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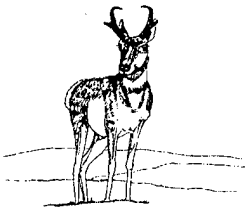

Landowner and Permit-holder Perceptions of Wildlife Damage Around the Idaho National Engineering and Environmental Laboratory

A SURVEY OF INEEL NEIGHBORS ABOUT ELK, MULE DEER, PRONGHORN ANTELOPE, AND DEPREDATION

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June 1998

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Landowner and Permit-Holder Perceptions of Wildlife Damage around the Idaho National Engineering and Environmental Laboratory:

A Survey of INEEL Neighbors about Elk, Mule Deer, Pronghorn Antelope, and Depredation

by Donald E. Roush, Jr. and David E. Beaver

ABSTRACT–Property-owners (N=220) around the Idaho National Engineering and Environmental Laboratory (INEEL) in southeastern Idaho were surveyed about depredation, control methods and economic issues related to use of the area by elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and pronghorn antelope (*Antilocapra americana*). Depredation was defined as damage to privately-owned crops, forage, and fences and irrigation equipment by these animals. The focus on the three ungulate species was prompted by concerns that elk, which had recolonized the INEEL since 1984, were responsible for an inordinate amount of unprecedented damage to agricultural operations. As the INEEL is a U.S. Department of Energy (DOE) reserve with little public hunting access, there have been calls for removal of elk from this land. This study's objective was to quantify the wildlife damage occurring on agricultural operations adjacent to the INEEL and to characterize the damage attributed to each big game species. Responses from 70.2% of the target population indicate an evenness of opinion, by which we mean that various opinions were represented equitably, toward these animals and wildlife damage. Total estimated wildlife damage in 1996 was between $140,000 and $180,000. It was attributed foremost to elk, although pronghorn antelope were viewed nearly as damaging. Respondents placed high values in big game animals and wished to see them continue to inhabit these lands. For managing depredation, adjusting hunting seasons was preferred.

INTRODUCTION AND PROBLEM DEFINITION

More than 200 property-owners are considered to be neighbors of the Idaho National Engineering and Environmental Laboratory (INEEL), an 2,308 km^2 U.S. Department of Energy (DOE) site in southeastern Idaho. This group consists of landowners whose property is adjacent to the INEEL and those persons holding grazing permits for lands on the INEEL (Peterson 1993). The largest and most visible of these properties are farm and ranch operations. The INEEL provides habitat to abundant wildlife, especially during the winter when wildlife migrates to the site from nearby mountain valleys (Reynolds et al. 1986, Connelly et al. 1988, Anderson et al. 1996, Cieminski and Flake 1997, Mitchell et al. 1997). From one-third to one-half of Idaho's pronghorn antelope, some from as far away as southwestern Montana, winter on the INEEL (Hoskinson and Tester 1980). Numbers of mule deer on the INEEL also increase during the winter (Peek and Beaver 1997). Elk populations have also increased since 1984. Because of this use of the INEEL by big game, a strong regional possibility exists for wildlife damage and its attendant economic problems. Reports, both formal and informal, about depredation by big game animals using the INEEL's lands prompted this study. We systematically surveyed the INEEL's neighbors about wildlife damage to their property and what they believed should be done about it.

The INEEL's environment offers a paradox to people in southeastern Idaho (Roush et al. 1997). The DOE site is both a high-quality example of the region's native sagebrush steppe ecosystem (Anderson et al. 1996) and a place where most people are not allowed to go. The site has restricted public access, with all INEEL facilities open to

employees and escorted guests only. Privately-driven vehicles have unrestricted use of about 125 miles of two-lane federal highways, state highways, and county roads on the INEEL, although there is no public access to hundreds of miles of other roads and the vast majority of the site's land area. Limited hunting is allowed in the autumn for elk and pronghorn antelope only. Hunters are, for the most part, restricted to areas within one-half mile of the INEEL boundary that are adjacent to private agricultural fields.

Livestock grazing has been excluded from the core 40% of the INEEL's lands for nearly 50 years. Grazing occurs, via Bureau of Land Management (BLM) permits, on the remaining peripheral 60% of the site (Figure 1). Wildlife, as public property of the State of Idaho, fall under the management aegis of the Idaho Department of Fish and Game (IDFG). These vagaries in managing the land and wildlife at the INEEL compound the already-complex issue of wildlife damage control (Berryman 1992).

Successful management draws on a broad diversity of opinion about wildlife issues. The full range of public opinions needs to be taken into account for the formation of widely acceptable management. Disparities in perceptions of wildlife damage can be a source of conflict in such a decision-making process (McIvor and Conover 1994). Despite recognition of the need for the inclusion of constituent concerns, only one in seven of the federal and state wildlife agencies in the United States were found to have conducted surveys to provide information for wildlife damage policy formation (Hewitt and Messmer 1997). Indeed, such information from those most affected by particular wildlife populations has been deemed "essential" for management agencies (Knuth et al. 1992). We assume property-owners closest to the INEEL represent this key stakeholder group.

Agency managers on and around the INEEL have recently become attentive to elk. Before 1984, elk sightings were rare on the INEEL (Strohmeyer and Peek 1996). Sightings increased during the next three years. By 1987, a total of 180 elk were observed; the herds had grown to more than 200 by summer 1991. In response to depredation attributed to elk, 248 animals were captured and relocated during 1992 and 1993. Though few elk were seen during aerial surveys immediately following these actions, recolonization continued, with winter survey observations of 115 elk on the INEEL in 1995, 221 in 1996, and 353 in 1997 (Warren and Markham 1997). Wildfires which burned almost 61,000 acres on the INEEL between July 1994 and July 1996 may have improved habitat for elk. With more elk have come increased concerns about depredation. Warren and Markham (1997, p. 1) stated, "Most depredation complaints from adjacent lands blame 'those INEEL elk'." They reported IDFG, in 1996, spent 384 staff hours administering and enforcing eight depredation hunts conducted on agricultural lands adjacent to the INEEL. Seventeen depredation complaints were filed during that year, one of which resulted in a restitution payment of $5,458.32; in addition, IDFG spent $9,200 to supply two landowners with materials to protect haystacks.

The return of elk to the sagebrush steppe of the INEEL is reflective of widespread increases in their populations and recolonization of non-forested, historically inhabited areas in the American West. These animals have expanded their habitat throughout Idaho as dramatically as anywhere (Bryant and Maser 1982, Thomas and Bryant 1987). With more elk in more places, damage problems have been increasingly noted, in the "West" (Conover 1994), the "Intermountain West" (Wywialowski 1994), Utah and Wyoming (McIvor and Conover 1994), and Montana, especially southwestern counties of that state (Lacey et al. 1993, Irby et al. 1996, Irby et al. 1997). Elk depredation in Idaho has also prompted popular press coverage (Fields 1996).

