

Introduction

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The National Elk Refuge in Jackson Hole, Wyoming, is renowned for the thousands of elk that winter there and the many other wildlife species that can be observed year-round. The refuge sits near the center of the Greater Yellowstone Ecosystem (Figure 1), a bioregion of nineteen million acres of national parks, forests, and wildlife refuges with national and global importance. Over ten million visitors enjoy the ecosystem each year, with three million viewing the refuge. The refuge was established in 1912, and generations of committed citizens and federal and state agency officials have taken care of the elk and their habitat over the last nine decades. An important public resource, the refuge's twenty-five thousand acres are all that remains of a much larger, historic winter range. Much of the Jackson Hole elk herd of sixteen thousand animals winters there, while in summer these same elk roam over a million or more acres of public lands, mostly managed by the U.S. Forest Service and U.S. National Park Service. Because this region is a leader in natural resource policy and management, what happens on the National Elk Refuge and adjacent public lands has ramifications far beyond their boundaries.

Currently, there is growing attention on the policies and practices by which the refuge is managed. A vigorous debate is underway in the region about what management goals are appropriate and how management should be carried out, by whom, and for whose benefit. At the same time, the 1997 National Wildlife Refuge System Improvement Act mandates comprehensive planning on this and other refuges. Finally, an upcoming environmental impact statement on elk and bison management in Jackson Hole under the National Environmental Policy Act will further focus the debate. Taken together, these exigencies now provide a rare opportunity for a strategic reassessment of the last few decades of management and open up the possibility for a new, more sustainable direction for policy.

Managing natural resources is becoming more complex as contexts change, as new demands are made on existing institutions, and as people strive to solve emerging problems in diverse and sometimes contradictory ways. No matter what the biological details, management usually boils down to two questions:

- How we are going to use natural resources?
- Who gets to decide?

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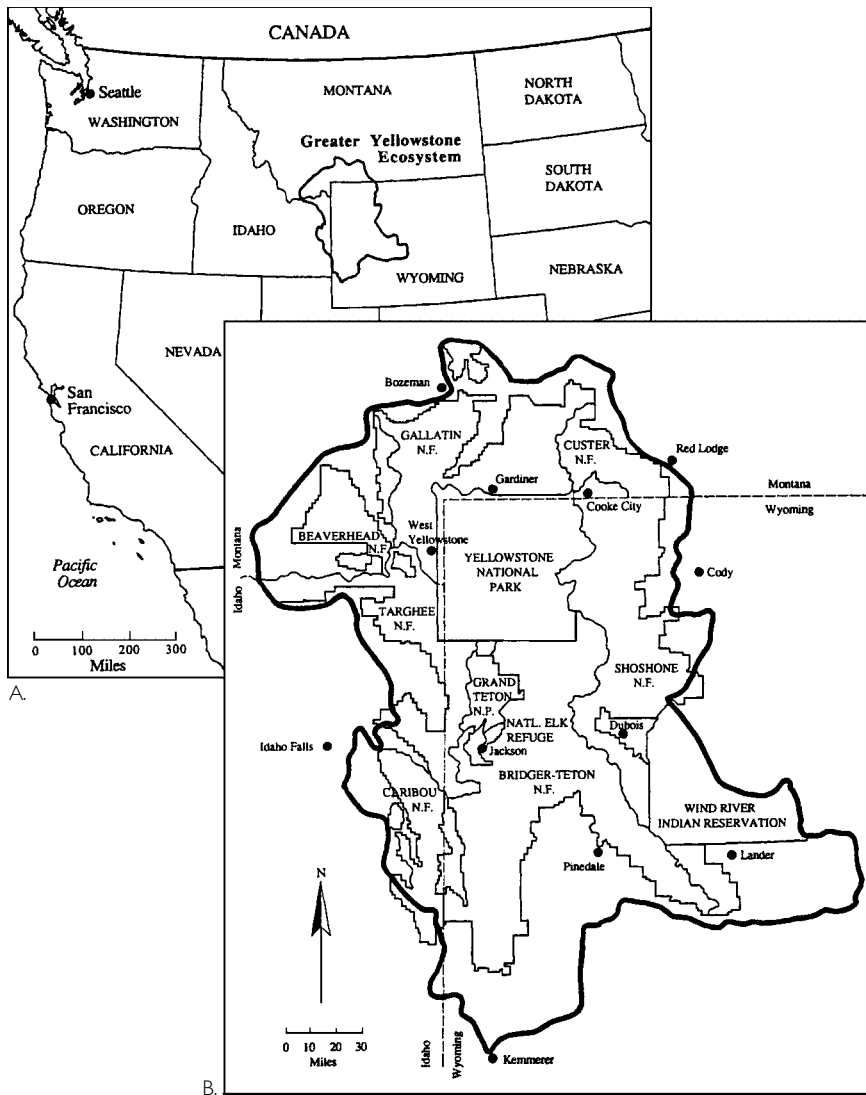


