

A quantitative content analysis of attitude expressions toward wolves in the United States  
and Canadian print news media, 1999-2008

Thesis

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By

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## ABSTRACT

Several trends suggest public attitudes toward wildlife—especially charismatic species such as wolves—changed during the latter half of the 20th century. Increases in wildlife ballot initiatives, declining participation in hunting and changes in the way predators are portrayed in the media suggest a fundamental change in the way US residents feel about wildlife. Identifying how attitudes toward wildlife have changed over time is difficult given that attitudinal studies tend to be cross-sectional and focused on relatively small geopolitical units. The current body of literature on attitudes toward wolves is inconclusive; some researchers suggest attitudes towards wolves have become more positive due to increased knowledge of wolves' role in ecosystems, while existing empirical research indicates attitudes toward wolves are generally stable. Quantitative content analysis of news media has emerged as an alternative method for measuring public attitudes and values and assessing attitude change. In this study, expressions of attitudes regarding wolves in US and Canadian print news media were analyzed over a 10-year time period. I used the LexisNexis Academic news database to identify stories written about wolves from 1999-2008. I limited my search to include only publications that were continuously available throughout this time period. I then developed a system of rules for classifying relevant paragraphs into positive-negative attitudinal expressions. My search identified 7,437 stories about wolves which were analyzed using the InfoTrend®, Inc. content analysis software. Results provided insights as to how attitudes

toward wolves change over time. Specifically I found that attitude expressions have become significantly more negative over the ten-year time period and that there are regional differences in the attitude expression trends.

## DEDICATION

This thesis is dedicated to my brother, Caleb Tanner Clark, an artist, drummer, athlete, nature lover, and friend to many

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### Field of Study

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## CHAPTER 1

### INTRODUCTION

Even early conservationists, such as Theodore Roosevelt, described the wolf (*Canis lupus*) as a “beast of waste and desolation.” Fear and negative perceptions of wolves were often rooted in fairy tales and religious beliefs that European colonists brought with them to the New World (Lopez, 1978). Public attitudes toward wolves and other large carnivores seemingly changed greatly during the course of the 20<sup>th</sup> century, yet anti-wolf sentiments still remain, especially for groups of people who are directly affected by these carnivores.

#### **Purpose of research**

Measuring attitudes toward wolves is important for a number of reasons. First, at the most basic level, individual attitudes affect behavior and behavioral intention (Eagly & Chaiken, 1993). Research indicates a strong connection between attitudes toward wolves and wolf restoration and an individual’s willingness to pay and vote for wolf restoration (Wilson & Bruskotter, 2009). In addition, attitudes have a strong influence on the formation of predator management policies and programs (Bright & Manfredi, 1996; Butler, Shanahan, & Decker, 2003). The influence of public attitudes was highly evident in the efforts to reintroduce wolves into the Yellowstone National Park in 1995, in which the debate became so acrimonious that the issue had to be battled out both in the courtroom and through legislation. The success of wolf populations in the U.S. depends

not only on biological conditions but also on public attitudes and perceptions of the species. As wolf populations in the United States rebound through legal protections and human recovery efforts, local resistance is likely to increase (Kellert, 1985; Ericsson & Heberlein, 2003). Being prepared for this opposition will assist wildlife management agencies in their work. Understanding which social groups support wolf reintroduction and where reintroductions are supported will also provide agencies with allies in developing effective wolf conservation and recovery programs (Williams, Ericsson & Heberlein, 2002).

### **Historical context of wolf management in North America**

Historically gray wolves were distributed throughout the Northern Hemisphere anywhere that wild ungulates could be found (Mech, 1995). The species saturated most of the region between 20 degrees N Latitude and the North Pole and in temperature regions between -40 degrees and 40 degrees Celsius in areas as diverse as Israel and Greenland (Mech, 1995). Before Lewis and Clark, estimates suggest there were over 35,000 wolves in the lower 48 states of the US (Morell, 2008) ranging from the west coast to the east coast. The southeast corner of the US, although not indicated in Figure 1 below, was historically inhabited by red wolves.



myth (Lopez, 1978; Browne-Nunez, 2002). Methods for killing wolves included the use of firearms, poisoning, and trapping. Wolf removal was so commonplace and generally accepted throughout American society at the time that many states implemented bounty programs in which a hunter or stockman would receive a financial reward for the head or body of a wolf (Messmer et al., 2001). Even the federal government adopted “predator control,” the lethal removal of wolves and coyotes, as one of their earliest forms of wildlife management (Di Silvestro, 1985).

By the 1930s, wolves were extirpated from more than 95 percent of their historical range in the U.S. (Morell, 2008). The North American populations of wolves survived mainly in Canada and Alaska where the populations of humans were not large enough to successfully eradicate the species. By the 1970s, in the 48 contiguous states of the U.S., only the remote wilderness areas of northern Minnesota and the Isle Royale National Park in Michigan continued to support wolves (Mech, 1995).

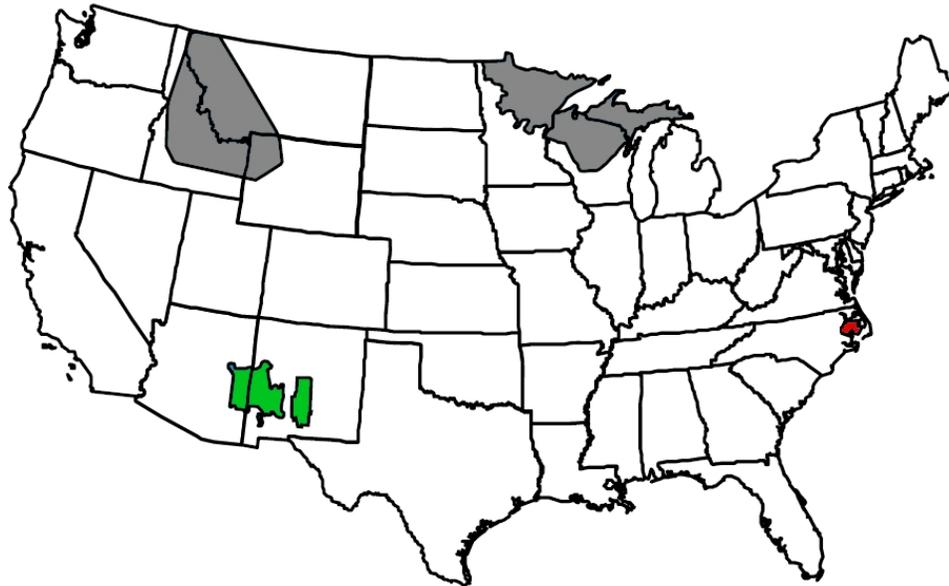


**Figure 2. Gray wolf range at the time of the ESA listing (1974) in the lower 48 states**

In 1933, Aldo Leopold challenged wildlife managers to think carefully about predator control in his book *Game Management*. Later, he directly challenged wolf eradication in his essay *Thinking Like a Mountain*, which was published posthumously in 1949 in Leopold's *A Sand County Almanac*. Some believe that these texts helped prompt a shift in predator management within the U.S. federal government (see Messmer et al., 2001). In the 1940s researchers began conducting scientific studies on wolves and by the 1950s, there had accumulated a considerable amount of scientific evidence to challenge the practice and science of predator control (Messmer et al., 2001). The environmental movement of the 1970s also spurred an increase in scientific research, public awareness, and favorable media coverage of wolves (Messmer et al., Kellert, Black, Rush, & Bath, 1996; Mech, 1995). Additionally, the environmental movement laid the groundwork for the passage of a number of environmental laws including the Endangered Species Act. The Red Wolf was the first to be listed, in 1967, under the Endangered Species Preservation Act of 1966 and the gray wolf was listed in 1974 under the Endangered Species Act (ESA) of 1973 (Browne-Nunez & Taylor, 2002). Mexican wolves were also listed as endangered in 1976.

Reintroduction efforts took place during the late 1980s and throughout the 1990s in three distinct recovery zones—the Red Wolf recovery zone, the Northern Rocky Mountains recovery zone, and the Mexican Wolf recovery zone. The first reintroduction effort occurred in 1987 with the release of four pairs of red wolves into Alligator River National Wildlife Refuge (ARNWR) in Eastern North Carolina. The second recovery effort began in 1995 when the US Fish and Wildlife Service reintroduced the North American Gray Wolf into the Yellowstone National Park (YNP) in Wyoming, Montana

and central Idaho. Finally, in 1998, the Fish and Wildlife Service released 13 captive-reared Mexican wolves in eastern Arizona. Mexican wolves currently populate parts of Arizona and New Mexico. As a result of reintroduction efforts and natural recolonization, wolves are making a strong recovery in the United States.



**Figure 3. Current range of wolves in the lower 48 states of the U.S. (including gray wolf, Mexican gray wolf, and red wolf)**

Although the growth and stability of wolf populations in the US is a great advancement from the near extinction of the 1920s, wolves are still vulnerable to human threats when federal protections are lifted. In 1978, Minnesota wolves were “downlisted” by the USFWS from endangered to threatened, which allowed depredating wolves, or wolves which prey on livestock, to be killed by authorities (Musiani & Paquet, 2004). In 2003, wolves in all areas of the United States, except the YNP areas, central Idaho, Arizona, and New Mexico, were “downlisted” from endangered species to threatened species status (Musiani & Paquet, 2004). However, wolves were re-listed following a

series of losses for the Department of Interior in the federal courts. Most recently, in April 2009, the US Fish and Wildlife Service removed the Northern Rocky Mountain population of gray wolves from all protections under the Endangered Species Act (74 Federal Register 15,123 ). With removal of the Northern Rocky Mountain gray wolf from the endangered species list, wolf management will fall under state government control in Idaho, Montana and Wyoming. Since some state management plans call for significant reduction in wolf populations, environmental groups fear that wolves could be driven back into extinction in the Northern Rockies (Defenders of Wildlife, 2009). The status of wolves in the Northern Rockies is currently being litigated in the federal courts.

Wolves continue to be killed for recreational (i.e. hunting and trapping) and commercial purposes in Alaska and in most Canadian provinces and territories. The government regulates wolf hunting and trapping by specifying the number of wolves to be killed, the length of the season, and the hunting and trapping techniques used (Musiani & Paquet, 2004). In some US states, however, private landowners are authorized to kill wolves in cases of demonstrable threats to humans and human property, including predation of livestock (Musiani & Paquet, 2004). In Canada, where the species numbers over 50,000, wolves are heavily hunted and trapped wherever they stray from the protection of national and provincial parks (Defenders of Wildlife, 2009). As social carnivores, wolves often require larger territories than solitary species of similar size (Carroll, Phillips, Schumaker, Smith, 2003). As a result, wolves also face the continuing threat of habitat loss as a result of human development.

## **Plan for Thesis**

This paper will follow the traditional long thesis format including five chapters: an introduction, literature review, methodology, results, and discussion. The introduction provided the purpose of the research study, an historical account of wolves in North America, and the overarching questions guiding this research study. The literature review provides an overview of literature examining individual's attitudes toward wolves, studies on societal level trends in attitudes toward wildlife and wolves, a theoretical basis for attitudinal change, and the research hypotheses. The methods chapter provides a justification for the methodology, defines the social constructs used in the study, and describes the process of the content analysis and the validity check. In the results section, a summary of the descriptive data are presented, along with overall trends in attitude expressions over time, regional differences in attitude expressions, and regional trends. Finally, the discussion reports and describes the most important aspects of the research findings and relates them back to the relevant literature.

The two primary research objectives for this study were to determine if public attitudes toward wolves, as measured by news media coverage, have changed over the past decade and to determine whether exposure to wolves, as measured by region of the news publication, has an affect on attitude expressions about wolves.

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## CHAPTER 2

### LITERATURE REVIEW

Understanding trends in society's attitudes toward wolves (*Canis lupus*) over time can provide insight to wildlife officials, policy-makers, and scientists who seek to continue to recover and manage wolf populations throughout the United States. As Butler, Shanahan & Decker (2003) noted, "wildlife management policies are to varying degrees, founded on the public's attitudes about wildlife" (Butler et al., 2003). Indeed, research indicates there is a strong association between attitudes toward wolves and support for wolf management policies such as reintroduction (Bright & Manfredi, 1996; Wilson & Bruskotter, 2009). Moreover, given the historical antipathy toward and controversial nature of wolf reintroduction, the biological recovery of wolves is not likely to be successful without public support and acceptance. For this reason, human dimensions research is fundamental to the successful recovery and management of wolves. This chapter provides an overview of the relevant empirical research on attitudes toward wolves, as well as theoretical bases for attitudinal change. It will also include the research hypotheses and justification of hypotheses put forth for this study.

#### **Cross-sectional studies of attitudes toward wolves**

The first published survey assessing attitudes toward wolves was conducted at the Minnesota State Fair in 1972 (Johnson, 1974). Since that time a number of studies have analyzed public attitudes toward wolves and the reintroduction and management of the

species (see Brown-Nunez & Taylor, 2002 for an Annotated Bibliography). In general, these studies have made progress in identifying certain demographic variables and social groups that relate to favorable and unfavorable attitudes toward wolves. Generally speaking, individuals' with more favorable attitudes toward wolves tend to be younger, live in urban areas, and have higher levels of education and income (Williams et al., 2002). Some studies have also found that women tend to have more positive attitudes than men (Williams et al., 2002). Members of wildlife and conservation organizations generally hold more positive attitudes toward wolves while individuals with farming and ranching occupations tend to hold more negative attitudes toward wolves (Bath & Buchanan, 1989; Williams et al., 2002; Bruskotter, Vaske, & Schmidt, 2009).

Experience with wolves and proximity to wolf territories also correlate negatively with attitudes toward the predator (Ericsson & Heberlein, 2003; Karlsson & Sjostrom, 2007). Historically, people with the most positive attitudes toward wolves have been those with the least experience (Williams et al., 2002). Finally, while a number of studies have found that hunters have more positive attitudes toward wolves than non-hunters, some also have found the opposite (Williams et al., 2002; Bruskotter, Schmidt, & Teel, 2007).

### **Trends in attitudes toward wolves**

While there have been numerous cross-sectional studies on individual level attitudes toward wolves, the literature on societal level attitudes toward wolves and trends in public attitudes toward wolves over time is sparse. Identifying trends in attitudes over time is much more difficult given the lack of survey data prior to 1972 and the paucity of longitudinal studies on attitudes toward wolves. Researchers have sought creative ways

around this problem by conducting meta-analyses (Williams et al., 2002) and comparing their results with similar surveys from the past (Ericsson & Heberlein, 2003; Duda et al., 1998). Yet, the conclusions that can be drawn from such studies are limited because of methodological differences (e.g. instrumentation, sampling design). Despite these limitations, results from these studies provide needed insights into if and how attitudes toward wolves could be changing. Unfortunately, no consistent pattern of change has emerged. Some researchers suggest that public attitudes toward wolves have continued to shift since the 1970s (e.g. Kellert et al., 1996; Musiani & Paquet, 2004). However, the empirical research literature is divided; some researchers have found evidence suggesting an attitudinal change in a positive direction (Ericsson & Heberlein, 2003; Kellert 1999), others have found evidence for change in a negative direction (Enck & Brown, 2002; Duda et al., 1998), while still others have found no change at all (Williams et al., 2002; Bruskotter et al., 2007).

Kellert and Westervelt (1982) studied the extent of change in American animal perceptions during the 20<sup>th</sup> century by conducting a content analysis of animal-related newspaper articles over a 77 year time period from 1900 to 1976. They selected newspapers that were in continuous publication through the century and which would reflect urban, rural and regional differences. The authors used a typology of ten “attitudes” including aesthetical, dominionistic, ecogistic, humanistic, moralistic, naturalistic, negativistic, neutralistic, scientific, and utilitarian. They found a decline in utilitarian attitudes (52% to 39%), a decline in negativistic attitudes (11% to 6%), and an increase in neutralistic attitudes (8% to 28%) from 1900 to the mid 1970s (Kellert & Westervelt, 1982). Although not specific to wolves, this study provides some limited

empirical support for a decline in negative attitudes toward animals and large carnivores which many researchers assume took place during this time period (e.g. Kellert et al., 1996; Musiani & Paquet, 2004; Messmer, Reiter, & West, 2001).

Ericsson and Heberlein (2003) found results similar to those of Kellert and Westervelt (1982) in their 2001 study of Swedes' attitudes toward and knowledge of wolves. In comparing their results to a similar survey by Andersson, Bjarvall, & Blomberg in 1977, they found that attitudes towards wolves among the public had become more positive during the last twenty-five years. However, they also found that hunters' attitudes toward wolves had become more negative during the last twenty-five years and that Swedes who live in areas where wolves had been restored have more negative attitudes than the general public.

Other information supports the hypothesis that public attitudes toward wildlife are continuing to become more positive. In the time period from 1990 to 1996, voters sponsored and passed 10 out of 13 statewide ballot initiatives prohibiting the trapping, baiting, or hunting of wildlife, suggesting underlying positive attitudes and protection-oriented values toward wildlife (Pacelle, 1998). In addition, participation in consumptive forms of wildlife recreation, such as hunting and fishing, has decreased in recent decades while non-consumption recreation such as bird-watching or wildlife viewing is on the rise (Adams, Leifester, & Herron, 1997; USFWS, 2007).

Contrary to these findings, a number of researchers suggest a need to re-evaluate the hypothesis that wildlife attitudes are evolving toward more of a protectionist orientation. Butler et al. (2003) conducted a multivariate trend analysis of attitudes toward wildlife, using archived surveys containing a standard scale to measure wildlife

attitudes and values, and found that problem tolerance of wildlife declined for New York residents over a twelve-year time period (1984-1996). In addition, Duda et al. (1998), although their study was limited by a small sample size, found that support for a proposed wolf restoration in the Adirondack Mountains in the state of New York dropped from 76 percent to 46 percent in a one year's time following a proposal to reintroduce wolves. Subsequent research found that support for wolf restoration remained low two years after the initial drop (Enck & Brown, 2002).

There are also studies which have found evidence that the public's attitudes toward wolves have not changed in any significant manner in recent decades (Williams et al., 2002, Bruskotter et al., 2007). Williams et al. (2002) conducted a meta-analysis of thirty-seven studies analyzing public attitudes toward wolves and the reintroduction of wolves. The authors reported that attitudes—aggregated across studies—have remained stable among the public over the last thirty years and suggested that the public's change in attitudes toward wolves occurred largely between the 1930s and the 1970s. Bruskotter et al.'s (2007) research findings were consistent with those of Williams et al. (2002); they replicated a survey of Utah residents' attitudes toward wolves conducted by LaVine in 1994. The authors found that Utah residents' attitudes toward wolves did not change significantly between 1994 and 2003. There are, however, limitations in both of studies. Meta-analyses, such as Williams et al.'s, seek to condense and compare the results of research with differing designs and survey instruments. Bruskotter et al. (2007) also focused on attitudinal change within a state with no viable wolf population. Nonetheless, the evidence provided from these two studies suggests general stability in public attitudes toward wolves, in the United States, over the last three decades.

While there is a recent perception among wildlife managers that attitudes toward wolves have improved in recent decades (see, for example: 74 Federal Register 15,123), the empirical literature does not support this claim. While most social scientists studying this area believe that attitudes toward wolves changed significantly between the 1920s and the 1970s, as evidenced by citizen support for legislated protection of wolves, increasing research and education on wolves, and more favorable depictions of wolves in the media (Messmer et al., 2001), the body of research about the trend in public attitudes toward wolves from the 1970s to the present is largely inconclusive. Thus, further research is needed to determine (a) if/when attitudes toward wolves shifted in the past, (b) if they are currently changing, and most importantly (c) to determine what factors are related with attitude change.

### **Theoretical bases for attitudinal change**

There are a number of theories to explain why attitudes toward wolves might be changing over time. These theories include: (a) media influence including increasing environmental education (e.g. Musiani & Paquet, 2004; Messmer et al., 2001; Kellert et al., 1996), (b) shifts in how wildlife are valued across generations (e.g. Manfredo, Teel, & Bright, 2003), and (c) increasing experience with wolves among the public (e.g. Ericsson & Heberlein, 2003).

#### *External Influence of the Media*

Musiani & Paquet (2004) suggested that attitudes toward wolves began to change in the 1970s with an increase in environmental awareness. Environmental catastrophes such as the burning of the Cuyahoga River and the detrimental effects of DDT were coming to the forefront of public's attention. Messmer et al. (2001) suggested that major

swings in public opinion occurred in response to these perceived ecological catastrophes, which were popularized by the media. An entire series of environmental laws including the Endangered Species Act (ESA) and the National Environmental Policy Act (NEPA) were also passed during this time period, suggesting broad public support for environmental conservation. Indeed, some sociologists have claimed that a new “environmental paradigm” centered on concern for the environment emerged during this time (Van Liere & Dunlap, 1980; Dunlap & Van Liere, 1978).

Messmer et al. (2001) asserted, in agreement with Wagner, “that knowledge generated through science and popularized in contemporary media can create a forum where new ideas and the scientific data to support them can be discussed, digested, interpreted, and reconciled with individuals’ value systems” (p. 1257) In addition, there is a significant amount of research in communications that points to the role of the media in mobilizing public concern and problem awareness for environmental issues (Ader, 1995; Brosius & Kepplinger, 1990; Kepplinger & Roth; 1979; Parlour & Schatzow, 1978). The notion that the media can influence the importance, or salience, of issues among the public has been referred to as the “agenda-setting” hypothesis (McCombs & Shaw, 1972). Ader (1995) found support for the agenda-setting hypothesis for the issue of environmental pollution from 1970 to 1990. Her findings suggest that the amount of media attention devoted to pollution influenced the degree of public salience for the issue. Ader (1995) also found that the effect of the media on issue salience for the public is greater for issues with which the public has less direct or indirect experience, such as environmental pollution. Therefore, it is understandable that researchers and wildlife

managers would expect the public to be influenced by media coverage regarding wolves given that most members of the public have very little experience with wolves.

Conversely, the agenda-setting and issue salience theories also give credence to the notion that negative media coverage of wolves could lead to increased unfavorable attitudes toward wolves among the public. For example, Enck & Brown (2002) hypothesized that the dramatic decline in support for the reintroduction of wolves into the Adirondack Park (AP) resulted from the largely negative media coverage that occurred in the AP about the issue in 1998 and 1999. Therefore, one might expect that media coverage of wolves and wolf reintroduction—depending on the pre-existing experiences and attitudes of the public—could lead to changing attitudes among the public in either direction.

While the media may have an impact on what issues the public perceives to be important, research suggests that information alone is not very effective at changing attitudes at an individual level (Meadow et al., 2005). Although a number of researchers suggest increased education as a force that is working to improve the public's attitudes toward wolves, few studies have demonstrated a correlation between knowledge of and attitudes toward wolves (Bath & Buchanan, 1987; Ericsson & Heberlein, 2003; Kellert, 1985). Instead, most evidence shows that increased information about wolves is unrelated or only weakly related to attitudes toward wolves (Black & Rutberg, 2007; Bright & Manfredo, 1996; Enck & Brown, 2002; Heberlein & Ericsson, 2008; Kellert et al., 1996; LaVine, 1995; Meadow, Reading, Phillips, Mehringer, & Miller, 2005; Wilson & Bruskotter, 2009). In one particular study, Meadow et al. (2005) found that persuasive arguments have little impact on respondents' attitudes toward wolves and their proposed

restoration. Rather most study participants who changed their opinion actually increased the extremity of their responses. This finding is supported by a significant body of research in psychology which suggests that people who hold strong attitudes are likely to bias information processing in a way which reinforces their pre-existing attitude (Petty & Krosnick, 1995; Teel, Bright, Manfred, & Brooks, 2006). These findings provide little support for the notion that attitudes toward wolves are becoming more positive due to increased education and information about wolves.

#### *Shift in wildlife value orientations*

Conversely, other researchers have provided theory and evidence for shifting values toward wildlife. Values refer to “fundamental, enduring beliefs or mental constructs that are used to evaluate the desirability of specific modes of conduct or the ends achieved through such conduct” (Fulton et al., 1996). In the cognitive hierarchy structure, values serve as a relatively stable foundation for attitudes and beliefs (Fulton et al., 1996). Given that values serve as a basis for higher-order attitudes, one might logically predict that changing values toward wildlife would have an affect on attitudes toward wolves.

Many researchers and wildlife professionals believe that there has been a gradual shift away from traditional wildlife values that emphasize the use and management of wildlife resources for human benefit toward protection-oriented wildlife values which emphasize wildlife education, wildlife-related recreation and wildlife protection for future generations (Manfred et al, 2003; Teel, Dayer, Manfred, & Bright, 2005). Declining levels of hunting participation, increasing rates of non-resource consumptive recreation, as well as increased interest and membership in environmental non-

governmental organizations (Manfredo et al., 2003 & Mankin, Warner & Anderson, 1999) support the notion that values toward wildlife are becoming more protection-oriented. Moreover, evidence from highly developed and urbanized societies suggests that modernization may be linked to this broad-based societal shift away from thinking about wildlife as a resource (Inglehart & Baker, 2000; Manfredo et al., 2003; Teel et al., 2005).

Manfredo et al. (2003) tested whether or not cultural conditions within a state influence the composition of *Wildlife Value Orientations (WVOs)* held by people within such states. Value orientations are an “expression of basic values,” which are “revealed through the pattern and direction of basic beliefs held by an individual” (Manfredo et al., 2003). More specifically, WVOs have been defined as an expression of both values and basic beliefs about wildlife held by an individual (Teel et al. 2005). Value orientations—in general—are important in that they help to guide an individual’s behavior. For example, research has shown that the protection-use orientation is strongly associated with attitudes and intentions toward wildlife management proposals (Bright, Manfredo & Fulton, 2000).

Manfredo et al. (2003) surveyed residents of six western states and found that the proportion of residents with use-oriented wildlife values within each state was strongly and inversely related to level of income, urbanization and education and positively related to residential stability. That is, people who believed that wildlife should be used for human benefit tended to have lower income and less education, live in rural areas and relocate less often. Manfredo et al. (2003) further theorized that if current social and economic trends (i.e. increasing education, wealth and urbanization and decreasing

residential stability) continue in the United States, it is likely that there will be a sustained erosion of use-oriented values toward wildlife. Using Manfredo et al.'s (2003) framework, one might predict that if there were increasing levels of income, education, and urbanization and decreasing residential stability during the period of 1999 to 2008, there would be less utilitarian oriented values leading, in turn, to more positive attitudes toward wolves.