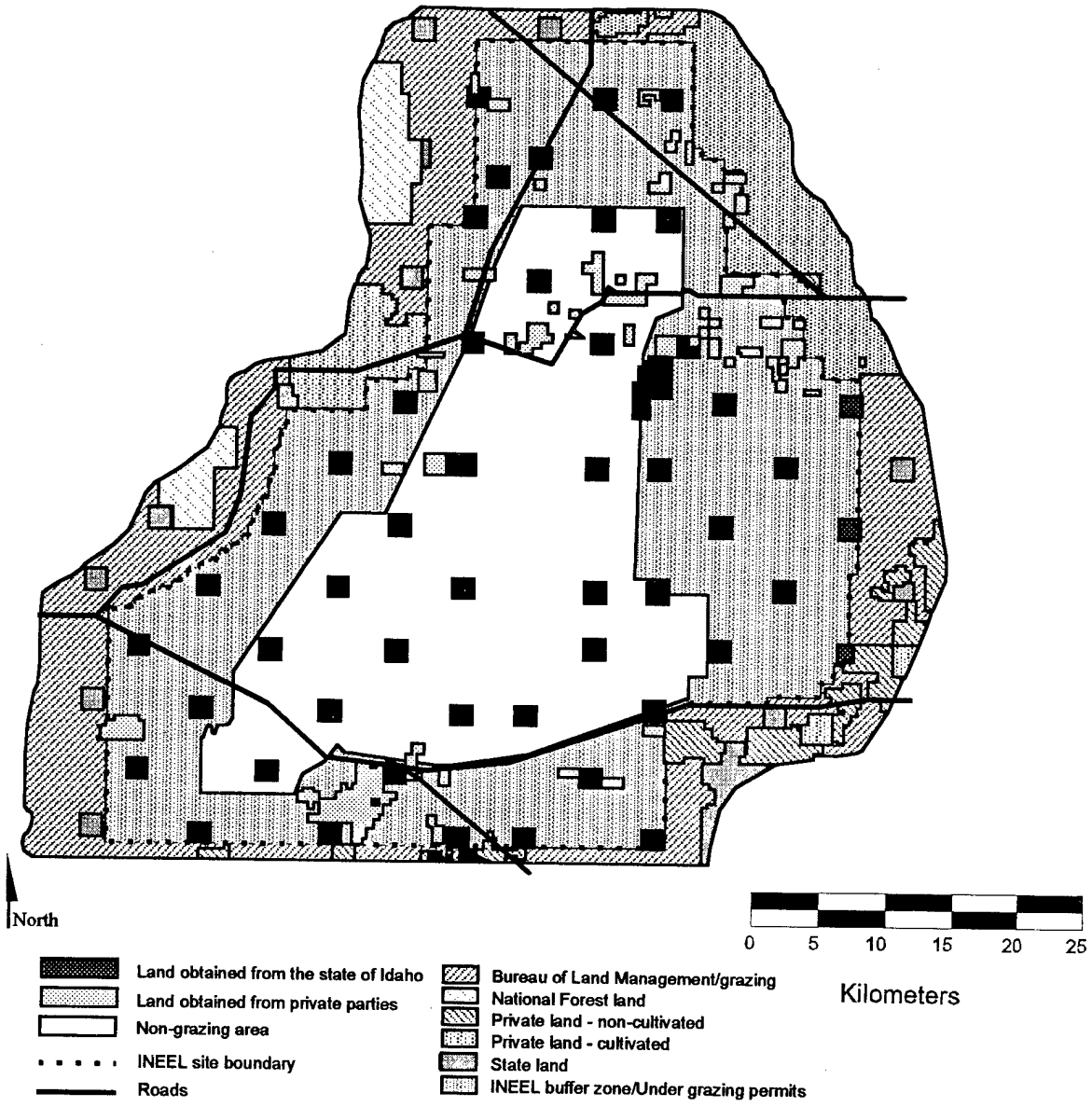

FIGURE 1—Land ownership and use on and around the INEEL

In Idaho, wildlife damage is legally referred to as "depredation." A legal mechanism for filing and funding depredation claims was established in 1990 (Rimbey et al. 1991). Claims are subject to a $1,000 deductible and are to be paid after preventative methods–scare devices, repellents, lure crops, baiting, paneling, depredation hunts, kill permits, and trapping and relocation–have failed (IDFG undated).

Despite being the subject of six chapters in the Idaho Code and mentioned in six other places in Idaho's statutes, depredation is not explicitly defined by the State of Idaho. Therefore, we stated an operational definition for this concept: damage to privately-owned crops, forage, fences and irrigation equipment by elk, mule deer, and pronghorn antelope. Our definition was based on references in the Idaho Code and to the three types of damage and three species of big game of most interest around the INEEL. We also noted taking of livestock by coyotes (*Canis latrans*) and other predators was not within the scope of this survey. Other species recognized by Idaho as potentially damaging–black bear (*Ursus americanus*), mountain lion (*Felis concolor*), etc.–were neither excluded nor included in instructions to respondents.

Study Area and Population

Located on 2,308 km^2 of federally owned and administered land on the upper Snake River Plain, the INEEL was established in 1949 as an isolated federal facility at which to build, test, and perfect nuclear reactors. Originally called the National Reactor Testing Station, this site's name was changed to the Idaho National Engineering Laboratory (INEL) in 1974, becoming the INEEL in 1997. About 8,100 people are employed at the INEEL.

Because the INEEL's roads and facilities occupy only about 6% of the land area, the restricted-access site represents an important example of the sagebrush-steppe biome (DOE 1994). The ecological importance of the site was recognized by DOE when it was declared a National Environmental Research Park in 1975. Lands immediately beyond the boundaries of the INEEL are desert, foothills or agricultural lands. Livestock grazing on the INEEL takes place away from the central locations of the major facilities. Most of the nearby farming is concentrated northeast of the INEEL (Mitchell et al. 1997).

In 1993, DOE commissioned the compilation of "Private Land Owners Adjacent to the INEL," a list of private landowners and grazing permit-holders immediately surrounding the site (Peterson 1993). Using tax assessment records of Bingham, Bonneville, Butte, and Jefferson counties and defining "adjacent" as abutting, a list of 233 entities was created. For this study, we omitted 13 entries, representing non-private institutions: government agencies, churches, publicly-held utilities, and banks. (Excluded were Atomic City, Bingham County, BLM, Butte County Park, Butte County Cemetery District, Howe Church of Jesus Christ of Latter Day Saints, Jefferson County, Little Lost Community Church, Lost River Electrical Co-operative Inc., Mountain States Telephone Co., State of Idaho Division of Highways, Valley Bank of Idaho Falls, and Westmark Federal Credit Union.) The remaining population of 220 was comprised of individuals and private businesses.

Since the purpose of this study was to gauge the opinion of INEEL-adjacent property-owners, we used this group as the study population. We made no attempt to generalize our findings to a larger group and did not use inferential statistics in analyzing the data, except in the case of comparing four cross tabulations. We present only descriptive statistics to support our conclusions, save for the use of chi-square statistics to show goodness of fit between four pairs of questions.

METHODS

Using the widely accepted Total Design Method (Dillman 1978), a mail questionnaire survey was conducted. Five separate mailings were sent as part of the study. All items followed Dillman's (1978) size recommendations, were stamped as opposed to metered, and were personally signed by one of the investigators. Each of these touches was designed to impress on the recipients the importance of their replies; in aggregate, the application of the Total Design Method aimed to result in responses from most of the targeted population. Dillman (1978, p. 21) found an average response rate of 74% for 48 surveys using the Total Design Method. Craven et al. (1992) state "response rates are generally excellent (70-90 percent) in wildlife damage surveys." They attribute this to strong interest in wildlife issues among those groups studied.

