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Wolf conservation in southern Alberta| Innovation beyond regulation

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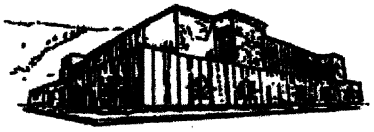

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WOLF CONSERVATION IN SOUTHERN ALBERTA: INNOVATION BEYOND REGULATION

by

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Preface

All carnivores have a certain level of ecological resiliency that enables them to absorb disturbance and continue to persist as viable populations (Weaver 1996). Throughout history, natural disturbance such as fire, disease, climatic variation, and flooding have been an integral part of the evolution of all species (Scott 1999). Today, however, species are faced with an accelerated and expanded scope of disturbance directly resulting from human activity. Anthropogenic disturbance regimes such as logging, mining, oil and gas development, road building, direct mortality, and grazing all affect the ability of native flora and fauna to adapt to an unpredictable environment. For wolves inhabiting the transboundary region of Montana, Alberta, and British Colombia, the past thirty years was a time for gradual recolonization following the eradication campaigns of the late nineteenth and early twentieth centuries. During this time, anthropogenic disturbance also lead to increased human access. A leading consequence of increased access is elevated human-caused mortality which can pose a serious threat to small populations and create barriers to dispersal (Weaver et al. 1996).

In a recent study of colonizing transboundary wolves, Boyd and Pletscher (1999) found that out of twenty-five human-caused wolf mortalities from 1979 to 1997, twenty-one occurred within 200 meters of a road or seismic line. In addition, between 1987 and 1998, researchers documented the deaths of fifty-eight wolves in the same study area and forty-nine of those deaths were caused by humans (Bangs et al. 1998). Even though wolves do have a medium level of ecological resiliency and a high degree of plasticity, human-caused mortality is the primary limiting factor affecting wolves in the transboundary

region (Weaver 1996, MT FWP 2001). In order to offset high levels of human-caused mortality, wolves must rely upon source populations from other regions to engage in demographic compensation. Although this is a valid recolonization strategy for a species facing stochastic events, demographic compensation does not lead to population stability and should not ultimately be relied upon as the solution for maintaining wolves in any given area. However, the driving force behind demographic compensation, dispersal, is an essential activity for all species to sustain ecological resiliency.

Dispersal is a natural activity for wolves and can be triggered through competition for food, social strife within the pack, habitat availability, environmental disruptions, and increased opportunity for breeding (Boyd and Pletscher 1999). Wolves are a mobile species capable of traveling distances in excess of 600 kilometers; dispersal initiated recovery in the U.S. Rocky Mountains when wolves north of Banff National Park migrated south nearly 300 kilometers to Montana in the late 1970's (Boyd et al. 1995). Dispersal between core refugia provides functional connectivity between metapopulations that are otherwise spatially isolated (Weaver et al. 1996). Maintaining metapopulation connectivity between core refugia such as Glacier National Park, Montana, and Banff and Waterton National Parks, Alberta is an important component in long-term wolf conservation. Even though Canadian and American wolf populations are politically divided into separate populations, several studies have documented the transboundary movements of wolves between Montana, British Colombia, and Alberta (Boyd and Pletscher 1999, Boyd et al. 1995, and Pletscher et al. 1997). Wolves inhabiting

this region may cross numerous jurisdictional boundaries where they may be either fully protected or legally shot, all within a day's travel.

Even though there is not a time-tested panacea to ensure the resiliency of wolf populations, those working towards the goal of metapopulation connectivity in transboundary wolf populations realize the critical importance of minimizing human-caused wolf mortality. In the United States, wolves have been legally protected under the Endangered Species Act since 1973 (Bangs et al. 1998). The Endangered Species Act provided necessary tools to aid in the recovery of wolf populations in the Western U.S. such as mandating recovery plans and prohibiting killing wolves under federal law. In contrast, Canadian wolves receive very few legal protections outside of a regulated hunting and trapping season. However, the success of carnivore restoration plans, especially regarding an animal as controversial as the wolf, ultimately rests in securing public support and increasing human tolerance (Clark et al. 2001). To move towards this goal, stakeholders are realizing the importance of expanding beyond technical solutions and are beginning to acknowledge the importance of integrating the full range of variables into problem solving. Through utilizing an interdisciplinary approach, managers are better able to effectively treat the social dimension of wildlife conservation problems (Clark et al. 1996). This is especially relevant in an environment like southern Alberta where wolf populations fluctuate under intense human hunting pressure without the legal protection of legislation like the Endangered Species Act.

I. Introduction

In April of 1995, a multi-agency team of researchers working on a year-old wolf study in southern Alberta tallied up a startling figure. Out of approximately forty-five to sixty wolves living in and around the Waterton Lakes National Park area an estimated forty-four wolves were dead (Long 1995, Francis 1997). Cause of death? Human hunters acting within the provincial laws of Alberta. With nearly all of the wolves eliminated, the researchers disbanded and the project was terminated. The story of the Belly River Wolf Working Group provides a stark example of the greatest challenge facing those working for wolf conservation in southern Alberta: high levels of human-caused mortality.

The prevalence of human-caused mortality makes wolf conservation in Alberta a tricky business. Throughout the entire province, wolf populations hover somewhere between three and five thousand animals (Alberta Environment 2000). Consequently, wolves are considered to be a secure species and are afforded few legal protections outside of liberal harvest regulations. This, combined with varying degrees of human tolerance, creates an environment where wolf populations, outside of protected areas, fluctuate greatly (CRWP 2002, SACC Interim Report 2001). From the area extending south of the Bow Valley to the border with the United States, wolf packs have failed to secure a stable existence since provincial-wide populations began to rebound after reaching an all time low in the mid-1950s (Gunson 1992). Proponents of securing a stable wolf population in southern Alberta claim that besides being an important component in maintaining ecological processes, wolves provide connectivity between disjunct populations in central Alberta, Montana, and British Colombia (CRWP 2002).

The Alberta Wolf Management Plan calls for a minimum population of fifty wolves to inhabit southern Alberta. However, there is no legal mandate to turn this recommendation into an on-the-ground reality. Wolves, in effect, are trapped in a management purgatory where they are a low priority for provincial managers yet there is a need recognized by the conservation community for the development of a proactive conservation strategy. In order to work toward the goal of stable, self-perpetuating populations of wolves in southern Alberta, conservation strategies must be created that are beyond the realm of statutory regulation. These strategies must focus on one of the most critical elements in any successful carnivore conservation program, promoting human tolerance. This paper will examine the strategies being used in southern Alberta to promote wolf conservation in an environment with few legal protections. In essence, there is no legal system in place to either prevent the eradication of wolves from southern Alberta or to mandate recovery measures. There is no law akin to the Endangered Species Act to provide disincentives to those with an inclination to kill wolves.

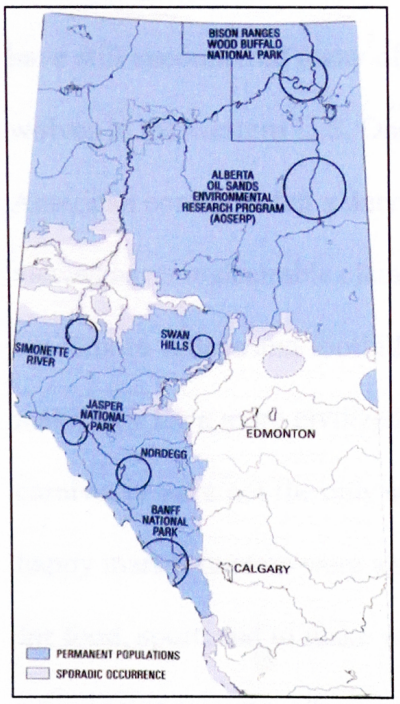


Figure 1, Wolf Distribution, courtesy of Alberta Environment

The study area for this project includes the region extending south of Banff National Park to the border with the United States (See Figure 1). Marked by the peaks of the Canadian Rockies and a narrow band of foothills, this area provides an excellent backdrop to study

the dilemma of wolf conservation. Although protected areas do exist, the majority of low elevation habitat essential for native wildlife occurs on private land used for livestock ranching. The presence of ranching in this part of Alberta provides a natural catalyst for wolf-human interactions and allows researchers the opportunity to work first-hand on the complex process of conflict resolution.

II. Historical Background

Even though Alberta has an unbroken history of wolves inhabiting the province, they have still encountered many of the same dynamics that resulted in the extirpation of wolves in the western U.S. One hundred years ago, settlers throughout the North American continent felt a duty to eliminate wolves from the landscape. Wolves were viewed as an undesirable element of frontier life and as settlement progressed throughout the remote valleys and foothills of the west, hunters attempted to eliminate wolves to make way for a more civilized way of life (Steinhart 1986, Kellert 1996). However, carnivores were not the only species experiencing intense hunting pressure. Trigger-happy market hunters were also exterminating game animals such as elk, bison, and deer for food, sport, and to make way for vast herds of domestic livestock. As a result of unregulated hunting, elk populations crashed so severely they had to be reintroduced to Alberta in 1910 (Alberta Environment 2000). Consequently, there was a dramatic reduction in the natural prey base for predators, resulting in reliance upon livestock as a food source. Increasing depredations only compounded the ingrained prejudice that many settlers already felt for wolves and extermination efforts increased.

Wolf hunters employed a variety of methods such as lacing prey carcasses with deadly poisons, setting trap lines, and rifle hunting. By the late 1800s, wolf populations had been greatly reduced in southern Alberta and, to encourage further harvest, a bounty was instituted in 1899 (Alberta Environment 2000). The bounty was administered by the Western Stockgrowers Association and became province-wide in 1907. During this time, protected areas such as Waterton Lakes National Park did not provide refuge for predators; throughout the early 1900s wolves were actively hunted within the park. In 1922, the last known wolf was taken from Waterton Lakes National Park in response to livestock depredations in surrounding areas. After decades of relentless hunting pressure, wolf populations in the southern portion of the province were effectively extirpated.

In the 1930s and 1940s, wolves staged a comeback in southern Alberta aided by dispersal from British Colombia and far western Alberta (Gunson 1992, Alberta Environment 2000). A temporary lapse in the provincial bounty coupled with a sharp decrease in fur values significantly decreased the hunting and trapping pressure on wolves. This was also during World War II, a time when many potential hunters and trappers were occupied with other responsibilities. As wolves reclaimed vacant territory, complaints from both ranchers and hunters spurred a renewed control campaign. A common assumption during this time was the belief that wolves decimate ungulate populations. Knowledge of ecology was starting to evolve in the 1940s and 1950s and there was not yet an understanding of the dynamic relationship between predator and prey. As a result, wolves were viewed as competition rather than a part of the natural system. Sporadic livestock depredations also continued to occur, further fueling anti-wolf sentiment. In addition to

fears over depredations and the perceived threat of reduced ungulate populations, rabies was detected in Alberta's fox and coyote population (Gunson 1992, Boyd and Pletscher 1999). In response, the province began a carnivore eradication program aimed to destroy possible vectors for the disease. The control program was widespread and thorough, leading to wolf populations hitting rock bottom throughout the province by the late 1950s. Perhaps recognizing the sharp decline in wolf populations, provincial wildlife managers terminated both the bounty in 1955 and the rabies control program in 1956 (Alberta Environment 2000). The year 1967 ushered in the first regulated trapping season for wolves, a needed change to the liberal eradication programs of the past. However, limited control efforts continued through the 1960s mainly under the guise of enhancing ungulate populations.

