

1           **A Role for the Social Sciences in Endangered Species Listing Determinations:**  
2                           **The Case of Gray Wolves in the Northern Rockies**

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12   **Abstract:** Conservation scientists increasingly recognize the need to incorporate the social  
13   sciences into policy decisions. However, in practice, considerable challenges to integrating the  
14   social and natural sciences remain. In this paper, we review the U.S. Fish and Wildlife Service's  
15   (FWS) 2009 decision to remove the Northern Rocky Mountain population of gray wolves from  
16   the federal list of endangered species. We examine the FWS' arguments concerning the threat  
17   posed by attitudes toward wolves in light of the existing social science literature. Our analysis  
18   found support for only one of four arguments underlying the FWS' assessment of public attitudes  
19   as a potential threat to wolves. While we found an extensive literature on attitudes toward  
20   wolves, the FWS cited just one empirical research article. We conclude that—when listing  
21   decisions rest on assumptions about society, these assumptions should be evaluated using the  
22   best available natural *and* social science research.

23   **(Word count: 4779 not including references)**

1 **Introduction**

2 In recent years, several authors have called for increased integration of the social and  
3 natural sciences in conservation management (e.g., Adams 2007, Jacobson and McDuff 1998,  
4 Mascia et al. 2003). These authors point out that while conservation issues are composed of both  
5 natural (e.g., the ecology of systems) and social components (e.g., the policies in place to guide  
6 decision-making), most conservation practitioners receive limited training in the social sciences  
7 (Jacobson and McDuff 1998). This condition is reflected in conservation decisions, where  
8 biological elements are generally emphasized with minimal, if any, social science contributions.  
9 Yet, as Mascia et al. (2003) noted, the success or failure of programs are often primarily  
10 determined by social factors. In this paper we review the April 2009 decision by the United  
11 States Fish and Wildlife Service (FWS) to remove the Northern Rocky Mountain population of  
12 gray wolves (*Canis lupus*) from protection under the U.S. Endangered Species Act (ESA). This  
13 decision provides an opportunity to examine the degree to which the social sciences were  
14 integrated into a controversial conservation action with long recognized human connections.

15 The reintroduction of gray wolves to the northern Rocky Mountains in 1995-1996 was  
16 perhaps the most politically contentious wildlife management action in modern history. The  
17 effort spanned two decades, involved more than 120 public hearings, and elicited over 160,000  
18 public comments (Wilson M. A. 1997). Dozens of special interest groups weighed in on the  
19 debate, where value-laden rhetoric and hyperbole were pervasive and the willingness to  
20 compromise in short supply (Bangs and Fritts 1996). Notwithstanding strong rhetoric and the  
21 threat by some opponents to “shoot, shovel, and shut up”, reintroduced wolves have thrived in  
22 the northern Rockies. Beginning in 2002—and in every year since—the Northern Rocky

1 Mountain (NRM) wolf meta-population exceeded the population threshold specified for removal  
2 from Endangered Species Act protections.

3         The issue of how to manage wolves in the northern Rockies transcends the biological and  
4 ecological sciences (Fritts et al. 1997, Wilson M. A. 1997). Biologists directly involved in the  
5 reintroduction of wolves to the northern Rockies concluded that “wolf recovery issues have more  
6 to do with deeply held personal values...than with wolves themselves” (Fritts et al. 1997). We  
7 concur with this assessment. Indeed, 15 years of intensive monitoring and rigorous biological  
8 studies have not reduced the conflict concerning western wolf management, nor lessened the  
9 controversy surrounding their reintroduction. In fact, these efforts only underscore how human  
10 behaviors are intricately linked with the long-term success of wolves: of 2,094 wolf mortalities  
11 documented by the U.S. Fish & Wildlife Service (FWS) over past decade (i.e. 2000-2009), 84%  
12 (1,763) were human-caused, and a minimum 80% of these (1,402) were intentional<sup>1</sup> (i.e. legal  
13 control actions or harvest). These data indicate that the success of wolves in the northern  
14 Rockies ultimately depends upon human behaviors, and the values and attitudes that underlie  
15 these behaviors.

16         When threats to a species are primarily driven by social factors (e.g. attitudes, values)  
17 reliance on biological data alone is insufficient to understand and evaluate these threats. The  
18 application of theory and data from the social sciences can improve our understanding of the  
19 social components of these issues and contribute to more informed policy decisions. In this  
20 paper, we use the FWS’ recent decision to remove wolves in the northern Rockies from  
21 endangered species protections to illustrate how the social sciences can contribute to such

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<sup>1</sup> We calculated these figures by aggregating data from the USFWS’ annual reports 2000 through 2009; these reports are available online at: <http://www.fws.gov/mountain-prairie/species/mammals/wolf/>. A copy of these data may be obtained by contacting the authors.