The first three mailings went to all 220 property-owners on the INEEL neighbor list (Peterson 1993). The first mailing, which entered the postal stream on January 7, 1997, was a postcard announcing the survey and asking for cooperation. The first wave of packets, each containing a questionnaire, cover letter, and return postage-paid envelope, was mailed on January 14, 1997. A second postcard, thanking early respondents and reminding others to complete and return their questionnaires, was mailed on January 21, 1997. A second questionnaire, cover letter and return envelope was mailed to non-respondents on February 4, 1997. A third package went to the remaining non-respondents on March 4, 1997. Randomly selected non-respondents were contacted by telephone and mail during April 1997.

The survey instrument contained 84 items in a 16-page, 6 7/8" x 8 ½" booklet. Questions included 21 multiple choice, 10 write-in, 50 Likert scale, and three ranking items (see Appendix A for all questions and complete results). The Likert scale items covered five pages in the middle of the questionnaire and used a five-choice, strongly agree through strongly disagree scale. Transition statements were used between groupings of similar questions and demographics were asked last.

A panel of 12 experts reviewed drafts of the postcards, cover letters, and questionnaire for content validity during November 1996. Their comments resulted in minor word changes to the postcards and cover letters, and the addition, rewriting, and reformatting of about one dozen questions. Panel members were Robert Bobo, Shoshone-Bannock Tribes; Eddie Chew, DOE Idaho Operations Office; Ted Chu, IDFG; Jack Depperschmidt, DOE Idaho Operations Office; Gerald Deutscher, U.S. Fish and Wildlife Service; Dave Fallis, Salmon-Challis National Forest; Tommy Gooch, BLM; Doyle Markham, Environmental Science and Research Foundation; Craig Miller, University of Idaho College of Forestry, Wildlife and Range Sciences; Mike Nitz, University of Idaho School of Communication; Tim Reynolds, Environmental Science and Research Foundation; and Rick Rine, Targhee National Forest.

A pilot test, with nine persons, was conducted on December 2, 1996, at a meeting of the Butte County Chamber of Commerce. Butte County contains a majority of the INEEL land area and home to a plurality of this survey's population. As a result of their comments, four items were reworded and one minor format change was made to the instrument.

TABLE 1–Levels of damage from elk reported by property-owners around the INEEL

	to CROPS (N=97)	to FORAGE (N=97)	to FENCES & IRRIGATION EQUIPMENT (N=97)
NONE	62.9%	72.2%	71.1%
LIGHT	19.6%	12.4%	15.5%
MODERATE	13.4%	12.4%	3.1%
HEAVY	2.1%	3.1%	**9.3%**
SEVERE	2.1%	0.0%	1.0%

Bold data are discussed in text.

TABLE 2–Levels of damage from mule deer reported by property-owners around the INEEL

	to CROPS (N=98)	to FORAGE (N=97)	to FENCES & IRRIGATION EQUIPMENT (N=96)
NONE	62.2%	66.0%	79.2%
LIGHT	33.7%	30.9%	18.8%
MODERATE	4.1%	3.1%	2.1%
HEAVY	**0.0%**	**0.0%**	**0.0%**
SEVERE	**0.0%**	**0.0%**	**0.0%**

Bold data are discussed in text.

TABLE 3–Levels of damage from pronghorn antelope reported by property-owners around the INEEL

	to CROPS (N=97)	to FORAGE (N=97)	to FENCES & IRRIGATION EQUIPMENT (N=97)
NONE	54.6%	55.7%	67.0%
LIGHT	**24.7%**	**24.7%**	**23.7%**
MODERATE	17.5%	15.5%	5.2%
HEAVY	2.1%	3.1%	3.1%
SEVERE	1.0%	1.0%	1.0%

Bold data are discussed in text.

RESULTS

Of the 220 in the population, 139 persons returned questionnaires and 22 were non-reachable, i.e., deceased, moved without forwarding address, etc. Using the Dillman's formula (1978, p. 50), this study's response rate was 70.2%. Of those returning questionnaires (N=139), 33 provided no quantitative data to our findings. (Many of this group offered written comments, however. These were included as qualitative data below in this section and verbatim in Appendix B.) Responses were similar between early and late respondents, including those contacted by telephone in the month following the final mailing.

Demographically, the population had an average age of 55 years and had worked their properties near the INEEL for an average of 23 years. Their operations had mean size of 5,426 acres, with an average of 1,290 acres in crop and 1,042 acres in forage. Grazing allotments ranged from 0 to 3,400 animal unit months. Operations were predominantly either large or small when considering gross sales, i.e., 40.3% had less than $50,000 gross annual sales in 1996, whereas 41.9% had more than $200,000. Fifty-two percent reported that more than 90% of their income was derived from agriculture.

Eighty percent of respondents reported seeing big game animals on their property, with almost half (49%) sighting elk, mule deer and pronghorn antelope "only during certain times of the year, such as spring and fall." Twenty-two percent claimed seeing these animals was a daily occurrence. Of the three species of interest, our findings suggest elk had the lowest land use (19.0% said elk were the most common species on their land), were spotted in larger groups (3.0% said they saw elk in groups of 100 or more), and were blamed for the most damage (57.0% ranked elk first in terms of their ability to depredate and cause damage). Pronghorn antelope were the most commonly spotted species (so labeled by 50.0% of respondents) and their ability to do damage neared that attributed to elk (39.5% ranked pronghorn as the chief depredating species). Mule deer were seen most commonly by 31.0% of respondents, yet were reported mostly in groups of 1-10 individuals; 61.5% of the people in the survey ranked them last when considering the damage they were thought to cause. Depredation rates for each species was reported. For elk, 27.8% reported damage; for mule deer, 12.1%; and, for pronghorn antelope, 38.5%. Crop types reported to be damaged by more than one-fifth of the respondents were alfalfa (86.5%), barley (59.6%), wheat (51.9%), and potatoes (21.2%).

When asked about their beliefs in sustaining wildlife damage, financial loss, and compensation for such losses, a narrowing segment of our study population believed there was a public responsibility incurred by big game depredation. Whereas 42.9% of the population attributed damage on their operation to big game animals and 37.1% perceived such losses to cause a financial burden, only 33.3% felt monies, presumably from public funds, should be paid to them for their losses. The population squarely viewed IDFG as the agency responsible for any wildlife damage management; 82.8% picked IDFG compared to 36.2% DOE, 32.8% BLM, and 17.3% "myself," a preponderance of opinion considering multiple selections were allowed.

This study targeted three species of big game animals and also had three categories of damage in its operational definition of depredation, namely crops, forage, and fences and irrigation equipment (Tables 1-3). Results interpreted as meaningful are printed in bold. For elk, an outlier of 9.3% was seen for heavy damage to fences and irrigation equipment. For mule deer, no respondents reported any heavy or severe damage. Almost one-fourth, however, reported depredation by pronghorn, in all three damage categories. Note that respondents had to arrive at their own categorization of

damage into one of the five available classifications.

Several questions explored the values placed in wildlife. Aesthetic value was measured by how much enjoyment people reported in seeing big game on their land. For elk, 67.1% reported a positive reaction, compared to 77.2% for mule deer. Only pronghorn antelope were not enjoyed by a large majority, as 48.9% said they enjoyed these animals and another 30.0% had neutral feelings toward this species. Consumptive values, measured by those reporting to enjoy hunting big game, generated similar measures. For elk, this positive value was reported by 71.9%; for mule deer, 70.8%; and, for pronghorn antelope, 31.4%.

