

# **Developing a More Successful and Integrative Elk Management Policy in Grand Teton National Park, Wyoming: *An Interim Progress Report***

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## **Introduction**

The elk reduction program, or elk hunt, in Grand Teton National Park (GTNP) has been a continuing source of controversy since it began in 1950. In recent years, public debate about the park hunt has centered on concerns about hunter behavior, the safety of visitors and hunters, and inadvertent impacts on the ecosystem and other wildlife species. These issues have been the topic of many newspaper articles and opinion pieces in the Jackson Hole News & Guide (e.g., Hatch 2010; Hatch 2011; Koshmrl 2012).

Chief among these concerns are increasing conflicts between hunters and threatened grizzly bears that are attracted to wounded elk, carcasses, and gut piles left behind by hunters in the park. Public attention and outcry about the park elk hunt escalated after two recent incidents of human-grizzly conflict. In 2011 an elk hunter in GTNP survived a mauling by a grizzly bear, and on Thanksgiving Day 2012 elk hunters in the park encountered a grizzly bear, which they shot and killed in self-defense (Vernon et al. in revision). These incidents—and the resulting public outcry—are symptomatic of the ongoing conflict that has surrounded the GTNP elk hunt for decades.

One of the underlying sources of conflict comes from the fact that the park elk hunt is part of a joint-management agreement for the Jackson Hole elk herd between the National Park Service (NPS) in GTNP and the Wyoming Game and Fish Department (WGFD)—agencies with conflicting mandates (Righter 1982; Vernon and Clark in revision). The NPS is charged with protecting natural and cultural resources and providing for public enjoyment (U.S. Congress 1916; Leopold et al. 1963; Vernon et al. in revision), while the WGFD's mandate is to conserve wildlife and serve the public, although in practice it mostly manages game species for hunting ([wyo.wgfd.gov](http://wyo.wgfd.gov); Vernon et al. in revision).

The conflict about the GTNP elk hunt ultimately stems from these incompatible obligations. Different perspectives are continually being negotiated about whether hunting should be allowed in a national park, what government management actions are appropriate, and what the role of the public should be in decision making in this case. The continuing conflict suggests that the major problem is an inability to integrate diverse people, worldviews, and values so that the broader community can decide on optimal wildlife management programs to best serve its common interests.

How can we resolve this persistent conflict? Our goal should be for government and citizens to decide on an integrated management policy—one that serves the community’s common interests, that operates fairly, and that succeeds in fixing the problems. The common interest can be thought of as the integration of people’s many different and sometimes conflicting interests in a way that benefits a broad range of members within the community.

While the conflict surrounding the GTNP elk hunt may seem intractable, there are examples of successful problem-solving approaches that can be used to identify and implement common interest solutions. These approaches are worth prototyping in Jackson Hole, provided that three conditions are in place: (1) all the agencies and people are open to exploring the core problems and underlying dynamics in this case, (2) they are willing to tackle these issues thoughtfully and pragmatically, and (3) they can let go of the fixed positions they have held in the past so that they can hear other people’s valid and appropriate concerns in an integrated, respectful, and inclusive way.

This report provides a brief overview of the problem of integrating people’s different interests and what we might do to achieve integration. It serves as an “interim report” summarizing my broad research findings at this point in my ongoing investigation into elk management in Jackson Hole and Grand Teton National Park. I am drawing on data and analysis from three publications currently in revision, and as such these arguments and results are preliminary and should be treated as such. In this paper, I will first describe the “structure” of elk management in Jackson Hole and GTNP, including the history of the park elk hunt, relevant management plans, and how government agencies make decisions about managing elk. This summary provides context and insight into trends in elk management that has led to the current situation. Second, I will discuss the biological and technical problems with the GTNP elk hunt (and elk management more generally) and what is being done about these problems. Third, I will explore underlying sources of social conflict over the elk hunt, specifically, the fact that there has been no melding or integration of the different standpoints and worldviews as part of decision making. Finally, I will offer some recommendations on how stakeholders may be able to create a more inclusive, respectful, and integrative elk management policy that reflects their common interests.