Figure 1 A: Location of the Greater Yellowstone Ecosystem in the Central Rocky Mountains of the United States. B: Administration of the Greater Yellowstone Ecosystem showing major jurisdictions.

We need to harvest the vast experience that is available in Jackson Hole—and elsewhere—in dealing with complex natural resource problems and turn it into practical lessons to improve management of the refuge and the elk. By doing so, we can forge best practices for wildlife conservation, build social capital, upgrade our community problem-solving capacities in the public interest, and create a workable model for others to follow. This volume provides the public and officials with key biological and social science data and policy analytic work that can help all of us decide how best to conserve this unique wildlife refuge, the biodiversity it harbors, and the surrounding landscape.

THE ELK MANAGEMENT DECISION PROCESS

Managing wildlife and land is actually an ongoing process of humans making decisions, not about elk behavior, but about our own actions. Should we limit how much we feed the elk? Should we vaccinate them? Or hunt them? Should we encourage them to range more widely off the refuge in winter? Should we leave them alone? How should we set management goals? Should we adopt a new policy for managing the elk? The management process is about people and what we value, how we interact, and especially how we set up and carry out practices to limit our impacts on the environment, including detrimental affects on wildlife. Because the outcome determines what happens to a public resource, the management process is—or should be—open and public.

The “decision process” has three stages. First, the activities that lead up to a decision include gathering, processing, and disseminating information about the issue, such as data on people’s values and beliefs, the behavior of organizations, and institutional practices as well as the wildlife and ecosystem. This stage also calls for open discussion, debate, and lobbying about the meaning of the data and what should be done with the information. Second, a decision is made based on all the information and debate, resulting in a prescription (plan, law, program, etc.), which should be realistic and detailed enough so that everyone knows what to expect. Finally, the follow-up activities include implementing the decision (administration and enforcement), evaluating the program (done by those formally involved as well as by outsiders), and eventually terminating old ways of doing things and moving on to new ways. Appraisals—formal and informal, public, comparative, and continuous—are particularly important in providing feedback for midcourse “corrections.” Appraisals and adaptation constitute learning.

Because managing elk involves many different people, agencies, and organizations, each with potentially different interests, information, roles, analytic and political challenges, and perspectives, we need to be careful about how we organize ourselves to carry out this decision-making process. A good process will not happen on its own, nor will it come about by recycling standard operating procedures, bureaucratic arrangements, existing conflict, and old ideas. Rarely do people discuss the difficulties and limitations of struggling to decide significant, complex public issues. Yet these interactions make all the difference in whether the decision process—in this case, how elk and the refuge will be managed—will succeed or fail.

Many people despair that decision making is a messy, politicized, irrational process (it’s even called the “garbage can” approach by some people). But recognized standards for good decision processes do exist, and everyone involved should try to make the overall process meet these standards. The decision-making process should be, first of all, rational, comprehensive, and integrated. At the same time it should be selective, targeted, and focused. The biophysical and social information considered in decision making should be reliable; if not, some measure or description of uncertainty (or risk) is needed.

