the overall National Environmental Policy Act (NEPA) process (Lavigne 2002). According to Montana FWP, the plan seeks to (1) reduce the risk of brucellosis transmission from bison to cattle by keeping the animals away from each other; (2) maintain a wild, free ranging bison population; and (3) protect the economic interest and viability of Montana's livestock industry (FWP 2005(a)). According to the Department of Livestock, a partner agency helping to oversee the plan, the goals of the plan are to (1) preserve a viable, wild population of Yellowstone bison; (2) address the management of bison when they leave Yellowstone National Park; (3) reduce the risk of transmission of brucellosis from bison to cattle; (4) maintain Montana's brucellosis free status; and (5) protect private property (DOL 2005).

Another important factor is the geographic scale at which the implementation of this plan takes place. According to the National Park Service the region outside of the park that is within the plan consists of 568,994 acres of land, with 97% managed by the Gallatin National Forest, 1% managed by state or local government, and 2% owned by private landowners (NPS 2000(a)). Within this vast ecosystem the Forest Service manages a large portion of the territory occupied by bison that leave the park, as well as two grazing allotments in the Taylor Fork region on the

west side of the park (NPS et al. 2000). Along with physical scale, is the importance of political scale and history involving public land and wildlife management in the western United States. As Peter Morrisette states in his article "*Is There Room for Free-Roaming Bison in Greater Yellowstone?"*, the current, and future, quandary concerning Yellowstone's bison is more than a public health and safety issue. He goes into further explanation:

> "At its core, it is a conflict over who controls the management of the federal lands in Greater Yellowstone. Numerous federal and state agencies have jurisdiction over wildlife and the public lands in the Greater Yellowstone region. These agencies have overlapping and conflicting mandates on how to manage the public lands and wildlife. To understand whether it is possible to have a wild, free roaming herd of bison in America thus requires understanding the larger battle taking place over how to manage the federal lands outside the boundaries of Yellowstone National Park….This is an ecosystem that many environmentalists and resource management professionals would like to see re-established in some form. To ranchers, however, allowing bison outside the boundary of Yellowstone National Park means more than an increased risk of brucellosis; it entails surrendering influence over part of the public lands and accepting a vision of land management that may threaten their way of life." (Morrisette 2000)

Lloyd Burton comments on the issues bluntly and forthright in his essay titled *"Wild Sacred Icon or Woolly Cow? Culture and the Legal Reconstruction of the American Bison."* Burton reiterates that much of the rangeland to the north and west of the park is federal (public) land managed by the Forest Service, with most of the pasturage being leased to private cattle ranchers. He argues that migrating bison are resented by ranching interests in the region for two reasons: 1) the as-yet unsubstantiated risk of brucellosis transmission to cattle; and 2) because of the competition for water and forage on the public range (Burton 2000). Burton claims the ranching interests in southern Montana, and throughout the West, are not necessarily trying to eradicate bison. Rather, with both the demand for beef products and their prices continuing to fall, they see the potential in commercial bison ranching that may provide an economic boost to

the industry. The concern of some individuals in the ranching industry surrounds wild bison which given the opportunity to migrate would re-inhabit much of the federal range currently being leased to private ranching interests (Burton 2000).

Furthermore the "boundaries" of natural ecosystems such as the GYE have been discovered to rarely match the human constructed borders of federal and state land management agencies. Therefore, effective management on an ecosystem scale requires federal and state agencies to develop shared goals and objectives that will maintain the ecological integrity of a region, while also conserving genetic and biological diversity among species (Morrisette 2000). There are obvious conflicting interests within the region concerning such an emblematic species as bison, the realistic threat of disease, and how public land, and wildlife for that matter, should be managed. The goal of the agencies is to handle these issues in a cooperative management structure, and in the eyes of many in the region the jury is still out on whether or not they will find success.

Research Goals and Objectives

The purpose of this applied research is to assess various stakeholders' perspectives on the effectiveness of the IBMP and what relevant research that has been carried out on the topic suggests with regards to the plan's effectiveness. Through this research I hope to identify potential ways to improve the process and policies concerning bison management within the GYE.

Some questions will be posed throughout the process as well: Is the current management framework justifiable at an ecosystem level? Through discussions with various representatives of

the participating agencies and NGOs, do they see a possibility of establishing a collaborative based approach to management that would involve interested parties outside of the current federal and state agency structure?

Beyond the stated goals and questions, there will be a set of recommendations presented, which are based around discussions from the interview process as well as information gathered through research. To accompany these recommendations there is a thorough analysis of the history of bison in the region, and the ensuing management history up until the current time.

History

The current controversy ultimately falls under a policy paradigm filled with compromised federal and state agency mandates, bungled management plans halted and done away with because of state and federal disagreements and lawsuits, as well as unclear communication between the state and federal government concerning the "brucellosis problem." Mixed within these conflicts is the local, regional, and national conservation and animal rights groups who have spent the last decade plus protesting the methods of bison management both inside and outside of the park boundary.

The history of the bison, beyond the management perspective, presents a dark past, which entrenches symbolism with the eradication of a species, and some say the loss of a culture and the potential loss of a continuing lifestyle. Whether it is the Native Americans systematically losing a large portion of their cultural foundation, or ranchers being imposed upon because of the possible loss of grazing land and consequently economic stability, the bison has become the central figure of disagreement and hostility in the GYE for decades.

History of Bison Within the Greater Yellowstone Ecosystem

When early European immigrants landed on the shores of North America and later began to settle across the Great Plains during the early 19th Century, they found roughly sixty to seventy million bison (Brunner et al. 2002, Nabakov and Loendorf 1999). Along with the bison they discovered an indigenous human population who had been living with and off these immense herds for thousands of years. Tribes from Canada to Mexico depended on this animal to varying degrees, and it was a central figure in terms of subsistence and spiritual beliefs for the tribes of the Western Great Plains (Burton 2000).

The foundation of their subsistence on and culture around this animal would later be used against them in the latter half of the 19th Century at the hands of the United States military. The United States government discovered that the most effective, long term strategy for carrying out a war with the Plains Indians was to make war on the bison (Burton 2000). This is mentioned within federal records, as representatives from the Department of Interior testified before Congress in 1874 that it would be impossible to "civilize" the Plains Indians as long as the bison remained in existence (Cong. Record 1874).

By the early 1870's bison were being killed at a rate of about five million per year, and during this time Congress actually managed to pass a Buffalo Protection Act in 1874. Unfortunately, President Ulysses S. Grant blocked the enactment of legislation by allowing it to succumb to a pocket veto (Boradiansky 1990). By the turn of the 20th Century only a thousand buffalo were known to still exist in all of North America, with roughly two hundred of them

seeking refuge within the boundaries of Yellowstone National Park (Brunner et al. 2002, Burton 2000, and Morrisette 2000).

Yellowstone National Park was established in 1872 through Congressional legislation that stated the park would be "dedicated and set apart as a public park or pleasuring ground for the benefit and enjoyment of the people." (16 U.S.C. 21 (1994)). The Act gives further authority to the Secretary of the Interior, who "shall…provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition." The Secretary shall also "provide against the wanton destruction of the fish and game found within [the] park." The establishment of Yellowstone National Park had a twofold purpose of 1) public use and enjoyment, and 2) the preservation of nature.

Despite the legislative efforts put in place, poaching continued to be an issue within the park boundary until the late 1800's, as market hunters killed thousands of elk and bison within the Yellowstone boundary (Burton 2000 and Morisette 2000). In 1894, Congress took another step to protect wildlife within Yellowstone, by passing House Resolution 6442, which later would become known as the Lacey Act of 1895 (Brunner et al. 2002). Along with the protection of wildlife within the park boundary, the Act also enacted standards for punishment of individuals who knowingly killed or harmed wildlife within the park. Remarkably, in 1895 when the Act became formal law, the bison herd within the park stood at two hundred. Despite the legislation the herd was on the brink of extinction in 1902, as the population size dwindled to twenty-five bison (Brunner et al. 2002, Burton 2000).

Due to the continued threats to the park, a limited budget, and a lack of staff, Congress handed authority over to the U.S. Cavalry to protect the park from poaching threats, unauthorized development, and exploitation of resources (Haines 1977). The concern for the bison population within the park began to grow, and far-reaching steps were taken to preserve the remaining herd. It was decided that twenty-one bison would be introduced from captive breeding facilities in Wyoming, Montana, and Texas in 1902 (NPS 2000(a)). Although the native and captive herds were kept separate within an aggressive management scheme at the park's Buffalo Ranch in the Lamar Valley, they began to co-mingle between 1915 and 1920 (NPS 2000(a), Keiter 1997). After 1920 there was little effort being made to keep the two populations separate.

It is important to note that Congress had relieved the United States Cavalry of its duties in the park with the establishment of the Park Service in 1916 under the National Park Service Organic Act (Morrisette 2000). The Park Service Organic Act conveniently contains the same dual purpose within the 1872 Yellowstone Act. The Organic Act states that National Parks should be managed "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (16 U.S.C. 1, National Park Service Organic Act). Despite the language within the Act, the Park Service emphasized the public use mandate over the preservation of nature for the first fifty years, by interpreting the idea of nature preservation as a mandate to protect the scenery within the parks, rather than ecological integrity (Morrisette 2000). The early management of bison within the park boundary exemplified this

management paradigm. In 1922 the administration in the park suggested that a law be passed on the federal level authorizing the sale or disposition of some bison. Authority for this was granted within the Appropriation Act of 1923 (NPS 2000(a)).

Re-establishment of the Yellowstone Herd

By 1930 the number of bison within the park had reached over one thousand animals and the Park Service continued to manage the species intensively, as management took on the character of a livestock operation rather than overseeing a wild, free-roaming herd. The largest concentration of bison were found in the Lamar River Valley, within the northeast corner of the park, where they were kept in corrals, fed, branded, and excess bison were culled (Morrisette 2000). Eventually a number of the bison from the Lamar region were transported to the Hayden Valley, and along the Firehole River, to establish herds in other areas of the park. Park officials also began shipping bison to public parks, zoos, and private estates to manage the size of the herd (NPS 2000, Morrisette 2000).

Rigorous management of the Yellowstone herd continued between the 1920's and late 1960's, with increased intensity during some periods. It is estimated that the Park Service removed over nine thousand bison (mostly by slaughter) between 1925 and 1967 due to concerns surrounding natural carrying capacity and negative impacts on the range (Meyer and Meagher 1995). In addition to impact on the landscape it was discovered that *Brucella abortus*, or brucellosis, was being carried within the bison herd around 1917 (NPS 2000(a), Meyer and Meagher 1995). Serological tests, or blood tests, on aborting bison indicated brucellosis infection at the Lamar Buffalo Ranch during this time. The sources of the infection within the herd were

and are still unknown, but the most likely sources would have been either the bison that were introduced in 1902, which would have acquired the disease from cattle, or directly from the dairy cattle that were being raised at the Lamar Ranch during the same time frame (DOL 2005). This would be the first time that brucellosis became an issue within the GYE in terms of wildlife, despite efforts that had already begun at the national level to rid domestic cattle of the disease.

Brucellosis: A Brief Overview

The original strains of *Brucella abortus* were imported into the United States from European cattle and non-pasteurized milk. In 1918 Bernard F. Bang, a Danish physician found cattle to be reservoirs of undulant fever (Bang's Disease), which was caused by the Brucella strain. He went on to discover that it was the same organism that was causing abortions in dairy cattle (DOL 2005). Bang's discovery, surprisingly, occurred seven years after the Bureau of Animal Industry (BAI), which later would become APHIS, began to recover the organism from the milk of apparently healthy cows and from tonsils removed from children (DOL 2005). Brucellosis causes a number of issues in cattle, including abortion, infertility, and lowered milk production (APHIS 2005(a)).

Brucella abortus is essentially a bacterium that is found within the reproductive tract, but most transmission occurs directly by the licking of aborted fetuses and the grazing of contaminated forage (Dobson and Meagher 1996). The transmission of disease is thought to occur through ingestion of bacteria contained in the after birth of an infected female at the time of calving or abortion (Lancaster 2005). Despite this opportunity there is no scientific evidence or evidence introduced in court showing that the disease has been transmitted from bison to

cattle in a wild setting. Further research has failed to prove how the bacterium is transmitted among wild ungulates, and the Record of Decision (ROD) accompanying the IBMP states, "without agency actions to minimize the risk, transmission could occur." (Lancaster 2005).

Brucellosis in the GYE

The concerns involving the transmission of brucellosis from bison to cattle were not evident during the early 1900's, either from park staff or the surrounding livestock interests in the region. The major concern still dealt with eradicating the bacteria from livestock and impacts on the market, not wild animals. This focus on an eradication effort enabled the formation of the Cooperative State-Federal National Brucellosis Eradication Program in 1934, which focused on 100% eradication in livestock (Brunner et al. 2002). In 1952, Montana began an aggressive program to eliminate brucellosis from the state livestock industry, which would lead to brucellosis-free status in 1985 after more than $30 million was spent by the industry to comply with APHIS regulations (DOL 2005).

By the 1960's brucellosis was becoming less of a problem in domestic cattle as a result of vaccinations and continued cooperation between the ranching industry, state agencies, and the federal government (Brunner et al. 2002). During this period brucellosis surveys were being carried out sporadically within the park on bison showing a seropositive prevalence of brucellosis within roughly fifty percent of the population (DOL 2005). This became fuel for the fire as the United States Animal Health Association (USAHA), an organization consisting largely of professional veterinarians, began to believe, and push, the opinion that the disease within the bison herd and other wildlife was a threat to the successful eradication program in the livestock

industry (Brunner et al. 2002). This stance supplied a foundation for the brucellosis issue lending to differing interests vying for power and influence within the region. Despite the clear mandate of the Park Service, under the Yellowstone Act and the Park Service Organic Act, the agency began to succumb to pressure in the region and responded in 1962 with a policy of capture, test, and slaughter for bison that tested seropositive (Brunner et al. 2002).

The Leopold Report

During that same year Secretary of the Interior Stewart Udall appointed a small committee, which was headed by A. Starker Leopold, to assess the management of wildlife from a policy perspective in the National Parks. The committee was formed in response to the increasing criticism of Park Service management of wildlife, particularly in Yellowstone (Morrisette 2000).

In 1963, the committee released a fourteen page report that would profoundly change how our National Parks would be managed in the future. The report began by simply stating that the key to preserving the various species across the landscape was the preservation of habitat, not just protecting "desirable" species. This was a groundbreaking approach during that time in history and the philosophy of the committee brought the Park Service within the realm of ecosystem management. In 1964 Secretary Udall followed the recommendations of the report and issued a new policy statement for the management of our National Parks, stating that management should be "directed toward maintaining, and where necessary re-establishing, indigenous plant and animal life." (Morrisette 2000).

With the implementation of the Leopold Report the agency began a new era where protection of park ecology became the central focus of the Park Service's preservation mandate under the Organic Act (Morrisette 2000). In 1964 the program of capture, test, and slaughter of bison was terminated after the release of the report and a review from park management who determined the process to be ineffective and "never-ending" (NPS 2000 (a)). State veterinarians from around the region expressed their concern to the Department of the Interior as the studies within the park involving brucellosis ceased (DOL 2005). The Park went a step further in 1967, with the bison population standing at a paltry 397 bison, when they ceased controlling the size of the elk and bison herds in the park in favor of natural regulation (Keiter 1997, Morrisette 2000). It should not go unnoticed that as the agency took this approach, they also implemented a boundary control policy to keep bison from leaving the park. Whether or not this is considered natural regulation depends on differing perspectives and observations.

Beginning of Federal and State Conflict

Despite Yellowstone's policy to keep the bison herds on the north side of the park from crossing the boundary into Montana, movement began to increase by 1968. Yellowstone's bison population originally wintered in the park, but this would be the beginning of movement in great numbers. Since this became a regular occurrence, some observers have suggested that the bison's tendency to move outside of the park during the winter is due to depleted range within the park boundary (Chase 1986). There is data that counters this as well, suggesting that conditions concerning the range in Yellowstone are good, and that range conditions are not a controlling factor on the size, or movement, of the herd (Morrisette 2000). Since the early migration

patterns, another view has attributed the increased migration to the herds adapting to the use of the park's roads, which serve as snow machine trails during the winter (Meagher 1993). On the northern range many believe the bison may simply have learned of new foraging areas and have begun exploring this new food source (Keiter 1997).

Nine years later the Secretary of Agriculture re-established the Animal and Plant Health Inspection Service (APHIS), which is a bureaucratic arm of the Department of Agriculture (Brunner et al. 2002). The purpose of re-instating APHIS was to conduct regulatory and control programs to protect and improve animal and plant health for the benefit of man and the environment (Brunner et al. 2002). As mentioned previously, in 1985 APHIS granted Wyoming and Montana brucellosis-free status for their respective livestock markets (Brunner et al. 2002). The result was an increase in political strength for the livestock industry as demand began to grow for Yellowstone officials to re-instate monitoring and eradication programs geared toward the bison herd so they could maintain the brucellosis-free status granted by APHIS (Brunner et al. 2002). Yellowstone officials initially followed the long standing policy with the argument that transmission of the disease from bison to cattle is too minuscule to justify the handling of wild animals. There had never been, and still has not been, a recorded case of brucellosis transmission from bison to cattle on public or private land in Montana or Wyoming (Brunner et al. 2002).

Livestock Industry Digs In

Despite the lack of research during that time to back up their demands, the livestock industry within Montana continued to grow frustrated with Yellowstone officials for not taking a stand on the issue. Instead of working with the Park, the industry turned their attention to the

state veterinarian and the Montana Department of Fish, Wildlife, and Parks for support (Brunner et al. 2002). Through their efforts, the state began to take management into their own hands outside of the park boundary.

During the winter of 1984-85, the FWP shot over eighty bison that wandered into Montana and thus began direct and intensive control of bison by Montana state agencies (Brunner et al. 2002). These management strategies were carried out after a failed attempt during a Park-State-Federal meeting to establish compromise on the bison management issue. An eradication program proposed by the livestock industry was rejected in favor of the continued boundary control policy established by the park and the Department of Interior in 1978 (DOL 2005).

In 1985 the Montana State Legislature authorized a public hunt for bison that migrated beyond the park boundary, with fewer than 100 bison taken during the first three years (Keiter and Froelicher 1993). This brought on a lawsuit from the Fund for Animals. Eventually, it succumbed to the decision of a federal judge in Montana who would later uphold the state's power to authorize a public hunt outside the boundary (*Fund for Animals v. Lujan*, 794 F. Supp. 1015 (D. Mont. 1991)). Following the initiative of the state legislature, YNP developed and completed an Environmental Assessment (EA) to evaluate various experimental methods to control the herd when it began to migrate across the park boundary. The state urged herd reductions, and the park continued to choose a program of barriers and "aversive conditioning" (hazing) to change the migratory patterns outside of the park (DOL 2005). This policy only temporarily mitigated the migration of the Northern Range herd as they continued to

migrate beyond the park boundary each winter. The agency followed this up with a "cropping" policy, which subjected the bison to lethal removal beyond the park boundary by state wildlife officials, which inspired another lawsuit brought by the Fund for Animals that ended in favor of the Park Service (*The Fund for Animals, Inc. v. Hodel* 85 Civ. 250-BU (D. Mont. 1985)). This decision by the Park did not impede the removal of bison on the opposite side of the boundary line at the hands of licensed hunters, with the most brutal years in terms of extirpation, occurring in 1988-89.

During the winter of 1988-89, which was the first winter after the historic 1988 fire season that burned over 40% of the park, bison began to leave the park in large numbers in search of forage (Morrisette 2000). As a result of the mass migration, hunters in Montana killed over 500 bison beyond the park boundary. The hunt provided quite a spectacle for regional, and even national, media outlets as many of the hunters did not have the skills to kill one quickly and cleanly with one shot, which resulted in a gory scene of unabated slaughter (Burton 2000). Following the hunt, and the blemish it created for the image of the state, Montana Governor Stephens wrote to Yellowstone Supervisor William Penn Mott stating that current park policy was unacceptable because the lack of control over the bison herd was resulting in a series of problems for the state (DOL 2005). This was an understatement in the midst of a growing public outcry against the slaughter of bison as well as the fear of anti-hunting sentiments growing within public perception.

This would ultimately prompt communication between the Park and FWP, as well as a joint partnership between FWP and the Board of Livestock (BOL) concerning bison management

beyond the park boundary (Keiter and Froelicher 1993, DOL 2005). In May 1990 a Notice of Intent to prepare an Environmental Impact Statement (EIS) for bison management was published in the Federal Register, with a draft letter of agreement among the NPS, USFS, and FWP to develop a long term management plan for bison in Montana (DOL 2005). In July of the same year a letter from the Yellowstone supervisors to Governor Stephens indicated that trapping bison inside the park boundary as part of the eradication program was not feasible unless NEPA protocol was taken into account. Furthermore, the park informed the state that the long term plan and the initial stages of the EIS were under way but the park did not have the funding to accomplish the task on an expedited basis (DOL 2005).

During this time period, federal and state officials continued with the interim policy subjecting bison to lethal removal beyond the park boundary despite further challenges from the Fund for Animals concerning NEPA compliance within both the Montana federal district court and on appeal to the 9th Circuit Court of Appeals (Keiter and Froelicher 1993). Specifically, the organization alleged violations of NEPA within the EA that was prepared for the interim plan. During the EA process the Park issued a Finding of No Significant Impact (FONSI) under NEPA (Morrisette 2000, *Fund for Animals v. Lujan* 794 F. Supp. 1015, 1021-22 (D. Mont. 1991)). The court sided with the agency in both cases, while the state enacted an interim operating plan and EA in accordance with state law in December 1990 (DOL 2005). The 9th Circuit declared that preventing the spread of brucellosis was within the broader public interest and that the case had failed to show how management of bison would result in irreparable harm to the human environment (Morrisette 2000). Despite the success of the agencies at the judicial level, a

proposal by Yellowstone officials to shoot twenty-five bison within the park boundary to sample them for brucellosis was successfully halted by an injunction (Keiter and Froelicher 1993, *Fund for Animals v. Ridenour*, Civ. No. 91-0726 (D.D.C. 1991)). In response to the growing publicity and the increasing protest of the state's current practices the state legislature repealed the authorization for a hunt in 1991 (Keiter and Froelicher 1993).

Dictation through Litigation

The above mentioned cases were a few of the six different cases that came before the courts concerning bison management at the federal level. Not all of the cases encompassed increasing protection for the bison population. There is no doubt that the livestock industry faces serious ramifications if a herd becomes infected and stockgrowers wanted to be heard as well. Furthermore, the laws dictating interstate commerce, testing, and overall management of cattle for commercial use come out of federal regulations. The sixty year old law, which encompasses the eradication of brucellosis from the industry, also prohibits the interstate transportation of infected livestock (21 U.S.C. § 114a-1, Keiter and Froelicher 1993). This law is implemented by APHIS and imposes expensive testing and limitations on exports from infected states. Montana has achieved brucellosis free status and ranchers can freely move cattle without limitations or additional expenses.

The problem is that neither federal nor state law, until now in some sense, addresses the issue of brucellosis in wildlife. This is where the agencies are struggling because there is a lack of guidance and direction for managing the disease in ungulate populations with the looming threat of jeopardizing the brucellosis eradication program in regional livestock. To make the

issue more difficult, federal brucellosis eradication requirements have been interpreted differently in Montana and Wyoming, which does little to establish a consistent management policy (Keiter and Froelicher 1993). An example of this disparity lies within Wyoming law where there is nothing in place to address brucellosis in wildlife, despite the fact that they house the greatest number of brucellosis infected animals (Keiter 1997). Because of this disparity many of the legal issues surfaced in a two prong outcome, with one approach involving the sufficiency of federal bison management plans and the other involving government liability for brucellosis-caused damages (Keiter and Froelicher 1993). The cases involving the *Fund for Animals* would obviously fall under the scope of sufficiency.

The most important case that questioned government liability involved Wyoming rancher Thomas Parker, who sued both federal and state officials seeking damages for the losses he faced after slaughtering his herd due to brucellosis infection (*Parker Land and Cattle Co., Inc. v. United States*, No. 91 Civ. 0039-B (D. Wyoming 1991), *Parker Land and Cattle Co., Inc. v. Wyoming Game and Fish Commission,* No. 91-147 (Wyoming Supreme Court 1991), Keiter and Froelicher 1993). Parker claimed that both bison and elk, without distinguishing the source, contributed to the infection in his cattle herd. He further alleged that bison management policies (not elk) allowed infected bison to transmit the disease within his herd. The Wyoming district court denied his tort claim, yet within their decision they suggested that federal officials were negligently managing infected bison within the region (Keiter and Froelicher 1993).

Unfortunately, this case caused the agencies and the region to choose between the GYE bison herds and the local livestock industry. Within the litigation there were suggestions that an

award for damages due to brucellosis transmission would require federal land management agencies to eliminate public grazing rights on federal land, which would have forced a number of ranchers out of business (Keiter and Froelicher 1993). At the other end of the spectrum the boundaries of the park and federal lands have been deemed irrelevant and the need for managing wildlife populations at an ecosystem level has become more evident (Keiter and Froelicher 1993). Other factors and issues come into play as well. The case questioned the natural regulation policy of the Park Service and the impacts on adjacent private interests, as well as the soundness of traditional private property rights within a wild setting where these conflicts are somewhat unavoidable (Keiter and Froelicher 1993).

Despite the fact that the court absolved the federal government of any responsibility by finding that wildlife did not cause the outbreak, they still concluded that wildlife disease claims in a future scenario could be covered by the Federal Tort Claims Act statute (*Parker Land and Cattle Co., Inc. v. United States (1991),* Keiter 1997). According to Keiter and Froelicher the court's decision ignored precedent under the FTCA's discretionary policy exception (28 U.S.C. § 2680(a)), which upholds the belief that federal wildlife management policy is not reviewable through a tort claim (Keiter and Froelicher 1993). The end result, according to Keiter, is that Greater Yellowstone federal land managers are left with the presence of tort claim liability hanging over their wildlife management decisions, as well as a possible influence on regional public land livestock grazing (Keiter 1997).

It could be argued that the ramifications and outcome of both *Parker* cases would play an indirect role in the stance and decisions made by the federal agencies concerning bison within

the GYE. The ripple effect has carried over into current management practices where management authority has been handed over to the DOL, and the NPS and USFS continue to move forward with a management scheme that does not meld with their mandates.

Working Toward Cooperative Management?

