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Analyzing Stakeholder Preferences for Managing Elk and Bison at the National Elk Refuge and Grand Teton National Park: An Example of the Disparate Stakeholder Management Approach

By Lynne M. Koontz and Dana L. Hoag

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By Lynne M. Koontz, U.S. Geological Survey, and Dana L. Hoag, Department of Agricultural and Resource Economics

Introduction

The U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS) are preparing a management plan for bison and elk inhabiting the National Elk Refuge (NER) and Grand Teton National Park (GTNP) near Jackson Hole, Wyoming. A management plan is needed to evaluate current and possible changes to habitat management, disease management, winter feeding and hunting programs related to the NER and GTNP. In order to make good decisions, managers need to incorporate the opinions and values of the involved stakeholders as well as understand the complex institutional constraints and opportunities that influence the decision making process. Federal, state, local, private and public stakeholders have diverse values and preferences about how to use and manage resources, and underlying institutional factors give certain stakeholders more influence over the outcome. How stakeholders use their influence can greatly affect the time, effort and costs of the decision making process. The overall result will depend both on the stakeholder's relative power and level of conviction for their preferences.

Many programs and tools have been developed by different disciplines to facilitate group negotiation and decision making. Three examples are relevant here. First, decision analysis models such as the Analytical Hierarchy Process (AHP) are commonly used to prioritize the goals and objectives of stakeholders' preferences for resource planning by formally structuring conflicts and assisting decision makers in developing a compromised solution (Forman, 1998). Second, institutional models such as the Legal Institutional Analysis Model (LIAM) have been used to describe the organizational rules of behavior and the institutional boundaries constraining management decisions (Lamb and others, 1998). Finally, public choice models have been used to predict the potential success of rent-seeking activity (spending additional time and money to exert political pressure) to change the political rules (Becker, 1983). While these tools have been successful at addressing various pieces of the natural resource decision making process, their use in isolation is not enough to fully depict the complexities of the physical and biological systems with the rules and constraints of the underlying economic and political systems. An approach is needed that combines natural sciences, economics, and politics.

Study Purpose and Objective

The purpose of this study is to develop a tool to help decision makers incorporate the wide range of stakeholder preferences for managing bison and elk at the NER and GTNP and to show stakeholders how their preferences were included in the decision making process. We integrated concepts from decision analysis, political and institutional analysis, and public choice economics into a single, comprehensive approach called Disparate Stakeholder Management (DSM). The objective of developing the DSM approach is to help decision makers better describe, measure, communicate and resolve management issues with disparate stakeholders. We demonstrate the DSM approach on elk and bison management and show how knowing about stakeholder preferences can increase satisfaction overall for stakeholders, even when they hold very different views.

Study Motivation and Background

The Jackson bison and elk herds are part of one of the largest concentrations of free-ranging bison and elk in the world. When deep snows cover the vegetation or the vegetation has been eaten by the elk, the FWS provides supplemental feed in the form of alfalfa hay pellets on the NER. The Jackson bison herd population has been increasing rapidly over the past 20 years, as the herd discovered the supplemental feed distributed for elk. However, the winter feed program at the NER artificially concentrates the elk and bison, thereby increasing the risk of the transmission and frequency of several diseases including brucellosis. A 1996 interagency management plan was approved that allowed public hunting of bison on NER lands to control the bison population. In 1998 an animal rights stakeholder group sued the U.S. government for pending management actions (i.e., public hunting) of the Jackson bison herd. The stakeholder group claimed that the 1996 interagency management plan had failed to adequately address the effects of winter feeding of elk at the NER on the Jackson bison herd. The Washington DC district court judge agreed and halted fatal management actions of bison on the NER until an Environmental Impact Statement (EIS) has been completed.

The EIS must include a range of alternatives for managing both the Jackson bison and elk herds on the GTNP and NER. The alternatives must address the politically and socially sensitive issues of habitat management, disease management, winter feeding, and hunting programs related to the NER and GTNP. Stakeholders have diverse and strong preferences for each of these management issues and have become polarized to the point where it is difficult to look at how important each issue is in the overall decision framework. An article titled “Ideas show elk-bison plan ideological divide” in the May 22, 2001 edition of the *Jackson Hole Guide* detailed the high level of polarization between the main stakeholder groups (Huntington, 2001). Because the bison and elk herds migrate across several jurisdictional boundaries (Figure 1)—the National Elk Refuge, Grand Teton and Yellowstone National Parks, the U.S. Forest Service Bridger-Teton National Forest (USFS-BTNF), and state and private lands—the FWS and NPS seek a cooperative effort among federal and state agencies and other stakeholders to develop a coordinated approach for managing the Jackson bison and elk herds. Achieving a common ground solution and thereby reducing the likelihood of more litigation could potentially avoid or greatly reduce the additional amount of time, money, and other resources expended by the federal government and stakeholder groups in the process leading to the actual implementation of a management plan alternative. For the elk and bison EIS, the DSM can help increase the opportunities for achieving a common ground solution.

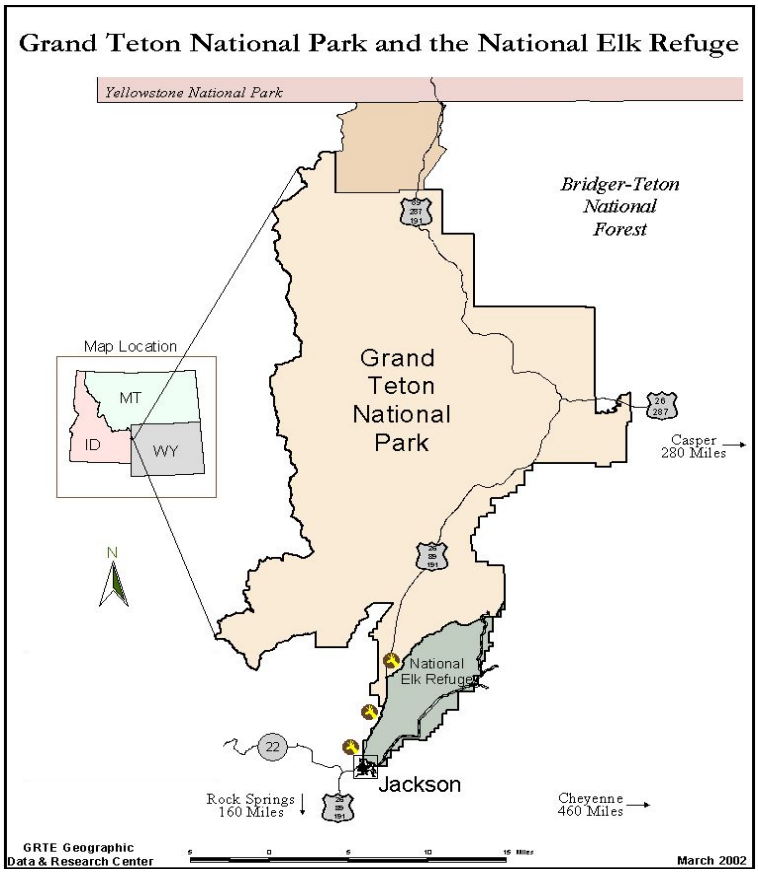


Figure 1. Map of the Jackson elk and bison management planning area.

Methods

In this project, we develop the DSM approach and apply it to the elk and bison case study in Jackson. The basic steps were:

1. to identify stakeholders,
2. to develop a policy options map, or hierarchy of the resource management options,
3. to develop a stakeholder preference map, or value weights for each management option for each stakeholder group, and
4. to develop a stakeholder standings map to display stakeholder standings for each policy option

In the first step, we asked stakeholder organizations to provide information about their organization's involvement and preferences for managing elk and bison at the NER and GTNP. A list of actively involved stakeholder organizations in the EIS process was provided by the EIS planning team. This list was used to create the initial stakeholder list for this study. Additional stakeholders were added to the list during the study process when additional stakeholder organizations were identified by other stakeholders. In total, we interviewed 49 individuals

representing 30 stakeholder organizations involved in the elk and bison management plan. As shown in Table 1, the thirty stakeholder organizations included federal and state resource management agencies; tribal representatives; local government representatives; local businesses; agricultural/ranching representatives; hunting and outfitting organizations; and environmental organizations. At least one representative from each of the thirty organizations was interviewed. Whenever possible, more than one representative from an organization was interviewed, especially within the most actively involved agencies and organizations.

Table 1. List of stakeholder organizations interviewed.

Government	**Local/Economic Interests**
Federal	*Local Business*
Animal and Plant Health Inspection Service	Dubois Chamber of Commerce
Bureau of Land Management	Jackson Hole Chamber of Commerce
National Park Service	*Hunting & Outfitting*
U.S. Fish & Wildlife Service	Dubois Outfitters Association
U.S.D.A. Forest Service	Elk For Tomorrow
State	Foundation for North American Wild Sheep
Wyoming Game & Fish Commission	Jackson Hole Outfitters Association
Wyoming Game & Fish Department	Wyoming Hunters Association
Office of Federal Lands Policy	*Agricultural*
Local	Independent Ranchers
Teton County Commissioners	Wyoming Farm Bureau
Town of Jackson	
	Environmental Interests
Tribal	*Animal Rights*
Shoshone Business Council	Buffalo Field Campaign
Inter-Tribal Bison Cooperative	Fund for Animals
	Conservation Groups
	Defenders of Wildlife
	Greater Yellowstone Coalition
	Jackson Hole Conservation Alliance
	Northern Rockies Conservation Cooperation
	Sierra Club
	Wyoming Outdoor Council
	Wyoming Wildlife Federation

Personal interviews were conducted during the summer of 2001 in Denver, Colorado and several cities and towns across Wyoming, including Jackson Hole, Dubois, Riverton, Laramie, and Cheyenne. The interview process consisted of having each stakeholder representative fill out two surveys. The first survey asked the stakeholder about their organization's preferences for managing elk and bison in the NER and GTNP. The second survey was to assess the types of political power of their organization and how important each source of power was for the elk and bison planning process. On average, it took 30 minutes to one hour for a stakeholder to complete the surveys. The methods for developing the surveys and their results are described below as part of steps for developing the DSM framework.

Developing the DSM Framework: Procedures and Results

The DSM was developed explicitly for this project. However, the DSM approach can be used for many different types of decision making problems. The objective was to weave together state-of-the-art methods for decision analysis, political and institutional analysis, and public choice economics into a single program. After the stakeholders were identified in step one, a policy options map was developed to describe the management problem in detail. One way this can be accomplished is by structuring the problem into a hierarchy. The hierarchy reduces a problem into smaller decision points that are choice variables in the policy. We used the Analytical Hierarchy Process (AHP) to design the hierarchy and elicit stakeholder preferences. The AHP is commonly used to prioritize the goals and objectives of stakeholders' preferences for resource planning by formally structuring conflicts and assisting decision makers in developing a compromised solution (Forman, 1998). AHP organizes the management decision in a hierarchy framework that allows for the weighting of all factors influencing the decision.

During the early stages of the EIS process we worked extensively with the EIS planning team to develop and define the management issues needed to formalize the AHP hierarchy. As an added benefit, building the hierarchy provided the EIS team with an effective way to visualize and conceptualize the large and detailed problem by breaking it down into all of its related parts. Consequently, the hierarchy was additionally able to assist the EIS team in their process of structuring and developing the draft management alternatives, and was helpful in explaining alternative plans to stakeholders.

The final elk and bison management hierarchy is shown in Figure 2. The main management objectives that were identified through our discussions with stakeholders and policy makers revealed three major objectives: 1) the transmission and prevalence of diseases; 2) managing forage by means of supplemental winter feeding and/or enhancing or increasing winter habitat; and 3) the use of hunting programs to control herd populations on the NER and GTNP. These three main objectives were further divided into management activities or strategies. For managing disease, strategies include one or more of the following: vaccination, test & slaughter, and dispersal (e.g., management that leads to increasing the distribution of animals over the landscape, thereby reducing the amount of concentration and disease risk). For managing forage, supplemental winter feeding strategies include the options of annual feeding, emergency feeding (feed only if there is not enough forage available), and no feeding. Forage management activities related to enhancing forage or increasing winter range include the options of no active forage management, maintain current conditions, enhance forage/range in Jackson, and enhance forage/range inside & outside of Jackson. The enhance forage/range in Jackson Hole scenario involved forage and habitat improvement on the refuge and surrounding lands in Jackson Hole, the enhanced forage/range inside & outside of Jackson Hole scenario included everything from the previous scenario as well as the restoration of traditional migrations out of the Jackson Hole area to traditional wintering areas. Management activities related to the use of hunting include allow hunting on the GTNP and NER, only allow hunting on the NER, and no hunting allowed. Appendix A provides a description of the management objectives and strategies asked in the AHP survey as well as the survey results. Because most stakeholders felt differently about how to manage elk and bison (i.e. wanted elk fed but not bison or wanted bison vaccinated but not elk) the management strategies were separated for bison and elk management options (Figure 2).

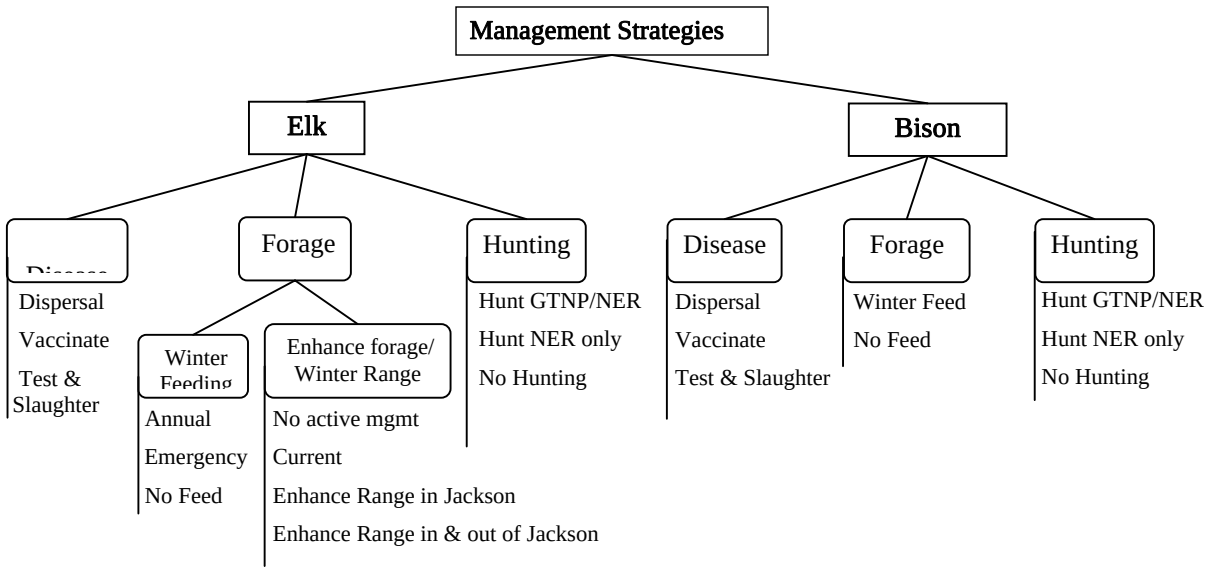


Figure 2. AHP hierarchy for elk and bison management strategies.

The Stakeholder Preference Map

Stakeholder preferences can be determined after the policy options map is developed. In this case, the options map involves structuring an AHP hierarchy. The preference map assigns preference weights to the policy options. Stakeholders were asked to fill out an AHP pairwise comparison survey to measure their weighted preferences for all of the elk and bison management strategies and management objectives shown in Figure 2. The AHP weighting scores add up to one (or 100% of preference weight) and can be analyzed at the localized or the overall decision context level. The localized scores focus on the preferences for a particular management option, where the overall decision scores include the weighting of the complete hierarchy. An example for the localized level of winter feeding of elk is shown in Figure 3. In this example of the preference weighting scores for a conservation organization, out of a total preference weight of 100%, 16% of their preference weight was given to allowing annual feeding, 77% to allowing emergency feeding, and 7% to not allowing feeding. These scores appear to indicate that this conservation organization has a very strong preference for an emergency winter feed program for elk. By knowing these weights, policy makers can identify where stakeholders are divided and gauge how strongly they are divided. We say that this group appears to favor emergency feeding because so far we have only reported the relative importance of the three subcategories, but do not yet know the relative importance of the feeding issue.

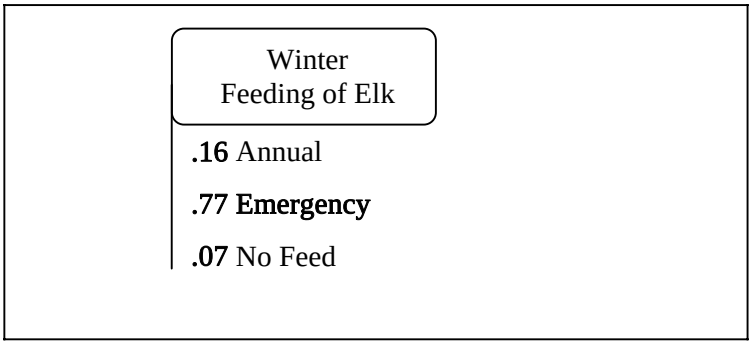


Figure 3. Example of a conservation group's preference weightings at the localized level.

Because the AHP weights each level of the hierarchy, we can analyze the importance of emergency elk winter feeding in terms of the overall management decision (i.e. how important elk winter feeding is compared to other issues such as bison disease management or allowing elk hunting). In Figure 3, emergency feeding of elk was the conservation group's most important issue within the winter feeding management options. Looking at the overall decision level scores we can tell how important emergency feeding of elk is when compared to other management issues. As illustrated in Figure 4, the weight of emergency feeding is 77% of the subcategory, but is only 5% of the overall weight. At the top hierarchy the conservation group gave 90% of their preference weight to elk management issues and 10% to bison management. At the next level, within elk management, forage issues were the most important accounting for 62% of the weight. Under elk forage issues, the majority of the preference weight went to enhancing the winter range; only 6% of the overall preference weight went to elk winter feeding issues. That is, while this group prefers emergency winter feeding to solve the feeding issue, they are much more concerned about forage than they are winter feeding (56% of 62%). One advantage of the DSM approach is that structuring, then weighting policy options, can help distinguish between the noise at meetings and real concerns. Detailed results of all stakeholder preferences from the AHP survey are presented in Appendix A.

Besides weighting the factors influencing the decision, the AHP hierarchy framework provides traceability for every management issue in the overall decision context. Tracing out the importance of each issue in the overall context empowers decision makers to go beyond the polarized public meeting discussions and see what issues are most and least important to every stakeholder group when all issues are considered. We know for example that the conservation group discussed above is more concerned about forage management to address the elk herd than they are about whether bison are receiving winter feed. The AHP also allows policy makers to develop compromised solutions that best maintain the interests of what is important to as many groups as possible. The degree of satisfaction can be determined for every resource management option by comparing how it impacts each stakeholder group. The DSM can help decision makers anticipate which stakeholders will be affected most by any single policy. Finally, the DSM can be used to show stakeholders in a tangible way how their preferences were incorporated in the planning process. That is, each stakeholder can be shown what they won and what they lost, and be shown how highly they prioritized these gains and losses.

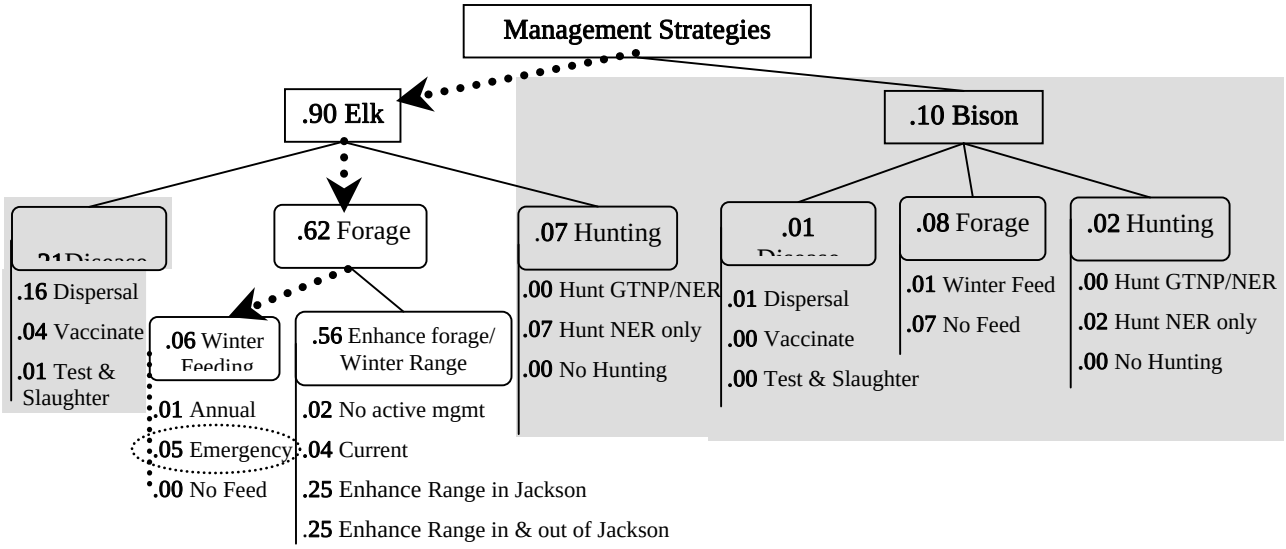


Figure 4. Example of tracing the importance of emergency winter feeding of elk.

Stakeholder Standings Map

The last step of the DSM is to develop a stakeholder standings map to display stakeholder preferences for each policy option. Resource management options and stakeholder preferences need to be displayed in a format that is easy for decision makers to understand and compare. In this case, we created a policy possibilities frontier (PPF), which represents combinations of land use management objectives with alternative combinations of each objective along the curve. The PPF is analogous to a production possibilities frontier in the economic literature (Bromley, 1989; Griffin, 1991; and Rhodes and Wilson, 1995).

In this case study, the management options for stakeholders were placed within the spectrum of management practices ranging from a "natural" land use approach to a more "managed" land use approach. The most "natural" management approach allowed in the preference survey would use dispersal to manage disease and would not allow hunting or winter feeding. The most "managed" management approach allowed in the preference survey would use test and slaughter to manage disease, have an annual winter feeding program, and allow hunting on both the refuge and park. We worked with the FWS and NPS, to match the preference weighting results of the AHP to the potential policy alternatives. Because most alternatives combine management options that are considered to be a natural or hands off approach with options that are considered to be more managed, index scores were developed to represent the amount of "natural" and "managed" land use services included in each alternative. Indexes were also used to mathematically match stakeholders' preference weightings from the AHP preference survey with the placement of the management alternatives on the PPF (for technical details on the development of the PPF see Koontz and Hoag, 2005). As of December 2004, the draft EIS analyzes six management alternative scenarios. Table 2 contains a description of each proposed alternative and the management options.