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Decision making should be open and accessible to those with something to contribute or something at stake. The process should also be open to scrutiny. It should be inclusive: “selective omission” may serve personal or special interests and cause unproductive conflict. Timeliness is also essential. The lag between finding a problem and fixing it should be as short as possible, and obsolete or unworkable practices and policies should be corrected promptly. Decision processes should also be honest, flexible, and efficient. Overall, decision making should make things better, not worse.

THE CHALLENGES WE FACE IN MANAGING ELK

In the most general terms, the goal is to manage the refuge and conserve elk in a healthy population in a healthy environment with broad public support. Clearly, there is a shared interest among many people in attaining this goal. But it is equally clear that not all is well: In recent years lawsuits have been filed concerning management of the elk refuge. Conflict has mushroomed among groups that have special interests in the Jackson Hole elk herd, the valley’s growing bison herd, hunting in general, and related issues. The incidence of diseases such as brucellosis and (possibly) tuberculosis has raised concerns. The loss of biodiversity and the presence of some invasive weeds are also troubling. It seems that, beyond the vaguest and simplest statement of our shared goals, our interests diverge. Where is our common interest?

Conflict comes from different views of the problem and what to do about it. These perspectives consist of what people believe and value and how they seek to achieve their values or goals. People’s beliefs and values become organized over time into personal “ideologies” and group subcultures, which serve at the subconscious level to guide people’s behavior. Perspectives function as a “lens” on the world for people to make sense or meaning out of their experiences. Most people are unaware of their own perspective. It is so much a part of their makeup that it is invisible to them, yet they are usually very emotional about defending what they believe in. Even scientists are not free of deep-seated belief systems, although they often view themselves as being neutral, impartial, and objective. At its best, however, science should recognize people’s perspectives and how they figure into natural resource management and policy issues.

Overall, the elk management situation we face is a complex, ill-structured problem with multiple components. It is a *biological* problem because it involves animals and plants and their environment. It is a *political* problem because people with different values are in conflict. And it is a *procedural* problem because there is disagreement about how to understand and resolve the biological and political problems. These intermixed issues make the elk management “system” complex and unpredictable. It is not easy to understand how the many elements are interrelated; like natural systems, human systems show organized forms of complexity with purposeful interactions, and they have emergent, irreducible properties that cannot be understood solely in

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terms of their constituent parts. It is impossible to predict the probabilistic behavior of complex systems by statistical procedures. Ultimately, we cannot expect our “fixes” of constituent parts to solve the problems of the whole system.

Because of these structural aspects of the elk management problem, it is accompanied by a lot of “informational noise.” Information does not appear all at once in a clearly defined package that is easily recognizable by society or even by the professionals directly involved. Part of our task as a community will be to sort out which information is relevant to defining and resolving the problems, what is missing, how to interpret it, and how to complete our picture, or definition, of the problems we face.

Because the elk management problem is complex both socially and technically, it will be difficult to achieve consensus on what the “problem” actually is and what a politically acceptable “solution” might look like. Even if we reach consensus, it may not be possible to get concerted, cooperative action from all participants to remedy the situation. But however we come to define it, the problem will not be solvable by technical means alone (although some people will try to do so) because, at heart, the elk management problem is not a biological, scientific problem: it is a problem of conflicting human values.

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AVOIDING THE PITFALLS

A broad community of people and organizations will be making numerous decisions over the next few years about management of the Jackson Hole elk herd, the National Elk Refuge, and intersecting issues—federal and state government agencies, local citizens, businesses that depend on viewing or hunting elk, environmental groups, and many others. As these decisions are made, we—whoever wishes to participate—need to watch out for a number of common pitfalls.