#### *Direct experience with wolves*

Although shifts in wildlife value orientations and some favorable media exposure of wolves suggest that the public's attitudes may be continuing to move in a positive direction, there is an alternative argument to suggest that the public's attitudes toward wolves could be becoming more negative as wolves become re-established in the United States. Ericsson & Heberlein (2003) found, in general, that Swedes who live in areas where wolves have been restored have more negative attitudes than the general public. Enck & Brown (2000) found that a higher proportion of the statewide population (60%) that they sampled was in favor of reintroducing wolves into Adirondack Park than the Adirondack residents (42%) who would be living in much closer distance to wolves were the proposal enacted. Similarly, Karlsson & Sjoström (2007) found that favorable attitudes toward wolf conservation were positively associated with distance to the nearest wolf territory. Moreover, the variable of distance to the nearest wolf territory affected attitudes as much as the variables of membership to a nature conservation organization, identification as a hunter, and owning livestock or owning a hunting dog. However, whether a respondent had ever seen a wolf did not affect attitudes (whereas hunting or owning a dog or livestock did correlate with the attitude score). This suggests that

attitudes toward wolves are more likely a result of indirect experience with wolves, such as personal contacts with other people who have had experiences with wolves or through the local media coverage, than direct experiences, which are uncommon.

In addition, individuals who live in proximity to wolves are more likely to have their attitudes toward wolves activated or “triggered” by hearing about them through the local news and political debates, through stories of neighbors or friends, or through personal interactions with wolves (viewing, hearing, livestock depredation). Heberlein and Ericsson (2008) suggested that an initial lack of experience with wolves may be more important for changing attitudes than experience itself. These authors found in their meta-analysis of 38 attitude stories from around the world, that greater than 30 percent of respondents reported no strong attitudes toward wolves (Williams et al., 2002). They suggest that one negative event (whether direct or indirect) could make this segment of the public change from neutral to negative attitudes. Particularly for individuals who live in states with new or recovering wolf populations, this direct or indirect experience with wolves could change their attitudes significantly (Heberlein & Ericsson, 2008).

There appears to be a difference in the public’s attitudes toward wolves in regions with long-standing populations of wolves and regions with newer populations of wolves. In contrast to the Swedish studies, Glickman and Bath (2009) found largely positive attitudes toward wolves in Italy, a country where wolves have lived very close to humans for centuries (McNamee, 1997). Additionally, Kellert (1985) found that, out of all regions of the country, Alaskans actually held the most favorable attitudes toward wolves. Wolves have also existed continuously in Alaska, despite extirpation in all of the lower

48 states (except Minnesota), and currently number around 50,000 (Defenders of Wildlife, 2009).

There are a number of possibilities for this discrepancy in public attitudes in regions with new(er) and long-standing populations of wolves. One potential explanation is the habituation hypothesis, which says that humans, with repeated exposure, can become desensitized to wildlife much in the same way that wildlife become desensitized to humans. “Habituation is defined by both ethnologists and psychologists as a diminishing response over time to a repeated neutral or un-reinforced stimulus” (Zinn, Manfredo, & Decker, 2008). There are also a few studies which suggest that enactive learning experiences with wildlife may sometimes lead to positive conditioning and a positive response to the animal. For example, Manfredo, Zinn, & Sikorowski (1998) found that Colorado residents who had experienced first-hand interactions with mountain lions tended to express less fear of mountain lions than residents who had no first-hand experience with them.

For the purposes of this study, the terms “experience” and “exposure” will be used synonymously to refer to the experiences of people who live in areas affected by wolves or areas which have a higher probability of being exposed to wolves. Experience and/or exposure may include people’s direct experiences with wolves (seeing or hearing wolves) or people’s indirect experiences with wolves (hearing stories about wolves from neighbors or friends or being exposed to local media coverage regarding wolves).

### **Research questions and hypotheses**

Based upon this research, I formulated the following research questions with corresponding hypotheses and rationale:

**Research Question 1: Are attitudes toward wolves changing over time?**

*Hyp 1: There will be no significant change in the percentage of paragraphs that have positive and negative attitude expressions toward wolves over the ten-year time period (1999 and 2008)*

Rationale: The most recent empirical research suggests that attitudes toward wolves have remained stable over the last three decades (Bruskotter et al., 2007; Williams et al., 2002).

**Research question 2: How does experience with wolves impact attitudes toward wolves?**

*Hyp 2a: Stories originating in states in recovery zones will contain a greater number of negative attitude expressions than stories originating in states with no wolf populations*

Rationale: Recovery zones, in this study, included states which do not have new populations of wolves, but which are adjacent to those states with new wolf populations and are located within an area of potential recovery for wolves. These included North Dakota, Illinois, Indiana, Ohio, Iowa, Utah, Washington, Oregon, and Texas (see Appendix A). Members of the public who live in these zones will have more exposure to wolves than members of the public who live in states with no wolf populations. This exposure will lead to more negative attitudes toward wolves (Ericsson & Heberlein, 2003).

*Hyp 2b: Stories originating in states with new wolf populations will contain a greater number of negative attitude expressions than stories originating in states with no wolf populations*

Rationale: States with new wolf populations are states that are located within the Fish and Wildlife Service's designated recovery zone areas and which have actual viable populations of wolves within the state. These included Montana, Idaho, Wyoming, New Mexico, Arizona, and North Carolina (see Appendix A). Members of the public who live in states with new wolf populations will have more experience with wolves than members of the public who live in states with no wolf populations. These experiences will lead to more negative attitudes toward wolves (Ericsson & Heberlein, 2003).

*Hyp 3a: Stories originating in states without wolves will contain a greater number of positive attitude expressions than stories originating in states with new wolf populations*

Rationale: Members of the public who live in states without wolves will have less direct and indirect experiences with wolves which will result in less negative attitudes toward wolves than among members of the public who live in states with new wolf populations.

*Hyp 3b: Stories originating in states without wolves will contain a greater number of positive attitude expressions than stories originating in states in recovery zones*

Rationale: Members of the public who live in states without wolves will have less direct and indirect experiences with wolves which will result in less negative attitudes toward wolves than among members of the public who live in states in recovery zones.

*Hyp 4a: Stories originating in states with new wolf populations will have a significant increase in the percentage of paragraphs with negative attitude expressions over the ten year time period (1999-2008)*

Rationale: An increasing number of people in states with new wolf populations will be affected by wolves either through hearing stories about neighbors' and friends'

experiences with wolves or by being exposed to negative local media coverage of wolves, such as human-wolf conflict. These experiences will lead to more negative attitudes toward wolves (Ericsson & Heberlein, 2003).

*Hyp 4b: Stories originating in states/provinces with permanent wolf populations will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period (1999 and 2008)*

Rationale: States/provinces with permanent wolf populations were operationalized as states/provinces that have had wolves continuously over time and which did not experience a total extirpation of wolves from the landscape. These included all of the Canadian provinces, Alaska, and Minnesota (see Appendix A). Members of the public who live in states with permanent wolf populations already have experience living with wolves and have been exposed to word-of-mouth communication and media coverage regarding wolves. Since there is essentially no change in “experience level” with wolves in states with permanent wolf populations, we expect no change in attitude expressions in the news media in these states.

*Hyp 4c: Stories originating in states in recovery zones will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period (1999 and 2008)*

Rationale: Members of the public who live in states in recovery zones do not have enough exposure to wolves to constitute a significant change in attitudes toward wolves over time. It is unlikely that most of the residents within these zones will have enough indirect experience with wolves (hearing stories from friends or neighbors, being exposed to local media coverage) to constitute a significant change in attitude expressions.

*Hyp 4d: Stories originating in states without wolves will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period (1999 and 2008)*

Rationale: Members of the public who live in states without wolves do not have any existing direct or indirect experience with wolves during any part of the time period. Therefore, it is unlikely that there will be a change among public attitudes in these regions. Instead attitudes among the public in states without wolves should remain stable.

Williams et al. (2002) suggested that most of the positive change in public attitudes occurred before the 1970s, which is the same point in time when social scientists began researching public attitudes and beliefs towards wildlife. My review of the empirical literature suggests that there is not yet enough evidence to ascertain whether attitudes towards wolves have stabilized since the 1970s. The purpose of my research will be to determine whether public attitudes regarding wolves have changed significantly in recent years (specifically, since 1999) and if so, the regions in which this change was most apparent. I will seek to answer the aforementioned hypotheses by content analyzing attitude expressions in the US and Canadian print news media between 1999 and 2008. This research is particularly timely given the U.S. Fish and Wildlife Service's (FWS) decision to remove the North American Gray Wolf from the endangered species list in April of 2009 based on the assumption that attitudes toward wolves have become more positive in recent decades (74 Federal Register 15,123). Given the importance of public attitudes and opinions to the formation of public policy and wildlife management techniques, further research on the topic of public attitudes towards wolves over time is imperative.

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## CHAPTER 3

### METHODS

In this study, computer content analysis was used to measure attitude expressions regarding wolves in the United States and Canadian print news media over time. Content analysis refers to a suite of methodologies for examining media content, such as newspaper stories, television coverage, or pictures. Computer content analysis enables the researcher to examine large amounts of information and systematically identify its properties by detecting the more important components of the communication content (Riffe, Lacy, & Fico, 1998). In social science research, attitudes are most often measured through the use of survey questionnaires or public opinion polls. Content analysis of news media, however, has emerged as an alternative method for studying public attitudes when longitudinal survey research or public polling is not feasible. Given the growing use of content analysis to measure public attitudes, and the logistical barriers to conducting longitudinal surveys, I decided to use this methodology for my study. The method described in this chapter provided a means for studying trends in attitude expressions toward wolves over time and across various regions of the US and Canada.

#### **Rationale for analyzing news media**

The media plays a role in both shaping and reflecting public opinion on a wide variety of social issues (Bengston, Potts, Fan, & Goetz, 2005). Many communication researchers have found evidence for the media's agenda-setting role and ability to

mobilize public concern for environmental issues (Ader, 1995; Brosius & Kepplinger, 1990; Kepplinger & Roth, 1979; Parlour & Schatzow, 1978). The agenda-setting hypothesis “posits a relationship between the relative emphasis given by the media to various topics and the degree of salience these topics have for the general public” (Ader, 1995, p. 300). By presenting coverage of a topic in the media, and by keeping this issue “alive” for some extended period of time, the media transmits a subtle message concerning the legitimacy of the issue to the public (Salwen, 1988).

Ader (1995) found that the agenda-setting effect of the media is strongest for unobtrusive issues, or issues for which individuals or the public have little personal experience. In addition, a number of studies have shown that the news media are the most important source of information for most people about environmental issues (Atwater, Salwen, & Anderson, 1985; Ostman & Parker, 1987). Ostman and Parker (1987) found television and newspapers to be the most frequently used media, however, other forms of media were often preferred for believable information.

Other communications researchers, however, have demonstrated the way in which public opinion can affect media coverage. For example, Brosius & Kepplinger (1990) found that problem awareness actually caused media coverage on three issues: pensions, public debt, and public security. Content analysis of news media has been shown to produce results that parallel the findings of public opinion polls; Fan (1997) used a content analysis on news media to successfully predict public opinion polls in the 1995 Sovereignty Referendum in Quebec.

Content analysis provides a useful methodology for monitoring broad shifts in public attitudes by allowing the researcher to “take the pulse” of on-going issue

discussions in the public arena. For the purposes of this study, I used content analysis to gauge the public's attitudes and concerns regarding wolves and wolf management policy at the time of each publication. The media, by serving as a direct forum for public debate on wolves through editorials, letters to the editor, etc. and by reporting on debates which occur in other forums (i.e. courts, legislatures, protests and confrontations, and meetings and hearings) provides a reflection of the national debate on wolves (Bengston, Fan, & Celarier, 1999). Therefore, analysis of media coverage regarding wolves is not simply "media analysis" but rather a view into the public's overall sentiment toward wolves (Bengston et al., 2005).

Computer content analyses have become increasingly common in the field of natural resources to analyze a variety of topics, including national forest benefits and values (Bengston et al., 1999), public discourse about urban sprawl (Bengston et al., 2005), and conflict over natural resource management (Bengston & Fan, 1999). Content analysis studies have also been used to study trends in public attitudes and values over time. Xu and Bengston (1997) conducted a study on the trends in national forest values among forestry professionals, environmentalists, and the news media from 1982 to 1993, in which they found a gradual shift in the structure of national forest values in the United States since the early 1980s. Kellert (1982) conducted a content analysis of news media, although he used human coders rather than computer software, to analyze historical trends in American animal use and perception. Finally, in a study very similar to ours, Wolch, Gullo, & Lassiter, (1997) content analyzed cougar-related coverage appearing in the Los Angeles Times from 1985 to 1995 in order to describe the tenor of coverage, specific attitudes expressed, and the terminology used to describe cougars. To date there

have been no content analyses, of which I am aware, studying trends in the public's attitudes toward wolves specifically.

Content analysis, like any other methodology, does have limitations. For the purposes of this study, the method requires three important assumptions: 1.) that the media has an effect on the public's level of exposure to issues (e.g. through the agenda-setting function), 2.) that media coverage has an effect on public opinion/attitudes and 3.) that public opinion/attitudes have an effect on media coverage of issues. In essence, although I cannot make claims about the direction of effects, I assume that the correlation between media coverage and public attitudes demonstrated in previous studies allows me to examine news media content as a proxy for public opinion/attitudes.

### **Overview of methodology**

This study followed the methodology frequently used by authors David Bengston and David Fan and utilized the InfoTrend© computer software developed by David Fan (See Bengston & Fan, 1999; Bengston & Fan, 1999; Bengston, Fan, & Celarier, 1999; Bengston, Potts, Fan, & Goetz, 2005; Bengston, Xu, & Fan, 2001; Webb, Bengston, & Fan, 2008). Computer content analyses utilizing the InfoTrend © software typically involve four key steps: (1) downloading electronically-available news media stories regarding the topic or issue of study, (2) developing a conceptual framework for categorization of the ideas to be analyzed, (3) developing computer coding instructions to score the paragraphs for the identified conceptual statements and (4) assessing the validity and reliability of the analysis. After the data were collected, time trend and regional analyses were conducted.

### **Downloading news media stories**

Data for this analysis consisted of all electronically-available U.S. and Canadian news media stories about wolves published over the period of January 1, 1999 to December 31, 2008. I chose this ten-year time period in order to be inclusive of as many years as possible while also having a suitable number of news sources. Based on an established protocol in the literature, I decided to include only publications which were continuously publishing over the entire time period. The rationale for this decision was to help reduce any potential bias that might enter into the study if selected newspapers were “entered” or “dropped” from the study during the time period. Similarly, researchers conducting panel studies seek to reduce attrition of subjects throughout a study in order to have confidence that the results are due to changes within individuals, as opposed to changes that result from altering the makeup of the group.

I chose the LexisNexis electronic database because it has the largest news library database and extends further back in time than similar databases (Bengston et al., 2005). Within LexisNexis, 147 US and Canadian sources were available during the time period of 1999 to 2008. For each of the 147 newspaper and newswire sources, I collected information on their dates of publication, publisher, state/province/region of readership, brief history, and gaps in coverage. Out of 147 sources, 139 sources (131 newspapers and 8 newswires) were selected based on their continuous publication over the 10-year time period and absence of substantial gaps in coverage. Out of the 139 sources, 16 were Canadian sources and 123 were U.S. sources.

The following newspapers were omitted from the pool of news sources due to large gaps in coverage or providing only the most recent six months of news coverage:

(1.) Baltimore Sun, (2.) Los Angeles Times, (3.) The Morning Call, (4.) Newsday, (5.) The Hartford Courant, (6.) Star-News, (7.) The Ledger. In addition, only 27 out of 38 stories entered the database from The Gazette, a newspaper published in Quebec, Canada. As a result, some of the stories may have been lost or more than one story may have been “glued” together to give a single story. Still these numbers were not substantial enough (out of a total of 7437 stories) to give cause for concern (D. Fan, personal communication, September 11, 2009).

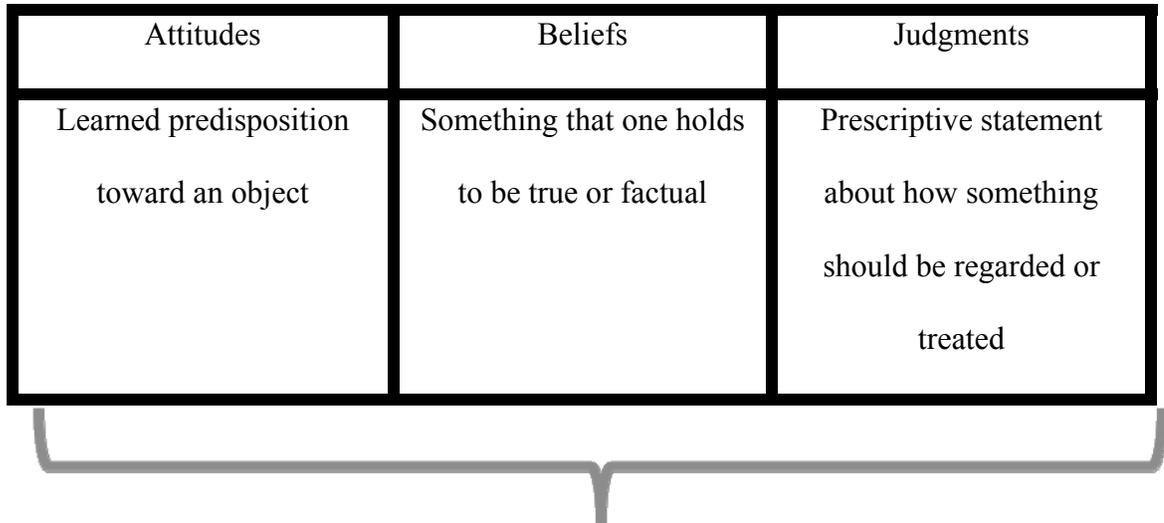
All types of stories were included in this study including both news articles and opinion articles. The search command used in LexisNexis to identify articles discussing wolves can be viewed in Appendix B. The search command was created to include as many “target stories” as possible while seeking to exclude stories that did not involve wolves. Many of the articles that were misidentified (i.e. “false hit” articles) were stories about sports, business dealings, weddings, obituaries, music, movies, politicians or well-known people with the last name Wolf. Using this search command I found a total of 7,437 stories, with 4,559 newspaper stories and 2,878 newswire stories. Therefore, approximately 60 percent of the total stories were from newspapers and 40 percent were from newswires. Among the newspaper stories, there were 3,976 US newspaper stories and 583 Canadian newspaper stories.

By reviewing one hundred random articles, the authors estimated that the accuracy rate of identified wolf stories being actual stories about wolves and not false hits was 86%. Due to the low rate of false hit stories, it was not necessary to filter out false stories or paragraphs within the InfoTrend© software once the stories were uploaded. Rather specific rules were created later in the coding framework to exclude certain words

for which I did not want to score, such as the word “wolf hybrid.” I also did not filter out “repeat” newswire stories due to 1.) the large numbers of stories which were analyzed in the study (7,437) and which made repeated stories less significant and 2.) the fact that repeated stories do not signify systematic bias within the study (that is, I had no reason to believe that repeated stories would include more negative attitude expressions than non-repeated stories).

### **Developing a conceptual framework**

In order to empirically analyze the trends in attitudinal expressions toward wolves in United States and Canadian print news media over time, a conceptual framework was needed. I developed a classification system that identified three broad conceptual categories of expressions toward wolves in the media including attitude, belief, and judgment statements. I drew these social constructs from the psychological literature and applied them specifically to the case of wolves. I defined attitudes as a learned predisposition toward wolves as either favorable or unfavorable. Beliefs were defined as what people think is true or factual about wolves and judgments as prescriptive statements about how wolves should be regarded or treated. For the sake of simplicity, throughout the remainder of this document, I will use the word “attitude expressions” to encompass all three of these categories (see figure 4). However, below is a more detailed description of these categories and how they are conceptualized within the psychological literature.



### Attitude Expressions

**Figure 4. Diagram of psychological constructs used for the content analysis**

#### *Attitudes*

An attitude is defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1); put succinctly, an attitude is expressed when some entity is evaluated. Within the field of social psychology, individuals’ attitudes are most often measured by asking respondents either (a) to evaluate a series of statements about the entity of interest, or (b) to evaluate the entity itself. The semantic differential scale (Osgood, Suci & Tannenbaum, 1957) is an example of the latter form which is commonly employed within surveys. This scale was designed to measure the connotative meaning of objects, events, and concepts. It asks individuals to evaluate stimulus words and concepts on bipolar scales defined with contrasting adjectives at each end (i.e. good/bad, beneficial/harmful,

ugly/beautiful) (Heise, 1970). The connotative meanings (i.e. degree of good or bad) are then used to derive the attitude towards the entity, event or concept of interest.

Since my primary interest was in determining how attitudes toward wolves change over time, and survey data do not exist for the population of interest, I operationalized attitudes differently from traditional psychological studies. Attitude expressions regarding wolves were operationalized as evaluative statements regarding wolves or wolf behavior. Because I did not have access to individuals, attitudes were assessed by determining the prevalence of positive and negative statements made about wolves or wolf behavior in print news media articles. Examples of attitudinal expressions present in the media were “wolves are beautiful,” “wolves are killing machines” or “pro-wolf movement.” Many of the evaluative words which appeared in the news articles and were categorized as attitudinal expressions are words which have been used in psychological experiments and surveys to indicate attitudes at the individual level (e.g., good, bad, beneficial, harmful, etc.).

### *Beliefs*

A belief is defined as a “cognition representing the attributes or characteristics” of an object or entity (Eagly & Chaiken, 1993). In short, a belief is something that one holds to be factual or true. The evaluative content of beliefs as well as the affective reactions of a person can be abstracted to produce an overall “attitude” toward the object (Eagly & Chaiken, 1993). Like attitudes, beliefs are often measured at the individual level through the use of surveys and questionnaires. Again, similar to attitudes, psychologists measure beliefs about objects or entities by asking individuals the extent to which they agree or disagree with a series of statements about that object or entity.

For the purposes of this study, I operationalized belief statements as factual or non-evaluative statements regarding wolves or wolf behavior within the text of news stories. For example, “wolves decimate deer,” “natural remedy: wild wolves” or “wolves are an endangered species” would be non-evaluative, belief phrases. These belief statements are, in most cases, specific to what wolves do or don’t do. Note, while statements such as “wolves decimate deer” have an implicit evaluation of wolf behavior (i.e. wolves decimating deer is bad, therefore, wolves are bad), the evaluative intent of the statement is not explicit and could be interpreted in multiple ways (for example, killing deer is good in places where deer are overpopulated). Thus, the primary difference between the way I operationalized attitudes and beliefs in this study parallels their operationalization in the psychological literature: attitudinal expressions make an explicit evaluation of wolves or wolf behavior, whereas expressions of belief do not explicitly evaluate either wolves or wolf behavior but rather, are simply stated as something that is so.

### *Judgments*

Ethics are defined as the “principles and norms which people are behooved to abide by when they talk or behave, and [are] connected to a person’s responsibilities and obligations” (Huiying, 2004, p.16). Historically, ethics deal with norms governing interpersonal relationships and reflect the ethical relationship between human beings. Environmental ethics, however, which originated at the end of the 1940s, examines “the relationship between human beings and nature” from [a] moral perspective” (Huiying, 2004, p. 16). Rather than looking at blood ties, environmental ethics are based on science, facts, and human’s relationship to nature. Therefore, environmental ethics

provides an historically different and complimentary way of talking about ethics (Huiying, 2004).

For the purposes of this study, I have defined ethical judgment statements as prescriptive judgments about how wolves *should* or *ought* to be treated or regarded. These judgments could be in regards to wolves, wolf management, or wolf policy. For example, judgments included phrases such as “obligation to bring [wolves] back,” “should allow ranchers to kill wolves” or “supportive of the wolf’s return.” These judgment statements typically took the form of: *wolves* → *should/ought/need (to be)* → *killed/protected/managed/restored/reintroduced/preserved/hunted...*

A detailed diagram of the ten specific conceptual categories on which the computer coding scheme was developed can be viewed in Figure 5 (see Appendix C for the most detailed description of the conceptual framework).

<b>Attitudes</b>	<b>Beliefs</b>	<b>Judgments</b>
Wolves are good (+) Wolves are bad (-)	Wolves Negatively Impact Ecosystems/Decimate Game (-) Wolves Positively Impact Ecosystems (+) Wolves Are Over-Abundant (-) Wolves Are Endangered/Threatened/Imperiled (+) Wolves Are A Threat/Have Negative Impact On Humans/Human Activity (-) Wolves Have A Positive Impact On Humans/Human Activity (+)	Wolves should be managed/killed/controlled (-) Wolves should be protected/reintroduced (+)

**Figure 5. Diagram of the ten conceptual coding categories**

## **Developing computer coding instructions**

Individual paragraphs were the unit of analysis for this study. Computer instructions were developed to score paragraphs for expressions of each of the ten concepts in the conceptual framework. Scoring was done with InfoTrend© computer software using the Filtscor computer language. The Filtscor language has two components, lexicons (the FSR1 rules) and idea transition rules (FSR2 rules), each of which were custom designed for the analysis. A lexicon, simply put, is a word dictionary. It was developed—as a series of word lists—to include all of the important ideas and concepts which appeared in the text about wolves. The lexicon contained 4,401 words. The idea transition rules are short, specific rules which “specify how words and phrases in the dictionary are combined together to create new meanings” (Bengston et al., 2005). The lexicon and idea transition rules work together to produce concept scores for paragraphs within the newspaper articles. For example, when the word “should” appears within 50 characters ahead of the word “protect”, the paragraph is scored as “wolves should be protected”. There were 264 idea transition rules created for this study.

Given the large volume of text, the authors did not examine each story in the database, however, a random sample of approximately 700 stories were examined throughout the process of developing the coding rules. Development of the coding scheme involved continuous testing and modification of lexicons and idea transition rules by applying them to random samples of text. Paragraphs which contained multiple expressions of the same concept were counted as a single expression. If a paragraph contained expressions of more than one of the ten categories; however, each category was

counted once. Following development and refinement of the lexicons and idea transition rules, a formal validity analysis was carried out.

### **Assessing validity and reliability**

With traditional human-coded content analyses, inter-coder reliability is often a problem due to ambiguous coding instructions, cognitive differences among the coders, and/or random recording errors (Weber, 1990). Inter-coder reliability is not an issue, however, in computer-coding analyses given that the computer always applies the coding rules consistently. It is important, however, to ensure the validity of the computer content analysis, or the degree to which the computer coding rules produce a score that is consistent with the evaluation of the analyst. I examined a random sample of 70 stories within the study to determine whether the computer coding rules were able to accurately identify expressions of positive and negative attitudinal expressions. Accuracy rates above 80 percent are considered acceptable for content analyses studies (Bengston et al., 2005). After final refinements in the computer instructions, the global accuracy rate for attitudinal expressions toward wolves was 89 percent. For positive attitude expressions the accuracy rate was 89 percent and for negative attitude expressions it was 88 percent. See table 1 for the accuracy rates of each of the ten attitude, belief and judgment categories.