1 decisions. Specifically, we examine the FWS’ analysis of the threat posed by human attitudes  
2 toward wolves in light of the existing social science literature and illustrate how this information  
3 can inform decisions regarding the listing status of endangered species.

4 ***Listing status determinations under the Endangered Species Act***

5 To determine the listing status of a species (i.e. threatened, endangered, or neither), the  
6 Secretary of the Interior or Commerce (jurisdiction varies by species) must decide whether a  
7 species is threatened with or in danger of extinction throughout all or a significant portion of its  
8 range as the result of *any* of five, statutorily-defined listing factors:

- 9 (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- 10 (B) overutilization for commercial, recreational, scientific, or educational purposes;
- 11 (C) disease or predation;
- 12 (D) the inadequacy of existing regulatory mechanisms; or
- 13 (E) other natural or manmade factors affecting its continued existence.

14 Listing status determinations are to be made “solely on the basis of the best scientific and  
15 commercial data available” (16 U.S.C. 1531-1544). In short, the ESA requires the Secretary  
16 (and corresponding agency) to review the best available information and determine whether the  
17 balance of evidence indicates that the threat posed by these five factors is sufficient to warrant  
18 listing the species as threatened or endangered (Figure 1). In practice, these “threats analyses”  
19 typically focus on the proximate causes of a species’ mortality and include an examination of  
20 relevant biological studies. We do not dispute the value of such information, but rather, contend  
21 that the social sciences can also provide relevant information that should be considered in listing  
22 determinations. In what follows, we describe FWS’ assessment of the threat posed by attitudes

1 toward wolves in the northern Rockies and examine their arguments in light of the best available  
2 *social science* data.

### 3 **Delisting Wolves in the Northern Rocky Mountains-The Threat Posed by Human Attitudes**

4 In April of 2009, FWS published a Final Rule (74 Federal Register 15,123; hereafter,  
5 NRM Final Rule) designating the NRM population of gray wolves as a Distinct Population  
6 Segment (NRM DPS) and delisting them. In the NRM Final Rule FWS argued that “[h]uman-  
7 caused mortality is the most significant issue to the long-term conservation status of the NRM  
8 DPS” and that “public tolerance” was critical to wolves’ long-term recovery (NRM Final Rule,  
9 p. 15,179). Because FWS recognized that human attitudes toward wolves posed a potential  
10 threat to wolves in the NRM DPS, the agency analyzed *attitudes toward wolves* as part of its  
11 threats analysis in the NRM Final Rule. Yet, while FWS noted that, “hostility toward wolves led  
12 to excessive human-caused mortality that extirpated the species from the [NRM DPS] in the  
13 1930s” it argued that “attitudes toward wolves have improved greatly over the past 30 years,”  
14 and “[p]ost-delisting management by [states would]...enhance local public support for wolf  
15 recovery” (NRM Final Rule, p. 15,175). Thus, the agency concluded, the management  
16 approaches employed by states “ensure[d] human attitudes toward wolves should not again  
17 threaten each state’s contribution to a recovered wolf population” (NRM Final Rule, p. 15,175).

18 By explicitly acknowledging that human attitudes threaten wolves’ continued existence,  
19 FWS is legally obligated to employ the best scientific and commercial data available in its  
20 analysis of this threat. Yet, while the NRM Final Rule contained an extensive literature review  
21 (65 pages, >200 citations) on the ecology and behavior of wolves, it cited just one single  
22 empirical study that examined attitudes toward wolves (i.e. Williams et al. 2002). This is not for  
23 a lack of literature on the topic. Several studies that examined attitudes toward wolves in this

1 region were undertaken by Bath and colleagues in the 1980s and 1990s (e.g. Bath 1987, 1989,  
2 1992, Bath and Phillips 1990). More recently, a number of studies have examined residents' and  
3 park visitors' attitudes toward wolves (Bruskotter et al. 2007, Duda et al. 2003, Duffield et al.  
4 2008, Taylor et al. 2005), and a 2002 review by the U.S. Geological Survey, identified 50  
5 published papers, theses, or abstracts that specifically addressed the topic (Browne-Nunez and G.  
6 2002). By citing just one of these studies, it appears the FWS was unaware of the larger body of  
7 research on attitudes toward wolves.