Twenty years later, in the 1970s, wolf populations were back on the rise and heading south from Banff and Jasper National Parks (Gunson 1992). The interplay of several key factors allowed wolves to recolonize much of their former range. Wolf control in National Parks came to an end in 1960 and wolf control both in response to depredations and to inflate ungulate populations was recorded as "light and sporadic" (Alberta Environment 2000). Also, during this time, the Alberta Predator Livestock Compensation Program was created to compensate livestock producers for animals lost through large carnivore depredations. However, as wolves gained a new foothold in Alberta, not unexpectedly, wolf control also began to rise. Reflecting the increase in wolf populations throughout the province, in the mid-1970s both fur harvest and depredation control peaked (Gunson 1992). However, the wolf control taking place during this time was

moderate compared to the eradication programs of the past. Instead of responding to the rise in wolf populations with yet another blanket control program, Alberta began to localize their control efforts through provincial management strategies.

During the 1980s, wolves in central Alberta began to establish more permanent populations. Although in southern Alberta wolf numbers were still low as a result of the increased control efforts in the 1970s, pack activity was documented south of Banff in the Bow Valley by the early 1980s (Alberta Environment 2000, CRWP 2002). These wolves carry the distinction of being the Valley's first established pack in over 30 years setting the stage for continued expansion into southern Alberta. By the mid-1980s, Banff National Park was home to several resident packs and monitoring efforts were undertaken by Parks Canada and the World Wildlife Fund (CRWP 2002). Wolves were now a species worthy of scientific study. With this shift in attitude, a new era in the wolf-human relationship was beginning to unfold in Alberta.

III. Methodology

In order to ascertain what management strategies are being used in southern Alberta, I first identified eight strategies that I felt are important for a comprehensive wolf conservation program. I chose the strategies based upon knowledge gained in previous course work and an extensive literature review. Table 1 illustrates the sources that I referred to when creating my list of eight management strategies. I then researched the status of each strategy to gauge if they were being used in southern Alberta and, if so, who was doing the work. I report on each of the strategies throughout the paper and

describe their role in the current system. I conducted sixteen interviews as my primary method of data collection and selected participants based upon their involvement with wolves in southern Alberta and wolf conservation in general. My goal was to interview a variety of stakeholders including wildlife biologists with Alberta Sustainable Resource Development and Parks Canada, Conservation Officers, representatives from NGOs, and livestock ranchers in order to understand the current status of wolf conservation. I had to rely upon interviews for most of my data collection because there is little printed information on the current status of wolves in southern Alberta. I used a standard set of questions, approached my interviews in a journalistic manner, and allowed the dialogue to flow in a conversational format. I used a mini-cassette recorder to tape my interviews and then proceeded to do an abbreviated transcription in order to contextually extract valuable information. These interviews are not meant to represent a complete review of all attitudes towards wolves but rather an assessment of how the wolf management system works in southern Alberta. Please see Appendix A for a list of interview participants and standard questions.

Wolf Management Strategies

The wolf management strategies I chose include:

- Monitoring and research
- Public education and outreach
- Depredation prevention
- Compensation for livestock depredations
- Harvest regulations

- Management documents
- Community involvement
- Partnership building

Table 1, Management Strategies and References

Reference	Management Strategies							
	Mon / Rsch.	Ed.	Dep. Prevent	Comp. Fund	Harvest Regs.	Mngt. Plan	Com. Involve.	Partner-ships
Bangs et al. 1998	X	X	X	X		X		
Boyd & Pletscher 1999	X					X	X	
Boyd et al. 1995	X					X	X	
CRWP 2002	X	X	X		X		X	X
Clark 2001		X					X	X
Clark et al. 1996		X					X	X
Clark 1996		X					X	X
Gunson 1992			X		X	X		
Keiter & Locke 1996					X	X		
Kellert et al. 1996		X	X	X	X		X	
MT FWP 2001	X	X	X	X	X	X	X	X
Musiani 2000			X					
Pletscher et al. 1997	X					X	X	
Primm & Clark 1996		X				X	X	X
SACC 2001	X	X	X	X	X	X	X	X

Reference	Mon / Rsch.	Ed.	Dep. Prevent	Comp. Fund	Harvest Regs.	Mngt. Plan	Com. Involve.	Partner-ships
Sillero-Zubiri & Laurenson 2001		X					X	X
Van Tighem & Fox 1994	X	X			X		X	X
Weaver et al. 1996	X							

Throughout the paper, the terms "conservation" and "management" are used frequently. Although their definitions are interconnected, I would like to explain how I chose to distinguish between them. Wolf conservation implies the use of a wide variety of tools to help promote and maintain a self-perpetuating, regional wolf population. Often, when the term management is used synonymously with wolves, some sort of population control is implied. My definition of management is much larger than that and embodies what Meffe and Carroll (1997) refer to as a "complicated mix of biological, economic, and humanistic concerns". By using this expanded definition, "management" includes the eight strategies I have identified to study in my paper.

Through my research, I uncovered an evolution of management strategies that began, in earnest, in the early 1990s and still continue to develop today. Management strategies form the basis of a wolf conservation program and, ideally, would include the eight I identified above. In southern Alberta, the basic wolf management system is run by the province and includes certain basic elements such as harvest regulations, a wolf management document, and a livestock compensation program.

IV. Provincial Management: the baseline of wolf conservation in Alberta

According to the Wildlife Act of 1987, Alberta holds the ultimate legal authority over wildlife and wildlife management (Keiter and Locke 1996). Consequently, the policies of the provincial wildlife agency, Alberta Sustainable Resource Development (ABSRD), form the foundation for wolf conservation through setting management guidelines and overseeing harvest regulations. Agency policy conveys a strong message to the people of Alberta by communicating the status and value of wolves to the province. Because of their underlying legal mandate, it is easy to assume that the province should and does engage in all the above-mentioned management strategies. However, during the course of my research, I found that the agency, in fact, fills very few roles in wolf management, despite their authority. Prior to my data collection, I was aware that provincial wildlife managers were responsible for the Livestock Compensation Program, overseeing harvest regulations, and the creation of a wolf management document. These three management strategies are important if they are utilized in an effective manner.

In 1991, the Alberta Fish and Wildlife Division, a previous incarnation of ABSRD, created a management document to promulgate guidelines concerning wolf conservation and harvest, protection of private property, and scientific research. The four main policy goals of the 1991 plan are:

1. Resource protection: To ensure that the provincial wolf resource is protected from irreversible decline and that current populations are maintained at viable

levels. This translates into a provincial-wide population goal of approximately 4000 wolves and 50 in southern Alberta.

2. Resource allocation: To maximize benefits to Albertans though the allocation of the wolf resource amongst recreational, commercial, and other users. This includes wolf viewing and photographing; the possession and propagation of wolves for zoos and other educational facilities; trapping and recreational hunting.

3. Protection of private property: To minimize property damage and other hazards to humans caused by wolves. This includes sensitivity to local concerns, wolf population reduction and prevention of livestock depredation.

4. Science and education: To promote and encourage scientific and educational activity to enhance knowledge of wolves. This includes scientific research of wolf populations and the effect of wolf predation, and educating Albertans about wolves and wolf management.

(Alberta Fish and Wildlife Division 1991)

On paper, the document provides a wide range of measures meant to further wolf conservation in Alberta. However, the province does not actively promote nor engage in all of the goals outlined above. Although the plan calls for the maintenance of fifty wolves in southern Alberta to assist with wolf recovery in the United States, there is no

legal grounding to mandate the agency to work toward and ensure that goal. As a result, wolf populations in southern Alberta receive no special management provisions to promote a target population.

The aforementioned policy goals call for the province to be involved in scientific research and monitoring and public education; two management strategies that I recognized as being important. Despite intentions, these are areas where the province falls short. I asked my interview participants who are affiliated with provincial management what the agency is doing in these areas and received some interesting answers. Carrie Bergman, the regional wildlife biologist for southern Alberta, commented that currently the agency is not involved in any systematic monitoring of wolves nor do they participate in scientific research (Bergman personal communication 2002). Public education and outreach, so critical to help formulate a more positive view towards wolves, is an area that is "not very developed" (Bergman personal communication 2002). Virtually the only public education that takes place via the province is in response to a livestock depredation. At that time, a provincial Conservation Officer contacts landowners to discuss how to respond to the depredation and to inform them of the compensation program.

Overall, the plan does not provide substantive protection for wolves or their habitat nor does it include any legally binding management strategies. Rather, it communicates broad-based management objectives that may or may not be implemented by the regional districts. With no true mandate to actualize management strategies, the plan creates an

atmosphere of impotency and contributes towards the lack of meaningful agency involvement in wolf conservation.

The question now stands, why would the agency go through the work of creating a management plan without the teeth to facilitate meaningful implementation? On a province-wide basis wolves are considered a 'secure' species meaning the overall population estimate of approximately 4000 animals is enough to ensure their persistence (Alberta Environment 2000). Therefore, two main factors contribute toward the ineffectiveness of agency-driven wolf management: the apparent provincial-wide abundance of wolves, despite struggles in southern Alberta, and the chronic lack of agency resources. In general, the resources afforded to Alberta's provincial wildlife managers have been extremely limited as the result of numerous departmental reorganizations and budget cutbacks in the 1980s and 1990s (Frith and Hawes personal communication 2002). Wolves are simply not considered a high priority animal so available resources tend to gravitate either towards at-risk or revenue generating species within the province. Given the conditions, virtually all wolf conservation efforts on behalf of the agency are reactive and deal primarily with livestock depredations and harvest regulations.

Harvest regulations

The 1991 plan also works in concert with Alberta wildlife regulations and recommends a yearly harvest of 1200 wolves with 75% from fur trapping and outfitting, 24% allocated to recreational hunting and 1% for other benefits including zoos (Alberta Fish and

Wildlife Division 1991). Wolves are classified as a fur-bearing carnivore which gives Alberta residents almost unlimited hunting and trapping opportunities (Alberta Fish and Wildlife Division 1991). Outside of protected areas, residents may hunt and trap wolves throughout the big game season which runs from October to May (Grant 2001, Gunson 1992, and Alberta Fish and Wildlife Division 1991). All licensing requirements for Alberta residents were dropped in 1987 and, according to Gunson (1992: 334), "resident landowners and their delegates may, at any time of the year and without a license, shoot wolves on private land and other lands within 8 kilometers of private or grazing leased lands". Non-residents are required to secure a license in order to hunt wolves. According to Hayes and Gunson (1995: 31):

> *Wolves pose one of the most difficult wildlife management problems in Canada because they often fall within a negative economic sphere. Our review showed a low value placed on the knowledge of wolf population trends throughout Canada, and widely different wolf hunting practices and seasons. The wolf is currently the only big game animal in Canada that is hunted year-round, has no bag limits in most areas, and does not require special seals or licenses to hunt.*

Liberal hunting and trapping regulations present a special set of challenges for an area like southern Alberta where wolf populations have fluctuated greatly. History has shown that human hunters can decimate an entire regional population of wolves, especially using tools like poison. The 1991 plan does recommend a shorter recreational hunting season south of the Bow Valley in response to these circumstances but, to date, the season has not been amended. However, after several years of failure, a new regulation finally passed in the year 2000 to require registration of all wolves taken through hunting

in southern Alberta. There is hope that mandatory registration will allow managers to better gauge how wolf populations are affected by hunting.