Preferences toward population sizes and management options were indicated by additional questions. Mule deer were viewed as having the smallest population relative to respondents' desires; 76.1% said they wished to see more deer and 56.6% disagreed that there were too many deer. For elk, 56.5% wished to see more of these animals in southeastern Idaho, although 30.0% felt too many elk were on and around the INEEL. For pronghorn antelope, data indicated even more ambivalence; 46.7% stated a desire to see more around southeastern Idaho, while 34.4% believed too many of these animals were already on and around the INEEL.

When considering the management of public land, big game populations, and wildlife damage mitigation, respondents expressed little satisfaction in current government efforts in southeastern Idaho. Fifty-seven percent were not satisfied with management of big game and 52.8% were not satisfied with management of public land. Respondents said the best information about big game and depredation came from IDFG, when compared to DOE, BLM and U.S. Forest Service (USFS). These same four agencies were ranked, with "1" signifying the best, similarly on their performance for managing natural resources. Average ranking for USFS was 2.27; for BLM, 2.44; for IDFG, 2.46; and for DOE, 2.72. Few moderate opinions of DOE's land management were held; DOE seemed to be more noticeable in its natural resource management than the other agencies, as 32.2% of respondents ranked the agency first and 42.4% ranked it fourth. In terms of the trust this public held for these agencies, a more skeptical picture emerged. A plurality of respondents took neutral stances on questions of trust of government entities. Among those expressing an opinion, there was more distrust than trust of government agencies.

In dealing with depredation, opinions on three management options were queried: adjustment of hunting seasons, depredation hunts, and trapping and relocation of animals. Of these, shifting hunting seasons was favored by 70.4% of respondents. Depredation hunts were also a preferred management technique for elk (69.7% in favor) and pronghorn antelope (73.9% in favor), though not for mule deer (47.3% in favor). A majority were against trapping and relocating mule deer (66.0% against), pronghorn antelope (62.7% against), and elk (58.3% against).

Two different estimates were made of overall financial loss in the population. First, respondents were requested to write-in an estimate of financial loss during 1996. Total reported damage via this item was $141,800, with a mean estimate of $1,817.95 and a range of $0-40,000. Later in the questionnaire, respondents were asked to again estimate financial losses for 1996; this time separate estimates for crops, forage, and fences and irrigation equipment were requested. Total reported damage by this method was $177,735. Of this, $119,875 was for crops; $45,375, for forage; and $12,485, for fences and irrigation equipment.

Four cross tabulations and accompanying goodness-of-fit statistics were calculated. These comparisons indicate a relationship between those reporting financial burdens from wildlife damage with their preference

for big game population sizes (Tables 4-7). Belief that one should be compensated for depredation had significant relationships with more than $1,000 worth of wildlife damage as well as the perception that there were too many elk, mule deer, and pronghorn antelope in southeastern Idaho.

Table 4–Cross tabulation of question 18 by question 20

		ESTIMATED FINANCIAL LOSS BECAUSE OF DEPREDATION IN 1996 (N=78)			
		$0	$1-999	$1,000-5,000	more than $5000
SHOULD YOU BE COMPENSATED FOR FINANCIAL LOSSES FROM DEPREDATION? (N=93)	No	57.9%	6.6%	5.3%	0.0%
	Yes	5.3%	2.6%	11.8%	10.5%

$X^2=38.736$, $p<0.001$, $df=3$

Table 5–Cross tabulation of question 18 by question 33

		THERE ARE TOO MANY ELK ON AND AROUND THE INEEL (N=90)				
		Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
SHOULD YOU BE COMPENSATED FOR FINANCIAL LOSSES FROM DEPREDATION? (N=93)	No	1.2%	7.1%	15.3%	18.8%	21.2%
	Yes	11.8%	10.6%	11.8%	2.4%	0.0%

$X^2=33.471$, $p<0.001$, $df=4$

Table 6–Cross tabulation of question 18 by question 34

		THERE ARE TOO MANY MULE DEER ON AND AROUND THE INEEL (N=90)				
		Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
SHOULD YOU BE COMPENSATED FOR FINANCIAL LOSSES FROM DEPREDATION? (N=93)	No	1.2%	4.7%	12.9%	20.0%	1.2%
	Yes	0.0%	0.0%	23.5%	12.9%	0.0%

$X^2=25.5451$, $p<0.001$, $df=4$

Table 7–Cross tabulation of question 18 by question 35

		THERE ARE TOO MANY PRONGHORN ANTELOPE ON AND AROUND THE INEEL (N=90)				
		Strongly agree	**Agree**	**Neither agree or disagree**	**Disagree**	**Strongly disagree**
SHOULD YOU BE COMPENSATED FOR FINANCIAL LOSSES FROM DEPREDATION? (N=93)	**No**	2.4%	11.8%	12.9%	17.7%	18.8%
	Yes	10.6%	11.8%	11.8%	2.4%	0.0%

$X^2 = 26.133$, $p < 0.001$, $df = 4$

Thirty-three questionnaires provided non-quantitative data. These respondents, who did not wish to provide their opinions, represent 23.7% of the respondents and 15.0% of the population. Table 8 categorizes their reasons for opting not to complete the questionnaire.

TABLE 8–Explanations given by respondents returning questionnaires with no quantitative data

Reason	**Number**
ABSENTEE OWNER	9
SOLD PROPERTY	8
NOT QUALIFIED TO RESPOND	7
BLANK	5
NOT AFFECTED BY PROBLEM	4

Complete data on percentages for each response to the 84 items included in the questionnaire are presented in Appendix A. All written responses are presented in Appendix B.

Discussion

Many times the term "perceptions" is used in discussing beliefs that are not factual. A better term in such contexts would be "misconceptions." Perceptions, as used here, is synonymous with "belief" and "opinion." Psychological research has shown what people believe they know is tantamount to what they know, and behavior is based on such cognition (Johnson 1993, Michaels and Carello 1981). Further, the way individuals think has been shown to affect what they perceive in their environments (Dansereau 1975). Pomerantz et al. (1986) related this concept to wildlife damage, noting perceived losses, regardless of verifiability, are what affected stakeholders base their calls for management.

The following conclusions can be drawn from our survey findings; they reflect generally-held perceptions in our study population:

- Four out of five neighbors of the INEEL observed big game animals on their properties.
- About one-third of the property-owning neighbors of the INEEL

perceived enough wildlife damage to their farm and ranch operations to view it as a financial burden.

- Elk were believed to have the greatest ability to cause damage, especially to fences and irrigation equipment. They were seen in large groups and seemed to frequent specific properties. The return of elk to the Snake River Plain was noticeable to most respondents.

- Mule deer were viewed as the least damaging species, both in terms of number of animals and ability to do damage. Some respondents were concerned deer populations were too small.

- Pronghorn antelope invoked the most neutral feelings. The damage attributed to them was somewhat less than that attributed to elk, though probably more widespread, and much greater than that given to mule deer.

- Alfalfa was reported as the favorite agricultural target of depredating animals; the largest damage estimate ($40,000), however, was for potatoes.

- Between $140,000 and $180,000 in big game depredation was estimated to be incurred by INEEL-adjacent agricultural operations in 1996.

- Most property-owners felt the IDFG was responsible for damage from depredation.

- The perception of wildlife damage as a financial burden was associated to smaller preferred big game populations, especially on and around the INEEL.