**Table 1. Accuracy rates for each of the attitude, belief and judgment categories**

Attitude expressions (attitudes/beliefs/judgments)	Computer score (# of expressions identified)	Hand score (# of expressions identified)	Accuracy rate
Wolves are good	9	7	78 %
Wolves are bad	4	4	100%
Wolves should be protected	63	62	98%
Wolves should be managed	102	98	96%
Wolves have positive impact on the ecosystem	15	15	100%
Wolves decimate game populations	7	12	58%
Wolves are endangered	35	31	89%
Wolves are abundant	40	42	95%
Wolves have a positive impact on humans	5	4	80%
Wolves have a negative impact on humans	137	148	93%

### **Statistical analyses**

I analyzed the data using SPSS Statistics version 17.0. I analyzed trends over time for the percentages of positive and negative attitude expressions, for each of the attitude, belief and judgment expressions, and for the experience level and recovery zone variables. The regional variables were based on the place (i.e. state/city) of publication for each news source rather than the geographic focus of the news story. I used linear regression to test for statistical significance of the trends. I used one-way analysis of

variance to test for significant differences in mean frequencies of attitude expressions within regions with different levels of experience with wolves and within recovery zone regions.

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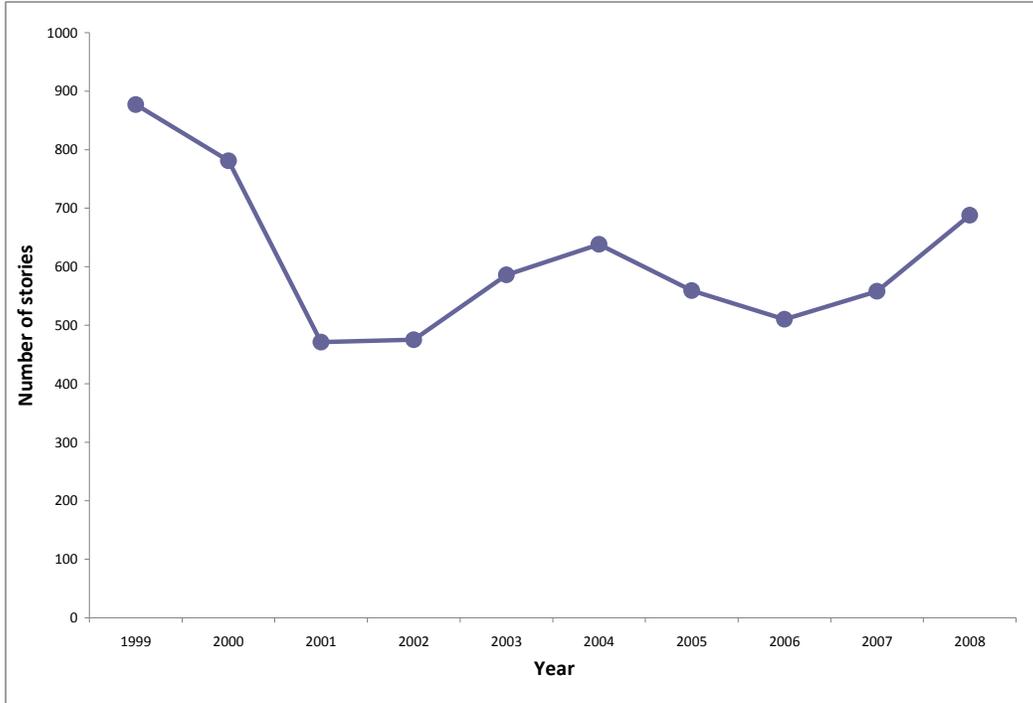
## CHAPTER 4

### RESULTS

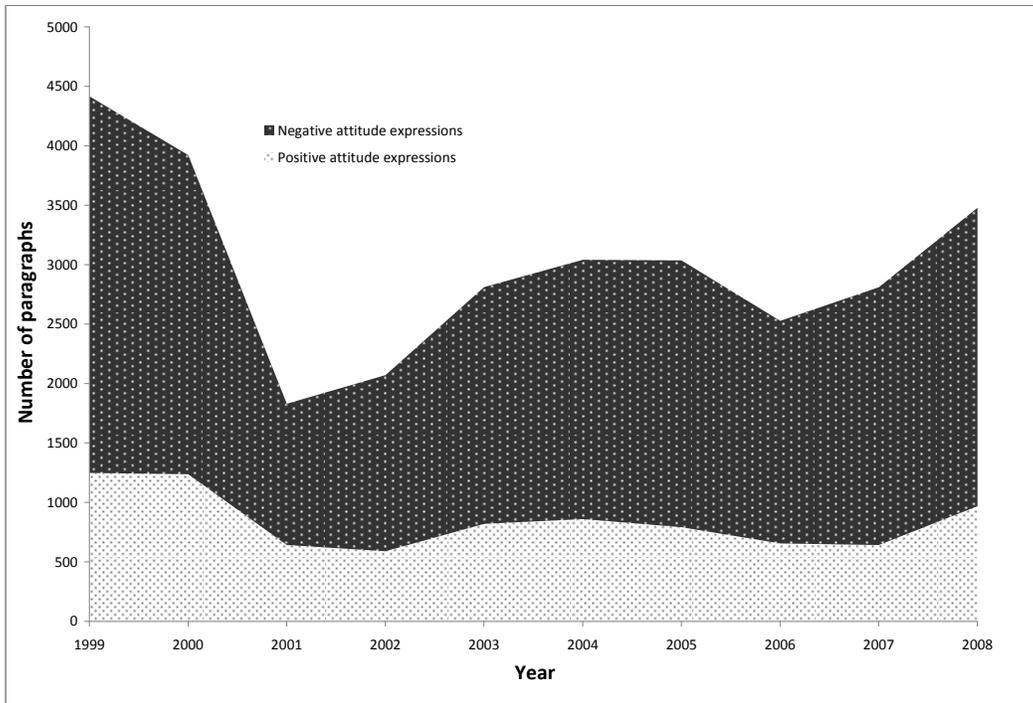
#### **Descriptive summary**

The final database of United States and Canadian news stories used in the analysis comprised 29,952 paragraphs from 7,437 relevant stories. The volume of stories across the period was not constant, with peaks in coverage occurring in 1999, 2000, and 2008 and with decreasing coverage during 2001 and 2002 (Figure 6). The decrease in coverage in 2001-2002 was likely due, in part, to the terrorist attacks that occurred on September 11<sup>th</sup>, 2001 and the subsequent shift in focus to stories covering the attacks.

Aggregating the data into positive and negative attitude expressions, at the US and Canadian national levels, provides a convenient method for summarizing the valence of the discourse surrounding wolves in North America. Aggregated results indicate that over 71 percent ( $n = 2,148$ ) of all attitude expressions were negative, while 28 percent were positive ( $n = 846$ ) over the ten year time period (Figure 7).



**Figure 6. Total wolf attitude paragraphs in the database of US and Canadian news media text, 1999 through 2008**



**Figure 7. Number of positive and negative attitude expressions toward wolves in the US and Canadian news media, 1999 through 2008**

A breakdown of the negative and positive attitude expressions by category demonstrates which categories were most frequently expressed in the news media as well as the relative differences between the 10 categories of attitude expressions (see Figures 8 & 9). Overall, the proportions of the attitude categories, in relationship to one another, stayed relatively stable over time. However, the frequency with which expressions appear were affected by the total number of stories published for each year, and provide some measure as to how important the topic of wolves was from year to year; therefore, the figures provided show actual counts (i.e. frequencies).

#### *Negative attitude expressions*

The belief that *wolves have a negative impact on humans* and the judgment that *wolves should be managed* were by far the most frequent expressions, accounting for 30.5 percent and 27.9 percent (respectively) of all attitude expressions over the ten-year time period (Figure 8). This was followed by the beliefs that *wolves are abundant* (9.7 percent) and that *wolves decimate game populations* (2.3 percent) and the attitude that *wolves are bad* (1.2 percent) (Figure 8).

#### *Positive attitude expressions*

The judgment that *wolves should be protected* was the most prominent positive expression, accounting for 14.9 percent of all attitude expressions over the ten-year time period (Figure 9). This was followed closely by the belief that *wolves are endangered* (7 percent). The belief that *wolves positively impact ecosystems* (2.3 percent), the attitude that *wolves are good* (2.1 percent) and the belief that *wolves positively impact humans* (2.0 percent) all accounted for relatively small percentages of the total attitude

expressions (Figure 9). Overall, the public discourse seemed to focus on the debate of whether wolves should be protected or managed.

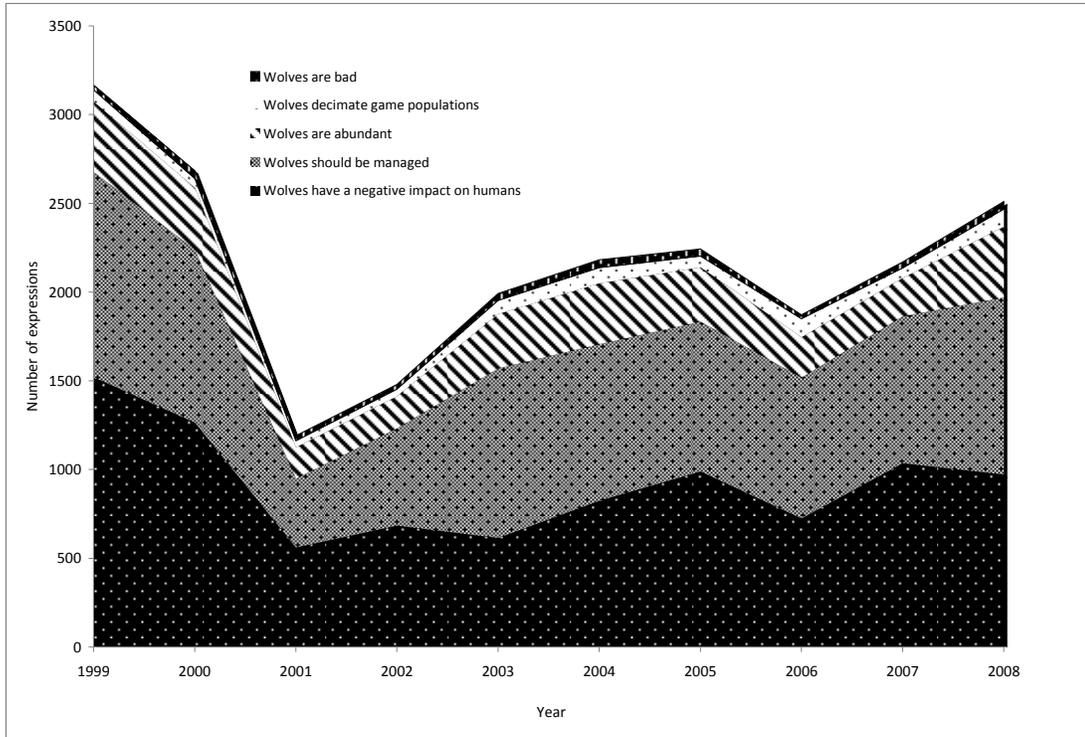


Figure 8. Breakdown of negative attitude expressions by category, 1999 through 2008

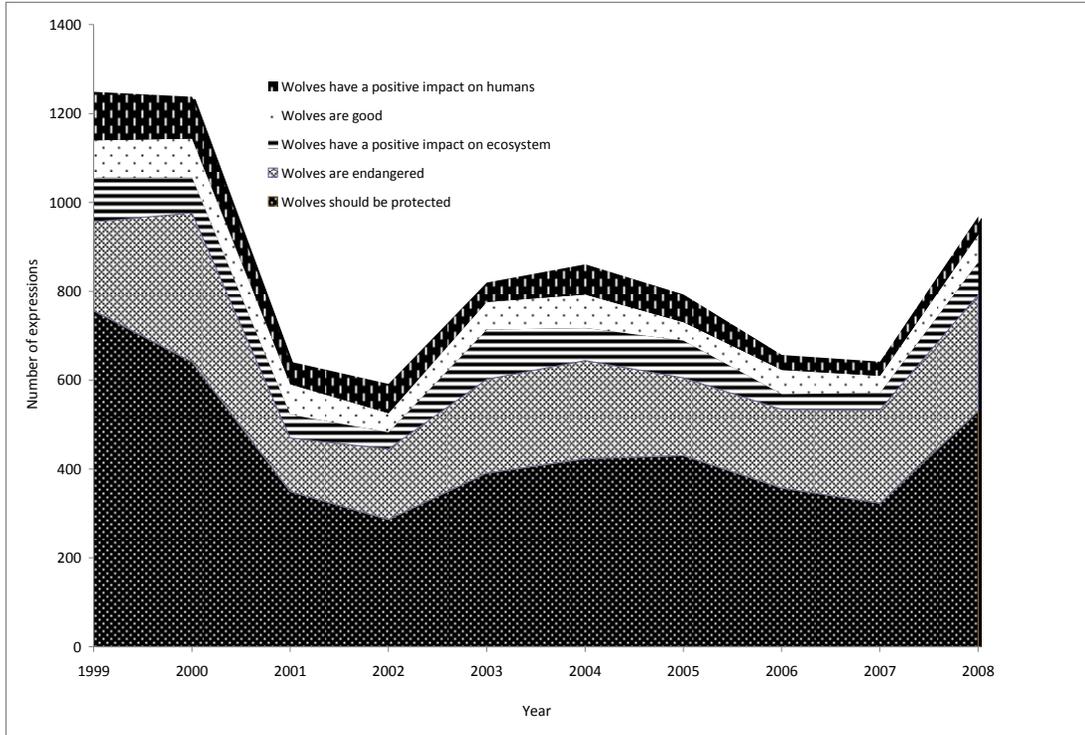


Figure 9. Breakdown of positive attitude expressions by category, 1999 through 2008

### Time Trends Analyses

When examined in aggregate—by positive and negative attitude expressions—my results indicate a slight but significant increase in negative attitude expressions over the study period and a slight but significant decrease in positive attitude expressions (Figure 10). An examination of the five paired attitude categories (ten attitude categories total) show that the overall trend in negative and positive attitude expressions appears to be driven primarily by increases in the belief that *wolves have a negative impact on humans* and the judgment that *wolves should be managed*, the most frequently expressed categories of attitudes (see Figure 8 and Figures 11 through 15).

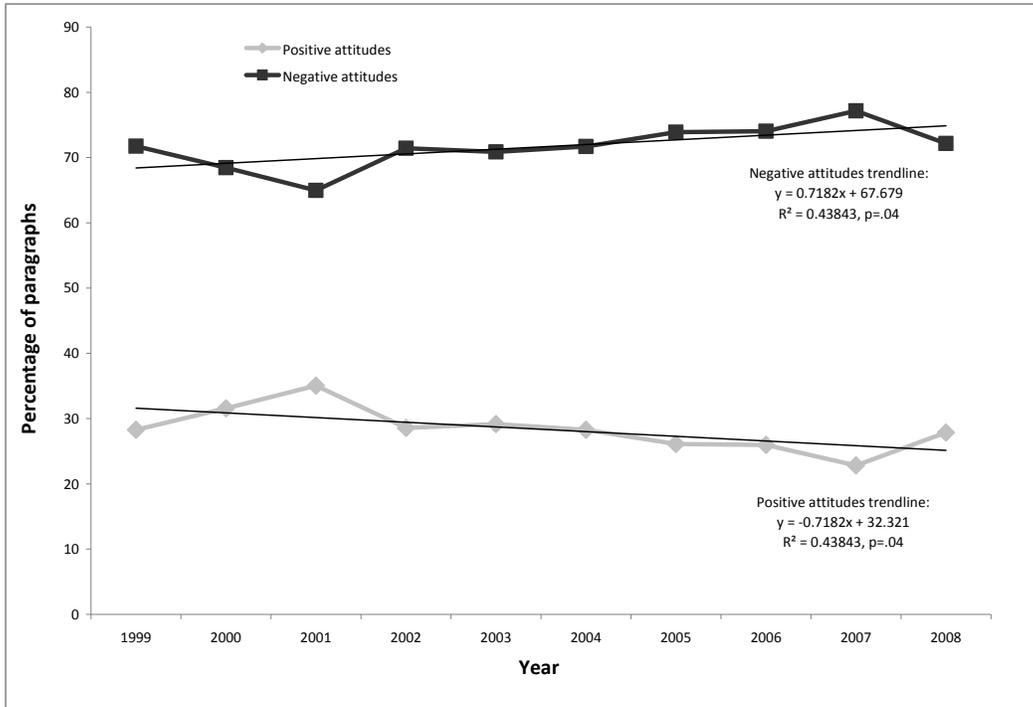


Figure 10. Percentage of paragraphs with positive and negative attitude expressions, 1999 through 2008

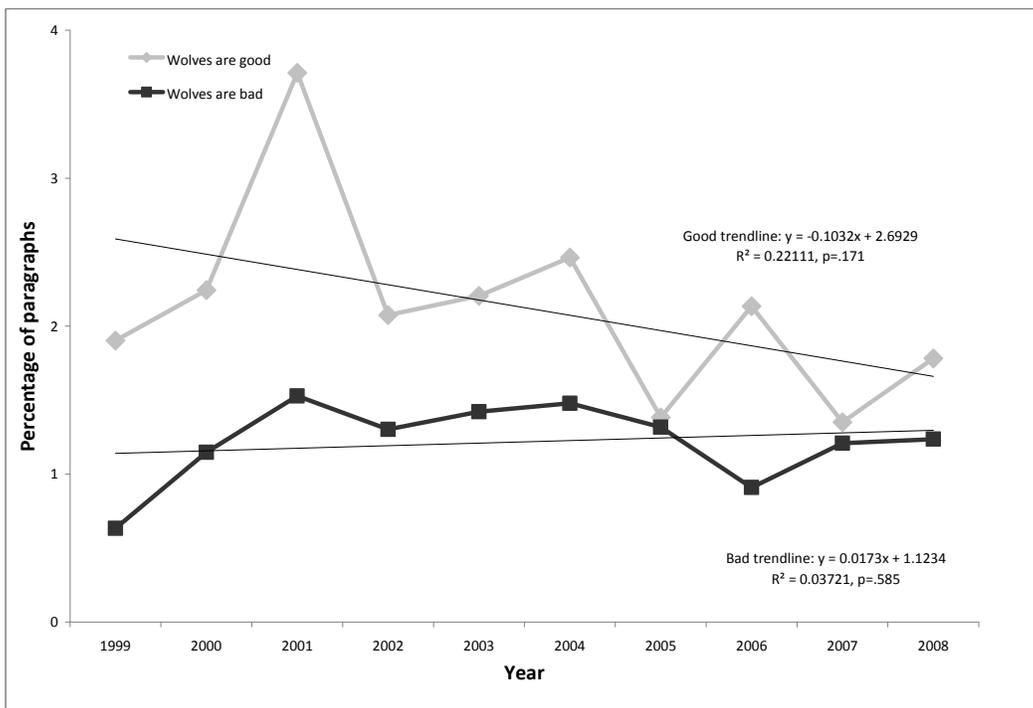


Figure 11. Percentage of paragraphs with wolves are good and wolves are bad expressions, 1999 through 2008

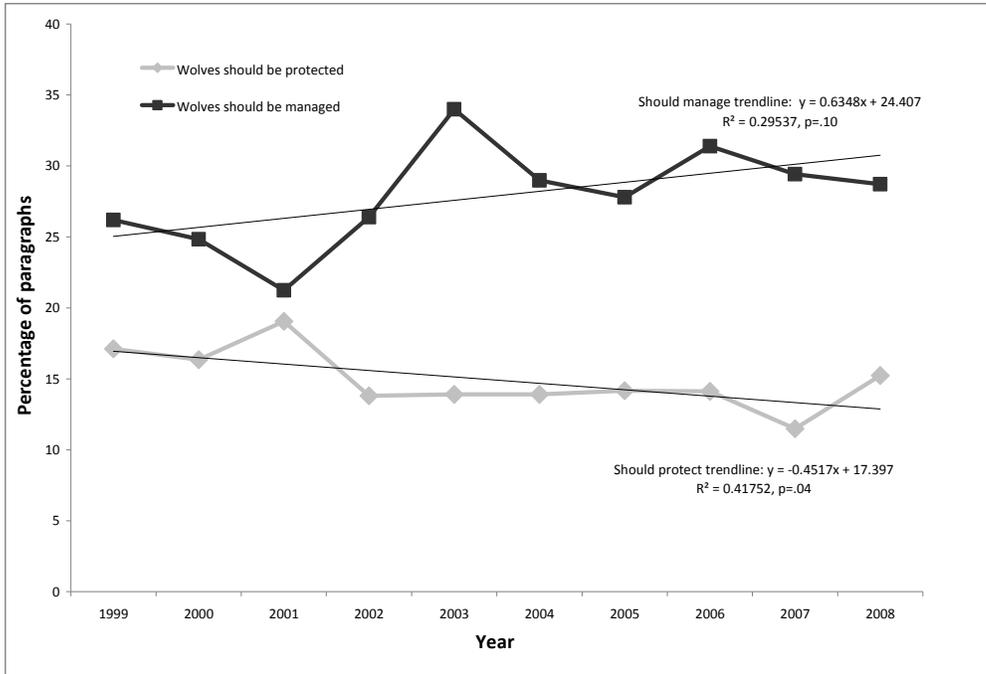


Figure 12. Percentage of paragraphs with wolves should be protected and wolves should be managed expressions, 1999 through 2008

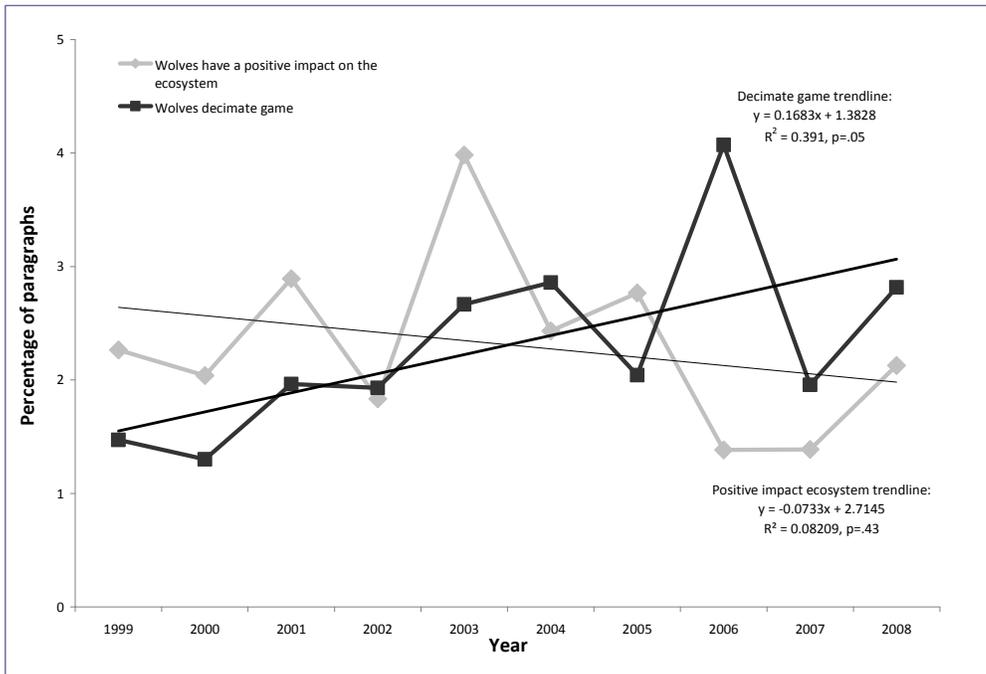


Figure 13. Percentage of paragraphs with wolves have a positive impact on the ecosystem and wolves decimate game expressions, 1999 through 2008

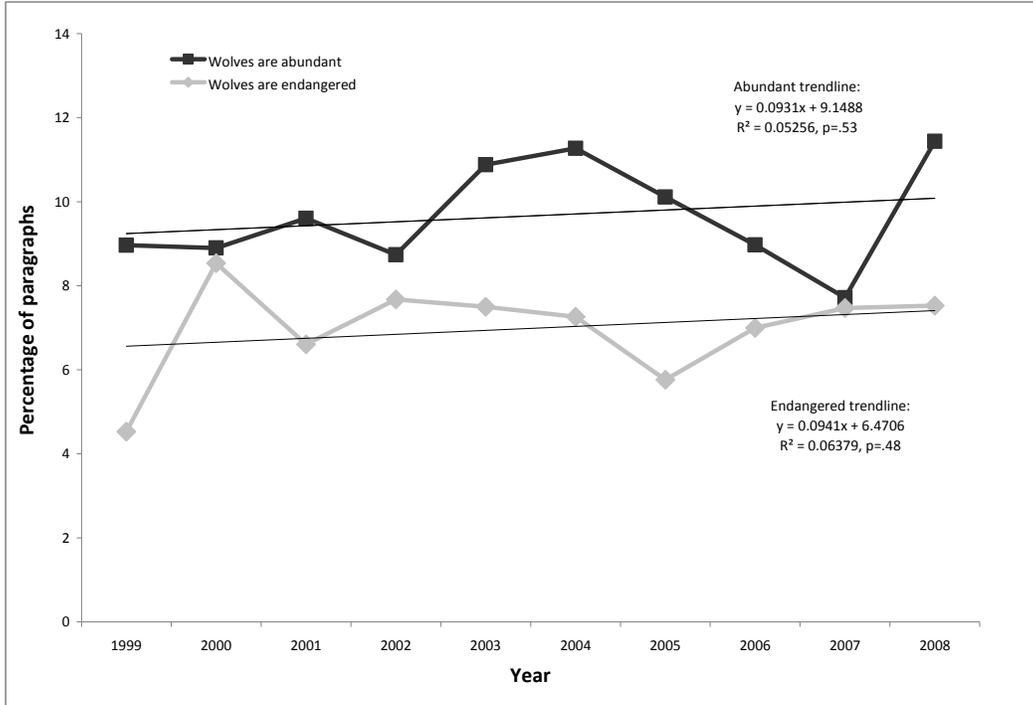


Figure 14. Percentage of paragraphs with wolves are abundant and wolves are endangered expressions, 1999 through 2008

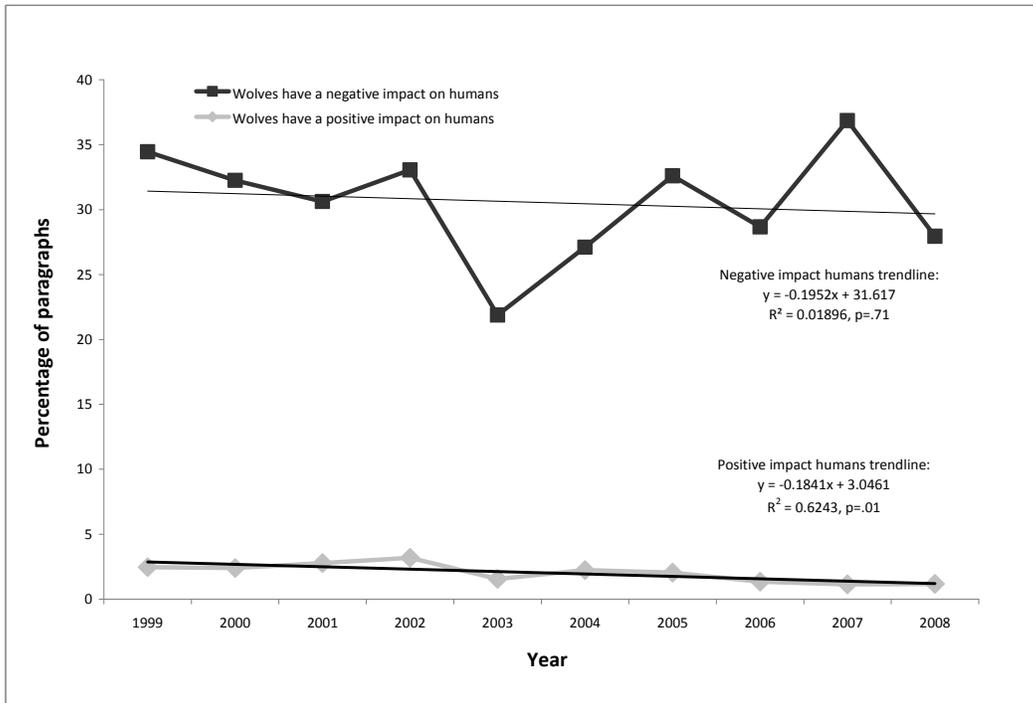


Figure 15. Percentage of paragraphs with wolves have a negative impact on humans and wolves have a positive impact on humans expressions, 1999 through 2008

To test the statistical significance of these apparent trends in attitude expressions toward wolves a linear regression was run with time as the independent variable and percentage of attitude expressions as the dependent variable. Results indicate that the percent positive attitude expressions decreased significantly over the ten-year period ( $p < 0.05$ , Table 2). For every year increase in time, negative attitude expressions increased (and positive attitude expressions decreased) by .72 percentage points. Results also indicate that three of ten expression category time trends were statistically significant ( $p < .05$ , Table 2). Expressions that *wolves should be protected* and *wolves have a positive impact on humans* decreased significantly and expression that *wolves decimate game* increased significantly. For every one year increase in time, *should protect* expressions decreased by .45 percentage points and *positive impact* expressions decreased by .18 percentage points. For every one year increase in time, *decimate game* expressions increased by .17 percentage points. The time trends were not significant for the other seven attitude expression categories, meaning that there were no discernable trends in those attitude expressions over time.