The state and federal process of evaluation and drafting the EIS continued to drag on with typical bureaucratic speed despite the uproar from various interest groups in the region. Bison were continuing to be shot beyond the park boundary by the state agencies and the park continued to haze bison within the boundary area. The Park, the Gallatin National Forest, Montana FWP, and the DOL signed a Final Interim Operating Plan and EA in 1992 (DOL 2005). In October of the following year a letter was sent out updating the management plans indicating that a DEIS would be available for interagency and public review in early 1994 (DOL 2005).

As this planning process continued to unfold the state of Montana began to establish itself as the obstinate party concerning the management of bison within the GYE. In July, 1994, without a DEIS or solid agreement among the various agencies, Montana Governor Mark Racicot wrote a letter to Yellowstone officials expressing his concern about the lack of progress on the EIS and the continued hindrance of state management (DOL 2005). A significant factor was Governor Racicot's controversial decision to move bison management into the DOL which was passed in the 1995 state legislature. Before 1994 the Montana Department of Fish, Wildlife and Parks (FWP) were in charge of managing bison outside of the park boundary and with a stroke of the pen Governor Racicot transferred authority for dealing with bison from FWP, to the Montana Department of Livestock (Lavigne 2002).

Once control was handed over to the DOL, Montana began to operate on an interim plan that consisted of a zero tolerance policy for bison beyond the park boundary, where DOL and FWP staff continued to administer lethal control of the population (Lavigne 2002, Keiter 1997). Montana became one state among five who operated under "dual designation" for the management of bison. The Montana statute calls for coordination between the DOL and FWP regarding wild bison, but it gives specific, preemptive authority to the livestock department whenever disease control or "estray" is concerned, which ironically is a term used to describe domestic animals that are wandering or lost (Burton 2000, Mont. Code Ann. § 87-2-101 (1998), Mont. Code Ann.§ 82-2-120(i) (1998)). Furthermore, Montana's poaching statute indemnifies from prosecution any rancher who kills wild bison on their private land (Burton 2000).

In 1994 Montana appealed to the federal government once again when Governor Racicot wrote to President Clinton expressing his concern about Montana's inability to solve a problem that involved the conflicting policies of two federal agencies, as well as a request for cooperation from the Secretaries of Agriculture and the Secretary of the Interior (DOL 2005). Between 1990 and 1995 three interim plans called for shooting bison that migrated beyond the park boundary (Lancaster 2005). Patience began to run thin within the state and communication on behalf of the federal government was non-existent. In January 1995, Montana sued the Park Service and APHIS in federal court stating that the park was not adequately controlling bison migrations and that APHIS was putting the state in an impossible position concerning the threat of disease. A 1994 letter from APHIS stated that the brucellosis-free status could be downgraded if bison migrations went uncontrolled within the state (Lavigne 2002, DOL 2005).

It was later discovered that the state encouraged this prospect based on the minimal threat from bison. The agency (APHIS) has stated that Montana asked APHIS to threaten Montana's class-free status. According to the director of APHIS legislative and public affairs during that time, "Montana called [APHIS] and requested that the letter be written…. because they wanted cover to deal with bison in the way they saw fit." (Lowe 1998). This same article cited evidence that the state veterinarian at the time contacted fellow veterinarians in neighboring states and encouraged them to threaten sanctions related to the disease if bison were tolerated beyond the park boundary (Lavigne 2002).

Despite the continued friction between the state and federal governments, the parties settled the suit by adopting a schedule for a completed EIS and a long term bison management plan within the region (Lancaster 2005). The settlement included a provision where the court would dismiss the suit with an issuance of a Record of Decision (RoD), or if one of the parties terminated the Memorandum of Understanding (MoU) (Lancaster 2005).

From 1990-1995 three interim plans were put in place which called for lethal control of bison beyond the park boundary, with a fourth interim plan put in place in 1996 after the court settlement (Lancaster 2005, DOL 2005). The fourth plan was modified beyond lethal control and provided for slaughter outside of the park in West Yellowstone, as well as untested bison within the Park near the northern boundary in the Stephens Creek region. The only concession made for bison provided them an opportunity to forage within the Eagle Creek/Bear Creek area on the northeast side of Gardiner (Lancaster 2005). Many argue that this is hardly a concession considering that those lands have never been set aside for domestic cattle to graze (Lancaster

2005). A contentious provision in the fourth interim plan called for the capture and testing of bison within the park boundary and Gallatin National Forest, as well as the subsequent slaughter of pregnant and positive-testing bison (Lancaster 2005). During the implementation of the interim plan, over 1,000 bison were removed from the GYE between November and April due to the regulations in the plan, and the unusually harsh winter of 1996-97 (NPS 2005). Of those bison killed, 1,084 were shot or slaughtered, 39 were used for research purposes, while others died of starvation or other natural causes within the park boundary (NPS 2005). The total population of bison, after the winter of 1996-97, fell from an estimated 3,500 in the Fall, to an estimated 2,000 bison by early Spring of the following year (NPS 2005).

Litigation Ensues

Following the initial implementation of the interim plan the Greater Yellowstone Coalition, along with the Intertribal Bison Cooperative brought a lawsuit to enjoin continued implementation of the plan and the continued killing of the Yellowstone herd (Burton 2000, *Greater Yellowstone Coalition v. Babbitt*, 952 F. Supp. 1435 (D. Mont. 1996)). These groups alleged that the Park Service had violated NEPA by not preparing an EIS for the Interim Plan and alleged under the Administrative Procedures Act (APA) that the plan violated both the National Park Organic Act and the Yellowstone Act (Morrisette 2000). Specifically, the Coalition argued that the plan was arbitrary and capricious within the realm of the APA, because it violated the National Park Service mandate under the Organic Act to conserve bison and leave them unimpaired for future generations. Furthermore, the lawsuit argued that under the Organic Act,

bison must be a detriment to the park and the resources within the park before they can be destroyed. The final argument was that the Yellowstone anti-poaching statute applied to the Park Service, and therefore the interim plan violated the law (Morrisette 2000, Lancaster 2005).

The court sided with the agencies (specifically the Park Service) on all three arguments in the case. In response to the first argument the court claimed that the Park Service's decision was based on an approved management plan, and therefore within the agencies discretionary power under the APA. The response to the second argument presented an interesting perspective, as the court began to take ecosystem management into account. The court concluded that the agency had statutory authorization to cooperate with the state, and that cooperation was necessary to manage the herd within a wide regional and ecosystem framework. The decision implied that if the agency failed to cooperate with Montana it would cause a detriment to the herd because the bison would be confined to the park where overpopulation would ensue and the bison would starve. In the end, the court used their interpretation of ecosystem management, in accordance with the Organic Act, to uphold the interim plan as a boundary protection program for the herd (Morrisette 2000). In terms of the argument surrounding anti-poaching legislation, the court stated that application of the anti-poaching statute to the agency would conflict with the agencies statutory authority to sell or dispose of surplus bison when it is necessary (Morrisette 2000).

The end result was the district court denying the parties a motion for a preliminary injunction to stop implementation of the interim plan, as well as a motion for a stay of the court's order pending appeal. On appeal to the Ninth Circuit Court, the district court's decision was upheld in its entirety (Morrisette 2000, *Greater Yellowstone Coalition v. Babbitt* 108 F.3d 1385

(9th Cir. 1997)). As Peter Morrisette states, "in two major legal challenges to the Yellowstone interim bison management planning process (the 1991 suit pursued by The Fund for Animals and the 1997 Greater Yellowstone Coalition suit), the courts have consistently upheld the process." He goes further stating that, "Not only [did] the courts dismiss the NEPA challenges, but in the [1997] lawsuit the court held that the Park Service has broad discretionary authority over how it decides to manage bison….[and] the interim planning process [allows] the Park Service to make substantial policy decisions regarding the management of bison." (Morrisette 2000). The public outrage was evident as the various lawsuits that had been brought forth over the previous five years displayed.

Increasing Frustration

On February 26, 1997 Interior Secretary Bruce Babbitt sent Governor Racicot a letter urging him to stop the killing and to work with the various agencies to identify immediate solutions aimed at saving the bison herd (Department of Interior 1996(b)). Babbitt continued to make pleas within the media and spoke directly to the state demanding that, "[The] needless and unnecessary shooting of Yellowstone bison must stop now…[the] continued killing of bison by the State of Montana is threatening the future of America's free roaming wild herd." (Department of Interior 1996(b), pg. 1). The Department went further stating that there were no documented findings or cases of cattle contracting brucellosis from bison in the wild and that although elk were a major carrier of the disease, Montana allowed them to migrate freely throughout the state (Department of Interior 1996(b)).

During that year Montana state agencies and the cooperating federal agencies discussed

the current situation and began to implement adjustments to the 1996 interim plan which were designed to reduce the number of bison shot or shipped to slaughter (NPS 2000). These adjustments included increased emphasis on hazing bison back into the park, holding bison to the capacity of the Stephens Creek capture facility on the west side of the park until weather conditions moderated, and allowing "low risk" bison that evade capture into the West Yellowstone area for thirty to sixty days (NPS 2000). This, of course, had to be approved by the state as well. Under the amendments, the state agreed to allow these bison to remain on public lands within the Gallatin National Forest during the winter at the discretion of the state veterinarian (Morrisette 2000). Under the 1996 Interim Plan bison within the capture facility on the west side of the park, as well as the facility within the park boundary, were sent to slaughter, while under the amended plan only those animals that tested positive for brucellosis were sent to slaughter (Morrisette 2000). Montana DOL and FWP also agreed to haze bison back into the park boundary or onto public lands designated for bison whenever practical, rather than continuing to use lethal controls. Interestingly, under the amended policies, no effort was made to adjust grazing allotments on National Forest land outside of the park to accommodate the needs of those bison that continued to leave the park boundaries during the winter (Morrisette 2000).

Despite the warming relations among the federal and state agencies, this situation was not as positive as it may seem on paper. The Council on Environmental Quality (CEQ), which is one of the many arms of the executive branch, became involved in the process to mediate a cooperative effort between the agencies involved in the process (Brunner et al. 2002). A second piece to the puzzle also came into place, as the CEQ convinced APHIS to change the definition

and give leeway to the Montana livestock industry concerning possible brucellosis transmission outside of the park boundary (Brunner et al. 2002). The role of APHIS within the process was to educate and notify other states about the low risk of bison passing the disease onto cattle within the region (DOL 2005). At this point the CEQ carried the responsibility of coordinating and enforcing the policies that had been laid out in the amended plan (Brunner et al. 2002).

Moving Forward with the EIS Process

After repeated lawsuits and failed implementation of numerous interim plans during the previous ten years a serious effort was underway to set a formal timeline for a Final Environmental Impact Statement (FEIS). This was realized despite the fact that work on a long-term plan officially began in 1989, with a target date of completion set in 1992 (Morrisette 2000, Lavigne 2002). The winter of 1996-97 also fueled the fire for various public interest groups to further their involvement in the process and to begin a draft for an optional plan.

During this time over nineteen groups formed a coalition to support the Citizens Plan to Save Yellowstone Bison as an alternative to the interagency planned EIS, which was due in 1998 (Brunner et al. 2002). The Citizens Plan was supported by over 7,500 individuals and family members, 125 local, regional, and national member organizations, and 125 business and corporate members (Brunner et al. 2002). The organizations involved in the process were aiming to create a new scale of bison management within the region, which would make the park boundary more permeable to bison and allow the animals to be regulated on an ecosystem level through cooperation between the federal and state agencies (Lavigne 2002). Much of this effort was orchestrated by the Greater Yellowstone Coalition (GYC) based in Bozeman, Montana,

which lies on the northern side of both Gardiner and West Yellowstone, Montana.

The Coalition's goal was embedded in the philosophy of ecosystem-based management. Their argument conveyed the idea that the overall health of the Park is dependent upon the perpetuation of the larger ecosystem which surrounds it, which is a vast and politically complex area including overlapping jurisdictions of two national parks, three states, twenty counties, seven national forests, and three national wildlife refuges (Lavigne 2002). The GYC "insisted, as we have for years, that the direction of a cooperative management plan should be towards supporting a sustainable population of bison, recognizing the needs of this and other migratory species to cross artificial political boundaries" (GYC 1990). This process involving the Coalition and the draft of an alternative plan was coordinated alongside the official process among the involved agencies.

The agencies, as well as the public, realized that the previous interim plans were always intended as stopgap measures until the implementation of a long-term plan dealt with the management of the species in the GYE. In May 1998, the DEIS for a long-term plan was released for review. Obviously the efforts of the Coalition and various organizations nationally and regionally, could not go unnoticed by the agencies, nor could the bison issue be hidden from national view.

In the opinion of the involved groups in the Coalition none of the seven alternatives proposed by the agencies provided adequate protection for bison leaving the park and they began to construct and distribute their own "preferred alternative." (Lavigne 2002). The Coalition officially released the Citizens' Plan to Save Yellowstone Buffalo in June, 1998 alongside the

official DEIS which was released the previous month. The differences between the plans were evident in the Coalition's greater tolerance for bison on public lands in the GYE, specifically within the Gallatin National Forest (Lavigne 2002). When it came to discussion about contact between bison and cattle, the Citizens' Plan viewed the cattle as the animals which should move from the area, with incentives to encourage landowners to change their grazing practices in ways that reduce contact, and conflict, between cattle and bison in the region (Lavigne 2002, GYC 1998). The major focus within the alternatives was enforcing a time separation (temporal and spatial separation) between the two animals, which is something the Forest Service could achieve by setting back, or delaying, the starting date for summer grazing on the allotments they manage (Lavigne 2002, GYC 1998). To control the population size the Coalition supported the standard version of game management in the region with annual harvests through public hunts.

Along with a hunt to control larger herd size, the Coalition recommended the idea of capturing some bison and transferring them to Native American ownership within the region for eventual release on reservation lands, with support from several tribes in the state. The final proposal demanded that jurisdiction over the species in Montana should be removed from the DOL and returned to MFWP. The Coalition believed that the DOL's interests and investment in the ranching constituency that supported the agency was the primary obstruction for bison on public land (Lavigne 2002, GYC 1998).

The document containing the Citizens' Plan was distributed widely within the region, with a prepared letter for individuals to sign and send to the NPS office that was coordinating the EIS process (Lavigne 2002). During the 120 day comment period, which ran from June until

October, 1998, the NPS received over 60,000 comments on the DEIS, which included over 40,000 in support of the Citizens' Plan (Lavigne 2002). Despite the overall support for the Citizens' Plan, the agencies chose their own strategy, which integrated some of the suggestions of the Citizens' Plan, yet stuck with the status quo over the past decade. The agencies did adopt a new strategy that would allow more tolerance for bison outside of the Park boundary under "stringent conditions that would continue to control the risk of transmission of brucellosis from bison to cattle." (Lancaster 2005).

According to the agencies this strategy was a possible modified preferred alternative for the FEIS, which would provide for a larger bison population than the preferred alternative in the DEIS (Lancaster 2005). This proposed plan was based around maintaining both a free-ranging bison herd within the Park and protecting Montana's livestock from brucellosis transmission outside of the Park boundary. Ultimately, this was no different than the interim plans that had been juggled previously where natural regulation of the herd would continue within the park boundary, and lethal control would remain in place to manage bison outside of the park. In this proposal the plan identified a target herd size for the first time, which would range between 1,700 and 2,500 bison (Morrisette 2000). As the herd approached the low end of these numbers, the plan would call for stopping lethal control of bison beyond the boundary, with a capture and slaughter method used when the herd went beyond 2,500 (Morrisette 2000). This idea was presented as a dynamic equilibrium for bison within the park, because of the lethal controls administered beyond the boundary (Morrisette 2000).

This would initiate the stages of the "capture, test, and slaughter" method administered by

the NPS, DOL, and MFWP. Furthermore, the plan proposed the idea of special management areas (SMAs) on National Forest land beyond the Park boundary, where bison would be tolerated as long as they "posed no risk to cattle" (Morrisette 2000). Of course bison could not access these SMAs very often, because the plan proposed herding bison attempting to leave the park into capture facilities where they would be tested for brucellosis. The bison that tested seropositive would be sent to slaughter, while those animals that tested negative would be "tagged and released" onto open public land, sent to a quarantine facility, or shipped to slaughter (Morrisette 2000). All of this, of course, depended on the overall size of the bison herd during that time. If possible, bison would be hazed back into the Park or into the above mentioned SMAs, and those that avoided capture and hazing would be shot (Morrisette 2000).

The primary SMAs proposed within the plan would run along the northern border of the Park from Gardiner to Cooke City, Montana, as well as the northwestern boundary from West Yellowstone to the northwestern tip of the Park. These SMAs represent an area beyond which bison would not be tolerated and they would be "actively" managed to prevent further conflict with cattle in the region (Morrisette 2000). The bison within the SMAs would still need to be removed from thirty to sixty days before a rancher planned to release cattle onto that landscape, with no adjustment to existing grazing allotments on the federal land within the same SMAs (Morrisette 2000).

Other elements of the proposed plan included vaccination of bison, as well as a limited public hunting season beyond the boundary to control the size of the herd. This would also require the approval of the Montana state legislature (Morrisette 2000). Because of the potential

environmental impact of a proposed vaccination program this effort would likely require its own NEPA review, as well as a potential program for elk in the region since they carry the disease as well. This proposed plan was more tolerant of bison on federal land beyond the Park boundary compared to previous interim plans, yet the proposed plan did not envision a functioning bison ecosystem extending beyond the boundary as the Citizens' Plan proposed. The long term proposal also seemed to display a shift in the philosophy of the Park Service not seen since the 1960s in terms of wildlife management since the herd would be managed based on a targeted size.

Tribal Voices are Heard?

In November, 1998 the federal court in Montana handed down a decision for *Intertribal Bison Cooperative v. Babbitt* 25 F. Supp. 2d 1135 (D. Mont. 1998), where the effort of several dozen tribes and conservation organizations to stop the killing of bison outside of the park was rejected. The court based much of the decision around previous rulings that were reached during the litigation between Montana and the federal government. Despite the fact that the state was unable to prove transmission of brucellosis had ever actually occurred between a bison and cow, the court found that it was within Montana's police powers to protect public health and safety by "removing possibly infected YNP bison that migrate into Montana" (*ITBC v. Babbitt* (1998), Burton 2000). The court justified their stance further by relying on the history of the bison herd and how it was previously managed to conclude that the herd was more domestic than wild. The result was framed around the federal government failing to comply with state estray and animal disease control statutes, and therefore, were negligent livestock managers.

The court also relied on the decision at the district court level from 1991, which found that the carrying capacity of the YNP herd was approximately 2,400 animals. This served as the rationale for the park superintendent's decision to allow all of the bison beyond that number to be killed upon exiting the park. This idea of carrying capacity and lethal management beyond a certain number was established during the 1995 lawsuit between the state and federal governments where it was deemed within the state's authority to kill bison under "emergency conditions" (Burton 2000).

During that time the National Academy of Sciences determined in a report that the carrying capacity inside the park was "about 3,000 bison" (National Research Council 1998, Burton 2000). This same report found that the risk of bison-to-cattle transmission was so low that it was not quantifiable. As Lloyd Burton keenly points out, in order for the court to find lethal management of animals reasonable, they "had to rely on a seven year old court decision rather than the latest evidence from the most authoritative governmental source of scientific information." (Burton 2000). Within the decision the court also upheld the FONSI for the current management scheme, which negated the preparation of an EIS.

Lloyd Burton does an exceptional job of comparing this case to a similar issue heard in the Washington, D.C. district court concerning bison management in Grand Teton National Park. In *Fund for Animals v. Rappaport,* (27 F. Supp. 2d 8 (D.D.C. 1998)) the court granted a preliminary injunction against a bison management plan on federal land adjoining GTNP, which would have allowed the Wyoming Game and Fish Department to kill bison to control herd size (Burton 2000). The two reasons the court gave for the injunction were that the USFWS failed to

comply with NEPA in authorizing the hunt and had also failed to demonstrate the likelihood of brucellosis transmission from bison to cattle if the hunt was not able to move forward (Burton 2000, *Fund for Animals v. Rappaport* (27 F. Supp. 2d 8 (D.D.C. 1998).

As Burton points out, the court agreed with the NAS study, which pointed out the approximate possibility of transmission and decided that this was not enough to warrant lethal management of bison. The D.C. court also agreed with testimony in the case that there was "virtually no risk" of human infection by the disease. Both of these perspectives and the ensuing decision were vastly different than the *ITBC* decision despite the similarities in both cases.

It should be noted that in both cases federal agencies were the defendant, because in both situations the agencies entered into agreements authorizing state agencies to kill bison that were "housed" on federal land (Burton 2000). Both cases asked the question of whether the federal agencies had evaluated the impacts of the killing under NEPA statutes, whether scientific evidence was sufficient enough to support lethal management, and the extent of state agency authority pertaining to the control of wild bison on federal land (Burton 2000). In both cases the federal agencies sided with the states.

The Coalition Continues to Present Alternative Views

During the process and subsequent communication surrounding the FEIS the Coalition continued to propose their views on the plan with counter arguments for the participating agencies. The GYC and participating groups focused their attention around the minimal risk that bison presented to cattle, the economic costs of intensive bison management versus the benefit to the state's ranching economy, and raising questions about the role of elk within the surrounding

ecosystem (Lavigne 2002).

In terms of risk presented to cattle the Coalition emphasized the fact that there had never been a confirmed case of brucellosis transmission from bison to domestic cattle beyond a research setting (Lavigne 2002). They argued that the risk of transmission could be considered a minimum through many factors: (1) it is unknown whether bison are capable of transmitting brucellosis to cattle, (2) the two species do not occupy the same landscape simultaneously, and (3) relatively few bison actually carried the disease, and fewer are capable of producing the bodily fluids which contain the active strain of *Brucella abortus* (Lavigne 2002).

In terms of economic issues the Citizens' Plan claimed that Montana ignored common sense solutions to the problem in favor of alternatives that would require taxpayers to pay well over a million dollars a year for bison to be caught and tested both inside and outside of the park (GYC 1998). The justification for control of the bison has always been the protection of livestock, yet by the late 1990s more than 2,000 bison had been killed to protect less than 2,000 cows that occupy grazing allotments within the region (Lavigne 2002). To put this in perspective the cattle population within the region is less than one tenth of one percent of Montana's 2.6 million cattle (Lavigne 2002). This, in combination with grazing fees, or Animal Unit Month (AUM) payments, that have never been adjusted since the historic starting point produces a very disparate cost versus benefit analysis. Within the GYC's literature they state that under an AUM of $1.50/AUM/year, the USFS receives roughly $6,500 a year for all cattle on public allotments at the border of the Park. During that same time, the Montana DOL spent over $200,000 in 1997 on bison operations and equipment, with a proposed 1998 budget hovering above $400,000

(GYC 1998). The case could be made that it would be less costly to vaccinate cattle within the region since APHIS had offered to pay for the vaccination program within the area, despite the effectiveness of the vaccine being under 100% (Lavigne 2002).

The third argument of the Coalition centered on the issue of elk within the region. Elk are a prominent ungulate within the region, yet their movement and migration patterns are almost completely unrestricted. The Citizens' Plan stated that even though elk have supposedly been infected at a lower rate than bison (approximately 2% for the northern herd but as high as 30% on the National Elk Refuge in the southern region around Grand Teton National Park) there are many more within the ecosystem: an estimated 120,000 (Lavigne 2002, GYC 1998). Another important issue to note is that numerous elk calving grounds overlap with cattle range on both private and public lands. The argument revealed the political character of the debate by exposing the fact that elk are a major source of revenue within the area, bringing more than an estimated $100 million per year into Montana and Wyoming (Lavigne 2002). Many have spoken about this issue and the political and economic impossibility of managing the elk as intensely as bison. Not only would the state lose money, but the residents within the state and the outfitters who depend on the elk hunting season each year would protest loudly if any management scheme similar to current bison management was implemented for elk. The question remains on whether these groups would support a larger public hunt on bison over the short term.

Despite overwhelming support, the Citizens' Plan was ignored by the government and the decision to adopt the proposed plan in the DEIS was implemented, despite the similarities with the Interim Bison Management Plan from 1996 (Lavigne 2002). Not only did the public support

the Citizens' Plan, but the secretaries of the federal agencies involved in the process showed support for it as well. In a letter written to Governor Racicot in 1997 Secretary of Interior Bruce Babbitt and Secretary of Agriculture Dan Glickman outlined their objectives for bison management in the region. They communicated the need for additional winter range for bison, which would come from national forest land as well as easements made available by willing property owners. They recognized the need to control the size of the herd with recommendations geared toward removal to Indian reservation lands and the resumption of an ethical public hunt. Finally, they recognized the objective of eventual eradication of brucellosis in bison and elk. In terms of the final objective, they acknowledged that brucellosis eradication would require the development of a safe and effective vaccine, as well as a new approach to eradication due to special circumstances within the GYE (Lavigne 2002). Despite the proposals from various levels the agencies moved forward with the proposed alternative and Montana continued to hold their authority over bison management beyond the park boundary.

Scientific Justification for the Park's Original Stance and the Citizens' Plan

One of the main federal agencies, APHIS, and probably the biggest proponent of the eradication program will admit many of the stances presented by the Citizens' Plan and the NPS over the previous decade are justifiable. Mary Meagher and fellow colleagues have carried out numerous research projects, with much of the findings justifying the Park's initial position against capturing and testing the bison population within the park. For example, on APHIS' website, they include information about research conducted in 1990 at Texas A&M University, which demonstrated that bison infected with *Brucella abortus* could infect cattle through

prolonged contact, but this was proven under controlled conditions (APHIS 2005). This experiment was severely criticized because of the use of an unusually large infective dose and for the limited efficacy in the Yellowstone ecosystem, where both bison and cattle are free-ranging and do not spend their time restrained in close quarters (Meyer and Meagher 1995). Furthermore, the researchers involved in the project stated that it is difficult to document the transmission of the disease in wild settings. The most striking statement, which continues to be ignored in the current management scheme, found that infected elk, rather than bison, were the most probable source of brucellosis infection in cattle (APHIS 2005).

Since that time much has been accomplished in terms of prevalence of brucellosis within the elk and bison populations within the GYE. Many of these studies arrive at similar conclusions about brucellosis in bison, the reproductive consequences within the population, and the overall effects on the ecosystem. The elk population within the GYE, specifically around the feed lots managed by the United States Fish and Wildlife Service (USFWS), cannot be ignored in this research as they have played a major role in brucellosis threats in the region over the past several decades.