- Adjustments to hunting seasons and depredation hunts were preferred wildlife damage management strategies. Trapping and relocation was not.

- The respondents' levels of satisfaction and trust in government agencies were low.

- Most INEEL neighbors enjoyed big game animals, both for aesthetic and consumptive reasons, and wished to see elk, mule deer and pronghorn antelope continue to inhabit these lands.

- There were widely differing opinions on most aspects of the depredation problem.

- Those respondents perceiving more than $1,000 worth of wildlife damage to their operations in 1996 felt they should be compensated for their losses.

Perceptions of wildlife and damage attributed to these animals on private property relates directly to public tolerance of them. Many commentators have explored this concept, which is underlain by the assumption that humans can and should manage wildlife populations. Labels applied to it include farmer tolerance (Little 1996, Little 1997), political carrying capacity (Irby et al. 1997), stakeholder tolerance (Craven et al. 1992), and wildlife acceptance capacity (Decker and Purdy 1988).

Of these admittedly similar concepts, we find the wildlife acceptance capacity to be the most fruitful to apply to the INEEL situation. Decker and Purdy (1988, p. 53) define the wildlife acceptance capacity as "the maximum wildlife population level in an area that is acceptable to people" and note its similarity to biological carrying capacity and social carrying capacity. This capacity is

purported to be dynamic and to differ among constituent groups, and comes about from a human constituency's relationship with a wildlife resource. It involves psychological weighing of both benefits and disincentives.

If one accepts that wildlife populations are under the control of government agencies, then social tolerance potentially measured as wildlife acceptance capacity becomes a limiting factor akin to ecological qualities such as predator-prey cycles and habitat availability. Reviewing our findings through the lens offered by this concept, we suggest wildlife acceptance capacity does not seem to have been reached in the constituency we surveyed. The exception to this claim were those few operators sustaining heavy to severe damage, mostly from elk and pronghorn antelope.

That elk have been the focus of management attention during the first decade of their return to these lands is not surprising. McIvor and Conover (1994, p. 217) noted new species tend to be blamed more in situations where there are multiple types of depredating animals. Agency experience prior to this survey suggested elk were to blame for nearly all of the depredation around the INEEL. This contention is not borne out by our data, however. Certainly, elk were seen as causing some damage, but there did not exist a common perception among INEEL neighbors that theirs was exclusively an elk problem. Again, however, there was a vocal minority that feels it has sustained intolerable damage from elk.

Another previously-noted dimension resembles the INEEL situation and may be responsible for some of the perceptions of those surveyed was explained by Adkins and Irby (1994). They found the largest proportion of depredation complaints from private landowners in Montana (44%) came from those properties adjacent to posted areas, i.e., lands next to lands where hunting was prohibited. As the INEEL is open only for extremely limited hunting along the site's periphery, it may be viewed as functioning as a refuge. Ten written comments received during this survey expressed the sentiments about the protection offered to game animals by the INEEL and/or a need for expanded hunting access to the INEEL.

Two final cautions from related literature are noteworthy. First, Craven et al. (1992) warned against focusing on total monetary loss figures generated by surveys. They found these to largely consist of many small, tolerable losses. In the figures we presented here, loss estimates below the Idaho legal deductible of $1,000 are included. Second, Wagner et al. (1997) examined the continuing debate about the efficacy of wildlife damage compensation programs at the state government level. They noted that 19 states have compensation programs and 34 states have damage abatement programs. Still, they found these programs rarely pay property-owners the full value of their losses and courts have repeatedly ruled that state governments are not liable for the damages. Reasons for compensation programs were hypothesized to be a political need to tackle a recent problem, a problem caused by previous governmental action, and/or a problem attributed to species with high economic values. All three of these hypotheses appear in combination at the INEEL.

In aggregate, the most notable feature of our findings were their evenness, by which we mean the wide and equitable diversity of opinions represented within our population of limited size (N=220). Those items on which there was wide agreement were few, perhaps most notably that depredation is viewed as IDFG's responsibility even when it occurs on farms and ranches abutting the INEEL. The "INEEL elk problem" may actually be a few property-owners suffering substantial damages, rather than a widespread crisis. Little (1996, 1997) found a similar case in Iowa, where a survey demonstrated no widespread demand for large reductions in deer populations. Management efforts focusing on problems of the INEEL neighbors suffering what they consider to be

intolerable losses should be just as productive as more broad-based, and potentially expensive, solutions, such as eradicating elk from these lands.

Conclusion and Management Implications

Wildlife management decisions made without a firm grasp of public sentiment are likely to be misunderstood, resented, and actively opposed (Johnson et al. 1993). For agencies to make better decisions, public opinion must be accurately gauged and incorporated into decision-making processes. For this reason, research on the human dimensions of natural resources is critical. Surveys are an excellent choice for elucidating the diversity of opinions held on issues. In breadth, surveys are often a better choice than public meetings, hearings, workshops, and unsolicited letters and phone calls (Johnson et al. 1993, Horton and Craven 1997, Swihart and DeNicola 1997); surveys may also make valuable contributions when used in conjunction with other techniques. Guarding against the imposition of the policy preferences of a vocal minority requires the use of such techniques (Horton and Craven 1997). Depredation complaints around the INEEL have focused almost exclusively on elk since those animals recolonized the upper Snake River Plain beginning in the late 1980s (Warren and Markham 1997).

This survey revealed an equitable variety of opinions about wildlife damage on properties around the INEEL that was not evident before. This quality of opinion is reminiscent to the ecological concept of evenness, where the species comprising a community having similar abundancies (Krebs 1989).

Based on reports to agencies, one would have concluded elk were responsible for unacceptable and widespread damage. Our data showed this not to be the case. Elk were causing some damage, but it was similar to that being attributed to mule deer and pronghorn antelope. Incorporating the new-found social components into decision-making could lead to different management tactics. Whereas managers were inclined toward elk removal by trapping and relocation and special permit hunts in recent years, our findings suggested only a limited number of stakeholders may be deriving benefits, by having damage to their private property reduced, from these undertakings.

This conclusion integrates well with the suggestions of Craven et al. (1992, p. 85):

> Surveys continue to reveal basically positive feelings toward wildlife on the part of most stakeholders, even those who sustain significant losses from wildlife damage. This finding can be used to support moderation and compromise when vocal minorities call for drastic reductions in wildlife populations.

The situation around the INEEL fits this description.

As surveys measure a cross-section of perceptions at one point in time, future replication of this study would be wise. Such assessment of the human dimensions affecting the natural resources on and around the INEEL could be useful to the various agencies active in land and wildlife management in that region. These include the U.S. Department of Energy, Bureau of Land Management, U.S. Forest Service, National Park Service, U.S. Fish and Wildlife Service, and Idaho Department of Fish and Game. Their management is, of course, not static and neither should be the information on which it is based.