**Table 2. Linear regression results for time trends in attitude expressions**

Variable	R <sup>2</sup>	Adj R <sup>2</sup>	t	df	B	beta	Sig.
Percent of negative attitude expressions**	.44	.37	2.50	1	.72	.66	.04
Wolves are good expressions	.22	.12	-1.51	1	-.10	-.47	.17
Wolves are bad expressions	.04	-.08	.57	1	.02	.20	.59
Wolves should be protected**	.42	.35	-2.39	1	-.45	-.65	.04
Wolves should be managed	.30	.21	1.83	1	.64	.54	.10
Wolves have a positive impact on the ecosystem	.08	-.03	-.84	1	-.07	-.28	.43
Wolves decimate game**	.39	.32	2.27	1	.17	.63	.05
Wolves are endangered	.06	-.05	.74	1	.09	.25	.48
Wolves are abundant	.05	-.07	.66	1	.09	.23	.53
Wolves have a positive impact on humans***	.62	.58	-3.64	1	-.184	-.790	.01
Wolves have a negative impact on humans	.02	-.10	-.39	1	-.19	-.14	.71

\*\*Significant at the  $p < .05$  level

\*\*\*Significant at the  $p < .01$  level

I hypothesized that there would be no significant change or trend in attitude expressions toward wolves over time. My results do not indicate support for this hypothesis. Rather, I found that there was a significant increase in negative attitude expressions ( $p = .04$ , Table 2) over time. Specifically, the belief that *wolves negatively impact humans* and that *wolves should be managed* seemed to contribute the most to the increasing negative attitude expressions over time (Note: Time trends in frequencies (rather than percentages) of attitude expressions may be viewed in the Appendix D for comparison purposes).

## **Regional comparisons**

### *Experience with wolves*

Four one-way ANOVAs were run to test whether aggregated expressions of positive and negative attitudes significantly vary by the geographical origins of newspaper stories. The first two ANOVAs were conducted to determine if attitude expressions differed regionally, based upon a varying degree of experience with wolves. Four regional groups were created that reflect each region's level exposure with wolves: (1) states/provinces without wolves, (2) states/provinces without wolves, but in wolf recovery zones, (3) states/provinces (in recovery zones) with new wolf populations, and (4) states/provinces with permanent wolf populations. Additionally, I created a fifth group that consisted of national newspapers (e.g. *The New York Times*) and newswires.

In the first one-way ANOVA, negative attitude expressions were the dependent variable. There was a significant main effect of experience with wolves on the mean number of negative attitude expressions, ( $F(4, 6138) = 47.08, p = .00$ ). Tukey's b post-hoc comparisons indicated that the mean number of negative attitude expressions for states without wolves ( $M = 2.31, SE = .09$ ) and the mean number of negative attitude expressions for states with new wolf populations ( $M = 4.27, SE = .12$ ) differed from one another and from the other three experience categories (i.e. states/provinces in recovery zones, states/provinces with permanent wolf populations, and national papers and newswires; see Table 3). Overall, newspaper stories in states without wolves had the least expressions of negative attitude expressions ( $M = 2.31, SE = .09$ ). Newspaper stories in states with new wolf populations had the most expressions of negative attitudes in newspaper articles ( $M = 4.27, SE = .12$ ).

I hypothesized that stories originating in states/provinces with experience with wolves would have more negative attitude expressions than stories originating in states without experience with wolves. More specifically, I hypothesized that states with new populations of wolves and states in recovery zones (adjacent to states with new populations of wolves) would have more negative attitude expressions than states without wolves. I did not make a prediction for stories originating in national papers and wires. My results supported these hypotheses. States with new wolf populations had the most negative attitude expressions (M=4.27, Table 3) and states without wolves had the least negative attitude expressions (M=2.31, Table 3). States in recovery zones also had a significantly higher number of negative attitude expressions than states without wolves.

**Table 3. Mean negative attitude expressions for experience with wolves variable**

<b>Experience Region</b>	<b>Mean</b>	<b>N</b>	<b>SE</b>
States without wolves	2.31	856	0.09
States in recovery zones	3.52 <sup>a</sup>	868	0.11
States with new wolf populations	4.27	924	0.12
States/provinces with permanent wolf populations	3.49 <sup>a</sup>	814	0.12
National papers/wires	3.61 <sup>a</sup>	2681	0.06

<sup>a</sup> Means were not significantly different from one another (i.e.  $p > 0.05$ ).

In the second one-way ANOVA, positive attitude expressions were the dependent variable. There was a significant main effect of experience with wolves on the mean number of positive attitude expressions, ( $F(4, 6138) = 47.08, p = .000$ ). Post-hoc comparisons using the Tukey's b test indicated that the mean number of positive attitudes for states without wolves (M= 1.60, SE = .06) and the mean number of positive attitudes for national papers/wires (M = 1.22, SE = .03) significantly differed from one another

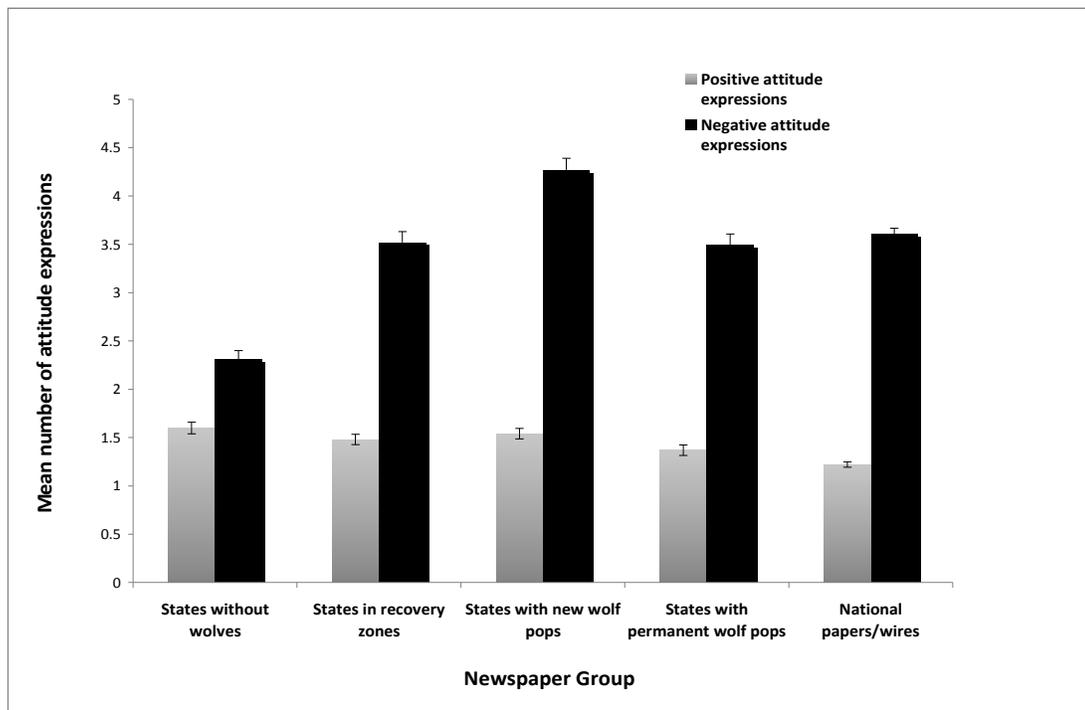
and from three of the other experience levels (i.e. states in recovery zones, states with new wolf populations, and states/provinces with permanent wolf populations; see Table 4). Overall, newspaper stories in states without wolves had the most positive attitude expressions ( $M = 1.60$ ,  $SE = .06$ ). National papers and wires had the least positive attitude expressions ( $M = 1.22$ ,  $SE = .03$ ).

I hypothesized that stories originating in states without experience with wolves would have more positive attitude expressions than stories originating in states with experience with wolves. More specifically, I hypothesized that states without wolves would have more positive attitude expressions (given no current exposure to wolves) than states with new wolf populations and states in recovery zones (given their level of exposure to wolves). I did not make a prediction for stories originating in national papers and wires. My results partially supported these hypotheses. States without wolves had the most positive attitude expressions ( $M=1.60$ , Table 4), however, this group was not significantly different from states with new wolf populations or states in recovery zones. In addition, the results demonstrated national papers and wires had the least amount of positive attitudes ( $M=1.22$ , Table 4) rather than states with new wolf populations. States without wolves did have a significantly higher number of positive attitude expressions ( $M=1.60$ , Table 4) than states/provinces with permanent wolf populations ( $M=1.37$ , Table 4).

**Table 4. Mean positive expressions for experience with wolves variable**

Experience Region	Mean	N	SE
States without wolves	1.60 <sup>c</sup>	856	0.06
States in recovery zones	1.48 <sup>bc</sup>	868	0.05
States with new wolf populations	1.54 <sup>bc</sup>	924	0.05
States/provinces with permanent wolf populations	1.37 <sup>ab</sup>	814	0.05
National papers/wires	1.22 <sup>a</sup>	2681	0.03

Superscript letters indicate that means were not significantly different from one another (i.e.  $p > 0.05$ ).



**Figure 16. Positive and Negative Attitude Expressions by Experience Level with Wolves**

### *Recovery zones*

The third and fourth one-way ANOVAs were conducted to compare aggregated positive and negative attitude expressions across established wolf recovery zones.

Newspapers were sorted into seven regional groups: (1) national newspapers/newswires, (2) non-recovery zones without wolves, (3) non-recovery zones with wolves, (4) Red

Wolf recovery zone, (5) Great Lakes recovery zone, (6) Mexican Gray Wolf recovery zone, and (7) Northern Rockies recovery zone.

In the third one-way ANOVA, negative attitude expressions were the dependent variable. Again, there was a significant main effect of recovery zone on the mean number of negative attitude expressions, ( $F(6, 6136) = 45.57, p = .000$ ). Tukey's b post-hoc comparisons indicated the mean number of negative attitudes for Red Wolf recovery zone ( $M = 1.52, SE = .24$ ), non-recovery zones without wolves ( $M = 2.33, SE = .09$ ), Great Lakes recovery zone ( $M = 4.21, SE = .15$ ) and Northern Rockies Recovery Zone ( $M = 4.28, SE = .12$ , Table 5) were significantly different from one another and from the other three groups (i.e. non-recovery zones with wolves, Mexican Gray Wolf recovery zone, and national newspapers and newswires). The mean numbers of negative attitudes for non-recovery zones with wolves, Mexican Gray Wolf recovery zone, and national papers and wires were not significantly different from one another. Overall, newspaper stories in the Red Wolf recovery zone had the least expressions of negative attitudes ( $M = 1.52, SE = .24$ ). However, the results for this group may have been affected by a small sample size ( $N = 79$ ). Newspaper stories in the Great Lakes recovery zone and the Northern Rockies recovery zone had the most expressions of negative attitudes ( $M = 4.21, SE = .15$  and  $M = 4.28, SE = .12$ , Table 5).

**Table 5. Mean negative expressions for recovery zone variable**

<b>Experience Region</b>	<b>Mean</b>	<b>N</b>	<b>SE</b>
Non-recovery zones without wolves	2.33	875	.09
Non-recovery zones with wolves	2.98 <sup>a</sup>	613	.11
Great Lakes RZ	4.21 <sup>b</sup>	674	.15
Red Wolf RZ	1.52	79	.24
Northern Rockies RZ	4.28 <sup>b</sup>	901	.12
Mexican Gray Wolf RZ	3.52 <sup>a</sup>	320	.19
National papers/wires	3.61 <sup>a</sup>	2681	.06

Superscript letter indicates that means were not significantly different from one another (i.e.  $p > 0.05$ ).

In the fourth one-way ANOVA, positive attitude expressions were the dependent variable. There was a significant main effect of experience with wolves on the mean number of positive attitude expressions, ( $F(6, 6136) = 14.71, p = .000$ ). Tukey's b post-hoc comparisons indicated that the mean number of positive attitude expressions for the Red Wolf recovery zone ( $M = 1.90, SE = .19$ , Table 6) was significantly different from the other six groups. Non-recovery zones with wolves ( $M = 1.17, SE = .05$ ) and national newspapers and newswires ( $M = 1.22, SE = .03$ ) were also significantly different from the non-recovery zones without wolves, the Great Lakes recovery zone, and the Red Wolf recovery zone. Overall, newspaper stories in the Red Wolf recovery zone states had the most expressions of positive attitudes ( $M = 1.90, SE = .19$ ). However, the results for this group may have been affected by a small sample size ( $N = 79$ ). Newspaper stories in the non-recovery zones with wolves and the national newspapers and newswires groups had the least expressions of positive attitudes ( $M = 1.17, SE = .05$  and  $M = 1.22, SE = .03$ , Table 6).

I did not hypothesize differences in means for positive and negative attitude expressions among the recovery zone variables given that there were a variety of differences at work within this variable, including differences in wolf species, geographic locations, socio-economic factors, and policy and management implications.

**Table 6. Mean positive expressions for recovery zone variable**

<b>Experience Region</b>	<b>Mean</b>	<b>N</b>	<b>SE</b>
Non-recovery zones without wolves	1.59 <sup>b</sup>	875	.06
Non-recovery zones with wolves	1.17 <sup>a</sup>	613	.05
Great Lakes RZ	1.63	674	.07
Red Wolf RZ	1.90	79	.19
Northern Rockies RZ	1.51 <sup>ab</sup>	901	.05
Mexican Gray Wolf RZ	1.48 <sup>ab</sup>	320	.09
National papers/wires	1.22 <sup>a</sup>	2681	.03

Superscript letter indicates that means were not statistically different from one another (i.e.  $p > 0.05$ ).

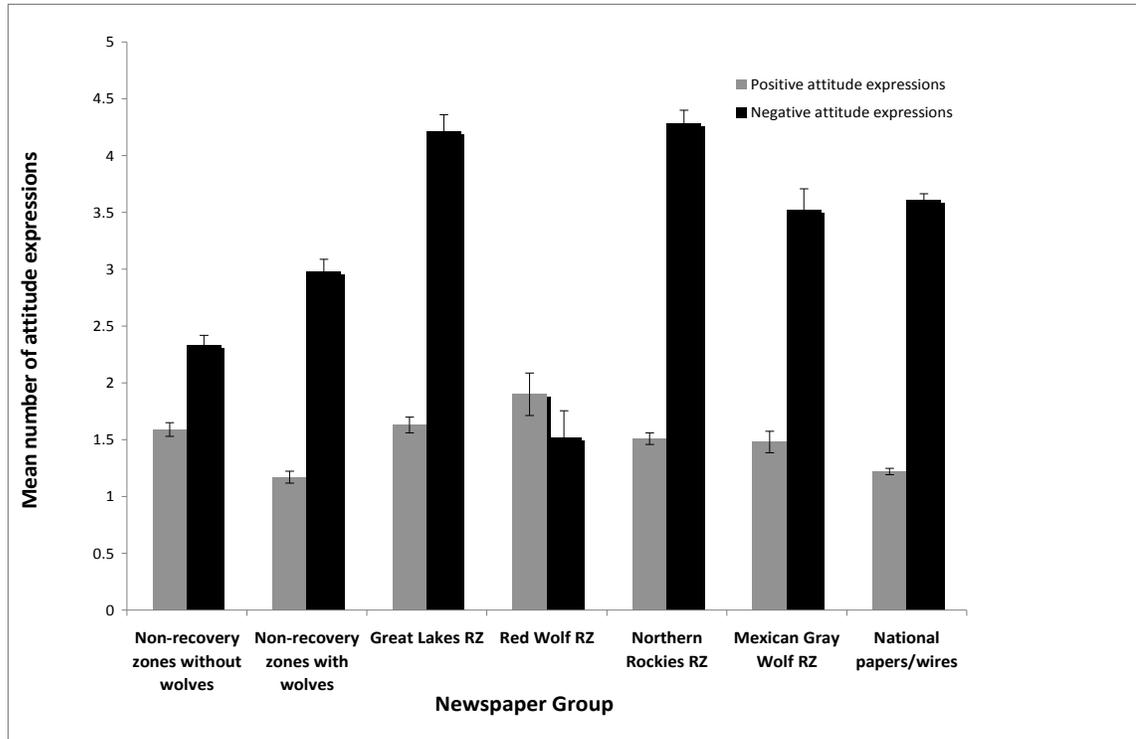
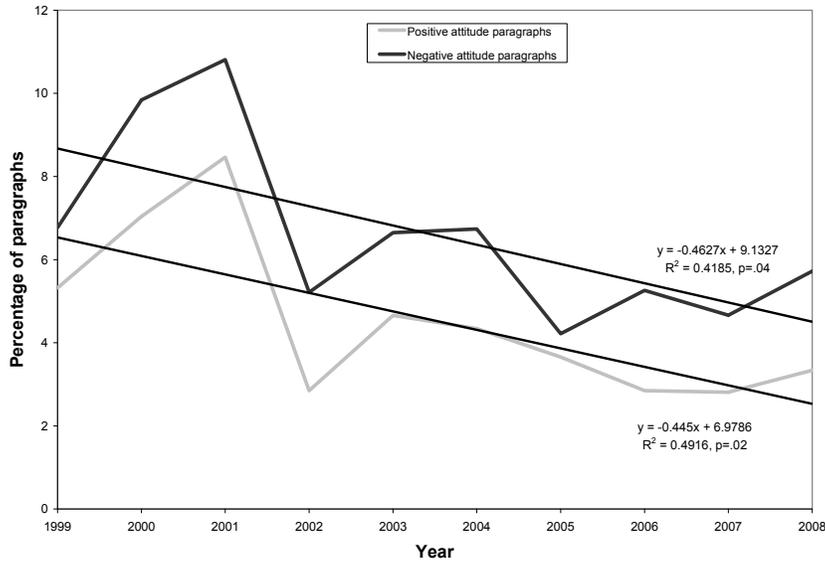


Figure 17. Positive and Negative Attitude Expressions by Recovery Zone

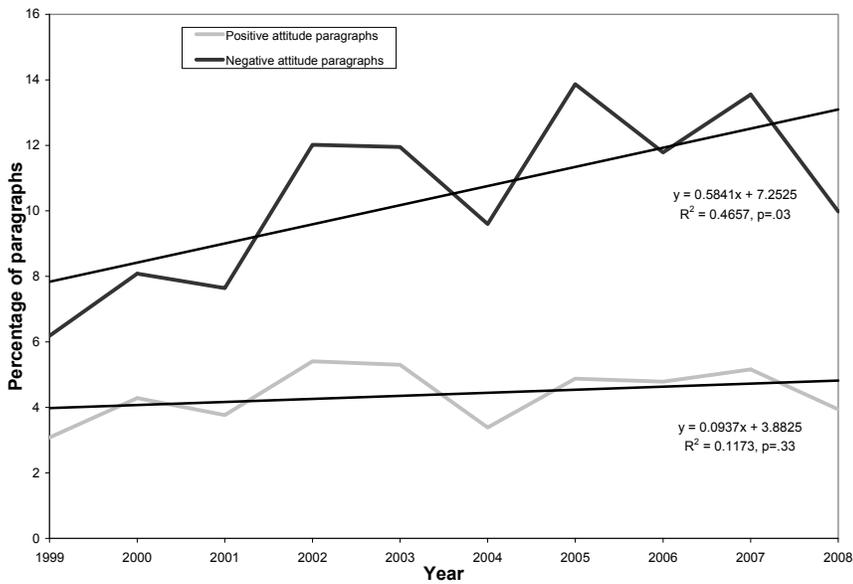
## Regional Time Analyses

### *Experience with wolves*

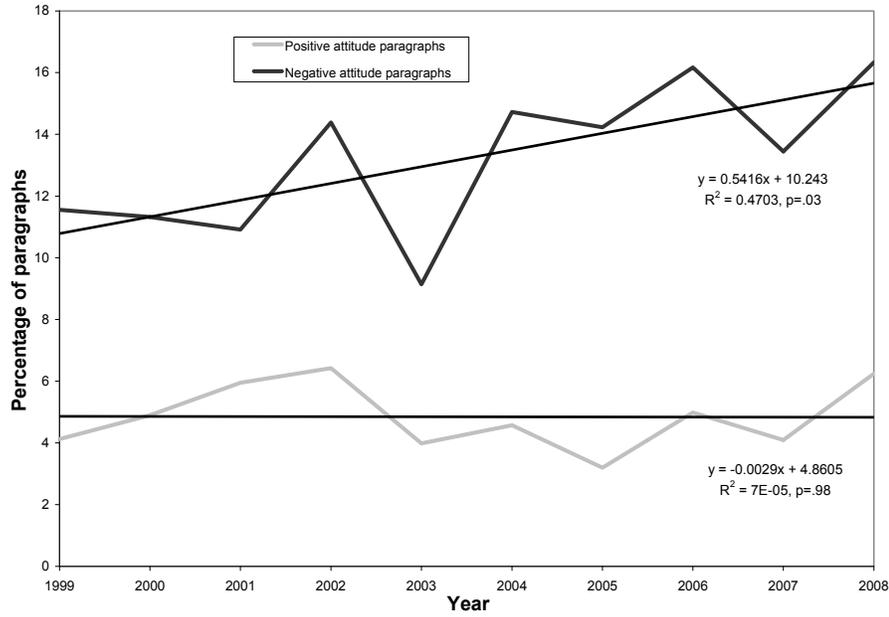
When time trends in positive and negative attitude expressions were examined according to the experience with wolves variable, overall results indicate (a) a decrease in both positive and negative attitude expressions in states without wolves, (b) an increase in negative attitude expressions in states in recovery zones and states with new wolf populations, and (c) no change in attitude expressions in states/provinces with permanent wolf populations (see Figures 18 through 21).



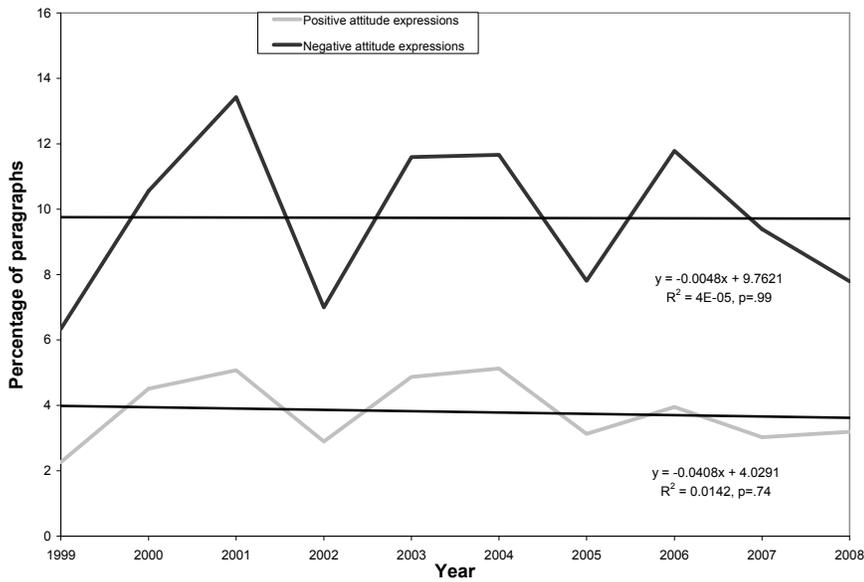
**Figure 18. Percentage of positive and negative attitude expressions within newspapers in states without wolves, 1999 through 2008**



**Figure 19. Percentage of positive and negative attitude expressions in newspapers within states in wolf recovery zones (states without actual wolf populations, but adjacent to states with new wolf populations), 1999 through 2008**



**Figure 20. Percentage of positive and negative attitude expressions in newspapers in states with new wolf populations, 1999 through 2008**



**Figure 21. Percentage of positive and negative attitude expressions in newspapers in US states and Canadian provinces with permanent wolf populations, 1999 through 2008**

To test the statistical significance of trends in attitude expressions toward wolves within each experience level group a linear regression was run with time as the independent variable and attitude expressions as the dependent variable (Table 7). Three of the experience with wolves categories were shown to have trends in the percentage of positive and negative attitude expressions (or both) at the  $p < .05$  level, including states without wolves, states in recovery zones, and states with new wolf populations. There was a moderate decreasing trend in percent positive attitude expressions ( $B = -.45$ ,  $p = .02$ ) and percent negative attitude expressions ( $B = -.46$ ,  $p = .04$ ) for states without wolves. There was a moderate increasing trend ( $B = .58$ ,  $p = .03$ ) in percent negative attitude expressions for states in recovery zones, but no significant trend in percent positive attitude expressions. There was also a moderate increasing trend ( $B = .54$ ,  $p = .03$ ) in percent negative attitude expressions for states with new wolf populations but no significant trend in percent positive attitudes.