8         In reaching the conclusion that the NRM wolf population is not a threatened or  
9 endangered species, FWS made four key arguments about public attitudes toward wolves that  
10 can be summarized as follows: (1) human attitudes are a potential threat to wolves because  
11 human-caused mortality, driven by human attitudes, extirpated wolves from this region in the  
12 first place; (2) the threat posed by human attitudes has lessened substantially because public  
13 attitudes have improved in recent decades; (3) state management of wolves will foster local  
14 support of wolves and wolf recovery; and, (4) existing state regulatory mechanisms will “balance  
15 negative attitudes” and ensure recovery (see NRM Final Rule, 15,175 & 15,179). We critically  
16 evaluate these arguments and the threat posed by attitudes toward wolves in light of the existing  
17 social science research and recent actions of state government officials within the NRM DPS.

18 ***1. Are Attitudes a Potential Threat to Wolves in the Northern Rockies?***

19         In order to determine if human attitudes threaten an endangered species, one must first  
20 establish that people—through relevant behaviors—have the ability to negatively impact a  
21 species. In the case of NRM gray wolves, there is little question that human beings can and are  
22 impacting wolf populations. Mortality data aggregated from the FWS' Rocky Mountain Wolf  
23 Recovery Annual Reports indicate that human beings cause the vast majority of all wolf

1 mortalities in the NRM DPS. Moreover, the proportion of mortalities that were human-caused  
2 increased substantially over the previous decade from roughly 2/3 in 2000 to 9/10 in 2009  
3 (Figure 2).

4         A second condition necessary to establishing that attitudes toward wolves represent a  
5 threat is a causal link between attitudes and behaviors. Theory and data from the social sciences  
6 substantiates the link between attitudes and behavior, which is especially well established in the  
7 field of social psychology (see Eagly and Chaiken 1993 for review). The literature on attitudes  
8 toward wolves also supports this relationship. For example, Wilson and Bruskotter (2009) found  
9 that attitude toward wolf restoration was strongly related ( $r = .85$ ) to one's intention to vote in  
10 favor of wolf restoration, and similarly, Williams et al. (2002) found a strong correlation ( $r =$   
11  $.82$ ) between attitudes toward wolves and support for wolf reintroduction<sup>2</sup>.

12         The FWS further argued that hostility toward wolves in the 1930s led to their extirpation  
13 from the NRM DPS. Although widely regarded as factual, this argument is particularly hard to  
14 evaluate. The earliest efforts to assess attitudes toward wolves did not begin until the 1970s  
15 (e.g., Johnson 1974), thus we are limited to inferences from historical accounts of government  
16 policies promoting wolf eradication. However, to the extent that such policies can be viewed as  
17 a proxies for attitudes, ample evidence exists in support of this view (Feldman 2007, Kellert et  
18 al. 1996). The policies of predator control and eradication in the late 1800s and early 1900s were  
19 the norm and directed not just at wolves, but also at coyotes (*Canis latrans*), mountain lions  
20 (*Puma concolor*), and grizzly bears (*Ursus arctos*) (Feldman 2007, Kellert et al. 1996). Thus,

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<sup>2</sup> It is relevant that existing studies have correlated attitudes toward wolves with support for particular policies (e.g. lethal control, wolf restoration) or intentions to engage in behaviors (e.g. vote for wolf restoration). The relationship between attitudes toward wolves and *actual* behaviors is likely to depend upon one's access to wolves, and motivation to engage in a relevant behavior.

1 the complete eradication of wolves may not have been directed at wolves, specifically; but  
2 rather, the result of the general hostility exhibited towards predators at this time.

3 ***2. Has the Threat Posed by Human Attitudes Lessened?***

4 The FWS contended that human attitudes no longer pose a threat to wolves in the  
5 northern Rockies because “[p]ublic attitudes toward wolves have improved greatly over the past  
6 30 years” (NRM Final Rule, p. 15,179). However, this argument greatly oversimplifies the  
7 empirical research literature. While Kellert et al. (1996) postulated that U.S. residents’ attitudes  
8 underwent a “significant attitudinal transformation” during the latter part of the 20<sup>th</sup> century, they  
9 cited no empirical work to support this claim. Rather, the attitudinal transformation they  
10 describe seems to have been inferred based largely upon changes in policies toward predators in  
11 North America that coincided with the environmental movement during the 1960s. In fact,  
12 recent research indicates that people’s value orientations concerning wildlife are driven primarily  
13 by the forces of modernization (e.g. increases in income, education and urbanization) which  
14 shifted dramatically following World War II (see Manfredo et al. 2009) and likely gave rise to  
15 the policy changes that took place during the 1960s.