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Appendix A
COMPLETE LIST OF QUESTIONS ASKED AND PERCENTAGES FOR EACH RESPONSE

1. How often do big game (elk, mule deer and pronghorn antelope) use your land? (N=100)

22.0%	ABOUT ONCE A DAY OR MORE
4.0%	ABOUT ONCE A WEEK
5.0%	ABOUT ONCE A MONTH
49.0%	ONLY DURING CERTAIN TIMES OF THE YEAR, SUCH AS SPRING AND FALL
20.0%	NEVER

2. Which of the following types of animal most often uses your land? (N=84)

19.0%	ELK
31.0%	MULE DEER
50.0%	PRONGHORN ANTELOPE

3. On average, about how many **elk** use your land often, about once a week? (N=97)

58.8%	NONE
18.6%	1-10
19.6%	11-100
3.1%	MORE THAN 100

4. On average, about how many **mule deer** use your land often, about once a week? (N=97)

49.5%	NONE
40.2%	1-10
10.3%	11-100
0.0%	MORE THAN 100

5. On average, about how many **pronghorn antelope** use your land often, about once a week? (N=98)

45.9%	NONE
22.4%	1-10
29.6%	11-100
2.0%	MORE THAN 100

6. Do elk, mule deer and pronghorn antelope cause damage to your operation? (N=98)

57.1%	NO
42.9%	YES

7. Does depredation hurt you financially? (N=97)

62.9%	NO
37.1%	YES

8. What kinds of crops have been damaged by depredation? (Multiple responses were allowed.)

86.5%	ALFALFA	3.8%	PASTURE
59.6%	BARLEY	1.9%	CANOLA
51.9%	WHEAT	1.9%	FRESH FLOWERS
21.2%	POTATOES	1.9%	GRASSES
3.8%	HAY	1.9%	PEAS
3.8%	OATS	1.9%	RANGELAND

9. What level of **crop** damage do you suffer from **elk**? (N=97)

62.9%	NONE
19.6%	LIGHT
13.4%	MODERATE
2.1%	HEAVY
2.1%	SEVERE

10. What level of **forage** damage do you suffer from **elk**? (N=97)

72.2%	NONE
12.4%	LIGHT
12.4%	MODERATE
3.1%	HEAVY
0.0%	SEVERE

11. What level of **fence and irrigation equipment** damage do you suffer from **elk**? (N=97)

71.1%	NONE
15.5%	LIGHT
3.1%	MODERATE
9.3%	HEAVY
1.0%	SEVERE

12. What level of **crop** damage do you suffer from **mule deer**? (N=98)

62.2%	NONE
33.7%	LIGHT
4.1%	MODERATE
0.0%	HEAVY
0.0%	SEVERE

13. What level of **forage** damage do you suffer from **mule deer**? (N=97)

66.0%	NONE
30.9%	LIGHT
3.1%	MODERATE
0.0%	HEAVY
0.0%	SEVERE

14. What level of **fence and irrigation equipment** damage do you suffer from **mule deer**? (N=96)

79.2%	NONE
18.8%	LIGHT
2.1%	MODERATE
0.0%	HEAVY
0.0%	SEVERE

15. What level of **crop** damage do you suffer from **pronghorn antelope**? (N=97)

54.6%	NONE
24.7%	LIGHT
17.5%	MODERATE
2.1%	HEAVY
1.0%	SEVERE

16. What level of **forage** damage do you suffer from **pronghorn antelope**? (N=97)

55.7%	NONE
24.7%	LIGHT
15.5%	MODERATE
3.1%	HEAVY
1.0%	SEVERE

17. What level of **fence and irrigation equipment** damage do you suffer from **pronghorn antelope**? (N=97)

67.0%	NONE
23.7%	LIGHT
5.2%	MODERATE
3.1%	HEAVY
1.0%	SEVERE

18. Do you feel you should be compensated for financial losses from depredation? (N=93)

66.7%	NO
33.3%	YES

19. Do you think any of the following are responsible for damage from depredation? (Multiple responses were allowed)

82.8%	IDAHO DEPARTMENT OF FISH AND GAME
36.2%	U.S. DEPARTMENT OF ENERGY
32.8%	BUREAU OF LAND MANAGEMENT
17.3%	MYSELF
13.8%	U.S. FOREST SERVICE
1.7%	SPORTSMAN'S CLUBS
1.7%	U.S. AGRICULTURAL RESEARCH SERVICE SHEEP EXPERIMENT STATION
1.7%	WEATHER

20. Think about your harvest last year (1996). If you suffered financial loss because of depredation, please estimate the amount in dollars. (N=78)

61.5%	$0
11.5%	$1-999
16.7%	$1,000-5,000
10.3%	MORE THAN $5,000

$141,800	TOTAL REPORTED DAMAGE
$0-40,000	RANGE OF REPORTED DAMAGE ESTIMATES
$1,817.95	MEAN OF ESTIMATES

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
21. My farm/ranch operation is depredated by **elk** from the INEEL. (N=90)	11.1%	16.7%	18.9%	21.1%	32.2%
22. My farm/ranch operation is depredated by **mule deer** from the INEEL. (N=91)	3.3%	8.8%	27.5%	27.5%	33.0%
23. My farm/ranch operation is depredated by **pronghorn antelope** from the INEEL. (N=91)	13.2%	25.3%	15.4%	17.6%	28.6%
24. I'd like to see more **elk** in southeastern Idaho. (N=92)	31.5%	25.0%	19.6%	10.9%	13.0%
25. I'd like to see more **mule deer** in southeastern Idaho. (N=92)	37.0%	39.1%	15.2%	6.5%	2.2%

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
26. I'd like to see more **pronghorn antelope** in southeastern Idaho. (N=92)	23.9%	22.8%	18.5%	21.7%	13.0%
27. My farm/ranch is depredated by **elk** from lands other than the INEEL. (N=91)	3.3%	18.7%	22.0%	29.7%	26.4%
28. My farm/ranch is depredated by **mule deer** from lands other than the INEEL. (N=90)	0.0%	24.4%	28.9%	23.3%	23.3%
29. My farm/ranch is depredated by **pronghorn antelope** from lands other than the INEEL. (N=91)	5.5%	27.5%	19.8%	24.2%	23.1%
30. More **elk** will mean more depredation. (N=92)	15.2%	31.5%	21.7%	20.7%	10.9%
31. More **mule deer** will mean more depredation. (N=92)	3.3%	27.2%	31.5%	25.0%	13.0%
32. More **pronghorn antelope** will mean more depredation. (N=92)	14.1%	41.3%	14.1%	19.6%	10.9%
33. There are too many **elk** on and around the INEEL. (N=90)	13.3%	16.7%	27.8%	22.2%	20.0%
34. There are too many **mule deer** on and around the INEEL. (N=90)	1.1%	4.4%	37.8%	33.3%	23.3%
35. There are too many **pronghorn antelope** on and around the INEEL. (N=90)	12.2%	22.2%	26.7%	21.1%	17.8%
36. I enjoy seeing **elk** on my land. (N=91)	24.2%	42.9%	18.7%	13.2%	1.1%
37. I enjoy seeing **mule deer** on my land. (N=92)	25.0%	52.2%	19.6%	3.3%	0.0%
38. I enjoy seeing **pronghorn antelope** on my land. (N=90)	20.0%	28.9%	30.0%	11.1%	10.0%