Research has found distinct differences in pathology levels associated with *Brucella abortus* in elk, bison, cattle, and other host species. For example, in experimental elk populations, around 50% of infected cow elk aborted their first calf, and sometimes the second (Thorne et al. 1978). This is similar to the situation found in the elk population around the Grand Teton National Park (GTNP) elk feed grounds in Wyoming. Within the Yellowstone bison population *Brucella abortus* does not seem to cause any noticeable pathology (Meyer and

Meagher 1995). The same research shows that as the herd has grown, the impact of the pathogen on productivity for bison seems to be minimal. In fact, brucellosis has the opposite effect on the elk and bison populations present on the National Elk Refuge adjacent to GTNP, where abortions among both populations are prevalent (Dobson and Meagher 1996).

This supports the theory that virulence differs depending upon the host species, whether it is elk or bison, and the intensity and scale of exposure. Furthermore, the serological tests used to determine the presence of brucellosis in elk and bison were originally developed for cattle. Unfortunately, despite basing current management around serology, the tests do not extrapolate efficiently to bison and elk (Dobson and Meagher 1996). Of particular concern is the large numbers of false positives and negatives that occur during serological testing. As Margaret Meyer's research shows, serological testing conducted with blood samples may indicate the presence of brucellosis antibodies in bison, but it is only possible to positively identify the animal as infected if positive cultures are gathered from the tissue of that specific animal (Meyer 1992). Dobson and Meagher (1996) concluded, through their subsequent research, that the incidence of *Brucella abortus* within the Yellowstone herd should be treated with extreme caution unless accompanied by data from tissue cultures. Their research took advantage of data sets, containing both serological and tissue cultures collected from the population between 1917 and 1992.

They concluded through these surveys that sero-prevalence within the population varied between 20 and 65-70%, while culture tests indicated a prevalence hovering around 10%. This would suggest that the estimates of brucellosis within the herd based around sero-prevalence

greatly overestimate the true level of infection within the bison population (Dobson and Meagher 1996). The inconsistencies found within serological testing continued to be found during scientific studies. Dobson and Meagher found that although the serology test accurately identified infected animals, the tests also gave a large number of false positives that reached upwards of three times the amount of true positives. These numbers suggest that the true prevalence of infected bison in Yellowstone is more in the range of 10-15%, rather than the 40-60% suggested by the serology samples that have become the foundation for the IBMP (Dobson and Meagher 1996). Of great importance was the prevalence among the female population, which presents the greatest threat to cattle due to the risk of infected after birth left on the range each spring. None of the female bison examined in their research showed evidence of reproductive tract lesions that may reflect abortion due to the brucellosis strain. This would suggest that the *Brucella* pathogen is relatively mild toward bison and the absence of any tendency toward prevalence for either the culture or serology data suggests that there is no significant mortality associated with brucellosis in bison (Dobson and Meagher 1996).

In order to truly discuss and dissect the brucellosis issue within the GYE, elk need to be brought into the conversation. Much of the research that has been conducted around the bison population has overlapped with the elk herds on both the south and north end of the Park. The prevalence of brucellosis within the elk population has remained low overall, with the exception of higher prevalence in the herds within the elk feed lots on the south end of the GYE. Through calculations during their research, Dobson and Meagher found that the numbers of infected elk on the northern range of Yellowstone are similar to, or greater than the numbers of infected bison

within the same region. This would imply that elk are as great a threat to cattle as bison (Dobson and Meagher 1996). Yet, the risks of elk transmitting brucellosis to cattle within the region have not been a topic of discussion within the management realm, nor is it mentioned within the IBMP.

The findings presented in their research suggest that we would need to almost eradicate the bison population before we could produce significant reduction in prevalence. This, of course, is a loaded statement and becomes even more profound when they state in their article that "the levels of removal required to eradicate *Brucella* may be sufficient to also drive the bison to extinction." (Dobson and Meagher 1996). This is a disturbing statement and issue that the managing agencies must confront in the ensuing management phases. It would seem that this possibility would not only have ethical impacts, but it would simply go against the mandates of the Park Service, the Forest Service, and Montana Fish, Wildlife, & Parks, who have a responsibility to manage species for longevity and the benefit of the overall public.

The continued discussion in management circles focuses on "cleaning up" the herd, or "fixing" the brucellosis issue within the bison population. Beyond the current capture, test, and slaughter paradigm is the push for research that would develop a vaccine for bison and other wild ungulates. The current RB51 *Brucella* vaccine, as well as the strain 19, that is available for cattle had been used with limited success on elk, and marginal success with bison (Davis et al. 1991). As of the last status report released by the partner agencies it was found through various research that the effectiveness of RB51 to protect against aborting pregnancies in bison did not provide consensus on overall efficacy (Olsen et al. 1997, Olsen et al. 1998, Davis and Elzer 1999, Elzer

et al. 2002, Clark et al. 2005).

The FEIS Process Begins

As stated previously the official process for the EIS began in the late 1990s, but comments on the FEIS began in 2000 and the EIS was approved during the winter of 2000-01. Before this could occur there were still hurdles that had to be cleared. In December, 1999 the participating federal agencies informed Montana that they were withdrawing from the Memorandum of Understanding, due to a lack of agreement surrounding ages and classes of bison to be vaccinated, when bison would be able to leave the Park, and the use of spatial and temporal separation within the adaptive management scheme (Lancaster 2005). The courts sided with the federal agencies and before the process could be initiated an agreed upon mediation occurred before the dismissal of the suit in 2000 (Lancaster 2000). The issue continued to be mired in controversy, with input from all sides of the spectrum and a significant amount of public participation. After the Citizens' Alternative was ignored, the agencies considered eight alternatives for the EIS, all involving and considering management on varying scales of intensity as well as the eventual eradication of brucellosis playing a role in many of the management schemes. It is also important to mention that Joint Management among all agencies was included in the alternatives.

Summary of the Eight Alternatives

Alternative 1 was considered the no-action alternative, in the sense that it would still adhere to the existing interim plan, and Alternative 8 was considered the modified preferred alternative, or the adaptive management approach (NPS 2000 (a)). The eight alternatives had

several features in common. All of them benefited from, and in some cases required, the cooperation of Montana, the Forest Service, the NPS, and APHIS, as well as various state agencies (NPS 2000 (a)). Every alternative envisioned the bison population being able to be managed primarily through natural processes inside the Park, yet there were only a couple of alternatives that offered this management alternative beyond the Park boundary (NPS 2000). In all of the alternatives (except Alternative 5 in the short term) lethal controls to manage bison would be minimized as the herd population approached 1,700 animals. Each alternative would include large geographic areas where bison could range and migrate with little human intervention.

Monitoring the herd was a fundamental part of all the alternatives, especially as the herd would begin to approach the boundary and migrate into Montana (NPS 2000 (a)). All of them included and defined a management boundary beyond where the agencies would take action to ensure bison would not remain once cattle were grazing in the region during the late spring and throughout the summer. This trend in the alternatives seems to be geared toward property rights (even public property) as research has shown that bison do not range outside of the park during this time of the year. If a capture facility was cited as part of an alternative, it would have to comply with certain environmental criteria, such as viewsheds, and it would have to comply with requirements under the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA) before construction began (NPS 2000 (a)).

All of the alternatives included the humane treatment of bison held in quarantine facilities (NPS 2000 (a)). All of the alternatives, with the exception of Alternative 5, would allow bison

beyond the park boundary and they would be managed to minimize impact on Montana's brucellosis free status. Special Management Areas (SMAs) or management zones (in the case of the modified alternative) would be created on the west and north sides of the park boundary. They also included language allowing slaughtered bison to be auctioned or distributed to various organizations, including tribes within the region (NPS 2000 (a)). In Montana, it was determined that private landowners were allowed to shoot bison with the permission of DOL, or they could request that the department remove the bison from their property.

In terms of confronting the brucellosis issue, all of the alternatives suggested the vaccination of calves in areas adjacent to the park or within the SMAs, as well as testing these cattle herds should there be the possibility of contact with bison (NPS 2000 (a)). All of the alternatives assume that vaccination of bison calves and adult bison would be administered when a safe and effective vaccine became available. Lastly, all of them included future research efforts into vaccinations and extended research on brucellosis transmission from wild ungulates to domestic livestock (NPS 2000 (a)).

The following section outlines and summarizes the modified preferred alternative proposed during the EIS process. The information came directly from the NPS files concerning the EIS.

Modified Preferred Alternative

The goal of the modified preferred alternative (which is the foundation of the current Interagency Bison Management Plan) was to use an adaptive management approach that would allow the participating agencies to gain experience and knowledge throughout the process before

moving on to the next step within the management scheme. This alternative uses many tools to address the transmission of brucellosis, but it primarily relies on strict enforcement of spatial and temporal separation of potentially infected bison or their afterbirth in relation to susceptible cattle within the GYE. The overall goal, beyond the park, after lands were purchased from the Royal Teton Ranch/Church Universal and Triumphant, is to allow seronegative bison beyond the boundary under strict population size limits.

Spatial and temporal separation from cattle would be monitored outside of the boundary seven days a week and as bison moved further from these areas the management practices would become increasingly aggressive. After the winter calving season, all bison present outside of the park would be hazed back into the park forty five days before cattle return to the allotments for the season.

This does not mean slaughtering would end under this alternative, as we have seen each year. For example, seronegative bison attempting to leave the park that are not submissive to hazing when either the population or tolerance levels outside the park have been met or exceeded, will be removed and sent to quarantine. If the quarantine facility is full and space is unavailable, they would be sent to slaughter. Another solution suggested by this alternative includes the vaccination of cattle in the GYE if 100% voluntary vaccination is not achieved. APHIS and Montana would conduct additional monitoring of cattle herds that graze in the region including regular testing of cattle and possible adult vaccination of select herds. Through 2005 APHIS had already appropriated $3 million toward vaccination and research in the region. Lastly, to minimize lethal control the agencies would maximize the use of hazing and other

control methods to keep bison off of private land, as well as keeping them from exiting the park.

The Modified Preferred Alternative is a fifteen year plan with five year status reviews to adjust management, discuss positives and negatives, and to move on to another phase in the management process. Some of the discrepancies discussed during the DEIS phase are still present post-FEIS. For example, AHPIS has yet to go through the NEPA process to take a look at the issuing of brucellosis-free certification and elk were never, and still have not been, included in the management plan even though research has shown possible threats from the elk herds within the GYE.

The USGS went even further to criticize the foundation and legitimacy of the plan on the spatial and temporal scale. The USGS argued that the Modified Alternative makes too many assumptions regarding bison demographic responses to the proposed management actions (USGS 2000 (b)). For example, the long term plan calls for selective removal of bison based on serological profiles, whether or not the bison test positive or negative for brucellosis, and non-selective removal of bison that leave the park and encroach outside of specified SMAs (USGS 2000 (b)). The USGS study built upon past research and suggested that selective removal is expected to eliminate entire aggregate social groups of bison, including complete, genetically related social units. Their research, as well as past research, tends to show the discrepancies between the plan and its goal to maintain a wild, free-ranging bison population. The research goes further to state that removals will be extensive in some years depending on the winter, drought cycles, and management practices, and ultimately there will be negative consequences for the population's age and sex structure, as well as long term productivity and growth rates

(USGS 2000 (b)). Furthermore, they argued that large scale removals may also have a negative effect on genetics, as it may alter genetic heterozygosity among the various populations within the herd.

Other Opinions on the Modified Alternative

Other agencies voiced their concerns, alongside the USGS, about the EIS process during interagency review and comment in 2000. The Environmental Protection Agency (EPA) had many concerns about the Preferred Alternative.

For example, the preferred alternative did not commit to joint federal and state decision making processes for the establishment of SMAs (EPA 2000). They went further to argue that the purpose of the EIS was not fully met within the preferred alternative because the bison management issue being addressed is one of national significance. Therefore, it warrants a significant federal role in the decision making process surrounding the management of bison and cattle on public land adjacent to a National Park, and without doing so the EIS improperly segmented the NEPA process (EPA 2000). The EPA also supported the findings within the National Research Council's work, *Brucellosis in the Greater Yellowstone Area,* which recommended vaccination of cattle as a less dramatic approach to management of brucellosis transmission, as opposed to remote vaccination of bison and elk (EPA 2000). The EPA also continued to recommend that APHIS should conduct a NEPA review of its brucellosis-free status policy, as well as the use of independent science review to guide bison and elk management decisions (EPA 2000).

The EPA dissected other sections within the EIS as well. The designation of SMAs within

the region was put in the hands of the Montana Board of Livestock, yet the lands mentioned in the EIS as SMAs were under the jurisdiction and management of the Gallatin National Forest (EPA 2000). Therefore, the EIS was proposing the control of federal public lands by a state agency, with board members appointed by the Governor.

Obviously the largest discrepancy concerned the actual proof and risk of transmission from bison to cattle, with limited pressure or emphasis in regards to elk within the region. The EPA correctly pointed out that the transmission of brucellosis from both species to cattle within the region is never quantified, simply because there is no record or proof of transmission from elk or bison in natural settings (EPA 2000). The agency argued that the agencies' chosen alternative made no sense because it only focuses on bison to control the spread of brucellosis to cattle, while the NRC report presented no scientific evidence that the risk of bison transmitting the disease is greater than elk within the GYE (EPA 2000). Furthermore, the NRC report stated that elk, which are given supplemental feed in Grand-Teton National Park, might cause re-infection within the bison population, and therefore need to be a part of the comprehensive plan (EPA 2000).

The Congressional Research Service confronted the issue as early as 1986. In a report released during that time the service felt that elk seemed slightly more likely than bison to spread the disease during migrations throughout the GYE simply because there were fifteen times more elk (Berger 1991). The National Elk Refuge, to many observers, must be done away with in its entirety, or adapted to fit a more hands off approach to game management. Despite the continued pressure to wean the estimated 3,200 elk and roughly 1,000 bison off of the reserve, and the

2,000 to 3,500 tons of alfalfa pellets they are fed each winter, the program continues (Tweit 2007). Brucellosis is one known threat within the refuge, as well as the neurological chronic wasting disease, which has been discovered within ninety miles of the refuge boundary (Tweit 2007). According to Tom Roffe with the USFWS, it is clear that these diseases are directly linked to density of populations, where the percentage of infection rises dramatically when free ranging opportunities are taken away from the process (Tweit 2007). Despite the known presence and continued threat, which is acknowledged in the recent EIS developed for the reserve, the draft of the preferred alternative calls for continuation of the winter feeding program and expansion of hay farming on the refuge, while maintaining the elk and bison numbers at twice the number the range can handle (Tweit 2007). Much of this is due to lasting pressure to continue the program from ranchers who fear that elk will spread out and eat their hay and infect cattle and to sportsmen and outfitters who do not want the elk numbers reduced (Tweit 2007). Furthermore, the facts cannot be ignored concerning the brucellosis status of Wyoming. Four outbreaks of brucellosis in cattle herds previously occurred in the northwestern region of the state and three of the four were attributed to elk, with the fourth attributed to neither bison or elk because the cattle source could not be identified (USDA 1997, Berger and Cain 1999).

The EPA also showed concern with the numbers used to evaluate qualitative risk, which is based on seroprevalence. For example, the EIS indicated that there were about 18,000 elk and roughly 2,000 bison in the area of concern, with a seropositive rate for elk at 1-2%. In terms of bison, the EIS estimated that the seropositive rate for bison in the region is 50%, but after being slaughtered and tested during that time, it was found that only 20% were infected with *Brucella*

abortus (EPA 2000). The inaccuracies involved with seroprevalence versus tissue cultures have been mentioned previously, yet the very foundation of the EIS is supported by these inaccurate statistics. The EPA based their calculations on a simple formula that used the relative numbers and used 2% of 18,000 elk (360 elk) and 20% of 2,000 bison (400 bison) and discovered that the relative qualitative risk of infection to cattle is the same for both ungulates, simply because there are far more elk in the region (EPA 2000). They further explained that the 20% prevalence rate was even high in the bison population because the samples included both males and females, and only females carry the threat of transmission (EPA 2000). Despite feedback from other agencies, the public, and the success of the Citizens' Plan during the DEIS comment period, the plan would move forward into the management paradigm that exists today.

The Plan Moves Forward

In January, 2001, the Record of Decision for the FEIS and Bison Management Plan for the State of Montana and Yellowstone National Park instituted the official policy that is currently in place. Even though the Modified Preferred Alternative stated that the main goal was not brucellosis eradication, all signs and actions have said otherwise and it was evident in the ROD as well:

> "In an effort to further reduce the risk of transmission and protect cattle, the agencies will require vaccination if 100% of all vaccination-eligible cattle in north and west management zones are not vaccinated within one year. APHIS will pay for all direct vaccination costs. Allowing untested bison outside the park in the north and west boundary management zones will begin after the agencies have had experience with seronegative bison in certain areas outside the park during winter and when the National Park Service initiates vaccination of bison with a safe and effective vaccine utilizing a safe remote delivery system inside the park." (Federal Register, pgs. 6665-6666, January 22, 2001).

The Continuance of Disagreement and Lack of Cooperation

Despite disagreements on the local, regional, and national level the 15 year Interagency Bison Management Plan has moved beyond one five year review and remains in Step 1 of the three part management phase. The contentiousness of the issue remains ripe within the region and has also spawned federal legislation and investigations by the Government Accountability Office (GAO) over the past several years. Many groups have remained vocal on the issue from both sides of the aisle, whether it is coming from Montana Stockgrower's Association or the Buffalo Field Campaign. The bottom line is that the issue is not going away anytime soon, despite the high level of scrutiny that management decisions have garnered.

In May 2005 Representative Maurice Hinchey (D-NY) and Representative Charles Bass (R-NH) introduced the Yellowstone Buffalo Preservation Act (H.R. 2428). In a nutshell the Act states the "rights" of the bison to graze on public lands both inside and outside of the park boundary, because they are the responsibility of the Department of Interior, not the USDA or Montana DOL. Secondly, the Act argues that the IBMP is flawed and superfluous with costs increasing each year at the hands of taxpayers for unsuccessful vaccination and capture programs (BFC 2005). The Act goes further to state that there are other species that carry brucellosis within the region, yet bison have been singled out within the management scheme. This situation has been questioned since the DEIS phase and it continues to be controversial.

The Hinchey-Bass effort was the second time that a bill had been brought to Congress concerning bison management within the GYE. Representative Nick Rahall (D-West Virginia) brought a similar bill to Congress in 2004. Both of the bills narrowly lost on floor votes, with the

Hinchey-Bass legislation losing by a 215-202 vote, and the Rahall bill losing on a 220-199 vote (BFC 2005). The limited success at the federal level is all too familiar when dealing with natural resource issues in the West, especially when dealing with private-public land conflicts. Until there is support from Congressional representatives who are from the region many bills like this will continue to fail, despite their efforts.

Adaptive Management Adjustments in the Western Boundary Area

On July 6, 2005 the Montana Board of Livestock voted to approve a proposed adaptive management adjustment for the western boundary. Specifically, the BOL approved a bison hunt for Fall, 2005 (FWP 2005(b)). The season would last from November 15, 2005 through February 15, 2006 when cattle were no longer present in the West Yellowstone Basin. Following the EIS process, where hunting was not mentioned within the Modified Preferred Alternative, the BOL amended the IBMP after being granted authority through the State Legislature.

Results of the State and Federal Five-Year Review

Yellowstone National Park released a report after the first five years stating that the involved agencies discovered they were not ready to move to Step 2 in the management process (YNP 2005). There are fourteen tasks within Step 1 that must be completed before the partner agencies are able to move on to Step 2 of the management phase (YNP 2005). In addition, the agencies cannot move forward with Step 2 on the west side of the park until a safe and effective remote delivery mechanism is available. At that point the state will be in a position to employ a remote vaccination program within the region (YNP 2005). This seems to be a flaw in

management priorities considering that a safe vaccine that is applicable to bison has not been found or developed. The report stated that the RB51 vaccine satisfies safety criteria for vaccination eligible bison in particular.

According to the plan, Step 2 will not begin on the northern side of the park until cattle no longer graze on private lands, specifically the Royal Teton Ranch (RTR). The land being held by RTR continues to be held up in negotiations, despite the fact that the land acquisition was scheduled for completion during the winter of 2005 (FWP 2005(a)).

The Five Year Status Review 2000-2005

The five year status review released by the participating agencies serves the purpose of reviewing recent accomplishments during the management phase, continuing work that needs to be accomplished, possible solutions, and recommendations. Within this report topics range from ongoing research, negotiations, and adaptive management techniques that could be adopted in the near future. Despite the fact that the management phase was initially projected to move on to Step 2 after the status review, the agencies still find themselves in Step 1 of the plan as of 2007. This is due to the lack of a suitable remote vaccine and the continuing negotiations surrounding the RTR land on the north side of the Park.

New Findings on Brucellosis and Bison Migration in the GYE

Migration Patterns

The theory surrounding bison movement on the west side of the park declared that migration was easier for the animal on the west side during the winter due to groomed trails catering to snowmobile traffic within the park. Recently this theory, which was accepted as fact,

has been turned upside down. The movement of bison was heavily monitored on the west side of the park, from 1997 through 2000. Migration of the herd on the west side was heavily monitored in the Madison, Gibbon, and Firehole river drainages (Bjornlie and Garrott 2001).

The research shows that peak bison migration occurred between March and April, which makes sense due to their calving season correlating with the search for forage. It was found that the major path of migration was along the Mary Mountain trail between the Firehole and Hayden valleys (Bjornlie and Garrott 2001). The important fact within this research is that a majority (77% foraging and 12% migrating) of the bison were traveling off road (Bjornlie and Garrott 2001). It was found that bison were using geothermal features, previous trails they have created, and river and stream banks for travel purposes. Surprisingly road use by bison had a negative correlation, with peak use in April after snow melt and the lowest use of roads occurring during the grooming period (Bjornlie and Garrott 2001).

The study found that bison do not necessarily seek out or avoid groomed roads during the winter months. Much of the data suggests that there is a direct correlation between the decreased use of groomed roads in the winter and the avoidance of negative interactions with over-snow vehicles (OSV) entering and exiting the park via the west entrance (Bjornlie and Garrott 2001). The bottom line is that grooming of roads during the winter months does not have a major affect on bison habits or their ecology.

Persistence of *Brucella abortus* in the Environment

As discussed previously an important factor involving the transmission of brucellosis is the ability of the disease to survive in managed environments, specifically those environments

controlled for agriculture purposes (Aune 2007). Most of the research into the persistence of brucellosis in different elements has been limited in scope and in habitats not typical to the Greater Yellowstone region (Aune 2007). Outside of specific environmental factors, the difference in persistence of brucellosis can depend on the location surrounding the fetus (i.e. under the fetus or on top of the fetus). For example, studies done in Laramie, Wyoming, using bovine fetuses, showed that brucellosis persisted on the bottom side of the animal for roughly sixty days in February to three days in May (Aune 2007). When the infected afterbirth was placed on top of the fetus, where it was exposed to sun light, the length of persistence was much shorter, with seventeen days in February and less than a day in June.

This same study also took into account the length of time fetuses remain in the environment before being scavenged. The study found that on the National Elk Refuge and in Grand Teton National Park the fetuses remained on average for about seventy hours, with the longest duration being 168 hours (Aune 2007). Since this research was carried out, Montana FWP conducted similar studies in West Yellowstone, MT and Corwin Springs, MT on the north side of the park. Both of these areas are locations where bison migrate frequently in the winter, as well as where cattle are placed on summer pasture land. Both areas are different in terms of environmental factors, such as snow pack and overall temperature. The purpose of the study was to follow the movement of previously collared bison to their calving sites. Once the sites were found, tests were conducted to determine the prevalence of contamination in naturally occurring birth or abortion events and the persistence of the contamination at these sites (Aune 2007).

During the field investigations, 152 sites were monitored due to the potential of an

abortion site or birthing site. Approximately half were found with the assistance of vaginal implants that were placed in the previously mentioned cow bison and the other half were found through chance encounters (Aune 2007). Fourteen of the 152 birth sites tested positive for *Brucella abortus*. Within those findings two of the fifty-six vaginal implant ejection sites and twelve of the ninety-six birth or abortion sites were culture positive. Aborted fetuses were found on six of the twelve birthing sites. Persistence of the bacteria was determined through multiple sampling efforts on nine of the fourteen sites, while the remaining five sites were monitored only once due to trampling, snow pack, and flooding (Aune 2007).

The bacteria was found to persist on the April test sites from ten to forty-three days, while it remained viable for only seven to twenty-six days on the May sites (Aune 2007). Although the sample size in the study was smaller than those conducted at the Elk Refuge and Grand Teton N.P., the findings of persistence mimic those of the previous study. The findings of both studies have since been used to justify the May 15th haze back date for bison in the GYE as stated in the IBMP, in combination with scavenging and natural degradation, to rid these areas of *Brucella abortus* by June 15th (Aune 2007).

Update on Royal Teton Ranch/Church Universal and Triumphant Land Negotiations

In December, 2008 after seven years of negotiations with RTR/CUT the Montana Fish, Wildlife, and Parks Commission took a vote on moving forward with the grazing lease acquisition to allow bison to migrate north of the park. According to the minutes for the meeting, Pat Flowers, the FWP Region 3 Supervisor, explained that the Governor's office asked FWP to negotiate with CUT in 2005 to acquire grazing rights on the RTR for bison (FWP 2008). Up until

the commission meeting a tentative agreement was reached for a 30-year grazing rights acquisition to be funded by the National Park Service (NPS), which would contribute $1.5 million, NGOs that would contribute $1 million, and Montana FWP, which would contribute $300,000 (FWP 2008).

When the IBMP was adopted by the partnering agencies in 2000, one of the requirements within the plan was to purchase the grazing rights on RTR property to remove cattle so that bison could migrate north of the park and west of the Yellowstone River. The idea was that it would reduce the risk of brucellosis transmission in the region. The end result would be the availability of bison to hunters on Forest Service lands north of the RTR (FWP 2008). The negotiations were put to an end in 2000 when the land was appraised at too high of a value.