16 Our review found only a handful of studies that empirically evaluated attitudes toward  
17 wolves over time. Rather than providing support for the FWS’ conclusions, the findings are  
18 decidedly mixed. While Kellert (1999) found evidence of an increased “affection for...wolves”  
19 in Minnesota, he also found increased support for the control of wolf damage to livestock, and  
20 Ericsson and Heberlein (2003) found similar results when comparing two Swedish surveys  
21 conducted over a 25 year period—while the general public was more positive toward wolves,  
22 hunters’ attitudes were more negative. Duda et al. (1998) found Adirondack area residents’  
23 support for wolf reintroduction decreased from 76% in 1996 to 46% in 1997, while a subsequent

1 study found support for wolf reintroduction at just 42% (Enck and Brown 2002). Enck and  
2 Brown (2002) hypothesized that this decline resulted from extensive, negative media coverage  
3 concerning a proposed reintroduction in the area. In the one empirical study of attitudes toward  
4 wolves cited in the NRM Final Rule (a meta-analysis), Williams et al. (2002) concluded:

5 “Across the 37 attitude surveys we studied, the reported statistics were stable over  
6 the last 30 years. This contradicts a recent perception among some ecologists that  
7 wolf support has recently grown” (p. 581).

8 Consistent with this conclusion, the only study to longitudinally examine attitudes toward wolves  
9 among residents of any portion of the NRM DPS found that Utah residents’ attitudes toward  
10 wolves did *not* change over an approximately 10-year time frame (Bruskotter et al. 2007).

11 Despite this evidence, FWS concluded that public attitudes toward wolves have “greatly  
12 improved” in the past 30 years and, thus, the threat of extirpation of wolves in the NRM DPS has  
13 been diminished. Such a conclusion is not supported by the data, but rather, appears to be based  
14 upon the very misperception of increasing “wolf support” to which Williams et al. refer.

15 A more recent study—not available at the time of delisting—suggests attitudes toward  
16 wolves in the northern Rockies may be becoming more *negative*. Specifically, a content analysis  
17 of news media coverage from the northern Rockies region indicates that public discourse about  
18 wolves in this region became increasingly negative from 1999 to 2008 (Houston 2009).

### 19 ***3. Will State Management Foster Support for Wolves in the Northern Rockies?***

20 The FWS asserted that “[p]ost-delisting management by [states] will further enhance  
21 public support for wolf recovery” and that state management of wolves “...ensures human  
22 attitudes toward wolves should not again threaten each state’s contribution to a recovered wolf  
23 population” (NRM Final Rule, p. 15,175). A recent survey of Idaho residents, hunters and

1 livestock producers conducted by the Idaho Department of Fish and Game (IDF&G) helps shed  
2 some light on this claim. Results of the survey indicate the majority of all groups surveyed do  
3 indeed support removing wolves from the endangered species list, and hunting them as a means  
4 of controlling wolf populations (IDF&G 2008). The survey also contained several items that  
5 help provide a more complete understanding of these responses, including potential motivations  
6 for supporting state management. Specifically, results indicate that approximately 75% of deer  
7 and elk hunters and 86% of livestock producers agreed that the best management strategy for  
8 wolves was “to reduce wolf populations to the minimum pack numbers necessary to keep them  
9 off the Endangered Species List” (IDFG 2008). Moreover, 64% of deer and elk hunters and 69%  
10 of livestock producers agreed that “[t]he Federal government had no right to reintroduce  
11 [wolves] into Idaho” (IDFG 2008), while more than three-fourths of deer and elk hunters and  
12 livestock producers agreed that “[t]here are not enough elk to go around, and hunters shouldn’t  
13 have to compete with wolves for elk to harvest” (IDFG 2008). While the results of this survey  
14 indeed support the assertion that Idaho residents want Idaho—rather than the Federal  
15 government—to manage wolves, nothing in these data suggest state management will change  
16 attitudes toward wolves nor increase support for the species. Rather, these data show that two of  
17 the most powerful stakeholders in the state (i.e. big game hunters and livestock producers) are  
18 motivated to kill as many wolves as possible without returning wolves to federal protections.

19         Some readers may question our focus on the attitudes of hunters and livestock producers;  
20 for example, one might point out that the majority of non-hunters (60%)—who make up the  
21 majority of Idaho residents—agreed with the statement “[i]t is important to me that wolves exist  
22 in Idaho” (IDFG 2008). Our focus on the attitudes of hunters and livestock producers recognizes  
23 that these groups exert strong political influence over wildlife management in the Western U.S.