Predator Livestock Compensation Fund

According to Carrie Bergman, the Predator Livestock Compensation Fund comprises the core of agency management (Berman personal communication 2002). In order to help defray the costs of living closely with predators, the province created the Predator Livestock Compensation Fund in the 1970s. At the outset, the province agreed to compensate livestock producers 100% for cattle and sheep confirmed killed by wolves and other predators (Gunson 1992, Alberta Environment 2000). With a compensation program in place, provincial managers were hoping to increase tolerance for wolves and show their general support for the ranching community. According to Conservation Officer Stan Hawes, compensation may buy wolves some time to move on before further depredations occur and lethal control is initiated, "that (the compensation fund) can hold a few farmers and ranchers and they can be comfortable with that and if they don't get hit again that's the end of it" (Hawes personal communication 2002).

After several years in the mid-1990s when the compensation program was eliminated in a flurry of government cutbacks, the program was eventually reinstated at only 85% of market value (Sargent and Frith personal communication 2002). The reduction was an attempt to give landowners some incentive to make changes to prevent future depredations. As of July 2002, the compensation fund is now back to a full 100% for food-producing domestic livestock. This is likely the result of pressure from both the

Alberta Cattleman's Association and also from the NGO working on behalf of wolf conservation issues in southern Alberta, the Central Rockies Wolf Project (Sargent personal communication 2002 and Callaghan personal communication 2002b). In addition to setting up a compensation payment, Conservation Officers will suggest ways to prevent further depredations such as disposing of livestock carcasses, bringing the livestock closer to ranch buildings, and monitoring the cows more frequently. If depredations continue, the issue can turn into a "real hot potato" and the agency fears that landowners may take matters into their own hands (Hawes personal communication 2002). Mr. Hawes communicated these fears when he told me, "If we don't take some sort of action then the landowners do" (Hawes personal communication 2002). The probable "action" that concerns the agency the most is the use of poison and the inevitable secondary effects on scavenging wildlife. So, if problems persist on a ranch, a Conservation Officer may bring in local trappers to remove the animals they feel are the offending wolves or, as a last resort, utilize poison such as strychnine or compound 1080.

Summary of provincial management

During my research, in order to build a balanced picture of provincial management, I asked my interview participants if they felt there were any advantages to wolves under agency management. Kevin Van Tighem, former conservation biologist for Waterton Lakes National Park offered an interesting perspective,

> *You have to dig pretty deep to find some of the benefits. The system is responsive to the politics of the host community and provincial management gives them total discretion over what happens to wolves on their land or near their land. It probably reduces the pressure to kill wolves because you don't feel like you have to take the problem into your own hands. The management regime supports your interests by making it*

> *awfully hard for wolves to stay alive; a perverse benefit to wolves. It (provincial management) probably keeps the heat off wolves but it also makes them bloody vulnerable.*
>
> (Van Tighem 2002)

Overall, provincial wolf management can be easily described using one word: reactive. The largely ineffectual wolf management document and liberal hunting and trapping regulations create a standard for wolf management in the province and conveys the message that wolves are not in need of any special conservation measures. Although the agency management document recommends active involvement in a number of management strategies, the province is only able to oversee harvest regulations and the livestock compensation program. This bare bones approach stems from lack of agency resources and an absence of necessity; wolves as a species are in no particular danger of extinction throughout the province. Harvest regulations that allow virtually unlimited opportunities to kill wolves are a significant source of additive mortality and can preclude population stability, especially in an area like southern Alberta where wolves exist in low-density populations.

As a result of these interplaying factors Carolyn Callahan of the Central Rockies Wolf Project, believes that, "The wolves are being maintained by de facto not by planned design" (Callahan personal communication 2002a). This laisez faire approach creates a dependence upon source populations to provide an influx of wolves to southern Alberta and not on the goal of creating an atmosphere conducive to population stability. The current management paradigm is akin to a half-inflated life raft. The occupants may not all immediately die but bit-by-bit most of them are sure to fall overboard. However, this

is not the end of the story. The evolution of more proactive strategies closely followed the resurgence of wolves into the Waterton Lakes National Park area in the mid 1990s. This story does illustrate the shortcomings of provincial management but also demonstrates how a group of creative people working to further wolf conservation began to set the wheels of change in motion.

V. The Belly River Wolf Study—an expansion of conservation strategies

In 1993, the first wolf pack to den in southwestern Alberta since the 1950s was discovered in Waterton Lakes National Park near the Belly River (Waterton Park Information Services 2001). The alpha female of the Belly River pack originally came from Montana's North Camas pack which sparked an interest in the U.S. Fish and Wildlife Service to monitor the wolves as a satellite pack linked to wolf recovery in the United States. Because the Belly River wolves inhabited an international and multi-jurisdictional territory, managers from the United States and Canada created The Belly River Wolf Working Group; a multi-agency steering committee with the following study objectives:

Figure 2, Belly River, photo by Pam Uihlein

- Determine pack dynamics
- Determine food habits and predation rates

- Evaluate wolf/livestock/human interactions
- Maintain a strong working relationship with ranchers and sportsman
- Provide information to area residents and maintain on-going dialogue

(Van Tighem and Fox 1994)

The Belly River Wolf Working Group consisted of representatives from Alberta Fish and Wildlife Services, Blackfeet Fish and Game Department, The U.S. Fish and Wildlife Service, Waterton Natural History Association, Waterton Biosphere Association, Blood Tribe, Glacier National Park, Waterton Lakes National Park, and the Alberta Cattle Commission (Van Tighem and Fox 1994). The working hypothesis of the Group stated that "Wolves can occupy livestock producing areas with minimal conflict with agriculture if stable packs that prey by choice on wild game are retained" (Van Tighem and Fox 1994). The core study area for the group was the region south of highway 3 to the international border. Although the main focus of the study was the Belly River wolves, two other packs, Beauvais Lake and Carbondale, were also included. Recognizing the unique opportunity before them, Kevin Van Tighem explains that regional stakeholders interested in wolf conservation "might as well learn more about them as long as they were there" (Van Tighem personal communication 2002). Here was an opportunity to delve beyond the current agency paradigm and look at ways to develop proactive management strategies with greater depth.

During the early 1990s, a neoconservative movement swept through Alberta and much of the western provinces and states (Van Tighem and Frith personal communication 2002,

Callaghan personal communication 2002a). The change in political climate ushered in an era of drastic deficit reduction which resulted in numerous agency cutbacks and program eliminations. It was during this time that the agency eliminated the Predator Livestock Compensation Fund causing a stir among the ranching community (Watt personal communication 2002). Wolf proponents feared that livestock producers would act with deadly haste towards any group of wolves suspected of depredation whereas the compensation fund may have afforded wolves a bit more tolerance. Now, with wolves recolonizing far southern Alberta, a core management strategy was missing. The Belly River Wolf Working Group responded to this need plus instigated a monitoring program and a public outreach campaign.

Monitoring and research

The Belly River Wolf Study officially began in May 1994. At the outset, one wolf from each of the packs had already been collared by American researchers when the wolves lived in the US portion of the Glacier National Park ecosystem (Van Tighem and Fox 1994). This is significant because although wolves had made many incursions into Waterton National Park, mainly from the Flathead Basin of Montana and British Colombia, the animals were largely unstudied (Watt personal communication 2002). Up to that point, American researchers had taken the primary responsibility for monitoring transboundary wolves but here was an opportunity for Canadian researchers to get more involved (Boyd and Pletscher 1999, Boyd et al. 1995, and Pletscher et al. 1997). Monitoring a wolf population is important for gathering basic technical information such as: the number of wolves present, natality, mortality, territory size, and food habits (Van

Tighem and Fox 1994, Callaghan personal communication 2002a). Monitoring provides baseline information that can then be communicated to other stakeholders or used in public education and outreach. Without this information, further wolf management is impossible.

Although a goal of the Group was to collar additional wolves in all packs, the project technician was only able to collar one additional wolf in the Belly River pack; well under the numbers originally desired (Fox personal communication 2002). Despite many unsuccessful collaring efforts, researchers were still able to ascertain some basic information. Through telemetry, ground tracking, and fecal analysis researchers discovered that the Belly River pack consisted of six to eight wolves that used both the Waterton and Belly River drainages and that approximately seven pups were born that spring. Researchers also made note that even though the Belly River wolves denned within one kilometer of a pastured cow/calf herd, no depredations occurred (Van Tighem and Fox 1994). Because these wolves were new arrivals to an area that had been without an established wolf population for many years, the Group decided that initiating an aggressive public outreach campaign was the next logical step. Well aware of the threat that human hunting could pose to area wolves, Group members hoped to use public education as a means to dispel negative myths and promote tolerance. Although public education is an essential component of any management strategy, the reaction they received after implementing a comprehensive outreach campaign was not what they had anticipated.

Education and outreach

The public education strategy of the Belly River Wolf Working Group was three-fold with the goal of utilizing a variety of tactics to reach a diverse pool of people. The three strategies included:

1. Going door-to-door in the area within the home range of the Belly River pack and talk directly with livestock ranchers
2. Producing a monthly newsletter, "Wolf Tracks"
3. Hosting two community meetings open to the public

(Van Tighem and Fox 1994)

Knocking on doors provided study group member Kevin Van Tighem with an avenue to directly contact their primary target group; livestock producers. Although it can be difficult to break through an initially suspicious veneer, face-to-face dialogue is perhaps the most effective way to communicate important information. Livestock ranchers in southern Alberta are a close community of individuals and families who share a communication network. Much like playing a game of telephone, when one individual passes along information to another, the facts of any situation are at risk of being convoluted by rumor and false information .

For the Group, the main goals of direct contact were to avoid the spread of rumors, educate ranchers about the study, and answer any questions in a safe and comfortable environment. Also, because of liberal hunting regulations, Group members wished to

encourage landowners to refrain from shooting a wolf with a radio collar. According to Mr. Van Tighem one of the primary messages conveyed to landowners was, "If you see three wolves in your pasture and two of them are collared, please shoot at the one that isn't" (Van Tighem personal communication 2002). Because the Belly River wolves traveled extensively throughout private land, the Group also asked landowners for access, if necessary, to conduct monitoring surveys. Although it is difficult to accurately assess how landowners processed the information communicated by the Group, Mr. Van Tighem clearly received one important piece of feedback. Some landowners were displeased that the compensation fund no longer existed; especially given the current circumstances. Even though livestock losses had not occurred south of highway 3, many ranchers were concerned about potential depredations and the lack of a financial safety net.

Revitalizing the compensation fund

Not every livestock producer is interested in receiving compensation for depredations. Some feel as though taking money from the fund is akin to accepting a pay-off (Van Tighem 2002). However, for those who welcome the support, compensation programs seem to be an important element in easing tensions between predators and ranchers. In Alberta, compensating ranchers for their losses has been fairly controversial because a depredating wolf can legally be killed and the producer will still receive compensation; an inequity to those who feel wolves should also receive some protection. Despite these questions, Mr. Van Tighem explained that reinstating a compensation fund would be an act of good faith and help dispel the stereotypes that some ranchers have about those

working for wolf conservation. Plus, a renewed compensation fund could possibly help the Belly River wolves establish a stable, long-term existence through promoting greater tolerance. After the Group realized the importance of the fund to some ranchers they set about to find a way to bring the compensation program back to life.

The first step was to convene a group of stakeholders interested in revitalizing the program. The committee consisted of representatives from Parks Canada (specifically Waterton Lakes National Park), ABSRD, and the livestock and environmental communities (Van Tighem personal communication 2002). Then, the committee needed to answer an essential question; where would the money come from for the fund? They found their solution through the Waterton Natural History Association. The Association, the support group to the National Park, agreed to solicit donations from visitors as the primary means of raising funds for the program (Quinlan and Van Tighem personal communication 2002).