- **Let’s not reduce the problem to technical issues.** In the face of political tensions, technical experts often insist that science is the main thing that matters, which only compounds the conflict by sidestepping the critical issues of people’s values and views. In this case there may be a tendency to reduce the overall complexity to biological models of elk carrying capacity, for example. These models are important, but they do not capture the overall problem or suggest what to do about it. Again, the problems in the elk case have many levels of complexity in social and biological systems that we need to address head on. Ignoring them won’t make them go away.
- **Let’s not be waylaid by the inevitable conflict.** Ideological clashes will spawn many conflicts between old and new ways of doing things, between interest groups, between agencies, and between government and non-governmental sectors. Cooperation is possible, but too often conflict and confrontation dominate. As one individual put it, opponents “face one another in a spirit of exasperation, talking past each other in mutual incomprehension...a dialogue of the blind talking to the deaf.” Our

valuable natural resources deserve more than special-interest-based, negotiated settlements, token public participation, rushing to the courts to dispose matters, bullying by government agencies, or whatever happens behind closed doors. All concerned parties must work through their differences to find common ground, a job that requires insight, skill, knowledge, and especially time and leadership.

- **Let's not fall back on the same, weary, problem-solving methods.** In recent years in the Greater Yellowstone area, notably in grizzly bear and bison management, "science" and "bureaucracy" have been the dominant tools put forward to solve these complex problems. Although most will agree that both are *necessary* to solve natural resource management problems, neither is *sufficient* because the problems are neither wholly scientific nor bureaucratic in nature. Too often, politicians, officials, managers, scientists, and the public treat complex, ill-structured problems (such as elk management) as though they were "tame" problems for which definitions are clear and straightforward methods are available. They thus ignore the real-world politics that comes to dominate and are ill equipped to deal with it reasonably, practically, and morally.

- **On the other hand, let's not fool ourselves into thinking we can jury-rig an adequate solution with add-on methods from other fields.** A conglomeration of "off-the-shelf" methods from public relations, sociology, or conflict resolution, overlaying a core of biological and bureaucratic problem solving, will probably not help us solve the fundamental problems of elk management. Nor is there some clever, new method or model waiting to be discovered by natural resource managers. This kind of "methods-thinking" is a false hope. It will not produce the integrated, rational, justifiable, and publicly supported results needed for problems of this scope.

These are, of course, not the only pitfalls. As this decision process unfolds, we as a community need to step carefully and shield ourselves against these all-too-common weaknesses in policy making.

BUILDING PARTNERSHIPS FOR EFFECTIVE PROBLEM SOLVING

People who are concerned about the National Elk Refuge and elk management must create a decision process for themselves that meets the highest standards. The best way to design good policy is, first, with a partnership that can effectively understand and address all the problems at hand, and second, with an integrated, adaptive, problem-solving approach.

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CAPABLE PARTNERSHIPS

It is clear today that the public wants to be involved in elk management and other conservation issues in the region and nation. Pimbert and Pretty (1995) have compared different kinds of public involvement in decision making, ranging from passive participation to self-mobilization. In *passive participation*, the public is merely told what is going to happen or what has already happened, while the information being shared belongs only to officials (and perhaps the outside professionals who generated it). This kind of participation is being rejected by the public. So too is *participation in information giving*, in which people participate by answering questions posed by experts and officials without having an opportunity to influence proceedings. The public is also rejecting *participation by consultation*, in which people are consulted and someone records their written or spoken views. In this case, experts or officials define both the problem and the solution and may (or may not) modify them in response to public input; otherwise, the public is left out of the process. NEPA is an example of participation by consultation. The next level is *functional participation*, in which members of the public join groups that respond to predetermined objectives. Their involvement comes, not at an early stage, but after all the major decisions have been made. Facilitators are often used in this type of participation, which is also being rejected.

Today the public demands more in-depth involvement. In *interactive participation* people participate in joint analysis, which, in turn, leads to action plans and formation of new local groups or the strengthening of existing ones. Through interactive participation, multiple perspectives are built in, and systematic and structured learning actively takes place. This kind of group takes control over local decisions so that people have a stake in maintaining structures or practices. When these kinds of participatory partnerships are not possible, however, some people become *self-mobilized*, taking initiatives to change systems independently of government. Such an approach may challenge the existing structure of authority and control. That is why interactive participation is the preferred way to go.