Table 2. Level of emphasis of management alternatives related to AHP survey.[a]

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Focus of Alternative	No action (status quo)	Minimal active management	Increased reliance on winter grazing habitat with minimal enhanced forage production	Increased reliance on winter grazing habitat with an increased carrying capacity	Continued winter feeding with enhanced forage production	Complete reliance on winter grazing habitat with an increased carrying capacity
Elk and bison disease management						
Dispersal	Medium	High	High	Medium	Medium	High
Vaccinate			Low	Low	High	
Test and slaughter						
Elk and bison supplemental feeding	Primarily annual feeding (feed 9 out of 10 years when snow covers vegetation)	No feeding (phase out within 10–15 years)	Feed on emergency basis only (e.g., 2 out of 10 years)	Feed on contingency basis only (e.g., 4–5 out of 10 years)	Same as Alt1	No feeding (phase out within 5–10 years)
Enhancing elk forage and/or winter range						
No active management		High		Low		
Current	High		Medium	High	Medium	Medium
Route in Jackson			Low		High	Medium
Route in and out of Jackson		Low	Low			
Elk hunting	Hunting on the northern two-thirds of the NER and east of the Snake River in GTNP	No hunting	Same as Alt1, except with an initial increase in harvest and use of other methods to better control park herd segment	Same as Alt 1, except with an initial increase in harvest and use of other methods to better control park herd segment	Same as Alt1	Same as Alt4 in the short term (except closures in the long term)
Bison hunting	No hunting	No hunting	Hunt NER	Hunt NER	Hunt NER	Hunt NER

[a]Note that these are brief descriptions of complicated management alternatives. This table only describes the portion of the alternatives related to the AHP Stakeholder Survey. Blank cells indicate the management activity is not addressed within the alternative.

Using a PPF, both draft EIS management alternatives and stakeholder preferences were mapped in the same continuum. In this way, the degree that any particular policy (EIS

management alternative) matched any particular stakeholder's preferences could be observed. All stakeholder preferences and weights are depicted in a single graph along with all possible policy choices. As illustrated in Figures 5 and 6, the PPF conveniently displays the "natural" vs. "managed" spectrum of stakeholder preferences and draft EIS elk and bison management alternatives. These figures also show how stakeholder preferences align with the proposed draft EIS management alternatives. Alternative 2 contains the most "natural" management approach with the highest possible amount of dispersal, no winter-feeding, and no hunting. Alternative 5 is the most "managed" management option, as it would allow vaccination, annual winter feeding, and hunting on both the refuge and the park. No alternative is close to the "managed" border because no draft EIS alternative included test and slaughter as a management option. Alternatives 1, 3, 4, and 6 contain combinations of "natural" and "managed" management options. The PPF bows outward to reflect that more people can be satisfied and by bigger amounts when there is compromise.

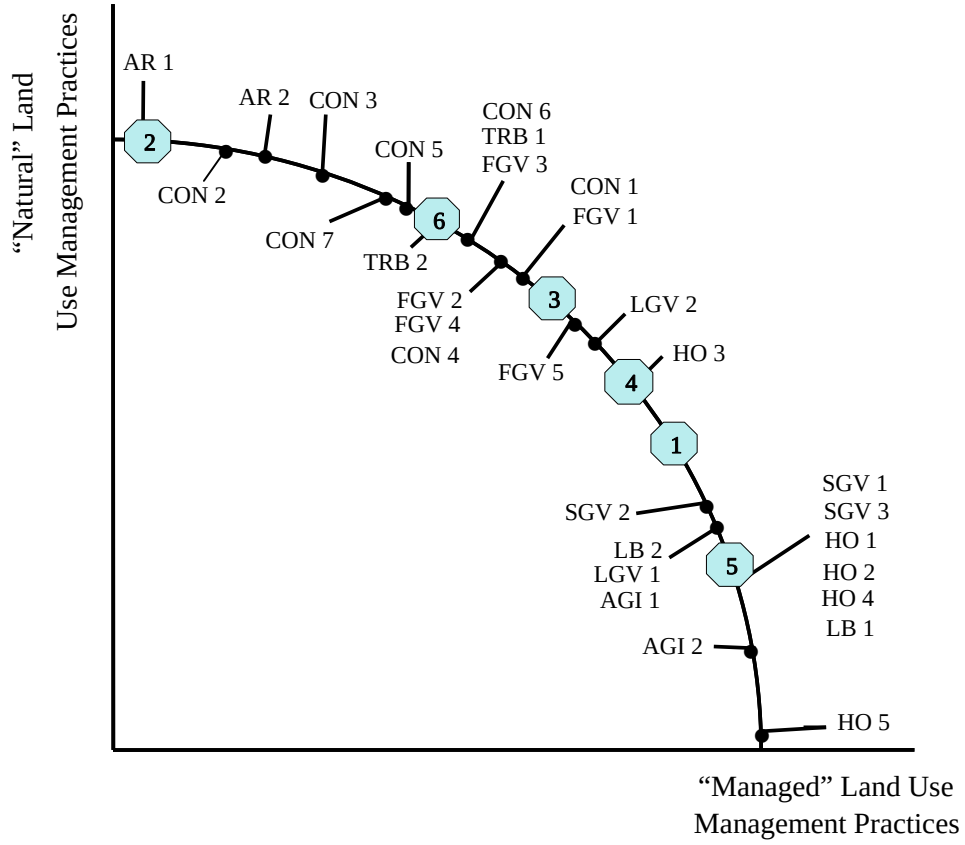


Figure 5. The policy possibilities frontier for elk management options.

Organizational Code Key		
AGI = Agricultural Interests	FGV = Federal Government	LGV = Local Government
AR = Animal Rights	HO = Hunting & Outfitting	SGV = State Government
CON = Conservation Groups	LB = Local Business	TRB = Tribal

Represent draft EIS management alternatives

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, the combined preference scores are shown.

Since the AHP preference analysis allowed stakeholders to choose any amount of each management option, some stakeholders fell between the alternatives or aligned with one alternative for elk management options but a different alternative for bison management options. Because of the complexities involved with issues related to the enhancing forage/winter range for elk management (restoring natural migrations is thought of as a hands off approach but would require high management levels to achieve it), these issues are not represented on the elk management PPF in Figure 5. However, these issues *are* included in the following steps of the DSM that address the importance of the different management issues and stakeholder satisfaction with the management alternatives.

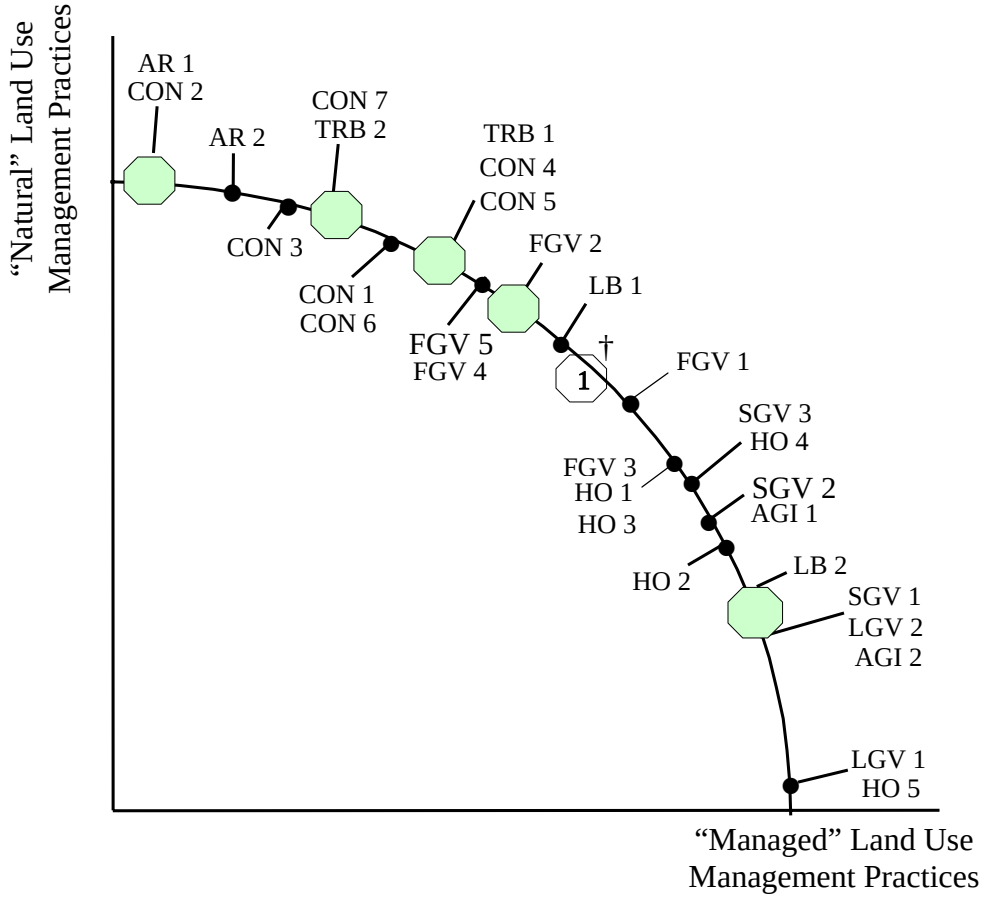


Figure 6. The policy possibilities frontier for bison management options.

Organizational Code Key

AGI = Agricultural Interests	FGV = Federal Government	LGV = Local Government
AR = Animal Rights	HO = Hunting & Outfitting	SGV = State Government
CON = Conservation Groups	LB = Local Business	TRB = Tribal

Represent draft EIS management alternatives

†Primarily because of the level of winter feeding allowed, Alternative 1 falls between Alternatives 4 and 5. However, Alternatives 4 and 5 allow bison hunting but Alternative 1 does not. All stakeholders that fell between Alternatives 4 and 5 were supportive of bison hunting and therefore would likely not be supportive of Alternative 1. Note: Numbers represent the different organizations within each group. If more than one

representative from an organization was interviewed, the combined preference scores are shown.

Results shown in Figures 5 and 6 indicate that most federal government representatives tend to prefer a management approach for both elk and bison that is somewhere between "natural" and "managed". Local and state government representatives, agricultural representatives, local business representatives, and hunting and outfitting organizations tended to favor more "managed" approaches for elk and bison management than natural approaches. Representatives of conservation groups tended to prefer more "natural" approaches for elk and bison management, as did representatives of animal rights groups but to a stronger degree.

Figures 5 and 6 illustrate the range of the current draft EIS management alternatives along the "natural" to "managed" land use practices spectrum. However, the initial set of alternatives developed by the EIS team excluded a couple of these alternatives. By using the PPF, we were able to show the EIS team the potential gaps in preferred management alternatives along the curve. In fact, the initial set of alternatives did not include an alternative that came close to matching the preferences of the EIS Team agencies. As a result, the EIS Team added a new alternative and modified an existing alternative to more accurately reflect the range of stakeholder preferences identified by the PPF. This outcome highlights the benefit and power of the DSM.

Developing Compromised Solutions

Because the allocation of scarce resources necessarily excludes or limits some types of resource use, stakeholders have an incentive to compete for a larger share of the allocation through the political process. Rent-seeking is the activity of influencing the political process by means of lobbying, media campaigns, public hearings, and litigation to obtain favorable results or avoid unfavorable ones. There will be certain issues in the decision (hunting, feeding, and vaccination) that some stakeholders might be less open to compromise. While each stakeholder group will favor or prefer a management alternative (one of the policy points on the PPFs in Figures 5 and 6) that most closely aligns with their preferences, the EIS team selects an 'official' preferred alternative in the Draft EIS. Once the preferred alternative is selected by the EIS team, stakeholders can increase their rent-seeking activities to try to force a more favorable outcome (e.g. if the outcome is not close to the preferences of a given stakeholder). The difficulty in reaching a compromise solution has important social welfare implications because the costs associated with individual or group efforts to maximize their own well being can generate social waste rather than social surplus (Buchanan and others, 1980). Therefore, decision makers need to understand the level of importance or conviction each stakeholder group holds for a particular management issue to determine where acceptable compromises are more likely to be reached.

Reaching a compromise solution could potentially avoid or greatly reduce the amount of time, money, and other resources expended by stakeholder groups in the process leading to the actual implementation of a management plan alternative. The level of difficulty for reaching a compromised solution among stakeholders will depend on the degree of importance of each issue to a stakeholder (the policy benefit), how different each draft alternative is to their preferred alternative (the policy cost), and the abilities stakeholders have to influence the outcome (political influence). To determine which management alternatives are most likely to result in a compromise solution that satisfies the strongest stakeholder interests, results from the AHP survey were used to estimate the "policy benefit" and "policy cost" of each management alternative.

The "policy cost" was determined by the difference between a stakeholder's preferred management option preference weighting scores and the weighting scores of each EIS management alternative. That is, the cost is how much the policy misses the most desired solution. In Figures 5 and 6 this is represented by the distance between each stakeholder's placement on the PPF and the placement of each draft management alternative; these scores are at the *localized* AHP level. This distance does not yet account for the *overall* relative importance of the different issues to the stakeholder (i.e., how important issues related to disease management are to forage management and/or hunting issues). If all stakeholders cared equally about all management issues, the PPF would fully represent stakeholders' policy costs and benefits. As shown by the example in Figure 4, while some stakeholders may care equally about all management issues, others will care a great deal about one issue more than the others.

A stakeholder's policy benefit was determined by the *overall* importance of the overall management strategies categories of disease management, forage management, and hunting. That is, these *overall* weights were used to weight how important the difference was between a stakeholder's desired preferences for disease, forage, and hunting management strategies and the actual management strategy combination within each alternative. For example, a stakeholder could have strong preferences for allowing elk hunting only on the NER and supplemental elk feeding and therefore not align close to Alternative 5 in Figure 5. However, when all issues are examined, elk hunting and winter feeding could have little importance as compared to using vaccination to manage elk diseases and therefore this stakeholder could view Alternative 5 as a satisfactory compromise solution even though they do not align closely with it on the PPF. Figures 7 and 8 show the average stakeholder group preference weightings for the importance of elk and bison management issues, respectively.

As shown in Figures 7 and 8, most stakeholder groups felt that one or two of the management issues were more important than the other issues for managing elk and/or bison (most did not weight all issues as having equal importance). For example, local government, tribal representatives, agricultural interests, hunting and outfitting organizations, and animal rights organizations gave less than 20% of their total preference weight to elk disease management as compared to elk forage management and elk hunting. As shown in Figure 7, most stakeholder groups thought forage management (winter range and/or winter feeding) was an important management issue for elk. Hunting was also an important management issue for elk, especially with representatives from the state and local government, tribal, agricultural interests, and hunting and outfitting organizations. Several groups rated disease management as an issue of low importance compared to forage and hunting issues, indicating possible compromises on disease issues maybe more likely than forage or hunting issues (Figure 7).

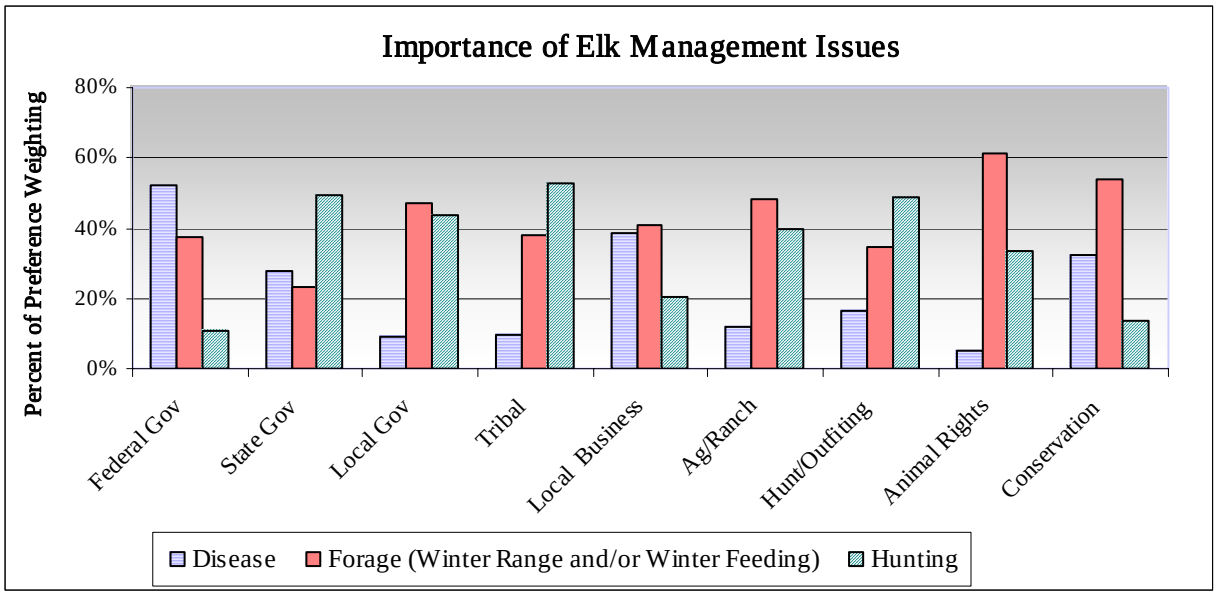


Figure 7. Stakeholder preference results for elk management issues.

As shown in Figure 8, for bison management the issue of hunting was highly more important to local government and hunting and outfitting representatives (greater than 80% and 60% of preference weight, respectively), indicating simple compromises on bison hunting issues are not likely. The issue of winter feeding was highly more important to tribal, animal rights, and conservation groups, indicating possible compromises on bison feeding issues are not likely.

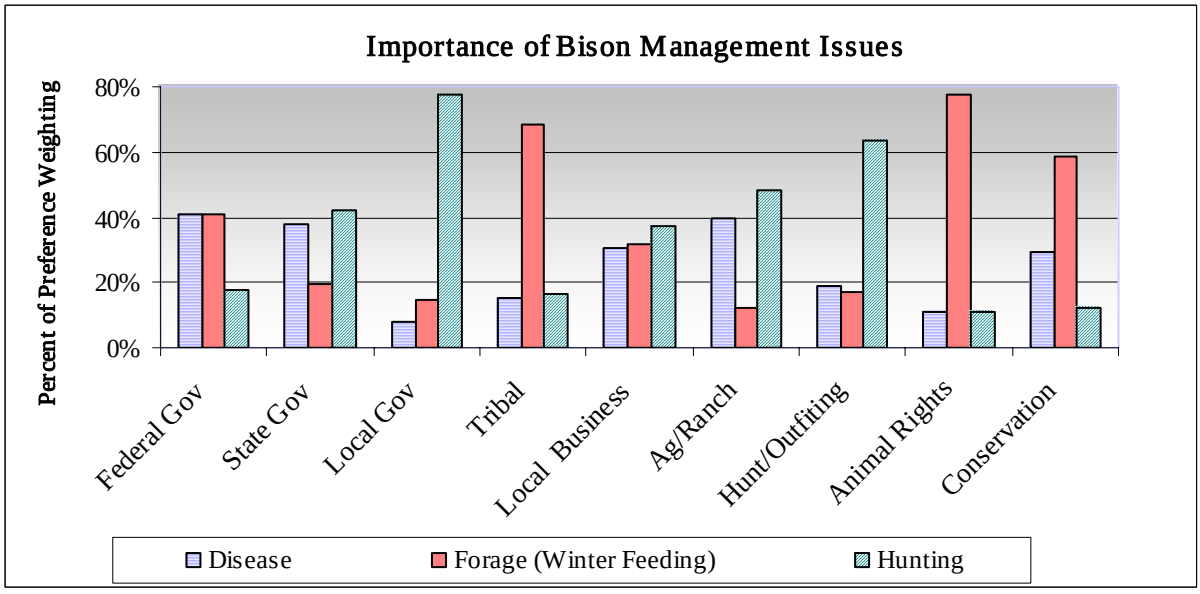


Figure 8. Stakeholder preference results for bison management issues.

Using the policy benefit and policy cost scores for each stakeholder, compromise ratings were developed for all of the management alternatives. A comparison of the main stakeholder group compromise ratings for each management alternative is presented in Table 3. These scores represent the combined ratings for all individuals within each stakeholder category. Table 3 reports an overall compromise rating for each alternative and also shows the rating split by elk related or bison related management issues within each alternative. An overall compromise rating of 100% would indicate all individuals of the stakeholder group were completely satisfied with all elk and bison management aspects for the alternative. The closer a compromise rating score is to 100% suggests that individuals within the stakeholder group are more satisfied with that alternative as compared to alternatives with lower compromise rating scores. Therefore, acceptable compromises with a particular stakeholder group will be more easily reached for alternatives with the higher compromise rating scores (Table 3). For example, the overall compromise scores indicate local government officials were most satisfied with the management options of Alternative 5 (77%) and the least satisfied with Alternative 2 (11%). Within Alternative 5, local government officials were highly satisfied with the management activities related to bison (91%) but not as satisfied with the management activities related to elk (62%). The compromise rating scores give the decision maker a tool to evaluate stakeholder preferences, where the consequences of any policy choice are revealed. The decision maker will know explicitly how each stakeholder is impacted.

Table 3. Compromise ratings for each management alternative by stakeholder group.

	Federal Gov't	State Gov't	Local Gov't	Tribes	Local Business	Ag/Ranch	Hunting and outfitting groups	Animal rights groups	Conservation groups	Average of all groups
Alternative 1										
Elk issues	45%	67%	58%	55%	71%	73%	69%	9%	31%	53%
Bison issues	45%	26%	21%	17%	39%	25%	25%	21%	33%	28%
Total	**45%**	**47%**	**39%**	**36%**	**55%**	**49%**	**47%**	**15%**	**32%**	**41%**
Alternative 2										
Elk issues	57%	8%	12%	44%	8%	4%	4%	49%	51%	27%
Bison issues	41%	10%	10%	75%	19%	6%	15%	87%	75%	38%
Total	**49%**	**9%**	**11%**	**60%**	**13%**	**5%**	**10%**	**68%**	**63%**	**32%**
Alternative 3										
Elk issues	73%	51%	48%	61%	35%	42%	54%	45%	62%	52%
Bison issues	64%	63%	82%	91%	65%	55%	72%	84%	88%	74%
Total	**68%**	**57%**	**65%**	**76%**	**50%**	**48%**	**63%**	**64%**	**75%**	**63%**
Alternative 4										
Elk issues	56%	61%	47%	69%	43%	48%	63%	15%	39%	49%
Bison issues	67%	68%	87%	69%	73%	61%	75%	60%	75%	70%
Total	**62%**	**64%**	**67%**	**69%**	**58%**	**54%**	**69%**	**37%**	**57%**	**60%**
Alternative 5										
Elk issues	43%	82%	62%	52%	85%	81%	75%	20%	37%	60%
Bison issues	59%	84%	91%	36%	88%	80%	71%	24%	39%	63%
Total	**51%**	**83%**	**77%**	**44%**	**87%**	**80%**	**73%**	**22%**	**38%**	**62%**
Alternative 6										
Elk issues	68%	43%	37%	59%	24%	33%	40%	39%	60%	45%
Bison issues	57%	59%	79%	91%	59%	51%	68%	85%	83%	70%
Total	**62%**	**51%**	**58%**	**75%**	**41%**	**42%**	**54%**	**62%**	**72%**	**57%**

As shown in Table 3, no stakeholder groups are 100% satisfied with all of the elk and bison management aspects of any alternative. Because the AHP preference analysis allowed stakeholders to choose any amount of each management option, stakeholder preferences were not constrained to the grouping of management options that makeup each Draft EIS alternative. Therefore, stakeholder preferences could align with one alternative for elk management options but a different alternative for bison management options. Out of the Draft EIS alternatives in Table 3, the highest compromise ratings indicate Alternatives 3, 5 and 4 are the most likely to reach an agreeable compromise by the most stakeholders. However, with overall average (of all stakeholder groups) compromise rating scores of only 63% for Alt.3, 62% for Alt 5, and 60% for Alt 4, achieving a compromise solution will be more difficult than with an alternative that had a 95% compromise rating score. Alternatives 2 and 1 stand out as those that will not be agreeable to a majority of the stakeholders.