At first, collaboration was difficult because the group operated under the assumption that all collaborations are adversarial which, in the end, means there will be winners and losers. So, the first order of business was dispelling this stereotype and creating an atmosphere where every participant benefits. This was a difficult task, according to Mr. Van Tighem, because they were working against a "history of distrust" with its origins in the old twentieth century conservation paradigm (Van Tighem personal communication 2002). In spite of these initial challenges, they were successful at both agreeing on a framework for the fund and raising money. However, throughout the process of

administering the fund they did encounter several more glitches. One notable problem arose due to a lack of clear communication between members of the committee. The Waterton Natural History Association ended up sending fund raising letters to its members that gave the impression that wolves would receive some sort of protection with a reinstated compensation program. Portraying inaccurate information, even inadvertently, can cause a rift in the tenuous network of trust that the committee tried to build between themselves and the community. This ad hoc compensation program only lasted for about two years.

Originally, the fund was set up only for southern Alberta. After a time, others interested in seeing a province-wide return of the program went to the legislature and the government officially reinstated the fund. However, in the end, this motley group of individuals accomplished something much more groundbreaking than raising money for a compensation program. They started building relationships between dissimilar groups of people who were all thrust into a situation where each had a vested interest in solving a common problem; reinvigorating the compensation fund. Mr. Van Tighem felt that this new model of partnership building had "a bit more elegance" than simply relying upon the agency to take care of everything; especially since the agency dropped the program in the first place. To summarize, the work of the committee represented a way for people to start sharing problems and create ways to solve them together because, as Mr. Van Tighem puts it so clearly, "There is only one landscape out there" (Van Tighem personal communication 2002).

Outreach continued

The final two educational strategies facilitated by the Group, a newsletter and public meetings, rounded out their program. The monthly newsletter, "Wolf Tracks" was designed to inform the public on regional livestock losses for the entire Oldman watershed, out of the home range of the Belly River wolves, and give updates on the Belly River Wolf Study (Van Tighem and Fox 1994). Presenting depredation information not directly pertaining to the Belly River wolves may have resulted in increased hunting pressure on non-depredating wolves through creating the illusion that all wolves are livestock killers. However, the Group was taking a regional approach and, during that time, livestock depredations were occurring north of highway 3.

To reach a wider cross section of the community, the Group offered two workshops, hosted by the Waterton Biosphere Association, in the towns of Mountain View and Twin Butte. Waterton Lakes National Park was designated a biosphere reserve by the United Nations in 1979 and the Waterton Biosphere Association acts as a liaison between the Park and people living in surrounding areas (Frith personal communication 2002). The Association identifies important regional conservation issues and facilitates cooperation between local residents and the Park as a way to work toward shared solutions (West personal communication 2002). Because of their unique position in the community, the Association was a natural host for the workshops.

Approximately 150 community members, mostly ranchers, attended the workshops and specialists from the United States and Alberta gave presentations on wolf ecology,

management, and control. The Group hoped that as people listened to credible scientific information any prejudice or misinformation surrounding wolves would diminish appreciably (Quinlan personal communication 2002). During the workshops, Mr. Van Tighem noticed that there was a lot of communication taking place but not necessarily between the speakers and the audience. Rather, during the workshops, most of the communication took place within the audience. This, for Mr. Van Tighem, was a warning sign that the workshops were not accomplishing their intended goals. Within a week, Group members were informed that a rumor started insinuating that the government was actually relocating wolves to the area (Van Tighem personal communication 2002). This rumor spread throughout the region and resulted in some unhappy residents. Despite the concerted effort to squelch rumors and promote tolerance, hunting pressure dramatically increased and, by April 1995, approximately forty-four wolves were dead out of an estimated population of forty-five to sixty animals (Long 1995, Francis 1997). As Mr. Van Tighem puts it, life after the workshops consisted of "wolves getting toasted out in the woods and radio collars turning up with blood all over them" (Van Tighem personal communication 2002). The Belly River Wolf Study was consequently terminated.

Good intentions, unfortunate results

> *Certainly don't look at the way we're doing it for the answer. There are occasionally things that we do that you guys can learn from but this ain't one of them.*
>
> AB SRD wildlife biologist on agency involvement with the Belly River wolves

With the termination of the study, Group members now had time to reflect upon what had gone wrong. They had attempted to create an atmosphere where stable pack structures

could become established in southern Alberta. Instead, they were left with dead wolves and a group of displeased local residents. We will never know exactly why each of those wolves were killed; human behavior is often wily and unpredictable. However, there may have been ways for the Group to approach the situation differently. In retrospect, the Group would probably have changed:

1. The problem definition of the Belly River Wolf Working Group
2. The scope of public outreach

(Van Tighem personal communication 2002)

Perhaps more attention should have been given to dealing with rumors before they began circulating through the community. The original working hypothesis of the Group supported the idea that wolves and livestock can coexist if nondepredating, stable pack structures are maintained (Van Tighem and Fox 1994). Throughout the duration of the Study, there were no confirmed livestock depredations south of highway 3. In fact, the Belly River wolves were documented as denning within one kilometer of a pastured cow/calf herd and the producer recorded no losses (Van Tighem and Fox 1994). However, north of highway 3, producers were experiencing livestock depredations and their negative experiences likely affected the image of wolves throughout southern Alberta and rumors began to spread insinuating that wolves were killing livestock throughout the entire region. Also, there seemed to be very different public perceptions about wolves that were reintroduced to an area and wolves that naturally recolonized. The rumor that wolves had been relocated to southern Alberta by the government certainly

generated discontent and perhaps created the illusion that the area had more wolves than should naturally be there.

According to Clark et al. (1996), how we define a conservation problem will dictate if and how the problem can be solved. A problem definition helps a group decide where to put their resources in order to work toward a solution. An inaccurate definition will inevitably funnel a group's resources in the wrong direction which will likely preclude resolution of the problem. Accurately defining a conservation problem is a challenging endeavor due to the number of variables at play and differing perspectives of those involved. Additionally, Clark et al. (1996) suggests that groups faced with defining a conservation problem should examine the following five factors as a way to help frame the situation:

1. Cultural history of the species
2. Valuation of the species
3. Ecology of the species
4. Current management systems
5. Current policy process affecting the species

An accurate problem definition can minimize social contention which will ultimately help preserve the target species (Clark et al. 1996). According to Mr. Van Tighem, at the outset, the Group knew that some rural residents might have a low tolerance for wolves. They also believed that an informed rural community would have greater tolerance for

wolves and change their behavior based on a better understanding of the situation (Van Tighem personal communication 2002). Therefore, if increased levels of public outreach containing credible scientific information rationally leads to greater tolerance the "problem" then becomes, how can we most effectively educate the host communities. The communication of scientific information is extremely important and should always be an integral part of all management strategies but because wolf conservation is so multi-faceted, the full range of cultural and ecological factors must also be included (Clark et al. 1996 and Clark and Primm 1996).

In this situation, the real 'problem' was not as simple as once perceived. There were some deep-seated cultural factors affecting the way some rural resident felt about wolves and the Group did not directly address these issues. Mr. Van Tighem states, "What we weren't recognizing at the time were agricultural realities" (Van Tighem personal communication 2002). During the mid-1990s, beef prices were low and many rural residents were feeling as though the rapidly changing world was creating less and less opportunity for them to maintain their chosen lifestyle. People were thinking much more about issues of fundamental importance like the viability of their livestock operation. As a result, many livestock ranchers were not willing to live with a high degree of risk. Even though wolves were not depredating in the area at that time, a combination of rumor, confirmed depredations to the north, and a growing local wolf population produced a volatile reaction. To assuage some fears, the Group did quickly act to reinstate the compensation fund which was a wise move. However, it is difficult to effectively deal with the core problems causing landowner angst which have their roots in a changing

global economy. Wolves have inadvertently played the role of scapegoat in the past and, unfortunately, they may continue to play it now. Perhaps a more relevant problem definition would include how to best ease the sense of heightened risk that many ranchers were feeling through directly dealing with depredation anxiety. This probably didn't seem necessary at the time given the absence of depredations but perhaps at the start of the outreach campaign the Group could have presented ranchers with practical information on depredation prevention.

The creation of the initial problem definition led directly to an aggressive public outreach campaign. Public outreach is an essential component of a carnivore conservation program but there are many ways to structure and implement an educational strategy. Conducting workshops is a strategy supported by many involved in carnivore conservation (Clark et al. 2001). However, Mr. Van Tighem feels that hosting the workshops was a "fundamental mistake" for several reasons (Van Tighem personal communication 2002). Not only did the workshops fail to prevent the spread of damaging rumors, Mr. Van Tighem was approached by a local resident after the workshops and berated for stirring up an issue that had hitherto been largely ignored. He claimed that people knew wolves were out there already but that their presence didn't become an issue until the Group starting calling so much attention to the situation. The resident then added, "Now we're all carrying guns and looking for them because of the attention you brought to it" (Van Tighem personal communication 2002). With at least forty-four wolves dead, there is no doubt that hunting pressure increased dramatically.

Large public meetings do serve a purpose but Mr. Van Tighem suggests that in order to create an atmosphere conducive for effective communication the meeting should originate from within the target community. He feels strongly that "People who are credible at communicating with any particular target group are people within the group" (Van Tighem personal communication 2002). This way, local residents are invited by their peers rather than an outside group and the community may feel a greater sense of ownership in the entire event. Also, it is important to remember that all people process information through the messenger. For some rural residents, government workers are inappropriate messengers regardless of the issue. The best-case scenario for communicating sensitive information is through an actual member of the target group. It is also important to remember that not every aspect of the outreach program was flawed. The Group did a tremendous amount of work with the community and chances are high they positively affected some of the residents they contacted, especially through the door-to-door outreach. This way, communication can take place over shared work on the landowner's property or over coffee in the kitchen. Sharing information in this manner can open up lines of communication that otherwise would be closed in a different context.

The life and death of the wolves south of highway 3 provides insight into how the provincial management regime affected wolves and how a little bit of innovation can begin to spark the evolution of new management strategies. Although the study met a premature end, there is no doubt that those involved with the Belly River Wolf Working Group learned a tremendous amount about community relations and effective public

outreach. The most important lessons to emerge from the experience are the absolute importance of partnership building and carefully developed education and community involvement. These are perhaps the most essential elements of wolf conservation and represent a vast departure from the laisez faire provincial management regime. With the termination of the Belly River Wolf Study, wolf conservation in southern Alberta was back to the status quo. It was inevitable, however, that at some point wolves would begin to recolonize the area.

VI. The Southern Alberta Conservation Cooperative—the backbone of wolf conservation in Alberta

The Central Rockies Wolf Project

The story of the Belly River wolves caught the attention of the Central Rockies Wolf Project (CRWP), a non-governmental organization working in the Banff National Park area. The Central Rockies Wolf Project began in 1987 and is the research arm of an educational organization called Wolf Awareness (CRWP 2002). In 1987, CRWP collared their first wolf in Banff National Park marking the start of a scientific study that grew to integrate a wide range of wolf management strategies. The primary goal of CRWP is to ensure the maintenance of viable wolf populations in the Central Rocky Mountains through using both scientific research and educational outreach as their main tools (Callaghan personal communication 2002a). After radio collaring their first wolf in 1987, they assumed the role of collecting rigorous scientific information in order to share data with the public and provincial wildlife agencies. It is their hope that the data they collect can then be used by provincial wildlife managers to positively affect management

decisions. In essence, CRWP proactively engages in the wolf management strategies left vacant by the province. Because they are an NGO they are afforded the flexibility and choice that provincial agencies may not have regarding wolf conservation. Thus, they are able to spark innovative new programs as well as cover the basics necessary for wolf conservation such as monitoring and educational outreach. However, CRWP focuses most of their attention on wolves in the Banff National Park and Bow Valley regions; far from this project's study area in southern Alberta. That all changed after the demise of the Belly River wolves.