## **Research Methods**

For the past several years, I have been studying Jackson Hole’s elk management practices and the GTNP elk hunt in particular. I have read and analyzed hundreds of newspaper articles, management documents, and scientific publications about the Jackson Hole elk herd and its management structure. In the summer of 2013, I interviewed 35 stakeholders involved with and interested in this case, including concerned citizens without an organizational identity (“unassociated citizens”); hunters; representatives from local and regional environmental non-profits; scientists; and officials from the NPS, WGFD, and U.S. Fish and Wildlife Service (USFWS) at the National Elk Refuge (NER).

Past research and recommendations about managing elk in GTNP and Jackson Hole have centered on biological and ecological problems, with little focus on understanding and addressing social conflict and the “human dimensions” of the issue. To fill this gap and provide useful recommendations, I relied on an integrative approach to my research. In addition to identifying and exploring management actions pertaining to relevant biological and ecological problems, I also identified underlying sources of conflict between the people involved and analyzed how decisions about elk management are being made. This integrative approach gave me a wealth of information and understanding of the complexities of this case. I am in the process of writing and revising three scholarly articles about the GTNP elk hunt, which largely informed the contents of this report. Supporting data can be found in these articles (Vernon et al. in revision; Vernon and Clark in revision; Clark and Vernon in revision).

I did my research in Jackson while earning a Master’s degree in Environmental Science at the Yale School of Forestry & Environmental Studies. While my current research centers on the social science of wildlife conservation and management, I also have a background in wildlife ecology. I have worked in California and Illinois as a wildlife technician and wildlife researcher, during which I gathered data and contributed to empirical studies on a wide range of mammal, bird, and herpetile species (including species of conservation concern). My background in wildlife ecology and in the social sciences, along with my undergraduate and graduate education, have helped me develop a more nuanced view of complex conservation challenges so that I am able to identify, understand, and prescribe realistic solutions for biological and social problems associated with wildlife management, conservation, and policy.

### **Elk management structure and the decision-making process**

In this section I will discuss why hunting occurs in GTNP, the management structure for the Jackson Hole elk herd (see Vernon and Clark in revision; Clark and Vernon in revision), and how decisions about elk management are being made by government agencies. A summary of considerations and my analysis of the decision-making process can be found in Table 1.

The GTNP elk hunt, or elk reduction program (as it is called by officials), is part of the management structure for the Jackson Hole elk herd. The herd has three segments located in GTNP, southern Yellowstone National Park, and Bridger-Teton National Forest, as well as adjacent private lands. The majority of elk migrate each fall and early winter to the NER, where they have access to native landscapes, irrigated pastures, and supplemental winter feed (Boyce 1989; Smith 2012). The feeding program is often cited as the reason why elk reduction within GTNP is necessary: The argument is that feeding increases the number of elk in the population by reducing mortality from winter starvation, requiring elk control (Wilbrecht and Robbins 1979; Clark 2001; Smith 2012). In fact, feeding was begun more than a century ago with the intent to reduce wintertime deaths and prevent elk from commingling with livestock on hayfields, which could lead to disease transmission between elk and livestock and crop depredation (for which the WGFD is liable to provide monetary compensation). The structure and behavior of the Jackson Hole elk herd requires four agencies to be involved in its management: the NPS, the USFS, the USFWS, and the WGFD.

When the NPS was negotiating the expansion of GTNP just before 1950, the state of Wyoming, and WGFD in particular, were concerned with maintaining local and state authority and control over elk management through hunting in the newly expanded park (Righter 1982; Righter 2014; Vernon and Clark in revision). The present elk reduction program emerged from these negotiations, allowing for joint management in the park by the NPS in GTNP and the WGFD (U.S. Congress 1950).