A genuine partnership, involving diverse people working cooperatively and interactively to address a common problem, would be a highly productive model for elk management in Jackson Hole. One common way of building partnerships is through a community-based effort, which requires government, businesses, environmentalists, community leaders, and residents to engage one another in resolving specific environmental conflicts. "Community-based conservation" originated in the 1990s as a popular form of problem solving. More broadly, it can be considered a revitalized form of governance. Some of these projects are relatively successful, but many are limited by their inability to build "social capital" or by domination of bureaucratic, controlling government agencies. Unfortunately, failure reinforces old ideologies and corrodes trust and future working relations. To make community-based conservation work, participants must be able to loosen the bonds of narrow

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perspectives and timeworn ways of doing things—a tall task for some rigid individuals and deeply entrenched organizations. Cooperative partnerships require people with appropriate knowledge, skills in problem solving, and good will, and they also require flexible, open organization. Such an approach would offer many benefits in the elk case.

EFFECTIVE PROBLEM SOLVING

It is certain that the elk case will not be resolved with a little technical tinkering. Something more fundamental, substantial, and practical is needed. Elk management should be viewed as a “systems” challenge—a system of decision making. The ideal problem-solving methods we want are *adaptive, integrated, and interdisciplinary*. The three-part scheme outlined below, invented decades ago to address complex problems, is an alternative to the conventional approaches so often applied to natural resource management problems. This simple framework—substantiated by extensive research and practical applications—enables users to manage enormous amounts of ecological and social complexity. It helps people understand situations, outcomes, events, and processes in real-life contexts, and it reveals opportunities to change things for the better.

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This framework will not provide quick answers. It is only a set of principles to organize and integrate knowledge to solve problems. It has a “checklist” of things to consider in any conservation project so that users can construct a realistic map of the social context and decision process and use it to define and solve problems. It is rational, integrated, and comprehensive. As Brewer and deLeon (1983: 22) noted, “Other approaches may appear to offer simpler or easier solutions, but each usually turns up lacking in important ways—not the least of these being their relative inability to help one think and understand, and hence to become a more humane, creative, and effective problem solver.” This approach, detailed in the appendix of this volume (“Interdisciplinary problem solving: Next steps in the Greater Yellowstone Ecosystem”), is often described as being *problem-oriented, contextual, and multi-method*.

The three activities that constitute effective problem solving follow. But, first, participants in problem-solving exercises must commit themselves to two standpoints: (1) to be as unbiased and as free as possible from parochial interests, cultural biases, ideologies, disciplinary rigidities, and fixed bureaucratic loyalties; and (2) to seek the common good, which is—in the best description we’ve come across—“a commonwealth of human dignity.”

1. Explore the problem fully. How we characterize the elk management problem will largely determine how we respond to it. Too often in environmental issues, people decide on *biological* solutions before they define the *conservation* problems. If we miscast or under-represent what is involved, we almost guarantee the misallocation of resources and increase chances of failure.

Goals: What goals or ends, both biological and social, does the community want? Are the values behind the goals clear? These may be refined over the course of the analysis.

Trends: Looking back at the history of the situation, what are the key trends? Have events and processes moved toward or away from the specified goals?

Conditions: What factors, relationships, and conditions created these trends, including the complex interplay of factors that affected prior decisions? What models, qualitative and quantitative, might be useful at this stage to explain trends?

Projections: Based on trends and conditions, what is likely to happen in the future? It is important to project several scenarios and evaluate which is most likely. Is this likely future the one that will achieve our goals?

Alternatives: If trends do not seem to be moving toward the goal, then a problem exists and alternatives must be considered. What other policies, rules, norms, institutional structures, and procedures might help us to achieve our goals? Evaluate each in terms of the goals. Select one or more and implement them.

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2. Ensure an adequate decision process. Elk management is concerned with establishing *who* will make decisions about *how* we use resources. Participants must successfully influence this process if we expect to save species and their habitats. Remember the standards for good decision processes described earlier.