When examining the PPF in Figures 5 and 6, it might be expected that the alternatives falling in the middle of the "natural" vs. "managed" management spectrum would be more agreeable for a compromised solution while, the alternatives closest to the "natural" (Alternative 2) or "managed" (Alternative 5) endpoints would be the hardest to reach a compromise. Alternative 2 (which would not allow elk or bison feeding or hunting and is the alternative preferred by animal rights groups) would have the highest overall level of opposition as expected. However, the only other alternative with a high compromise rating, Alternative 1, is not at the opposite end of the management spectrum. Alternative 1 is a continuance of the current management activities, which means bison hunting is not permitted. As shown in Figure 8, bison hunting is substantially more important than disease or forage issues to several stakeholder groups. The compromise scoring results in Table 3 indicate that the importance of the overall management issues (Figures 7 and 8) matters more than the actual distance on the PPF in Figures 5 and 6. For example, as shown in Figures 3 and 4, the conservation group had a strong preference for emergency winter feeding of elk (Figure 3) but when all issues were examined, this issue had little importance as compared to enhancing elk winter range (Figure 4). This gives the decision makers a tool to work with stakeholders to identify areas of common ground.

Accounting for Political Influence

An addendum to the DSM is accounting for how political influence can affect the compromised solutions in Table 3. That is, one might conclude that a policy decision is influenced more by who has power than by who's interests are best represented. Decision making activities for federal land management take place within established boundaries provided by statute, legal precedent and tradition. Institutional analysis provides an assessment of these boundaries by studying the legal, political, and administrative processes through which public policy decisions are made (Ingram and others, 1984). For example, the Council for Environmental Quality oversees federal agency implementation of the environmental impact assessment process and requires agencies to consider the effects of their actions on the quality of the human environment (Executive Office of the President, 2004). Interest in how institutions affect the decision making process continues to increase as institutions become larger, more autonomous and more influential in political decision making (March and Olsen 1984; Lamb and others, 1999). The Legal Institutional Analysis Model (LIAM) is a computerized model that examines the political aspects of a natural resource conflict (Lamb and others, 1998). The model enables the various stakeholders involved to understand the nature of the issue at hand as well as evaluate the roles, needs, and power of organizations involved in a natural resource conflict.

The LIAM uses a series of questions to measure respondent knowledge about an organization's (stakeholder's) likely role and sources of power in the natural resource conflict (Taylor and Lamb, 1989). Organizational power is determined by the resources, expertise, and outside support that a stakeholder has as well as the degree to which it is willing to use these elements of power to force an outcome that is favorable to its own position (Wilds 1988). As shown in Figure 9, the three LIAM power measures (resource, information, and support) have several distinct attributes that are measured to characterize an organization's level of power. Resource power focuses on the available personnel, funding, experience, and legal authorities of an agency (Lamb and others, 1998). Information power indicates the type, volume, and influence of information that an organization produces or has access to, while support power focuses on the organization's constituency in terms of size, cohesiveness, interest, and reputation of groups of supporters (Lamb and others, 1998). The questions relating to a particular type of power are scored, added, and averaged to calculate an index for each power type.

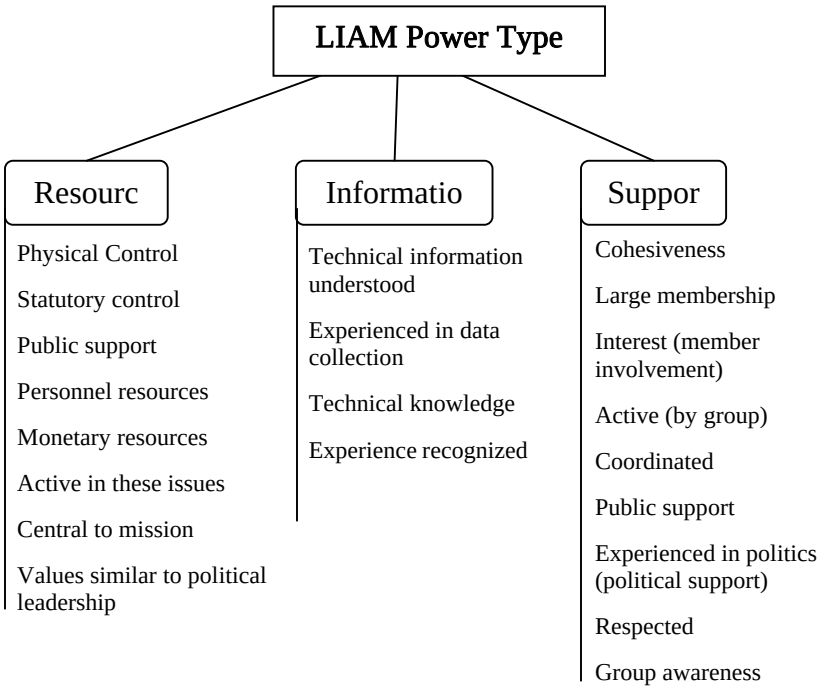


Figure 9. LIAM power attributes.

Each stakeholder completed the LIAM assessment to determine their organization's political power for the elk and bison planning process. A comparison of the average power scores for main stakeholder groups are presented in Table 4. Scores are shown as the percent of total possible power for each LIAM power type. For example, the group aggregate power scores of local business stakeholders indicate they do not feel that they have high levels of the resource power attributes listed in Figure 9 scoring only 38% out of a total of 100%. However, local

business representatives felt they had high levels of the information power attributes listed in Figure 9 (scoring 63% out of 100%) and even higher levels of the support power attributes (scoring 85% out of 100%,Table 4).

Table 4. Percentage of total stakeholder group possible power by LIAM power type.

	Federal Gov't	State Gov't	Local Gov't	Tribes	Local business	Ag and ranch	Hunting and outfitting groups	Animal rights groups	Conservation groups	Average across all groups
Resource power	63%	69%	41%	61%	38%	45%	66%	72%	55%	56%
Information power	76%	83%	38%	53%	63%	80%	79%	88%	77%	71%
Support power	77%	74%	76%	89%	85%	67%	84%	94%	78%	81%
Average total power	**72%**	**75%**	**52%**	**68%**	**62%**	**64%**	**76%**	**85%**	**70%**	**69%**

As shown in Table 4, all of the stakeholder groups felt that they had a high level of support power with scores ranging from 67% for agricultural groups to 94% for the animal rights groups. Most groups also felt they had high levels of information power and some also felt that they had high levels of resource power. Typically the LIAM is used in a workshop setting where participants work in groups of three to analyze the organizational behavior of other organizations involved in the natural resource decision process. However, because we needed to ask stakeholders about their own organization's preferences for elk and bison management options, we could not conduct our interviews in the typical LIAM workshop format. Given that stakeholders filled out the LIAM as a self-assessment in this situation, it could be possible that stakeholders overstated their actual power attribute levels. In future DSM research, we will work on testing if there are differences between having stakeholders rate each other rather than self-assess their power.

Results from the LIAM assessment were used to determine if the political influence of each stakeholder group could affect the compromise ratings in Table 3. These self-assessed LIAM power results indicate that no individual or group of stakeholders had enough power characteristics, as compared to other stakeholder groups, to change the ordering of the compromise ratings in Table 3 given the current property rights. If these self assessed scores are accurate, a stakeholder would need an exceptionally high level of influence or would have to litigate to get the property rights changed in order to alter the outcome. In the end as long as Alternative 2 or 1 is not selected, the balance of power can lead to a compromise solution for a majority of the stakeholders.

Conclusions

Managers are legally or ethically bound to consider all opinions when they develop management policies. By constructing the DSM framework, we were able to predict the level of support and conflict for all relevant policy decisions, and identify the degree to which each decision would be opposed or supported. The DSM approach has several advantages. First, it reduces polarity in stakeholder preferences by breaking problems down into smaller pieces where acceptable compromises are more likely. Second, it helps identify many dimensions of a problem, which gives policy makers more policy options. Third, it helps assure policy makers that policy options offered for consideration cover the gambit of stakeholder preferences. And fourth it promotes inclusion and equity for stakeholders by applying a consistent process to develop the PPF.

The DSM approach can be used for many different types of decision making problems. Even in early initial stages of developing the DSM, it has proved to be a useful decision tool to the federal land managers and planners. The DSM hierarchy assisted the elk and bison management EIS Team in their process of structuring and developing the draft management alternatives. Based on the DSM, the EIS team modified one alternative and added a new alternative to better reflect the preferences of different stakeholder groups (including the EIS team agencies). The DSM can increase the overall efficiency of the natural resource decision making process and reduce the risk of having the process sent into litigation.

Literature Cited

Becker, G.S.,1983, A theory of competition among pressure groups for political influence: The Quarterly Journal of Economics, v. XCV111, no. 3, p. 371–400.

Bromley, D.W., 1989, Economic interests and institutions: Oxford, Basil Blackwell.

Buchanan, J.M., Tollison, R.D., and Tullock, G., 1980, Toward a theory of the rent-seeking society: Texas A&M University Press, College Station.

Executive Office of the President, 2004, Council on environmental quality NEPA guidelines: http://www.whitehouse.gov/ceq/

Forman, E., 1998, Decision by objectives: Expert Choice Inc., McLean, Va,

Griffin, R.C., 1991, The welfare analytics of transaction costs, externalities, and institutional choice: American Journal of Agricultural Economics, v. 73, p. 601–614.

Huntington, R., 2001, Ideas show elk-bison plan ideological divide, Jackson Hole Guide: May 22, p.15–18.

Ingram, H. M., Mann, D.E., Weatherford, G.D., and Cortner, H.J., 1984, Guidelines for improved institutional analysis in water resources planning: Water Resources Research, v. 20, no.3, p. 323–334.

Koontz, L.M., and Hoag, D.L., 2005, Elk and bison management in the Southern Greater Yellowstone Area: The disparate stakeholder management approach: U.S. Geological Survey, Open-File Report 2005-1181, 20 p.

Lamb, B.L., Taylor, J.G., Burkardt, N., and Ponds, P.D., 1998, A policy model to initiate environmental negotiations: three hydropower workshops: Human Dimensions of Wildlife, v. 3, no. 4, p. 1–17.

Lamb, B.L., Taylor, J.G., Burkardt, N., Ponds, P.D., and Caughlan, L., 1999, Report to participants in the workshops to initiate a collaborative planning process for the Wyoming state grizzly bear management plan: http://www.mesc.usgs.gov/pubs/liam-biblio.html.

March, J.G., and Olsen, J.P., 1984, The new institutionalism: organizational factors in political life: American Political Science Review, v. 78, p. 734–749.

Rhodes, T.C., and Wilson, P.N., 1995, Sky islands, squirrels, and scopes: the political economy of an environmental conflict: Land Economics, v. 71, no. 1, p. 106–121.

Taylor, J.G., and Lamb, B.L., 1989, Using role analysis for instream flow negotiations, Legal, institutional, financial and environmental aspects of water issues, in Baumli, G.R. (ed.), Proceeding of the Specialty Conference on the Irrigation and Drainage and Water Resource Planning and Management Division of the American Society of Civil Engineers, p.131–140, New York, NY.

Wilds, L. J., 1988, The legal-institutional analysis model (LIAM): a validation study: Instream Flow Information Paper No. 25. Biological Report , v. 88, no. 33, U.S. Fish and Wildlife Service, Washington, DC.

Appendix A. Results of the Stakeholder Preference Questionnaire for Managing Bison and Elk

The purpose of the stakeholder preference questionnaire was to evaluate the importance of various management issues associated with the National Elk Refuge and Grand Teton National Park Bison and Elk Management Plan. We surveyed 49 individuals representing 30 stakeholder organizations involved in the elk and bison management plan. We used an Analytical Hierarchy Process (AHP) survey that allowed us to measure the weighted preferences for elk and bison management strategies and management objectives for each stakeholder.

The first section of this appendix shows the *management strategies* asked in the AHP survey and then provides the survey results. Preference results for each management strategy include:

1. A summary graph representing the combined preferences for all individuals within each of the main stakeholder organization categories of federal government, state government, local government, tribal representatives, local businesses, agricultural interests, hunting and outfitting organizations, animal rights groups, and conservation organizations.
2. A table reporting the preference scores for each organization interviewed. Individuals within the federal and state government organizations are aggregated to show the average preference for each agency, individual level preferences are shown for all other organizations.

The second section displays summary graphs for individuals interviewed within the hunting and outfitting and conservation organizations. We show the graphs for individuals within each of these organizations because there were a large number of individuals interviewed and some individual preferences were different to others within their organization. Individual summary graphs are not presented for other organizations because other non-government organizational groups only had two or three individuals interviewed and their preferences often matched. Therefore, their individual preferences are more accurately represented by the averages in the overall group combined preference graphs in section one as compared to the conservation and hunting and outfitting organizations.

The third section of this appendix explains the *management objectives* asked in the AHP survey and provides the survey results. Due to the larger number of categories within this section all preferences are provided in table format only, graph comparisons are not displayed.

Explanation of Data Organization

To protect the privacy of the individuals interviewed, we did not report the names of the individuals or their agencies. For each of the main stakeholder organization categories, stakeholders are listed by **numbers** (i.e. Tribal 1 and Tribal 2). If more than one stakeholder was interviewed within an organization, each individual is listed by a **letter** following their organization number (i.e. Agricultural 1 (A) and Agricultural 1 (B)). The AHP weighted scores sum to one (or 100%) of a stakeholder's preference (however some scores could total 99% to 101% due to rounding). For example within the disease management for elk category, out of a total preference weight of 100%, individual B, of Agricultural interest group #1 gave 24% to using dispersal techniques, 70% to relying on vaccination, and 6% for using test and slaughter to

control elk disease. This indicates, stakeholder Agricultural 1 (B) has a strong preference for vaccinating elk and to a lesser degree also using dispersal methods to deal with elk disease. The AHP model must allocate a score to each category therefore the highest preference weight a management option can receive is 98%. A score of 98% for one management option such as vaccination and scores of 1% for dispersal and 1% test and slaughter indicate that stakeholder strictly preferred vaccination over the other management options.

Section 1. Management Strategies for the Jackson Elk and Bison Herds

Definitions of the Elk and Bison Management Strategies

Disease Management: This concerns how to deal with disease transmission, spread, and prevalence in the Jackson herds. Management activities could include one or more of the following: *vaccination*, *test & slaughter*, and *dispersal* (e.g., management that leads to increasing the distribution of animals over the landscape, thereby reducing the amount of concentration and disease risk).

Forage Management: Forage management activities are divided into two categories: Supplemental Feeding and Enhance Forage and/or Increase Winter Range.

Supplemental Winter Feeding: This concerns the winter feeding program on the National Elk Refuge. Management activities include one or more of the following scenarios:

- *Annual Winter Feeding*: This scenario is the current or increased feed program on the National Elk Refuge. Under the existing program, a sufficient amount of alfalfa pellets are distributed to meet the maintenance requirements of all elk and bison on the feedgrounds.
- *Sufficient/Emergency Winter Feeding*: This scenario involves only feeding elk to the extent that an adequate amount of forage is not available on enhanced native winter range and in designated pastures in Jackson Hole.

- *No Winter Feeding:* This scenario is the elimination of the feed program on the National Elk Refuge.

Enhance Forage and/or Increase Winter Range (for elk only): This concerns the quality and/or quantity of vegetative forage for the Jackson Elk Herd. Management activities include one or more of the following scenarios:

- No Active Forage Management
- Current Conditions: This program is the current forage enhancement program on the National Elk Refuge. Current management activities include prescribed burning, irrigation, harrowing, and the use of fertilizers.

Enhanced Forage and/or Increased Winter Range in Jackson Hole: This scenario involves increasing the forage quality and/or quantity on pastures and other areas on the National Elk Refuge through increased irrigation, prescribed burning, and other measures, and involves increasing the acreage of suitable winter grazing habitat on native winter ranges on the National Elk Refuge and surrounding lands in Jackson Hole.

Enhanced Forage and/or Increased Winter Range Outside of Jackson Hole: This scenario includes everything from the 'Enhanced Forage and/or Increased winter range in Jackson Hole'

scenario as well as the restoration of traditional migrations out of the Jackson Hole area to traditional wintering areas, especially those in the Green River basin. This scenario assumes that sufficient forage would be available, or made available to the herd.

Manage with Hunting: Use hunting as a management tool to control the herd populations. Management activities include one or more of the following scenarios:

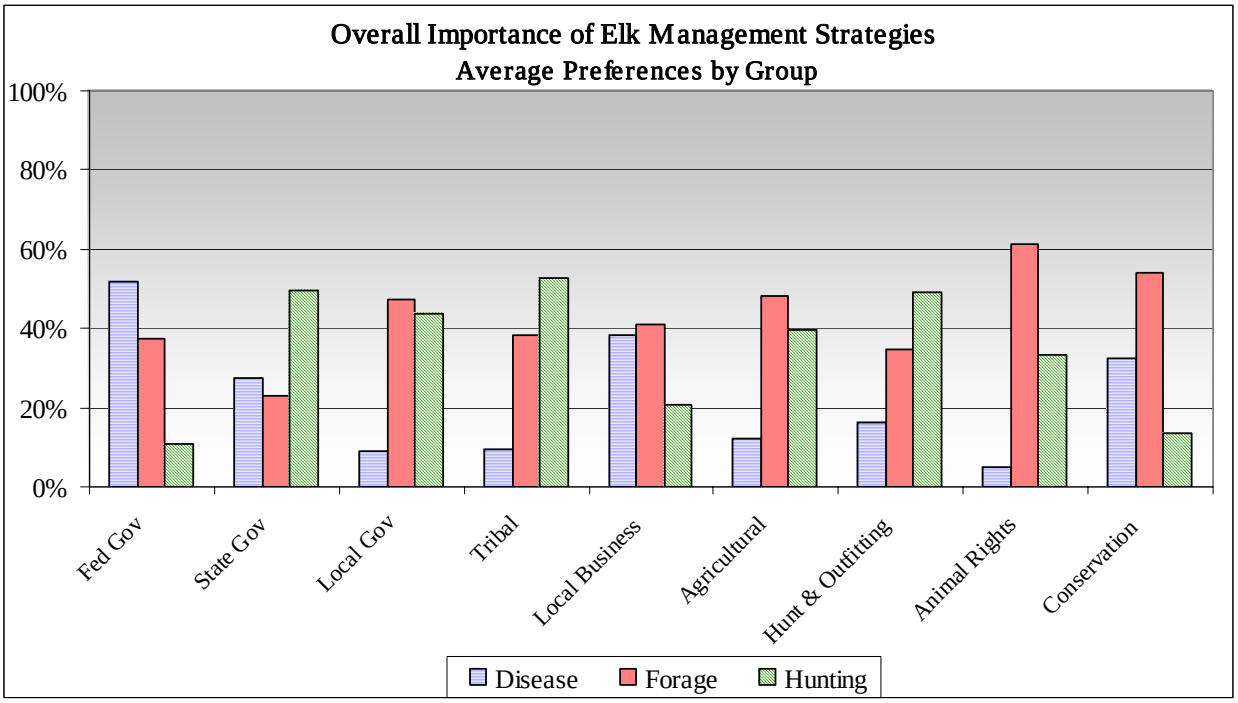
Allow Elk Hunting on Grand Teton and the National Elk Refuge: Under this scenario hunting is allowed as a management tool to control the Jackson herds on Grand Teton National Park and the National Elk refuge. Hunting on surrounding Forest Service, State, and private lands would continue.

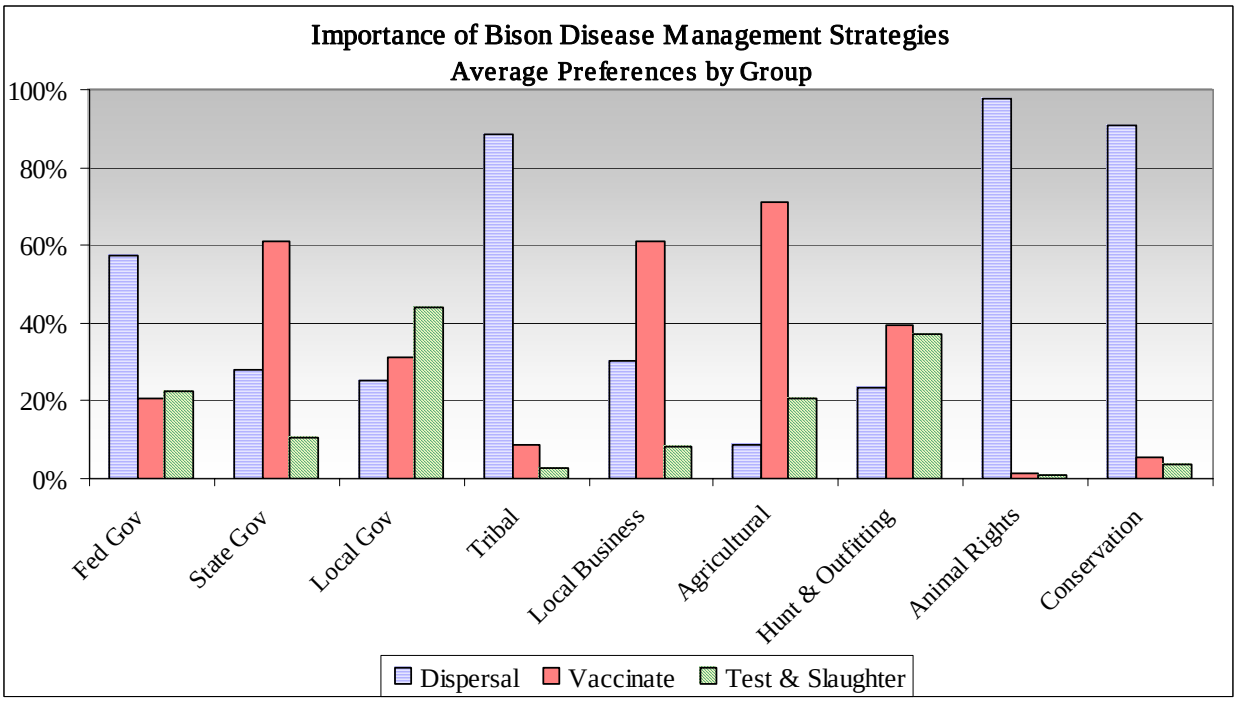
Allow Hunting Only on the National Elk Refuge: Under this scenario hunting is allowed as a management tool to control the herd population on the National Elk refuge. Hunting would not be allowed on Grand Teton National Park. Hunting on surrounding Forest Service, State, and private lands would continue. Because allowing bison hunting on Grand Teton National Park would need approval by Congress and will not be addressed in the management plan, hunting for bison was asked in term of allowing hunting (on NER) or not allowing hunting.