The program is used jointly with the 2007 Federal Bison and Elk Management Plan, which guides decisions for the Jackson Hole elk herd on GTNP and the NER in conjunction with WGFD (U.S. Department of the Interior (DOI) et al. 2007; Clark and Vernon, in revision). This plan has four primary goals: (1) to conserve habitat, (2) to maintain sustainable populations of elk and bison that can adapt to changing environmental conditions with reduced risk from non-endemic diseases, (3) to meet and maintain WGFD's target population size to the extent compatible with goals 1 and 2 and the legal directives for the NER and GTNP, and (4) to manage for disease. The plan also calls for "adaptive management" actions to transition from intensive supplemental winter feeding to greater reliance on natural forage, based on other considerations (e.g., desired herd size, public support, approval by the WGFD; DOI et al. 2007; Vernon and Clark in revision). Progress to date has been minimal (Koshmrl 2015; Clark and Vernon in revision).

The plan also lists numerical objectives for the herd: 11,000 elk in the overall herd unit, 5,000 elk wintering on the NER, and 1,600 elk summering in the central valley of GTNP (DOI et al. 2007; Vernon and Clark in revision). As of February 2014, the overall herd unit was estimated at 11,600 animals, with about 8,300 animals that wintered on the NER. As of August 2013, 923 animals were counted in the GTNP central valley herd unit (WGFD 2013). The plan also states that GTNP's elk reduction program can be used to assist the state in managing herd sizes as well as maintaining desirable sex and age ratios and summer distributions (DOI et al. 2007, p. 5).

The perspectives and concerns of several agency officials I spoke with centered on the challenge of jointly managing the Jackson Hole elk herd in accordance with the Federal Bison and Elk Management Plan while balancing their own specific interests, operating requirements, and mandates and addressing public concerns (Vernon and Clark in revision). These joint management challenges were made worse by differing perceptions among agency officials about the purposes of the elk reduction program. For example, GTNP officials emphasized the hunt's importance in keeping elk numbers at sustainable levels for the available summer range in the park, whereas WGFD officials emphasized the need to manage the elk that migrated through the park and control elk distributions, among other things (see also Barmore 1985; Clark and Vernon in revision).

In practice, the arrangement means that all four agencies have joint authority and control over elk management and decision-making for the Jackson Hole elk herd. However, this makes it difficult for the agencies to make substantial changes to management policy. Officials often expressed contrary remarks about which agency was authorized to make such changes. One

WGFD official said the NPS had ultimate authority over decisions made about the GTNP hunt. At the same time, several NPS officials argued that any decisions about the park hunt needed to be made jointly with the WGFD, and some said that the hunt could only be altered or terminated through an act of Congress. These underlying disputes about power and authority, as well as disagreement over the conditions under which the program could be altered or terminated, have prohibited substantial changes to the program (Clark and Vernon in revision) and contributed to dissatisfaction with the decision-making process by outside participants.

Officials from all the agencies said that decisions about elk management and the GTNP elk reduction program were directly informed by scientific inquiry and data collection. All agreed that the available data supported the need for the program, based on the objectives and goals listed in the Bison and Elk Management Plan (DOI et al. 2007) as well as the informal goals established by the WGFD. At the same time, agency officials said it was difficult to evaluate whether the program’s goals have been met because of limited resources and funding. The agencies have not implemented a comprehensive appraisal of either the elk hunt or the overall management strategy to determine if their methods and techniques are effective in reaching their objectives while minimizing inadvertent negative side effects (e.g., impacts to other species and resources, park visitor experiences).

As a result, some participants from outside the agencies challenged the adequacy of the scientific data used to make decisions about the park elk hunt and the feeding program. Some argued that the elk reduction program and feeding practices are used to boost elk numbers and provide hunting opportunities for the benefit of WGFD and its constituents (hunters). Others questioned the dependability of the data and called for appraisal of the program as a whole to determine if management practices were actually contributing to the agencies’ desired outcomes, goals, and objectives. People’s requests for program appraisal and inclusion in decision-making have been largely unsuccessful. This has prompted some participants to conclude that the agencies’ decision-making process lacks transparency and openness, with few opportunities for public input.