1 (Nie 2004). More importantly, hunters, ranchers and other rural residents have direct access to  
2 wolves, and are thus more likely to have an opportunity to influence wolf populations. Notably,  
3 in their meta-analysis, Williams et al. (2002) found that groups who exhibited the most negative  
4 attitudes toward wolves were (a) ranchers and farmers, (b) rural residents, and (c) hunters and  
5 trappers, underscoring the importance of these groups.

6         The second component of the FWS' claim—that state agencies' efforts will ensure  
7 favorable attitudes—is also questionable. This argument implicitly assumes that agencies will  
8 attempt to promote wolves as a valued part of the ecosystem. Yet, as recently as February of  
9 2009 the IDF&G released a report in which the agency estimated the *negative* economic impacts  
10 of wolves on hunting revenues. Importantly, the report assumed that all wolf-caused mortality of  
11 elk was additive (not compensatory) and that elk killed by wolves would directly—and  
12 negatively—impact other big-game hunting opportunities, and in turn, the sale of elk hunting  
13 licenses. The report made no mention of the positive economic impacts of wolves documented  
14 as a result of increased tourism, which dramatically outweigh the negative impacts estimated by  
15 IDF&G (Duffield et al. 2008). Even if agencies were interested in promoting wolves, research  
16 indicates that efforts to change attitudes toward wolves via direct informational interventions  
17 yield little or no effect (Meadow et al. 2005, Wilson and Bruskotter 2009). Indeed, the  
18 relationship between attitudes toward wolves and more deeply-ingrained cultural values (Wilson  
19 M. A. 1997) suggests localized opposition to wolves is unlikely to change, leading Williams et  
20 al. (2002) to conclude that managers “should recognize that attitudes toward wolves, tied to  
21 economic interest and broader ideological conflict, will change very little, and...not be  
22 susceptible to education campaigns.”

23 ***4. Are State Regulatory Mechanisms Likely to Balance Negative Attitudes?***

1           While FWS acknowledged that attitudes could impact wolf recovery, they argued that the  
2 regulatory mechanisms put in place by states “...will balance negative attitudes towards wolves  
3 in the places necessary for recovery” and ensure that wolf populations in the NRMs are not again  
4 threatened with extinction (NRM Final Rule, p. 15,175). We see reasons to be positive about the  
5 wolf management plans developed by state agencies; however, the FWS’ assumption that the  
6 actions of state agencies will “ensure” that wolves in the NRM DPS will remain recovered into  
7 the foreseeable future is overly optimistic. Removing wolves from the endangered species list  
8 means turning over management to the relevant states, who have little incentive to consider the  
9 desires of those from outside their borders. State wildlife management agencies will be forced to  
10 pay extra close attention to the desires of hunters, whom they have long viewed as paying clients,  
11 and ranchers, who have powerful political lobbies in the West (see Nie 2004, for discussion). In  
12 fact, state wildlife boards/commissions, which are ultimately responsible for making policy  
13 decisions for agencies, are often heavily weighted in favor of hunters and agricultural interests.  
14 The disproportionate influence of these groups on wildlife policy in the West is captured in the  
15 Utah Division of Wildlife Resources’ position on wolves:

16           “Many statements have been made to the effect that the Regional Advisory  
17 Councils (RACs) and the Utah Wildlife Board are dominated by agricultural and  
18 sportsmen interests, thus making them incapable of developing sound wolf  
19 management policy. I would concur that the views and concerns of these two  
20 interests groups play a dominant role in the development of wildlife policy in  
21 Utah, and rightfully so. . . By statute, the legislature has appropriately given  
22 landowners and sportsmen a prominent seat at the policy making table in Utah”  
23 (Utah Division of Wildlife Resources 2002).

1           The ability of hunters and livestock producers to affect wildlife policy in the West is not  
2 limited to their influence with wildlife management agencies. In February of 2010, after the  
3 FWS published the NRM Final Rule, the Utah Senate passed S.B 36, which requires the Utah  
4 Division of Wildlife Resources to abandon its wolf management plan in favor of a plan to  
5 “prevent the establishment of a viable pack in all areas of the state where the wolf is not listed as  
6 threatened or endangered...until the wolf is completely delisted under the [ESA].” The bill  
7 justified this action by arguing that Utah “...cannot adequately or effectively manage wolves  
8 ...without significantly harming other vital state interests, including livestock and big game  
9 populations.” Notably, according to the Utah Division of Wildlife Resources, there was no  
10 known population of wolves in Utah when S.B. 36 passed.