No Hunting: Hunting would not be allowed on Grand Teton National Park and the National Elk refuge. Hunting on surrounding Forest Service, State, and private lands would continue.

Stakeholder Preference Results for Elk and Bison Management Strategies

A) Results on the importance of ***overall management strategies*** (disease management, forage management, or manage with hunting) for elk and bison management.



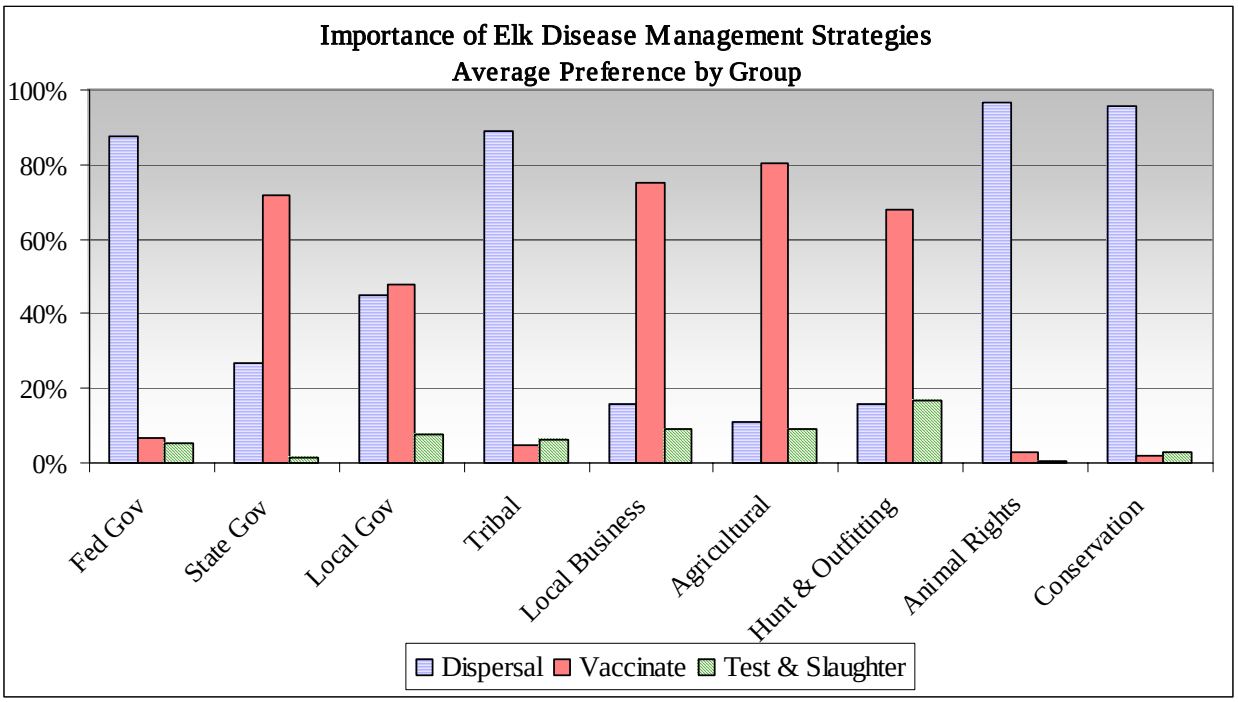


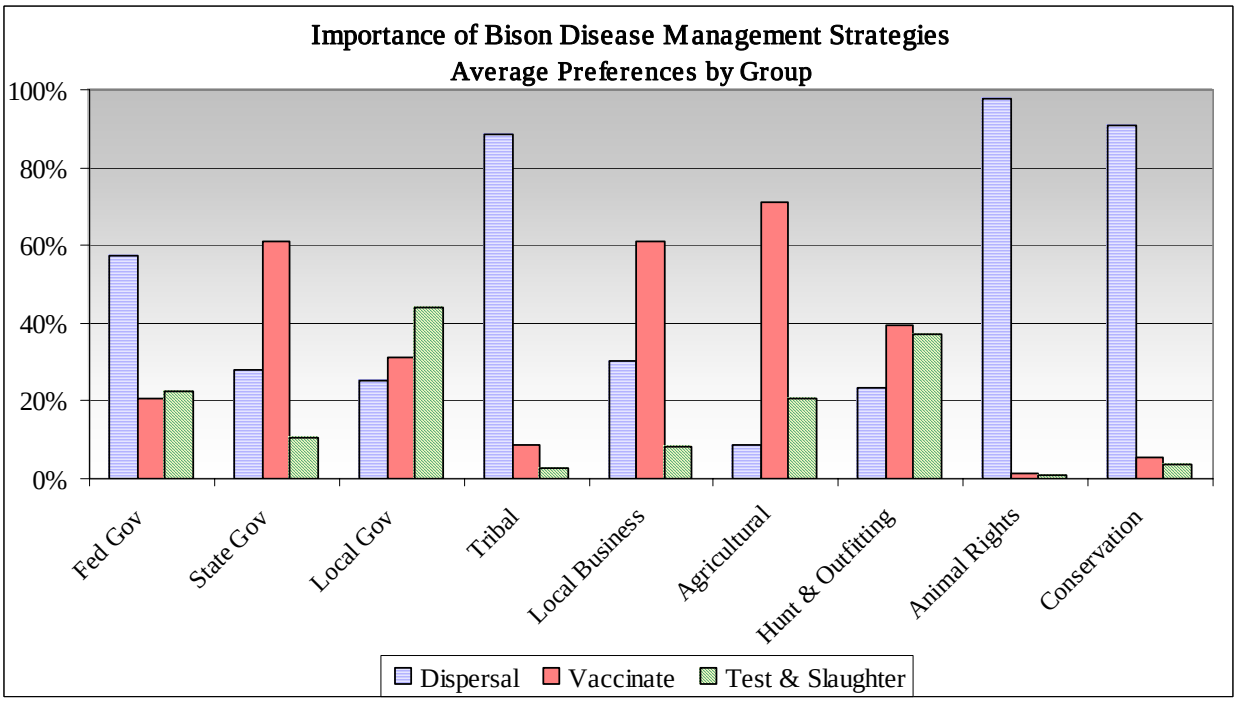
Individual and Group Average Preferences of Elk & Bison Management Strategies **Overall Importance**

	Elk Management Strategies				Bison Management Strategies		
	Disease	**Forage**	**Hunting**		**Disease**	**Forage**	**Hunting**
Fed Gov 1	19%	76%	5%		6%	74%	20%
Fed Gov 2	82%	9%	9%		52%	30%	18%
Fed Gov 3	78%	18%	4%		78%	18%	4%
Fed Gov 4	47%	34%	19%		52%	31%	17%
Fed Gov 5	34%	49%	16%		16%	52%	33%
Fed Gov Average	**52%**	**37%**	**11%**		**41%**	**41%**	**18%**
State Gov 1	4%	21%	75%		17%	5%	77%
State Gov 2	22%	28%	50%		33%	27%	40%
State Gov 3	74%	6%	20%		78%	4%	18%
State Gov Average	**28%**	**23%**	**49%**		**38%**	**20%**	**42%**
Local Gov 1	5%	77%	18%		4%	18%	78%
Local Gov 2	13%	17%	69%		11%	11%	78%
Local Gov Average	**9%**	**47%**	**44%**		**8%**	**15%**	**78%**
Tribal 1	5%	18%	77%		17%	79%	5%
Tribal 2	14%	58%	28%		14%	58%	28%
Tribal Average	**9%**	**38%**	**53%**		**15%**	**69%**	**16%**
Local Business 1	33%	33%	33%		16%	19%	66%
Local Business 2	44%	49%	8%		45%	45%	9%
Local Business Average	**38%**	**41%**	**21%**		**31%**	**32%**	**37%**
Agricultural 1 (A)	18%	30%	52%		36%	14%	50%
Agricultural 1 (B)	6%	49%	45%		9%	17%	74%
Agricultural 1 Average	*12%*	*40%*	*48%*		*22%*	*16%*	*62%*
Agricultural 2	13%	65%	22%		74%	6%	20%
Agricultural Average	**12%**	**48%**	**40%**		**40%**	**12%**	**48%**
Hunt & Outfitting 1 (A)	5%	64%	31%		9%	9%	82%
Hunt & Outfitting 1 (B)	9%	9%	82%		9%	9%	82%
Hunt & Outfitting 1 (C)	33%	33%	33%		9%	9%	82%
Hunt & Outfitting 1 (D)	43%	43%	14%		4%	18%	78%
Hunt & Outfitting 1 Average	*23%*	*37%*	*40%*		8%	11%	81%
Hunt & Outfitting 2 (A)	33%	33%	33%		14%	28%	58%
Hunt & Outfitting 2 (B)	5%	47%	47%		28%	14%	58%
Hunt & Outfitting 2 Average	*19%*	*40%*	*40%*		21%	21%	58%
Hunt & Outfitting 3	5%	69%	26%		33%	33%	33%
Hunt & Outfitting 4 (A)	5%	29%	66%		6%	30%	63%
Hunt & Outfitting 4 (B)	18%	30%	52%		15%	7%	79%
Hunt & Outfitting 4 (C)	4%	18%	78%		5%	15%	80%
Hunt & Outfitting 4 Average	*9%*	*26%*	*65%*		9%	17%	74%
Hunt & Outfitting 5	19%	5%	76%		79%	17%	5%
Hunt & Outfitting Average	**16%**	**35%**	**49%**		**19%**	**17%**	**64%**
Animal Rights 1	4%	78%	18%		18%	78%	4%
Animal Rights 2	6%	45%	49%		4%	78%	18%
Animal Rights Average	**5%**	**61%**	**34%**		**11%**	**78%**	**11%**
Conservation 1	14%	58%	28%		9%	82%	9%
Conservation 2	47%	47%	5%		47%	47%	5%
Conservation 3	58%	28%	14%		58%	28%	14%
Conservation 4	47%	47%	7%		47%	47%	7%
Conservation 5	23%	69%	8%		8%	77%	16%
Conservation 6	14%	58%	28%		14%	58%	28%
Conservation 7	24%	70%	6%		24%	70%	6%
Conservation Average	**32%**	**54%**	**14%**		**30%**	**58%**	**12%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

B) Results on the importance of ***disease management strategy*** emphasis for elk and bison management.



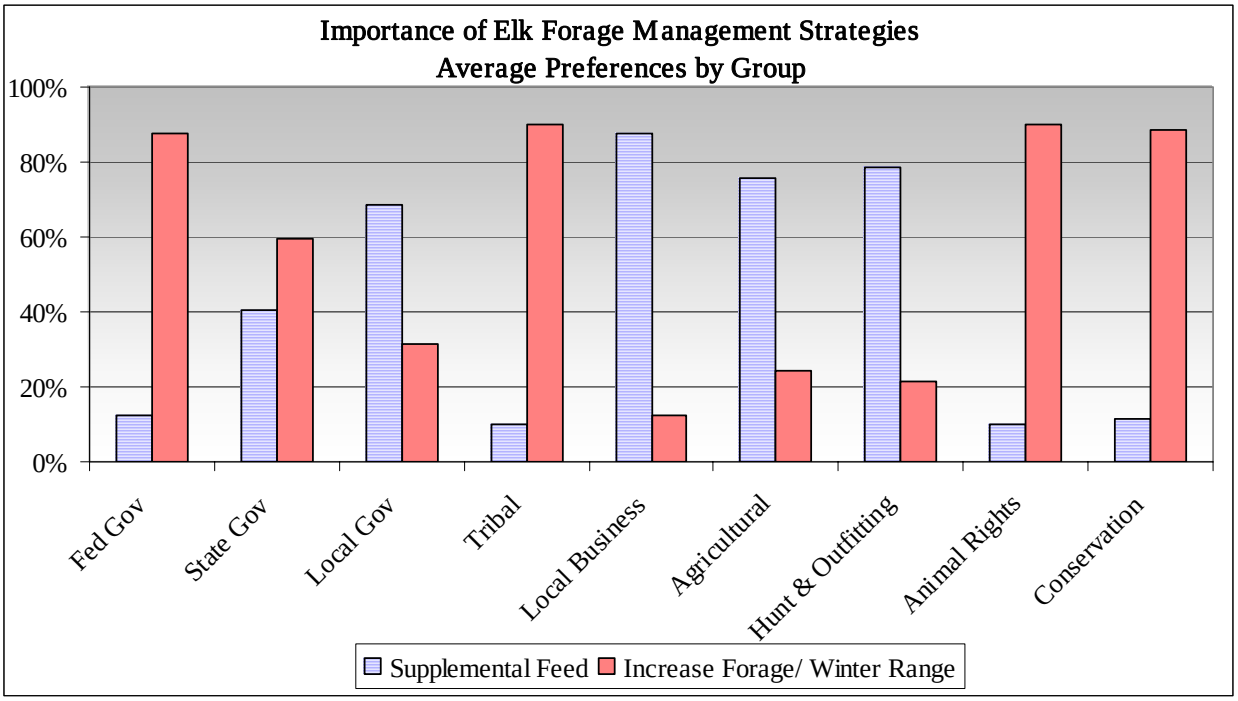


Individual and Group Average Preferences for Elk and Bison Disease Management Strategies

	Elk Management Strategies				Bison Management Strategies		
	Dispersal	Vaccinate	Test & Slaughter		Dispersal	Vaccinate	Test & Slaughter
Fed Gov 1	98%	1%	1%		98%	1%	1%
Fed Gov 2	98%	1%	1%		56%	15%	29%
Fed Gov 3	78%	11%	11%		0%	50%	50%
Fed Gov 4	74%	14%	12%		64%	25%	11%
Fed Gov 5	91%	6%	2%		68%	11%	21%
Fed Gov Average	**88%**	**7%**	**5%**		**57%**	**20%**	**22%**
State Gov 1	1%	98%	1%		0%	80%	19%
State Gov 2	37%	63%	0%		41%	53%	6%
State Gov 3	13%	81%	6%		6%	74%	20%
State Gov Average	**27%**	**72%**	**1%**		**28%**	**61%**	**11%**
Local Gov 1	18%	81%	1%		5%	17%	79%
Local Gov 2	71%	14%	14%		45%	45%	9%
Local Gov Average	**45%**	**48%**	**7%**		**25%**	**31%**	**44%**
Tribal 1	80%	9%	11%		79%	17%	5%
Tribal 2	98%	1%	1%		98%	1%	1%
Tribal Average	**89%**	**5%**	**6%**		**88%**	**9%**	**3%**
Local Business 1	13%	75%	12%		41%	48%	11%
Local Business 2	18%	75%	6%		20%	74%	6%
Local Business Average	**16%**	**75%**	**9%**		**30%**	**61%**	**8%**
Agricultural 1 (A)	1%	98%	1%		7%	42%	51%
Agricultural 1 (B)	24%	70%	6%		18%	75%	6%
Agricultural 1 Average	*12%*	*84%*	*3%*		*13%*	*59%*	*29%*
Agricultural 2	8%	73%	20%		0%	95%	4%
Agricultural Average	**11%**	**80%**	**9%**		**9%**	**71%**	**21%**
Hunt & Outfitting 1 (A)	1%	98%	1%		0%	50%	50%
Hunt & Outfitting 1 (B)	11%	80%	9%		98%	1%	1%
Hunt & Outfitting 1 (C)	5%	80%	15%		1%	98%	1%
Hunt & Outfitting 1 (D)	37%	54%	9%		10%	13%	77%
Hunt & Outfitting 1 Average	*14%*	*78%*	*8%*		*27%*	*40%*	*32%*
Hunt & Outfitting 2 (A)	1%	98%	1%		33%	33%	33%
Hunt & Outfitting 2 (B)	1%	98%	1%		0%	4%	95%
Hunt & Outfitting 2 Average	*1%*	*98%*	*1%*		*17%*	*19%*	*64%*
Hunt & Outfitting 3	75%	18%	6%		72%	23%	5%
Hunt & Outfitting 4 (A)	24%	32%	43%		28%	58%	14%
Hunt & Outfitting 4 (B)	15%	80%	5%		8%	49%	44%
Hunt & Outfitting 4 (C)	1%	98%	1%		4%	95%	0%
Hunt & Outfitting 4 Average	*14%*	*70%*	*16%*		*13%*	*67%*	*19%*
Hunt & Outfitting 5	0%	9%	91%		0%	10%	90%
Hunt & Outfitting Average	**16%**	**68%**	**17%**		**23%**	**39%**	**37%**
Animal Rights 1	98%	1%	1%		98%	1%	1%
Animal Rights 2	95%	4%	0%		98%	2%	1%
Animal Rights Average	**97%**	**3%**	**1%**		**98%**	**1%**	**1%**
Conservation 1	98%	1%	1%		98%	1%	1%
Conservation 2	98%	1%	1%		98%	1%	1%
Conservation 3	98%	1%	1%		98%	1%	1%
Conservation 4	81%	6%	13%		75%	18%	6%
Conservation 5	98%	1%	1%		71%	14%	14%
Conservation 6	98%	1%	1%		98%	1%	1%
Conservation 7	98%	1%	1%		98%	1%	1%
Conservation Average	**96%**	**2%**	**3%**		**91%**	**5%**	**4%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

C) Importance of Supplemental Feeding and Enhancing Forage and/or Increasing Winter Range as part of the **Elk Forage Management Strategies.**

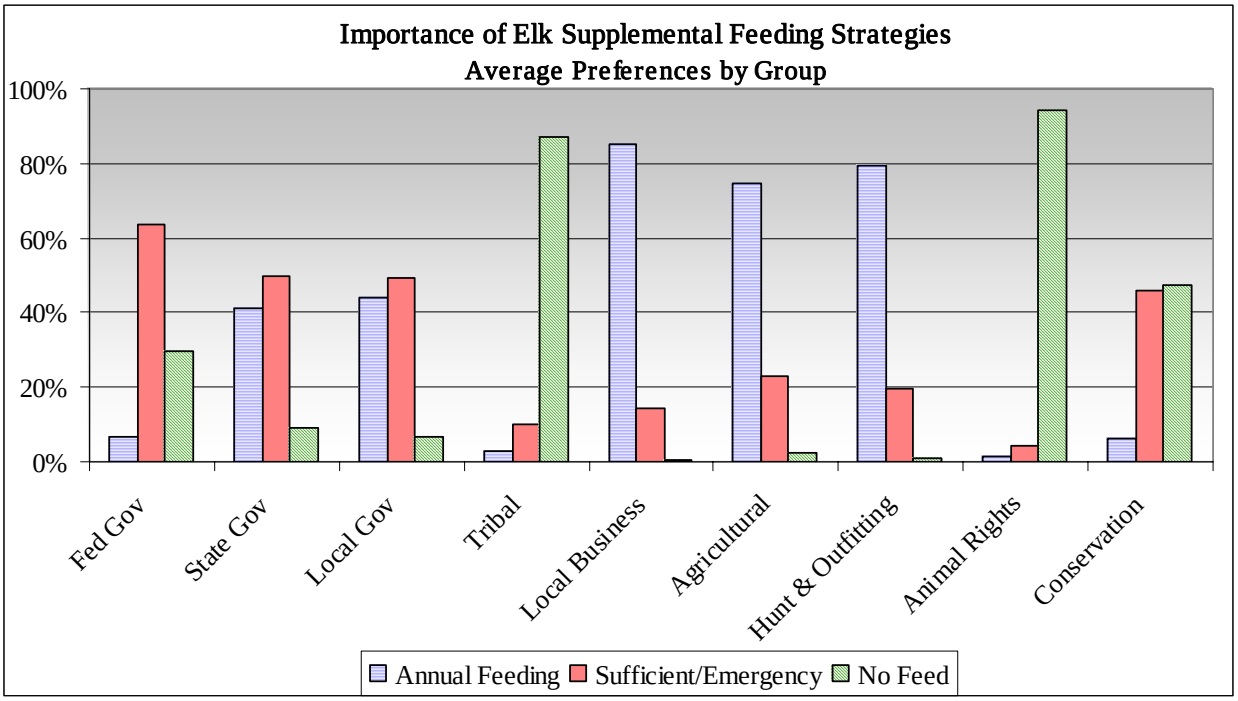


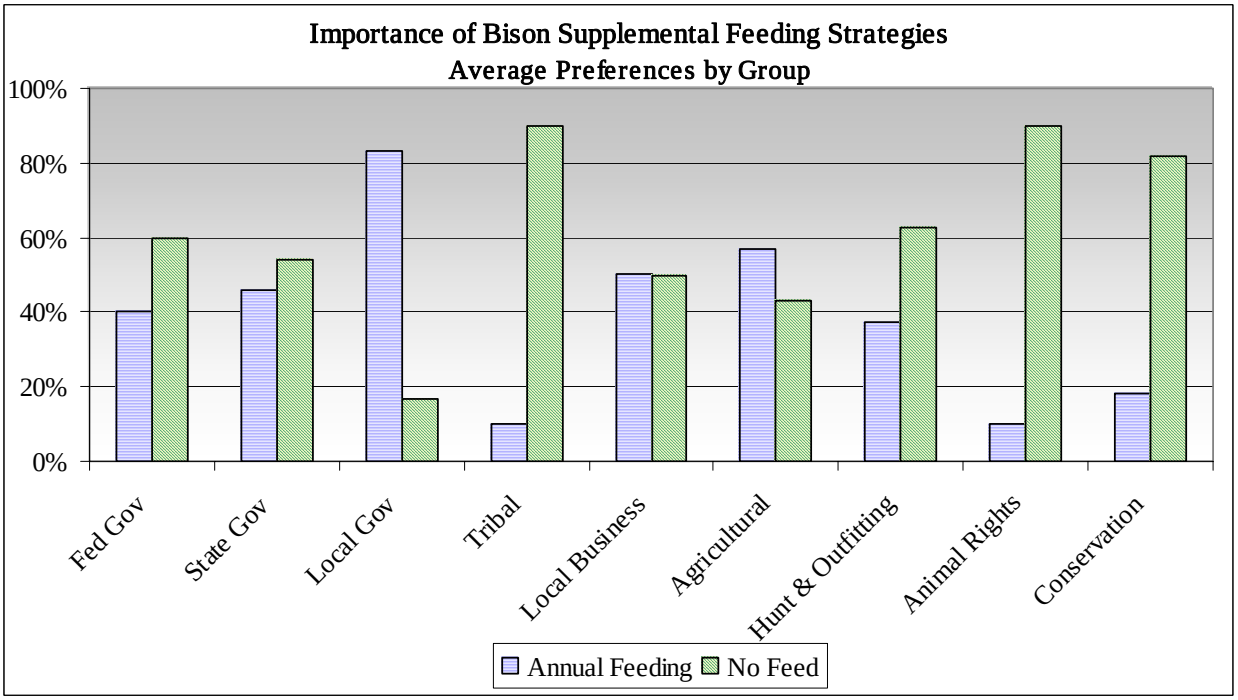
Individual and Group Average Preferences for Elk Forage Management Strategies