**Table 1:** Summary of elk management and the decision-making process

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*Notable problems and considerations*

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- Challenges of agency coordination and joint management
  - Unclear patterns of decision-making authority
  - Disagreement over program purposes
  - Difficulty evaluating goals and objectives
  - Lack of comprehensive appraisals for elk management practices
  - Perceived lack of transparency and exclusion of outside perspectives
  - Unclear dependability of scientific data used in decisions
  - Provisioning of hunting opportunities at the expense of other interests
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**Biological and ecological problems with elk management**

The difficulties of sharing management authority are compounded by the persistence of biological problems that management was developed to address, as well as inadvertent biological problems that have emerged as a result of current management practices. These

inadvertent problems, which can be thought of as unintended side effects, have come to dominate public dialogue about the GTNP elk hunt and Jackson Hole’s elk management practices more generally. In this section I will summarize my findings from interviewing participants and reviewing the literature about these problems and the management actions used by the agencies to resolve them (see Table 2).

Representatives of environmental non-profit groups and agency officials often discussed GTNP’s elk reduction program in the context of the supplemental winter feeding program on the NER. Both programs are sources of long-term disagreement. Elk feeding on the NER and on additional state-run feed grounds in western Wyoming has created conditions for a number of problems throughout the Greater Yellowstone Ecosystem. For example, feeding prevents elk from migrating long distances to more suitable winter range; creates conditions for spreading disease among elk and other ungulates (e.g., chronic wasting disease, brucellosis); and degrades habitats as high elk numbers put more pressure on grassland communities.

Agency officials said that hunting in GTNP is necessary because it helps decrease elk numbers to more sustainable levels for the available summer and winter habitats. The agencies use hunting to reduce elk numbers and control their distribution; rely on an intensive irrigation system on the NER to encourage the growth and regeneration of native plants; and vaccinate elk to reduce disease transmission. These management solutions have had mixed success in ameliorating the conditions contributing to these biophysical problems.

One issue that has emerged recently as a direct result of the GTNP elk hunt as a management action is the elevated risk of direct encounters between hunters and grizzly bears. While the grizzly population in the Greater Yellowstone Ecosystem has recovered under the Endangered Species Act, grizzlies are now losing significant native food sources (e.g., cutthroat trout, whitebark pine nuts) because of warming climate and invasion of non-native species, which may threaten this species’ future viability (Middleton et al. 2013). Grizzly bears may now be relying more heavily on elk gut piles left behind by hunters as a food source in the fall months, as they work to gain weight in preparation for hibernation. As a result, they sometimes end up in areas where hunting occurs, creating conditions for conflicts with hunters.

The two incidents of hunter-grizzly conflict in GTNP (described earlier) received widespread media attention and criticism, with many people expressing concern for the safety of hunters and the wellbeing and protection of bears within GTNP. In response, agency officials closed the GTNP hunt area where past conflicts had occurred. Additionally, the USFWS increased its

**Table 2:** Summary of ecological and biological considerations

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*Notable problems and considerations*

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- Feeding issues (loss of migrations, disease risk, habitat degradation)
  - Hunter-grizzly conflicts
  - Unethical, unsportsmanlike hunter behaviors
  - Human safety concerns
  - Questionable adequacy of hunt regulations and enforcement
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estimate of the number of grizzly bears that might be killed as a result of the GTNP and NER hunts over a 15-year period (2007-2022) from one to six bears. Essentially, this change means that the regulating agencies and the hunts would not violate the Endangered Species Act as long as this level is not exceeded over that period (Thuermer 2013; Vernon et al. in revision).