11           Explicitly anti-wolf legislation has not been limited to Utah. In 2001, the Idaho State  
12 Legislature passed House Joint Memorial No.5, demanding that “wolves be removed [from  
13 Idaho] by whatever means necessary.” A year later Idaho reaffirmed this position in Senate  
14 Concurrent Resolution No. 134, again calling for the removal of wolves from Idaho and, in 2009,  
15 the Idaho House of Representatives passed House Bill 138, which imposes liability on FWS  
16 officials if someone is injured or killed by wolves, and in 2007, Idaho’s Governor publicly  
17 declared that he would support a hunt to kill all but 100 of the state’s estimated 800+ wolves  
18 (Alderman 2007). These actions underscore the tenuous nature of state wolf management plans,  
19 and the regulations concerning wolves set forth therein.

20           To be clear, while we do not question the *capacity* of state wildlife management agencies  
21 to develop policies for the sustainable management of wolves, the actions of state government  
22 officials demonstrate the extent to which wildlife management agencies will be limited in their  
23 ability to implement such policies over the long term. Ultimately, authority to manage wildlife

1 emanates from state legislatures that have evidenced clear hostility toward wolves, and  
2 demonstrated a willingness to intervene on the behalf of powerful interest groups that oppose  
3 wolves in the NRMs. Given the policy preferences of hunters and livestock producers recently  
4 documented in IDF&G's survey (2008), the historical antipathy of these groups toward wolves  
5 (Williams et al. 2002), and their dominant role in Western wildlife policy (Nie 2004), we are  
6 skeptical that existing regulatory mechanisms will remain in place for the foreseeable future.

7 ***Summary: Analysis of Threats of Attitudes Toward Wolves in the Northern Rockies?***

8         In its analysis of the threat posed by attitudes toward wolves, FWS argued that human  
9 attitudes potentially threaten wolves in the NRM DPS. Even a cursory review of the relevant  
10 literature supports this conclusion; however, FWS' analysis regarding the extent to which  
11 attitudes threaten wolves was guided by *at least* three faulty assumptions. The existing social  
12 science literature suggests that (a) attitudes toward wolves are generally stable in the U.S., but  
13 could be deteriorating in the northern Rockies, indicating the threat posed by attitudes in this  
14 region has *not* decreased since reintroduction; (b) a shift to state management is unlikely to  
15 change attitudes and, more importantly, state agencies are likely to face strong pressure from  
16 influential interest groups (i.e. hunters, livestock producers) to significantly reduce wolf  
17 populations; and (c) the policy preferences of these constituencies could force state agencies to  
18 modify existing regulatory mechanisms cited by FWS as justification for delisting wolves.

19         Importantly, our finding of fault with FWS' analysis of threats should *not* be interpreted  
20 as a condemnation of the agency's conclusions. As Freyfogle and Goble (2009) noted,  
21 determining the status of endangered species requires agencies to answer two fundamental  
22 questions: (1) what is the risk of extinction to the species; and (2) is this risk acceptable? We  
23 recognize that such determinations will always contain a high degree of subjectivity that reflects

1 not only agencies' confidence in evaluating risks, but more importantly, the normative nature of  
2 judgments regarding the acceptability of these risks (Sabatier 1978). Our purpose in highlighting  
3 faults in FWS' analysis is to demonstrate that information from the social sciences can contribute  
4 meaningfully to a threats analysis, and, in this case, the best available data—which do not appear  
5 in FWS' analysis—largely conflict with FWS' assumptions about human attitudes. Thus, we  
6 conclude that, to the extent that these faulty assumptions guided FWS' assessment of the threat  
7 posed by attitudes toward wolves, *this threat has been underestimated.*

### 8 **Discussion: A Role for the Social Sciences?**

9 Numerous calls have been made for resource management agencies to better integrate the  
10 social sciences into their research agendas and policy decisions (e.g. Primm and Clark 1996,  
11 Endter-Wada et al. 1998, Mascia et al. 2003). Our analysis demonstrates one way in which this  
12 laudable goal can be accomplished. Specifically, when agency decisions turn on assumptions  
13 about society, then agencies should employ appropriate social science methodologies (or existing  
14 data) to evaluate those assumptions. With respect to endangered species status determinations,  
15 when threats to a species' continued survival are primarily social in nature, FWS should use the  
16 same effort and care that goes into monitoring and analyzing biological and ecological threats.

17 Drawing on social science theory and methods to increase scientific understanding of the  
18 social components of these issues rather than potentially inaccurate assumptions, can contribute  
19 to improved policy and management decisions. The social sciences provide a suite of methods  
20 for examining not only individual attitudes and behaviors, but also for identifying broader social,  
21 cultural, political and economic factors that impact such attitudes and related behaviors (Endter-  
22 Wada et al. 1998).