	Supplemental Feed	Increase Forage/ Winter Range
Fed Gov 1	10%	90%
Fed Gov 2	17%	83%
Fed Gov 3	13%	87%
Fed Gov 4	14%	86%
Fed Gov 5	10%	90%
Fed Gov Average	**13%**	**87%**
State Gov 1	88%	13%
State Gov 2	35%	65%
State Gov 3	13%	87%
State Gov Average	**40%**	**60%**
Local Gov 1	88%	12%
Local Gov 2	50%	50%
Local Gov Average	**69%**	**31%**
Tribal 1	10%	90%
Tribal 2	10%	90%
Tribal Average	**10%**	**90%**
Local Business 1	87%	13%
Local Business 2	88%	13%
Local Business Average	**87%**	**13%**
Agricultural 1 (A)	90%	10%
Agricultural 1 (B)	50%	50%
Agricultural 1 Average	*70%*	*30%*
Agricultural 2	87%	13%
Agricultural Average	**76%**	**24%**
Hunt & Outfitting 1 (A)	90%	10%
Hunt & Outfitting 1 (B)	90%	10%
Hunt & Outfitting 1 (C)	90%	10%
Hunt & Outfitting 1 (D)	50%	50%
Hunt & Outfitting 1 Average	*80%*	*20%*
Hunt & Outfitting 2 (A)	50%	50%
Hunt & Outfitting 2 (B)	50%	50%
Hunt & Outfitting 2 Average	*50%*	*50%*
Hunt & Outfitting 3	88%	13%
Hunt & Outfitting 4 (A)	88%	13%
Hunt & Outfitting 4 (B)	88%	13%
Hunt & Outfitting 4 (C)	90%	10%
Hunt & Outfitting 4 Average	*88%*	*12%*
Hunt & Outfitting 5	90%	10%
Hunt & Outfitting Average	**78%**	**22%**
Animal Rights 1	10%	90%
Animal Rights 2	10%	90%
Animal Rights Average	**10%**	**90%**
Conservation 1	10%	90%
Conservation 2	10%	90%
Conservation 3	10%	90%
Conservation 4	17%	83%
Conservation 5	10%	90%
Conservation 6	10%	90%
Conservation 7	13%	87%
Conservation Average	**11%**	**89%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

D) Importance of ***Supplemental Winter Feeding Strategies*** for elk and bison (options for bison were limited to allowing feed (annually) or not allowing feed)



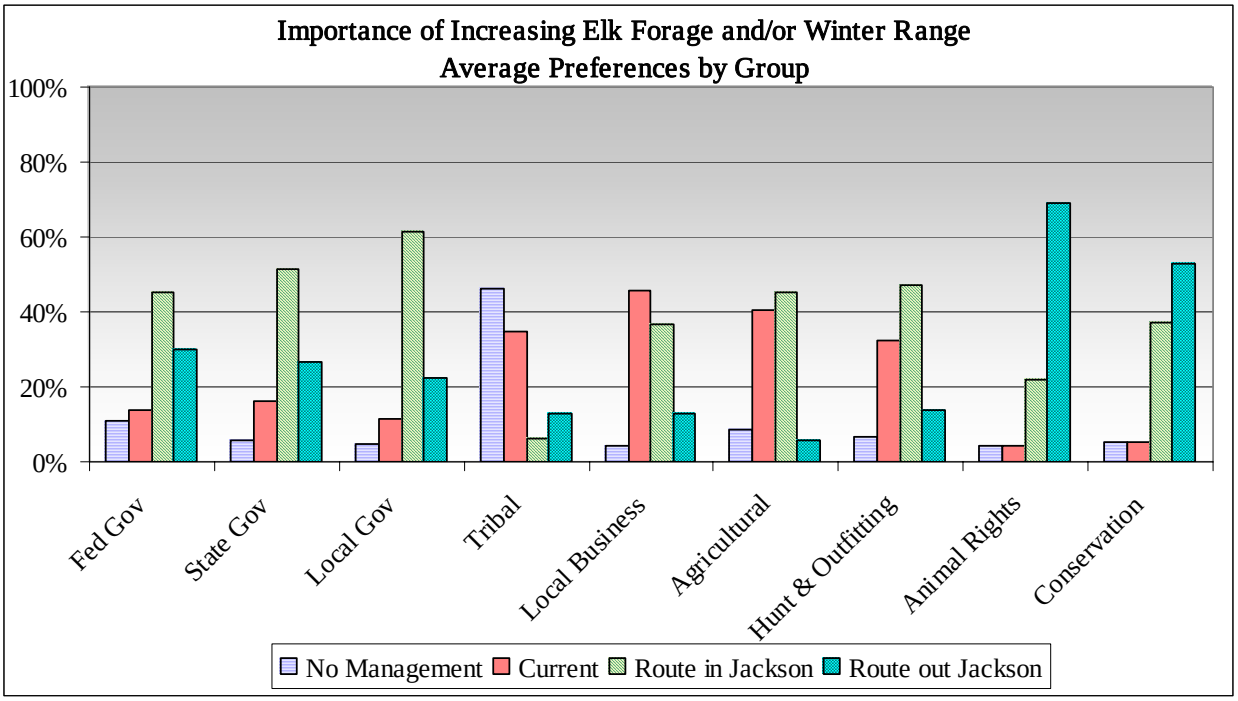


Individual and Group Average Preferences for Elk and Bison Supplemental Feeding Scenarios

	Elk Feeding Strategies				Bison Feeding Strategies	
	Annual	Sufficient/Emergency	No Feed		Allow feeding	No Feed
Fed Gov 1	17%	79%	5%		88%	12%
Fed Gov 2	2%	97%	1%		50%	50%
Fed Gov 3	0%	4%	95%		10%	90%
Fed Gov 4	7%	55%	39%		14%	86%
Fed Gov 5	7%	84%	9%		39%	61%
Fed Gov Average	**7%**	**64%**	**30%**		**40%**	**60%**
State Gov 1	78%	21%	0%		75%	25%
State Gov 2	24%	64%	12%		47%	53%
State Gov 3	75%	21%	4%		13%	87%
State Gov Average	**41%**	**50%**	**9%**		**46%**	**54%**
Local Gov 1	69%	26%	5%		83%	17%
Local Gov 2	19%	73%	8%		83%	17%
Local Gov Average	**44%**	**49%**	**7%**		**83%**	**17%**
Tribal 1	5%	19%	76%		10%	90%
Tribal 2	1%	1%	98%		10%	90%
Tribal Average	**3%**	**10%**	**87%**		**10%**	**90%**
Local Business 1	93%	7%	0%		13%	87%
Local Business 2	77%	22%	1%		87%	13%
Local Business Average	**85%**	**14%**	**0%**		**50%**	**50%**
Agricultural 1 (A)	75%	24%	1%		13%	87%
Agricultural 1 (B)	74%	25%	0%		83%	17%
Agricultural 1 Average	*75%*	*25%*	*1%*		*48%*	*52%*
Agricultural 2	74%	20%	6%		75%	25%
Agricultural Average	**75%**	**23%**	**2%**		**57%**	**43%**
Hunt & Outfitting 1 (A)	98%	1%	1%		10%	90%
Hunt & Outfitting 1 (B)	98%	1%	1%		10%	90%
Hunt & Outfitting 1 (C)	98%	1%	1%		50%	50%
Hunt & Outfitting 1 (D)	17%	79%	5%		10%	90%
Hunt & Outfitting 1 Average	*78%*	*20%*	*2%*		*20%*	*80%*
Hunt & Outfitting 2 (A)	85%	15%	0%		10%	90%
Hunt & Outfitting 2 (B)	95%	4%	0%		10%	90%
Hunt & Outfitting 2 Average	*90%*	*10%*	*0%*		*10%*	*90%*
Hunt & Outfitting 3	19%	81%	0%		88%	12%
Hunt & Outfitting 4 (A)	94%	6%	0%		17%	83%
Hunt & Outfitting 4 (B)	80%	20%	1%		25%	75%
Hunt & Outfitting 4 (C)	95%	4%	0%		90%	10%
Hunt & Outfitting 4 Average	*90%*	*10%*	*0%*		*44%*	*56%*
Hunt & Outfitting 5	95%	4%	0%		90%	10%
Hunt & Outfitting Average	**79%**	**20%**	**1%**		**37%**	**63%**
Animal Rights 1	2%	7%	91%		10%	90%
Animal Rights 2	1%	1%	98%		10%	90%
Animal Rights Average	**1%**	**4%**	**94%**		**10%**	**90%**
Conservation 1	0%	95%	4%		50%	50%
Conservation 2	0%	4%	95%		10%	90%
Conservation 3	7%	32%	60%		13%	87%
Conservation 4	7%	71%	22%		17%	83%
Conservation 5	16%	77%	8%		13%	87%
Conservation 6	8%	19%	73%		13%	87%
Conservation 7	6%	24%	70%		13%	87%
Conservation Average	**6%**	**46%**	**48%**		**18%**	**82%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

E) Importance of Enhancing Forage and/or Increase Winter Range for elk.

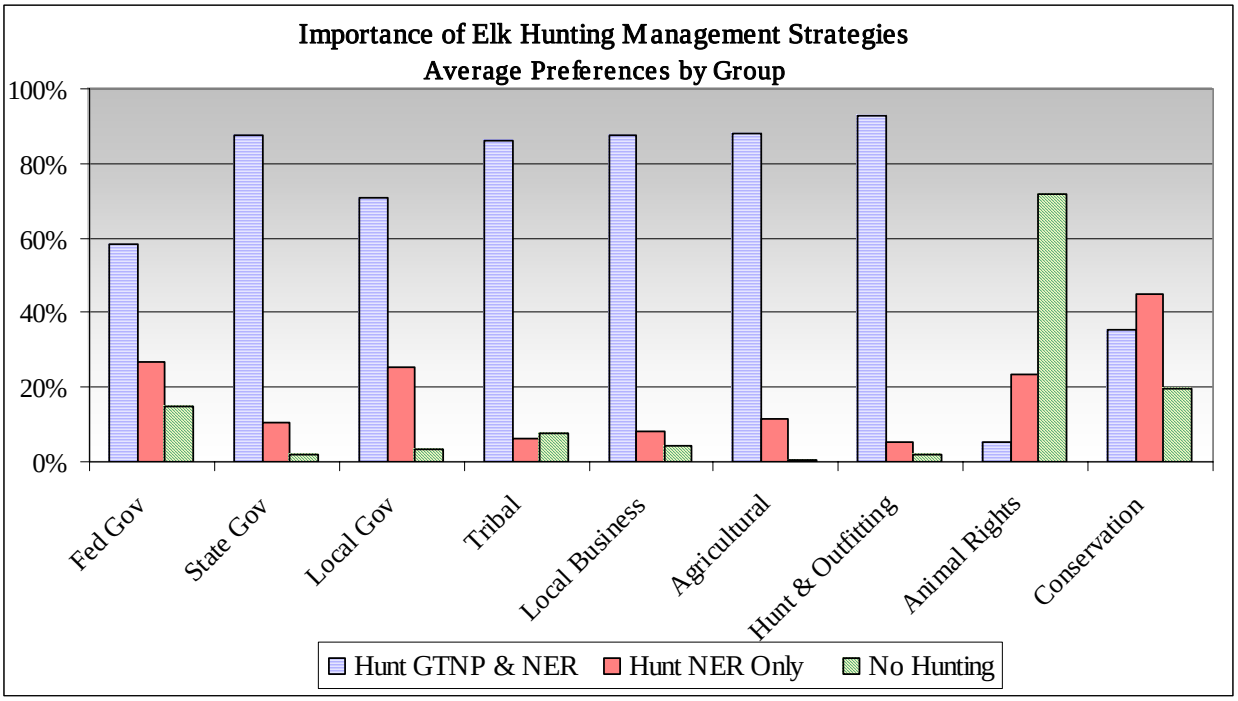


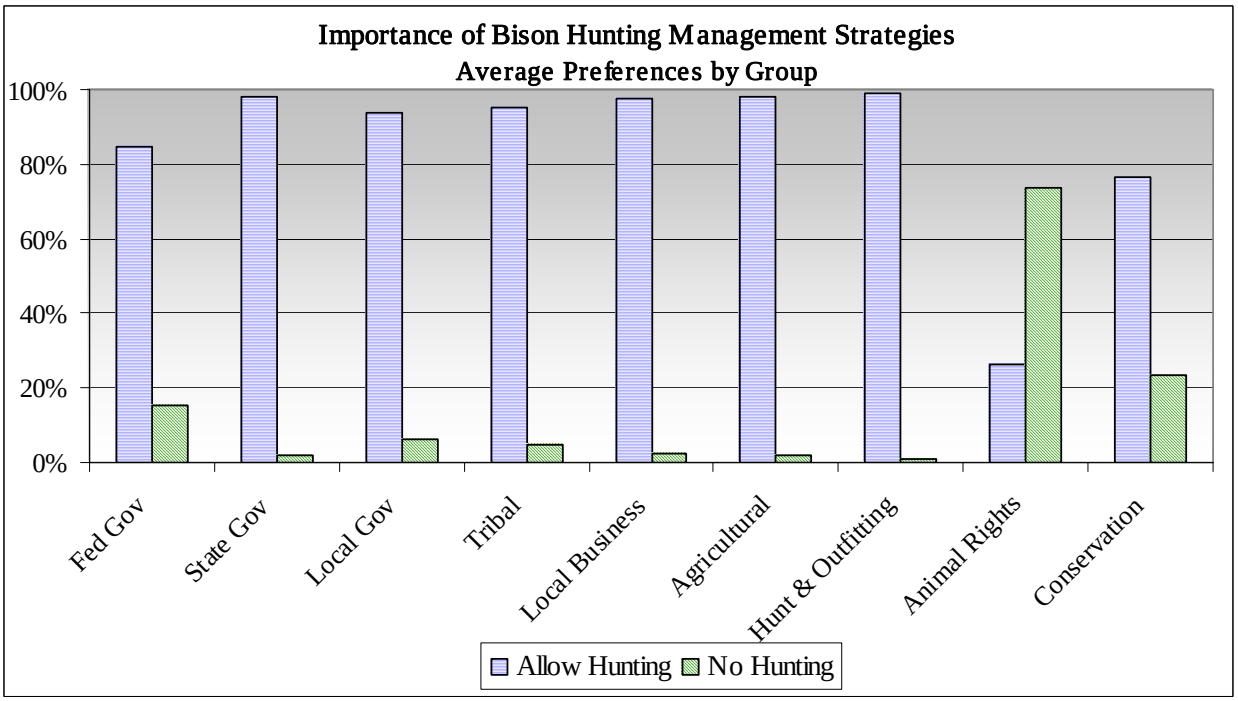
Individual and Group Average Preferences for Enhancing Forage and/or Increasing Winter Range for Elk

	No Active Mgmt	Current Mgmt	Route in Jackson	Route in & out of Jackson
Fed Gov 1	3%	7%	22%	68%
Fed Gov 2	25%	17%	44%	14%
Fed Gov 3	8%	24%	65%	3%
Fed Gov 4	15%	8%	38%	39%
Fed Gov 5	3%	13%	58%	27%
Fed Gov Average	**11%**	**14%**	**45%**	**30%**
State Gov 1	10%	22%	65%	3%
State Gov 2	5%	16%	54%	25%
State Gov 3	4%	10%	27%	59%
State Gov Average	**6%**	**16%**	**51%**	**27%**
Local Gov 1	3%	8%	69%	20%
Local Gov 2	6%	15%	54%	25%
Local Gov Average	**5%**	**11%**	**61%**	**22%**
Tribal 1	23%	67%	6%	5%
Tribal 2	69%	3%	7%	21%
Tribal Average	**46%**	**35%**	**6%**	**13%**
Local Business 1	6%	22%	58%	14%
Local Business 2	3%	70%	15%	12%
Local Business Average	**4%**	**46%**	**37%**	**13%**
Agricultural 1 (A)	6%	27%	63%	4%
Agricultural 1 (B)	4%	27%	63%	7%
Agricultural 1 Average	*5%*	*27%*	*63%*	*6%*
Agricultural 2	17%	68%	10%	6%
Agricultural Average	**9%**	**41%**	**45%**	**6%**
Hunt & Outfitting 1 (A)	1%	97%	1%	1%
Hunt & Outfitting 1 (B)	8%	75%	8%	8%
Hunt & Outfitting 1 (C)	25%	25%	25%	25%
Hunt & Outfitting 1 (D)	4%	30%	52%	14%
Hunt & Outfitting 1 Average	*10%*	*57%*	*22%*	*12%*
Hunt & Outfitting 2 (A)	4%	21%	71%	4%
Hunt & Outfitting 2 (B)	4%	22%	74%	0%
Hunt & Outfitting 2 Average	*4%*	*22%*	*72%*	*2%*
Hunt & Outfitting 3	4%	32%	32%	32%
Hunt & Outfitting 4 (A)	3%	10%	69%	18%
Hunt & Outfitting 4 (B)	3%	10%	65%	22%
Hunt & Outfitting 4 (C)	13%	25%	55%	7%
Hunt & Outfitting 4 Average	*6%*	*15%*	*63%*	*16%*
Hunt & Outfitting 5	3%	8%	68%	22%
Hunt & Outfitting Average	**6%**	**32%**	**47%**	**14%**
Animal Rights 1	3%	6%	22%	69%
Animal Rights 2	6%	3%	22%	69%
Animal Rights Average	**4%**	**4%**	**22%**	**69%**
Conservation 1	5%	5%	45%	45%
Conservation 2	4%	7%	45%	45%
Conservation 3	11%	6%	31%	53%
Conservation 4	9%	4%	44%	44%
Conservation 5	3%	8%	44%	44%
Conservation 6	5%	5%	45%	45%
Conservation 7	0%	0%	6%	94%
Conservation Average	**5%**	**5%**	**37%**	**53%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

F) Importance of ***Hunting Management Strategies*** for elk and bison (options for bison were limited to allowing hunting or not allowing hunting)





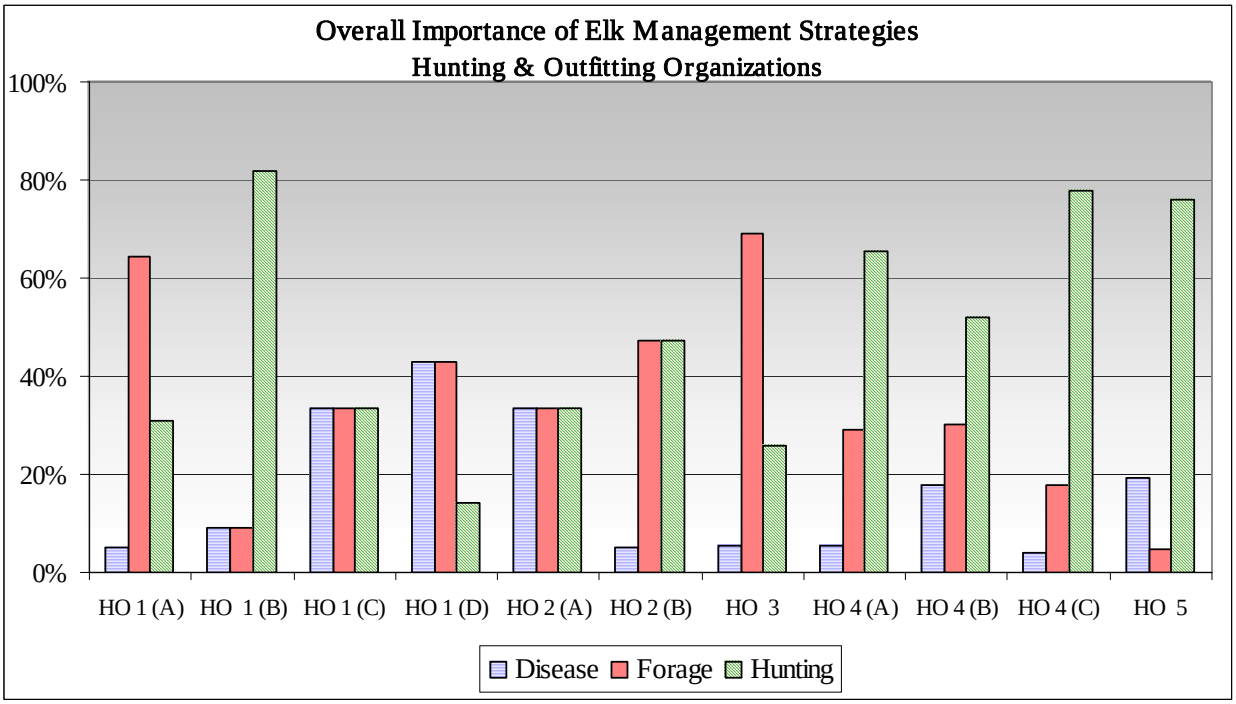
Individual and Group Average Preferences for Elk and Bison Hunting Strategies