The evolution of the Southern Alberta Conservation Cooperative (SACC)

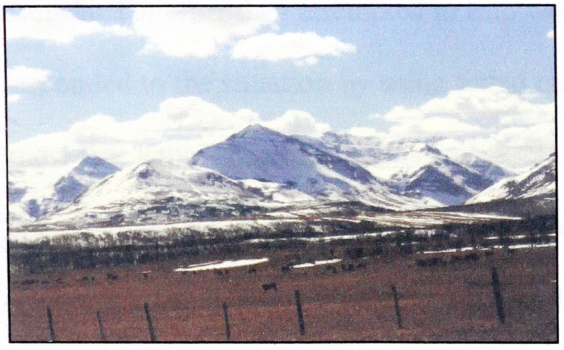


Figure 3, Rocky Mountain Front, Alberta photo by Pam Uihlein

From their years of research and observation in the Banff National Park area, CRWP found that wolves mainly denned within protected areas and away from human disturbance. In southern Alberta they quickly realized that wolves rarely, if ever, denned in protected areas and that home ranges consisted mostly of rural lands outside of Park boundaries (Callahan personal communication 2002b). This combination of factors pointed to one very important piece of information; wolves in southern Alberta would have to largely depend on private land in order to persist in viable populations. Because much of the private rural land in this region is used for livestock production, CRWP knew that conflict on some level was inevitable. Observing what happened to the wolves south of highway 3 confirmed this

hypothesis and sparked an interest to create some sort of conflict prevention program (Mamo personal communication 2002). Thus, southern Alberta became a new target for CRWP.

In 1994, Carolyn Callahan, current executive director of CRWP, received a phone call from her graduate advisor Paul Paquet to inform her of an opportunity to help collar wolves north of highway 3 (Callahan personal communication 2002a). During this time, livestock depredations were occurring and the government was trying to get a handle on the situation. However, they did not have the expertise to capture and collar wolves so they called upon Dr. Paquet, a leading wolf researcher and conservation biologist in Canada. Together they attempted to trap wolves but were unsuccessful. The government responded to the situation by using lethal control but both Ms. Callahan and Dr. Paquet knew that lethal control would not prevent conflicts from reoccurring again in the future. They realized the need to be proactive instead of reactive in order to give wolves a chance at establishing a viable population. Provincial managers were in a limited position; they could assist a livestock producer through shooting, trapping, or poisoning wolves but they did not have many tools to engage in proactive depredation prevention.

As a response, CRWP decided to launch a new initiative, the Southern Alberta Conservation Cooperative (SACC), with the goal of reducing conflicts between livestock producers and wolves (SACC Interim Report 2001). The six main elements of the project include:

1. Determining the factors that contribute to wolf depredations on livestock
2. Identifying effective depredation avoidance techniques
3. Evaluating alternate livestock management methods
4. Collaborating with government to improve its depredation compensation program
5. Education and outreach to urban and rural audiences
6. Assisting in the development of a wolf management plan that incorporates human interests

Inherent in these elements are many of the management strategies previously outlined in this paper. In order to actualize these six objectives, the specialists working for SACC plan to use a blend of traditional husbandry knowledge gained from local ranchers and scientific research. The entire aim of SACC is preventing conflict from happening rather than perpetuating the reactionary cycle of lethal control and opportunistic hunting. Perhaps the most promising tool for depredation prevention is a European flag system called fladry that will be discussed in greater detail in a later chapter.

Building Partnerships

The evolution of SACC didn't occur overnight, however. The Central Rockies Wolf Project engaged in several years of relationship building and strategizing before officially starting the program in 1999. Given the lack of resources allocated for wolf management, there is virtually no way that CRWP could have successfully created and implemented an innovative program centered around wolf conservation on their own. The Central Rockies Wolf Project understood the importance of building partnerships with all stakeholders,

even those not directly involved in wolf conservation. To forge a long-lasting partnership based upon something as controversial as wolf conservation, SACC needed to "clarify and secure their common interests" with potential partners (Clark and Brunner 1996: 1). SACC's primary goal of reducing conflicts between ranchers and wolves coalesces well with the interests of both the livestock community and the provincial agency. Even though there may be different end-goals in mind, all parties would like to see a reduction of depredation conflicts in southern Alberta. The agency is notoriously low on resources and, often times, has difficulty locating and removing depredating wolves (Hawes and Bergman personal communication 2002). These deficiencies often lead to frustrated ranchers taking matters into their own hands which results in dead wolves. Plus, a rancher does not have to contact the agency when they experience a depredation unless they would like to receive compensation. With the common goal of reducing conflict, SACC proceeded to bring together the following key cooperators: the provincial wildlife managers, the Alberta Cattleman's Association, individual ranchers, and the University of Calgary (Callahan personal communication 2002a).

Ultimately, SACC would like to see their research implemented into a comprehensive wolf management strategy for southern Alberta. In order to turn this goal into a reality they must work closely with the legal managers of wolves, the provincial wildlife agency. There is virtually no way that SACC could participate in the types of research and monitoring that are essential elements of the program without provincial support. Any NGO in Alberta must receive permits to both capture and handle wolves before they embark upon a project (Jorgenson personal communication 2002). This leads to the

question, what are the benefits that the provincial agency receives from a program bent on preventing livestock depredations? Information sharing is a fundamental tenet of SACC's research philosophy and, since one of SACC's primary activities is collaring and monitoring wolves, they are able to keep the agency up to date on their latest findings (SACC Interim report 2001). As Jon Jorgenson, regional biologist out of Canmore puts it, "If it wasn't for that work (CRWP does) we wouldn't have that information" (Jorgenson personal communication 2002). Data on how many wolves are in an area, their home ranges, eating habits, and depredation information can be helpful for many different aspects of provincial wildlife management. The depredation prevention work and monitoring that SACC does gives the provincial Conservation Officers additional options when dealing with serious depredation problems (Hawes personal communication 2002). In the case of recurring depredations, if a specialist with SACC is able to collar a member of the suspected pack then the agency is more likely to selectively control only the offending wolves. This is a better alternative than either poisoning entire packs or allowing opportunistic hunting. In response, the agency helps SACC through the donation of small sums of money; use of government vehicles and lodging; and occasionally hiring technicians that CRWP originally trained to monitor wolves (Callahan personal communication 2002a). Conservation Officer Stan Hawes sums it up well when he says, "We have a really good working relationship with those folks" (Hawes personal communication 2002).

Perhaps ten or fifteen years ago the partnership between SACC and the Alberta Cattlemen's Association (ACA) would not have happened. However, when SACC

approached the ACA to inform them of their ideas, it quickly became apparent that common ground existed between the two groups. The ACA realized that although southern Alberta has not had a stable wolf population during the last decade, wolves will continue to recolonize the area regardless of control efforts. Plus, one current theory regarding livestock depredations posits that when blanket control efforts wipe out either parts of packs or entire regional populations, the resulting social instability may lead to increased depredations (Hawes, Sargent, and Callahan personal communication 2002). Therefore, if wolves are going to have a continual presence the ACA wanted to look into the science behind depredations. Up to that point, little was known about what factors lead to depredations and how to best identify and deal with problem wolves. In order to tackle questions of such magnitude, the ACA decided to help fund SACC on a yearly basis (Sargent 2002). Through SACC's monitoring and depredation prevention research, the ACA hopes to move towards facilitating a greater coexistence between wolves and livestock.

From the outset of their work, CRWP recognized a very simple cause and effect relationship. When livestock depredations occur, wolf tolerance plummets and wolf mortality rises (SACC Interim Report 2001). Through a combination of stereotype and reality, livestock ranchers have historically been the archenemies of wolf conservation making them, at first glance, the least likely partner in a wolf conservation initiative. However, even though ranchers may be unlikely fans of wolf conservation they are, by far, the most important community involved in SACC's project. Without the livestock community on board, SACC simply couldn't exist. The monetary support SACC receives

from the ACA is crucial for their basic operation, but even more important is the acceptance of the program by the livestock community. The Central Rockies Wolf Project describes it well in their position statement, "For a viable wolf population to persist in the Central Rocky Mountains, a successful conservation strategy must be developed in partnership with local communities" (CRWP 2002, Sillero-Zubiri and Laurenson 2001).

To create meaningful relationships with a community of people that are traditionally considered your adversary, it is important to choose representatives that you feel will effectively communicate your message. The Southern Alberta Conservation Cooprtative chose two such representatives, Charles Mamo and Tim Kaminski, to begin the process of landowner contact in southern Alberta. Both raised in agricultural settings, the two men seem to have a knack at talking to ranchers. Carrie Bergman feels that their approach has been right on the mark, "They build personal and professional relationships with ranchers that help build their credibility" (Bergman personal communication 2002). The two have also been described as being able to "speak the talk of the local landowner" and, according to Stan Hawes, "They come to the table with a solid background in wolves and wolf management. Chuck and Tim have really good people skills and are good communicators" (Hawes personal communication 2002). Charles himself describes his method of communication when he emphasizes the "need for real dialogue". "I'm not there to tell people what to do or how to do it. We take suggestions from folks and find out what works" (Mamo personal communication 2002). Not only have several ranches agreed to try fladry, rancher cooperation has been crucial to help SACC gather important

information on wolf sightings, depredations, and mortality. In addition, some ranchers assisted SACC with capturing wolves and all ranchers contributed information on "traditional grazing and livestock husbandry practices in southern Alberta" (SACC Interim Report 2001).

Education and outreach

The main target group for SACC's education and outreach is the livestock community. To get the project off the ground, SACC needed to engage in an initial round of landowner contact in southern Alberta. In 2000 and 2001, Charles Mamo and Tim Kaminski met with forty-one ranchers to gather information on depredation events; wolf sightings and mortality; and to inform them of SACC's new project. The Southern Alberta Conservation Cooperative also received valuable information on different depredation avoidance techniques already being used by ranchers. These "surveys" were conducted informally and took a conversational format. The Southern Alberta Conservation Cooperative primarily conducts outreach on a one-on-one level rather than organizing large public meetings. In April of 2002, Mr. Mamo was invited to speak at a small gathering of ranchers in order to reach more people that either may be interested or potentially receive a benefit from SACC's work (Mamo personal communication 2002). In this case, a local rancher was the impetus behind setting up the meeting which helped create an inclusive atmosphere.

Educational outreach to more urban environments is also important for securing long lasting support for SACC. The Southern Alberta Conservation Cooperative and CRWP

both engaged in a number of educational activities to spread the word about SACC including many presentations to audiences in Calgary. A variety of organizations hosted educational presentations including Husky Energy, the Alberta Association of Professional Biologists, the Cross Conservation area, and CRWP's own annual research seminar. Also, CRWP reached over 1000 students during the 2000/2001 school year through their classroom educational program (SACC Interim Report 2001 and Callahan personal communication 2002a).