For every one year increase in time, (a) positive attitude expressions decreased by .45 percentage points and negative attitude expressions decreased by .46 percentage points in states without wolves, (b) negative attitude expressions increased by .58 percentage points in states in recovery zones and, (c) negative attitude expressions increased by .54 percentage points in states with new wolf populations. The time trends in either negative or positive attitude expressions were not significant for states/provinces with permanent wolf populations, meaning that there were no discernable trends over time in that category.

I hypothesized that stories originating in states with new wolf populations would have increasing negative expressions; we found clear support for this hypothesis. I also

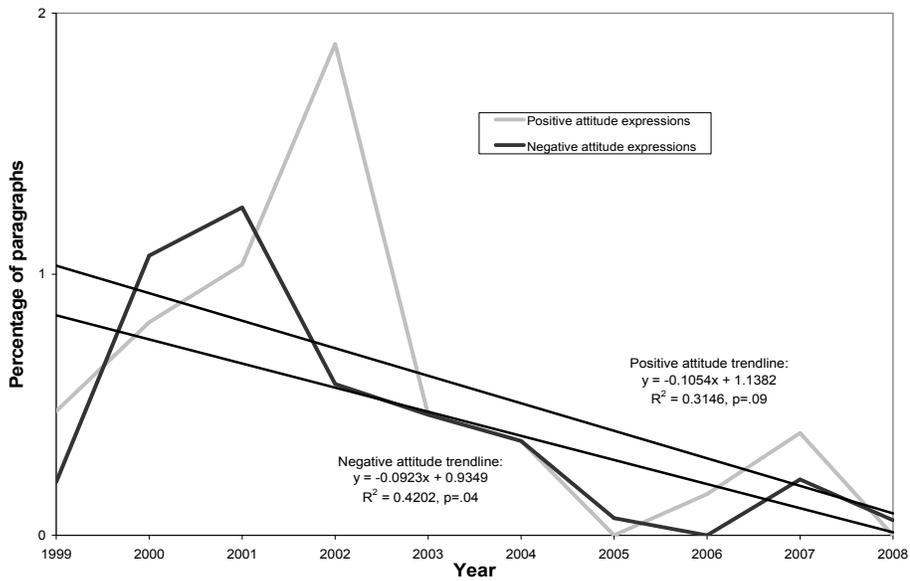
hypothesized that stories originating in states/provinces with permanent wolf populations, states in recovery zones, and states without wolves would have stable, or no discernable trends, in attitude expressions. This hypothesis was partially supported by the results. States/provinces with permanent wolf populations had no discernable trends ( $p=.74$  and  $p=.99$ , Table 7); however, states in recovery zones (states without actual wolf populations but adjacent to states with new wolf populations), actually had an increasing trend in negative attitudes ( $p=.03$ , Table 7). Finally, states without wolves demonstrated a decreasing trend in both positive and negative attitudes ( $p=.02$  and  $p=.04$ , Table 7). Although there was a significant trend in attitude expressions for states without wolves, since both negative and positive attitude expressions were decreasing at a similar rate, this trend seems to be representative of an overall decline in discourse regarding wolves in this region.

**Table 7. Linear regression results for time trends in attitude expressions within newspapers grouped by level of experience with wolves**

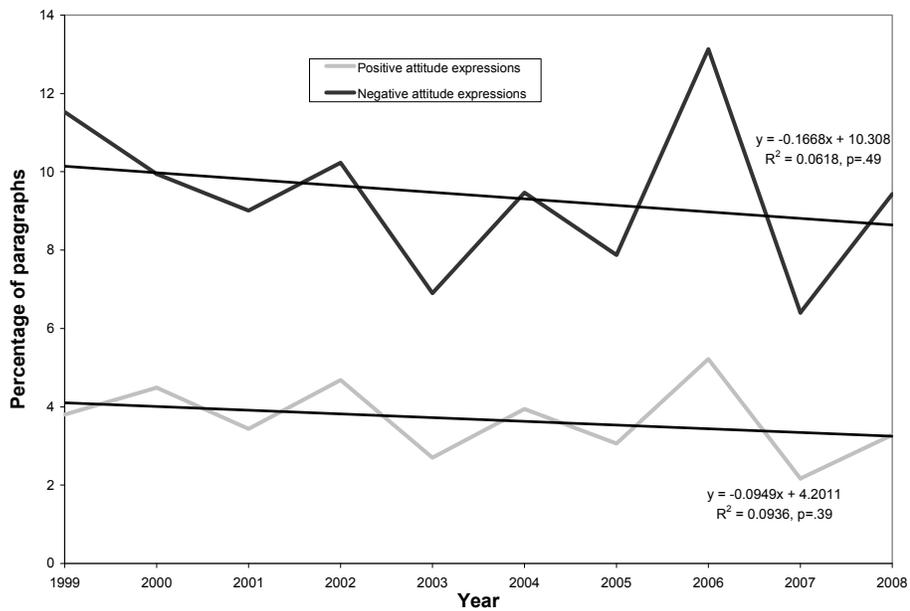
<b>Percentage of:</b>	<b>R<sup>2</sup></b>	<b>Adj R<sup>2</sup></b>	<b>t</b>	<b>df</b>	<b>B</b>	<b>beta</b>	<b>Sig.</b>
States without wolves- %Positive	.49	.43	-2.78	1	-.45	-.70	.02
States without wolves- %Negative	.42	.35	-2.4	1	-.46	-.65	.04
Recovery zones- %Positive	.12	.01	1.03	1	.09	.34	.33
Recovery zones- %Negative	.47	.40	2.64	1	.58	.68	.03
New wolf populations- %Positive	.00	-.13	-.02	1	-.00	-.01	.98
New wolf populations- %Negative	.47	.40	2.67	1	.54	.69	.03
Permanent wolf populations- %Positive	.01	-.11	-.34	1	-.04	-.12	.74
Permanent wolf populations-%Negative	.00	-.13	-.02	1	-.01	-.01	.99

*Recovery zones*

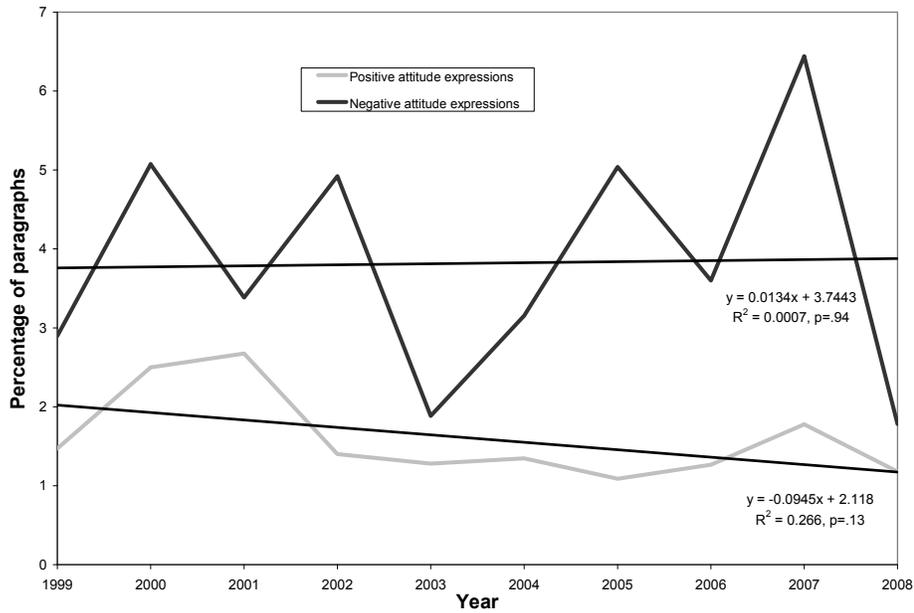
When time trends in positive and negative attitude expressions were examined according to the recovery zone variable, the overall results indicate a decrease in all attitude expressions in non-recovery zones without wolves, an increase in all attitude expressions in the Northern Rockies recovery zone (with a more substantial increase in negative attitude expressions), a decrease in negative attitude expressions in the Red Wolf recovery zone, and no discernable trends in the Great Lakes recovery zone, the Mexican Wolf recovery zone, and in non-recovery zones with wolves (see Figures 22 through 27).



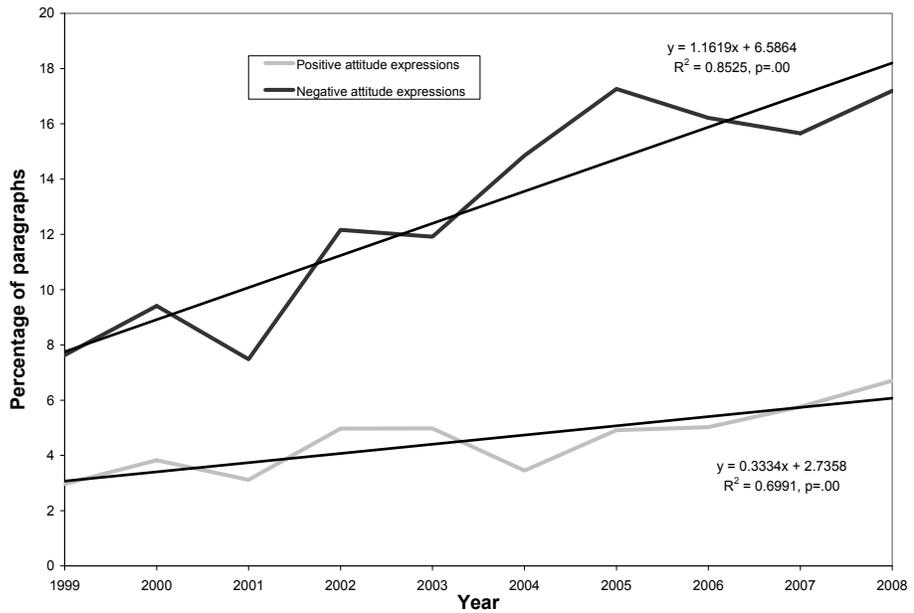
**Figure 22. Percentage of positive and negative attitude expressions in newspapers in the Red Wolf recovery zone, 1999 through 2008**



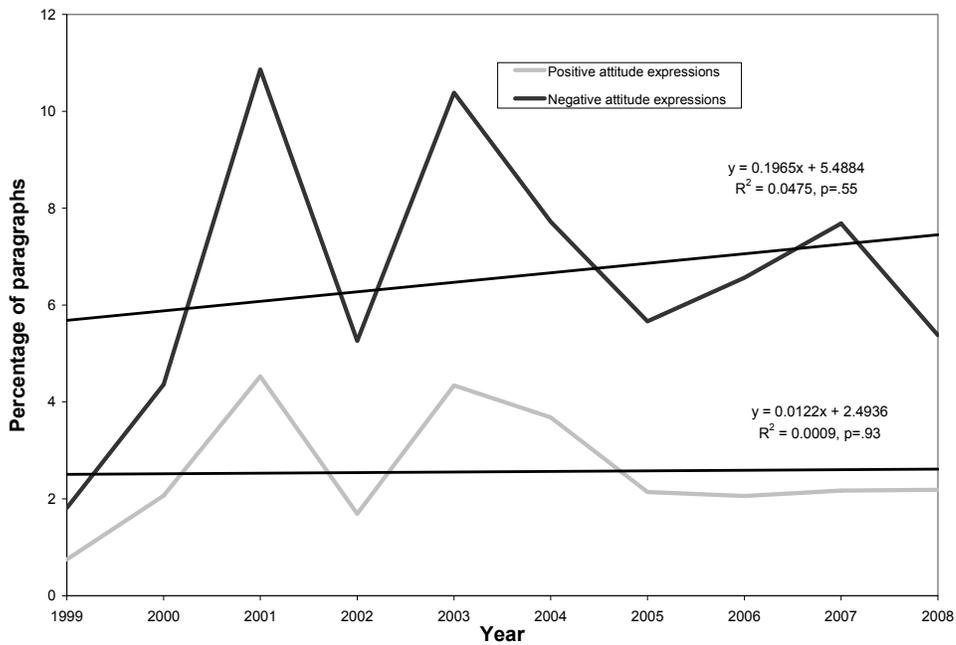
**Figure 23. Percentage of positive and negative attitude expressions in newspapers in the Great Lakes recovery zone, 1999 through 2008**



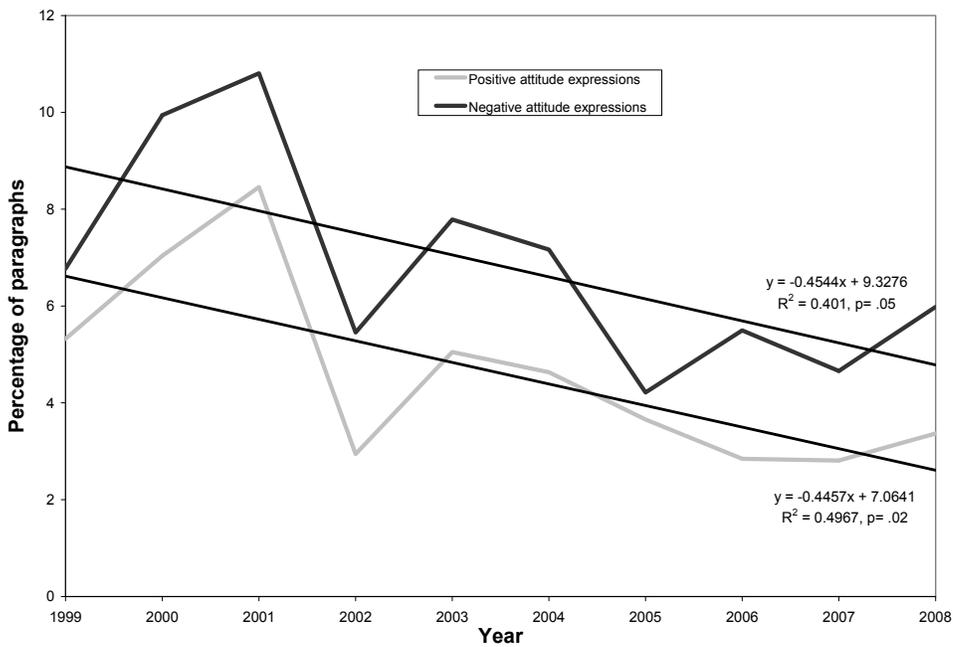
**Figure 24. Percentage of positive and negative attitude expressions in newspapers in the Mexican Wolf recovery zone, 1999 through 2008**



**Figure 25. Percentage of positive and negative attitude expressions in newspapers in the Northern Rockies recovery zone, 1999 through 2008**



**Figure 26. Percentage of positive and negative attitude expressions in newspapers in states/provinces in non-recovery zones with wolves, 1999 through 2008**



**Figure 27. Percentage of positive and negative attitude expressions in newspapers in states in recovery zones without wolves, 1999 through 2008**

To test the statistical significance of the apparent trends in attitude expressions toward wolves within the recovery zone groups a linear regression was run with time as the independent variable and attitude expressions as the dependent variable (see Table 8). Three of the recovery zone variables were shown to have statistically significant trends in the percentage of positive and/or negative attitude expressions (or both) at the  $p < .05$  level including non-recovery zones without wolves, the Red Wolf recovery zone, and the Northern Rockies recovery zone. There was a moderate decreasing trend in percent positive attitude expressions ( $B = -.45$ ,  $p = .02$ , Table 8) and percent negative attitude expressions ( $B = -.45$ ,  $p = .05$ , Table 8) for states in non-recovery zones without wolves. There was a moderate decreasing trend in percent negative attitude expressions ( $B = -.09$ ,  $p = .04$ , Table 8) for the Red Wolf recovery zone. There was a moderately strong increasing trend in percent positive attitude expressions ( $B = .33$ ,  $p = .00$ , Table 8) and percent negative attitude expressions ( $B = 1.16$ ,  $p = .00$ , Table 8) for the Northern Rockies recovery zone. Specifically, for every one year increase in time, (a) positive attitude expressions decreased by .45 percentage points and negative attitude expressions decreased by .45 percentage points in non-recovery zones without wolves, (b) negative attitude expressions decreased by .09 percentage points in the Red Wolf recovery zone, and (d) positive attitude expressions increased by .33 percentage points and negative attitude expressions increased by 1.16 percentage points in the Northern Rockies recovery zone. The time trends in positive and/or negative attitude expressions were not significant for the Great Lakes recovery zone, the Mexican Gray Wolf recovery zone, or non-recovery zones with wolves, meaning that there were no discernable trends over time in these categories.

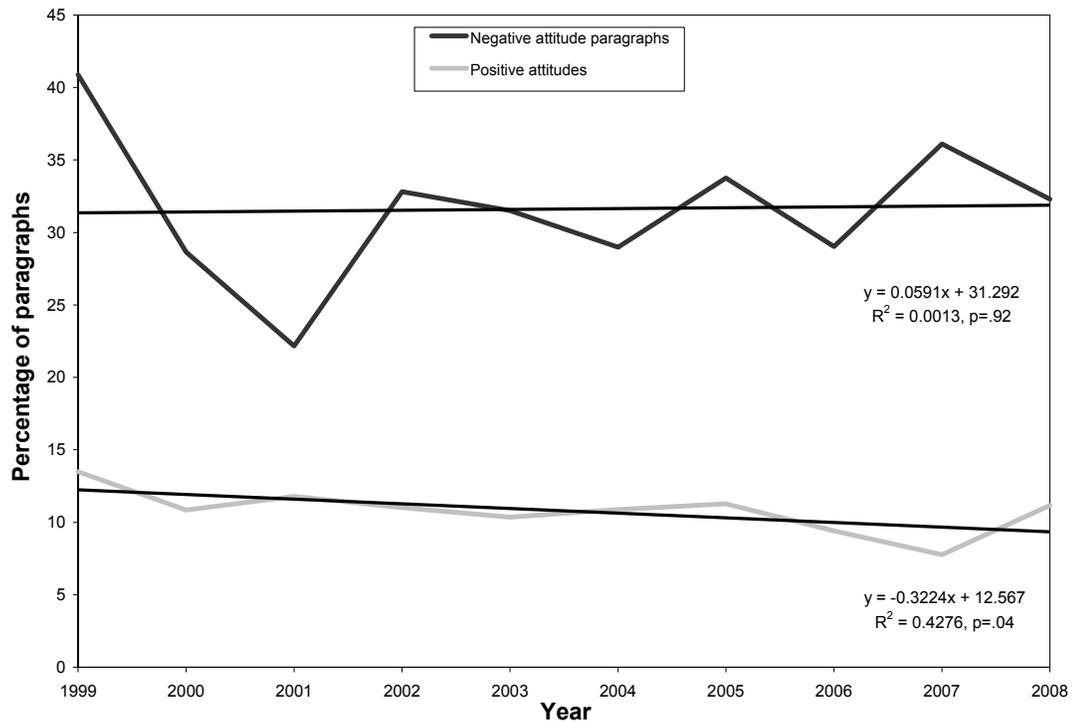
I did not hypothesize differences in trends among the recovery zone variables given that there were a variety of differences at work within these categories, including differences in wolf species, geographic locations, socio-economic factors, and the policy and management of wolves.

**Table 8. Linear regression results for time trends in attitude expressions within newspapers grouped by recovery zone region**

Percentage of:	R <sup>2</sup>	Adj R <sup>2</sup>	t	df	B	beta	Sig.
Red wolf RZ-%Positive	.32	.23	-1.93	1	-.11	-.56	.09
Red wolf RZ-%Negative	.42	.35	-2.4	1	-.09	-.65	.04
Great lakes RZ-%Positive	.09	-.02	-.91	1	-.10	-.31	.39
Great lakes RZ-%Negative	.06	-.06	-.73	1	-.17	-.25	.49
Mexican gray wolf RZ-%Positive	.27	.17	-1.70	1	-.09	-.51	.13
Mexican gray wolf RZ-%Negative	.00	-.12	.08	1	.01	.03	.94
Northern Rockies RZ-%Positive	.70	.66	4.31	1	.33	.84	.00
Northern Rockies RZ-%Negative	.85	.83	6.80	1	1.16	.92	.00
Non-recovery zone with wolves-%Positive	.00	-.12	.09	1	.01	.03	.93
Non-recovery zone with wolves-%Negative	.05	-.07	.63	1	.20	.22	.55
Non-recovery zone without wolves-%Positive	.50	.43	-2.81	1	-.45	-.71	.02
Non-recovery zone without wolves-%Negative	.40	.33	-2.31	1	-.45	-.63	.05

*National papers*

Figure 28 presents trends in positive and negative expressions of attitudes toward wolves in national newspapers and newswires in the United States and Canada from 1999 through 2008.



**Figure 28. Percentage of positive and negative attitude expressions in US and Canadian national newspaper and newswires, 1999 through 2008**

To test the statistical significance of the trends in attitude expressions toward wolves within US and Canadian national papers and newswires a linear regression was run with time as the independent variable and attitude expressions as the dependent variable. Table 9 shows the results of the linear regression for the overall percentages of

positive and negative attitude expressions within the US and Canadian newspapers and newswires group.

The trend in percent positive attitude expressions in national newspapers and newswires was shown to be statistically significant at the  $p < .05$  level. There was a moderate to weak decreasing trend in percent positive attitude expressions for this group ( $B = -.32$ ,  $p = .04$ , Table 9). For every one year increase in time, positive attitude expressions decreased by .32 percent in the national newspapers and newswires group.

The trend in percent negative attitude expressions in national newspapers and newswires was not statistically significant, meaning that there was no discernable trend over time for this category. In conclusion, table 10 provides an overview of the hypotheses for this study and the degree to which they were supported by the results described above.

**Table 9. Linear regression results for time trends in attitude expressions in US and Canadian national papers and newswires**

Percentage of:	R <sup>2</sup>	Adj R <sup>2</sup>	t	df	B	beta	Sig.
% Positive	.43	.36	-2.45	1	-.32	-.65	.04
% Negative	.00	-.12	.10	1	.06	.04	.92

**Table 10. Support for or against original study hypotheses**

<b>Hypothesis:</b>	<b>Support:</b>
1. There will be no significant change in the percentage of paragraphs that have positive and negative attitude expressions toward wolves over the ten-year time period	Not supported
2a. Stories originating in states in recovery zones will contain a greater number of negative attitude expressions than stories originating in states with no wolf populations	Supported
2b. Stories originating in states with new wolf populations will contain a greater number of negative attitude expressions than stories originating in states with no wolf populations	Supported
3a. Stories originating in states without wolves will contain a greater number of positive attitude expressions than stories originating in states with new wolf populations	Not supported
3b. Stories originating in states without wolves will contain a greater number of positive attitude expressions than stories originating in states in recovery zones	Not supported
4a. Stories originating in states with new wolf populations will have a significant increase in the percentage of paragraphs with negative attitude expressions over the ten year time period	Supported
4b. Stories originating in states/provinces with permanent wolf populations will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period (1999 and 2008)	Supported
4c. Stories originating in states in recovery zones will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period	Not supported
4d. Stories originating in states without wolves will have no significant change in the percentage of paragraphs that have negative attitude expressions toward wolves over the ten year time period	Partial support (both positive and negative attitude expressions decreased significantly).

## CHAPTER 5

### DISCUSSION

#### **Interpretation of results**

Based on a quantitative content analysis of US and Canadian print news media from 1999 to 2008, I found that, overall, attitude expressions toward wolves in the media are of a negative orientation and that there has been an increasing trend in negative attitude expressions toward wolves over the past ten years. This finding is generally consistent with Butler, Shanahan, and Decker (2003) who found that problem tolerance of wildlife declined for New York residents over a twelve-year time period, between 1984 and 1996 and Duda, Bissell, and Young (1998) who found increasing negative attitudes toward wolf restoration from 1996 to 1997.

Although Williams, Ericsson, and Heberlein (2002) concluded that attitudes toward wolves have remained relatively stable between 1972 and 2000, my results suggest that attitudes may have been changing in a negative direction since the end of their study period (i.e. between 1999 and 2008). Williams et al. (2002) may have missed a relatively subtle trend given that they aggregated data from several studies in their research (thereby introducing error). Alternatively, the discrepancy between our results may be a function of the different methods employed to analyze attitudes.

One important caveat to this study is that while mail surveys have typically found that attitudes toward wolves are positive, I found a much greater frequency of negative expressions in the news media. This discrepancy may be due to journalist norms which encourage reporting events that are most newsworthy to increase readership. Certainly stories about wolf depredations, human-wildlife conflict and wolf killings are more sensational than stories depicting wolf conservation and the positive impact of wolves on the ecosystem. Despite this media tendency, by employing the same methodology over a series of years we can be reasonably confident in the trends we find—even if the actual estimates are skewed. Note, biologists use a similar procedure for studying population trends in wildlife over time (Gehrt, Hubert, & Ellis, 2002; Gehrt, Hubert, & Ellis, 2005). That is, although they are often unsure about the accuracy of a population estimate in a given year, by using the same method over a series of years, they have a high degree of confidence that the bias is the same across years and therefore, that the changes witnessed in these estimates are reflective of trends in that particular species.