	Elk Hunting Strategies				Bison Hunting Strategies	
	Hunt GTNP & NER	Hunt NER Only	No Hunting		Allow Hunting	No Hunting
Fed Gov 1	33%	33%	33%		67%	33%
Fed Gov 2	47%	47%	7%		89%	11%
Fed Gov 3	74%	20%	6%		100%	0%
Fed Gov 4	52%	23%	25%		74%	26%
Fed Gov 5	86%	11%	3%		94%	6%
Fed Gov Average	**58%**	**27%**	**15%**		**84%**	**16%**
State Gov 1	95%	4%	0%		100%	0%
State Gov 2	88%	10%	2%		98%	2%
State Gov 3	78%	18%	4%		96%	4%
State Gov Average	**88%**	**10%**	**2%**		**98%**	**2%**
Local Gov 1	95%	4%	0%		94%	6%
Local Gov 2	47%	47%	7%		94%	6%
Local Gov Average	**71%**	**26%**	**3%**		**94%**	**6%**
Tribal 1	74%	11%	15%		91%	9%
Tribal 2	98%	1%	1%		99%	1%
Tribal Average	**86%**	**6%**	**8%**		**95%**	**5%**
Local Business 1	95%	4%	0%		100%	0%
Local Business 2	80%	11%	9%		95%	5%
Local Business Average	**88%**	**8%**	**5%**		**97%**	**3%**
Agricultural 1 (A)	74%	26%	1%		94%	6%
Agricultural 1 (B)	95%	4%	0%		100%	0%
Agricultural 1 Average	*85%*	*15%*	*0%*		*97%*	*3%*
Agricultural 2	95%	4%	0%		100%	0%
Agricultural Average	**88%**	**11%**	**0%**		**98%**	**2%**
Hunt & Outfitting 1 (A)	98%	1%	1%		99%	1%
Hunt & Outfitting 1 (B)	98%	1%	1%		100%	0%
Hunt & Outfitting 1 (C)	98%	1%	1%		99%	1%
Hunt & Outfitting 1 (D)	98%	1%	1%		96%	4%
Hunt & Outfitting 1 Average	*98%*	*1%*	*1%*		*98%*	*2%*
Hunt & Outfitting 2 (A)	98%	1%	1%		100%	0%
Hunt & Outfitting 2 (B)	95%	4%	0%		100%	0%
Hunt & Outfitting 2 Average	*97%*	*3%*	*1%*		*100%*	*0%*
Hunt & Outfitting 3	58%	28%	14%		100%	0%
Hunt & Outfitting 4 (A)	91%	8%	0%		99%	1%
Hunt & Outfitting 4 (B)	95%	4%	0%		100%	0%
Hunt & Outfitting 4 (C)	95%	4%	0%		100%	0%
Hunt & Outfitting 4 Average	*94%*	*6%*	*0%*		*100%*	*0%*
Hunt & Outfitting 5	95%	4%	0%		100%	0%
Hunt & Outfitting Average	**93%**	**5%**	**2%**		**99%**	**1%**
Animal Rights 1	1%	1%	98%		2%	98%
Animal Rights 2	9%	45%	45%		50%	50%
Animal Rights Average	**5%**	**23%**	**72%**		**26%**	**74%**
Conservation 1	50%	50%	0%		99%	1%
Conservation 2	11%	11%	78%		2%	98%
Conservation 3	10%	68%	23%		77%	23%
Conservation 4	43%	43%	14%		78%	22%
Conservation 5	1%	98%	1%		99%	1%
Conservation 6	74%	25%	0%		99%	1%
Conservation 7	60%	20%	20%		80%	20%
Conservation Average	**36%**	**45%**	**20%**		**76%**	**24%**

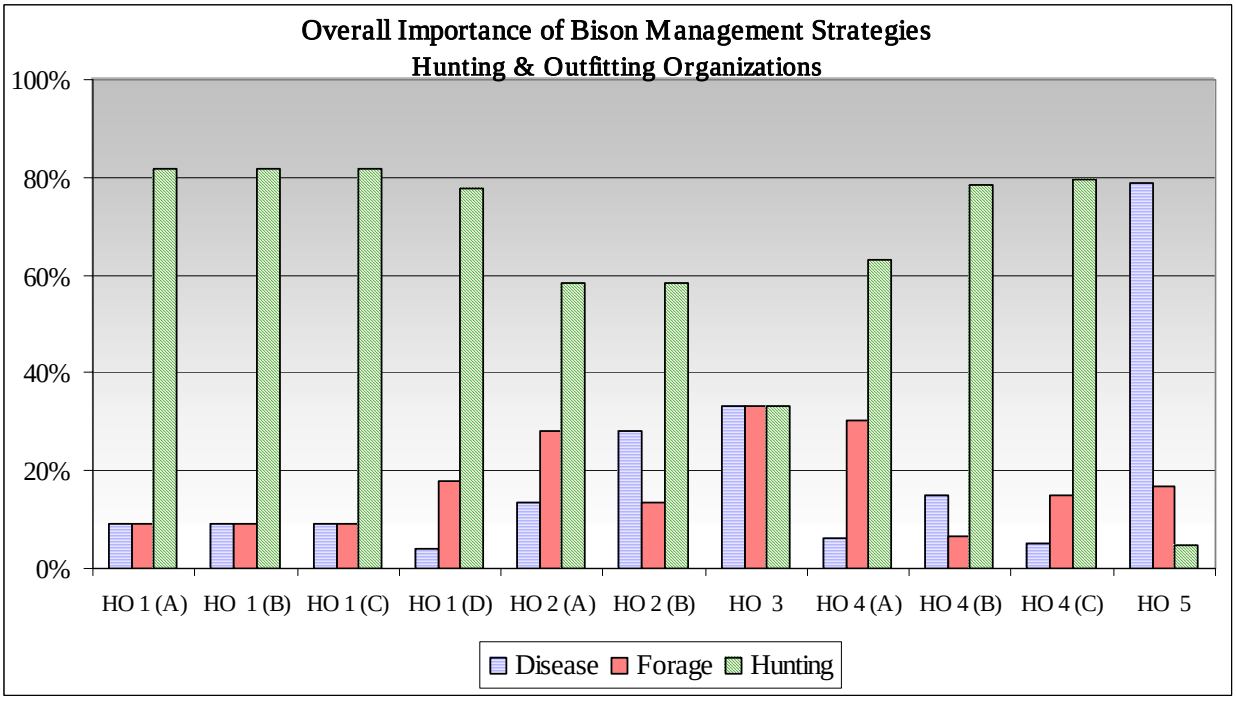
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

Section 2. Elk and Bison Management Strategies Summary Graphs for Individuals Interviewed within the Hunting and Outfitting and Conservation Organizations START HERE

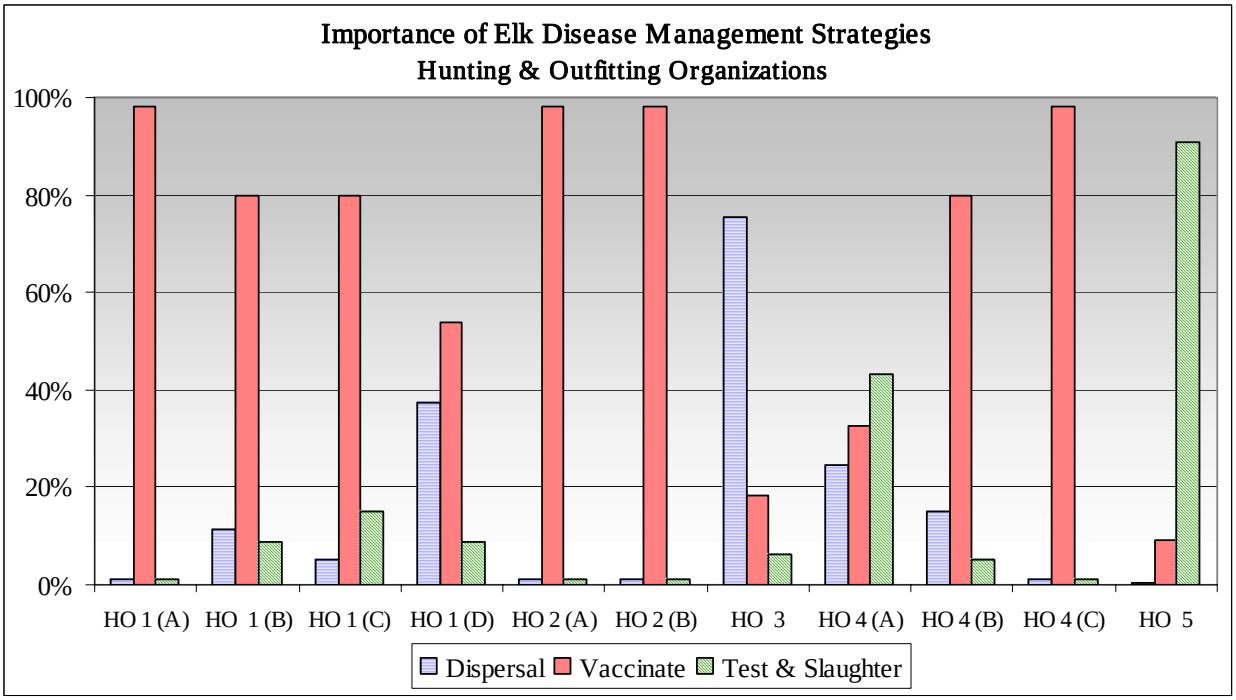
Individual Summary Graphs for Hunting and Outfitting Organizations



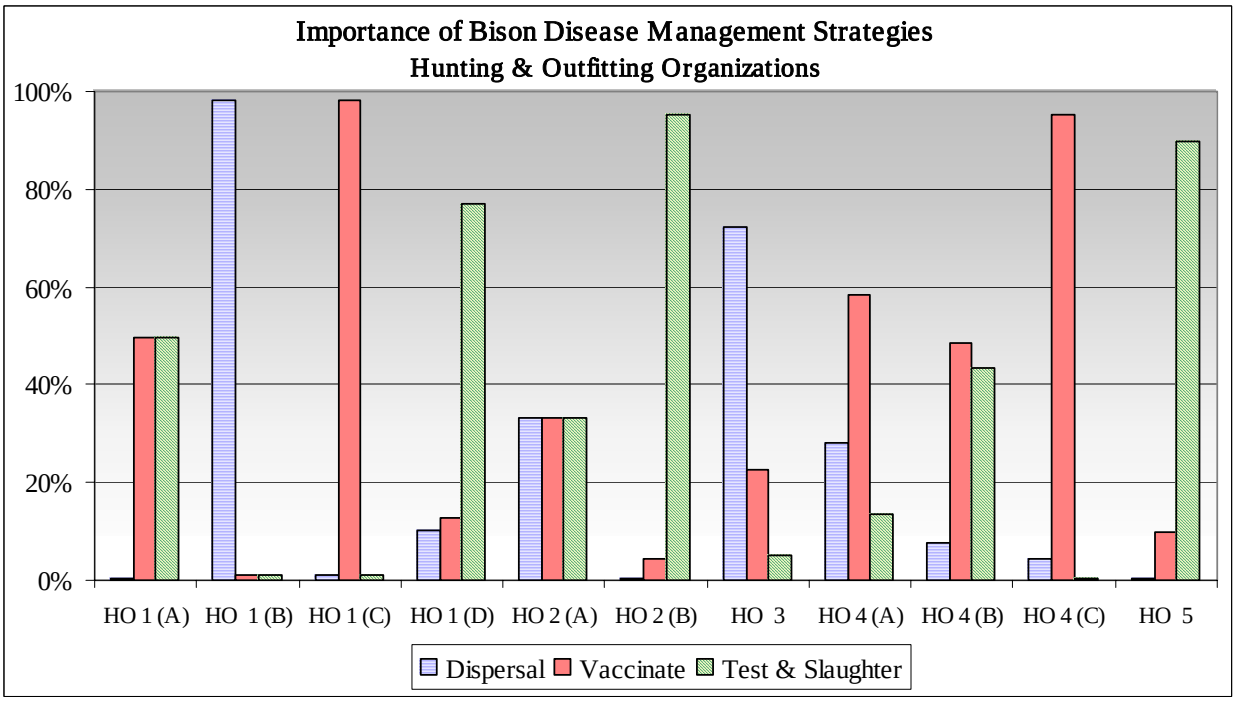
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



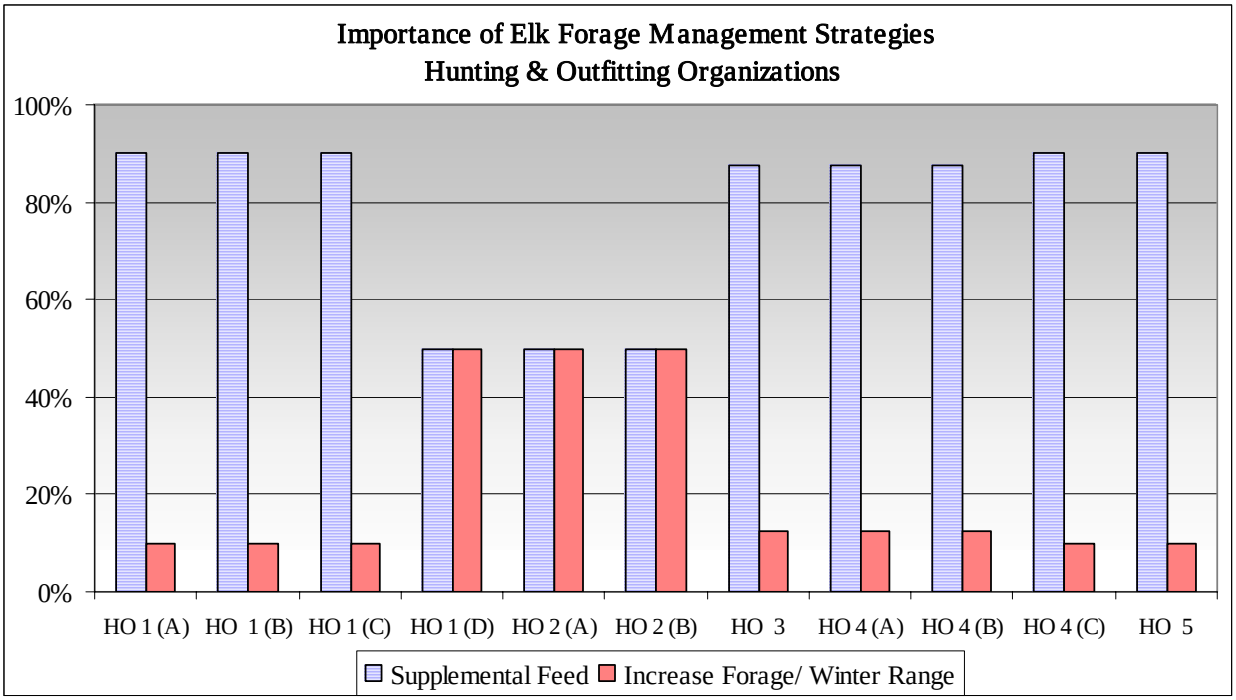
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



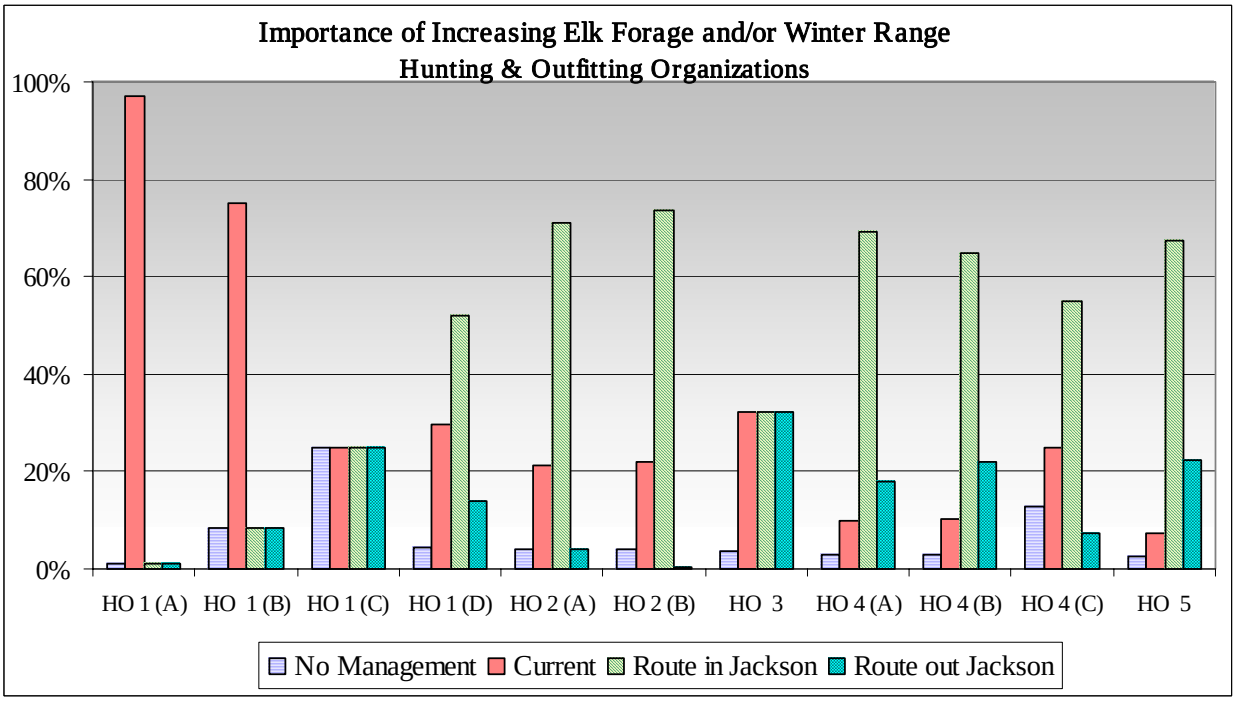
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



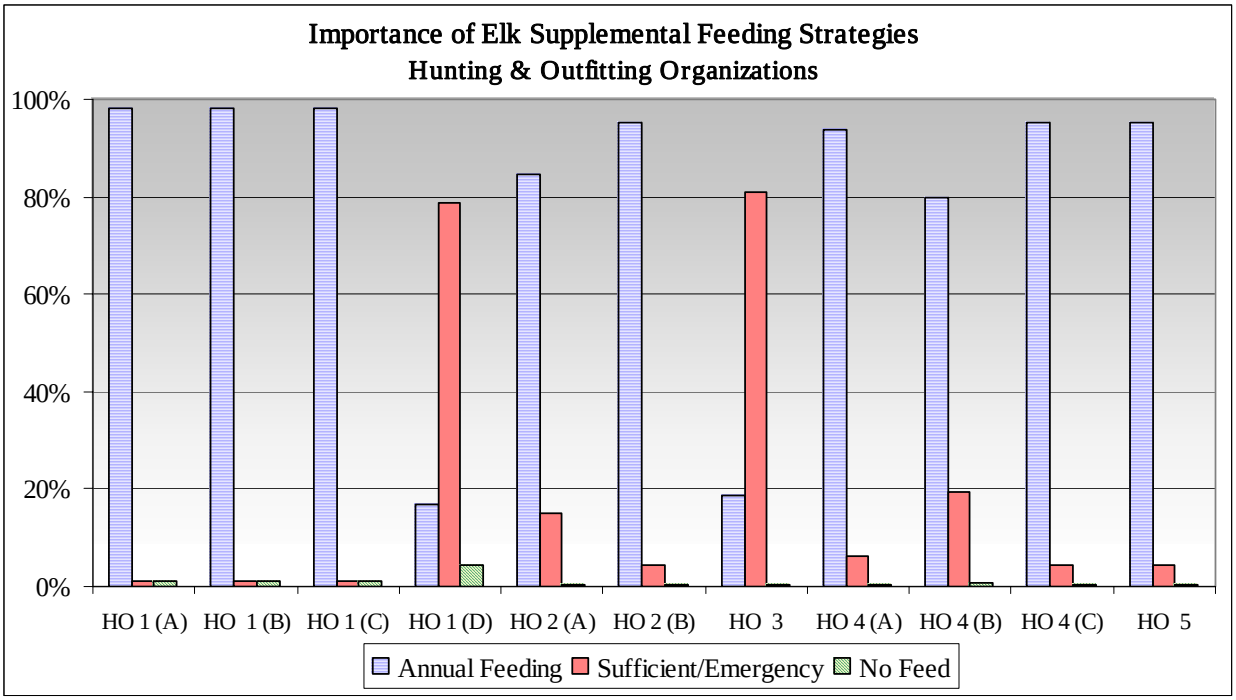
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



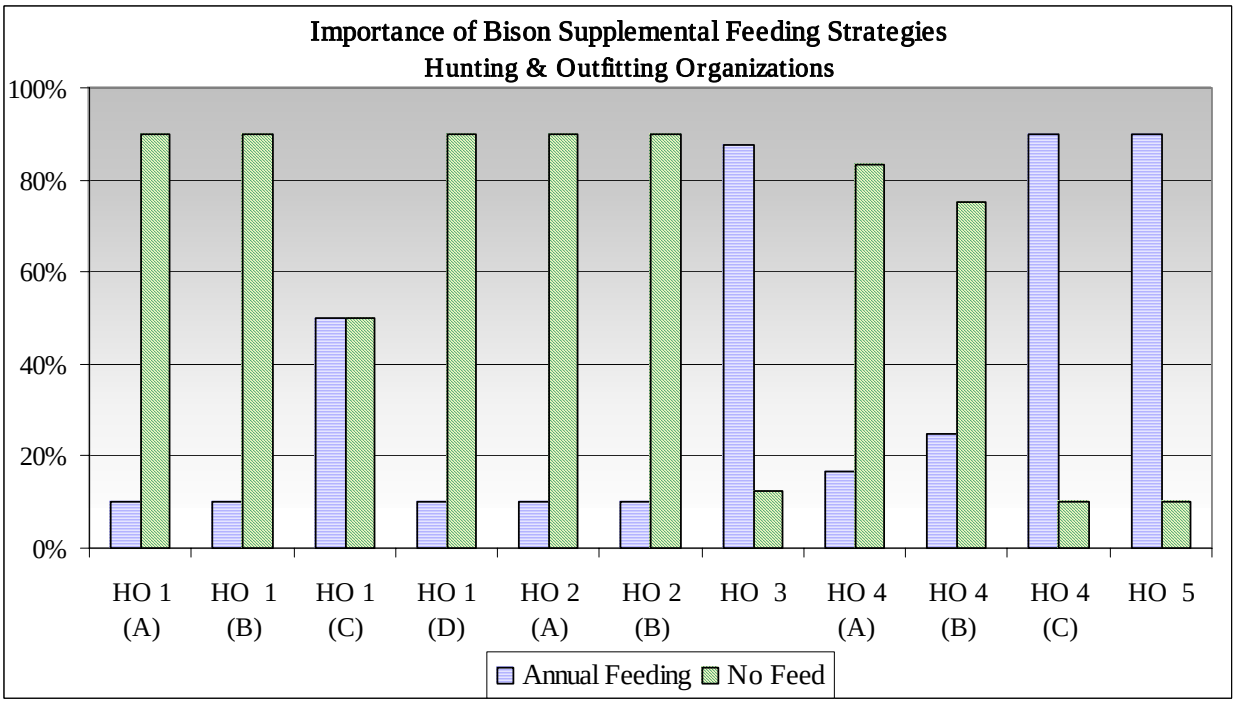
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



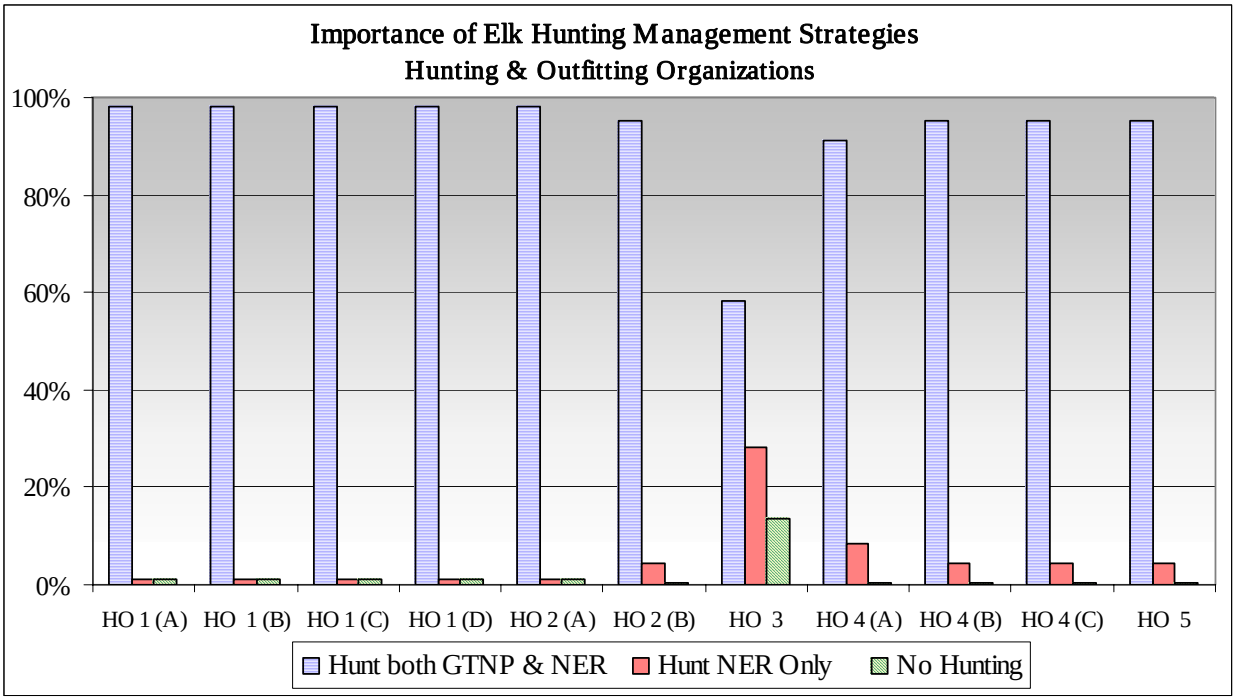
Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.