Finally, some people I spoke with were concerned that hunters participating in the park elk hunt exhibit unethical and unsportsmanlike behavior. Several unassociated citizens cited incidents where hunters shot into herds of elk, fired on elk from the side of the road and/or towards roadways, and attempted to herd elk toward waiting hunters. These problems have received widespread local media attention. Agency officials countered these arguments by saying that, while such bad behaviors and violations of hunt rules do occur, they are minor and the hunt is well regulated. To address these concerns, the agencies implemented new regulations for the program, such as limiting the number of bullets that hunters are allowed to carry and prohibiting hunters from shooting into running elk herds, which could lead to wounded elk.

### **Social conflict**

Regardless of whom I spoke with about elk management, everyone mentioned at least one (and often several) of these biological problems. Newspaper articles and opinion pieces in the Jackson Hole News & Guide also centered on these problems and potential solutions to resolve them. Agency officials have implemented changes to their management practices to address public concerns and to reduce elk reliance on supplemental winter feed in the winter. They have worked to reduce conflicts between hunters and grizzlies and to prevent hunters from behaving in an unsportsmanlike manner. Nevertheless, conflict continues, and its intensity and persistence—even in response to concrete management actions and planning undertaken by the agencies—suggests that there must be something else going on (see Table 3).

At the most basic, that “something else” can be understood as a clash of worldviews—that is, differences in how different stakeholders view, appreciate, orient, and relate to nature and wildlife (see Kellert 1997). There are no formal opportunities for stakeholders to discuss their perspectives, identify areas of common ground, or find ways to integrate their worldviews and interests. Until there is some sort of resolution and integration, elk management policy will continue to be a source of conflict in the Jackson Hole community, and it will never truly reflect the diversity of stakeholders engaged in these issues.

While environmental non-profit representatives and “unassociated” citizens expressed concern about biological problems, many were ultimately opposed to the park elk hunt because they felt that it was fundamentally an incompatible use within a national park. They often shared the view that wildlife and wild lands possess inherent, intrinsic value and that wildlife should be free from human interference as much as possible. Some even expressed strong distaste for hunting or were morally opposed to killing animals for sport or for food.

These perspectives reflect what Kellert (1997) called “naturalistic-aesthetic” and “humanistic-moralistic” worldviews. People who orient to the naturalistic-aesthetic worldview inherently appreciate the aesthetic qualities of nature and connect affectionately with animals. The humanistic-moralistic worldview is also characterized by strong affection for animals, but goes much further. People who orient to this worldview perceive animals in human terms and believe strongly that the compassionate, ethical treatment of animals is a moral obligation. It is not hard to see that people who ascribe to these worldviews would believe that undue harm to wildlife through hunting or other forms of human interference should be avoided at all costs, especially within national parks.

On the other hand, agency officials viewed the park hunt as part of the scientific wildlife management regime necessary to reach their management objectives. They said that they rely on scientific data to make decisions about elk management and the elk reduction program. In their worldview, the use of science is of paramount importance in discharging wildlife management policy, and their default tool for managing wildlife is through hunting. Thus, they addressed management issues solely within the confines of existing management plans, programs, and standard decision-making approaches (Vernon and Clark in revision). Their perspectives, decisions, and implementation were all based on a model of rational, science-based decision-making practices carried out by technical experts.

Agency officials’ approaches and views of the GTNP elk hunt reflect the scientific-ecologicist worldview (Kellert 1997). People who orient to this worldview see the natural world as a system and focus their attention to the attributes and functioning of such systems. They believe that scientific management of wildlife and wild lands is the best approach to make decisions.

The fundamentally different worldviews of hunt opponents and agency officials have made it difficult for these participants to interact constructively to determine elk management policies that are widely representative of and supported by the broader community. Agency officials, who have power over decision making for elk management, tend to make decisions based on the advice of technical experts. The perspectives, interests, and concerns of other participants, such as the wellbeing of individual animals and the appropriateness of hunting in national parks, are not considered in the agency-dominated decision process. Outside, external participants felt that officials dismissed their concerns about managing for the wellbeing of wildlife through natural regulation and minimal human interference. These interactions led to a sense of powerlessness among hunt

**Table 3:** Summary of social conflict

*Notable problems and considerations*

- Clash of worldviews
- Hunting as an incompatible use in national parks
- Concerns for moral, ethical treatment of wildlife
- Preference for natural regulation of wildlife
- Biological, technical focus of management agencies
- Use of scientific management for decision-making
- Powerlessness, exclusion, disrespect among many participants
- Personalized and aggressive criticism of all involved
- Lack of an inclusive and integrative decision-making process

opponents and contributed to personalized, aggressive criticism directed at agency officials and a loss of respect for all involved.