Following the stalled negotiations an Environmental Assessment was prepared by FWP and presented for public comment. A number of comments were received on the proposal, with two major concerns revolving around the erection of a fence within the corridor and the cost of the land acquisition (FWP 2008). As the negotiations carried forward, RTR indicated they wanted protection for their property and it was determined that an electric fence would be the solution. After the bison travel through the RTR land and relocate themselves on Forest Service land, it would be the responsibility of FWP to drop the fence so that other wildlife can move through the corridor. In terms of cost, there are concerns surrounding cost versus benefit, especially since this is a 30 year agreement and the agencies see it as the only opportunity for bison to move north along the river corridor (FWP 2008). Costs will also be added on an annual basis because of the fence removal and maintenance, which is estimated to cost $5,000 per year

with no responsibility placed on RTR to maintain the fence (FWP 2008).

There were people present for public comment at the Commission meeting as well, with the majority of the public comment on the opposing side of the land deal. Much of the opposition came from a mixture of sporting interests and those interest groups that simply want to see a shift in policy surrounding bison management in the region. Concerns ranged from bison being managed as romanticized livestock rather, as opposed to maintaining their wild character (FWP 2008). There was also some disagreement about the fencing restricting migration of other species on the landscape, along with the possibility of other partnering agencies backing out of their financial end of the deal (FWP 2008). Simply put representatives from the Headwaters Sportmens' Association, the Gallatin Wildlife Association, and Buffalo Allies believe that evidence of bison use areas in the agreement are sparse, with conflicting answers, and an extremely expensive proposal (FWP 2008).

There was also opposition voiced from private land owners who own property adjacent to the RTR land. Bonnie Lynn, out of Bozeman, brought up the point that she owns the first parcel of land where the fence will be erected and that the proposal is for only twenty five bison. The rest of the bison will end up on her land and the fence will kill other wildlife (FWP 2008). She went further to bring up the point that the river is their source for water and the fence will create problems and death for other animals and she believes the agencies need to "stop thinking about money and start thinking about protecting wildlife." (FWP 2008). A representative from the Buffalo Field Campaign stated that they adamantly opposed the land lease, stating that it is "a corridor to nowhere" and the ranch had received money before and failed to come through on

their end of the bargain (FWP 2008).

Many questions were asked about the future of the land lease after the thirty year period on the contract ended. Bill O'Connell, from the Gallatin Wildlife Association, felt that it was best for the Commission and the Director of FWP to tour the area because he felt there was a lack of understanding during the negotiations (FWP 2008). He pointed out that public comment is overwhelmingly in opposition because it is a preposterous proposal and there is room for improvement. He did not believe this was a step forward for bison. It is important to note that Ben Lamb, a representative for the Montana Wildlife Federation, disagreed with the view of the Gallatin Wildlife Association. He believes it is a small step forward and it remains within the framework of the IBMP (FWP 2008). He believes there could be some continuity to build off of the proposal and encouraged the Commission to go forward with the purchase.

Kate Gordon, the Royal Teton Ranch president, was in attendance as well. She tried to clarify the history of the land negotiation deal between the agencies, RTR, and the Church. She stated that 5,300 acres of the RTR land was sold for $11.2 million in 1999 (FWP 2008). An additional 1,500 acres were put into a conservation easement. She stated that there is a misconception that the Church was given $13 million and that there has never been an agreement with RTR either. Most of the fencing on the property was already up, but a different type of fencing will be erected as well. She also stated that they are bound by the agreement signed in 1999 stating that there will be twenty-five bison during the first year, with more discussions to follow that would allow additional bison to migrate through the corridor (FWP 2008).

Representatives from the Commission stated that this is an emotional issue and that both

FWP and the folks who oppose the proposal share the common goal of trying to increase habitat for bison. They went further to state that some people do not want to see bison leave the park at all and that the agreement with RTR was not perfect, but it was a step forward (FWP 2008). Representative Workman from the Commission was vocal about the agreement, stating that the issue is not about bison or brucellosis, but rather it is simply about grazing rights (FWP 2008). He pointed out that the livestock industry does not want bison on the open range and that if it was about brucellosis that the disease is also transmitted through elk, yet the FWP continues to spend money on bison, which is an atrocity (FWP 2008). He summed it up by saying "voting should be based on reality and not on politics" (FWP 2008).

Pat Flowers, the Region 3 Supervisor, later reiterated the point that there are a series of steps in the adaptive management portion of the plan and that the land deal with RTR is a major component of Step 2. The purpose of the plan is to reduce risk of transmission of brucellosis to cattle by removing cattle from this narrow corridor, as well as allowing bison the opportunity to move out of the park into new habitat (FWP 2008). The point was made that FWP committed to this step when it signed the agreement with the Department of Agriculture and the Department of the Interior, in coordination with the Governor's office. There were questions brought forward about the thirty year portion of the agreement and Flowers stated that RTR and FWP discussed a permanent agreement, but because the whole world could be different in thirty years, FWP was willing to accept a thirty year time frame (FWP 2008). Despite the timeline, some representatives opposing the land deal asked why the agencies were in a rush to go through with a questionable plan when the IBMP should be further along at this point anyway. Many did not understand why

the agency was in a rush to get the deal done. Flowers said that there is a timeline for the steps in the process and because the management plan was already behind schedule, it is important to act now.

After an initial vote, the motion failed to go through with two Commission members in favor and two opposed. After the motion was amended and the action was to be tabled pending a tour of the RTR land within the next ten days, the motion later carried on a vote of three against one (FWP 2008). Up to this point land has already been exchanged and the land negotiations are moving forward despite overwhelming public opposition. This seems to coincide with the status quo involving the history of the IBMP.

Chapter Two

Summary of Interviews in Relation to the Proposed Research Questions

The following section contains brief summaries of the interviews conducted with various representatives of the NGOs, state and federal agencies, and the Governor's office in Montana, that have been involved with the formulation or the implementation of the IBMP. The various organizations and agencies included are the Buffalo Field Campaign, Defenders of Wildlife, National Wildlife Federation, Greater Yellowstone Coalition, Gallatin Wildlife Association, Bear Creek Council, Montana Stockgrower's Association, Montana Farm Bureau Federation, Montana Department of Livestock, Department of Interior/National Park Service, Department of Agriculture/United States Forest Service, Department of Agriculture/Animal and Plant Health Inspection Service, Montana Fish, Wildlife, and Parks, and the Governor's Office in the State of Montana. It should be noted that the Montana Board of Livestock and the Royal Teton Ranch/ Church Universal Triumphant both declined interviews despite the large role that both have played in the process.

The summary attempts to encapsulate the responses from these various participating groups as they relate to the previously mentioned research questions in the first chapter. If there is no response included for some of the groups then a response was not given or the response was vague. Obviously there will be more passionate and in-depth responses given by those groups that have directed their energy or their management strategy within a particular area. These interviews were conducted throughout the early part of 2007 either in person or over the phone. In some cases there were multiple representatives for a group or agency present at the interviews

and in other cases there was only one individual present during the interviews. While keeping that in mind, it should be understood that these interviews were candid despite the structure of the research, which means that some responses may not represent the overall stance of the participating agency or interest group.

Is the current management framework justifiable at an ecosystem based level?

Obviously the answers to this question will represent the interests of the group or agency, as well as the individual's perspective on ecosystem management. For example, the agencies have a responsibility to uphold and justify the management strategy within the Memorandum of Understanding (MoU) due to the agreements that have been made among the partners. Whether or not the individual representatives that were interviewed have a different opinion, it simply will not be reflected in the responses for the agencies or the interest groups for that matter.

Also, it is important to differentiate between the various stances of the groups involved and their expectations for the future of bison in the GYE. Even among the groups that disagree with how the IBMP is being implemented on the ground, expectations of an ecosystem based management model are variable, especially in terms of the overall scale that is being demanded by certain groups. In simplistic terms, this means there are some groups that would like to see bison repopulate their previous range as much as possible, while other groups do not envision bison expanding beyond the realm of the Greater Yellowstone Ecosystem. The major views that dominate the argument are managing for the risk of transmission through less restrictive means versus simply "cleaning up" the herd, so to speak, through testing, slaughtering, and vaccinating

bison over a large and dynamic landscape. Within these arguments there are different stances that have been taken in terms of the opinions and views of the effectiveness of the IBMP since its implementation in the mid-1990s.

Many of these views range from scrapping the plan, to making some changes within the plan through adaptive management, to simply leaving the plan as is and operating within the framework that was created and agreed upon among the agencies. For example on one end of the debate you have the Buffalo Field Campaign, Gallatin Wildlife Association, and to an extent the National Parks Conservation Association saying that we should scrap the plan and start over. Other organizations are proposing changes in the plan through lobbying and building alliances with bison "champions" at the state and federal levels. While others, mainly the agencies and the stock production interests, would like to maintain the status quo, either because it is part of the Memorandum of Understanding, or because at this point the plan benefits their long term interests.

Conflicting Interests

In terms of staunch disagreement with the plan many of the groups are quite adamant about changing the plan completely. For example, the Buffalo Field Campaign believes " the IBMP was inherently flawed from the get go. It is called a bison management plan but it has the dual goals of protecting livestock and bison. Unfortunately, it has been weighted heavily in favor of protecting the livestock industry." They go even further to state that it should simply be restructured and renamed because "it seems like it should have been labeled a brucellosis management plan that managed for the [risk of] brucellosis because that is what it sets out to do,

but by only focusing on bison it is missing a huge reservoir of brucellosis in the elk population." They also believe "it misses the fact that cattle don't have to share any of the burden; it is placed completely on the bison. Currently people who want to graze cattle in the region can go about business as usual, but we believe an equal burden should be placed on both wildlife and domestic livestock." To them the issue is simple, the plan is aimed at benefitting the livestock industry because "the bottom line is that it is all geared toward the economic protection of the livestock industry and we have continued to see a lot of the same implementation that we saw with the interim plan."

Whether this is true or not, a representative from the Montana Stockgrower's Association made it clear that "the livestock industry needs to stay unified on this issue and [we believe] that it is an issue we need to continue to move toward fixing. If we begin to separate segments in the state then ultimately we would not be successful in our efforts to accomplish the goals within the IBMP." The fact is that it is true that the adaptive management structure is influenced by both the DOL and the Board of Livestock, despite the fact that the adaptive management portions were written and recommended by Montana FWP. Despite the FWP recommendations, as their representative points out, they still need to work within the authority of the DOL and BOL.

It falls back to 2003 when legislative authority in the state of Montana laid down the foundation for the hunt. As the FWP representative points out, "We still have management authority over bison, despite the special concern label. The authorizing legislation for the hunt in the 2003 legislative session was introduced by Senator Gary Perry and it gave the DOL joint authority over the hunt." The question arises about what this truly means for management on the

ground. To clarify, the FWP representative explained that what it means "on the ground is that the FWP conducted the EA, developed the hunting protocol, and did the leg work. We took that work to the DOL and BOL for their approval, even though according to the statute we only had to take it to the DOL. If we decide on a different method we must take it to the DOL and out of courtesy we have decided to take it to the BOL as well." The end result is that FWP "manage[s] the hunt through jurisdiction from the DOL. Currently the hunt is mandated to treat bison as we treat other wildlife in the state, yet it is different than other hunts and we want to work toward making it similar to elk."

Whether or not the hunt will ever be managed in a similar manner to the current elk hunting season in Montana is yet to be seen. Many groups would contest that it will never happen until the DOL is relinquished of the management authority over bison due to their conflicting interests and affiliation with the industry. The other arguments for not supporting the hunt relate to the lack of habitat and, therefore, the legitimacy of a fair chase hunt. This of course has proven to be a contentious issue in the debate, in combination with the DOL's lack of training, knowledge, and expertise in relation to wild species.

The issues involving a conflict of interest were a recurring theme among many of the groups throughout the interview process. As the Gallatin Wildlife Association spokesperson pointed out, "the current foundation of the plan is flawed because the majority of the plan was written by the DOL and was accepted by Montana FWP." The critical statements surrounding the management authority granted to the DOL continued with the Bear Creek Council, Buffalo Field Campaign, the National Parks Conservation Association, and many others. As a representative

from the Bear Creek Council stated, “from the beginning our emphasis has been based around the agencies getting the management right, starting with the removal of the DOL as the managing agency and transferring authority back to the FWP. The current management scheme is mandated by state law and we are hoping things may change with new appointments to the BOL.”

The influence of the BOL surrounding this decision has been moot thus far and with the end of Governor Schweitzer’s tenure in office coming around the corner, there is always the possibility of the BOL appointments changing once again. The concerns surrounding management authority being handed over to the DOL were echoed by the Defenders of Wildlife as well, who stated that, “one of our biggest concerns is the management of bison being handed over to the Department of Livestock once they cross the park boundary.” Whether or not there is a conflict of interest continues in the discussion, but a representative from the DOL was open about their mission and stance as an agency. As he stated, quite clearly, “The number one interest of the DOL is disease control and when managing bison the disease issue takes precedent. The fact is our agency is driven by the industry and answers to the livestock industry in terms of disease control in Montana. This does not mean that we do not want to see a wild herd, we just want it to be disease free.”

Many of the conflicts go beyond conflicting interests according to Defenders of Wildlife, because the current management scheme is also creating conflicts in terms of actual mandates for other agencies involved in the process. Defenders believes that “it cannot be denied that the IBMP is very pro-cow and anti-bison, despite the responsibility of the NPS under the Organic

Act to protect species." Furthermore, they believe that "if we want to treat these animals as wildlife, as they should be, then FWP should be in charge of the management on the ground. If this happened there would probably be a more fundamental shift in terms of management."

Adaptive Management

The adaptive management portion of the plan was orchestrated by Montana Fish, Wildlife, and Parks and it presented an opportunity for the state game agency to play a larger role in the on the ground implementation of the plan beyond the hunt. There is a positive tone coming from their perspective and they see the steps that were taken as advancement in the right direction no matter how small it may seem in the eyes of the public. This is evident from the words of their representative who described the process specifically:

"As an agency we pushed for the adaptive management changes that recently took place. There were three issues that were dealt with: 1) Strategic hazing, 2) Increased tolerance for bulls, and 3) the "carrying capacity" within the park. The strategic hazing applies to both the north and west side of the park. Instead of running bison back into the park, there will be land appropriated during a certain time of the year that would be open for bison beyond the park. All of this will be on public lands." Thus, adaptive management as implemented in the IBMP is ecosystem level management or at least a concrete step toward such management. This is evident through the incorporation of carrying capacity and increased tolerance for bison outside of the park on public lands.

The disagreements and discussions involving habitat availability for bison in the GYE, as we have seen, tend to overlap with many of the issues involving the actual threat of brucellosis

within the region. Obviously, habitat has been restricted or monitored for bison within the region due to the threat of disease and the impact this would have on the livestock industry within the region and, more importantly, the state. Therefore, many of the adaptive management adjustments that have been made in the plan have revolved around these two issues and each of them influences the other on the ground.

Despite their support for the adaptive management recommendations within the plan and their continued support of the needs of the livestock industry in the region, a representative from the National Parks Conservation Association stated "we should scrap the IBMP and start over again in some ways, but we don't have the stomach to go through three years of planning while we maintain the status quo on the ground." The justification for not changing course was reflected in the adaptive management language. As the representative stated, "they have the management provisions in the plan to change things for the better and we need to take a look at what is going on at the field level and change management from a policy perspective to scientific based management." Ultimately they "would like to see science guide and inform the process, because at this point research has already given a nod toward adaptive management in the IBMP." Up until this point they argue that they "have not seen much success meeting the stated goals because they have relied on fallacy to protect the livestock industry with little concern for the bison herd." The issues surrounding science, specifically the gestation period of the disease in the environment, the overall rate of infection in the herd, and the efficacy of the proposed vaccines will be explored further, but disagreements about the legitimacy of the scientific process are a common theme among many of the groups.

For example, the National Wildlife Federation has been critical of adaptive management in general stating that "this philosophy is about implementing a strategy and adjusting as you go along in the process. There is no criteria or specific rules in place to guide that type of management and there are some consequences for stating that you have met the criteria, but we will have to wait for a couple of years before we move in that direction." They compare the flaws of the current adaptive management process in the IBMP with the adaptive management plans that have been implemented toward oil and gas development throughout the west because "all of those plans are based around adaptive management techniques, [but] there is no criteria or penalty for ignoring the changes that occur on the landscape."

The Gallatin Wildlife Association, a group that represents hunting and sporting interests in the region, takes a different stance in terms of the flaws surrounding the adaptive management strategy. They simply see it as a political instrument stating that, "One of the biggest issues is that this has been held up as an adaptive management plan, and we fail to see these agencies adapt to good ideas continually." They explained further that "if the plan actually did evolve and adapt it would be great, but if it is dictated by the BOL and preventing the public process from unfolding then the plan is failing. The zones, we believe, were designed to perpetuate the conflict in the area, because it is almost as if they purposely are grazing cow/calf pairs in the region."

As for the zone management portion of the plan, according to many of the groups there are flaws within the structure of the boundaries, how they were drawn up, and how it has affected management on the ground. This has played a role in the restrictions that have denied bison access to reach their calving grounds during the winter. A member of the BFC explained the

inconsistencies within the zone management scheme:

"The plan contains a zone system where Zone 1 is the park, Zone 2 is a bit further beyond the boundary, and anywhere labeled Zone 3 is considered the kill zone. These zones are not really drawn properly because they do not have any relation to the level of risk in terms of transmission. For example, we could draw a Zone 3 designation around some cattle, yet we now have some areas in the region where people bring cattle in the warmer months, which is inside Zone 2. Then there are areas where there are no cattle and it affords great habitat for bison and it is written up as Zone 3. Instead of looking at reality on the ground, we have these lines that are drawn arbitrarily instead of investigating real risks."

The Gallatin Wildlife Association pointed out these inconsistencies as well. They "believe the Upper Taylor Fork would provide the best habitat for the recovery of bison in Montana, yet it is considered Zone 3/No Tolerance because of two cattle allotments administered by the Forest Service. The area south of this is considered Zone 2/3 depending on movement of bison." Despite the fact that the allotments seem to be an impediment, it is not the case. Leases on public land allotments can be retired and the GWA, as well as the Forest Service, which administers the allotments, know this is a possibility. As the GWA put it "the Forest Service....has said that if the state is ready to have bison then we will change the allotments in the upper Gallatin and this is why we have pushed for an EA and public comment." Despite previous procedures that have occurred during the implementation of the plan the GWA believes that "they should not have to ask the BOL, or DOL, if they can conduct an EA. The board and that agency have continually tried to impose their will on a democratic process, which continues to be

stalled up to this point."

The GWA recommended that the plan "needs to be rezoned immediately in the context of protecting private property, protecting our status, and thinking about how we can provide more habitat for bison. In terms of the RTR land, we should be fencing off the feed lot area of the property and 'encourage' bison to migrate into the neighboring public land, because it is conflict free, publicly owned land and winter range for bison versus deep snow and no food within the park." They also reiterate the fact that "currently we allow elk to migrate into their winter range, which has been 'bought' through tags and permits with sportsmen dollars."

It seems that the jury is still out in terms of the benefits and successes attributed to the changes within the adaptive management portions, because of the differing opinion revolving around what would constitute ecosystem level management. During the time of these interviews the adaptive management triggers had been implemented for less than a year and it seems that many of the groups did not see long term benefits within those changes. Yet some groups, including the agencies, saw benefits within the adaptive management scheme, no matter how incremental the steps are in the broader process. For example members of the Bear Creek Council in Gardiner believe that the IBMP "is much better than what it was, when we were dealing with litigation between both the state and federal governments over management of bison beyond the park boundary. For example, we now have adaptive management protocol in writing, which gives the public a tool to check on the agencies. It also lays down specific stipulations for the vaccination of cattle in Zones 1 and 2, which has been formalized and is currently taking place on the ground."

Along with Montana FWP, there is some hope present in the comments coming from the USFS, which is responsible for managing the allotments on the northwest side of the park, as well as a large portion of the public lands beyond the park boundary. Despite their lack of involvement with the on the ground management, they are responsible for retaining a large portion of the public lands beyond the park for the possibility of future habitat expansion. They believe the potential expansion of habitat in the region is present on "public land...on the west side of the park, rather than on the north side." They went further in depth in terms of their role and responsibilities stating that, "Basically, we will provide habitat for any species that the state has in their wildlife management plans, goals, and objectives. For example, determining what the appropriate size and type of land for the management of a species would come into play. Right now a lot of that is tied up in the IBMP in terms of what parameters they have laid out concerning where they will have bison as a wildlife species, and where they will not have bison as a wildlife species, which is what encompasses the zone management issue."

Unfortunately, the USFS also pointed out that "Montana FWP is in charge of that issue and of course they're not going to expand the range of a wildlife species that is going to have untenable effects in the livestock world. So, we stand with the wildlife habitat and part of our long term goals within the plan are maintaining and sustaining viable populations of wild bison." The only result is that they can "continue to manage the land and make sure that it stays in the condition that is acceptable if it were to become available for bison." This has further contributed to a lack of viable habitat for the bison herd in the GYE.

Carrying Capacity within the Adaptive Management Framework

There are a number of groups that are opposed to the current framework due to the lack of drastic changes occurring on the ground, despite the language in the adaptive management protocol. This is especially true in regards to the allowable numbers of bison in the region that was decided on between Montana FWP and the Department of Livestock. For example, a representative from the Buffalo Field Campaign points out through their experiences that, "what [they] have seen is the adaptive management schemes have been put into effect verbally, but on the ground it is simple conjecture." They go on to express their skepticism surrounding the recent adjustments with carrying capacity in the adaptive management protocol: "the 3,000 number for carrying capacity was not based on any real science in the first place, it was more of a political compromise that the livestock industry and the NPS arrived at in negotiations." They were quick to point out that "recent studies have shown that the park could possibly sustain 7,500 bison, but carrying capacity is not a firm, concrete number because there will be fluctuation depending on habitat availability, seasonal changes, and moisture." Their perspective on the issue was also echoed by the National Parks Conservation Association who stated that "the agencies need to understand that bison are not leaving the park because they are eating themselves out of house and home. In fact, the latest science states that the carrying capacity is between 5,500 and 7,500 bison within the park boundary and currently we have 3,600 inside the park in addition to a healthy range."

Montana FWP has attempted to clarify the carrying capacity issue as well. They explain it through the actual language within the Record of Decision that was written to integrate the

adaptive management strategies into the IBMP. According to the agency they "have set the number at 3,000 bison. In the Record of Decision it is called a "threshold". What it means is that when we have a population above 3,000 we will take certain management actions which may include lethal control. This does not mean we cannot have over 3,000 bison. The agreements that were made for the adaptive management portion are a big step forward over the long term." It is true that the language does not demand a limit of 3,000 bison within the park, but flexibility allowing for an increase in numbers does not look like it will be granted anytime soon by the industry.

The Montana Farm Bureau Federation has stated that they "feel the numbers of bison need to be maintained within the IBMP, because carrying capacity is important. When the carrying capacity was at 5,000 the south facing slopes within the park, the willows, the browse, and grasses, were smaller than my thumb. Putting that into perspective, if I was a private landowner leasing that property, and I left my range in that condition my ass would be thrown off the land." They referenced "studies conducted back in the 1950s and 1960s where carrying capacity among ungulates, especially for bison, were recommended to be much smaller and now we are at 5,000." They went even further to suggest that "the numbers need to be managed and fair chase hunting should be allowed inside the park boundary to manage the population. There are other national parks that currently allow hunting inside the boundary, so why not in Yellowstone?" The gap between different perspectives as they pertain to the implications of ecosystem based management could not be wider.

Dual Designation of Bison

Beyond the debates concerning the adaptive management changes and what those entail for the future of bison, as well as the issues surrounding on the ground management and where authority has been placed, the overall issue of habitat availability and maintaining a wild and free-roaming herd could not be more polarizing among the various interests. The most prominent issue revolves around available habitat and how that habitat can be expanded beyond the park boundary. Much of this hinges on the perspectives of managing for risk of transmission outside of the park and simply not allowing the risk to even be present. The latter perspective coming from the partnering agencies and the industry.

A portion of this conflict and disagreement relates to issues surrounding the dual designation of the species and the reluctance to accept bison as a game species as opposed to a domestic animal that must be managed for the threat of disease. A representative from the Buffalo Field Campaign attempted to describe this conflict by explaining that, "it is hard for the industry to value what 'wildness' is and what this means. This is where the conflict occurs because we cannot convey that importance when a member of the DOL views bison as an oversized stock animal. For example, they will say Yellowstone is overgrazed and if they treated their range like that with their cattle they would lose their permit. The problem is that Yellowstone is not a ranch."

They went on to explain that the "animal is a part of the western ecosystem, so rather than saying we cannot, we need to start looking at the possibilities that are there and create solutions to the problems. This is what the plan really lacks." A Defenders of Wildlife

representative echoed the same sentiments on the issue of habitat and the species' role in the western ecosystem, stating that, "[Bison] are an important part of the ecosystem and the character of the American citizenry due to their symbolic history as the first success in the conservation movement. Yet, even today this is not a total success, because we have not restored their ecological role on the landscape, specifically the migratory herds in the region." These views were echoed by The Greater Yellowstone Coalition relaying the message that, "We believe bison are an integral part of the landscape and are wild animals, so they should be treated as such. Our goal is to move management and encourage the managers to treat bison as wildlife. Right now we are failing to reach that goal and we think that Montana could benefit if they shift from thinking about bison as a pest and move toward thinking of them as an asset."

This has become a complicated issue due to the conflicting mandates within the plan itself. They went further to explain that "the biggest limitation we have seen with the IBMP is the conflicting mandates, which are the protection of the brucellosis free status in Montana and sustaining a wild bison population. It is a risk management plan and they have been able to reduce the risk of brucellosis transmission, mostly because they have not allowed bison to leave the park, but they continue to fail at treating bison as a wild population." They believe that the conflicts will continue "until bison are provided habitat outside of the park and are allowed to roam beyond the boundary without facing heavy handed management; [if not] we are failing on one of the two mandates." The GYC believes the "bison can be managed in a way where we respect those concerns of the industry while continuing with risk management, but we also need to provide bison with room to roam outside of the park."

The issue of conflicting mandates was even discussed within agency circles and quite a few of the representatives agreed with the GYC on their position surrounding the difficulties of conflicting management strategies. As a FWP employee pointed out, "there are limitations....specifically the part of the plan encouraging a free and roaming bison population. We have seen clear limitations with this part of the plan. As the state wildlife agency we would like to see them roam more freely within the ecosystem."