Kellert and Westervelt (1982), in one of the first content analyses to study attitudes toward animals, asserted that “[h]istorical studies are necessarily fraught with uncertainty, particularly when novel, empirically-oriented techniques are employed. Nevertheless, the need to understand the past in attempting to avoid previous mistakes when planning for an uncertain future rationalizes the effort” (p. 28). Content analyses provide a useful alternative methodology for studying attitudes over time, particularly when longitudinal survey data are difficult to collect.

### *Experience level with wolves*

Attitude expressions varied according to the experience level regions that I examined. Stories originating in states with new wolf populations had the highest number of negative attitude expressions while stories in states without wolves had the lowest number of negative attitudes. This is could be due—in part—to the tendency of local papers in states with wolves to report depredation events (i.e. events where wolves kill livestock or pets) (G. Edwards, personal communication, November 16, 2009). There were also increasing trends in negative attitude expressions in states with new wolf populations and states in recovery zones. This outcome could be due to an increasing perception of risk associated with the reintroduction or recolonization of wolves into a new state or area.

### *Risk perception*

Researchers have shown that greater risk is associated with more negative attitudes toward a risk object (Sjoberg, 2000). In particular, the degree of familiarity, dread, and/or voluntariness of exposure may affect the degree of risk members of the public are willing to accept regarding wolves (Slovic, 1992; Sjoberg, 2000). Dread is defined as the degree to which an object evokes a feeling of fear (Slovic, 1992). Because wolves have the ability to cause serious injury or even death to humans, wolves rate high as a dread threat, increasing risk perception and decreasing risk acceptance. Similarly, fear is one of the most important factors that contribute to unfavorable attitudes toward wolves (Hook & Robinson, 1982). For example, Lohr, Ballard, and Bath (1996) found that individuals who had less fear of hiking in the woods knowing that wolves were present also had higher positive attitude scores. Thus, in areas where wolves have been

newly reintroduced, members of the public have a lower degree of familiarity with the animal and risk perception would likely be higher. As familiarity with wolves builds, I would expect that fear toward wolves would also decrease, which helps explain why stories from areas with permanent populations of wolves did not demonstrate increasing negative attitude expressions or significant trends at all.

Finally, it is likely that a large percentage of the public living in states with new wolf populations and in recovery zones do not consider their exposure to wolves as voluntary providing another explanation for why risk perception and negative attitudes in these areas might be higher. Overall, in states with wolves (including states with new populations of wolves, states in recovery zones/adjacent to states with new wolves, and states/provinces with permanent wolf populations), members of the public have a higher probability of being affected by wolves either by hearing stories about them from neighbors or through local media attention. However, according to Ericsson and Heberlein (2003) it is new exposure to wolves that leads to more negative attitudes toward the animal—at least in the short term. As humans become more familiar with and less fearful of newly reintroduced populations of wolves, I would expect a decline in negative attitudes in these regions. Zinn, Manfredo, and Decker (2008) suggest that humans can become habituated to wildlife over time in much the same way that wildlife become habituated to people. Still the literature on human habituation to wildlife is sparse and therefore, it is unclear how long this process might take.

#### *Effect of the recovery zone region*

Attitude expressions also varied within the recovery zone regions that I examined. Stories originating in the Great Lakes and Northern Rocky Mountains recovery zones had

the highest number of negative attitude expressions while stories in the Red Wolf recovery zone had the least negative attitude expressions. I surmise that these higher levels of negative attitude expressions in the Northern Rocky Mountains and the Great Lakes recovery regions are due in part to the controversial nature of the wolf reintroduction in the Yellowstone National Park in 1995, the successful recolonization of wolves in these regions, and the legal delisting battles in both regions. The low level of negative attitude expressions in the Red Wolf Recovery zone will be discussed in more depth below.

The Northern Rocky Mountains recovery zone was the only recovery zone region to experience an increasing trend in negative attitude expressions toward wolves, most likely accounting for the increasing trend in negative attitude expressions in the experience level variable (mentioned above) as well as the increasing trend in percentage of negative attitude expressions at the national level. The Northern Rocky Mountain recovery zone stands out from the other recovery zones for the unique and acrimonious public debate that polarized proponents and opponents of wolf reintroduction into the Yellowstone National Park (Paystrup, 1993; Wilson, 1997). Indeed, wolf recovery in the Northern Rockies continues to cause controversy. For example, the 2009 Final Rule delisting wolves in the Northern Rocky Mountain distinct population segment (DPS) drew approximately 240,000 public comments (E. Bangs, personnel communication, November 16, 2009).

Conversely, the Red Wolf recovery zone was the only recovery zone to actually experience a declining trend in negative attitude expressions. Although this trend should be viewed with caution, given the relatively small sample size of stories (N=79), public

debate regarding reintroduction of wolves in North Carolina came earlier in time (wolves were reintroduced beginning in 1987) and appears to have been far less controversial than the Northern Rocky Mountain reintroductions. In addition, the sheer number of wolves and the extent of their geographic range in these two different regions may also have affected the numbers of individuals who have had exposure to wolves and the levels of fear and risk perception associated with coming into contact with the animal. The Northern Rocky Mountain recovery zone has approximately 1,600 wolves while the Red Wolf recovery zone has only roughly 100 wolves (Defenders of Wildlife, 2009). Finally, red wolves smaller size may also have reduced perceptions of risk associated with the predator.

#### *Social and cultural context*

These differences could also be explained in light of social and cultural differences between residents of the different recovery zones. The Northern Rocky Mountain recovery zone, comprised of Montana, Idaho, Wyoming, Washington, Oregon, and Utah, is located in the West where population densities are lower, there are more public lands, and the economy is based more heavily on commodity production. Wilson (1997) makes a convincing argument for how wolves have become a symbol of a broader cultural conflict in the West. This debate can be traced back to a long-standing conflict over the ways in which federal lands should be managed and put to use. Specifically, many Westerners believe strongly in private property rights and therefore, are opposed to much of the Western landscape being “locked up” in national forests and parks. Despite the fact that the land belongs to the public, many ranchers and farmers believe it is their right to use the land for livestock grazing (Wilson, 1997).

Conflict with livestock has been a particular source of controversy regarding wolves and wolf reintroduction in the northern Rockies, an area where livestock interests are highly influential in politics. In a telephone survey, Lenihan (1987) found that the most important rationale for the opposition of wolf reintroduction was that livestock loss would be unacceptably high. Moreover, politicians and wildlife management agencies in the West have argued that wolves negatively impact big game populations and hunting opportunities (IDF&G, 2008), which could help explain opposition to wolves among some hunters. Lohr et al. (1996) found that the most common reason given for opposing wolf reintroduction in New Brunswick was that it would result in a deer population decline.

The Red Wolf recovery zone in North Carolina, on the other hand, is located in the Eastern portion of the United States where there are higher population densities, fewer public lands and less economic reliance on commodity-based production. Conflicts with livestock here are relatively few, and wolf populations and distribution have not reached a level where they are capable of affecting the primary big game species in the state—white tailed deer.

#### *Return to the theory*

While my results demonstrate a shift toward more negative public attitude expressions toward wolves in the last decade (1999 through 2008), there is theory to support the notion that attitudes toward wildlife and wolves should be continuing to become more positive. Inglehart (1995), for example, argued that intergenerational value shift occurs as a result of increasing levels of education, income, and urbanization among the populations of industrialized countries such as the United States and Canada. This

value shift leads to less materialist and utilitarian orientations toward wildlife and generally, more protectionist and positive attitudes toward wildlife (Manfredo, Teel & Bright, 2003). While it might be tempting to suggest that the data reported here are in conflict with Manfredo et al.'s (2003) hypotheses, there are several reasons why such a conclusion is not warranted. First, this study was designed to examine trends in attitudes toward wolves, not wildlife values or value orientations. Attitudes are relatively less stable than values and value orientations, and therefore more subject to short term fluctuations (Fulton, Manfredo, & Lipscomb, 1996). Second, textual phrases taken from news media content provide a rather gross measure regarding public opinion about a topic. The measures employed in this study were specific to wolves and were not designed to tap broader public views on the general value of wildlife. Finally, this study examined attitude expressions over a 10-year time period, which is likely insufficient for detecting broad shifts in societal views about wildlife in general (Bruskotter et al., 2007).

Ericsson and Heberlein (2003) provided evidence for another force that may be at work on the public's attitudes toward wildlife: increasing exposure to and experience with wolves. Their data suggest, and my results also support, that increasing exposure to wolves (after a period of no exposure) leads to more negative public attitudes, at least in the short term. Yet, while we can clearly see that attitude expressions are more negative in regions with new populations of wolves and in certain recovery zones, it is more difficult to decipher what is happening in the other regions of the country. Williams et al. (2002) recognized that attitudes that are not strong among the public may be susceptible to change and change is most likely to occur among individuals who have little experience with wolves and other large carnivores.

Another possible explanatory factor for the increasing negative trends toward wolves is the changing economic and national security conditions in the United States during the 2000s. In their content analysis of newspaper articles from 1900 to 1976, Kellert et al. (1982) found larger percentiles of utilitarian perspectives toward animals and animal use during war times. Similarly, Inglehart & Baker (2000) & Manfredi et al.'s (2003) research suggests that societies tend to focus more on material concerns when they feel threatened. "Should we enter into a period of increased warring or widespread disease, where affluence is threatened, one could predict a trend back toward utilitarian value orientations and materialist values" (Manfredi et al., 2003). It is therefore reasonable to surmise that the terrorist attacks of September 11<sup>th</sup>, 2001 and the Iraq war coupled with recent economic downturns could have led individuals to focus more on materialistic concerns over the past decade. In addition, heightened levels of general risk perception, as a result of these societal level conditions, could have led to higher levels of risk associated with wolves (Sjoberg, 2000). Such concerns and levels of risk awareness could help explain why people would call for increased depredation control (i.e. wolf management).

### **Focus of the debate**

Looking both quantitatively and qualitatively at the composition of attitude expressions allows us to see what the focus of the public discourse was in regards to wolves from 1999 to 2008. It is apparent that most of the discussion about wolves in the media had to do with wolves' impact on humans and human activity and the belief that wolves should be managed in order to reduce their "negative effects" on humans. Statements about the negative effects of wolves on humans often centered around the

ideas that wolves kill and/or injure livestock, that wolves kill dogs and/or other pets, and that wolves are dangerous and pose a serious threat to humans. Many of the expressions which indicated that wolves should be managed included phrases that wolves should/ought to be reduced in number and/or managed under state authority, that hunting of wolves should be allowed, and that wolves should not be reintroduced into their historical range. The following quotation illustrates both the notion that wolves should be managed and that wolves have a negative impact on humans:

“...reclassifying wolves to threatened status—the wolf's current status in Minnesota—would allow authorities in Wisconsin to trap and kill problem wolves, those animals that have killed dogs, calves, chickens or sheep...”  
(Vandenbrook, 1999, p. 1)

Running contrary to these ideas, however, was the third most frequently expressed idea that, rather than being controlled, wolves should be protected, reintroduced and/or released, that wolves belong in a certain state or region, that wolves should remain under federal protection, and that wolves should not be hunted or killed. Most of the public discourse regarding wolves related to humans and the animal's impact on human activities. Additionally, these attitude expressions point to the ongoing debate about the degree to which wolves should be managed and whether wolves should continue to receive federal protection under the Endangered Species Act (ESA) once they are recovered to the point of a biologically viable population.

The region in which the stories originated had a significant effect on the proportion of the attitude expressions. A larger proportion of protection-oriented expressions (comprising most of the positive attitudes) originated in states without

wolves and the Red Wolf recovery zone and a greater proportion of the management-oriented expressions (comprising many of the negative attitude expressions) originated in states with new wolf populations and in the Great Lakes and Northern Rocky Mountains recovery zones. Certainly this supports the finding that experience with wolves relates to more management-oriented expressions toward wolves. However, this debate also relates to the demographic composition of these different regions of the country. Given that individuals with farming and ranching occupations as well as hunters and rural residents tend to have more negative attitudes toward wolves (Williams et al., 2002; Bruskotter et al., 2007), it is not surprising that a greater proportion of management-oriented expressions occurred in the Northern Rocky Mountain recovery zone where a greater proportion of the population holds these livelihoods and pastimes.

Again, individuals who live in urban areas and individuals with higher levels of education and income tend to have more positive attitudes toward wolves (Williams et al., 2002 and Kellert 1985), helping to explain the higher proportion of protection-oriented expressions in the Red Wolf recovery zone in the southeastern state of North Carolina. The Great Lakes recovery zone is more difficult to characterize, however, given the demographically diverse population (including hunters and farmers, but also large numbers of urban dwellers) that resides in this region.

### **Limitations of the study**

The primary limitation of this study is its reliance on news media sources as an indicator of public opinion/attitudes. At best, content analyses are an approximation of how society views a particular topic or object, such as wolves, at a particular point in time. Although content analyses have been demonstrated to parallel the findings of

attitude surveys and public opinion polls (Fan, 1997), they are still an indirect, and relatively gross measure of the public's attitudes. Additionally, content analysis does not provide me with the necessary information to draw conclusions about attitudes as they relate to particular individuals. I can use content analysis, however, to talk confidently about trends in attitude expressions over time and the differences in attitude expressions between stories originating in different regions of the US and Canada,

In addition, I was limited by the time frame that I chose for this study. Although I hoped to examine trends in attitudes over a longer period of time, such as twenty or thirty years—which is more representative of a generation—the desire to reduce bias by including only newspaper sources that were available continuously over the entire time period of the study significantly reduced my timeframe to that of only ten years. Had I been able to include a longer time period, such as two or three decades, for analysis in the study, I could have spoken more confidently about trends in attitude expressions over a generation and perhaps related attitudinal trends to trends in underlying values and value orientations toward wildlife.

Due to constraints on time and resources, I chose to use only stories that were electronically available through LexisNexis academic database. Although the offering of newspaper sources within LexisNexis was substantial (139 sources encompassing 46 states and provinces), it was in no way inclusive of all newspapers and print media sources in the United States and Canada. Nonetheless, even if I collected print news media through microfilm or microfiche, it still would have been impossible to account for all sources of media in every state in the US and every province or territory in Canada. Therefore, I used the best means practicable to select a sample of newspapers sources that

was representative of the print news media in the United States and Canada. Moreover, LexisNexis academic is the source for news media used in prior Natural Resources studies (Bengston & Fan, 1999; Bengston & Fan, 1999; Bengston, Fan, & Celarier, 1999; Bengston, Potts, Fan, & Goetz, 2005; Bengston, Xu, & Fan, 2001; Webb, Bengston, & Fan, 2008; Wolch, Gullo, & Lassiter, 1997).

*Over-representation of urban and national papers*

It is also possible that my study may have over-represented newspaper sources in urban areas and under-represented newspaper sources in smaller towns, suburbs, and rural areas. If there was a bias in the over-inclusion of urban news publications; however, it would have likely been a bias toward more expressions of positive attitudes given that positive attitudes toward wolves are correlated to urban-dwellers and individuals with higher levels of income and education. My results, however, indicated that negative attitude expressions outnumbered the positive attitude expressions. In addition, newswires accounted for 40 percent of the coverage that I examined in my initial descriptive results and general time trends. I investigated the potential problem of over-representation of newswires and national newspapers in the data by examining time trends in national newspapers and newswires isolated from the other regional groups. I found that there was no discernable trend in negative attitude expressions and a very slight decline in positive attitude expressions in the national newspapers and newswires. Therefore, it is unlikely that this segment of the newspaper stories significantly affected the overall trend results.

### *Story length*

My study was also limited in that I did not account for story length (i.e. total number of paragraphs per story) in my examination of expressions of attitudes. Rather I chose to describe the expressions of attitudes in frequency format (i.e. the total number of positive or negative attitude expressions per year), in mean format (i.e. the average number of attitude expressions per story), or by percentage (i.e. the total number of positive attitude expressions, divided by the total number of all scored attitude expressions, multiplied by 100). In my initial descriptive report of the attitude categories, I did not account for the fluctuation in the numbers of stories per year rather they are represented visually through the graphs. In reporting the percentages of attitudes, however, I used the number of scored paragraphs as a proxy for the total number of paragraphs since it provided us with an approximation of the amount of overall discussion about wolves in the media during each year.

### *Neutral attitude expressions*

An additional limitation of my study is that I did not account for neutral attitude expressions toward wolves (i.e. phrases about wolves with no evaluative orientation) in the media. I considered scoring for neutral attitude expressions and concluded that this method would encompass too much of the “gray area” in the discussion regarding wolves. For simplicity sake, I choose to account for only positive and negative attitude expressions (and the attitude, belief and judgment categories within those summary groups) rather than including attitude expressions which were neutral toward wolves. Bengston et al. (2001) support this approach; they assert that neutral attitudes are harder

to find and identify in the news media than are arguments in favor of or opposed to a particular object or issue.

### **Management implications**

Social science research provides managers with the means to make sound policy and management decisions by providing accurate information about the state of the public's attitudes and how those attitudes are shifting over time. Wildlife managers who use public meetings, personal experiences, and other unsystematic processes to make important management decisions run the risk of operating on inaccurate information (Butler et al., 2003). This is because members of the public who are most vocal and assertive often are not representative of the opinion of the broader public (Bruskotter et al., 2007).

In April 2009, the Fish and Wildlife Service (FWS) published a final rule that removed gray wolves from the endangered species list in the Northern Rocky Mountains region. They based their delisting rule on a thorough review of the biological and ecological literature on wolves, yet included only one empirical social science study in their analysis. After citing a meta-analysis of attitudes toward wolves over time (i.e. Williams et al., 2002), FWS concluded that “attitudes toward wolves have improved greatly over the past 30 years” (74 Federal Register 15,123). My results provide evidence that this assumption is inaccurate and misleading for wildlife managers and policy-makers.

Despite a number of societal indicators which demonstrate support for wildlife, human tolerance—in the form of attitudes and behaviors—continues to be the primary threat to the long term success of wolves (74 Federal Register 15,123). In 2008, 160 out

of 180 FWS-documented wolf mortalities in the central Idaho Recovery area were human-caused while only three were deemed natural (74 Federal Register 15,123). Moreover, nearly three quarters of all wolf mortalities in the Greater Yellowstone recovery area (where wolves are given additional protections) were human-caused (74 Federal Register 15,123). These on-the-ground findings, paired with my results of increasing negative attitude expressions toward wolves over the past decade, suggest the need for a critical evaluation of the assumption that attitudes toward wolves are continuing to become more positive or protectionist. Indeed, a previous attempt to reintroduce wolves into Michigan's Upper Peninsula in the 1970s failed largely because of human-induced mortality (Kellert, 1996). Deeply ingrained anti-predator and anti-government attitudes were identified as significant reasons for the failure of this reintroduction (Hook & Robinson, 1982). By making unfounded assumptions about attitudes toward wolves and prematurely lifting endangered species protections, wildlife agencies run the risk of repeating such mistakes with wolf populations.

### **Future research**

Additional research on trends in public attitudes toward wolves, and more broadly toward wildlife, is necessary to inform policy-makers and wildlife managers. My research sought to examine the trends in positive and negative attitude expressions toward wolves over the past decade and to look at regional differences within those trends. This study was the first of which I am aware to use a computer content analysis to analyze public attitudes toward wolves as expressed in the print news media. Content analyses offer a reliable, expedient and alternative method of gauging public opinion toward wildlife when longitudinal survey data do not exist or are not practical to collect. I

suggest future use of computer content analyses to measure societal level attitudes, beliefs and values toward wildlife or specific species of concern. The benefits of using computer content analyses include the ability to update information easily, expand the research question to include additional issues, and extend back or forward in time as more newspaper sources become available online (Bengston et al., 1999).

However, in addition to the use of content analyses, attitudinal surveys may also be developed with time trend analyses in mind. For example, social scientists could seek to collect scientific information based on established methodologies which will allow for comparison to historical data. When researchers implement surveys using novel survey designs, they should be conducted and documented in a way that allows for straightforward replication in future studies. In addition, social scientists may seek to expand their geographic area of study by working in collaboration with other researchers in the university or government setting.

### **Summary**

This study was the first of which I am aware to use a computer content analysis to study public attitude expressions toward wolves at a national level and within regions based on the public's level of exposure to wolves. These findings add to a body of literature which has been somewhat inconclusive about change and the direction of change in attitudes toward wolves since the 1970s. This research is particularly timely given the Fish and Wildlife Service's recent decision, in April 2009, to delist the gray wolf in the Northern Rocky Mountains region. In their delisting, FWS concluded that attitudes toward wolves have improved or are improving, yet based this assertion on little consideration of social science research (74 Federal Register 15,123). My findings give

reason to suggest that attitudes may actually be increasingly negative toward wolves and particularly in regions with new wolf populations and in recovery zone regions where the public is gaining new exposure to wolves. The gray wolf is a prime example of a species which can benefit from the use of human dimensions research in management decisions. It behooves wildlife managers to collect accurate and up-to-date information about public attitudes toward species and to use that information to make informed choices in order to better provide for the continued survival of imperiled species.

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APPENDIX A  
REGIONAL VARIABLES DEFINED

<b>Experience with wolves variable:</b>	<b>States or provinces included in the category:</b>
States/provinces with permanent wolf populations	Alaska, Minnesota, Alberta, British Columbia, New Brunswick, Ontario, Quebec
States with relatively new wolf populations	Idaho, Montana <sup>a</sup> , Wisconsin, Wyoming, New Mexico, Arizona, North Carolina
States in recovery zones	North Dakota, South Dakota <sup>a</sup> , Illinois, Indiana, Ohio, Iowa, Utah, Washington, Oregon, Texas
States without wolves	Remaining states in US <sup>b</sup>
National newspapers and newswires <sup>c</sup>	

<sup>a</sup> Montana and South Dakota were two of the states for which there were no newspaper sources available

<sup>b</sup> States that were missing from the analysis, due to a lack of newspaper sources, were Delaware, Connecticut, Hawaii, Kansas, Kentucky, Mississippi, and Vermont

<sup>c</sup> Only included US national newspapers and newswires (Canadian national newspapers and wires was included in the states/provinces with permanent wolf populations)

<b>Recovery zone variable:</b>	<b>States or provinces included in the category:</b>
Northern Rockies recovery zone	Montana <sup>a</sup> , Idaho, Wyoming, Washington, Oregon, Utah
Mexican Gray Wolf recovery zone	Arizona, New Mexico, Texas
Great Lakes recovery zone	Minnesota, North Dakota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Iowa, South Dakota
Red Wolf recovery zone	North Carolina
Non-recovery zone with wolves	Alaska, Alberta, British Columbia, New Brunswick, Ontario, Quebec
Non-recovery zone without wolves	Remaining states in US <sup>b</sup>
National newspapers and newswires <sup>c</sup>	

<sup>a</sup> Montana was one of the states for which there were no newspaper sources available

<sup>b</sup> States that were missing from the analysis, due to a lack of newspaper sources, were Delaware, Connecticut, Hawaii, Kansas, Kentucky, Mississippi, and Vermont

<sup>c</sup> Only included US national newspapers and newswires (Canadian national newspapers and wires was included in the states/provinces with permanent wolf populations)

APPENDIX B

LEXISNEXIS SEARCH COMMAND TO LOCATE STORIES ABOUT WOLVES

headline(wolf OR wolves) AND (Atleast4(wolf OR wolves) OR ((gr\*y or mexican or timber) pre/1 (wolf or wolves))) AND NOT (Net sales OR Corporate OR conglomerate OR Wolf camera OR wolf road OR Wolf Trap Farm OR Wolf Trap OR Peter Wolf OR Wolf Haldenstein OR Wolf Popper OR wolf block OR weddings OR music review OR Opera OR Sea Wolves OR Markus Wolf OR Iraq OR Wolf Prize OR terrorism OR supremacist OR hate group OR pop music OR crime rate OR gang OR stockholder or Great Wolf Resorts OR Great Wolf Lodge OR cinema OR orchestra OR album OR home appliance OR obituary OR paid notice OR Sudan OR Frank Wolf OR Naomi Wolf OR Virginia Wolf OR sports news OR baseball OR hockey OR tennis OR football OR basketball OR coach OR penalty kick OR pitching OR first quarter OR goaltender OR Admirals OR Rider OR field-goal OR free throw OR point guard OR Chicago Bulls OR The Spurs OR bench player OR Clippers OR natural gas OR merger OR basic energy services OR radio advertising OR Air Force OR wolf prize OR Pope OR Dances with Wolves OR wolf creek OR teen wolf OR Kevin Costner OR drunk! Driver OR DUI OR wolf trap's face OR grey wolf inc OR astronaut OR intellectual property OR patent OR Law order OR video game Dick Wolf OR Wayne Wolf OR Kate Wolf OR Alice Wolf OR Vicente Wolf OR Jack Nicholson OR Mike Nichols)

APPENDIX C  
CONCEPTUAL CODING CATEGORIES

### SIMPLE DIAGRAM OF CONSTRUCTS

<b>Attitudes</b>	<b>Beliefs</b>	<b>Judgments</b>
<p>Wolves are good (+)</p> <p>Wolves are bad (-)</p>	<p>Wolves Negatively Impact Ecosystems/Decimate Game (-)</p> <p>Wolves Positively Impact Ecosystems (+)</p> <p>Wolves Are Over-Abundant (-)</p> <p>Wolves Are Endangered (+)</p> <p>Wolves Have a Negative Impact on Humans/Human activity (-)</p> <p>Wolves Have A Positive Impact On Humans/Human Activity (+)</p>	<p>Wolves should be managed (-)</p> <p>Wolves should be protected (+)</p>

## DETAILED DIAGRAM OF CONSTRUCTS

### ATTITUDES

- WOLVES ARE GOOD:
  - Wolves are good
  - Wolves are beautiful
  - Wolves are gentle
  - Wolves are wise/intelligent
  - Pro-wolf
  - Humans love, like, care about wolves
- WOLVES ARE BAD:
  - Wolves are bad/evil
  - Wolves are ugly, unsightly
  - Wolves are vicious, harmful
  - Wolves are killing machines
  - Anti-wolf
  - Humans hate, dislike, do not care about wolves

### BELIEFS

- WOLVES NEGATIVELY IMPACT ECOSYSTEMS (I.E. DECIMATE GAME POPULATIONS):
  - Wolves decimate deer and elk
  - Wolves kill/eat too many moose, deer, etc.
  - Surplus killing/overkill
- WOLVES POSITIVELY IMPACT ECOSYSTEMS:
  - Restoring nature's balance, return missing component of wilderness
  - Restoring balance for game populations (i.e.-balance deer/elk populations)
  - Offer natural balance, ecological health and recovery
  - Nature needs top predators
  - Cull the weak/old
- WOLVES ARE ABUNDANT:
  - Too many, pests, like vermin
  - Not endangered, threatened, imperiled
  - Have recovered enough, populations have grown rapidly
- WOLVES ARE ENDANGERED:
  - Too few, are rare