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
39. I enjoy hunting **elk**. (N=89)	32.6%	39.3%	16.9%	9.0%	2.2%
40. I enjoy hunting **mule deer**. (N=89)	31.5%	39.3%	18.0%	9.0%	2.2%
41. I enjoy hunting **pronghorn antelope**. (N=89)	15.7%	15.7%	29.2%	22.5%	16.9%
42. Responsibility for dealing with big game depredation should be shared by landowners and the government. (N=90)	16.7%	35.6%	15.6%	18.9%	13.3%
43. Hunting seasons around the INEEL should be adjusted to lessen depredation problems. (N=91)	25.3%	45.1%	16.5%	11.0%	2.2%
44. Depredation hunts should be allowed to control **elk**. (N=89)	22.5%	47.2%	12.4%	14.6%	3.4%
45. Depredation hunts should be allowed to control **mule deer**. (N=91)	8.8%	38.5%	23.1%	25.3%	4.4%
46. Depredation hunts should be allowed to control **pronghorn antelope**. (N=92)	25.0%	48.9%	8.7%	15.2%	2.2%
47. I would prefer there to be no **elk** on the INEEL. (N=92)	7.6%	3.3%	18.5%	34.8%	35.9%
48. I would prefer there to be no **mule deer** on the INEEL. (N=91)	3.3%	2.2%	17.6%	40.7%	36.3%
49. I would prefer there to be no **pronghorn antelope** on the INEEL. (N=92)	5.4%	3.3%	18.5%	37.0%	35.9%
50. I am satisfied with current efforts to control depredation by **elk**. (N=92)	5.4%	21.7%	28.3%	21.7%	10.9%

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
51. I am satisfied with current efforts to control depredation by **mule deer**. (N=91)	5.5%	42.9%	34.1%	15.4%	2.2%
52. I am satisfied with current efforts to control depredation by **pronghorn antelope**. (N=92)	4.3%	31.5%	28.3%	28.3%	7.6%
53. Trapping and relocation should be used to control **elk** on the INEEL. (N=91)	2.2%	16.5%	23.1%	35.2%	23.1%
54. Trapping and relocation should be used to control **mule deer** on the INEEL. (N=91)	2.2%	9.9%	22.0%	40.7%	25.3%
55. Trapping and relocation should be used to control **pronghorn antelope** on the INEEL. (N=91)	4.4%	13.2%	19.8%	37.4%	25.3%
56. Depredation by **elk** is not a problem. (N=92)	4.4%	32.6%	22.8%	25.0%	15.2%
57. Depredation by **mule deer** is not a problem. (N=92)	7.6%	39.1%	32.6%	17.4%	3.3%
58. Depredation by **pronghorn antelope** is not a problem. (N=90)	5.6%	26.7%	27.8%	26.7%	13.3%
59. There is a need to better understand the use of the INEEL by big game animals. (N=92)	14.1%	42.4%	25.0%	14.1%	4.3%
60. I feel my tax dollars are well-spent on studies to better understand the use of the INEEL by big game animals. (N=92)	3.3%	18.5%	31.5%	27.2%	19.6%
61. I feel my concerns regarding depredation are taken seriously by the U.S. Department of Energy. (N=90)	3.3%	27.8%	32.2%	28.9%	7.8%

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
62. I feel my concerns regarding depredation are taken seriously by the Idaho Department of Fish and Game. (N=91)	3.3%	37.4%	24.2%	22.0%	13.2%
63. I feel my concerns regarding depredation are taken seriously by the Bureau of Land Management. (N=90)	3.3%	20.0%	37.8%	30.0%	8.9%
64. I feel my concerns regarding depredation are taken seriously by the U.S. Forest Service. (N=90)	2.2%	17.8%	40.0%	30.0%	10.0%
65. I am satisfied with the government's management of big game in southeastern Idaho. (N=91)	0.0%	15.4%	27.5%	30.8%	26.5%
66. I am satisfied with the government's management of public land in southeastern Idaho. (N=91)	1.1%	20.9%	25.3%	28.6%	24.2%
67. I trust the U.S. Department of Energy when it comes to dealing with depredation. (N=92)	1.1%	29.3%	27.2%	25.0%	17.4%
68. I trust the Idaho Department of Fish and Game when it comes to dealing with depredation. (N=92)	2.2%	23.9%	26.1%	31.5%	16.3%
69. I trust the Bureau of Land Management when it comes to dealing with depredation. (N=92)	3.3%	17.4%	34.8%	32.6%	12.0%
70. I trust the U.S. Forest Service when it comes to dealing with depredation. (N=90)	1.1%	20.0%	38.9%	30.0%	10.0%

71. In terms of their ability to depredate and cause damage, rank the big game animals. (enter "1" for the most damaging, "2" for the next most damaging, and "3" for the least damaging) (N=81)

Average ranking		
1.63	ELK	
	57.0%	Ranked elk first
	24.1%	Ranked elk second
	19.0%	Ranked elk third
2.54	MULE DEER	
	6.4%	Ranked mule deer first
	32.1%	Ranked mule deer second
	61.5%	Ranked mule deer third
1.83	PRONGHORN ANTELOPE	
	39.5%	Ranked pronghorn antelope first
	38.3%	Ranked pronghorn antelope second
	22.2%	Ranked pronghorn antelope third

72. In terms of how much information about big game animals and depredation they provide to you, rank these agencies. (enter "1" for the best source of information, "2" for the second best source, "3" for the third best source, "4" for the source from which you get the least information) (N=66)

Average ranking		
2.81	U.S. DEPARTMENT OF ENERGY	
	25.8%	Ranked DOE first
	15.2%	Ranked DOE second
	15.2%	Ranked DOE third
	43.9%	Ranked DOE fourth
1.63	IDAHO DEPARTMENT OF FISH AND GAME	
	65.2%	Ranked IDFG first
	18.2%	Ranked IDFG second
	3.0%	Ranked IDFG third
	13.6%	Ranked IDFG fourth
2.69	BUREAU OF LAND MANAGEMENT	
	7.6%	Ranked BLM first
	26.6%	Ranked BLM second
	29.7%	Ranked BLM third
	16.7%	Ranked BLM fourth
2.92	U.S. FOREST SERVICE	
	7.8%	Ranked USFS first
	26.6%	Ranked USFS second
	29.7%	Ranked USFS third
	35.9%	Ranked USFS fourth

73. In terms of how good a job they do managing their natural resources, rank the same agencies. (enter "1" for the best, "2" for the second best, "3" for the third best, "4" for the source you see doing the worst job) (N=60)

Average ranking		
2.72	U.S. DEPARTMENT OF ENERGY	
	32.2%	Ranked DOE first
	10.2%	Ranked DOE second
	15.3%	Ranked DOE third
	42.4%	Ranked DOE fourth
2.46	IDAHO DEPARTMENT OF FISH AND GAME	
	28.8%	Ranked IDFG first
	22.0%	Ranked IDFG second
	20.3%	Ranked IDFG third
	28.8%	Ranked IDFG fourth
2.44	BUREAU OF LAND MANAGEMENT	
	16.7%	Ranked BLM first
	36.7%	Ranked BLM second
	33.3%	Ranked BLM third
	13.3%	Ranked BLM fourth
2.27	U.S. FOREST SERVICE	
	27.6%	Ranked USFS first
	32.8%	Ranked USFS second
	24.1%	Ranked USFS third
	15.5%	Ranked USFS fourth

74. If you own or lease land, how many acres are on your farm/ranch? (N=71)

25.4%	0-40 ACRES
29.6%	41-640 ACRES
39.4%	641-10,000 ACRES
5.6%	MORE THAN 10,000 ACRES
385,263	TOTAL ACREAGE
0-223,000	RANGE OF ACREAGE
5426.23	MEAN OF NUMBER OF ACRES