Pre-decision

Intelligence: What information—biological and social—do we need to make good decisions about elk management? Do we have it? What is missing? How do we get it? How will it be integrated and used? Does everyone have the information who wants it?

Promotion: Who is advocating which courses of action for what reasons? Is there adequate opportunity for debate? Who might be served by which courses of action and who might be harmed?

Decision

Prescription: Will the new policy be adequate to solve the problems we have identified? Will it be efficient, effective, and equitable? What are its goals?

Post-decision

Invocation: How will we “invoke,” implement, or enforce the new rules? Who will do it, where, when, and how? Is it authoritative? Are adequate assets available to carry it out? Is it clear under what circumstances we will invoke the new rules, i.e., do people know what to expect?

Application: How will the new rules be administered? By whom? What sanctions will apply if people violate the new rules?

Appraisal: What standards will we use to evaluate whether the new policies have succeeded? Who will do the evaluations? Who will get and act on the evaluations? How will their actions be appraised?

Termination: How will we know when to end this policy and move on to something more fitting? Who will decide? How can we start the process over again smoothly?

3. Understand the context. The human social context is too easily overlooked, ignored, or viewed as a constraint to the central biological task of elk management, when, in fact, it is central to understanding the problem and finding a permanent solution. “Map” the social process as realistically as possible.

Participants: Which individuals and organizations are participating? Who wants to participate or should participate?

Perspectives: What demands are participants making? What expectations do they have? On whose behalf are demands made, i.e., what groups or beliefs do people identify themselves with?

Situations: What is the “ecology” of the situation—geographic features, for instance? Are there any crises? Which institutions are or should be involved? Is the situation organized or not, and is it well organized?

Values: What “assets” do participants have in terms of power, wealth, skill, knowledge (enlightenment), affection, well-being, respect, and rectitude?

Strategies: How are these assets being used? Are people’s strategies educational, diplomatic, economic, or militant? Are these used persuasively or coercively?

Outcomes: What are the results of each decision activity? Who benefits and who is harmed in terms of which values or assets?

Effects: What institutions and practices are promoted and which are set back?

Attending to these three aspects of problem solving increases the chances that, as we tackle the problem of elk management in Jackson Hole, the process will be procedurally and substantively rational, politically practical, and morally justified.

A CIVIC DIALOGUE

“The significant problems we face cannot be solved at the same levels of thinking we were at when we created them.” – Albert Einstein

The elk case represents a strategic opportunity to improve wildlife conservation in Jackson Hole, to integrate competing agency ideologies, and to include diverse groups of people. The idea is to create “a community of good judgment with a license to think.” We need the political will to engage in this kind of

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fundamental sociopolitical change. Government agencies, which now currently control the form and dynamic of the management process, are vested in certain ways of doing things. To modify this arrangement will require change on the part of officials and professionals as well as the public. It will also require “transformative” leaders to encourage and enable change, innovation, and entrepreneurship, excite followers to new levels of activity, and move discussion, self-perception, and action to a new “moral” level.

Foremost, elk management policy should seek a common interest outcome. Finding the common interest is “a process of balancing, accommodating, and integrating the rich diversity of culture, class, interest and personality which characterizes” all policy making (McDougal *et al.* 1981: 207). Many special interests speak out in community decision making and exert influences in favor of decisions that benefit them, sometimes at the expense of the community’s common interest. When special interests dominate public decision making, it can result in less than desirable outcomes.

Several steps have been taken already to move problem solving in the elk case in a more adaptive, cooperative direction. We need to capitalize on these and continue our efforts. This *Bulletin*, the many people who contributed information and ideas, and the scientific information about biological and social issues are all ways to encourage a good management process in the public interest. As described in the appendix of this volume, there are additional designs available for upgrading our efforts, including workshops for “capacity building,” leadership and staff development, and case analyses and appraisals aimed specifically at policy learning. The community might also consider problem-solving exercises, seminars, or prototyping exercises to improve interdisciplinary and interagency coordination.