1           We recognize there are legitimate concerns with the appropriate role of the public in  
2 developing management plans. As Mech (1996) warned: “If major carnivore management  
3 decisions are determined by public mood rather than by knowledge of professionals, we could  
4 end up with California full of carnivores and North Dakota with none”. Our position—that the  
5 conservation and management of natural resources can be improved by including a greater  
6 emphasis on social science data—should not be interpreted as ceding control of decisions to  
7 public whims. Information on the values and attitudes of affected human populations should not  
8 supersede key biological or ecological data, but should be gathered, interpreted, and used in  
9 tandem with biological and ecological information to provide a more complete picture of the  
10 issue and context within which management decisions are made. In our view, surveys of affected  
11 stakeholders should *never* be used to set public policy, but rather, to inform policy decisions—  
12 the same way biological and ecological data should be used. However, while listing decisions  
13 would never be made without verifiable, empirical data on such things as population size, birth  
14 rates, and reproductive success, wildlife managers seem comfortable making assumptions about  
15 human attitudes that are at least as critical to a successful and sustained recovery.

16           Our review highlights the bias against the social sciences that is pervasive in wildlife  
17 management and, more generally, in conservation science. This traditional view of conservation  
18 science as limited to biology prevents meaningful dialogue between biologists, managers, and  
19 social scientists, decreasing the likelihood that relevant social science information will be  
20 considered in policy decisions. Indeed, the primary limitation of our review is due, in part, to  
21 FWS’ myopic focus on biological data. While the FWS has directly administered or supported  
22 substantial research on the biological aspects of wolf recovery, there was no similar systematic  
23 effort to collect longitudinal data on the attitudes and policy preferences of NRM residents.

1 Even those studies conducted within the NRMs are hard to compare due to differences in survey  
2 methodologies, instrumentation, and populations studied. These limitations only serve to  
3 underscore the need for well-designed, longitudinal studies about attitudes and human  
4 interactions with wolves within the recovery area. More importantly, they lead us to ask why—  
5 if FWS believed human attitudes caused wolves’ extirpation in the northern Rockies—the  
6 agency hasn’t undertaken or supported research efforts to scientifically evaluate this threat?

7 Bergstrom et al. (2009) recently concluded that the FWS and Secretary of Interior  
8 “ignored the best available science” with respect to wolves. Whether the agency ignored the  
9 existing literature on the social sciences or was simply unaware of this literature is largely  
10 irrelevant. What is clear is that this information was *not* used in the NRM Final Rule in  
11 accordance with the ESA’s mandate that listing determinations be based “solely on the...best  
12 scientific and commercial data available”. It is time for the FWS to expand its view of what  
13 constitutes “science” and fully incorporate the social sciences into listing decisions. The FWS  
14 can strengthen future analyses of human-caused threats to endangered species by increasing  
15 support for social science research and, where appropriate, including social scientists as peer  
16 reviewers as part of the Interagency Policy for Peer Review in Endangered Species Act  
17 Activities (59 FR 34,270, July 1, 1994).