- Endangered, threatened, imperiled
- Numbers of wolves have decreased

- WOLVES HAVE NEGATIVE IMPACT ON HUMANS/HUMAN ACTIVITY:
  - Kill or injure livestock
  - Kill or injure pets
  - Dangerous/pose threat to humans, children, pets
- WOLVES HAVE A POSITIVE IMPACT ON HUMANS/HUMAN ACTIVITY:
  - Increase tourism, economic value
  - Reduce rodent populations
  - Valuable to humans, part of natural heritage, enjoyable to see/ hear

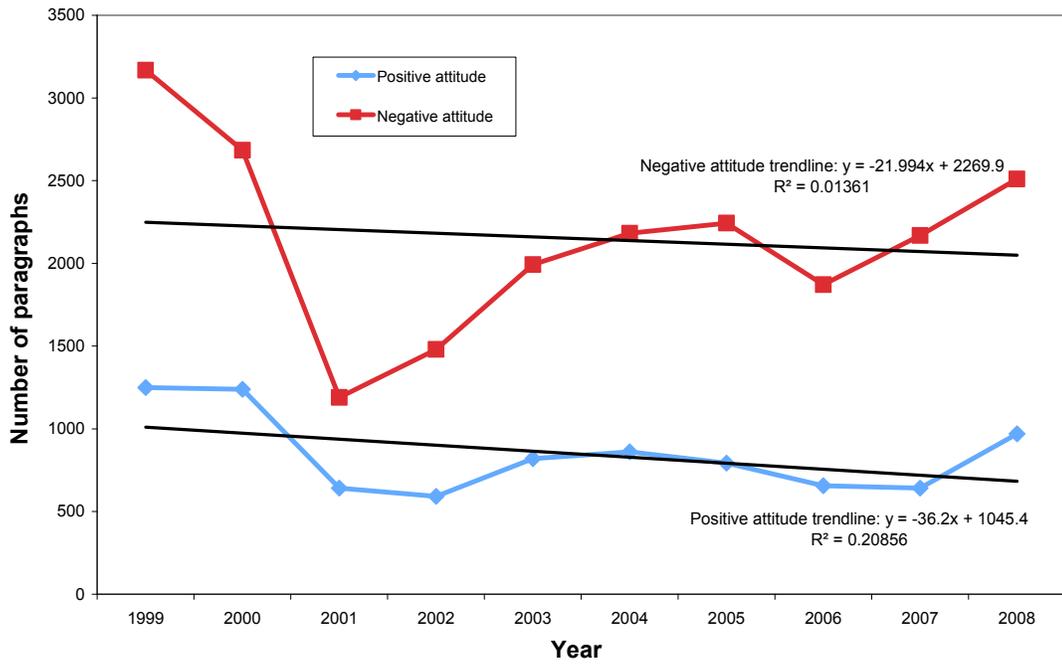
### **JUDGMENTS**

- WOLVES NEED TO BE MANAGED:
  - Wolves should be managed/controlled
  - Wolves should be killed/hunted/reduced in number
  - Wolves should not be restored/reintroduced/ or protected/preserved
  - Wolves should be managed under state authority (removed from endangered species list)
- WOLVES NEED TO BE PROTECTED:
  - Wolves should be restored to historical range/reintroduced
  - Wolves should be protected/preserved
  - Wolves should not be killed/hunted/managed/controlled
  - Wolves should remain listed under endangered species act

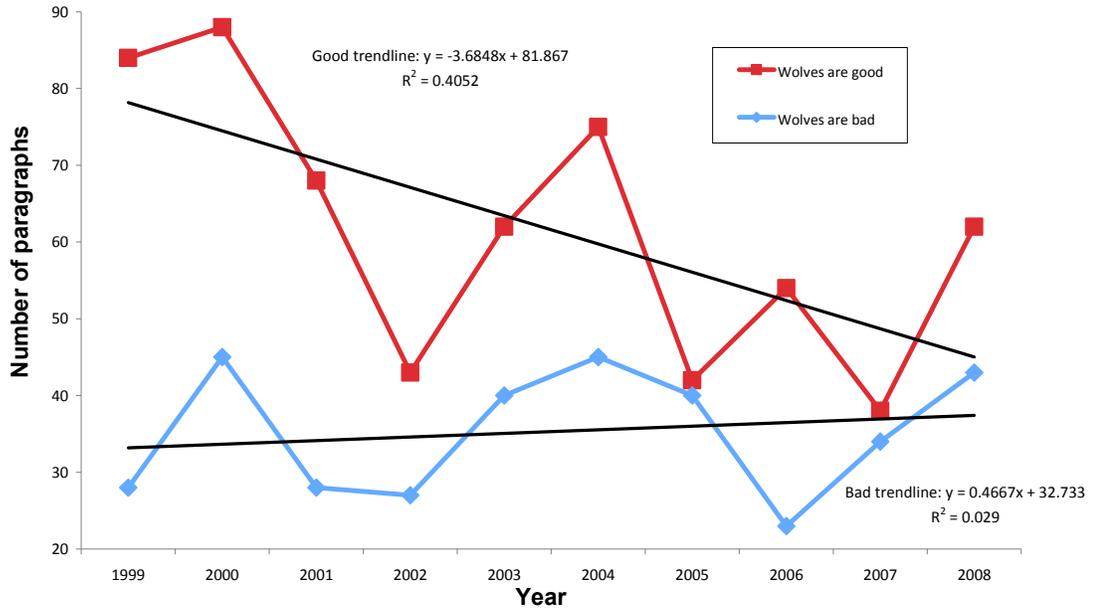
APPENDIX D

ALTERNATIVE PRESENTATION OF TRENDS IN ATTITUDE EXPRESSIONS,  
1999 THROUGH 2008 (FREQUENCY OF PARAGRAPHS)

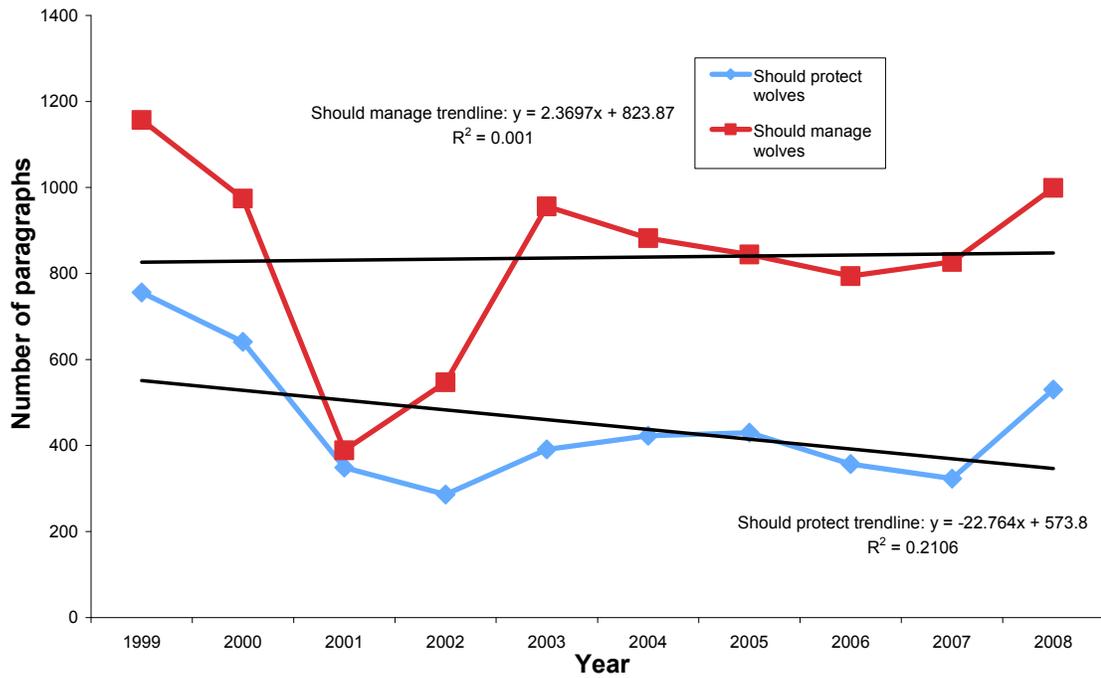
### Frequency of positive and negative attitude paragraphs per year



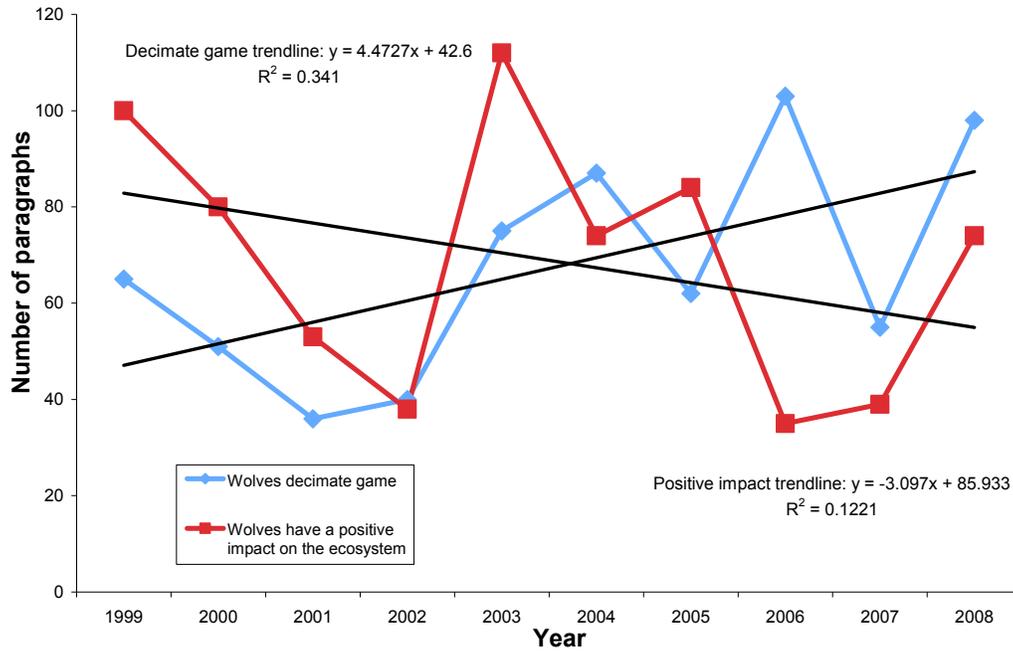
Frequency of wolves are good and wolves are bad paragraphs per year



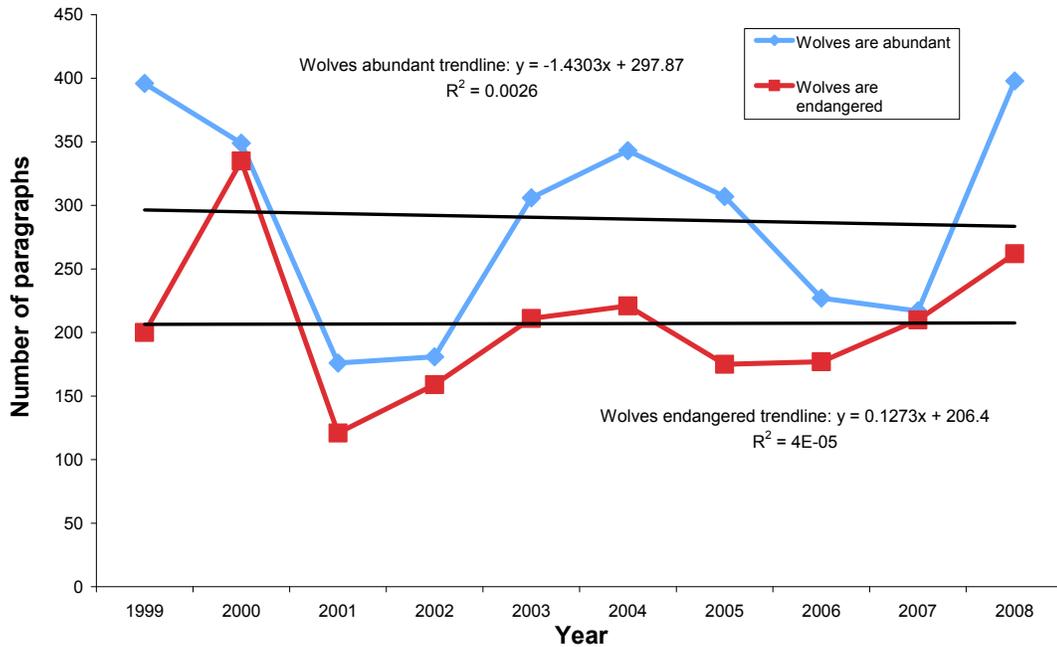
Frequency of should protect wolves and should manage wolves paragraphs per year



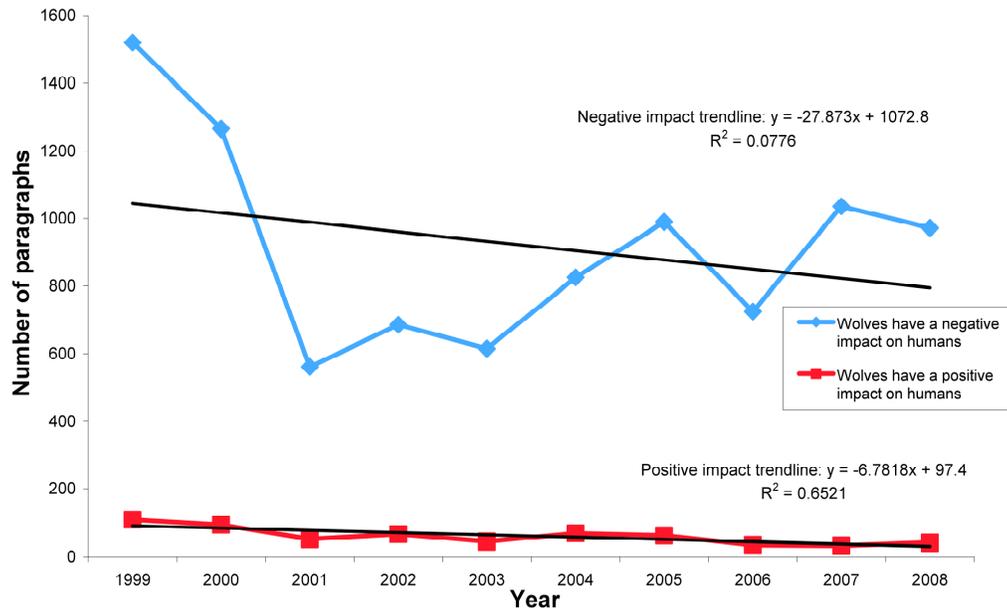
**Frequency of wolves have positive impact on ecosystems and wolves decimate game paragraphs per year**



**Frequency of wolves are endangered and wolves are abundant paragraphs per year**



### Frequency of wolves have positive impact on humans and wolves have negative impact on humans paragraphs per year



APPENDIX E

CODING RULES FOR THE INFOTREND© COMPUTER SOFTWARE

FILTSCOR rules ; last written by FILTSCOR 09/07/2009;17:09  
 FSR1 OUTSTRING=# --> # is output if idea found

Wrongkind

{ hybrid}s { wolf hybrid}s { hybrid wolf } { wolf - hybrid}s { wolf - dog}s { wolf dog}s { wolf river } { wolf lodge } { wolf lake } { wolf covered bridge } { wolf bridge } { wolf man } { wolf boy } { wolf woman } { wolf girl } { frank r . wolf } { peterson } { bangs } Irrelevant

{ not do } { no limit } { net gun } { wolf roundtable } { wolf of wall street } { bad weather } { hatfield } { anti-lice } { endangered species act } { likely } { no. } { bad teeth } { helen wolf } { wolf haven } { good enough } { any good } { good news } { good idea } { generations removed } { a bit } { barry } { good people } { for good } { wolf recovery foundation } { manage lice } { good thing } { looking good } { more important } { little bit } { sea wolf } { gorgeous place } { eradicate infestations } { eradicate lice } { manager } { return of packs } { love to hate } { scott wolf } { wolf habitat } { hang out } { cowardice } { remove his traps } { return a call } { important for } { creativity being important } { two - legged wolves } { bad for the image } { lice problem } { people management } { bad reputations } { bad luck } { reasonable evil } { bad news } { myths both good and bad } { bad decision } { wolf whistling } { wolf whistle } { balancing act } { bad plan } { bad joke } { bad for him } { felt bad } { animals with rabies } { harmful to her physical and psychological } { good home } { bad wolf sculpture } { negative aspects } { hybridization } { bad name } { bad leg } { bad moods } { bad results } { bad things } { bad winters } { human wolf } { anti - wolf coalition}s { anti - wolf interest}s { anti - wolf group}s { anti - wolf advocates } { pro - wolf advocates } { wolf advocates } { pro - wolf interest}s { pro - wolf group}s { anti - palin } [wolf ad] { previously eradicated } { historically eradicated } { wolf association } { bark } { good for the wolves } { disease control } { good yellowstone } { bad thing } { introduced a bill } { bartlett } { against footage of wolves } { no proof } { good example } { growl of disagreement } { overstated the danger } { potential threat } { wolf said } { my wife and i love it } { man to attack } { key lake } { workers returning to camp } { he was treated and released } { manage its elk and deer } { important step } { as good a solution } { livestock growers association } { livestock industry } { wolves that had killed livestock } { wolves only killed } { wolves killed only } { big bad wolf } { big . bad wolf } { that bad } { big and bad } { problem is } { bad week } { bad science } { both good and bad } { wolf st } { must land } { howlin ' wolf } { bad rap program } { bad idea } { bad deal } { reintroduced wolf population } { reintroduced wolves' } { eradicated wolves } { too many people } { protect livestock } { protecting their livestock } { protection from wolves } { protect the livestock industry } { no - shoot endangered species } { support packs of wolves } { pleasant valley } { could support } { prey base to support } { peninsula a key part } { prevent a deadly attack } { finance the management } { post - delisting } { wolf plan } { endangered species coordinator } { park could support } { wolves are afraid of people } { balanced the diet } { dog food } { pro - agriculture } { anti - environmentalist } { quebec was bad } { killer gases } { which manages } { residents prefer to eat } { wolf case } { non - lethal } { not apologize } { why should } { endangered species specialist } { no evidence of wolves having killed people } { rare incident } { advocate for senior citizens } { ignore wolf } { wolf coordinator } { love the wilderness } { wildlife manager}s { management of multi - use } { support the demand } { preventive } { necessary for a healthy population } { poisoning of streams } { released a plan } { release a plan } { no good at all } { pay for their management } { release of a dangerous animal } { prevent attacks } { have a wolf } { a wolf jumped } { lost their balance } { growling over wolves } { eat the bulbs } { reactions to them in balance } { goose population } { reduce hooking mortality } { opposing views } { rabid hunters } { hardly overrun with wolves } { promoting the conference } { ideal region for a wolf comeback } { animal control officer } { in favor of natural prey } { support staff } { against researcher of park wolves } { important roles in myths } { too dangerous for the wolves } { control pit bulls } { stop buying and breeding } { bite through its chain } { pose threat to red wolves } { threat to gray wolves } { threat to wolf } { threat to wolves } { eat deer } { should wisconsin allow hunting } { balance all those factors } { if reintroducing wolves } { judge turned aside a challenge } { unlikely to stop } { nothing to stop those wolves } { killing an elk every day } { eat elk } { questioned what wolves } { healthy wolf attack } { the public supports wolves } { predator / prey balance } { large male wolf appeared injured } { water - control } { permit system } { allowed has been reduced } { what the wolves eat } { hormonal balance } { poach deer } { poaching deer } { hurt in pursuit of a bear } { endangered species check - off } { endangered resources } { injured or killed by bears } { killed by bears } { injured by bears } { bonny wolf } { relocate near weston } { bruce wolf } { good reporter } { shot way low } { said wolf } { healthy wolf killing } { endangered species laws } { releasing their dogs } { winning streak against } { so large a territory } { favorite } { last stop for a wolf } { challenge in recovery } { department of arkansas heritage } { department of heritage } { environmental protection } { heritage ranch } { heritage state park } { world heritage sites } { disease management } { heritage area } { introduce the legislation } { protecting private property rights } { heritage of colonization } { wolf recovery manager}s { turner endangered species fund } { not only } { wolf heritage } { outdoor heritage alliance } { dangerous game } { pro - wolf crowd } { coyotes amazing animals } { pro - wolf scientist}s { pro - wolf environmentalist}s { wolf country usa } { bishop wolf } { slow comeback } { bear population } { opposite } { associated press } { management tools }

Bear

{ grizzly } { grizzly bear } { black bear }

SManage

{ only good wolf is a dead wolf } { wolf hanging above my piano }

SProtect

{ bounties have no place }

DoNotBelong

{ wolves don 't belong } { wolves do not belong }

Belong

{ belong }

Wild

{ wild}erness { here } { there }

Oppose

[combined with shouldnot category] { shouldn ' t } { ought not } { don ' t need to } { must not } { do not want } { don ' t want } { not necessary } { oppos } ing,ed,ition { prohibit } ing,ed,s { barring } { bars } { against } { prevent } ing { unnecessary } { halt } ed,ing,s { war on } { ban } ned { fined } { fined for } { block any effort } { block } { reject } ed { challenge } d,s { challenging } { stop } ed,ping,s { condemn } ed,ing,s { will not allow } { not allow } { cannot be } [ sue ] [ take them to court ] { no longer can } { suspend } ed,ing,s { protest } ing,ed,s { little public support } { repealed laws allowing }

Negation  
{ never } { no } { not } { none } { nothing } { without } { wasn ' t } { don ' t } { don ' t } { won ' t } { will not } { doesn ' t } { aren ' t }

Whether  
{ whether } { if } { once }

Should  
{ should } { ought } { demand } ing,ed { sought } { seek } [ seeking to have ] [ seeking to ] { must } { is necessary to } { necessary to } { is necessary } { necessary for } { necessary } { obligation to } { petition } s,ed,ing { push } ed,ing,es { insist } s,ed,ing { press for } { pressed for } { press } ing,ed,es { want } ed,ing,s { desire } ed,ing,es { would like } { propose } s,ed,ing { authorized to } { authoriz } e,ed,ing,es { allow } s,ed,ing { able to } { able } { permits to allow } { permit to allow } { permit for } { permit } ed,s,ing { permission } { calls for } { call for } { calling for } { called for } { calls to } { call } ed,ing,s { urge } s,d { urging } { goal } { proposal } s { encourag } ed,ing,es { hope } d,s { hoping } { ask } ed,s,ing { vote for } { voted for } { voting } { vote } d,s { request } ed,ing,s { initiate steps that } { legal to } { legal for } { legaliz } e,ed,ing,es { intent on } { set up } { plan } s,ed,ing { offer } ed,ing { commit } ted,s,ing { can } { could } { may } { order } s,ing,ed

ShouldAfter  
{ would be allowed } { deserve } s { permitted }

Supporters  
{ supporter } s { proponent } s { worshiper } s

Opponents  
{ opponent } s

Support  
{ public support } { support } s,ed,ive { advocate } { fight for } { favor } s { promot } e,ed,ing,es { upheld } { refused to prohibit }

ReduceGame  
{ shutdowns of elk hunting } { elk decreasing } { moose decreasing } { elk decreases } { moose decreases } { decrease in elk } { decrease in moose } { fallen so low } { wildlife has been depleted } { ran the elk out } { reduce the number of other animals } { elk herd on the verge of extinction } { animals ' impact on deer and elk } { predator pit } { right down where the game herds are }

WordGone  
{ gone }

WordEat  
{ eat }

WordTake  
{ take }

EcosystemBal  
{ overgrazing } { help thin out the deer } { take out the least fit elk } { abundant prey } { populations in check } { ecological link } { solve deer overpopulation } { sustainable levels } { weeding out the old and infirm } { overabundant coyote populations } { naturally functioning ecosystem } { biodiversity } { natural balance } { balance of nature } { ecological health } { ecological character } { trophic cascade } { top predator } { cull the weakest } { oldest and sickest } { missing component } { cascade } { biological health } { wholeness of } { natural remedy } { unique ecosystem } { important link } { biological chain } { ecological relationships } { truly native animals } { ecological balance } { help yellowstone blossom } { environmental transformation } { ecological recovery } { magnificent diversity } { increase in aspen } { control the spread } { control elk } { control deer }

Ecosystem  
{ are necessary to the earth } { advantages for the ecosystem } [ natures,al ] [ wilderness ]