Toward the goal of finding common interests, a civic dialogue was held on March 23, 1999, at the National Museum of Wildlife Art in Jackson, Wyoming, to address elk management. The Northern Rockies Conservation Cooperative (NRCC) of Jackson, Wyoming, organized this effort in cooperation with the U.S. Fish and Wildlife Service, other organizations, and many individuals. Diverse citizens and agency personnel spent the day in conversation about the elk and how best to conserve them. The impetus for this dialogue was the planning effort over the next few years directed at improving National Elk Refuge management as mandated by Congress. The dialogue began with short presentations from the four student authors of the reports in this volume, followed by a free-ranging discussion on how best to manage the refuge. The specific question addressed by the group was “How can consensus be achieved in terms of elk, bison, and biodiversity on the National Elk Refuge?”

Here is a sampling of responses to the civic dialogue from participants:

“I was quite impressed with the student papers and presentations. Not only were they well researched and replete with valuable information (all of which should be considered in any NEPA process), but they highlighted the complexity surrounding

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the management issues on the refuge. Hopefully, they will be used to increase the public's understanding of this complexity. It would be a shame to have their work simply wind up in the file cabinets of a governmental agency or published in an academic journal that no one reads except peers. Either finding or creating fora for disseminating the information is critical."

"The best aspect was getting various interest groups there to discuss items outside of a particular project, question or controversy. It is good to have a philosophical discussion without the weight of a particular proposal or issue with imminent time lines."

"The three take home lessons are to have more such dialogues, to encourage dialogue among the refuge personnel and members of the public and different interest groups in the public, and to view the refuge in a larger ecological and community context (and carry out management with this broader perspective)."

"(1) This approach gives a forum for each participant to not only hear out other opinions, but to assess in his or her own mind the legitimacy of other opinions. This process of assessing legitimacy is going on whether we acknowledge it or not. It's part of figuring out where the power lines and networks are and aren't. The main thrust of such an assessment of legitimacy is whether a claim to a right or benefit has a public or private 'color,' and if the latter, whether granting it harms the community. I think it's best that this happen in a community forum instead of through preaching to the choir, as it were. (2) The situation in Jackson Hole has reached the point of 'irresistible force meets immovable object.' It's recognition AND acceptance of this fact that opens up other possibilities. This is also the point at which the policy sciences are most fruitful, because they encourage rethinking things in a fundamental way, and of course provide a framework for the rethinking. (3) The question/problem (for me) is one of governance. The answer seems to depend on whether issues such as those impinging upon the National Elk Refuge are sufficient to carry the weight of changing how we make decisions generally. I think they are."

"It has been a catalyst for trying to bring together a 'larger' circle of people to reassess the problems—specifically, the need for an Environmental Impact Statement as a result of the Fund for Animals lawsuit, and generally, managing elk and bison—and most importantly, biodiversity—into and out of Jackson Hole."

"In my opinion, it would be helpful to offer a series of community-wide discussions in which various viewpoints could be more comprehensively developed and then discussed—perhaps one or two viewpoints per session. It may also be useful to conduct some national surveys about Refuge management to solicit input from a national public about both the NER and a broader vision for the National Refuge System. Otherwise, there is the risk of marginalizing the national public's voice."

"I think continued meetings would help. I think it is important to involve any group

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that can upset collaborative processes and might sue. While we don't want to 'give in' to special interests, it is important to include them in discussions to gauge their true concerns and where they might be willing to compromise. I also think some of the next steps might come from participants on their own (i.e., their own personal contacts)."

Clearly, the civic dialogue proved its worth. These kinds of comments make us hopeful that there are people, organizations, and agencies in the region with a lot to offer in terms of thoughtfulness and analytic skills, that they are concerned and willing to contribute time and energy to solving these intransigent problems, and that they want to be part of interactive, participatory processes to manage public lands and resources. We have a rare opportunity ahead of us in deciding how to manage the National Elk Refuge, the Jackson Hole elk herd, and related resource issues, and as a community we can improve the management process as well as the biological outcomes.

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