Despite the points made by the various interest groups involved in the process, very few of the agencies explained their reluctance to allow bison to inhabit more of the range within the GYE. Many of the discussions and arguments revolved around managing for disease, rather than solutions that would allow the bison to roam freely beyond the park boundary. Beyond the statements of FWP representatives, the National Park Service and the USFS gave a slight nod to the importance of habitat expansion during the interview process. For example, the NPS touched on the issue, yet still reaffirmed their position concerning the threat of brucellosis in the region. They made the point that "the IBMP basically sums up the interests of the park, which are conserving the wild bison population, because these animals are the symbol of the first successful attempt at species conservation. At the same time there is roughly 2.2 million acres within a much larger ecosystem. This is important, because we have to recognize that YNP is not operated in a vacuum."

They are correct that the GYE is a constantly changing ecosystem that is not only affected by change on the ground in terms of wildlife, as well as drought, wild fire, and changing elements, but also the changing landscape due to human encroachment in the form of

development. At the same time, they immediately countered with the argument surrounding disease combined with the rationale being used to support current management. They were quick to mention "that brucellosis management is also important and contributes to the success of our other missions as an agency. At times this can look contradictory in terms of how management of the species has been carried out." They made the point that "we believe we have a vibrant [herd], because the growth rate is still between the historic 8-13% in terms of [the bison] population. Even with the intense management practices, the park does not believe it has impacted the population and we see the current situation as a success."

This statement, concerning the health of the herd, came into question often during interviews with the various interest groups. Many of the opinions came from the Gallatin Wildlife Association, which is very concerned about genetic diversity within the herd, as well as the loss of separate herds that historically branched out into other regions outside of the park. For example, they point to the loss of a herd in the Taylor Fork region on the northwest side of the park that no longer migrates into the region. They "argue that we have lost an important genetic and environmental component of the Yellowstone herd and the recovery of that herd in southwest Montana." They believe that the reason falls on the lack of understanding amongst politicians and the lack of information that is being circulated within the biological community. They feel "it is hard for the politicians to see this potential and the biologists have not promoted the idea because the plan has been so politicized."

They went further to defend their point about the overall health of bison in the region by, ironically, using information distributed by Montana FWP as a reference concerning the potential

loss of the species in the state. They pointed out that "currently, this animal does not roam freely anywhere in Montana and the potential for bison is widespread all over the region according to FWP." Yet, "their status is S2, which means they are at risk because of potentially limited and declining numbers. This is occurring along with a loss of habitat, which is making them vulnerable to extinction or extirpation in the state. So, currently this animal is listed as worse off than fisher, wolverine, and lynx, yet there has not been a review by FWP and the state on this issue."

Conclusions

Out of all the conservation, pro-bison organizations that have taken part in the IBMP process the National Wildlife Federation took the issue beyond habitat, adaptive management, and disease. They believe the issue simply revolves around states' rights, control of a resource, and the continual enforcement brought forth by the state veterinarians. As they explained in the interview they "see two issues that are dictating bison management in the region: 1) the maintenance of state and federal roles involving wildlife is a major issue for us involving all species on public and state lands; [and] 2) bison have been historically treated as a second class wildlife species by state and federal agencies, as well as the American public, for much of our history." They went further to explain the issue in historical terms. They believe there is "one thing that the 'bison heroes' did not pay attention to: they saved bison from extinction, but they failed to think through the ideas that all of the bison herds they were protecting for the public were left behind fences and the public view of bison developed into a skewed perception." That perception "was that they're not really wildlife and that view is further perturbed by a domestic

bison industry and market." The result for NWF and the "corollary to [their] fundamental involvement with the bison issue was to advocate that bison should be managed just as any other North American species of wildlife. They should not be managed in a 'pen', but rather managed by state and federal agencies just the same as elk, bighorn, and grizzlies."

The problem according to NWF representatives is not necessarily the IBMP "but fundamentally this is about state's rights and state authority. It is not about the bison, nor is it about reserving public lands. This is about the ability of the state vet from Hawaii, Vermont, or Alabama to issue sanctions against the state of Montana or Wyoming because of the presence of brucellosis." They went further to describe this process as it relates to past issues, by explaining that they "don't care how much public land [we] have for the bison, [we] don't care how clean the bison are in the mind of the public...the facts don't matter, because the state vet of Alabama has in the past, and can again, issue sanctions against Montana based on no credible evidence." The issues surrounding brucellosis research and the viability of those studies in relation to the legitimacy of the plan will be explored further, but it should be noted that this is an interesting take on the issue. The only other organization that spoke about these dynamics on record, even though it was only touched on briefly, was the National Parks Conservation Association.

As for the industry representatives, their take on the issues concerning habitat were rarely touched on and when they were it was usually in the capacity of the bison having adequate habitat, the status being maintained, and the negative ramifications if we allowed bison to venture any further beyond the park boundary. For example, a representative from the Montana Stockgrower's Association stated outright that "this is an animal health issue first and foremost."

He went further to reiterate the fact that the "main issue for us is maintaining our status because the industry cannot afford a transmission of the disease." In combination with those concerns they claimed that they "have always held our laurels around decisions being made that involve good, sound scientific research." The end result, in terms of their position on the overall success of the IBMP was the "status has been maintained, so it is passing that test. Still, we need to have an avenue that allows those bison to move around using spatial and temporal separation because they increase 600-700 head of bison a year depending on seasonal losses and predation."

The issues surrounding habitat expansion and solutions to the problem are obviously on the industry's radar, but the MSA representative was quick to rebuff the previous statement by making the point that their "only concern is that when we look at the landscape it is not a large area and those bison could move through the region in a day. When you get beyond that, it is tough to control those bison in some of the areas north of the park in terms of hazing, which would put the state in jeopardy of transmission. If those bison get too far, they will not get them back very easily and we would be putting the entire state at risk, so we have to be careful in that process."

The same concerns were reiterated by the Montana Farm Bureau. They claim that "before the IBMP there was not a large emphasis on Montana cattle, so this allows some flexibility in terms of allowing tolerance for bison beyond the park. The downfall is that if we allow them to continually migrate they will inhabit that area permanently and move to another area for forage." They firmly believe that the previous management techniques adhered to by the NPS and Montana FWP, "allowed bison to drive elk off the land, deer, and other species, because as their

numbers get so big they somehow have to control the population."

All of this begs the question: So what is the solution to the lack of habitat and how could the hunt play a role in the expansion of more habitat for bison? As an advocate for BFC pointed out "the mindset, in the west, of progress conflicts with maintaining viable species, so the result is the eradication of bison is progress within this utilitarian view." This is a continual struggle, especially in this region, as public and private land conflicts remain in the spotlight, whether it involves in-stream flows, wildlife, or the management of wildfire within designated wilderness that borders private lands.

Many of the solutions surrounding habitat issues were tied into a viable and legitimate hunt among many of the groups. Other solutions revolved around spatial and temporal separation, consistent vaccination of cattle, and providing funding to fence off private property to reduce risk of transmission. The GYC summed up both of these issues when they proposed the idea of "[using] fencing, temporal start dates on allotments on the west side, and [giving] ranchers incentive to delay putting cattle on private land during the turnout dates. At the same time their interests need to be respected and listened to, which will take compromise on both sides to solve the issue." They included the hunt as a legitimate form of managing wildlife in the region as well. If we are going to treat bison as wildlife then it will "have to involve a hunt because that is how we have managed wildlife populations in this state, in the west, and across the country. We cannot allow hunting in the park, but we have to provide a way to manage the population, because at this time it is a healthy, robust population that continues to grow and do well in the park."

This same sentiment was echoed by the BFC, but they believe "if bison were afforded habitat we would have a more viable hunt and BFC would support it fully. Not only is habitat an issue, but the bison are being hazed before, during, and after the hunts." They explained their case even further by giving the example on the north side of the park "when bison even approach the boundary, they are hazed back across before they exit the park. Ideally, we would like to see them have access on the north side into Yankee Jim Canyon." Basically, they "would like to see some proactive thinking to allow the bison access in that area for calving. There are no cattle and it presents very little conflict, so why not let them access that region?" Members of the Bear Creek Council concurred and believe that "if we begin to view bison as wildlife in Montana, such as elk and deer, then we think we will have another factor that would benefit the species, especially in terms of expanding and protecting habitat through sporstmen dollars." As the GYC representative pointed out, though, none of this is possible "until the Board of Livestock...gives something back in return." They summed up the current situation by explaining that "at this point they have the ability to say no to any suggested changes in habitat for the hunt and they have the final say on the hunt in general. If they are not willing to allow FWP to conduct an analysis that shows how inflexible the BOL is, then they will never be willing to give the public good information, or give FWP good information to recommend changes."

The NPCA representative looked at it from the perspective of current uses on the landscape. They reiterated the fact that they "do not want the livestock industry to lose their status, but we do need to look at the allotments around the park and consider their importance in the overall ecosystem. We are not advocating for allowing bison to roam all the way to White

Sulphur Springs, but there needs to be a bit of give and take in the process." Ultimately, they "would like to see them free ranging outside of the park on their calving grounds during the winter. We really need to let science and reality guide the process, as opposed to some weird boogyman that some strange agency holds over the head of everybody involved in the process." There solution is to "take the $10 million spent every year and use it in more productive ways, such as working with livestock producers to change turnout dates on allotments, or retiring allotments in high risk areas." In addition to that they believe we "could also work toward securing easements around the park, and fencing, rather than boosting a federal bureaucracy in the region." This, of course, is a direct reference to APHIS's role in the process.

The governor's office agreed with many of the above statements, and concluded that "if we can back off current herds of bison that constantly come out of the park, set back turnout dates for cattle coming into the area in the spring, and open up corridors for migration we would see more progress." Whether or not these compromises among groups will occur is yet to be seen. Members of the Gallatin Wildlife Association have found the process discouraging and they believe that "until we begin protecting and connecting, then we are continuing to shuffle chairs on the Titanic because the foundation of the plan is flawed and it needs to be rebuilt." They felt "that almost every good idea that has been brought to the agencies' attention has been rejected because of the plan and almost every bad idea we have seen has been perpetuated by the IBMP." At this point their solutions are quite simple, with a direct reference to the Governor's office, despite what the office representation stated on the issue. They referenced the hunt in 2007 as a symbol of business as usual, by pointing out the fact that "during the second hunt the

FWP Commission and the Governor's office, against the recommendation of FWP, increased the permits and did not increase the habitat for bison." They feel they "have been patient, but we feel like if we tear down government intervention, reduce spending, and cut waste we could do better for the species and the industry. For some reason the governor has gone back to the existing plan and is afraid to amend the plan, but we cannot administer a vaccine over 22 million acres, to a variety of wildlife, and know how much we are containing." This statement brings us to the next question involving the efficacy of the previous and current brucellosis studies, as well the legitimacy of this research within the current conflict and disagreement.

Are current management strategies adequate and are they supported by current research concerning Brucella abortus?

The issues and disagreements involving research pertaining to Brucella abortus and the current management strategy tend to go hand in hand. Many of the faults involving management strategies discussed above gave reference to the industry inflating the issue and the participating agencies using the disease to mask many of the conflicts that are occurring on the ground, in terms of resource management and control, the oppression of a specific species over others, and the lack of management geared toward actual risk due to arbitrary zone management. Many of the interest groups who are opposed to current management have directed the majority of their frustrations toward APHIS and the industry. This is understandable considering that both of those groups have focused heavily on the control of disease with the ultimate goal of full eradication within the herd.

Regional Status

In terms of the research involving both of the herds in the GYE, in Grand Teton N.P. and Yellowstone N.P., many of the conclusions that have been brought out over time are roughly the same. This was discussed thoroughly in the first chapter and it was updated at the end to include research that has been conducted in an actual field based setting outside of Yellowstone. The conclusions from that study overlapped, for the most part, with the same type of research that was conducted in Grand Teton N.P. previously. Despite room for flexibility in the region and alternatives aimed at managing for actual risk beyond the park boundary, the partnering agencies have stuck with the status quo. Much of this is due to the MOU that is in place, some of it has to do with the influence from the industry and state veterinarians, and still, some of it is due to the insistence from APHIS to continually manage for the elimination of the disease.

As the BFC representative stated, "Instead of having it play out as a huge threat we should really be looking at what the risk is and minimize that risk rather than slaughtering every bison that steps beyond the park boundary." This is an opinion that is held by many of the other groups involved in the process as well. There has been a suggestion, in combination with this belief, that APHIS should allow a bit more flexibility with a move toward a more regionally based status system. This does not mean that the status would not be enforced within the GYE, rather the suggestions focus on not expanding sanctions to other regions of the state that are not directly affected by the circumstances around Yellowstone. For example, the same representative posed the question of "why a rancher in Miles City should be penalized for transmission in the GYE? With more stringent requirements in the GYE we could take care of the perceived risk and

only affect a small cadre of producers." Besides, as they point out, "not a whole lot of money is being made in the region in terms of cattle production due to harsh winters, high elevation, and limited range anyway."

Beyond the NGOs that are working on this issue, there are also individuals within the industry who are asking the same questions. Members of the Defenders of Wildlife referenced a recent case where a rancher brought the idea up during a committee meeting. The rancher brought up the idea of regional classification, stating that "it should be more regionally based so that if a cattle herd is infected in Park County then the county/region would have their status changed rather than the whole state." The Defenders representative agreed and said that "we do not believe it makes sense to penalize all of the stock growers for a relatively localized and isolated issue. We believe this would be beneficial for folks on all sides of the spectrum." As for how this would, or could occur, with a powerful agency like APHIS in charge is another question. When this was posed, the same representative believed that "the stock growers and producers need to put pressure on APHIS to change the policy because they are the constituency that is more involved in those issues."

The BFC has also brought up the issue and has even worked toward a change in the classification system. They "feel that a zone drawn around the GYE would be much more sensible to show the reasonable risks within the region. We have encouraged Governor Schweitzer to meet with the governors of Idaho and Wyoming to petition APHIS for zone designation around the GYE, so there is a separate designation for the rest of the state." The Bear Creek Council, which counts ranchers and livestock managers within their membership, also

"would like to see a change in management of brucellosis in the state. Specifically, we would like to see this come from APHIS, where a line would be drawn around the GYE without punishing the majority of the state." They referenced the same issue as the Defenders of Wildlife representative, bringing up the fact that, "In the July management meeting these concerns and ideas were brought to the attention of APHIS by a stock producer, not a conservation group, yet no one from the agencies has agreed or cooperated with this change in policy, and it seems as though they get especially heated about the issue."

Members of the Gallatin Wildlife Association summed up this issue quite well. They think "regionalization is a possibility with APHIS, because we cannot eradicate brucellosis in Montana due to the linking up of winter range in Montana and the feedlots in Wyoming." If regionalization does not occur then we would be "requiring administration of a vaccine, test, and slaughter program through two National Parks, six national forests, three national wildlife refuges possibly, and a variety of private land." This begs the question of whether or not "we [are] going to impose the will of the federal government across this whole landscape, on a variety of different wildlife, within the 'gem of the planet'?" The National Wildlife Federation concurred with all of the above strategies. They believe that "if we could figure out a way to decouple the statewide sanctioning of livestock producers because of the presence of a disease in a remote corner of the state, as well as getting the state livestock boards to agree to a change in structure around Yellowstone, then the IBMP could work to facilitate the interests of the majority of Montanans."

APHIS, for their part, does not hold back on their role in the management process. They

state that "[their] focus involves the disease element of the management stratagem." Members of the USFS concurred and even suggested that APHIS is the main agency behind the current management model. As they said "APHIS is a very large player in the process. They play the largest role in the day-to-day management decisions that are being made." This begs the question of how APHIS has continually operated under the radar when it comes to the public's knowledge of the agency and what their mandate is involving wild animals? The bottom line, as it was shown earlier, is that APHIS has always been involved in domestic animal disease and they have rarely been involved, or even put in charge, of managing wild animals for disease. Again, on this issue, APHIS was open about the significance of their role, as they "continue to take the lead as an agency in surveillance and sampling of brucellosis, as well as the containment of the disease. As an agency, we are also committed to maintaining the integrity of the wild, free ranging bison herd in the GYE."

Because of their role in the process, a representative from the NPCA believes "APHIS, specifically, needs to inform the public why they are consistently testing and slaughtering almost every bison that leaves the park boundary. At a minimum they should be focusing on the areas where there is risk of transmission, which would allow us to enforce spatial and temporal separation of bison and cattle during the transition seasons." Since that has not happened they simply believe "it is more about the bureaucracy sustaining itself over time, rather than solving the problem on the ground."

APHIS and Disease Eradication

During the interview process, though, APHIS was clear about what their role and goals

are pertaining specifically to brucellosis and bison within the GYE. Obviously it should come as no surprise that the majority of their responsibilities involve disease control and eradication. They summed it up in one quote, stating that "We have provided for the oversight of brucellosis diagnostic testing and research on bison. Our research revolves around the prevention of brucellosis transmission from wildlife to cattle." In addition they "are also working on research involving the feasibility studies for the quarantine facilities for wildlife and bison." When asked who is pushing the agency toward this type of work involving the herd, they broadly stated that "much of this work comes from the information we receive from various stakeholders involved in the issue who have presented ideas on how to solve these problems." They further explained that "[their] main goal is to ensure that risk is minimal, as well as preventing transmission of brucellosis within state cattle herds." Despite the fact that they want to ensure minimal risk, many of the groups do not see the IBMP being effective at managing for risk at all.

Members of the Bear Creek Council conveyed their opinion surrounding the issue of risk. They believe it comes down to how the IBMP was written in the first place. For example, they point out that "there is language in the IBMP that continues to discuss the eradication of brucellosis, which will perpetuate misunderstanding on the issue. We will continue to bring people together until that language is taken out of the plan because in some ways wording needs to be molded around management for risk, rather than eliminating risk." No group was more outspoken about the flaws within the management plan concerning the science surrounding brucellosis than the Gallatin Wildlife Association. They believe the "stance of the agencies on bison to be more of an enforcement issue, rather than a biological issue. Rather than the FWP

having game wardens involved with the hazing process, we have encouraged them to shift more toward biological efforts concerning brucellosis." As an example, they explained that "the winter range for bison is beyond the 'approved' zones on the management map, which shows that the major problem with this plan is it is politically based and not scientific based." Ironically, the USFS echoed the same belief, by saying, "The science and biology foundation of the plan is one thing, but we cannot forget the political aspects of the issue. This is on an equal playing field with the other issues involved."

Members of the Gallatin Wildlife Association expounded on the various topics surrounding APHIS' role in the process. During meetings they brought up the point that "APHIS has stated in conversation that they do not manage for disease, they eradicate disease. So, if we want to take care of the problem the way they state it, then we will ultimately allow APHIS to round up bison, test, slaughter, and restock." In addition to this they explained that "unfortunately, the governor's office is on board with this idea." The problem is that "even if we go through that drawn out, expensive process, we still have the feedlots in Grand Teton and the Montana Stockgrowers Association went on record stating that they do not want bison to be managed as wildlife in Montana, therefore, this is a failed policy from the start." They went even further to explain that "the foundation for this plan is so flawed scientifically that there are virtually no solutions, in my opinion, evident in the current framework." Again, the references pertaining to the lack of heavy handed management for elk in the region was brought up to reinforce the thought that this issue is more about resources and politics, than it is about the threat of disease. As an organization "the way we see it, all the plan does is contain bison and not

brucellosis. It does not allow bison to be free-ranging because it cuts them off from a critical aspect of their habitat." They referenced what many biologists already know, and that is the fact that "whenever we sever an animal's access to habitat, we will continue to have problems, especially when you sever them from calving grounds. Elk, which also carry the disease, calve a month later than bison, in May, in the same spots that are being cut off to bison."

Differing Views on Brucella abortus

Despite the opinions of the majority of the groups involved, both the Greater Yellowstone Coalition and the National Wildlife Federation have taken different stances in terms of the brucellosis debate and actual threats in the region. This does not mean they do not believe in flexible management, although NWF has been a proponent of the quarantine facility since the early stages. As the representative from the GYC explains, "There needs to be continuance of the spatial and temporal separation among cattle and bison. We have seen transmission of brucellosis between bison and cattle occur in experimental situations and both Wyoming and Idaho have seen the transmission of brucellosis from wildlife to cattle as well." They believe "it is naive to continue to say we are not going to see transmission, because it is possible and it is only a matter of time if we allow free ranging bison. It is important to respect the cattle production industry's concerns because they play a role in our economy and ranching has been an important part of this state and this region throughout history."

As for the National Wildlife Federation, they have "advocated from the beginning that if Montana was going to slaughter bison as soon as they left the park boundary that a better option would be to test and certify them as healthy." They "had an agreement with the Intertribal Bison

Council (ITBC) that the bison would be held in a reserve herd so that we could release bison into more of the public land in the west. The ITBC would then release the disease free bison back to other public land." They went even further to justify their stance saying that "we have always advocated for a quarantine facility because that is the only way we can get the bison out alive and it is the only way we can restore the public and private lands for bison." They admit that their stance has "irritated some other groups involved in the issue." They went further to justify their opinion, falling back on the issues concerning the political foundation of the argument. They believe "this is a systemic issue that we have to change and until it is we will continue to have the problem. That is why Wyoming continues to test and slaughter elk, because the brucellosis status was subject to be sanctioned by APHIS if they did not do something about the problem...and APHIS likes dead animals to show that they are actually doing something."

As for the actual risk, the prevalence within the herd, and the science that revolves around brucellosis gestation and eradication, it seems to be all over the spectrum in terms of statistics, opinions, and strategies. According to APHIS the "bison in YNP deserve special attention because more than 40% of the herd has tested positive for Brucella abortus." This means "that the animal has been exposed and is more likely infected." The ramifications of infected bison in the region were laid out very clearly by APHIS personnel. They explained that "brucellosis is one of the more serious diseases in livestock considering the damage done to the animals, including the loss of calves, infertility, decreased milk production, weight loss, and lameness. The rapid rate at which it spreads and the fact that it is transmissible to humans makes it all the more serious." APHIS maintains that their "role as an agency is to help producers understand the

seriousness of the disease and how to deal with the disease, as well as to reduce any transmission risk that may exist in the region, because no one wants more than we do, to see bison that are 'clean'." Many of the constituents within the stock production industry have relied on the economic argument to back up their stance on the issue, but as APHIS pointed out, maintaining the brucellosis free status "is not just an economic piece, this is also about the genetic integrity of the livestock herds."

As for the legitimacy of the testing procedures, whether samples were taken from blood or tissue, or whether transmission tests were conducted in controlled settings versus non-controlled, natural settings, there remains much debate. The Montana Stockgrower's Association, "understands that research can be twisted toward specific views, but what we have concluded is that a transmission could occur even though this has been tough to quantify in the wild." They went further to explain the lab setting that was used to justify some elements of the IBMP, especially the capture, test, and slaughter procedures that are taking place on both sides of the park. They explained that with "the laboratory setting, the research was conducted within a one hundred square yard area and it was controlled, to an extent, to resemble a natural landscape setting." Despite the controlled setting they "firmly believe this can occur in the wild, because we have seen this occur with elk." Even though there has been "some debate about the long term viability of brucellosis in fetuses and placenta in the wild...from the industry perspective we have to base our judgment around the shortest length possible, which is thirty to sixty days."

Viability of Vaccines and the Impacts on Industry

Despite their stance based around minimal risk, they did say "if there are studies

developed that claim differently in terms of viability and vaccination, then we would take a look at those options." They also stated that "if a company could establish a more viable option, in terms of a vaccine, there is a great market available for that currently.", because "the option of using RB51 presents a success rate between 60-70% among bison and a bit higher among livestock." They feel that "if we could get to 85-90% in terms of success that would be ideal and, realistically, that is about as successful as it could get in a non-controlled setting." The viability of a vaccine would solve many of the current conflicts that are occurring between the diverse interests, according to MSA. They believe "success in the vaccination process would most likely present a decline in test and slaughter of bison." At this point "the park service is beginning to use a remote vaccination process and the research and development continues." Still MSA reiterated that "during this process, we cannot wait until the perfect remote vaccination, mode of administration, or virus strain is found while allowing bison to roam. Obviously we would be in full support of an efficient remote vaccination process, even if we are obtaining a 50-60% success rate" But, they stated that "ultimately we want a healthy population and this is possible even at that level, for both bison and elk."

In terms of the economic side of the issue MSA was specific about the impact that it would have on the industry in Montana. They point out that in Montana "we are looking at a billion dollar industry." So, "even if we do not lose our status there are a number of state veterinarians around the country who are watching the livestock industry in Montana." Because of that if "we do not comply with the IBMP, or do not fulfill our responsibilities within that framework, they would not be afraid to set sanctions on the state." The result of the sanctions

"would lower our market value and we would have to continue to test cattle, which costs a large amount of money. We would also lose a tremendous amount of the market in particular areas, such as the seed stock market in Montana that is probably the best in the country." As MSA stressed, if "we cannot ship out animals across the state line it would have a crippling effect on the industry. We want to allow bison room in Montana, but we will have to keep a pretty short leash on them so that we do not put the industry at risk and this is the stance we have maintained since the beginning of the process."

Many of these issues and threats were reinforced by representatives from the Montana Farm Bureau as well. They pointed out that the "testing of livestock is a big deal and it is not a quick process. Furthermore, it is not easy and it is not cheap, as it can cost state producers millions of dollars annually. Because of the stringent qualification procedures "the states have the potential to reject beef, or the simple transport of untested cattle "on the hoof" when it is being brought through interstate commerce. This has become a global issue, not just an interstate or national issue." This has resulted in the industry being "told that if the plan changed significantly they are more than ready to step out and require us to test our animals before they accept our beef. The state veterinarians have the ability to require this, this is not APHIS. Each state determines what is best for the state and their livestock industry in particular."

Fortunately, for the industry, they have had the governor's office on their side when it comes to the quarantine and testing paradigm within the IBMP. As a representative of the governor stated, "The containment of Brucella abortus and the potential loss of our free status are paramount in the governor's mind. We are attempting to uphold both principles of the IBMP and

we believe that achieving both goals is possible, but ultimately we want to eradicate the disease in the GYE." They also brought up the lack of efficiency concerning the vaccination process and they believe that much of the responsibility falls with the federal government. They stated that RB51 "is 65-70% successful in cattle at best. We need more research to be conducted in this area. The NPS just conducted the EIS on remote vaccination, where we would vaccinate them with darts, salt licks, and feed." They went further to explain that "we could then begin vaccinating the animals in the park including bison, as well as elk." This is the same mentality and response conveyed by the industry and APHIS. The fact that these various interests are directing energy toward both bison and elk should ring alarms among constituencies that work within the realm of wildlife management. An aggressive capture, test, and slaughter program is basically being proposed across the board for wildlife who carry diseases that threaten the industry in the region.