WordCrucial  
{ key } { umbrella } { top } { crucial } { vital }

WordPart  
{ link } { part } { piece }

WordNiche  
{ niche }

WordSpecies  
{ specie } s

WordCurb  
{ curb } s,ed,ing

WordDisease  
{ wasting disease } { disease }

WordEcosystem  
{ ecosystem } s { ecological } { environment }

WordIndicator  
{ indicator } { indication }

WordForest  
{ forest } { vegetative structure }

WordHealth  
{ health } y,ier

WordMaintain  
{ maintain }

WordOldSick  
{ old } { sick }

WordRepair  
 { repair}ed,ing,es  
 WordFoodChain  
 { food chain }  
 WordRegulate  
 { regulat}e,es,ing,ed  
 WordPredator  
 { predator }  
 WordPositive  
 { positive }  
 PosEffect  
 [category use for fsr2 rules to create positive effect on ecosystem rule ]  
 NegEffect  
 [ for fsr2 rules only]  
 WordRole  
 { role }  
 WordBalance  
 { balance }  
 WordDiversity  
 { diversity }  
 WordNatural  
 { natural }  
 WordNeed  
 { need }  
 Manage  
 { predator control } { wolf control } { wolf management } { state wolf management plan } { public harvest } { wolf delisting } {  
 rather than endangered } { threatened , not endangered } { threatened to remove } { down - listing } { status changed to threatened } {  
 roll back protection } { population control } { control the population } { listing them as predators } { wolf - management bill } { wolf -  
 management plan } { wolf - management } { rid of wolves } { eradicat}e,ed,ing,ion { exterminat}e,ed,ing,ion { eliminat}e,ed,ing,ion  
 { lethal control } { lethal } { poison}s { bounty,y,ies { be thinned } { poach}ed,ing,ers { shoot , shovel and shut up } {rid of } { wolf -  
 control } { predator - control program } { have no place } { dead wolves } { dead wolf } { wolves to be killed } { euthanize}d {  
 denning } { gunned } { wolf hunt}s { hunt } { trap } { harass } { anti - predator policy } { wolf eradication } { to threatened }  
 WordControl  
 { control}ing,led,es  
 WordEliminate  
 { eliminate}ed,ing,s  
 WordPups  
 { pup}s  
 WordManage  
 { manag}e,ed,ing,es { management }  
 WordList  
 { list }  
 WordReduce  
 { lessen}ing { reduced } { reducing } { reduction } { will reduce } { lift}ed { weaken }  
 Remove  
 { remov}e,ed,al,ing { reclassif}ied,y,ying { rather than } { downgrad}e,ed,ing { upgrad}e,ed,ing { relax}ed,ing { delist}ed,ing {  
 downlist}ed,ing { reduce } { weed out }  
 WordShoot  
 { shoot}s { shot } { shooting }  
 WordStatus  
 { status }  
 WordChange  
 { chang}e,ed,ing  
 WordRare  
 { rare }  
 WordLoss  
 { loss } { lost }  
 Threateningwolfbeh  
 { biting someone } { fearless behavior } { habituated } { wolf aggression } { caused a problem } { wolves attacking } { attacks by the  
 large predator } { predatory wolf } { predatory wolves } { bite wound } { killer dog } { wolf depredation } { depredation } { loss of  
 livestock } { stalk}ed { livestock lost } { lost livestock } { livestock loss } { cattle loss } { attacks on livestock }  
 Threat  
 { wolf attack}s { threat } { threats } { threatening } { threaten } { harm } { non-compatible } { danger}ous { troublemakers } {  
 troublesome } { killer}s { bit } { bite } { bitten } { terroriz}e,ed,ing,es { depriv}e,ed,s,ing { growl}s,ing,ed { hurt}ing { hysteria } {  
 problems from } { conflict with } { conflicts between } { attacked wife } { attacked pets } { attacked children } { lunged at } {  
 predators as pests } { crippling } { depredatory } { endanger } { safety concern}s { costly } { child - eating } { livestock death}s {  
 injure}d { create problems } { killed by a pack } { wolf food } { wolf incident}s { trouble with livestock } { losses due to } { livestock  
 has taken a hit } { being eaten alive } { attack}ed,ing,s { grabbed } { chas}e,ed,ing { snatch}ed,ing { brutal killing}s { risk }  
 WordKill  
 { kill }

WordDeath  
 { death } { dead }  
 Decimate  
 { decimat}e,es,ed,ing { destroy}s,ed,ing { destruction } { maul}ed,ing,s { devour}ing,ed,s { raid}s,ing { annihilat}e,ed,ing,es {  
 devastat}e,es,ing { depredat}e,es,ing,ation,ations { menac}e,ing { slaughter}ed { thin}ning  
 EatTooMany  
 [for fsr2 rules only]  
 KillTooMany  
 [for fsr2 rules only]  
 WordDecline  
 { declin}e,ed,ing { absence }  
 WordDie  
 { die }  
 WordAffect  
 { affect}ing, ed { effect}ing,ed { impact}ed,ing  
 WordNegative  
 { negative }  
 GameDie  
 [used for decimate game category]  
 GameAffected  
 [used for decimate game category]  
 Prey  
 { prey}s,ed,ing { kill or harm } { kills } { killed } [ eat ][ kill,ed,s,ing,ings]  
 { took } { cull}s { predation }  
 Killings  
 { killing}s  
 Humans  
 { cattleman } { cattlemen } { residents } { child}ren { farmer}s { econom}y, ies { livelihood}s { industry } { human safety } {  
 livestock owners } { livestock group}s { wife } { man's head } { man } { woman } { pet owners }  
 Animals  
 { farm animal}s { livestock } { sheep } { cow}s { cattle } { llama}s { turkey}s { pet}s { dog}s { goose } { geese } { surplus } {  
 horse}s { cattle herd } { herd of cattle } { poodle } { hounds } { puppies } { puppy } { cat}s { colt } { calf } { calves } { domestic  
 animal}s [ calf & calves -removed because can also be elk calves]  
 Fear  
 { fear}ed { afraid }  
 Protect  
 { them to come here } { establish packs } { keep the wolf alive } { reprieve from death } { re - establish } { repopulat}e,es,ing,ed {  
 releas}e,ed,ing,es { wolf restoration } { wolf reintroduction } { wolf release } { re - establish}ed,ing,es { ensure wolves survive } {  
 rehabilitat}e,ation, ing,es { reintroduc}tion,e,ed,es,ing { relocat}e,ed,ing,es { return}ed,ing,s { introduc}e,es,ed,tion,ing { wolf  
 recovery } { wolf care } { sanctuar}y,ies { wolf back } { ensure the population thriv}es { be banned } { safe for large carnivores } { co  
 - exist with wolves } { learn to live with } { let wolves be } { be left alone } { allow wolves in } { less control } { roam free }  
 WordRecover  
 { recover}s,ed,ing  
 WordProtect  
 { protection}s { protect}s,ing,ed,ion  
 WordRestore  
 { restor}e,ed,ing,ation,es  
 WordRemain  
 { remain}ed,ing,s { keep}ing,s  
 WordAnimal  
 { animal}s  
 WordFederal  
 { federal }  
 WordSafe  
 { safe for }  
 WordCarnivore  
 { carnivore}s  
 WordBring  
 { bring}ing  
 WordWelcome  
 { welcome}d  
 WordBack  
 { back }  
 WordPop  
 { population}s { pack}s { animal 's range } { count }  
 { number}s { range}s  
 WolfPop  
 [for fsr2 purposes only]  
 Illegal  
 { illegal }

WordTooMany  
 { too many } { too much } { overkill }

WordRebound  
 { rebound } ed,s,ing

WordExtinction  
 { extinct } ion { dying out }

WordModerate  
 { moderat } e,es,ing,ed { stability }

WordEnsure  
 { ensure }

WordSurvive  
 { survive }

WordImportant  
 { important }

WordMoratorium  
 { moratorium }

WordViolation  
 { violation }

WordLaw  
 { law }

WordClassify  
 { classif } ication, y,ied,ying

WordBounce  
 { bounce } d

WordSuccess  
 { successful } ly { strong } { remarkable }

WordRecovery  
 { recovery } { comeback } { re-established }

WordBrink  
 { brink } { threshold } { edge }

WordEnough  
 { enough }

Abundant  
 { overfill } ing,ed  
 { multiply } ing { multiplied } { crawling } { balloon } ed,ing { surg } ing,es,ed { flourish } es,ed,ing { thrive } e,ing { vermin } { pest } s { running amok } { abundant } { abundance } { nuisance species } { plentiful } { capacity } { overrun with } { everywhere } { overpopulated } { so prevalent } { prolific } ally { out of room } { rampant } { explosion } { expansion }

Endangered  
 { endangered } { threatened } { imperlied } { at - risk } { at risk } { species at - risk } { species at risk } { in danger } { too low } { not enough } { too few } { rare species } { rare subspecies } { rare sub - species } { rare animal } s { rare creature } s

AreEndan  
 [for fsr2 rules only]

Good  
 { good } { beneficial } { gorgeous } { intelligent } { smart } { beautiful } { magnificent } { amazing } { kindred spirits } { gentle } { tender - hearted } { tender } { devoted } { wise } { pleasant } { valuable } { loving } { playful } { attractive } { striking } { eye - catching } { handsome }

Bad  
 { bad } { evil } { harmful } { ferocious } { detrimental } { vicious } { cruel } { violent } { killers } { ugly } { unpleasant } { foolish } { stupid } { enemy } { enemies } { horrible } { dreadful } { mean } { nasty } { brutal } { malicious } { pitiless } { hideous } { unsightly } { revolting } { repulsive }

AreGood  
 [for fsr2 only]

AreBad  
 [ for fsr2 only]

Wolfs  
 [this category for coding purposes only]

WGood  
 { beautiful creature } s { amazing creature } s { gentle creature } s { wise creature } s { gorgeous creature } s { magnificent creature } s { beautiful animal } s { amazing animal } s { magnificent animal } s { gentle animal } s { wise animal } s { gorgeous animal } s { intelligent animal } s { intelligent creature } s { bad wolf not so bad after all } { wolf as cause for celebration }

WBad  
 { bloodthirsty killers } { killing machine } s { bad creature } s { evil creature } s { harmful creature } s { ferocious creature } s { vicious creature } s { cruel creature } s { violent creature } s { ugly creature } s { unpleasant creature } s { foolish creature } s { killer creature } s { killer dog } s { bad animal } s { evil animal } s { harmful animal } s { ferocious animal } s { vicious animal } s { cruel animal } s { violent animal } s { ugly animal } s { unpleasant animal } s { foolish animal } s { killer animal } s { serial killer } s [ fear ] [ fierce ] [ problem ]

HelpingVerb  
 { is } { are } { were } { was } { still } { classified as } { as an }

BenefitHum

{ decreased rodents } { valuable assets } { valuable to human}s { heritage } { wolf - related ecotourism } { wolf paraphernalia } { increase in tourism } { increase tourism } { draw visitors to } { treasure } { inestimable value } { economic windfall to the area } { buoy tourism } { aesthetic standpoint } { positive experience } { exciting for people } { thrilling experience } { aesthetic } { spiritual } { look forward to seeing } { thousands of visitors } { visitors } { tourist attraction } { wilderness experience } { valuable experience } { future generations to enjoy }

WordHelp

{ help}s,ed,ing { benefit}s,ed,ing { improv}e,ed,ing,es { boost}ing,s,ed { enrich}es,ed,ing

ImproveHealth

[ for fsr2 purposes only ]

WordTourism

{ tourism } { eco - tourism } { tourist }

WordValue

{ valu}e,able

WordEconomy

{ economy } { economic } { economies }

WPosImpHum

{seeing a wild wolf } { opportunity to see a wolf } { love to see a wolf } { love to see wolves } { wolves are part of their culture } { wolves can be good neighbours } { guiding wolf trips } { pictures of wolves } { animals good tourist bait } { wolf watching }

WordHappy

{ happy } { thrill}ed,ing { excit}ed,e,ing

WordSee

{ see}ing, { saw }

Largepop

{ large } { healthy } { stable } { high } { highest } { robust } { doubling }

WordIncrease

{ increas}e,ed,ing { expand}ing,s,ed { grow}ing { grown } { grew } { climb}ed,ing,s { rise } { rising }

Smallpop

{ small } { struggle } { struggling } { grappling } { below carrying capacity } { decreas}e,ed,ing { unhealthy } { low}est { shrink}ing { implosion } { fallen } { shrunk }

Game

{ elk } { deer } { antelope } { moose } { owl}s { caribou } { big game herds } { big game } { recreational hunt}ing { subsistence hunt}ing [ bison-because can be game or livestock, keeping out to make it neutral ] { herd }

GamePop

[ for fsr2 rules only ]

InCheck

[ for fsr2 rules only ]

Pests

{ raccoon}s { beaver}s

ImpactHum

{ animals ' presence could be used to stop logging } { new controls on timber harvesting if wolves took up residence } { predators would affect their livelihoods } { squelch future economic development } { presence of wolves would be detrimental to business in general }

WordLess

{ less }

Love

{ lov}e,es,ed,ing { likes } { liking } { pro - } { revere } { fond of } { affection for } { adore } { worship } { care}d,ing

Hate

{ hate}d { hating } { hatred } { dislik}e,ed,ing { anti - } { don ' t like } { revile } { despise } { scorn } { condemn } { disparage } [ fear of ]

Wolf

{ wolf } { wolves } { canines } { reintroduced wolves } { pack member}s

WolfGood	1 cSCORED	'Wolves are good'
WolfBad	2 cSCORED	'Wolves are bad'
ShouldPrt	3 cSCORED	'Wolves should be protected'
ShouldMge	4 cSCORED	'Wolves should be managed'
DecimGame	5 cSCORED	'Wolves neg impact game/ecosystem'
PosImpEco	6 cSCORED	'Wolves pos impact ecosystems'
WolfAbun	7 cSCORED	'Wolves are over abundant'
WolfEndan	8 cSCORED	'Wolves are endangered'
NgImpHm	9 cSCORED	'Wolves neg impact human activities'
PosImpHm	10 cSCORED	'Wolves pos impact human activities'

```
----->-----|----->-----|-----
FSR2   Acting: No. spaces      R if operator
Operator----> (A/B/E) | <-Target----> <-New target-> || Rule
-----|-----|-----|-----|-----|
                Irrelevant   DELETED           1
```

Negation            A 30 Protect                            Manage            2

Negation	A	30	Manage	Protect	3
Negation	A	30	Oppose	Support	4
Negation	A	30	Support	Oppose	5
Bear	E	45	Threat	DELETED	6
Bear	E	45	Protect	DELETED	7
Bear	E	45	WordRecover	DELETED	8
Manage	E	45	Bear	DELETED	9
WordRare	E	30	Threat	DELETED	10
Whether	A	20	Wolf	DELETED	11
Negation	A	50	Abundant	Endangered	12
Negation	A	50	Endangered	Abundant	13
Endangered	E	30	Game	DecimGame	14
Negation	A	20	HelpingVerb	DELETED	15
HelpingVerb	A	30	Endangered	AreEndan	16
HelpingVerb	A	30	WordRare	AreEndan	17
HelpingVerb	A	40	Bad	AreBad	18
HelpingVerb	A	40	Good	AreGood	19
Wolf	E	-1	AreEndan	WolfEndan	R 20
Wolf	E	-1	AreBad	WolfBad	R 21
Wolf	E	-1	AreGood	WolfGood	R 22
			HelpingVerb	DELETED	23
WordRole	A	10	WordEcosystem	EcosystemBal	24
WordHealth	A	30	WordEcosystem	EcosystemBal	25
WordNatural	A	30	WordEcosystem	EcosystemBal	26
WordImportant	A	30	WordEcosystem	EcosystemBal	27
WordControl	A	50	Game	EcosystemBal	28
WordControl	A	50	Pests	EcosystemBal	29
WordNeed	A	30	WordPredator	EcosystemBal	30
WordNatural	A	15	WordBalance	EcosystemBal	31
WordHealth	E	30	WordEcosystem	EcosystemBal	32
WordNatural	A	20	WordControl	EcosystemBal	33
WordNatural	A	15	WordPredator	EcosystemBal	34
WordModerate	A	30	Game	EcosystemBal	35
WordModerate	E	30	WordEcosystem	EcosystemBal	36
WordMaintain	A	30	WordBalance	EcosystemBal	37
WordManage	A	30	WordForest	EcosystemBal	38
WordRecovery	A	30	WordForest	EcosystemBal	39
WordIndicator	A	30	WordHealth	EcosystemBal	40
WordIndicator	E	30	WordSpecies	EcosystemBal	41
WordCrucial	E	30	WordSpecies	EcosystemBal	42
WordCrucial	A	30	WordPart	Ecosystem	43
WordCrucial	A	30	WordPredator	EcosystemBal	44
WordCurb	A	30	WordDisease	EcosystemBal	45
Remove	A	30	WordDisease	EcosystemBal	46
WordReduce	A	30	WordDisease	EcosystemBal	47
WordControl	A	30	WordDisease	EcosystemBal	48
WordEcosystem	E	30	WordNiche	EcosystemBal	49
WordChange	A	30	WordForest	EcosystemBal	50
WordKill	A	15	WordTooMany	KillTooMany	51
WordEat	A	15	WordTooMany	EatTooMany	52
WordTake	A	15	WordTooMany	KillTooMany	53
KillTooMany	E	30	Game	DecimGame	54
EatTooMany	E	30	Game	DecimGame	55
WordTooMany	A	20	Game	EcosystemBal	56
WordIncrease	E	30	WordDiversity	EcosystemBal	57
WordRemain	A	30	WordBalance	EcosystemBal	58
WordRepair	E	30	WordFoodChain	EcosystemBal	59
Negation	A	15	Remove	DELETED	60
Negation	A	15	WordChange	DELETED	61
Negation	A	15	WordList	DELETED	62
Negation	A	15	WordShoot	DELETED	63
Whether	A	20	WordKill	DELETED	64
Whether	A	20	Threat	DELETED	65
Remove	E	30	WordOldSick	EcosystemBal	66
			EcosystemBal	PosImpEco	67
Wolf	E	-1	Ecosystem	PosImpEco	R 68
EcosystemBal	E	50	Game	PosImpEco	69
WordRestore	A	40	WordBalance	PosImpEco	70
WordHelp	A	30	WordHealth	ImproveHealth	71
ImproveHealth	E	30	Game	PosImpEco	72

WordPositive	A	20	WordAffect	PosEffect	73
WordNegative	A	20	WordAffect	NegEffect	74
NegEffect	E	30	Animals	NgImpHm	75
NegEffect	E	30	Game	DecimGame	76
PosEffect	E	30	WordEcosystem	PosImpEco	77
WordRestore	A	40	WordPredator	PosImpEco	78
WordBack	A	10	WordBalance	PosImpEco	79
WordHelp	E	40	WordEconomy	BenefitHum	80
WordHelp	E	40	WordTourism	BenefitHum	81
WordHelp	A	30	WordDiversity	EcosystemBal	82
WordHelp	A	30	WordEcosystem	EcosystemBal	83
			WordHelp	DELETED	84
Wolf	E	70	WordShoot	Manage	85
Remove	E	20	Endangered	Manage	86
Wolf	E	30	Remove	Manage	87
Remove	E	30	WordProtect	Manage	88
Remove	A	30	Endangered	Manage	89
Remove	A	30	Remove	DELETED	R 90
WordReduce	E	20	Endangered	Manage	91
WordFederal	A	40	WordManage	Protect	92
			WordManage	Manage	93
			WordShoot	Manage	94
			WordFederal	DELETED	95
WordReduce	E	30	Wolf	Manage	96
WordReduce	E	30	WordProtect	Manage	97
WordReduce	A	20	Endangered	Manage	98
WordReduce	A	20	WordList	Manage	99
WordChange	E	20	WordStatus	Manage	100
Decimate	A	30	Wolf	Manage	101
WordKill	A	20	Wolf	Manage	102
WordShoot	E	30	Wolf	Manage	103
WordKill	A	20	WordPredator	Manage	104
WordDeath	E	10	Wolf	Manage	105
WordTake	A	20	Wolf	Manage	106
WordList	A	15	WordPredator	Manage	107
WordEliminate	A	20	WordProtect	Manage	108
WordEliminate	A	20	Wolf	Manage	109
			WordControl	Manage	110
Wolf	E	30	WordRestore	Protect	111
WordRestore	E	30	WordAnimal	Protect	112
WordRestore	E	30	WordCarnivore	Protect	113
WordRestore	A	30	Endangered	Protect	114
WordRestore	A	30	WordStatus	Protect	115
WordRemain	A	30	WordProtect	Protect	116
Wolf	E	30	WordRemain	Protect	117
WordRemain	A	30	WordCarnivore	Protect	118
WordSafe	A	30	Wolf	Protect	119
WordSafe	A	30	WordCarnivore	Protect	120
WordBring	A	10	WordBack	Protect	121
WordWelcome	A	10	WordBack	Protect	122
WordRemain	A	10	Protect	Protect	123
WordRemain	A	10	WordRecover	Protect	124
WordMoratorium	A	20	WordControl	Protect	125
WordMoratorium	A	20	Manage	Protect	126
WordEnsure	A	20	WordSurvive	Protect	127
WordClassify	A	30	WordPredator	Manage	128
			WordProtect	Protect	129
WordViolation	A	20	WordLaw	Illegal	130
Illegal	E	30	Animals	DELETED	131
Illegal	E	-1	Manage	ShouldPrt	R 132
Illegal	E	-1	WordKill	ShouldPrt	R 133
Illegal	E	-1	Killings	ShouldPrt	R 134
Whether	A	30	Oppose	DELETED	135
Whether	A	30	Support	DELETED	136
WordLess	A	30	Support	DELETED	137
WordLess	A	30	Oppose	DELETED	138
Negation	A	20	Should	Oppose	139
Oppose	A	30	Should	Oppose	140
Oppose	A	20	Remove	ShouldPrt	141
Oppose	A	40	Protect	ShouldMge	142

Oppose	A	40	Manage	ShouldPrt	143
Oppose	A	30	Wolf	ShouldMge	144
Oppose	A	30	Decimate	ShouldPrt	145
Oppose	A	20	Support	Oppose	146
Oppose	A	30	WordKill	ShouldPrt	147
Oppose	A	30	Killings	ShouldPrt	148
Support	A	40	Manage	ShouldMge	149
Support	A	30	Wolf	ShouldPrt	150
Support	A	40	Protect	ShouldPrt	151
Support	A	40	WordRecover	ShouldPrt	152
Support	A	40	WordRecovery	ShouldPrt	153
Negation	A	15	Opponents	Supporters	154
Negation	A	15	Supporters	Opponents	155
Whether	A	50	Should	DELETED	156
Should	A	50	Protect	ShouldPrt	157
Should	A	50	Manage	ShouldMge	158
Should	A	15	WordKill	ShouldMge	159
Should	A	15	Killings	ShouldMge	160
Should	A	30	Remove	ShouldMge	161
WordNeed	A	40	Protect	ShouldPrt	162
WordNeed	A	40	Manage	ShouldMge	163
WordNeed	A	15	WordKill	ShouldMge	164
WordNeed	A	30	Remove	ShouldMge	165
Wolf	E	30	WordNeed	ShouldPrt	166
ShouldAfter	E	30	Protect	ShouldPrt	167
ShouldAfter	E	30	Manage	ShouldMge	168
Wolf	E	30	Belong	ShouldPrt	169
			DoNotBelong	ShouldMge	170
			SManage	ShouldMge	171
			SProtect	ShouldPrt	172
Negation	A	25	Decimate	DELETED	173
Negation	A	25	Prey	DELETED	174
Negation	A	25	Killings	DELETED	175
Negation	A	25	WordKill	DELETED	176
Whether	A	30	Endangered	DELETED	177
			Whether	DELETED	178
Smallpop	E	30	Game	DecimGame	179
WordDecline	E	40	Game	DecimGame	180
WordReduce	E	40	Game	DecimGame	181
WordGone	E	40	Game	DecimGame	182
WordDie	E	30	Game	GameDie	183
WordIncrease	E	30	GameDie	DecimGame	184
WordAffect	E	30	Game	GameAffected	185
Wolf	E	50	GameAffected	DecimGame	186
Decimate	A	60	Game	DecimGame	187
			ReduceGame	DecimGame	188
Abundant	E	30	Game	Game	189
Negation	A	50	WordBrink	Abundant	190
Negation	A	30	Largepop	Endangered	191
WordClassify	A	30	Endangered	WolfEndan	192
Endangered	E	20	WordAnimal	WolfEndan	193
WordRemain	A	40	Endangered	WolfEndan	194
WordBrink	A	20	WordExtinction	WolfEndan	195
Wolf	E	40	WordPop	WolfPop	196
Game	E	40	WordPop	GamePop	197
GamePop	E	40	InCheck	PosImpEco	198
WolfPop	E	40	InCheck	Manage	199
Smallpop	E	40	WolfPop	WolfEndan	200
WordReduce	A	40	WolfPop	WolfEndan	201
WordDecline	E	40	WolfPop	WolfEndan	202
Endangered	E	40	WolfPop	WolfEndan	203
Endangered	A	20	WordExtinction	WolfEndan	204
WordRare	A	10	Wolf	WolfEndan	205
WordBounce	A	20	WordBack	WolfAbun	206
WordSuccess	A	30	WordRecovery	WolfAbun	207
WordBack	A	40	WordBrink	WolfAbun	208
Wolf	E	70	Abundant	WolfAbun	R 209
Abundant	E	50	WolfPop	WolfAbun	210
Largepop	E	50	WolfPop	WolfAbun	211
WordIncrease	E	-1	WordPop	WolfAbun	R 212

Wolf	E	50	WordIncrease	WolfAbun	213
WordRebound	E	60	WordPop	WolfAbun	214
WordRebound	E	60	Wolf	WolfAbun	215
WordRecovery	E	15	WordEnough	WolfAbun	216
WordRecover	E	15	WordEnough	WolfAbun	217
Negation	A	15	BenefitHum	DELETED	218
Negation	A	15	WPosImpHum	DELETED	219
Good	E	40	WordEconomy	BenefitHum	220
WordValue	E	40	WordTourism	BenefitHum	221
WordValue	E	40	WordEconomy	BenefitHum	222
WordValue	E	40	Humans	BenefitHum	223
WordIncrease	E	30	WordEconomy	BenefitHum	224
WordHappy	E	40	WordSee	BenefitHum	225
Love	E	40	WordSee	BenefitHum	226
Wolf	E	-1	BenefitHum	PosImpHm	R 227
			WPosImpHum	PosImpHm	228
Negation	A	30	Threat	DELETED	229
Negation	A	40	Threatingwolfbeh	DELETED	230
			Threatingwolfbeh	NgImpHm	231
WordLoss	E	40	Animals	NgImpHm	232
Decimate	E	50	Animals	NgImpHm	233
Decimate	E	30	WordAnimal	NgImpHm	234
Prey	E	50	Animals	NgImpHm	235
Killings	E	50	Animals	NgImpHm	236
WordKill	E	40	Animals	NgImpHm	237
WordEat	E	40	Animals	NgImpHm	238
Wolf	E	40	Threat	NgImpHm	239
Threat	E	50	Humans	NgImpHm	240
Threat	E	50	Animals	NgImpHm	241
Threat	E	30	WordAnimal	NgImpHm	242
WordDeath	E	40	Animals	NgImpHm	243
			ImpactHum	NgImpHm	244
Humans	A	30	Fear	NgImpHm	245
Fear	E	30	Animals	NgImpHm	246
Negation	A	30	WGood	WolfBad	247
Negation	A	30	WBad	WolfGood	248
Negation	A	30	Love	DELETED	249
Negation	A	30	Hate	DELETED	250
Love	A	20	Wolf	WolfGood	251
Hate	A	20	Wolf	WolfBad	252
			WBad	WolfBad	253
			WGood	WolfGood	254
Wrongkind	E	-1	WolfGood	DELETED	R 255
Wrongkind	E	-1	WolfBad	DELETED	R 256
Wrongkind	E	-1	ShouldPrt	DELETED	R 257
Wrongkind	E	-1	ShouldMge	DELETED	R 258
Wrongkind	E	-1	WolfAbun	DELETED	R 259
Wrongkind	E	-1	WolfEndan	DELETED	R 260
Wrongkind	E	-1	PosImpHm	DELETED	R 261
Wrongkind	E	-1	NgImpHm	DELETED	R 262
Wrongkind	E	-1	PosImpEco	DELETED	R 263
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