Agency officials had a very different view of the situation. They often said that a wide range of the general public supported their objectives, goals, and management practices for the herd and that outside participants are actively included in the decision-making process. At the same time, agency officials felt that it was difficult to interact with outside participants when their perspectives conflicted with the management directions proposed and implemented by the agencies. Additionally, some viewed the perspectives and desired management directions of outside participants (e.g., non-profits, citizens) as motivated by non-rational opinions, values, and emotional sentiments. Some said that these participants lacked knowledge of the scientific data and information used by the agencies to guide their decisions. As a result, agencies tend to view the problem as a scientifically illiterate public and believe that public education about management issues and how science informs management is the best way to get outside participants to understand their management approaches.

### **Analysis and Alternatives**

Clearly, there is a fundamental alienation of worldviews and perspectives in this case. Participants defined problems differently, were at odds about what management actions are acceptable, and disagreed about the role of public participation in decision-making. These factors have made it difficult for people and agencies to interact constructively as part of a respectful decision-making process aimed at jointly determining appropriate management actions for the elk herd. Little progress has been made in remedying and rebuilding relationships in the hope of creating a more democratic and representative decision process. As a result, conflict over the hunt continues, exacerbating feelings of disrespect and exclusion among all participants (Vernon and Clark in revision).

While biological and ecological problems with elk management are the main focus of public dialogue, the real problem is the lack of integration of worldviews and perspectives among participants. There are no opportunities for the community of affected stakeholders to clarify and integrate their perspectives and interests.

This case is arguably typical of many contentious natural resource management issues in the Greater Yellowstone Ecosystem (Vernon and Clark in revision). Indeed, many participants related and linked elk management to other regional conservation issues, such as managing large carnivores, conserving ungulate migrations, regulating or enhancing hunting opportunities, mitigating disease risk, and adapting to changing climatic conditions. In all of these issues, conflict centers on negotiations regarding how lands and wildlife should be managed and which stakeholders and interests should be considered in management decisions. My recommendations (which follow) are widely applicable to this and other cases and can help address the integration problem (see Table 4).

The purpose of these recommendations is not to prescribe concrete actions to address technical problems (e.g., ending the hunt, removing gut piles, experimenting with ending feeding, increasing hunt enforcement). Instead, my recommendations focus on fulfilling the earlier stated goal for government and citizens to develop and put in practice an integrated management policy that serves the common interest, that is fair in process, that is widely supported, and that works effectively. It is up to the community of affected stakeholders to integrate their diverse interests and worldviews and jointly specify appropriate concrete management actions for this case.

First, I recommend incorporating more active public participation into decision making to help resolve social conflict (Vernon and Clark, in revision). Participants should actively create more opportunities for inclusive, respectful interactions and dialogue. Collaborative problem-solving workshops could help participants to clarify their goals, promote policy alternatives, and solve resource management problems jointly through shared and clearly defined decision-making authority (Wilkinson et al. 2007; Richie et al. 2012; Oppenheimer et al. 2014; Vernon and Clark in revision). Such workshops and improved public participation in decision-making are win-win solution for resource management on public lands. Participants and organizations outside of the agencies may be able to provide external resources, such as place-based knowledge, expertise, scientists, data, and resources, to aid government agencies in research, monitoring, and appraisal of elk management. All participants would benefit from the opportunity to clarify their goals and interests for wildlife management and find solutions that are widely acceptable within the community.