Monitoring and research

The purpose of SACC's monitoring and research program is two-fold. First, one of their primary goals is collaring wolves in southern Alberta to facilitate their data collection on spatial distribution and other characteristics of area packs. Collaring wolves will also be important in the event of livestock depredations; SACC may have a better chance at figuring out which pack or, better yet, which wolves took part in the depredation. The other branch of SACC's research includes piecing together wolf and livestock mortality data, gathered from the province, in order to create a more comprehensive picture of population dynamics. Trying to quantify wolf mortality in southern Alberta is difficult because of past inconsistencies in record keeping. The government does not directly record the number of wolves harvested through trapping nor have they had a system for recording hunter-killed wolves prior to mandatory registration in 2000 (SACC Interim Report 2001). In total, SACC gathered information on trap line mortality, wolf sightings, government sponsored depredation control, and livestock mortality data. Anecdotal

evidence strongly suggested that southern Alberta's wolves have been in a state of flux for many years and SACC confirmed this general trend. These population fluctuations

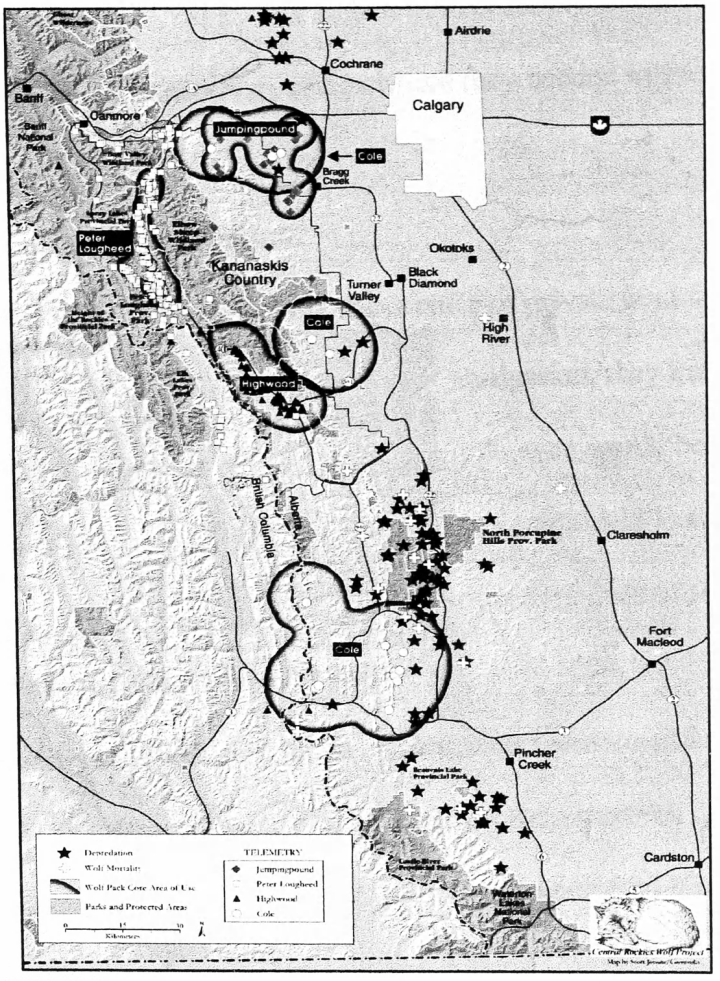


Figure 4, Wolf and Livestock Mortality, courtesy of CRWP

may contribute to increased livestock depredations resulting from social instability and greater opportunistic hunting within the pack (SACC Interim Report 2001).

From their research, SACC also shed light on other important aspects of wolf management. During 1999-2001, SACC collared three wolves in southern Alberta and, through the use of ground tracking and aerial telemetry, were able to distinguish home ranges and movements (See Figure 4). Collared animals included wolves from the Jumpingpound pack, Peter Lougheed pack, and a lone wolf called "Cole" (SACC Interim Report 2001). SACC then correlated these data with confirmed livestock depredations and human-caused wolf mortality and ended up identifying three "hot spots" of both livestock

depredation and wolf mortality: the Whaleback area, areas southwest of Pincher Creek, and areas northwest of Cochrane. Determining land ownership was another important facet of SACC's research that clearly showed that a majority of conflicts were occurring on private land. These data helped SACC understand where wolf mortality sinks were occurring and, therefore, places where they needed to focus their attention.

Depredation prevention

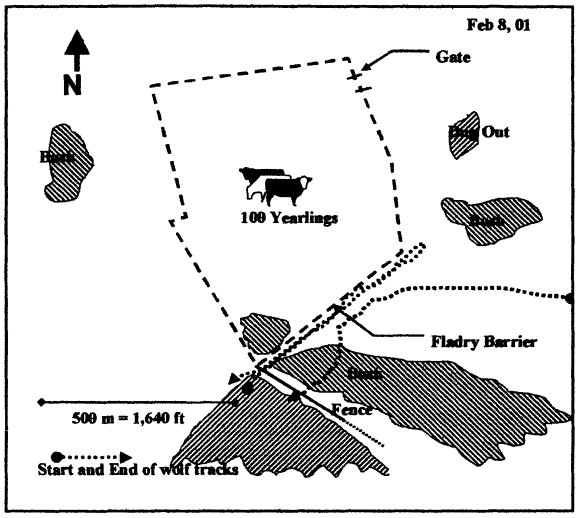
After SACC established the importance of private land for wolf/livestock conflict mitigation, they knew that the key to promoting tolerance would be depredation prevention. Fladry is a traditional European wolf hunting technique that uses lines of red flags, 50 x 10 centimeters, to create a psychological barrier that wolves seem unwilling to cross (Musiani 2000 and SACC Interim Report 2001). There has been research done on the efficacy of fladry as an exclusionary barrier and, in 2000, SACC conducted an experiment to test the potential usefulness of this tool in southern Alberta (Musiani 2000). They chose a ranch outside of Cochrane that had experienced several depredations and who were willing to try something new. The Southern Alberta Conservation Cooperative set up the fladry around the calving grounds on the ranch and, during the time it was in use, no further depredations occurred (SACC Interim Report 2001). This successful use of fladry bolstered SACC's confidence as well as helped build trust with the livestock community.

Figure 5, Fladry, photo by Pam Uihlein

The next experiment took place within Peter Lougheed Provincial Park in 2001. This trial was designed to test if fladry could provide an effective barrier around a wild ungulate carcass. At first, SACC deposited a white tail deer carcass without fladry to allow wolves a chance to feed and give them incentive to return to the area. Next, a carcass was put out with fladry around it and, for the entire time the carcass was exposed, wolves never crossed the fladry barrier (SACC Interim Report 2001). During this same time, a ranch outside of Pincher Creek that had experienced several depredations allowed SACC to construct 2400 meters of fladry around a group of yearlings. The fladry was in place from January through April 21, 2001 and there were numerous occasions when wolves approached the enclosure. SACC used ground tracking to determine wolf movements and found some fascinating results. The following section, taken from SACC's 2001 Interim Report demonstrates the typical behavioral response of wolves to fladry.

> *On February 8, two sets of wolf tracks were observed. One wolf approached from the SE (area where yearlings had been killed earlier) and came within 8 m of the fladry along the SE section. It then turned and walked parallel to the fladry for about 150 m then turned and headed south. The second wolf approached from the SW corner and walked parallel to the fladry the entire length to the SE corner whereupon it reversed course and repeated its movement to exit at the SW corner. This wolf tested the fladry at four locations along the SE section.* (See Figure 6)

Wolves did enter the pasture on several occasions due to an unprotected gate and small-scale fladry failure. At the outset of the experiment, a 50 meter section at the pasture gate was not covered with fladry. Two wolves did proceed to enter the pasture but no depredations occurred. In another instance, a section of the fladry rope broke



and several other flags were wrapped up in the barbwire fence allowing a wolf to enter the pasture. As with the previous incident, no depredations occurred at this time either. Tracks indicated that the wolves might have been stressed to be on the inside of an enclosure surrounded by fladry.

Figure 6, Fladry at Pincher Creek Ranch, courtesy of CRWP

Fladry may hold great potential as a highly effective depredation prevention tool. However, researchers are not sure how long a fladry line could potentially stave off a pack intent on depredation. There is the possibility that wolves could eventually become habituated to the fladry but more research is needed to test this hypothesis. For now, SACC will continue to use fladry as a way to protect livestock while continuing to work on additional prevention techniques. Besides effectiveness, fladry is also fairly cost effective. Initial costs consist of the rope with attached flags plus installation and maintenance time. The Southern Alberta Conservation Cooperative provides fladry at no cost to livestock producers which is a key selling point at this early stage of experimentation. Many stakeholders involved in wolf conservation agree that depredation prevention tools must be both easy to use and cost effective in order for ranchers to give it a try (Jorgenson, Hawes, and Main personal communication 2002).

Although fladry is fairly inexpensive to make and install it can still be challenging to work with. Perhaps the greatest limitation is the amount of maintenance time needed to ensure that a line is working up to its potential (Main and Mamo personal communication 2002). Wind is the biggest threat to fladry; flags can easily become tangled which eliminates their effectiveness. Inquisitive yearling cows can also present problems. In more than one case, yearlings have torn flags off the fladry rope and scattered them all over the pasture (Mamo personal communication 2002). There is also a concern that cows may eat the flags. So, there is an inherent amount of people power needed to maintain a fladry line and this demand may prove to be too much for many ranchers. The Southern Alberta Conservation Cooperative has taken care of all the maintenance and upkeep to this point but, if fladry becomes widespread, there is virtually no way for them to oversee every operation unless they greatly increase their staffing. In addition to fladry, there are other anti-depredation techniques that ranchers use. The Southern Alberta Conservation Cooperative documented many of these techniques when they were making initial landowner contacts. They discovered that certain producers were engaging in practices like frequently riding the cows; placing unpredictable and inquisitive yearlings in with older cows that may be able to protect them; immediately disposing of dead carcasses in their pasture; calving later in the season or calving in a protected area; and investing in hardier breeds of cow like longhorns (SACC Interim Report 2001 and Main personal communication 2002).

In sum, SACC understands the importance of conflict mitigation in order to promote tolerance of wolves in southern Alberta. They have combined a number of conservation

strategies to create an interdisciplinary approach which considers cultural, economic, socio-political, and ecological factors (Clark et al. 2001 and CRWP 2002). Too often, those with the responsibility of tackling tough conservation problems, usually government agencies, have viewed conservation problems through a narrow perspective. This perspective ignores the social dimension inherent in conservation problems and relies instead upon technical-based solutions. This "bounded professional perspective" can squelch the creative process and, more often than not, leaves the problem without viable solutions (Clark et al. 2001). Through their consideration and treatment of the many variables present in wolf conservation, SACC is creating a framework for long-term conservation which significantly involves the ranching community. The Southern Alberta Conservation Cooperative realizes the inherent value of partnering with the community that has the most direct contact with wolves and, therefore, the most opportunities to kill wolves that are either a real or perceived threat to their livestock. The partnership that is being forged here is powerful. Based on inclusion rather than imposition, SACC's strategies present some of the most promising advances for wolf conservation in an environment nearly absent of legal protections. Even though wolf conservation in southern Alberta is still evolving, there may be some important lessons for the U.S. to keep in mind as wolf management undergoes the transition from federal to state management.

VII. Implications for the United States

For the last several years, federal managers in charge of wolf recovery in the western U.S. have been closely watching the region's growing wolf population. In September of

2001, wolf biologists south of McCall, Idaho made a surprising discovery. They found that the Gold Fork pack successfully produced pups for a second year in a row making them the thirtieth breeding pair of wolves in the northern Rockies. Today, managers believe that there are approximately thirty-four packs distributed throughout Montana, Idaho, and Wyoming which means that wolves could potentially be de-listed from the Endangered Species List starting in January of 2003 (Means 2001, USFWS 2001, MT FWP 2002). When wolves are de-listed, a shift in management authority will take place. Once the sole charge of the federal U.S. Fish and Wildlife Service (USFWS), wolves will be managed by individual western states. This devolution of responsibility from the federal government to the states represents a move toward management on a more local level.