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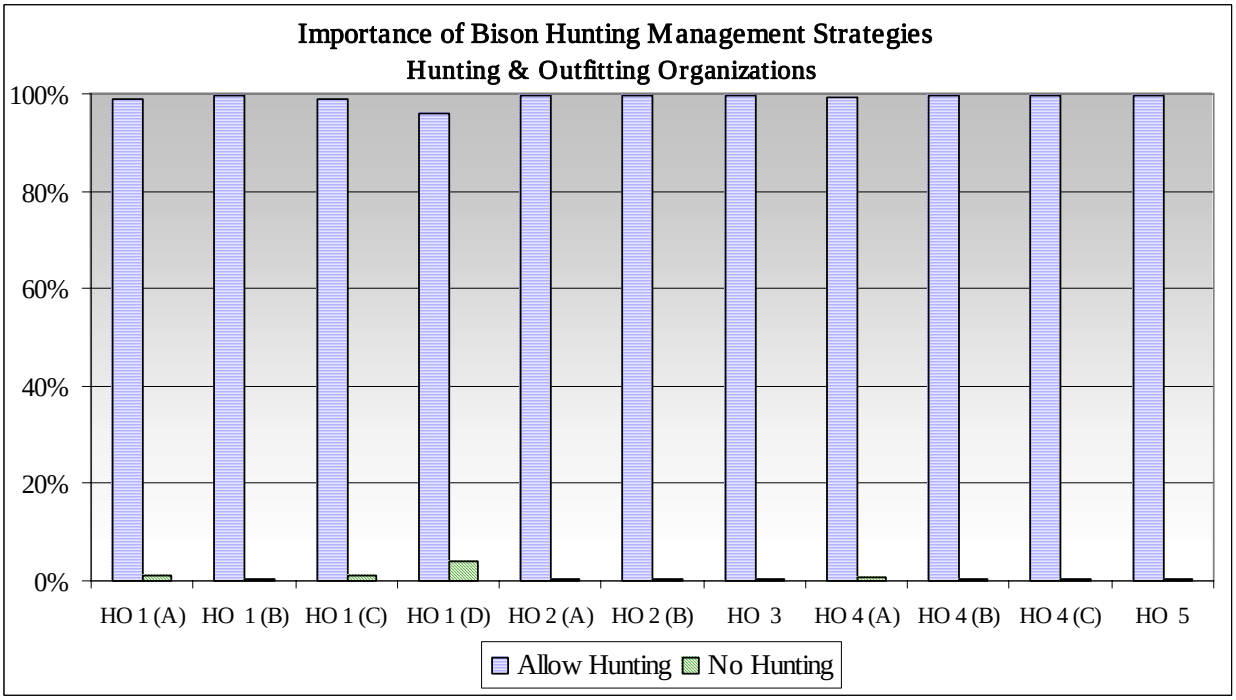

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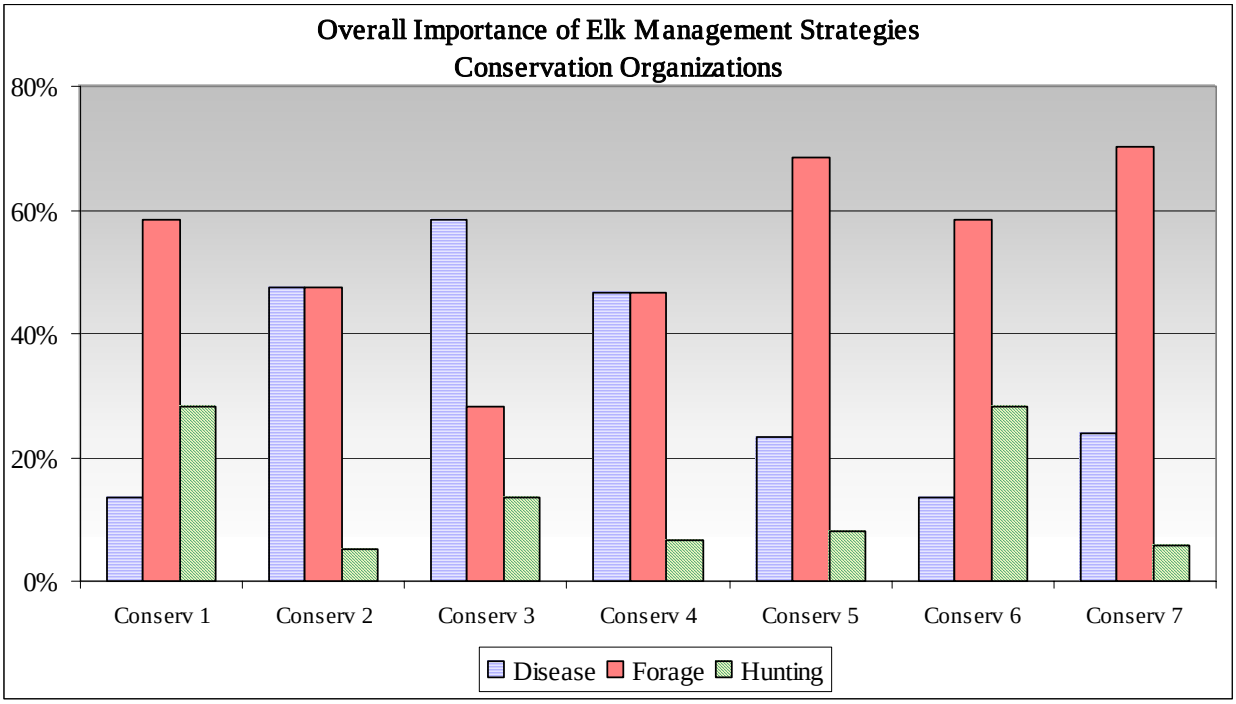
Individual Summary Graphs for Conservation Organizations



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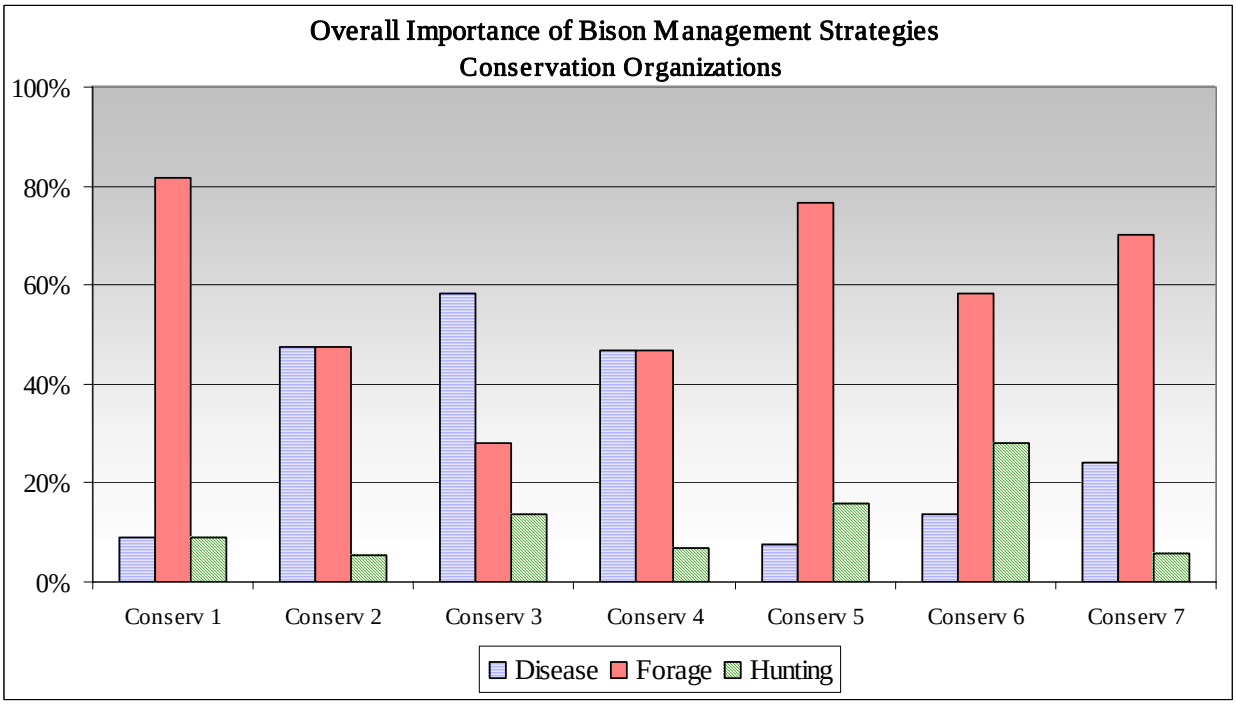

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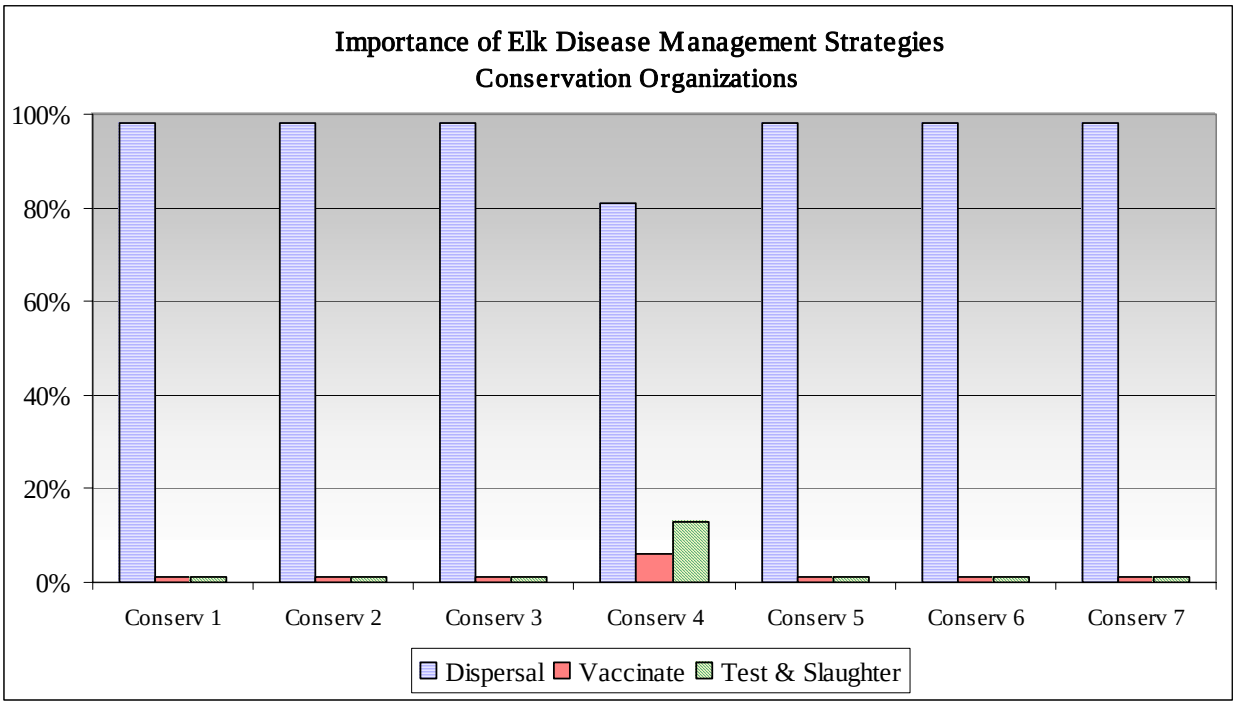

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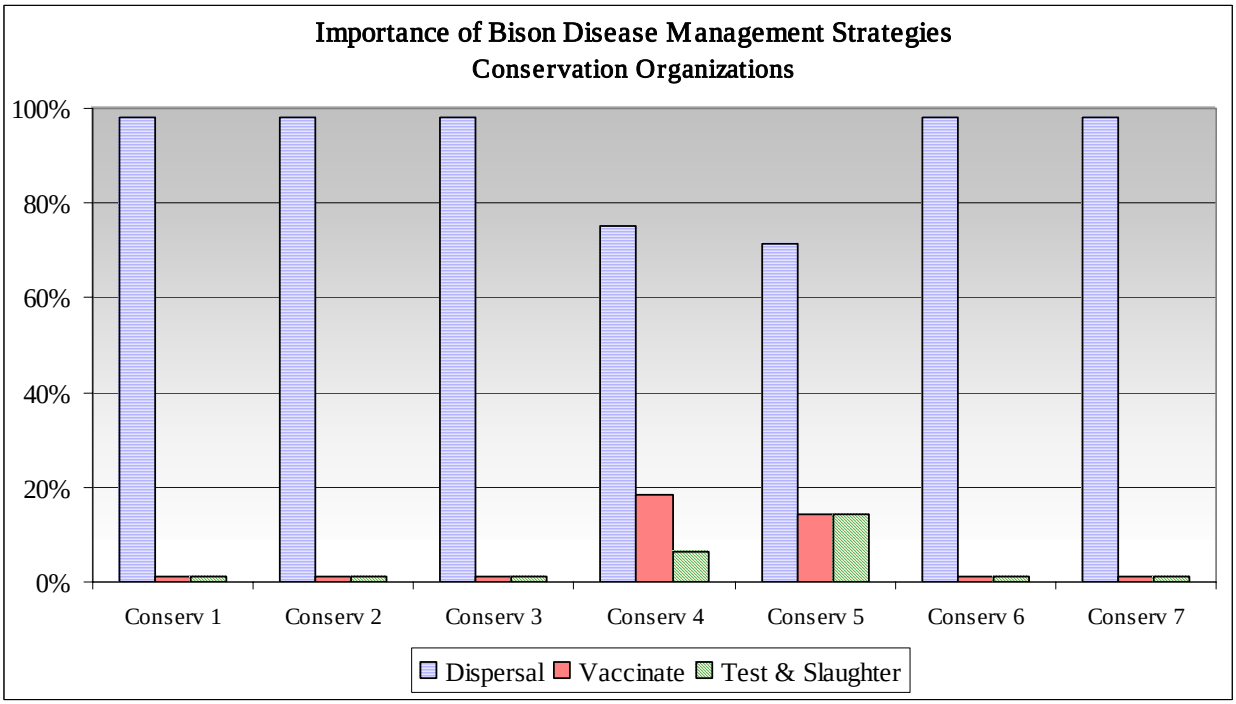

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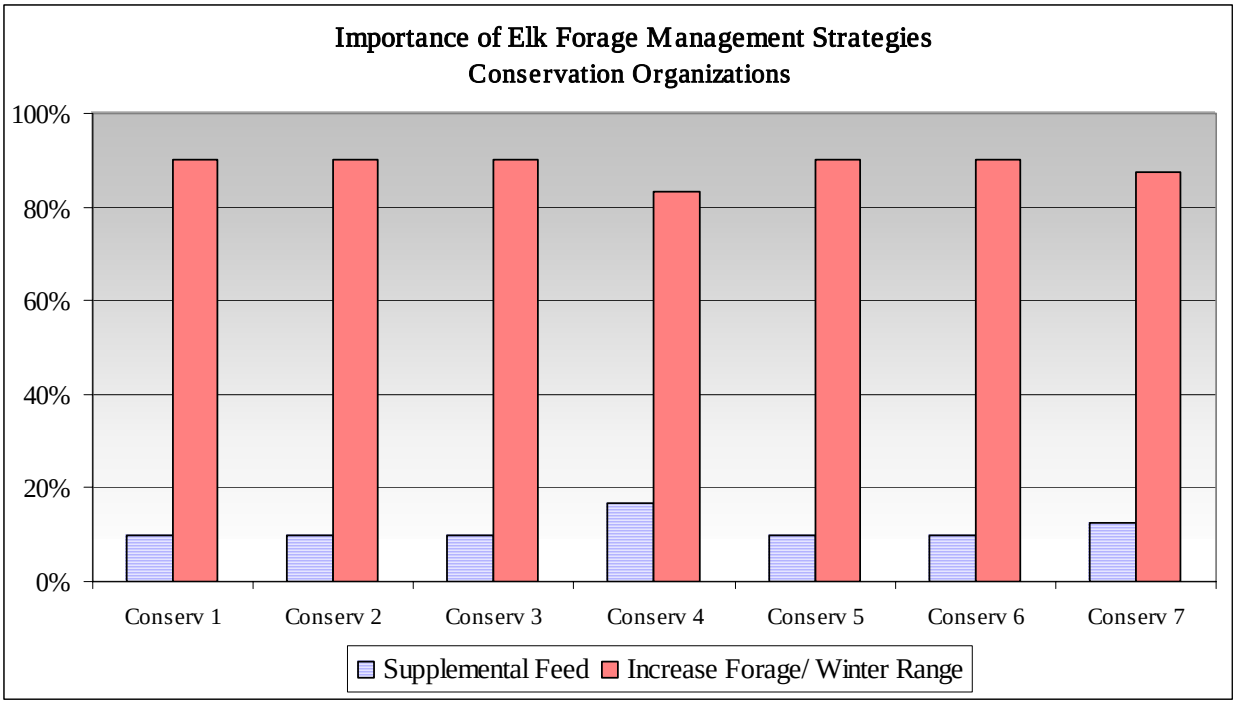

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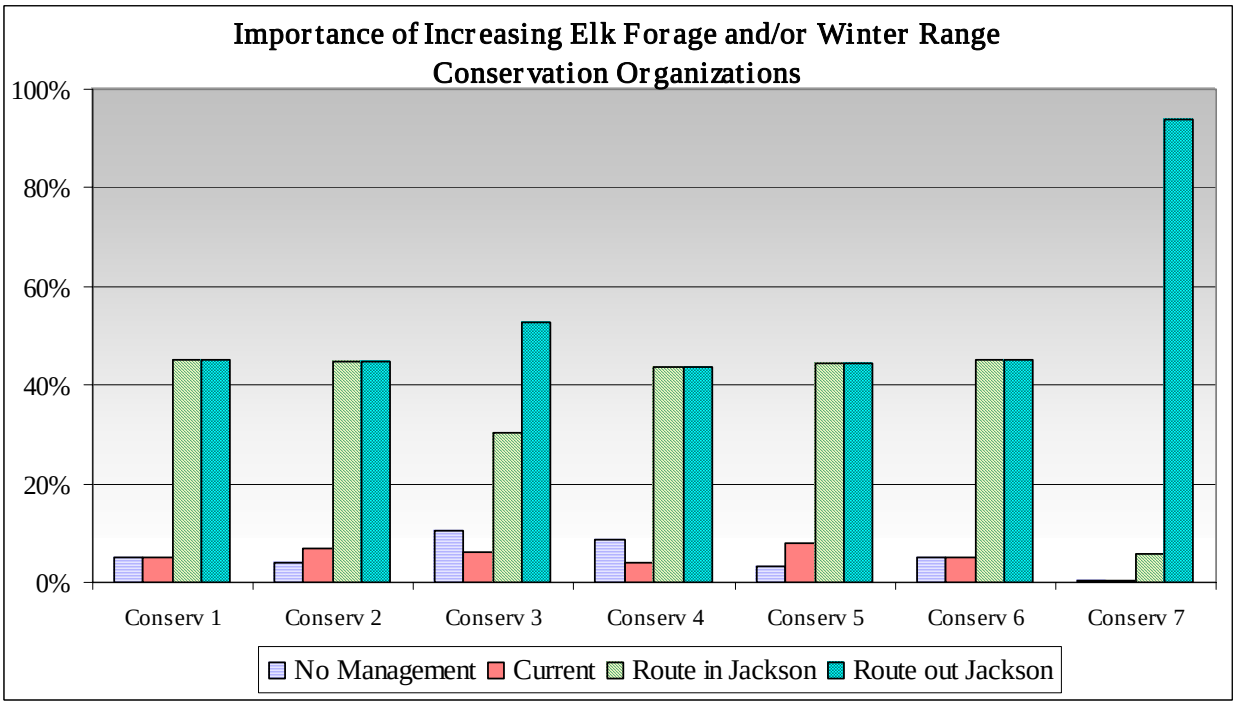