**Table 4:** Recommendations and alternatives

<i>Recommendation</i>	<i>Examples</i>
Improved public participation in decision-making	Collaborative problem-solving workshops Sharing of resources and knowledge Development of integrative problem-solving skills
Enhanced appraisal of elk management to identify and resolve biological and social problems	Independent outside appraisal Examination of technical issues Evaluate effectiveness of methods and techniques Identify knowledge and research gaps
Integration of social sciences in government decision-making for resource management	Attitudinal surveys Targeted stakeholder interviews Focus groups Strategies for public involvement in decision-making Identification of areas to resolve social conflict

For example, in the mid-2000s Parks Canada at Banff National Park put into action a “prototype” working group where diverse stakeholders were invited to meet and discuss grizzly bear issues (Richie et al. 2012). The group generated management recommendations determined jointly by all concerned parties. The aim was to reduce social conflict and create a more collaborative, contextual, and integrative decision process. This case not only

demonstrates that collaborative processes are possible, but also provides valuable insights into the conditions required for the success of such initiatives. These include committed stakeholders, continuous teaching and refreshing of skills, clarification of rules, roles, representation, and expectations, and actually allowing for shared decision-making authority (Richie et al. 2012).

Second, I recommend enhancing appraisal of elk management policies to help identify and address biological as well as social problems (Vernon and Clark in revision). Many participants expressed interest in an independent, outside appraisal of the GTNP elk reduction program and elk management more generally. A formal, open appraisal could examine technical issues (e.g., human-grizzly conflict, disease management), evaluate the effectiveness of current methods used by the agencies to achieve their stated goals, and identify areas where further data and resources are needed to guide decision making. Such an appraisal could help meet my goal of a decision-making process that is fair in process and effective in practice.

Third, I recommend strengthening leadership within the agencies to help address technical problems, improve decision making, and resolve social conflict (Clark and Vernon in revision). Collaborative problem-solving workshops and appraisals have the best chance of being successful if supported and implemented by agency officials. Clarifying the roles and authority of the government agencies involved in the joint management arrangement can also lead to more substantial changes to elk management policy. This can help reduce conflict stemming from frustration and criticism by some about the slow pace of change.

Finally, I recommend making progress toward integrating the social sciences in governmental decision-making (Clark and Wallace 2012; Clark and Wallace 2015; Clark and Vernon in revision). Current approaches focus primarily on collecting and compiling data from the biological sciences, including little data from other disciplines. The agencies primarily fall back on technical data, linear science-to-policy models, and campaigns to educate the public. But these strategies have had little effect on mitigating social conflict in this case because they do not acknowledge, reflect, or integrate diverse worldviews, perspectives, and knowledge. Incorporating social science data in decision making through such methods as attitudinal surveys, targeted stakeholder interviews, and focus groups could provide key insights into the worldviews and perspectives of outside participants. Such approaches could also help the agencies design strategies to engage the public in decision making, resolve conflict, and build more respectful and trustful relationships for all involved.

## **Conclusion**

The GTNP elk hunt, or elk reduction program, remains a source of continuing conflict, making it a persistent policy problem (Vernon and Clark in revision). Agency officials apply scientific methods to biological issues to guide their decision making within the lens of existing management programs and policies. This, however, has had little effect on mitigating conflict among stakeholders, which really stems from the clash of worldviews, conflicting agency mandates, and lack of opportunities for their integration. The conflict is driven in part by

continual disagreement about who should be involved in decision-making and whose interests, perspectives, and worldviews are considered valid and appropriate. These issues are rarely discussed and have not been resolved through an integrative, participatory decision-making process, resulting in widespread feelings of disrespect and exclusion among many participants.

I recommend boosting public participation in decision making, upgrading program appraisal, strengthening agency leadership, and integrating social sciences into decision making. These suggestions can help address biological and technical issues, enhance relationships and trust among stakeholders, reduce criticism and mistrust of agency officials and management policies, and improve the likelihood of successful outcomes.

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