The major question that emerges is whether or not we, the public, are willing to allow various agencies, including game agencies, to vaccinate wild animals across our public lands? If so, this would create a major shift in game management, and the case involving bison in the GYE would set a major precedent for future management procedures. This would possibly ripple into other areas of management throughout the state, or possibly, the country. The governor's office continues to stick with this paradigm, because they believe "long term vaccination is the only possibility and we need to press the federal agencies to invest in that and move forward." They added that "they need to invest money in the process, but when you're fighting wars in other parts of the world it contributes to a lot of the funding problems. For the people who are

looking to conquer and limit the disease totally from the ecosystem; this is probably the only way we're going to do it." The words "conquer" and "limit" are prime examples of the goals in the circle of IBMP supporters. As APHIS stated during the interview process, "the APHIS veterinarians suggest that the health of wild animals is just as important as the health of domestic animals and in this case it is bison and elk for that matter." So, one could draw the conclusion that these agencies, specifically APHIS, are relentless about cleaning up wild ungulate herds, which could potentially blur the lines between the management of wild and domestic species.

Agency Views

As for the agencies' stance on these issues, many of them stick to the status quo when it comes to the stated goals of the IBMP concerning capture, test, and slaughter of bison in the GYE. Many of the agency representatives discussed other conflicts outside of the brucellosis issue as well. For example, the National Park Service made the point that "it is not just brucellosis; it is tolerance of large, migrating animals outside of the park boundary that the communities struggle with in the surrounding valleys." As for the move toward vaccination of the species in the region, the NPS representative was clear about the reality of the situation. They pointed out that "we do not have the tools available to solve what many see as a problem. The agencies are not capable of eradicating brucellosis within this ecosystem, whether it is bison, or elk, or whatever, because the tools do not exist." Furthermore, they "also recognize that [they] would have to manage for this within a public and private interface beyond the park boundary in terms of land, and this is always a tough issue."

Montana FWP has taken a bit of pragmatic approach toward the current management

strategies. They will not deny some of the success, especially in terms of not experiencing transmission of the disease in the region, but they still believe there is room for improvement beyond the current strategies. They point out that "there has been no transmission of brucellosis since the plan went into effect and the bison population has been thriving despite removal, testing, and slaughtering. We still see high recruitment levels each year because they are healthy and the economic viability of the livestock industry continues to stay afloat." Unfortunately, since the time of the interview there was transmission in the GYE, but the transmission was suspected to occur between elk and cattle in the Park County region north of Gardiner.

Despite the success of not having transmission occur FWP believes "there needs to be a continuation of exploring opportunities based on research and lessons learned." They point to recent research conducted by the agency pertaining to the gestation period of brucellosis in the natural environment. They stated that the "research conducted around brucellosis viability in the environment....ended up telling us that eighty days is the longest that brucella persists in the environment. That study could bring about flexibility in terms of management, such as the continuation of turnout dates in June." They believe that "with this research we need to continue to adapt and change throughout the process", but unfortunately "the brucellosis free status tends to override the goal of maintaining a wild and free roaming herd in Montana." The DOL and the industry do not hold back on this issue and they are up front about maintaining the status by any means necessary. For example, a representative from the DOL stated outright that "the main issue is disease and if this poses a threat to our status, then it will be pretty darn difficult to

obtain more area and habitat in the region for hunting and recreation opportunities. As long as the disease is present the industry will become more rigid and these issues have come up when discussing the hunt."

It seems that every time the DOL or the industry is open to some flexibility in the region, they quickly counter with the threat of disease. The power of the DOL and the industry is evident, in terms of the political pull they harness in the management process. Members of the USFS explained this when discussing their adherence to the IBMP. They pointed out clearly that "we take a lot of responsibility as an agency to advocate for the goals of the IBMP, rather than the individual stance of the agency...we all advocate for the needs of the DOL, so that we retain the brucellosis free status." So, even the agency that has been put in charge of managing the public lands for future habitat expansion, professes to prioritize the needs of an agency that is working for the interests of the industry, rather than wildlife.

Concluding Thoughts from the NGOs

Of course, all of the disparity and inconsistency among the agencies and the industry is evident to the NGOs that have been working on the issue for the past decade or more. Furthermore, they believe the burdens presented by the disease in the region should be put on stock producers, rather than placing the burden on a wildlife species that does not operate or migrate within arbitrary, human drawn boundaries. They also point to the research conducted by Keith Aune and FWP to justify the possibility of allowing bison to roam into their winter range beyond the park boundary. The BFC references this research by pointing out that "all of the brucellosis persistence studies conducted by Keith Aune clearly show that brucellosis does not

persist in the environment for very long, especially during the spring elements when it dies quickly." They further explain the fact that "currently the turnout dates in that region are June 15th, which provides a solid cushion for the gestation period to subside." Therefore, they believe "it makes sense that in the areas that pose a risk, the livestock industry should take on the burden of adapting their turnout dates so that livestock are not mingling with bison. Typically, by mid-May the bison are back in the park on the west side, with an earlier time frame on the north side of the park." Members of the Gallatin Wildlife Association echoed the same sentiments, and they "claim the point [they] try to make centers around the idea of brucellosis gestation being stronger based on seasonal change, which would allow us to roll the turnout date for those cattle to July 1st and decrease the risk of transmission. If this is a real problem for those allotments, in terms of bison, then it is also a problem because of the thousands of elk who calve in that area in May."

Defenders of Wildlife points specifically to the flawed process with the research, which focuses on antibodies, rather than tissue samples. They believe "The process surrounding brucellosis testing is flawed", because "it tests for antibodies and this does not necessarily mean that the particular animal is a carrier. It is possible that the bison might actually be resistant to brucellosis because it is showing those antibodies within it's system. It is similar to a natural vaccine, such as when humans contract chicken pox." Due to the flawed process, in their opinion, we may be "undermining the resiliency of the species by taking all of them out of the herd. It needs to be based on scientific research, but we also need to be a bit more conservative if we do not have the research to back it up. There should be a more precautionary approach that falls on the side of doing no harm to the species."

Again, the Gallatin Wildlife Association delved into this issue heavily and brought up some promising ideas and alternatives for management in the region. They reference the same concerns as the Defenders of Wildlife in terms of the loss of genetic diversity. They point to the herd within the Crown Butte region of the park and they believe we have "extirpated [it] because of our management practices." Furthermore, they state that "no one in the IBMP participating agencies will mention the loss of this herd. They tend to focus on the west side (Horse Butte/ Hebgen Lake) and the north (Gardiner), but they never discuss the northwest movement of bison through the upper Gallatin headwaters, into the Buffalo Horn area."

Beyond the harmful practices and how that impacts the genetic diversity and sustainability of the herd, their biggest concern is the inconsistency in management policy and the political sway that the producers have with the issue. For them, the belief is that the "stock producers are not interested in seeing bison managed as wildlife and they have effectively used the fog of disease to create a paranoia." Much of the inconsistency is based on the discrepancies between how we manage elk in Montana in comparison to how we manage bison in the state. They point out that management is currently "working for elk and they calve in mid-May and finish in mid-June, which means if they shed brucellosis it would be there. Yet bison would calve from mid-April until mid-May, which shows how inconsistent these policies are in terms of species and risk." They believe that much of the blame should be put on the participating agencies for this issue. They explained that the agencies will call this plan a "'Brucellosis Management Plan', including Keith Aune, who is the FWP biologist. Brucellosis, currently, is

not being contained in this area at all, only bison." So they conclude that "this presents another scientific flaw because it does not allow bison to get to their critical range and we are not confining brucellosis because we have elk calving in the same region."

The Gallatin Wildlife Association also believes that the perpetuation of conflict has become beneficial for the industry in the region. Despite the evident risks in the GYE, they continue to see producers willingly grazing cow/calf pairs in high conflict areas. This does not take away from the real threats and the GWA agrees with the fact "that brucellosis is a serious disease, but they make it sound like if the state loses the status the sky will fall, yet we have seen it occur in Wyoming and Idaho and in neither case did it become tragic." They make the point that through cooperation with APHIS "Idaho clearly could have regionalized by allowing a region around the park to become Class A status, but they chose not to because they did not want to go through the process." The result, according to the GWA, is "that they wanted to keep the stock producers in the western part of the state engaged, even though they had no stake in the direct issue."

This is quite similar to what is occurring in Montana as well. They point this by conveying that, "According to the Stockgrower's Association this issue is all about the disease.... [but] it is not just about disease, because the management in the northern part of the state and at the Bison Range fly in the face of their argument." So, "what we are doing is eliminating animals that are resistant because we are singling out animals that migrate and testing them for seropositivity. This has become a nightmare from a genetics standpoint and now we have people claiming there are two different herds, with one in the northern end of the park and one in the

south end of the park." The reason they reference the Bison Range in Moise and the northern herds managed by the World Wildlife Fund, is because those bison are vaccinated and clean, yet all of them are kept within a fenced in area of range and they are tagged.

The Buffalo Field Campaign has echoed many of these same beliefs surrounding inconsistencies in the plan pertaining to brucellosis research. They point to the hunt and the quarantine process as evidence of misled management. For example, they are "seeing bulls brought into the holding pens, which shows that this is really a bison control mechanism because bulls pose a minimal threat in terms of brucellosis transmission." They point to the hunt as a "prime example of how this issue has persisted." They noted that "in the past from late fall into early winter, the only bison that would leave the park were bulls and the DOL would kill them. We brought attention to this issue." They believe the hunt has "now placed the responsibility outside of the hands of the agency in a convenient manner, because in 2007 we saw only one bison shot that was not a bull and in 2006 all of the bison that were shot were bulls."

The bottom line, according to the GWA is that "there has been a reluctance for any change to occur because there has always been a call for brucellosis eradication in either bison, elk, or both." They believe this is a failed proposition and they point to management that is counterproductive to brucellosis eradication in general. They believe that eradication will never occur due to the elk feed lots in Grand Teton National Park. They explain that the region "is between 18-22 million acres depending on who you talk to. If you want to eradicate brucellosis in the region there better be a wide loop and you are going to have to bring a whole lot of wildlife into the spectrum because many of them are carriers of the disease." Because, "currently

we have twenty two feedlots in Wyoming, where a reservoir for the disease has been created mostly through the elk inhabiting the area." They believe "feedlots and allotments are issues that need to be dealt with, but unfortunately two of the largest are managed by the federal government in Grand Teton National Park and at Stevens Creek inside Yellowstone. Both of these feedlots should be taken out of the parks and their use for wildlife should be put to an end. It is not part of the agencies' mandate anyway." They reiterate the point that they "are treating brucellosis as a real issue and threat, but if we do not have any susceptible cattle on allotments during the wrong time of the year we should be fine. These are the only places we know of that brucellosis has been transferred from ungulates to cattle." But, "in a free ranging setting, such as the Madison Valley we do not know if there has been any documented cases of brucellosis being transferred from wildlife to livestock."

Group's Views on Solutions

So all of this discussion surrounding failed policy based on inconsistent scientific findings brings up the question of what we should do to solve the problems? Many groups suggested easement propositions, a change in turnout dates, producers raising low risk animals, and stripping dual designation from bison. The GWA referenced past successes involving agency assistance. They pointed out that, "With the agencies' help we have done all of these wonderful things for elk and grizzlies, and yet we still cannot quite embrace bison, because we use the excuse of brucellosis, but all of the other species have been exposed and are shedding the disease during the calving season." According to the group "we should not have been spending millions of dollars on research for wildlife vaccines that have gone nowhere, when we could have been

funding livestock vaccination with federal dollars, in combination with a change in production practices in the region." They feel that "we should quit talking about eradicating brucellosis in wildlife, and vaccinating wildlife, and learn to live and manage for the issue rather than focusing on eradication."

One solution that was brought up by the GWA was a change in production practices in the region and the additional burden that should be placed on the producers. First and foremost, they "believe that if there is a positive test for brucellosis in elk, then it is up livestock managers to adapt to the issue." Their solution lies in grazing different stock. They explained that "the benefits of raising spayed heifers, steers, horses, and mules are two fold: 1) they are low risk for brucellosis and, 2) cow/calf pairs are more susceptible to predation in an area where wolves and grizzlies are protected."

Members of the BFC agreed that more of the burden needs to be put on the producers who are willingly taking the risk to graze livestock in such a high risk area. They feel that the best avenue for vaccination is focusing on the cattle. They believe this process "would improve the efficiency of the vaccine, but instead we are talking about vaccinating a wild animal, which is an impossibility in a large geographic area." Yet the "governor continues to talk about eradication of brucellosis, which is backed by APHIS." In terms of the possible success oriented with a vaccination program, the BFC points out that the "research states that with the current tools eradication will never occur amongst game species. Instead of talking about eradication we should be focusing on managing for risk."

Despite all of the above recommendations and evident inconsistencies within the current

management scheme, an NPS representative summed it up by saying "The challenges of management will be with us for the long haul, specifically the brucellosis risk, and this needs to contain public involvement." Whether or not the public will be involved in future management, or recommendations toward management, remains to be seen. The same representative also warned that there "is no panacea about where bison can be and there will always be some line. The questions will focus around where and what tolerance can we work with in terms of the public realm and within the agencies' desires." Despite many of the issues brought up by those NGOs that are working toward improving current management, the producers believe the plan is satisfactory enough when it comes to brucellosis. In some cases, they want even more heavy handed management when it comes to the eradication of the disease.

As the Montana Farm Bureau put it, "there is flexibility....because it allows animals out of the park when no cattle are present and the time frame is long enough so that disease cannot be transmitted to cow/calf pairs." The Department of Livestock, on the other hand, believes they "actually are limited at times with what we can do as an agency." Despite the Montana Stockgrower's Association's rhetoric surrounding flexibility, it is quite obvious that they will not be satisfied until brucellosis is completely eradicated from the region. They believe "the strengths of the IBMP are pretty narrowly focused, because it is not a plan to eradicate brucellosis in the GYE; so there is room in the plan to expand that language." They feel that "we need to expand beyond the current language because if we eradicate brucellosis we could end a lot of the conflicts within the region." It is evident from the above comments and information that there are disparities among the various interests when discussion revolves around habitat and

brucellosis eradication or containment.

Is it possible to establish a collaborative based approach to management that would involve interested parties outside of the current state and federal structure?

The idea of coming together within the current framework was explored during the interview process. It is obvious that this issue has created strong polarization between the various interests, and historically it was a polarizing issue among the partnering agencies involved. Whatever occurs in terms of a final product of collaboration the accomplishments or recommendations that come from the public participants will fall within the parameters of the agencies' mandate when it comes to management. So, none of these projects will meet success unless they fall within the jurisdiction, authority, and capabilities of the agency involved in the actual management of the land or species in question.

Many of the groups involved in the bison conflict view communication between non-traditional allies as beneficial, but they also believe that the structure of the IBMP is an impediment to the possibilities of the process ever unfolding. Along with this, they cite the inability of the various interests to relate, or even trust, one another as a major road block in the process. For example, a representative from the BFC believes that "expanding communication certainly would not hurt from an objective standpoint." At the same time they "see the plan as a real divisive tool between people. It ignores the biggest economy in the GYE, which is tourism, because it is geared toward protecting the profit and interests of the industry."

The GYC agrees with the divisive nature within the structure of the IBMP. They believe "there is potential to unify people with different interests, but there are many people that are

unsatisfied with the IBMP." They pointed to the reason that "the plan has not worked as well as expected, so there is plenty of reason to be upset with the process." Yet, they also believe that "the plan will never meet a broad range of interests, specifically the outer 'flanks' of the opposing interests on the spectrum." They did point to the adaptive management provisions as having potential to bridge some of the gaps. They believe there is "a way through the adaptive management provisions in the plan to meet the needs of more interests in the region, as well as bison, but this will have to be done through a lot of negotiation and compromise among interest groups and agencies." Within that scope they believe that "everyone will have to part ways with a bit of their ideology in order to find success. The political reality is there is no support to allow bison to roam wherever we want them to in the state." All of this, of course, is dependent upon the agencies and how they decide to manage the population. As the GYC put it, "The plan could satisfy more people if the agencies embrace the learning aspects of management over the past six years and are willing to be open to providing greater flexibility to bison outside of the park boundary." If they do not "this plan will continue to fail a lot of people and bison if the agencies aren't willing to honestly respect the adaptive management provisions."

According to the NPCA "the agencies in some way have been an impediment in the potential process of the conservation community sitting down with the livestock industry." They pointed to the meeting that occurred in 2007. They believe "there is skepticism when you allow the agencies to bring in their own facilitator because it has never worked." This is because "there is too much at stake from a bureaucratic perspective when facilitation is brought into the equation so what it will take is an alliance among traditionally opposing interests, who will force

the agencies to change." They believe, "if this collaborative effort could take effect, we could then line up important political figures, specifically within the Rocky Mountain west, which will force the agencies to change their rhetoric and their current operation." As they put it, "Imagine if the conservation community and stock growers got together at the table and united around a management format that circumvents the policies put into place by the agencies?" They believe "if both groups walked away from the table satisfied with the give and take, and laid down the changes they would like to see with the IBMP to the agencies, we would see it reach a higher political level."

Representatives from the Defenders of Wildlife believe the IBMP has been an impediment to further collaboration as well. They believe that "the IBMP is not helping to bridge the gap between varying interests. In some ways, the whole plan needs to be revisited because a lot of the relationships have coalesced within groups who should be working together on the issue." In the beginning of the process, Defenders "took issue with the lack of public engagement at the national level. We do believe that hosting meetings and public comment within the gateway communities is helpful, but we are dealing with both federal and state lands." Even with those meetings taking place representatives see complications with the process. In reference to the meeting that took place in the spring of 2007 they believe "it was a step in the right direction but it was the same people saying the same things and not a lot of new things were happening. It was not a great way to build trust among the different people who are involved." They believe "part of the issue is that folks do not talk to each other outside of the forum, while in other

forums there is the opportunity to talk to people outside of the structured meeting. We need the informal setting so there is no pressure because it allows us to build relationships and make progress on the issues."

As for the National Wildlife Federation, they believe there is little, to no, possibility of a collaborative effort taking place in the future. In their opinion "there are underground agendas occurring here with all of the agencies and the one's that are most distrustful are APHIS and the state veterinarians who continue to establish their power and justify their role in management." According to the NWF "it is about the consolidation of authority and the ability to dictate to wildlife advocates how much wildlife they can have and they will not budge. In order to have any success we need to get beyond these agendas." They explained that the "IBMP was initially about taking the heat off the system and giving the people a chance to see if there are other ways to deal with this issue, such as research and development to establish new vaccines and techniques to try and put some real science into the situation that could blend with the management plan." But they believe this will "fail because of the craft of the MOU between the agencies, which allows the state to continue to get their brucellosis research money and put the power in the hand of the Interagency Brucellosis Committee to have a stranglehold on the IBMP." Because of this they believe "we could be in store for another huge blow against bison if APHIS continues to get their way in the process." The bottom line for the Federation is that they "really do not think facilitation would help in this process, because this not about bison, this is about 'power politics'. As stated before, APHIS and the state vets will be reluctant to experience any diminishment in their power, so we have to work through Congress and pass laws that

restrain their power."

According to the Bear Creek Council they "still take issue with the overall honesty, or lack thereof, coming from the agencies." For them, "the bottom line is that we are demanding transparency from the agencies involved in the management plan." They also reference previous attempts at collaborative efforts on the issue. They mentioned the fact that "years ago we helped in the development of the Greater Yellowstone Alliance, which had the goal of bringing interest groups together to find common interests and work with the state legislature on the issue." In the end, "this organization fell apart, but during that three years of existence the work that was accomplished helped to produce the current GAO investigation. The other benefit of the GYA was opening up dialogue on the differences between the needs of the north side and west side of the park." They believe that "if the agencies were willing to accept the advice from the public we could possibly move forward, but the states are going to have to initiate the process." Furthermore, they believe "we all could benefit from getting stock producers and other interest groups together at the same table to talk about the issue. It would be nice to cut the agencies out of that process and allow the citizenry to play a role in the issue, which is essential to building understanding between the groups." They think this would "inform the agencies that there are greater powers than them and it is the constituents that they represent. The tribes should be included in this dialogue as well."

As for bridging the gap between the industry and the conservation community within the current management scheme, few people see hope. Most of the potential, according to the groups, lies within the hunting community. Many hunting groups want to see a viable hunt in the

region, yet a portion of them, such as the Gallatin Wildlife Association, continue to protest the hunt due to the lack of habitat afforded to the bison. As for relations with the industry, a representative from the GYC admitted "there has not been any real engagement between the ranching and conservation communities up to this point." They believe that "both of the gateway communities (Gardiner and West Yellowstone) could benefit from a compromise as well." At this point, though, "the IBMP cannot be given any credit for bringing folks together on the issue."

They mentioned that the agencies continue to meet outside of the public process. Along with this, they did give praise to the efforts of the agencies to assist in stimulating discussions and solutions in the 2007 meeting in Bozeman. This has been the only attempt to confront the public's questions and ideas in such an informal format. They mentioned that "currently the IBMP agents host meetings twice a year at the FWP office in Bozeman and the meetings do not really meet the immediate needs of people who care about bison or the overall issue."

As for the 2007 meeting, they believe it was "so far, the best step they have taken to engage the public, but what remains to be seen is how they use the input they received and return the information to those people who attended the meeting." As the GYC explained, setting up a mediation process among the agencies and the public is a difficult process. With that in mind, they believe most of the work, in terms of building trust and working relationships, needs to involve the inner circle of the participating agencies. As they said, "this is not necessarily a debate between GYC and stock growers, but rather a conflict between the agencies. This is where the mediation needs to occur, because there is quite a bit more the private constituencies can do in terms of reaching out to each other on the issue." Beyond the work of the agencies,

they do believe "if a good idea was put forward that had broad representation, then it would give the agencies more cover to consider such a process. Until there is engagement from both sides we will not see much change." This belief, though, counters many of the feelings of the other groups involved, because as the GWA pointed out the agencies seem to balk at any new, adaptive ideas that are presented by the public to these stakeholders.

In terms of the hunting community being involved in the process, the Defenders of Wildlife has recognized "the hunting contingency has become more involved despite initial fears from the public concerning the hunt." They believe this "has been less of a problem than originally thought for a couple of reasons: a) bison move out of the park depending on the severity of the winter, available forage, etc., so they are not always there; and b) hunting bison, as many people have figured out, is tough simply because of the size of the animal, hauling the meat, and field dressing the animal." Because of this "the novelty of hunting bison will never be a major threat to the population, and in the long run it is beneficial because it begins the discussion of allowing FWP to manage the species."

Despite the positive rhetoric coming from Defenders, members of the GWA believe "FWP has given up on bison after receiving a black eye for the hunts in the 90s, which has caused the agency to distinguish bison as a domestic animal." Because of this "lack of enthusiasm and support from the agency it has sent a ripple effect into the hunting community." In their opinion "FWP has kind of put their tail between their legs when it comes to the DOL and they have struggled on how to manage the issue; consequently, they have not engaged the sporting community and asked for help." Either way, the GWA thinks "this should not be a factor

anyway because we should be managing the livestock in the region for risk." They reiterated that the "best way for wildlife to deal with the disease is through resistance, where the strong survive and the weak die. Nobody mentions the fact that wildlife has been exposed to a number of livestock diseases, including brucellosis, and some of these diseases are more detrimental than brucellosis." For the GWA, the end result, they believe is "if we, in the sporting community, do not stand up for the ethical management and increased habitat then we have become a lethal arm of a plan that has an unsustainable foundation."

As for the industry stance on potential collaboration, there does not seem to be as much leeway. Again, much of their stance revolves around the threat of disease and the impact that would have on the statewide industry. As the Montana Farm Bureau representative put it, "We believe the process has potential to build a coalition, but the truth is expanding boundaries and retiring allotments becomes a balloon...you fill that up and people will want more. This will simply exacerbate the problem and we do not see this as a viable option." They feel that many people see the solution as being too simple. They mentioned that "if there was no grazing in the region then people believe the problem would be solved, but in West Yellowstone we are dealing with private land. The Gardiner side is mostly private land as well, it is not like we can allow them out of the park without it affecting somebody." In terms of coalition building, they believe the pressure and burden overwhelmingly falls on the side of the industry. They think the "ability to build a coalition comes and goes depending on the current rhetoric. For example, retiring allotments from grazing and turning it over for habitat tends to raise a lot of questions among some groups. People end up with their back against the wall and this does not help the process."

For the Farm Bureau it simply comes down to the point that "with the bison issue there is not a lot of common ground with the two different perspectives." For example, "Representative Rahall (D-WVa.)...is saying we cannot manage these animals as we are and this is the common theme. This leaves very little room in the middle. That is their stance and ours is to protect the brucellosis free status." They ended the discussion saying "there is some potential common ground with some groups like the GYC and Defenders of Wildlife, but in facilitation you trade marbles with someone who has no marbles, and they take half and continue to want to trade again. We would never say absolutely not, but we have our position and anything we can do while remaining in our position is the most important aspect."

The Montana Stockgrower's Association echoed the unified stance of the industry as well. They explained their stance, and mentioned that "even though some members are hundreds of miles away from the issue they are aware and well informed on the issues concerning brucellosis, which is why we have stayed together on this issue as a unified front." Some may ask, how many members are there in the MSA? Currently, "there are a little over 2,000 members within the organization and some of those people have dual interests in farming, so some members do overlap with other organizations." This may come as a shock, considering how much political pull they have had in the legislative process, as well as the amount of influence they have had on agency decisions. They understand "the sporting interests want to see more habitat and ultimately more bison and we are not necessarily opposed to this if we have a clean herd. I would think they would agree because they do not want to see elk herds become even more infected due to exposure." Again, much of the concern revolves around the disease and

cleaning up herds of wild animals in the GYE. They do not deny that "it is a good thing to learn other people's views and a potential for meeting half way on some of the issues." They also understand that "we need to reach out to other groups and agencies about what is still on the table, but most likely it will be baby steps throughout the process." Their "concern would be around not politicizing the discussions. We do not want an occurrence that allows one group in a position of power to override the minority, which would allow something to get pushed through that does not benefit all parties involved." This is understandable considering the small amount of representation that they do have, but many have argued that the industry interest has had the loudest and most influential voice in the process.