When the western states assume management responsibility, wolves will consequently receive less legal protection. Because human-caused wolf mortality is the limiting factor for wolves in both the U.S. and Canada, conservation efforts in both countries must focus heavily on the social dimension (Bangs et al. 1998). Through studying wolf conservation in an environment with few legal protections, U.S. managers may glean important information on management strategies that can help promote tolerance without the use of laws. In order to assume management responsibility, each state must prepare a wolf management plan that demonstrates to the federal government adequate regulatory mechanisms to prevent wolves from becoming endangered again (MT FWP 2002). In Montana, the state released a draft management plan in September 2001 and plans on completing the final draft by early 2003 (MT FWP 2002).

Even though Montana's wolf management plan is still in the planning stages, the draft appears to have some of the basic elements of a wolf conservation strategy. At the core of their plan is a proactive agency that has created a proactive plan; very different from what we find in southern Alberta. This is promising because, like Alberta, Montana is the legal manager of wolves and a strong show of support and resources is essential for the success of a new state management regime. Montana's plan will have legally binding prescriptions for several important facets of management including how wolves can be lethally controlled and harassed. Also, if populations continue to grow, Montana may have a regulated public wolf harvest that would include license requirements, quotas, and regulations (MT FWP 2001). An important facet of scientifically based management will be continued monitoring and research which the state plans on closely following for at least the first five years after de-listing (MT FWP 2001).

The draft plan also speaks to the importance of depredation prevention as a tool to prevent future conflicts. Non-lethal control strategies will be emphasized when there are fewer than fifteen statewide packs and may include using aversive stimuli, disruptive stimuli, changes in husbandry practices, and relocation of depredating wolves (MT FWP 2001). These are techniques that the US FWS has used in concert with Wildlife Services and livestock producers but the plan does not mention the possible of fladry as an option. However, U.S. NGOs such as Defenders of Wildlife and the Turner Endangered Species Fund, are currently engaged in testing several non-lethal methods, including fladry (Johnson personal communication 2002). Their research has involved collaboration with the US FWS and, as the states take control, continuing partnerships with NGOs involved

in non-lethal research would be advantageous for wolves, the state agencies, and ranchers. Defenders of Wildlife created and implemented a predator livestock compensation fund in 1987 and, as wolves near de-listing, they are unsure whether or not they will continue the program (Johnson personal communication 2002). The state, at this time, is prohibited by law to administer a compensation fund which may put the program in jeopardy. There are so many existing and potential stakeholders in wolf conservation that, once again, the necessity of partnership to facilitate a compensation fund seems likely.

Education is an inherent part of wolf conservation but, as illuminated in southern Alberta, there are a variety of ways to educate the public about wolves. The draft plan states, "The primary determinant of the long-term status of gray wolf populations will be human attitudes towards wolves" (MT FWP 2001). The plan also mentions the potential for a strong outreach program to minimize illegal mortality rates. However, it will be very important for the state to first identify their target groups and then tailor the outreach to fit the audience. A continuation of one-on-one dialogue with the livestock community should be a primary means of disseminating information on that level. Education through conducting open workshops may not be the best way to communicate important information about wolves as evidenced by the aftermath of the Belly River Wolf Working Group. Large public meetings do seem to work well in more urban environments where people are interested in receiving general information about wolves and wolf recovery. A blanket approach to education will surely be unable to effectively reach all intended target groups. There are so many diverse groups of people involved

with wolves that the state should, once again, emphasize creating partnerships in order to meet the educational needs of a state managed wolf population.

Although the draft plan mentions the importance of including social, biological, and economic variables in the creation of a wolf management plan, there still seems to be a heavy reliance upon technical methods to promote wolf conservation. I believe that state mangers understand the importance of the social dimension behind the success or failure of wolf conservation but, in order to properly address this key factor, partnership building and community involvement should be at the base of all conservation strategies. Although both the chapters on monitoring and education do show the intent of the state to develop partnerships, there are no specific prescriptions. Perhaps these will come in time but all the western states should emphasize these areas as one of their greatest potential assets to wolf conservation. Because of comprehensive federal involvement in wolf conservation for the past twenty-five years, I think U.S. managers still feel a dependence upon an agency to take charge and control the entire process. The importance of agency involvement is a reality but there are also downsides such as getting stuck in a technical based perspective (Clark et al. 2001). In southern Alberta, their provincial involvement is so weak that those working for wolf conservation have no other choice than to be visionary, creative, and inclusive.

VIII. The Future of Wolf Conservation in Southern Alberta

Nobody knows what the future holds for the wolves of southern Alberta. However, we do know that whomever has resources will have the best opportunity to continue the implementation of the management strategies discussed in this paper. Under the present circumstances, wolf conservation in southern Alberta will likely move forward with CRWP continuing their lead role with the agency in an essential supporting role. Even though the province appears to be in a supporting role for many of the conservation strategies initiated by CRWP, they are in a unique position. First off, they have the legal authority to permit or forbid much of SACC's field work and they still ultimately control some very important facets of wolf conservation such as harvest regulations, designation of protected areas, and the creation of management plans. Although the agency is an essential partner in SACC's quest for effective conflict mitigation it is uncertain whether or not they will ever assume a lead role in wolf conservation. Carrie Bergman expressed concern that the agency is not living up to their mandate regarding wolf conservation but mentioned that someday she hoped the province would be able to actively participate in all management strategies. The greatest limiting factor, she believes, is a lack of funding and concomitant resources, a variable strongly at play for both the agency and NGOs. She, however, did acknowledge the strong role CRWP plays in all aspects of wolf conservation and realizes that they now hold a predominant leadership position regarding the development and implementation of management strategies (Bergman personal communication 2002). Jon Jorgenson, the regional biologist out of Canmore, praised the positive contributions that SACC has made towards wolf conservation but also feels

similarly to Ms. Bergman when he expresses his wish that the agency take a more active role:

> *It would be nice if the government could fund some of these kinds of wolf management projects. The only ability we have is to rely on these NGO organizations but they require funding also. Ultimately, the mandate to deal with these issues is ours. We can take advantage of the work they are doing and direct them into areas and issues we would like to get answers to and work with them as best we can and provide them with whatever resources we can so they can do what they need to do. But any work dealing with depredation issues has to be done hand-in-hand with the government. Otherwise it won't happen.*
>
> (Jorgenson 2002)

In order for the agency to have a greater role in wolf conservation two things should be in place: committed resources coming from agency leadership and staff who are infused with the impetus to tackle a tough issue. Securing government funds for wildlife programs can be difficult, especially given the propensity for government agencies in Alberta to be in a constant state or reorganization. Likewise, as discussed previously, wolves are not highly valued within the agency as a species in need of or worthy of special management programs. Simply stated, support from agency leadership is essential and, at the going rate, it does not seem likely that the sentiment towards wolves will dramatically change. Non-governmental organizations also experience limitations in what they are able to accomplish due to availability of resources but they draw from a more diverse funding base than government agencies. This could bode well for CRWP and SACC. There are many private foundations and other sources of potential funding plus an overall sense of greater creativity when exploring options for NGOs. Mr. Jorgenson's quote points towards the necessity of partnership in order for SACC to work toward their

goals and partnership building also opens up funding options with organizations that would not have been available in the past such as the Alberta Cattleman's Association and Husky Energy. Thus, the importance of private sector funding can't be overemphasized at this time.

Even though the statutory flexibility of wolf management in Alberta may appear to be a disadvantage to wolves, it also may provide some interesting opportunities. Carrie Bergman hints at this when discussing the future possibility of regional wolf management plans that are written and directed by local stakeholders in concert with the agency. A regional management plan, according to Ms. Bergman, could be tailored to local needs and involve key communities such as environmentalists, ranchers, hunters, and First Nations (Bergman personal communication 2002). Such a plan could better work with local conditions to create a management framework that is sensitive to both people and wildlife. One of SACC's ultimate goals is to contribute to the design and implementation of an adaptive management plan for wolves in southern Alberta.

Community involvement will remain one of the most essential management strategies and should continue to be a top concern for both the agency and CRWP. One agency strategy that has been effective for grizzly bear management is the Southwestern Alberta Grizzly Bear Strategy or SWAGS. Grizzly bears do receive some statutory protection and there is a "begrudging acceptance" of bears in southern Alberta according to Richard Quinlan, former wildlife biologist for southern Alberta (Quinlan personal communication 2002). The Southwestern Alberta Grizzly Bear Strategy involves communities in grizzly

bear management through giving them a sense of ownership in the welfare of resident bears. Also, SWAGS teaches landowners how to effectively curb problems with bears through cleaning up attractants and, when problems do arise, bears are much easier to find and capture than wolves. It was Mr. Quinlan's original intention to create some sort of program for wolves that mirrors SWAGS but there was a lack of commitment on the part of the agency and less societal acceptance of wolves (Quinlan personal communication 2002). Carolyn Callahan, however, does not feel as though this idea is completely moot. She envisions still trying to instill that sense of ownership into communities beyond what they are already doing through SACC. Through collaring and monitoring packs, management could be initiated on a very localized basis and could ultimately be overseen by a community working group (Callahan personal communication 2002b). However, as Ms. Callahan pointed out, the question Albertan's have to eventually answer is how much do they value wolves? Are they worth that level of effort? Clark et al. (2001) would agree that these are the basic questions that humans have to answer regarding all conservation problems. How to increase the "value" of wolves in southern Alberta is an important, yet elusive, question that needs to underlie all management strategies. Certainly, continuing to nurture and grow existing programs is essential, keeping in mind that generating this type of change is a slow process.

In addition to community based conservation work, careful attention should also be given to the possibility of amending regulations to benefit certain wolf populations. In the mid 1990s, Richard Quinlan wanted to amend hunting regulations in order to get a more precise handle on the population dynamics of area wolves. His original goal included

requiring a license to hunt wolves, setting a quota for southern Alberta, and a mandatory registration of all hunter-killed wolves south of the Bow Valley. As a regional wildlife biologist, Mr. Quinlan had a yearly opportunity to introduce amendments to regulations. First, the regional biologist must pass the amendments through the department supervisor. Then, the proposed change moves up through the bureaucracy and must be approved by a peer review committee and then, ultimately, to the headquarters in Edmonton where final decisions are made (Quinlan personal communication 2002). Year after year, Mr. Quinlan's proposed changes were rejected by a system that, at that time, supported the status quo. In order to successfully pass an amendment, one must prove that the change is biologically necessary; a challenging case to win for wolves. Finally, in 2000, part of Mr. Quinlan's original proposal passed and mandatory registration of all hunter-killed wolves south of the Bow Valley became official. To take the idea of amending harvest regulations a step further, an idea expressed to me by Carolyn Callahan of CRWP included the creation of buffer zones around protected areas as a way to provide additional protection for wolves. Buffer zones would acknowledge the fact that in southern Alberta wolves largely depend upon habitat outside of protected areas and a zone that prohibits or restricts hunting and trapping would give wolves a better chance to form stable pack structures.