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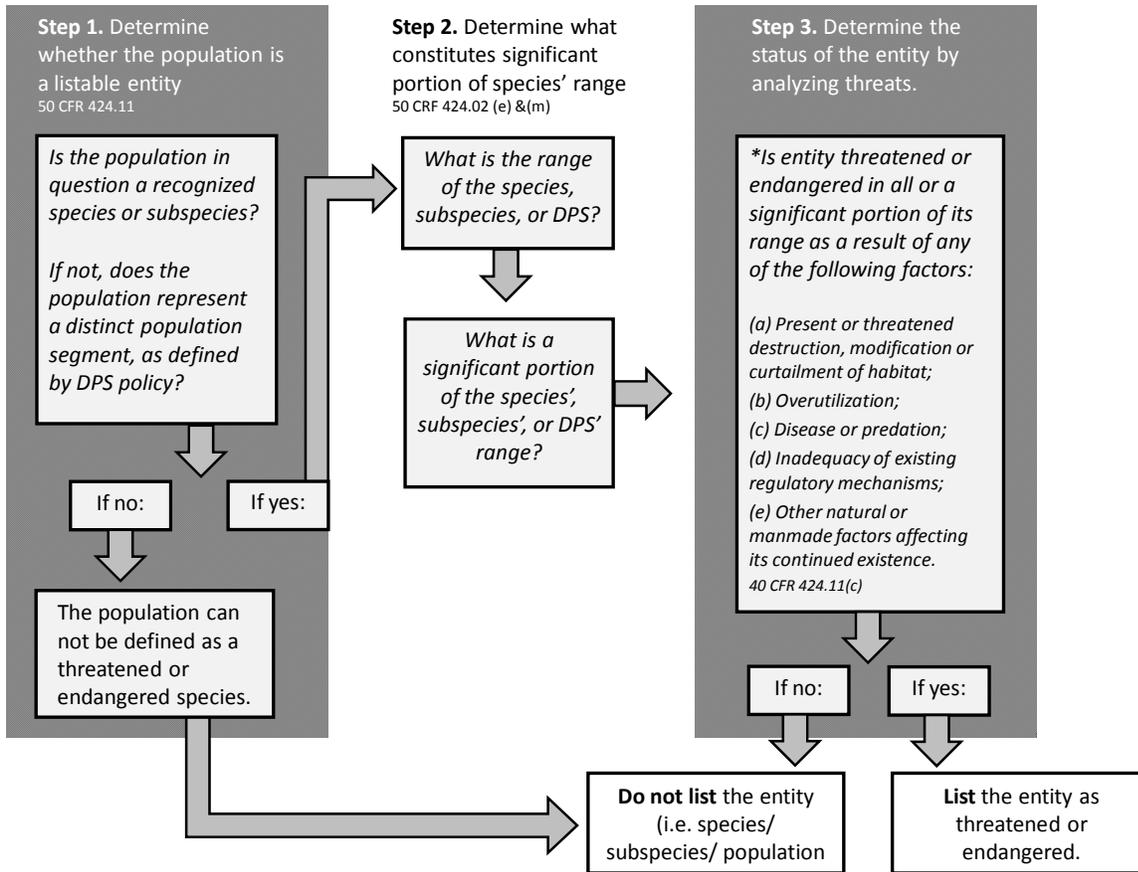
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Figures

2 Figure 1. Determining the status of a species under the Endangered Species Act of 1973.

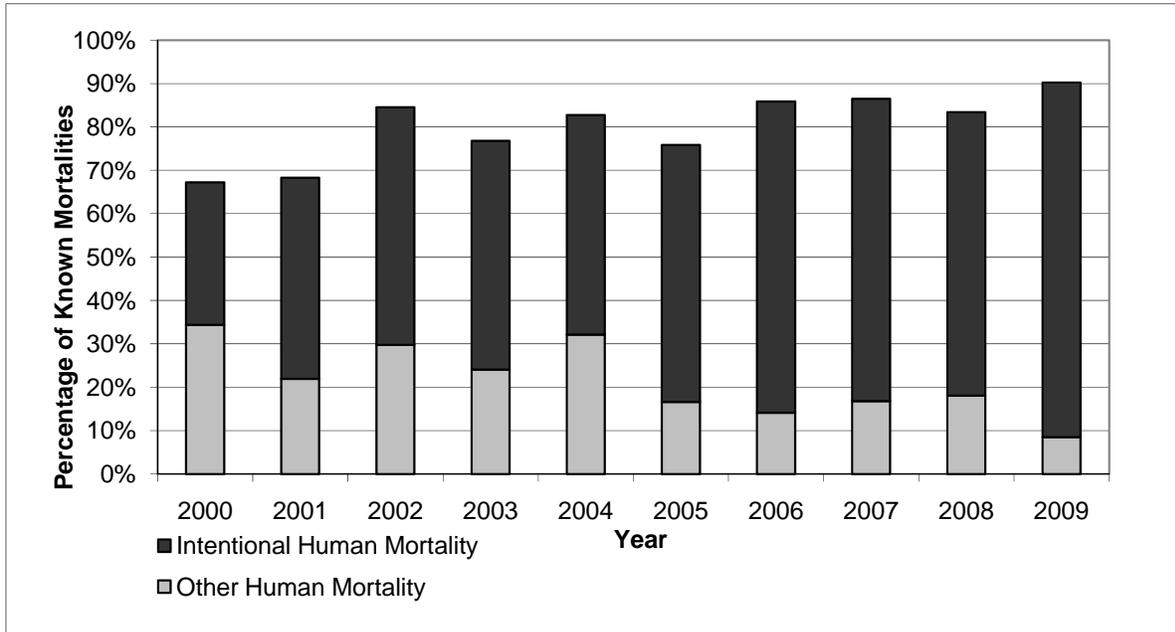


3

\*Denotes analyses that could be improved by the inclusion of social science data.

4

1 Figure 2. Percentage of wolf mortalities in the northern Rockies attributable to human causes  
2 (2000-2009).



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