The agencies, for the most part, have become familiar with the mediation process, specifically during negotiations surrounding the initial authoring of the IBMP. Despite the experience they have had in the process, many of them admit that the IBMP carries little possibility of bridging the gaps among the varying interests. For example, the DOL feels "there are some interests in the region that the IBMP will not be able to reach, and may never in the long term." Within the framework of the plan "as many goals as possible are being met currently and it will be impossible to meet every interest's goal within the plan. The agencies are vocal about the interests of their constituents or supporters during meetings, but catering to all of those interests is a tough task." Despite their doubts "they do see potential for the sporting community to get involved and we are beginning to see communication starting to pick up between producers and the sporting interests." There are some positive views coming out of the DOL, as

they “do not see setbacks from allowing the public to get their voice out to the partnering agencies. By bringing people into the process without bantering back and forth and sharing ideas and views with a facilitator at each table is extremely helpful.”

APHIS, on the other hand, does see potential within the plan to bring opposing interests together around a common goal. They referenced the 2007 meeting in Bozeman as a positive step to opening up these possibilities. They “believe the plan has the ability to bridge gaps among diverging interests. We would suggest that some proof lies with the recent IBMP open house in Bozeman in 2007, which brought together a broad set of interested parties.” They stated that “everyone participated in the different discussions and they were able to present their views on the issue. That is a good sign that interests are being represented.” Representatives from the USFS agreed, stating that “the January meeting was successful due to the people who showed up to share in dialogue. This was encouraging and reaffirms some things in the manager’s minds that we can have these open discussions with a positive result.”

Still, according to the USFS the agencies “have struggled to incorporate the public in a meaningful way, especially in terms of their input and desires. This is because we are not operating in a traditional NEPA or public comment process. We are actually in a management process, but it does not mean we are not concerned about listening to the public and involving them in the process.” They mentioned that this “is one of the main issues we want to improve on throughout the management phase. It is a challenge, though, because the decisions have been made and all of the actions taking place are within the framework of the IBMP.” Despite their struggles to communicate with the public, the USFS does not believe there has been much

"opposition to the hunt, but there is opposition in terms of the lack of habitat. We would think the bison population would benefit from the presence of these interests in the state, but whether or not it is viable is yet to be seen, especially in terms of the habitat issue." This is a direct nod to the sporting interests coming from one of the partnering agencies, but as the GWA mentioned previously the lack of a larger role in management at the hands of the FWP has sent a ripple effect through the hunting community.

Montana FWP admitted as much, stating that their "work with the public has been fragile and there is more we can do to communicate and interact with the public. We have seen this evolution occur among the participating agencies being more willing to involve members of the public in the process." Again, there was a carrot given to the hunting community, but despite this recognition from the agencies, only a handful of hunting based organizations, like NWF and the GWA, have continued to remain involved and vocal.

Montana FWP is also trying to "draw the tribes into the process. As an agency we regulate hunting based on a population/harvest ratio. With their treaty rights they are not accountable to our laws, so take is of no concern and that puts us in a difficult position in terms of permits because of uncertainty around total harvest." FWP representatives believe the "policy side of the issue needs improvement." According to them this could "improve with us taking advantage of evolving management philosophy. For example, the open house in January, 2007 was put in place of regular meetings. In the past there was no dialogue and we would like to see open meetings like that one continue among the public and the acting agencies." The goal is that with "more trust built through engagement the more efficient the process becomes despite the

lack of gains on the extreme ends of the spectrum. This will continue the process of building trust among participants and agency personnel, as well as improve the communication among the agencies." Furthermore, they suggested that "a facilitator could help even further in terms of assisting the agencies in clearly stating their goals and management direction outside of the partnership. This would help us remain honest and open in terms of communication with the public." Still, they recognized that they need "to bring what we heard from the public in meetings and present these findings in a structured manner." This, again, will be tough because there "are other issues as well, such as the variable interests within the area that make it difficult to meet the demands of the extreme viewpoints."

Governor Schweitzer's office spoke of these same issues surrounding the polar opposite viewpoints. They are blunt in their assessment of the IBMP's capability of bridging the different interests. They feel the "particular form of the IBMP does not present an opportunity to bridge different interests." They believe it is because the "two goals of keeping the state livestock industry brucellosis free and preserving the bison as a wild, free ranging game animal are conflicting by nature. So, we do not think much credit can be given to the plan for the possibility of bridging interests." Despite the fact that "the adamant groups on both sides will continue to support the hard line on each side", the rest of the groups, according to the governor's representative, "will try to work in the middle to accomplish the two goals stated in the IBMP. This will be slow and it will only happen with voluntary commitment from the people who raise cattle in that region, because those people hold the key in my opinion and what RTR is doing we applaud."

The National Park Service agreed with the other agencies and they believe that work still needs to be done in the realm of educating the public on the management issues and strategy. They want to "help the public understand that some of the ideas are outside of the scope of our capabilities, but it does not mean we cannot acknowledge what the public has suggested. There are possibilities of working collectively with these interests and some would require the work of an individual agency. Again, this does not negate the value of the public participation, interests, and comments that are relayed to us." They do "believe the plan has potential for coalition building, as long as we can inform the public that this is a long term process." Still, they echoed what many of the agencies said previously. In terms of reaching out to the public about the realities of management, it is "especially true on the "edges" and we need to help these groups and individuals bring their vision toward realistic goals. We want to include every interest, but we need to help those outside interests get a better comfort level with what we are doing in terms of management." Overall, they admit they "can do a much better job of engaging them and the larger land owners within the region. Many people in this region have strong ties to a sense of place and the agencies have not done as well of a job engaging these individuals in the conversation." Furthermore, there "needs to be attempts made to increase tolerance, through education, additional habitat, and increasing the spatial and temporal distance between cattle and bison. Some of the interest groups could help us in terms of the messages concerning education of the public, because we can only have a supportive role outside of the park boundary."

So, what can be done in the realm of collaboration, or avenues taken toward a mediation process? Much of it comes down to trust and messaging, and still, some of the gaps are due to

the lack of public participation outside of the active organizations. Surprisingly, the bison issue in the GYE is not on the radar for many members of the public. Still, the GWA sees "the potential for positive progress if there was a third party for stockgrowers, conservation groups, and the sporting community. We have actually entertained the idea of a "Buffalo Working Group", which would get differing views together while also holding everyone accountable in the process." This idea has yet to develop into fruition as of 2009, but there has been a proposal and scoping process conducted by the partnering agencies. The Bear Creek Council believes there is hope as well and they believe the more "often we can get folks together there should be a greater chance of concessions and compromise. The fact that we have a plan, which requires adaptive management, and if we hold the agencies' feet to the fire on updating the public, then we stand a good chance of bringing folks from opposite interests together." They even pointed to their own organization as an example, where "ranchers involved with the BCC are willing to accept the risk of bison on their property and are willing to change their turnout dates for their cattle. Besides there are other areas of greater concern, such as the feedlots in Grand Teton National Park, the encroachment of chronic wasting disease in ungulates, and trichinosis."

According to Defenders of Wildlife, "Opening the process to additional scientific input and public comment and participation would be a worthwhile proposition. Along with that there should be a concerted effort to educate the public about the management plan so they can give constructive input, rather than simply voicing their opinion on the issue." They believe "there is potential for different forums to take place." They used the same example as the GWA, stating that "the governors in the past have pulled together 'working groups' that include both agency

representatives and citizens who have a vested interest in the issue. These have been helpful for showing people different perspectives, but also for coming up with workable language which has provided the template for public comment." They believe this "would also give people more ownership on the issue and a vested interest in seeing success." This would come with a clause because "obviously from the beginning it needs to be made clear that the agencies are responsible for managing these species and they have the last say, but at least people feel as though their voice is being heard." They believe we should start the process over from there by taking "whatever language this group comes up with and send it back out for public comment. Here we are almost ten years later and we still have not gotten that much closer to resolving the issue, so we need a change."

Obviously, according to Defenders, "People need to be committed to a solution, because if not then we will accomplish nothing. We keep hearing from politicians and agency representatives that we need more collaboration and cooperation, but in past issues collaboration has occurred (i.e. Bitterroot grizzly re-introduction) only to get axed by those at a higher level of influence." According to the BFC, the continuing conflicts in the region will only create benefits in terms of uniting opposing interests and the private property owners that reside in the gateway communities. For example, the "Homeowner's Association on Horse Butte told the DOL they did not want them in the area and the DOL sent a letter stating that they would be coming into the area no matter what it takes." In the BFC's opinion, "claiming the IBMP will bridge differences among people is a reach, especially given the way the agencies have been interpreting the plan." The BFC believes this "has become a positive asset because in the face of

a negative situation, people who are advocating for the bison are going to come together. This has happened, but I do not give the agencies any credit for that because it is a simple reaction to the consequences."

Still, members of the organization admit that they "struggle to see the perspective of the livestock industry as well and we have to work to bridge that gap." But, like the industry, they continue to stick to their perspective of reality on the ground. They stated that for "a long time the burden has been placed on the wildlife in the region and they have been sacrificed at the hands of cattle. If we put it into perspective we are talking about roughly 3,000 bison." They compared this to the current cattle numbers in the state, with their belief that "there are probably millions of cows and various stock animals in Montana and we are wondering where the balance is at this point. We are not talking about jeopardizing Montana's livestock industry and we are not going to bankrupt them with more balance on the landscape." They believe this dynamic "encompasses the biggest issue we see at this point, which is the mindset and history involved with opposing competition on the landscape. We need to set the baggage aside and try to convey our points of view in a civil manner, but these opportunities have not been established, except through public meetings." The NWF echoed the same belief, and they think if "we could create a paradigm shift in terms of views surrounding bison as a wildlife species, then we could have a better outcome from a sporting perspective, as well as with public perception."

It is evident that until various perceptions among the stock production industry and, specifically, APHIS and the DOL change no middle ground will be met between the opposing interests. This does not mean that groups like the Buffalo Field Campaign can continue on

without some compromise in terms of their stance on the issue. The fact remains though, that the failure of the agencies and the industry to adapt to the changing landscape has contributed to the increased stress on the species and several transmissions of brucellosis in the region. The disease is particularly embedded in the GYE and the IBMP has done little to prohibit the transmission of the disease to cattle in the region. It is obvious that current management practices are missing a large reservoir of the disease, particularly in the Grand Teton elk feed lots south of the park.

Furthermore, the responses that were given from the opposing sides concerning potential collaboration has shown that many of the organizations will continue to stick by their beliefs and play their cards close. This is especially true within the industry perspective where very little flexibility was offered due to the continued threat of disease and market impacts. As the history has shown with this issue, the industry has remained entrenched around the issue of disease and, subsequently, the threat this poses to the brucellosis free status in the state and the ripple effect this would have on the overall market. Throughout the interview process, as their responses had shown, there was little leeway given to the idea of free-ranging bison, unless or until, the herd was completely clean and would no longer pose a threat to livestock in the region. Even then, they still felt there needed to be some restrictions in place in terms of available habitat for the species in the GYE. Again, as the GWA pointed out, the disease is prevalent in the elk population as well due to the "sink" that has been created around the feedlots in Grand Teton N.P. It would seem the industry is quite aware of this issue, yet there was no mention of the threat of disease due to the continued management of the feedlots. Until issues such as these have been dealt with, the threat of transmission and disease in the region will continue well into the future.

Also, as the GWA and other organizations pointed out, if the threat of disease was a true risk in the region, then why would the industry continually graze high risk cow/calf pairs in the GYE? This failure to adapt within the ecosystem shows inflexibility as well. It seems as though there were many alternatives presented by the NGOs, such as fencing to increase spatial and temporal separation, strict vaccination protocol for stock in the region, changing turnout dates, and retirement of allotments to name a few, yet the industry continually clings to the threat of disease and the impact on the market. Despite their determined stance, it will be shown in the next chapter that the industry is still facing the consequences of disease in the region due to a number of transmissions in the GYE that have been linked to the elk migrating through the corridor each year.

In addition to the industry's inflexible stance, the NGOs admitted to their failure to relate to the industry's needs in the region as well. The BFC admitted to this flaw and the GYC pointed out the naivete that many of the groups carry in terms of the real threat of transmission in the region. A number of groups, including the GWA and BFC, correlated future management of bison with that of elk management in the state. Due to the amount of graze that is on private land in the region and the ability of bison to repopulate these areas, this is simply not realistic. This, along with some of the demands and expectations they have put on the industry, such as retirement of allotments and placing the majority of the burden on the industry in terms of cost, seem a bit inflexible. As representatives from the industry pointed out, millions of dollars have come from the industry over a period of time to combat the threat of brucellosis in Montana. In some ways, the industry has been taking on the majority of the sacrifices to improve the situation

and it is understandable that they feel this should not be a required of them again. Still, it is hard to deny that the NGOs have remained patient and have shown some flexibility in terms of their desired goals for bison through years of hazing, capturing, testing, and slaughtering, despite the fact that the disease is bovine in nature.

As for the agencies and various NGOs many ideas were suggested to make the process more accessible and "user friendly" for public participation in the future. Unfortunately, this would require an about face in the process, which would involve a possible adjustment in the plan that would require another NEPA process to integrate public comment. Beyond this point, much of the gridlock can be attributed to the historic nature of the issue as the representative from BFC pointed out during the interviews. As Chapter 1 and the various responses in the interviews pointed out, the issues surrounding bison in both Montana and the GYE have caused the various parties to remain embedded in their current stances. Much of this can be attributed to the utilitarian perspective that has been used to justify certain uses of the land and the extermination of animals that rely on these landscapes. It is difficult to ignore this history in the west and how it has shaped this region of the country. The result is that many of the groups that are grappling with the issues involving bison in the GYE have held on to their positions for decades, even a century, when you consider the first attempts at expansion into the western landscape and the attachment of "rugged individualism" that remains within the culture of the stock production industry as an example. This movement into a vast landscape required people to "domesticate" their surroundings as much as possible in order to gain the most productivity from the land. This often required the extermination of both plants and animals that were a detriment

to their livelihood and their existence in the ecosystem.

Secondly, it is hard to deny the role that the various lawsuits between the state and federal government play in the current debate. This was explained thoroughly in Chapter 1 and a significant portion of the court decisions resulted in favorable outcomes for the industry and continually placed the agencies' backs against the wall in terms of how they would carry out management of bison. The end result of these struggles between the NPS and the Governor's office, for example, resulted in the authoring and implementation of the current plan. This has created a bit of an issue when considering the mandates of the NPS and how that has been modified to meet the needs of the state, specifically the DOL and stock producers.

There is one case, mentioned in Chapter 1, that is especially significant in terms of how the agencies have been forced into this position. Parker Land and Cattle Co., Inc. v. United States, No. 91 Civ. 0039-B (D. Wyoming 1991), set the foundation for the current management paradigm in a way. Both the Wyoming district and supreme courts denied Parker's tort claim at the time, but in their decision they left the door open for future claims against the agency concerning bison and elk and the threat of disease. Within the district court's decision there was the suggestion that federal officials (NPS) had negligently managed bison within the region (Keiter and Froelicher 1993). The end result questioned natural regulation of bison at the hands of the NPS as substantive and forced the agency to choose between the bison and protecting the local livestock industry. Furthermore as Keiter (1997) pointed out, despite the fact that the court absolved the agency of any responsibility by finding that wildlife did not cause the outbreak in Parker's herd, they still concluded that wildlife disease claims could be covered by the Federal

Tort Claims Statute in future scenarios.

Because of this case, and the continued pressure that has come down from the Montana Governor's office and the state legislature over the past several decades, it is easy to see the reluctance of the agencies to adapt beyond the language of the IBMP. The federal, and state agencies for that matter, cannot afford to be involved in litigation. Furthermore, it seems to have contributed to some of the reluctance to collaborate outside of the management framework due to the possible threats of tort claim litigation from the industry. Still, as Chapter 3 will show, despite the historical conflict there have been some significant changes that have occurred in terms of collaboration and transparency among the partners. This is mostly due to pressure from the Government Accountability Office (GAO), new cases of transmission within cattle herds in the GYE over the past several years, as well as new findings around the gestation period of brucellosis and the realistic threat of the disease being transferred from bison to cattle.

Chapter Three

Conclusions and Recommendations

A Government Accountability Office (GAO) investigation in 2008 recognized that the agencies decided to adopt an adaptive management approach that promotes flexible decision making throughout the process when events and actions become better understood by the agencies. The conclusion was that the agencies have not adequately implemented adaptive management practices because they:

1) have not established critical linkages among clearly defined objectives (which are absent from the plan), information about the impacts of their management actions obtained through monitoring, and decisions regarding adjustments they make to the plan and their management actions;
2) have continued to act more as individual entities rather than as an interagency group; and
3) have not adequately communicated with or involved stakeholders, such as conservation groups, livestock industry groups, and private landowners.
4) The end result, according to the GAO report, is that their decision making more often resembles trial and error rather than adaptive management, along with a lack of accountability and transparency (GAO 2008).

The following section is an attempt to draw conclusions from the interviews that were conducted in the Spring of 2007. Since that time there have been some changes on the ground, as well as in the overall policy approach from the agencies. It can be assumed that some of this change was a result of the public outreach efforts put forth by the partnering agencies, as well as

the influence from the Government Accountability Office (GAO) investigations that were conducted during that same time. As was stated many times during the interview process, any changes in bison management in the GYE will take time, and in many cases it will require incremental change at the hands of the bureaucratic process. The IBMP was authored with the intention of managing over the long term through a process of trial and error, continued research and development, and adaptation. So, the end result is that management of bison in the region, whether stringent or not, will continue beyond the fifteen year proposed time frame in the plan.

Management at an Ecosystem Level

The first question that needs to be addressed is whether or not the current management scheme is justifiable on an ecosystem level. Obviously the answer depends on which lens we look through in terms of the agency, industry, or NGO perspective. From the perspective of the partnering agencies and the stock production side of the IBMP, the current management efforts are realistic. It is evident that much of the burden, in terms of solutions, research, and strategy, has been put on the shoulders of the partnering agencies. At this stage much of the effort has been focused on eradication of the disease within the herd. Through the capturing, testing, and slaughtering of bison there remains hope that a clean herd can be put back on the landscape. This work began in December, 2004 when the partnering agencies conducted an Environmental Assessment (EA) to assess the impacts of the proposed vaccination on bison using strain RB51 (IBMP 2009). The administration of the vaccine would be conducted by the DOL on bison calves and yearlings outside of the western boundary, in accordance with the IBMP. None of the proposed actions would have an adverse impact in terms of management on the west side, nor

were there any changes to the operations within the EA. Based on the analysis of the EA and the comments submitted during the process, the DOL determined that the EA adequately addressed the impacts, which negated the need for an EIS (IBMP 2009). Still, within this process the proposed goal is to vaccinate once the population on the west side exceeds 100 seronegative bison and the actions would be carried out on an opportunistic basis.

The perspective from the NGO side of the table is, for the most part, on the opposite side of the spectrum from the involved agencies and the stock production interests. Many will not deny the importance of sustaining the state's brucellosis free status, or maintaining the economic viability of the stock production market on the national level. At the same time many of the involved organizations do not see any viable or realistic way to manage an animal like bison for a disease that is prevalent among numerous species on such a large and dynamic landscape.

Furthermore, many of them point to the amount of money and time that has been put into remote vaccination efforts, the testing and slaughtering of bison, which many believe is based on a flawed scientific approach, as well as the transporting of the animal to the various facilities around the state once they have been quarantined at Horse Butte. Furthermore, they also have concerns about the potential for similar management strategies being brought forward for elk in the GYE. They believe the overall burden should be placed on the stock producers to protect their investment through consistent vaccination efforts for cattle and rolling back turnout dates to a later time to reduce the risk of transmission. Many times the enforcement of spatial and temporal separation and stringent monitoring of regional herds were mentioned as solutions. The idea of a special regional classification in the GYE was mentioned often, despite disagreement

from APHIS and many of the other agencies. As for the stock interests, they claim they have already invested a large amount of money and time on the issue over the long term beginning decades ago. So, placing a further burden on them is both unrealistic and unfair in their opinion.

Since that time, management on the ground has changed and adaptations have been made in the region by the agencies. Along with a change in strategy, the industry has loosened their hold on certain demands. Much of this is due to changes that have impacted cattle herds in the GYE, as well as the realization from the partnering agencies that some of the goals in the management plan were impractical at best. For example, since the time of these interviews there has been transmission of brucellosis from wildlife to cattle in the GYE. It has been suspected that the transmission occurred between elk and cattle, or possibly from cattle to cattle (McKee 2008).

Since this has occurred, APHIS has tentatively agreed to regional classification in the GYE, which would require more stringent testing and transport regulations for cattle in the region. In September, 2008, APHIS announced a plan to carve out the region so that infections do not bring about statewide sanctions for other producers (Brown, 2008). In some ways this has caused the agency to address some of the inadequacies within the IBMP. Furthermore, it has now put a hold on the eradication of the disease in wildlife, which, in the words of APHIS, will "have to be [dealt] with separately." (Brown, 2008). As initially feared by the industry, APHIS will be allowing veterinarians from other states to review the plan, which could cause them to balk at the perceived weakening of brucellosis prevention in the region (Brown, 2008). Despite the actions taken by APHIS, veterinarians, and the industry, the plan to adjust classification could take up to a year to complete according to Montana's state veterinarian Marty Zaluski (Brown, 2008).

Future Collaboration Efforts

Another issue that was discussed with all of the involved parties was the potential for a more collaborative approach that would take place outside of the current state and federal structure. This would be similar to past efforts, such as "working groups", or groups that combine the interests of the stock producers with some of the NGOs involved in the issue. Some similar groups that are well known are the Malpai Borderlands Group (McDonald 2009), the Blackfoot Challenge (Blackfoot Challenge 2009), or the infamous Quincy Library Group (Moore 1997). Many of these past efforts have put some responsibility in the hands of citizen's groups with additional assistance coming from the various managing agencies. Obviously, whatever ideas or decisions that came out of these types of groups would have to fall within the rules and authority of the agencies in charge of management.

It should be noted, as well, that the groups mentioned above were founded by a mixture of individuals that found specific interests that were at risk in combination with a mutual need for the protection of these interests. For example, the Malpai Borderlands Group was officially founded as a non-profit in 1994 after initial meetings took place as early as 1991. The main issue was the preservation of the ranching industry, especially on public land, during a time when the industry was under attack. At the same time, the ranchers throughout the region, which lies in Arizona and New Mexico, noticed that their grasslands were slowly turning into shrub lands due to grazing practices.

Two important issues came out of the process, which saw area ranchers reaching out to "critics" and the agencies to solve problems on the ground through partnership rather than

dissent. One of the issues was the inevitable approach of fragmentation due to development, and the other was the loss of biological diversity and productivity on the landscape. The consensus was that less government regulation would be necessary to solve these problems (McDonald 2009). This does not mean that the agencies were cut out of the process, instead they became partners in the process, rather than the various interests becoming their clients (McDonald 2009). Due to significant events on the landscape, partnerships were formed between area ranches, the various agencies in the region, and The Nature Conservancy (McDonald 2009). Out of all of this came an official citizen based non-profit that continues to raise funding as a 501(c)3, as well as playing an instrumental role in management decisions within the region. This is one example that is comparable in some way to the current issues in the GYE, where the NGOs, agencies, and the ranching industry see many of the same problems carrying negative impacts in the region. Still, throughout Chapter 2 there were responses from all three groups that carried potential collaborative solutions. This does not mean that a separate non-profit needs to be formed, but it does present evidence that a successful working group could potentially be formed.

As the example of the Malpai Borderlands Group shows, there must be common interests and a "tipping point" that encourages historically non-allied groups to come together and discuss solutions. At this point it is evident that the issues within the bison management conflict in the GYE are presenting some potential points of interest that these opposing parties can come together and discuss.

The most obvious is the potential of the hunt to bridge these gaps, which was mentioned numerous times by all of the parties in Chapter 2. Furthermore, the hunt could create a ripple

effect in terms of contributions to other potentially overlapping interests among the parties. It was mentioned by the Montana Farm Bureau, a number of the agencies, and a number of the NGOs, with some of them directly representing sporting interests. In combination with the potential the hunt carries, there is the issue of habitat. This is one area where give and take could take place between the opposing interests. Solutions could involve the expansion of habitat for bison in exchange for the money made from the tags going to area ranchers for various costs due to the expansion, such as fencing, vaccinations, or feed to name a few. The benefits from culling these animals in a traditional hunt would carry over to the agencies, the NGOs, and the industry. Culling would allow the herd to become a bit more wary of human contact, which would impact their movement, in combination with allowing the agencies to carry out different management strategies, and it would allow some of the weaker animals in the herd to be removed, which would produce a healthier herd that is more resistant to disease. Furthermore, it would help to reinforce the idea of managing a wild herd, rather than the fear among NGOs that the herd is becoming more domestic due to hazing strategies carried out by the partner agencies.

If the hunt became viable and it was fully supported by all of the interest groups, it would continue to draw in tourism dollars through tags, visiting hunters, and the continuing visitors to the park. As mentioned by various NGOs and the industry, stock producers continue to have an important role in the local and regional economy. Still, it has become well know that the region is supported more from the tourism industry than the local stock production industry. The contributions garnered from a viable hunt could directly benefit the industry and ultimately keep it afloat in the region. At this point, the validity of the industry in the region has come into

question from some of the NGOs in the region, such as the Buffalo Field Campaign, Gallatin Wildlife Association, and Defenders of Wildlife to an extent. A viable hunt that allows the bison to access more habitat, specifically their calving grounds, would both appease these groups, and if supported fully by the industry, would add some legitimacy to the industry in the region.

The hunt, when looking at a potential catalyst among the various groups, seems the best option for bringing opposing interests to the table. Hopefully other by products from the hunt would follow, such as a growing acceptance of bison as wildlife and an asset, sustaining the industry in the region despite the risk of disease, and the potential of a more collaborative based approach to management. Just like the example of the Malpai Borderlands Group, this will require all of the interested parties to look at avenues that benefit the whole, rather than the current disparities that were mentioned by the various interviewees.

As the interviews moved forward and more information was obtained it was discovered that effort was being put into collaboration in some ways, specifically between the partnering agencies. There were past efforts, as mentioned in the interview with representatives from the Bear Creek Council, between the various NGOs to form a partnership around a coalition model. This was a short lived proposition, but some of the results that came out of this effort produced positive contributions, such as the foundation for the adaptive management adjustments that are now included in the IBMP language.