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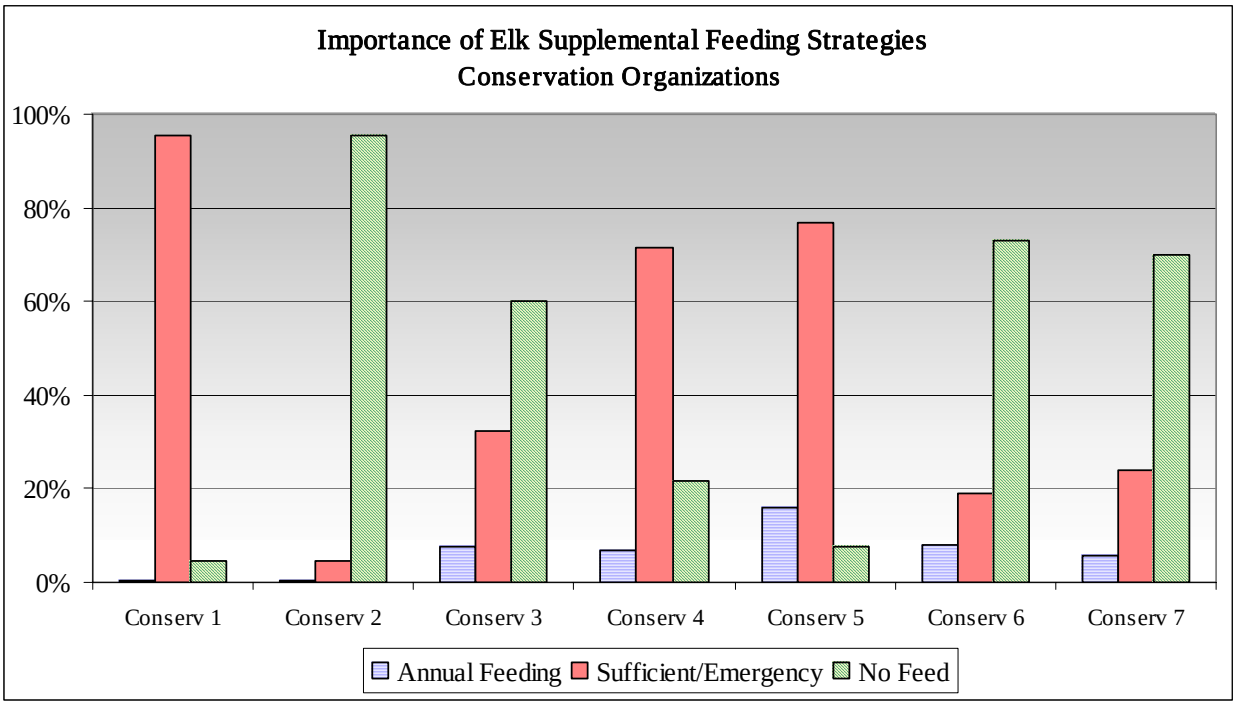

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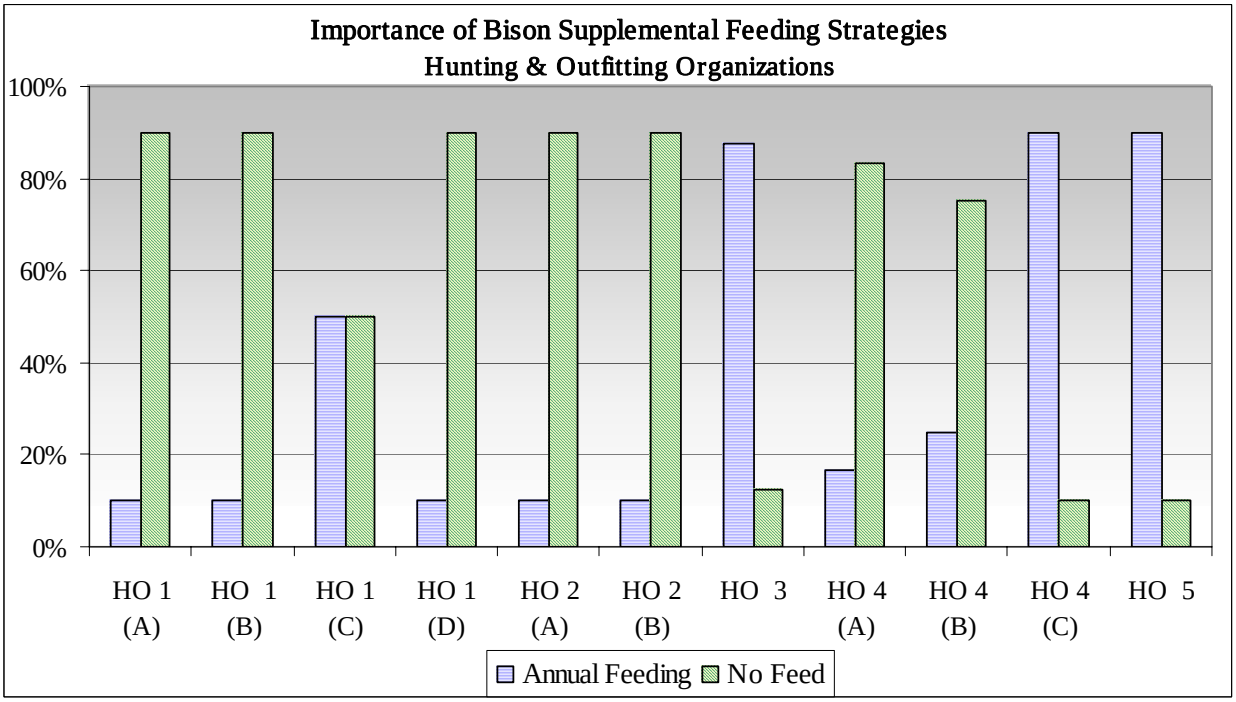

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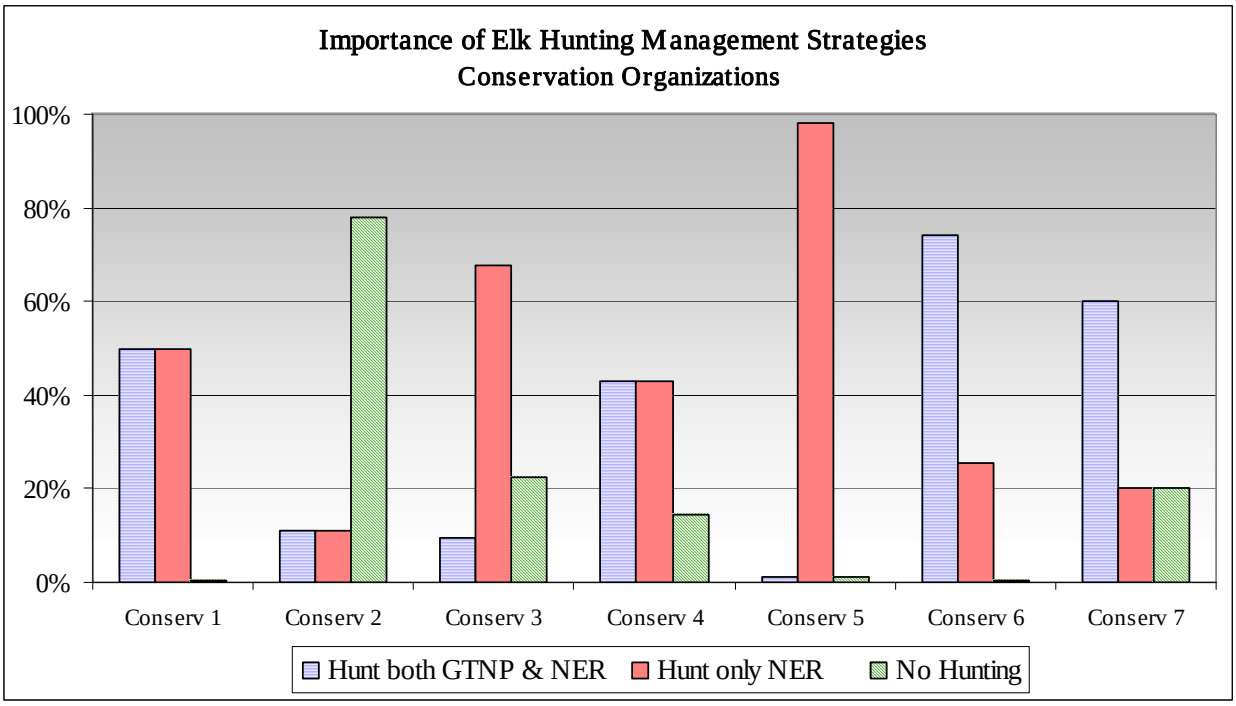

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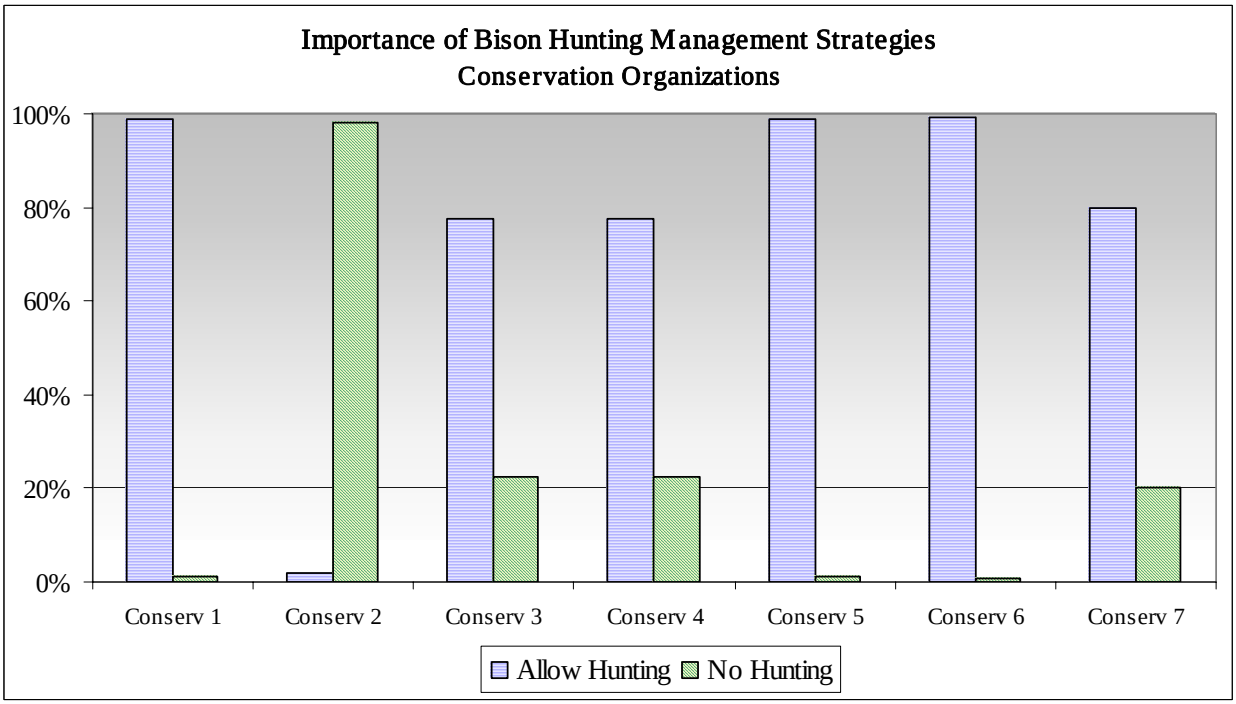

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

Section 3. Elk and Bison Management Objectives

Management Objectives for the Jackson Elk Herd

Herd Health:

Manage to maintain a healthy and genetically viable elk herd.

Healthy Native Habitat and the Needs of Other Wildlife:

Elk management goals would take into consideration the health of native habitats and the habitat needs of other wildlife that the agencies are responsible for conserving and protecting.

Minimize Conflicts with Agriculture and other Landowners:

Manage elk to minimize conflicts with agricultural land holders (e.g., depredation of hay, co-mingling of elk and cattle during critical periods, forage competition) and with other landowners.

Minimize Starvation for Ethical Reasons:

Provide feed for all elk that inhabit the National Elk Refuge in winter to make sure that elk do not risk starvation. Under this scenario, elk are fed in order to maintain a high population.

Provide Many Recreational Opportunities:

Manage the Jackson elk population to support high levels of recreational and tourism opportunities associated with the herd. Recreational opportunities would include hunting, general wildlife viewing, and winter sleigh rides. Spending associated with recreational and tourism activities generate considerable economic benefits for the regional economy.

Individual and Group Average Preferences for Elk Management Objectives

	Herd Health	Healthy Habitat	Min Conflicts w/Agriculture	Minimize Starvation	Recreation Opportunities
Fed Gov 1	38%	39%	6%	3%	14%
Fed Gov 2	15%	27%	46%	7%	5%
Fed Gov 3	65%	10%	18%	4%	2%
Fed Gov 4	28%	52%	6%	7%	7%
Fed Gov 5	38%	42%	6%	3%	11%
Fed Gov Average	**37%**	**34%**	**17%**	**5%**	**8%**
State Gov 1	9%	3%	4%	63%	21%
State Gov 2	26%	33%	14%	11%	16%
State Gov 3	54%	24%	6%	12%	3%
State Gov Average	**30%**	**20%**	**8%**	**29%**	**14%**
Local Gov 1	10%	45%	3%	16%	25%
Local Gov 2	12%	15%	24%	19%	30%
Local Gov Average	**11%**	**30%**	**14%**	**18%**	**28%**
Tribal 1	31%	41%	11%	2%	14%
Tribal 2	26%	51%	18%	3%	3%
Tribal Average	**29%**	**46%**	**14%**	**3%**	**9%**
Local Business 1	39%	10%	10%	4%	37%
Local Business 2	21%	18%	16%	26%	18%
Local Business Average	**30%**	**14%**	**13%**	**15%**	**28%**
Agricultural 1 (A)	4%	4%	30%	30%	32%
Agricultural 1 (B)	11%	8%	23%	36%	22%
Agricultural 1 Average	*7%*	*6%*	*27%*	*33%*	*27%*
Agricultural 2	14%	19%	59%	5%	3%
Agricultural Average	**10%**	**10%**	**37%**	**24%**	**19%**
Hunt & Outfitting 1 (A)	7%	2%	30%	30%	30%
Hunt & Outfitting 1 (B)	31%	31%	3%	3%	31%
Hunt & Outfitting 1 (C)	8%	17%	29%	29%	17%
Hunt & Outfitting 1 (D)	9%	14%	11%	49%	17%
Hunt & Outfitting 1 Average	*14%*	*16%*	*18%*	*28%*	*24%*
Hunt & Outfitting 2 (A)	18%	3%	22%	35%	22%
Hunt & Outfitting 2 (B)	12%	31%	12%	31%	16%
Hunt & Outfitting 2 Average	*15%*	*17%*	*17%*	*33%*	*19%*
Hunt & Outfitting 3	14%	44%	14%	4%	25%
Hunt & Outfitting 4 (A)	19%	2%	26%	19%	35%
Hunt & Outfitting 4 (B)	4%	23%	23%	25%	25%
Hunt & Outfitting 4 (C)	2%	5%	13%	40%	40%
Hunt & Outfitting 4 Average	*8%*	*10%*	*21%*	*28%*	*33%*
Hunt & Outfitting 5	19%	46%	8%	16%	11%
Hunt & Outfitting Average	**13%**	**20%**	**17%**	**25%**	**24%**
Animal Rights 1	24%	60%	4%	2%	10%
Animal Rights 2	28%	54%	3%	3%	12%
Animal Rights Average	**26%**	**57%**	**3%**	**2%**	**11%**
Conservation 1	29%	51%	11%	6%	5%
Conservation 2	37%	42%	7%	2%	12%
Conservation 3	26%	52%	5%	5%	11%
Conservation 4	40%	40%	4%	9%	6%
Conservation 5	24%	61%	3%	6%	6%
Conservation 6	24%	35%	15%	4%	22%
Conservation 7	20%	65%	5%	5%	5%
Conservation Average	**28%**	**49%**	**7%**	**5%**	**9%**

Note: Numbers represent the different organizations within each group. If more than one representative from an organization was interviewed, letters represent the different individuals within each organization.

Management Objectives for the Jackson Bison Herd

Herd Health:

Manage to maintain a healthy and genetically viable bison herd.

Healthy Native Habitat and the Needs of Other Wildlife:

Bison management goals would take into consideration the health of native habitats and the habitat needs of other wildlife that the agencies are responsible for conserving and protecting.

Minimize Conflicts with Elk:

Manage the bison herd to minimize co-mingling and forage competition conflicts with elk.

Cultural Significance:

Management of bison that recognizes their cultural significance to Native Americans and to the history and culture of the American West.

Provide Many Recreational Opportunities:

Manage the Jackson bison population to support high levels of recreational and tourism opportunities associated with the herd. Recreational opportunities would include hunting, general wildlife viewing opportunities, and winter sleigh rides. Spending associated with recreational and tourism activities generate considerable economic benefits for the regional economy.

Individual and Group Average Preferences for Bison Management Objectives

	Herd Health	Healthy Habitat	Min Conflicts w/Elk	Cultural Significance	Recreation Opportunities
Fed Gov 1	13%	50%	11%	25%	2%
Fed Gov 2	4%	23%	6%	61%	6%
Fed Gov 3	64%	9%	19%	5%	2%
Fed Gov 4	27%	48%	9%	9%	7%
Fed Gov 5	15%	49%	27%	4%	6%
Fed Gov Average	**25%**	**36%**	**14%**	**21%**	**5%**
State Gov 1	3%	20%	66%	4%	7%
State Gov 2	27%	40%	6%	6%	21%
State Gov 3	13%	26%	50%	4%	7%
State Gov Average	**14%**	**29%**	**41%**	**4%**	**12%**
Local Gov 1	14%	51%	24%	3%	7%
Local Gov 2	7%	10%	52%	7%	23%
Local Gov Average	**11%**	**31%**	**38%**	**5%**	**15%**
Tribal 1	30%	30%	3%	32%	6%
Tribal 2	25%	25%	3%	23%	25%
Tribal Average	**27%**	**27%**	**3%**	**28%**	**15%**
Local Business 1	5%	10%	42%	7%	36%
Local Business 2	23%	23%	23%	8%	23%
Local Business Average	**14%**	**16%**	**33%**	**8%**	**29%**
Agricultural 1 (A)	3%	8%	24%	3%	63%
Agricultural 1 (B)	21%	24%	7%	7%	41%
Agricultural 1 Average	*12%*	*16%*	*15%*	*5%*	*52%*
Agricultural 2	56%	26%	13%	2%	3%
Agricultural Average	**27%**	**19%**	**15%**	**4%**	**36%**
Hunt & Outfitting 1 (A)	1%	1%	96%	1%	2%
Hunt & Outfitting 1 (B)	8%	8%	69%	8%	8%
Hunt & Outfitting 1 (C)	14%	4%	50%	4%	28%
Hunt & Outfitting 1 (D)	23%	9%	61%	2%	5%
Hunt & Outfitting 1 Average	*11%*	*5%*	*69%*	*4%*	*11%*
Hunt & Outfitting 2 (A)	10%	6%	51%	10%	22%
Hunt & Outfitting 2 (B)	5%	2%	63%	7%	24%
Hunt & Outfitting 2 Average	*7%*	*4%*	*57%*	*8%*	*23%*
Hunt & Outfitting 3	15%	27%	25%	15%	18%
Hunt & Outfitting 4 (A)	3%	25%	57%	3%	12%
Hunt & Outfitting 4 (B)	9%	18%	40%	4%	30%
Hunt & Outfitting 4 (C)	2%	4%	12%	22%	61%
Hunt & Outfitting 4 Average	*5%*	*16%*	*36%*	*9%*	*34%*
Hunt & Outfitting 5	7%	37%	33%	4%	19%
Hunt & Outfitting Average	**9%**	**13%**	**51%**	**7%**	**21%**
Animal Rights 1	22%	61%	2%	5%	9%
Animal Rights 2	30%	32%	31%	4%	4%
Animal Rights Average	**26%**	**46%**	**16%**	**4%**	**7%**
Conservation 1	33%	39%	4%	20%	4%
Conservation 2	31%	45%	2%	16%	6%
Conservation 3	20%	49%	6%	17%	8%
Conservation 4	25%	40%	6%	22%	9%
Conservation 5	25%	59%	9%	3%	3%
Conservation 6	24%	34%	3%	16%	23%
Conservation 7	17%	60%	3%	14%	6%
Conservation Average	**25%**	**47%**	**5%**	**16%**	**8%**

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Importance for management objectives to address the needs of elk verses the needs of bison

	Needs of Elk	Needs of Bison
Fed Gov 1	75%	25%
Fed Gov 2	50%	50%
Fed Gov 3	50%	50%
Fed Gov 4	50%	50%
Fed Gov 5	86%	14%
Fed Gov Average	**62%**	**38%**
State Gov 1	90%	10%
State Gov 2	69%	31%
State Gov 3	88%	13%
State Gov Average	**76%**	**24%**
Local Gov 1	13%	88%
Local Gov 2	83%	17%
Local Gov Average	**48%**	**52%**
Tribal 1	50%	50%
Tribal 2	50%	50%
Tribal Average	**50%**	**50%**
Local Business 1	88%	13%
Local Business 2	50%	50%
Local Business Average	**69%**	**31%**
Agricultural 1 (A)	88%	13%
Agricultural 1 (B)	88%	13%
Agricultural 1 Average	*88%*	*13%*
Agricultural 2	83%	17%
Agricultural Average	**86%**	**14%**
Hunt & Outfitting 1 (A)	90%	10%
Hunt & Outfitting 1 (B)	50%	50%
Hunt & Outfitting 1 (C)	90%	10%
Hunt & Outfitting 1 (D)	90%	10%
Hunt & Outfitting 1 Average	*80%*	*20%*
Hunt & Outfitting 2 (A)	50%	50%
Hunt & Outfitting 2 (B)	50%	50%
Hunt & Outfitting 2 Average	*50%*	*50%*
Hunt & Outfitting 3	50%	50%
Hunt & Outfitting 4 (A)	88%	13%
Hunt & Outfitting 4 (B)	90%	10%
Hunt & Outfitting 4 (C)	90%	10%
Hunt & Outfitting 4 Average	*89%*	*11%*
Hunt & Outfitting 5	90%	10%
Hunt & Outfitting Average	**75%**	**25%**
Animal Rights 1	83%	17%
Animal Rights 2	50%	50%
Animal Rights Average	**67%**	**33%**
Conservation 1	50%	50%
Conservation 2	50%	50%
Conservation 3	88%	13%
Conservation 4	50%	50%
Conservation 5	90%	10%
Conservation 6	50%	50%
Conservation 7	50%	50%
Conservation Average	**61%**	**39%**

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