Implementing wolf conservation strategies in an environment like southern Alberta is a daunting job with many inherent challenges. Liberal regulations, prejudice, varying degrees of tolerance, ineffective agency management, and a disproportionate dependence upon private land all merge to create a risky situation for wolves. As I interviewed

Charles Mamo of SACC last spring, I asked him about the status of five possible packs in southern Alberta and I was met with a grim response; Mr. Mamo felt as though only one of these packs was probably still functional (Mamo personal communication 2002). A Belly River rancher sums up the situation when he says, "I don't really think it would make any difference what anybody does around here as long as you got ranchers and cattle and calves, wolves are going to get shot and that's the bottom line" (anonymous personal communication 2002). To a certain extent, SACC realizes this may be true but they believe there are more options that what the old paradigm offers. In addition to further research and use of fladry, SACC could also look into other depredation prevention techniques such as remote or radio collar activated scare devices, guard dogs, and other aversive stimuli. Some of these techniques are currently being used in the U.S. so this may be an ideal opportunity for sharing expertise and resources between the countries. Although rancher response to SACC has been very positive, only three ranchers out of all those interviewed were vehemently opposed to wolves, some members of the livestock community are a bit frustrated with SACC's progress (Sargent personal communication 2002). To date, they have collared fewer wolves than expected and wolves keep on getting killed on a regular basis. This is also frustrating for SACC but there is also an understanding that to change an established paradigm is a long and slow process. SACC is committed to continuing the project "as long as we're being helpful to the situation, learning new things, applying new things, and working with the community. If they feel this is a useful thing then we will continue" (Callahan personal communication 2002a). According to the SACC Interim Report (2001), the project will be considered successful when "the majority of participating groups report a benefit and

when wolf populations are no longer subject to potentially unsustainable levels of human-caused mortality". Time will tell if these aspirations can turn into a reality for wolves in southern Alberta.

IX. Conclusion

The purpose of this project was to examine if people have advanced wolf conservation without the use of laws that legally protect wolves. At the outset of this study, options seemed to be limited given the liberal hunting regulations in Alberta. However, the lack of protection generated a very real impetus to work directly with people to come up with creative ideas to prevent conflict between wolves and livestock; ultimately increasing tolerance for wolves. The Canadian paradigm of wolf management is very different from the American system in this manner and I would not suggest erasing the protective laws for wolves as a way to further the use of the management strategies being used in southern Alberta. However, as wolves move toward de-listing in the U.S. and less physical protection, American managers can look at what is happening in southern Alberta as a reminder that giving top priority to the social dimension of wolf conservation is the key to long-term success.

Wolf conservation should engage a wide variety of management strategies but two basic elements need to first be established as a base:

1. Agency support
2. Community support

Figure 7, Bridging Agency and Community Support

From my research, I conclude that the provincial wildlife agency is, by and large, supportive of having wolves on the landscape and it is their legal mandate to oversee all management activities. However, as we've seen, wolf conservation won't advance through agency action alone. Many more active participants are needed if wolves are to have a chance at establishing viable populations in southern Alberta. Gaining community support is a much more broad-based concept that includes many different target groups such as environmentalists, ranchers, hunters, First Nations, the public, and academic researchers. The participation of all these groups is extremely important for long-term, successful wolf conservation; especially members of the livestock community who live and work in southern Alberta. Agency and community support are not mutually exclusive, however, and must operate interdependently. For this connection to be made, there must be a unifying force capable of generating support and active involvement. In southern Alberta, this force is the Southern Alberta Conservation Cooperative and the two key management strategies that they employ: building partnerships and effective community involvement (See Figure 7).

SACC provides a solid bridge between the agency and communities through facilitating partnerships revolving around wolf/livestock conflict prevention. The benefits of building partnerships are extensive and include the discovery of common ground between stakeholders with different perspectives; a diversification of resources and expertise; the dissemination of high quality information through reliable avenues; the opportunity for people to work together to solve each other's problems; and greater community involvement. Partnerships generate active participation to work towards a common goal and demonstrate support for the success of a target project. Of course, in southern Alberta, one of the most important benefits resulting from SACC's partnership with the livestock community will be an increase in tolerance for wolves.

Effective community interface and inclusion is a challenge, especially when faced with a complex issue like wolf conservation. Identifying their target audience and creating non-threatening methods of communication are two important components of SACC's outreach plan. Reaching out to the livestock community based on inclusion and not imposition was an intelligent way for SACC to invite ranchers to participate in their conflict prevention program. The Southern Alberta Conservation Cooperative approaches landowners as both an educator and a student, acknowledging the potential for both parties to benefit from one-on-one dialogue. Another positive facet of SACC's landowner outreach includes offering fladry as a depredation prevention tool at no cost to the rancher. This, I believe, demonstrates that they come prepared to work with ranchers and take affirmative steps toward solving problems.

With the exception of the Belly River Wolf Working Group, before SACC began their program, wolf conservation in southern Alberta was highly one-dimensional. Today, wolf management has greater depth, especially with the development of strategies that are not under the control of the agency such as community involvement, depredation prevention, monitoring, education, and partnership building. Their approach embodies the principles of adaptive management. Adaptive management acknowledges that research and management decisions must occur in concert in order to further the forward progress of their project. In the case of preventing livestock depredations, as new data is collected, SACC will amend their management prescriptions to reflect those changes.

The prominence of SACC in creating and implementing management strategies in southern Alberta demonstrates how an NGO is able to significantly advance wolf conservation. This illuminates one of the strengths of the system in southern Alberta, the ability for NGOs to play an extensive role in wolf management. NGOs like SACC have the capability to generate innovative ideas and, with agency consent, put them into action. In essence, SACC blends all eight management strategies to create a singular interdisciplinary strategy. Ultimately, this interdisciplinary effort slowly feeds into the promotion of greater tolerance for wolves. Despite the benefits that a strong statutory framework can provide for a wolf conservation program, long-term success still depends on the overall support of people. There is no perfect prescription in either the U.S. or Canada for guaranteed success but SACC realizes that the primary resource available to those working for wolf conservation is the people that co-exist with wolves. Although less predictable than a law or regulation, people and the choices they make are the root of

any successful conservation program. The Southern Alberta Conservation Cooperative recognizes the need to build partnerships and involve communities in meaningful ways and, although their efforts are still in an early stage, they will continue with the hope that they can create a wolf conservation model with far-reaching implications, even for countries with the luxury of laws like the Endangered Species Act.

Appendix A

Interview subjects

Rob Watt—Senior Park Warden, Waterton National Park

Richard Quinlan—Endangered Species Biologist, Alberta Sustainable Resource Development (ABSRD)

Kevin Van Tighem—Ecosystem Secretary, Jasper National Park

Carrie Bergman—regional biologist in southern Alberta for ABSRD

John Jorgenson—regional biologist in Canmore for ABSRD

Stan Hawes—conservation officer for south central Alberta

Elliot Fox—biologist for Blood Tribe

Carolyn Callahan—Central Rockies Wolf Project

Charles Mamo—Southern Alberta Conservation Coop.

Rick West—Waterton Biosphere Association and southern Alberta rancher

Larry Frith—Waterton Biosphere Association and southern Alberta rancher

Mac Main—southern Alberta rancher

Gary Sargent—Alberta Cattleman's Association

Doug Skinner—Alberta Conservation Association

Minette Johnson—Defenders of Wildlife

David Gaillard—Predator Conservation Alliance

Interview questions

Questions, non-NGO

- Please describe your experience with wolves or your area of expertise.
- What role does your organization/agency play in wolf conservation/management?
- What do you feel are the benefits of provincial management?
- What do you think are the deficiencies of provincial management?
- What factors do you think lead to the deficiencies in provincial management?
- What important roles in wolf conservation are consequently not being filled (adequately) as a result of provincial deficiencies?

- Do you feel that NGO's are able to fill a needed niche in: education, research, monitoring, livestock depredation prevention, other conservation needs?
- What NGO's do you feel play an important role in wolf conservation in southern Alberta?
- What are the limitations of NGO involvement?
- How do you or your organization/agency view the role of NGO's in wolf conservation?
    - Positive, negative, neutral
- Do you feel more comfortable working with an NGO or agency official regarding wolf issues?
- Do you think that the agency or an NGO has greater credibility?
- What future roles do you think NGO's may play in wolf conservation?
- Which of the following factors do you feel could/do contribute to a more stable wolf population in southern Alberta?
    - Possible factors may include: increased education, regulated hunting, trapping and depredation take, depredation prevention techniques, increasing local tolerance.
    - Are there additional factors not mentioned that could/do contribute to a more stable wolf population?
- What do you feel is the best strategy for increasing local tolerance/acceptance for wolves?
- Do you think your organization/agency helps increase local tolerance/acceptance of wolves? If so, how?
- What do you think is the most effective way to conduct wolf education/awareness?
- Do you feel that the Alberta livestock compensation fund is effective? What do you think are the pros and cons?
- What do you think are the greatest challenges facing long-term wolf conservation in southern Alberta?

Questions, NGO

- What triggered your organization to become involved in wolf conservation?
- What role does your organization play in wolf conservation?
- What do you feel are the benefits of provincial management?
- What do you think are the deficiencies of provincial management?
- What factors do you think lead to the deficiencies in provincial management?
- What important roles in wolf conservation are consequently not being filled (adequately) as a result of provincial deficiencies?
- Do you feel that NGO's are able to fill a needed niche in: education, research, monitoring, livestock depredation prevention, other conservation needs?
- What specific roles does your NGO fill?
- What are the limitations of NGO involvement and of your organization in particular?
- Describe your relationship to the province and other stakeholders.
- How do you think your organization is viewed by agencies and other stakeholders involved in wolf conservation? Positive, negative, neutral
    - Stakeholders include: agency officials, ranchers, First Nations, hunters/trappers.
- What future roles do you think NGO's may play in wolf conservation and what future role would you like to see your organization play?
- *The following question pertains to any NGO that has been or is involved in any sort of working group or collaborative effort that has not yet been discussed,* Describe the collaborative effort you are currently involved with? Do you feel that this effort is positively contributing towards wolf conservation?
- Which of the following factors do you feel could/do contribute to a more stable wolf population in southern Alberta?
    - Possible factors may include: increased education, regulated hunting, trapping and depredation take, depredation prevention techniques.
    - Are there additional factors not mentioned that could/do contribute to a more stable wolf population?

- Do you think your organization helps increase local tolerance/acceptance of wolves? If so, how?
- What do you feel is the best strategy for increasing local tolerance/acceptance for wolves?
- What do you think is the most effective way to conduct wolf education?
- Do you feel that the Alberta livestock compensation fund is effective? What do you think are the pros and cons?
- What do you think are the greatest challenges facing long-term wolf conservation in southern Alberta?

The use of the word 'benefits' in the question lists always refers to the benefit to wolf populations in southern Alberta.

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Interviews 2002

Rob Watt—Senior Park Warden, Waterton National Park

Richard Quinlan—Endangered Species Biologist, AB Sustainable Resource Development

Kevin Van Tighem—Ecosystem Secretary, Jasper National Park

Carrie Bergman—regional biologist for ABSRD

John Jorgenson—regional biologist in Canmore

Stan Hawes—conservation officer

Elliot Fox—biologist for Blood tribe

Carolyn Callahan—Central Rockies Wolf Project

Charles Mamo—Southern Alberta Conservation Coop.

Rick West—Waterton Biosphere Association and southern Alberta rancher

Larry Frith—Waterton Biosphere Association and southern Alberta rancher

Mac Main—southern Alberta rancher

Gary Sargent—Alberta Cattleman's Association

Doug Skinner—Alberta Conservation Association

Minette Johnson—Defenders of Wildlife

David Gaillard—Predator Conservation Alliance