The agencies made an effort to begin a more collaborative approach to the issue in January, 2007 with the round table discussions that took place in Bozeman involving the various NGOs, individual property owners, and the agencies acting as hosts. They had a mediator present

during this process to assist in the discussions that took place between the groups at each station. According to their own admissions during the interviews, the agencies' have had mediators present at their meetings since the beginning of the process in 1996-97. This is understandable when looking at the historical relationships between the agencies involved and the contentious nature of bison management in the GYE. There should be some credit given to the agencies for going along with this strategy given the working relationships that have now been created among the partners over the past decade.

In terms of suggesting this approach for the current process there were mixed results among all of the groups interviewed. Some groups saw it as a possibility that would be beneficial, some figured there would be nothing to lose with the inclusion of collaboration in the process, and other parties brought up the fact that trust needed to be built among the involved parties before a mediated or collaborative approach could be implemented. Much of the fear revolved around the possible politicization of the process, but it was conveyed by many people in the interviews that the issue has already reached a level of politicization. In some ways, as was evident from the responses of the Montana Stockgrower's Association and the Montana Farm Bureau Federation, there is no need because they currently have the advantage under current management. There has not been transmission of brucellosis from bison to cattle, they have thus far maintained their brucellosis free status, and the stock industry remained economically viable at the time. Ironically, as was mentioned by many of the groups, the industry and the agencies continue to ignore the threat of brucellosis from the regional elk herds. This has resulted in seven cattle herds being infected in the Greater Yellowstone Region over the past decade due to the

infected elk population. As was feared by the industry, this will require seven counties to administer testing to their cattle herds before the end of this year. Still, some producers may be able to avoid testing if they complete a risk survey and it is found that their herds are at a low risk of transmission (Associated Press, October, 2009).

Many of the groups referenced past experiences with collaborative efforts involving other species and land management issues. For example, Defenders of Wildlife referenced past efforts during an attempt at grizzly bear reintroduction in the Selway-Bitterroot region of western Montana. Success was met amongst the involved parties, agreements were made, and concessions were made as well, only to be foiled by higher political powers at the Congressional and Executive levels. Along with the issues that have been confronted at the highest levels, it is important for those interests that are involved to feel there is a benefit if they decide to participate. This may be in the form of monetary incentives, or certain guarantees such as vaccines being paid for through hunting permits for example, that are made between the state and the property owner or producer. Still, the conclusion can be drawn from many of the responses that a collaborative approach outside of the state and federal structure is off the table at this point due to various reasons. As the representative from the National Wildlife Federation stated, many of the complexities and issues surrounding the IBMP will have to be dealt with through a combination of state legislation and Congressional action rather than at the local level.

Despite the reluctance of many in the involved parties to participate in collaboration efforts, the agencies have continued to host open houses with public participation present. Furthermore, in accordance with many of the GAO recommendations in 2008 to promote

transparency, the agencies have proposed the idea of a Citizens' Working Group geared toward bison management (IBMP, 2009). This idea was also suggested by both Defenders of Wildlife and the Gallatin Wildlife Association during discussions.

According to the concept, the working group could be chartered by the state of Montana, allowing a more open, public process, rather than operating under the strict regulations of the Federal Advisory Committee Act (FACA). The goals mentioned by the partnering agencies in the document would allow the generation of new, good ideas, the building of consensus and community through shared solutions, and the development of realistic and attainable solutions that would be recommended during the adaptive management process in 2011-12 (IBMP, 2009). Additional ideas would be the allowance of 20 representatives from the public with an open nomination process, working with a facilitator to determine procedures, standards of conduct, and the overall decision making process. Along with these responsibilities, the meetings would be open to the public and the working group participants would have to develop a process to communicate to the broader public, as well as their specific constituents (IBMP, 2009).

Along with the Citizens' Working Group Concept, the agencies have followed the recommendations for transparency by developing and maintaining a website that provides information to the general public. The site, http://ibmp.info/index.php, provides information from recent meetings between partnering agencies and additional information pertaining to recent Environmental Assessments for the quarantine procedures, remote vaccinations, the Royal Teton Ranch deliberations, and the GAO reports, to name a few. Obviously, all of the above steps that have been taken by the partnering agencies show a direct effort to follow the suggestions of

the GAO report, as well as the suggestions of the public participants over the past several years. Many of the steps that have been taken recently are a direct reflection of the suggestions and critiques that evolved during the interview process in 2007.

Despite many of the stories that have been perpetuated by the agencies' and the media concerning the members of the community in the gateway regions, it was discovered that there was support for bison coming out of Gardiner and the Hebgen Lake region outside of West Yellowstone. Many of them would like to see habitat expanded for bison, despite the risks that come along with that possibility. For example, members of the Bear Creek Council, which represents a diverse array of constituents in Gardiner, stated that they "would like to see habitat expanded so that the hunt can be justifiable, because we do not think it is a realistic measure without habitat available to the species in question. If the hunt is a success, with greater buy in from the sporting groups, it is going to create greater pressure to increase habitat and tolerance." They also "believe bison have become heavily managed and we would like to see them become a natural part of the landscape. We do not deny that bison have an inherent risk, but in the long run, Gardiner would benefit from the presence of bison, especially in terms of the tourism aspect." Furthermore, the Council "[does] not think [the IBMP] has really met the interests of our organization. It has provided structure for management, which is necessary, but we do not feel like the structure of the plan and the ensuing management is beneficial to bison."

Management for Brucellosis Adequate and Supported by Research

In many ways the answers to this question are similar to the first one involving justification: it will depend on which side of the spectrum you are receiving information through,

whether they are “pro-bison” or “anti-bison”. The agency response tends to be a mixture ranging from adequate to doing more to prevent brucellosis transmission between bison and cattle. Both of the organizations that are involved with stock production (Montana Farm Bureau and Montana Stockgrowers) believe there is more that can be done to prevent transmission and retain Montana’s brucellosis free status. Some of their proposed solutions are on the extreme edge of the scale, such as allowing hunting within the national park boundary and “cleaning” the herd through an extensive and costly capture, test, and slaughter regime. This was repeated many times by some of the representatives from the partner agencies and the governor’s office as well.

On the opposite side of the spectrum the overwhelming majority believe that the current management paradigm is too aggressive and fails to manage for true risk of transmission in the GYE. Many of the responses to the current management objectives referred to the plan as overly “pro-cow” with very little responsibility being put on the stock producers in the region, who’s stock are greatly outnumbered by both bison and elk. Many of them stated they do not want to infringe on the interests of stock producers and the loss of status, but they believe it is unrealistic to administer a remote vaccination on thousands of wild animals within a landscape like the GYE. The lack of progress on a viable vaccine for bison, provides support for their stance. In terms of the natural elements within the GYE and the impact that has on management of this nature the proof is on the ground. It is undeniable that the GYE is a massive, complex ecosystem that contains a mixture of rugged alpine terrain, high desert plateau, harsh winters, and extreme cycles of aridness and wildfire.

In terms of research that has been conducted over the past several decades concerning

probability and threat of transmission in the region, much of it has drawn the same conclusions in terms of the duration of the gestation period in soil. If the studies done by Aune (Aune 2007), Meagher (Meagher et. al. 1997), and the various studies around Grand Teton National Park (Berger et. al. 1999, Tweit 2007) are compared with each other the results are pretty similar. The impact on gestation periods and the strength of the bacteria are heavily impacted by ultraviolet exposure from the sun, temperature, snowpack, and the scavenging of carcasses by other wildlife species. In terms of a window of safety, the research consistently lines up with anywhere between late May through the middle of June, which provides an ample timeframe for stock producers to turn their cattle out onto the landscape. This is especially true when we take into account the comparisons between elk and bison calving seasons within the region. This was brought up on a number of occasions in interviews because of the conflicting management in the region, since elk calve in May, whereas bison begin calving in April. Despite recent transmissions that have been suspected of occurring due to the presence of infected elk in the area and the continuous threat of disease being propagated by the elk feed lots in Grand Teton N.P., the issues involving calving seasons were never touched upon by the industry. This is the case, despite the fact that the Montana Stockgrower's Association mentioned during discussions that if there were different conclusions presented from "good, sound science" that they would be willing to adapt, or adjust, their stance if necessary. This difference in seasons, and therefore inherent risk, is well known among the NGOs and agencies, yet there has been no consensus built around managing for this risk.

The elk population, which migrates through the Grand Teton feedlots during the winter,

are also a major carrier of the disease. Unfortunately, as was discussed in Chapter 1, the research concerning prevalence in the elk population is similar to the research conducted on bison. There are some gaps in the research and very little is known about the prevalence of the disease within the herds. Despite the lack of continuity, the findings suggested that the risks being posed by elk could be greater, not because of prevalence, but rather because of the larger number of elk present on the landscape. Representatives from the Gallatin Wildlife Association brought up some very profound points about these issues surrounding conflicting and inconsistent management practices between the two species in the region and how it correlates with the profits that are gained within the region due to elk hunting. Despite the threat of regional elk herds and the risk this poses for cattle in the region, the agencies were unresponsive about the issue. Representatives from APHIS and the DOL touched on the issue briefly during discussions, but the lack of recognition in regards to the elk population seemed to be a topic they did not want to discuss. This could be due to a couple of reasons: 1) the majority of the discussions revolved around bison, not elk, and 2) it may tie into what members of the GWA discussed concerning elk and the reputation that Montana has for their substantial elk hunting season. The end result presents a political quagmire for the agencies, despite the recent transmission of brucellosis within regional cattle herds.

The legitimacy surrounding the threats that elk present is recognized by all of the NGOs, with the most vocal side being the various organizations that would like to see a change in the current bison management strategies. Despite their recognition of the threats that elk present, the industry and the governor's office seem to have made a point to stay away from the issue due to

potential political backlash from the hunting communities. This was not discussed in depth, but the governor's office and the agencies were well aware of the influence hunters have had in past management issues both in the state and nationally, as well as how important this block of voters is in the state.

The largest conflicting issue concerning scientific studies of prevalence among bison between opposing interests is the use of blood samples versus tissue sampling to determine the actual prevalence within the population. This really comes down to the agencies, specifically APHIS and the DOL, as well as the industry using seropositive tests to justify both their stance and the foundation of the IBMP. The agencies have done little to justify the use of these samples to convince opposing interests that the current management scheme is legitimate. As the research has shown, the comparisons between tissue sampling versus blood sampling show a large disparity of prevalence among the bison population. The agencies have continued to use blood samples as their justification for the test and slaughter regime, even though research was conducted by Montana Fish, Wildlife, and Parks' Keith Aune and a team of researchers using tissue samples to determine the length of gestation in the soil. As their research shows, through a relatively small sample, the prevalence of brucellosis within that population was quite small (~ roughly 9% of birth sites out of a sample size of 152) when tissue samples were used in comparison to blood samples that have been gathered in the holding facilities on the north and west side of the park.

Despite these recent findings by the state game management agency, in combination with previously mentioned research efforts that arrived at similar conclusions, there has been no

consensus around the actual threat presented by bison and how that could, or would, shape management. As the MSA representative stated the industry has always "rested on their laurels" when dealing with bison and the eradication of disease. With a situation that requires some give and take, along with shifting gears as the agencies gain more experience and knowledge through the adaptive management process, the industry has done little to acknowledge these scientific findings.

Furthermore, these same results were found by Meagher and her team over a decade before when using tissue samples to determine prevalence within the bison herd. This begs the question of why the agencies and APHIS continue to carry out the same research repeatedly only to net similar results? The bottom line is, they have little justification for the continued testing and slaughtering of hundreds of bison each winter based on brucellosis. This is especially true when Meagher's, and now Aune's research, point out that bison can test seropositive for the disease through a blood sample but seronegative through the more accurate tissue sampling methods. The NGOs have presented this case as well. To put it into perspective, these bison have already been "inoculated" through exposure on the landscape. Through exposure they have become stronger and more resilient to the disease. The continued use of marginally accurate and outdated research, as opposed to these new findings, to justify the test and slaughter of the herd simply provides ammunition to those interest groups who simply see this as a bison control plan, rather than a bison management plan.

Along with the information that was already known through previous research efforts, a recent study out of the University of California, Santa Cruz found that the risk of brucellosis

transmission from bison to cattle is low (Brown 2009). Their findings were similar to statements made by various NGOs, such as the Buffalo Field Campaign, which is the fact that there are very few cattle beyond the park boundary. The article also reiterated that there has never been a transmission of brucellosis from bison to cattle, but there have been suspected transmissions from elk to cattle seven times over the last several years in Idaho, Wyoming, and Montana (Brown 2009). The researchers suggested other avenues of management, rather than culling and slaughtering bison each year. Again, their suggestions were similar to the ideas presented by many of the NGOs that have been involved in the process over the past decade or more. They said the most cost effective solution would be the purchase of grazing rights from ranches near the park boundary (Brown 2009). This was the intention of the RTR negotiation, which was formalized in December, 2008 at the cost of $3.3 million over a thirty year period (IBMP 2009), yet that plan only allows for one hundred bison to migrate through the corridor. Whether or not the allowance of this small amount of bison through the area is justifiable with such a large price tag remains to be seen.

The researchers explained that the threat was low, based on their computer models, simply because there are fewer than 1,000 cattle that graze in areas where Yellowstone bison typically migrate. That total drops to 300 in the winter, with no cattle present during that time on the west side o the park (Brown 2009). Despite these findings, Jack Rhyan, a veterinarian with APHIS, does not believe the purchasing of grazing rights will solve the problem. He points to the fact that the bison will continue to migrate beyond that habitat as the herd grows, so the only solution lies in ridding the wildlife population of the disease (Brown 2009). Despite the recent

increased tolerance of bison beyond the boundary in the winter, APHIS and the agencies continue to carry out the capture, test, and slaughter program within the zone management system of the IBMP.

Conclusion

The IBMP has been summed up repeatedly as a political issue that has everything to do with controlling a resource (grazing rights and grass) rather than disease. It harkens back to the age old issues that have played a role in public and private land disputes in the west for well over a century: utilitarian use of the land and control of resources for human benefits versus conservation and preservation of resources for the benefit of native species, and in some cases the public, in the region. Until there is a paradigm shift in thinking about how land within a region like the GYE should be used, issues such as these will continue to linger in political circles rather than in a public realm. At this point individuals who have been working on this issue over the past decade, within both the agencies and the various interests groups, are at loggerheads about the best way to move forward. The United States Government Accountability Office could not have summed the issue up any better than they did with their report in March, 2008.

The intention of the GAO report was to discuss 1) the progress made in implementing the bison management plan and 2) the plan's soundness and the effectiveness of the agencies' implementation of it for managing bison related issues in and near YNP (GAO 2008). The basic recommendations that came out of the report suggested that the Departments' of Agriculture and Interior, along with the two Montana state agencies, improve their accountability, transparency,

and management of Yellowstone bison by developing measurable objectives and reporting yearly on progress along with a number of other actions (GAO 2008). This has been implemented by the agencies through the previously mentioned website and the continuation of meetings with the public concerning any new adjustments that have been made in the plan.

The GAO report also stated that the federal and state agencies implementing the interagency bison management plan have made less progress than expected up to this point, especially since they were expected to progress to step two of the three step plan by the winter of 2002-03. Of course, this is not ground breaking news to those organizations and individual interests that have opposed the plan since the beginning. It is important to note that progression through the three steps is meant to increase tolerance of bison who roam beyond the park boundary. It seems that the politicization of the process and the plan will continue to prevent this from occurring until the agencies begin to follow through with the three steps.

The GAO pointed out that as of late 2007 the agencies remained in step one because of their failure to reach two important conditions for moving on to step two of the plan. The first issue was the RTR/CUT land deal that at the time had yet to be completed and the second issue was the development of a safe and effective remote vaccination delivery method for bison (GAO 2008). Neither of these tasks had been completed at the time of the report and a remote vaccination has yet to be developed even now, with the only progress being the administration of RB51 on the west side of the park. Yet, combined, the agencies have spent more than $2 million annually implementing the plan since 2002, with the federal government footing 95% of the bill and the state agencies contributing 5% to the budget (GAO 2008). If the calculations are made

up to this point, the agencies have spent a combined $14 million dollars over the past seven years, with the taxpayers *nationwide* contributing the majority of the money at a regional level. Yet, this issue rarely makes it into a national discussion, nor is it even discussed during state or federal elections. Adding insult to injury, the agencies have no estimate to predict how long it will take to meet the conditions for starting step two, nor had they revised their estimated dates for reaching step three, which was expected to begin by the winter of 2005-06 (GAO 2008).

The study found many deficiencies in the plan, some of which were brought up repeatedly during the interviews with the participating NGOs. The GAO found that these limit the effectiveness of the agencies in terms of managing bison and the related issues that correlate with the species. The GAO reiterated the two broad goals of maintaining a wild and free-ranging herd and protecting the industry from the risk of brucellosis transmission as an impediment to progress. Yet, as the GAO pointed out, there are no clearly defined, measurable objectives as to how progress will be achieved and the partnering agencies have no common view of the objectives (GAO 2008). This correlates with the criticism of the National Wildlife Federation who has found fault with previous adaptive management structures, as well as this one.

Representatives from the Gallatin Wildlife Association have summed it up well: the issue could be solved tomorrow if concessions were made and there was an effort to truly protect cattle from the disease. This is not occurring due to the fact that thousands of elk migrate north through the same landscape after spending long periods of time in the supplemental elk feed lots outside of Grand Teton N.P. The issue continues to reflect what many of the groups already believe. The industry wants to continue to hold on to a resource despite the fact that, in this particular region,

their economic viability plays second fiddle to tourism and recreation. Tourism and recreation, it should be noted, that is geared toward the enjoyment of species such as bison. Furthermore, as is evident from the comments coming from APHIS representatives, many of the partnering agencies and the governor's office will not adjust the current management scheme despite the findings of the GAO. There also continues to be an avoidance of reality when elk are brought into the conversation. Despite this avoidance, it has forced the agencies to be more flexible in terms of managing for the disease in the GYE. The reluctance to construct a regional boundary around the park and the surrounding area has apparently come to an end, but it took infected herds rather than suggestions from the public to truly move into a more adaptive management protocol.

Despite the fact that the bison population in the GYE remains in limbo due to a number of different factors, there has been gradual improvement in terms of management and the function of the partnering agencies. Since the GAO report was written and investigations were carried out there have been noticeable changes in terms of transparency and accessible information for members of the public. Most of the changes that have occurred in terms of transparency, continued research, and information gathering, have come about due to diligent and continued public pressure, in combination with the release of the GAO report. Furthermore, many of the on the ground management changes, such as more flexibility being given to bison beyond the park boundary and regional classification, came about due to circumstances in the region and outside research. For example, the proposal for regional classification came about because various herds contracted the disease within the region due to exposure from elk, rather

than bison. As mentioned previously, this forced the agencies to recognize that the previous management strategies were ineffective and unrealistic, despite their continued rhetoric geared toward the eradication of the disease in wildlife. As for flexibility, much of that has been brought about by research findings similar to those conducted by a team from the University of California, Santa Cruz.

Recommendations

It seems there is reluctance from many of the groups to sit down in a neutral setting at this time. Even though this is the case, due to longstanding mistrust and unwillingness to compromise positions on both sides of the issue, the agencies have made efforts to both inform and involve the public during the process. This does not mean there is not potential for collaboration in the future, but it will depend on whether the opposing interests can agree on some key points presented by recent circumstances and research.

First, the research conducted by Aune concluded that the gestation period is variable depending on a number of environmental factors. This, in combination with the difference in calving seasons between elk and bison, presents an opportunity for compromise between the NGOs and the industry. Of course, the agencies would have to agree to any compromise that is made between the groups, but if the research presents evidence that the risk is low when one considers the turnout dates for cattle in that region then it may present an incentive for the industry to compromise. All of this was supported by the research conducted by the team at the University of California, Santa Cruz as well. If adjusting turnout dates is necessary to reach the goal of expanding habitat through the calving season for bison on the north side, then it is one

compromise that the industry could make if incentives were present. Most of the suggestions for adjusting the turnout date pointed to mid-June, rather than June 1st of each season. One way to cover incidental loss, in terms of losing access to graze for two to three weeks, could be in the form of monetary compensation through bison hunting tags.

Of course if the industry refuses to concede or compromise on this position, the agencies could force the industry to change by adjusting the turnout dates for the two allotments managed by the Gallatin National Forest. Furthermore, the private allotments could be forced to adjust turnout dates if the suggestion was made within the framework of the working group proposal. If the agencies are not willing to discuss the option, then a citizen's working group structure would provide cover for the NGOs to propose such a change. This would provide more hope for success in terms of enforcing spatial and temporal separation in the region.

Second, research has shown, and all of the involved parties are aware, that the elk feed lots maintained by USFWS in Grand Teton N.P. pose a major threat in terms of disease. This is one issue where a collaborative effort could present a win-win situation for all parties. As mentioned in Chapter 1, the elk feed lots not only present a problem due to disease, but they are also costing the agency, and more broadly the federal government, millions of dollars annually to maintain. There lies the win-win for all of the interest groups. If the feed lots were gradually, and later finally, retired both the NGOs and the industry would benefit from reducing the increased prevalence and frequency of transmission of the disease which is present among both species. The outcome, hopefully, would be both elk and bison being slowly weened off of supplemental alfalfa feed and managed within an ecosystem based setting.

Unfortunately, in order to find some compromise on the issue there will be a loss in numbers of elk and bison initially because of the long term dependence on the supplemental feed program. This is why it would have to be carried out in a gradual process so there is not a major reduction in those dependent species, because the supplemental feed program is carried out during the winter and early spring months. At the same time, the reduction in supplemental feed could also benefit herds by reducing numbers and extirpating the weaker animals that are more vulnerable to the number of diseases that could present a problem in the region. These diseases go beyond brucellosis, and include the potential of chronic wasting disease in mule and white tail deer in the region, trichinosis, and other wildlife diseases caused by population density and inbreeding.

Furthermore, the greatest compromise would have to come from the industry which operates outside of the park boundary, as well as the continued use of federally leased allotments that were "grandfathered" within the park boundary. These allotments have been the suspected link to the transmissions between elk and cattle in Wyoming and continued use would surely contribute to potential future risk between bison and cattle (Gearino 2004). Most of the leased allotments have already been retired up to this point, but continued work in this direction in combination with the gradual retirement of the federally funded and operated program would remove a large threat from the region. It is evident that the only way these can be retired is through the industry being willing to compromise and discontinue the potential threat of transmission in the area. Again, there would most likely have to be incentive in place, such as direct payment by the agencies to retire the leases in perpetuity and some measures taken to

reduce the impacts on privately owned allotments that could be impacted by elk, bison, and deer migrating through the region. Of course, in an ideal situation there is always the possibility of reaching agreements with area ranches on large scale conservation easements, or at least easements being established for migration corridors.

Still, this would require two and three state discussions between governors, state veterinarians, and federal and state agencies sitting down and formulating a long term plan. Combine this with the various interest groups that would be impacted by the decision and it is evident that this would be a daunting task beyond the scope of the already difficult mandates of the IBMP. Ideally, the most productive way to confront this issue would be from the ground up, where the industry and various NGOs representing different stances would present a plan to the agencies through a similar structure as the proposed working group in the IBMP. If the agencies do not have the "cover" to implement a plan or strategy, then the supplemental feeding program will most likely remain intact.

Third, and finally, it seems the best avenue for holding the partnering agencies accountable is through the avenue of a citizen based working group. Obviously this is not a silver bullet solution to the cadre of present problems with management, or the actual plan, but the fact that the potential is being scoped by the partnering agencies due to the recommendations of the public and the GAO presents a positive step. Just like the idea of a working group, the above recommendations would require some agency involvement, particularly within the framework of the IBMP. Furthermore, this step being taken by the partnering agencies, to at least scope the

idea of a working group, shows that the adaptive management framework within the language of the plan carries the potential for a more expanded collaborative approach in the future. From this point forward, collaboration will be dependent on the above factors.

Closing Thoughts and Lessons Learned

The difficulties surrounding bison management in the Yellowstone region have been lingering for what will soon be a century. From the passing of the Lacey Act and the creation of Yellowstone National Park, to the current conflicts surrounding the IBMP, it is evident that issues concerning this species will remain in political and management circles well into the future. This does not necessarily mean that the current framework or the issues that are most predominant will continue to remain in the spotlight.

Management strategies and changes to the current plan can always go through restructuring due to the revolving door of leadership within the agencies, the industry, and the NGOs. In many ways, this is what is currently lacking within the structure of the IBMP. There is a leadership vacuum within the agency structure due the MoU and mandate of the partner agreement. During the initial stages, there was hope that Governor Brian Schweitzer would provide leadership at the state level due to his influence and his desire to set up regional classification in the GYE. Unfortunately, those ideas fell off quickly due to political pressure from the industry and APHIS. Hopefully the structure of the proposed working group will provide the opportunity for solid leadership, and leaders, to come from a grass roots, citizen based format. During the interview process it was evident that there was an obvious lack of leadership, or a clearly defined leader, especially within the agency structure. Consideration

should also be given to the difficulties of managing across boundaries that carry multi-jurisdictional mandates among state and federal agencies. The typical bureaucratic issues that the agencies confront on their own are enough of a task on standing on their own and in this situation these obstructions are only compounded.

As mentioned previously, up until recently there was not a universal catalyst or agent of change that would force compromise among the interested parties. Obviously the agencies are bound to certain language within the plan and the NGOs have wanted change to occur since the initial EIS stages of the IBMP. Where a catalyst would play an important role is on the industry side of the issue. Recently a catalyst has become more present in the form of recent disease transmission in the region due to elk. At some point it would seem the industry would have to concede some of their obstinate stances regarding the bison herd and flexibility regarding management beyond the park boundary. Some concessions have been made by the industry within the adaptive management portion of the plan, but the lingering impacts of disease in the region due to the presence of elk would seem to play a role in future communication and collaborative efforts.

The fact is the issues concerning bison in the region have become intractable to an extent. This was evident during the interview phase of research, when responses from the participating parties exemplified disagreement, mistrust, and lack of understanding for each other's perspective and interests. Due to such conflict, it is difficult to point out one particular solution that would solve the problems or open the door for collaboration beyond the current structure. If anything, the research shows that cases presenting similar issues, in terms of agency involvement

and incompatible interests within a region, are difficult to work with from a solution oriented perspective. In many ways, consequences and circumstances may present, or force, solutions to such a diverse, entrenched conflict. Outside of those possibilities, the unfortunate fact is that conflicts such as this will need to play out over an extended period of time, especially when it comes to changing a management structure that has been implemented and mandated through a series of lawsuits between both the state and federal government.

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