75. If you hold a grazing permit, how many animal unit months (AUMs) are in your INEEL allotment? (N=64)

76.6%	0 AUMs
4.7%	1-100 AUMs
9.4%	101-1,000 AUMs
9.4%	MORE THAN 1,000 AUMs
16,476	TOTAL AUMs
0-3,400	RANGE FOR AUMs
257.44	MEAN FOR NUMBER OF AUMs

76. Which category best describes the dollar amount of gross sales from your agricultural operation during 1996? (N=62)

40.3%	LESS THAN $50,000 GROSS ANNUAL SALES IN 1996
17.7%	$50,000 TO $200,000 GROSS ANNUAL SALES IN 1996
41.9%	MORE THAN $200,000 GROSS ANNUAL SALES IN 1996

77. What percentage of your income comes from your agricultural operation? (N=70)

30.0%	0-10 PERCENT
7.1%	11-50 PERCENT
10.0%	51-90 PERCENT
52.9%	91-100 PERCENT

78. How many acres do you have in crops? (N=69)

28.9%	0-40 ACRES IN CROPS
31.9%	41-640 ACRES IN CROPS
37.7%	641-10,000 ACRES IN CROPS
1.4%	MORE THAN 10,000 ACRES IN CROPS
89,010	TOTAL ACREAGE IN CROPS
0-38,000	RANGE OF ACREAGE IN CROPS
1290.00	MEAN OF NUMBER OF ACRES IN CROPS

79. How many acres do you have for forage? (N=62)

38.7%	0-40 ACRES IN FORAGE
33.9%	41-640 ACRES IN FORAGE
25.8%	641-10,000 ACRES IN FORAGE
1.6%	MORE THAN 10,000 ACRES IN FORAGE
64,662.5	TOTAL ACREAGE IN FORAGE
0-22,200	RANGE OF ACREAGE IN FORAGE
1042.94	MEAN OF NUMBER OF ACRES IN FORAGE

80. Please estimate your 1996 financial loss, if any, due to depredation to **crops**. (N=60)

55.0%	$0
18.3%	$1-999
16.7%	$1,000-5,000
10.0%	MORE THAN $5,000
$119,875	TOTAL REPORTED CROP DAMAGE
$0-40,000	RANGE OF REPORTED CROP DAMAGE ESTIMATES
$1,997.92	MEAN OF CROP DAMAGE ESTIMATES

81. Please estimate your 1996 financial loss, if any, due to depredation to **forage**. (N=57)

68.4%	$0
12.3%	$1-999
14.0%	$1,000-5,000
5.3%	MORE THAN $5,000
$45,375	TOTAL REPORTED CROP DAMAGE
$0-12,500	RANGE OF REPORTED CROP DAMAGE ESTIMATES
$796.05	MEAN OF CROP DAMAGE ESTIMATES

82. Please estimate your 1996 financial loss, if any, due to depredation to **fences and irrigation equipment**. (N=59)

64.4%	$0
23.7%	$1-999
11.9%	$1,000-5,000
0.0%	MORE THAN $5,000
$12,485	TOTAL REPORTED FENCE AND IRRIGATION EQUIPMENT DAMAGE
$0-2,500	RANGE OF REPORTED FENCE AND IRRIGATION EQUIPMENT DAMAGE ESTIMATES
$211.61	MEAN OF FENCE AND IRRIGATION EQUIPMENT DAMAGE ESTIMATES

83. What is your age? (N=80)

6.3%	0-35
27.5%	36-50
41.3%	51-65
18.8%	66-80
6.3%	MORE THAN 80
30-90	RANGE OF AGES OF RESPONDENTS
55.07	MEAN OF AGES OF RESPONDENTS

84. How long have you worked this land on or near the INEEL? (N=79)

25.3%	0-10
25.3%	11-20
26.6%	21-30
12.7%	31-40
10.1%	MORE THAN 40
1,826	TOTAL NUMBER OF YEARS WORKING THIS LAND
0-76	RANGE OF YEARS WORKING THIS LAND
23.11	MEAN NUMBER OF YEARS WORKING THIS LAND

Appendix B
WRITTEN COMMENTS FROM QUESTIONNAIRE

Written comments from questionnaire pages and responses to the final, open-ended question "Is there anything else you would like to tell us about big game and your opinion? If so, please use this space to tell us. Also, feel free to share any comments you think will help the state and federal managers of Idaho's land and big game in their efforts" were:

We have had some success with the fish & game in depredation hunts. They were helpful at times. It would seem though that most of the elk killed on these hunts were by the ranchers and farmers themselves. We have a huge problem with elk & antelope. One only has to try to fix back a fence or try to harvest a crop after they have been on your place to realize the devastation they can cause. The INEL is a game refuge and as long as the boundaries are where they are we will have big game problems.

Keep up the good work.

Depredations hunts help in keeping the animals away. Need to have hunting boundary into INEEL increased. Need to extend boundaries to mountains also.

I like to see big game animals on our land. The deer and elk visit mostly at night, coming in for water. Antelope numbers have been much lower the past few years. And while they really don't eat much grain, they do tromp down trails running in and out of fields of grain. I am a sportsman and do enjoy hunting and fishing with my sons. But, we have more problems with hunters than we do big game. We've had to post our property as off-limits to hunting, because of many bad experiences with slob-hunters, 4 X 4ers making their own roads, property getting shot-up and people dumping garbage out everywhere. Big game has never damaged any irrigation equipment, but hardly a year goes by that hunters don't. I feel the INEL ground is a good place to winter range. I know farmers to the north have problems with big game, at this point–we don't.

I feel the Fish & Game as with BLM and Forest Service are more concerned about the public than with the land owner. I feel at times they feel the private land is not important in the whole plan. Maybe if private landowners were given more say in the problem, some of the problems could be worked out.

Those big black birds that come in when we are irrigating are far worse than those few big game animals that come thru property. The elk that I see, also moose, are just traveling thru the property. Antelope could be a problem, but so far have not been for me. We've just had a few females w/ calves staying in hay fields. They are no problem. But, if I had a hundred that could be a problem.

The elk pull the seed potatoes up (uproot) with their horns and make wallows. They make trails through potatoes. Seed potatoes average $14.00 a hundredweight, much more valuable than commercial.

The elk need to be hunted and controlled on the INEEL. There needs to be a buffer zone around buildings etc.; but animals know they're safe there and come into the field at night. The hours need to be extended so farmers can hunt them on their own land and further into the INEEL in order to control them.

The animals are just fine.

I would like to see closed season on mule deer for 2 or 3 years. There are not that many in our area. We try to protect any on our land.

Winter deer come to haystacks.

Big game from the INEL don't do any damage to farmland operated by us because we have farmland too far away. I don't think very much trapping & relocating should be done because of cost. If they do too much depredation hunting I think is the best. The only damage big game does to us is a little bit of tearing down fences on our Quaking Aspen Butte allotment.

My 240 acres has not been developed for farming nor is it fenced or used for grazing.

I have seen elk on my land during the winter months only. I see deer on and off during the summer but, mostly during the winter. Antelope are on my property summer and late fall. Most of the time in small bunches but, in the fall sometimes they are in the thousands. Where I don't farm or graze at this time, I feel no loss from depredation and thoroughly enjoy seeing the wildlife. I'm sure when I start producing crops on my land, there will be financial loss due to the antelope summer and winter and due to the elk and deer in the winter. Depredation hunting permits would be useful to control animal numbers.

It always bothers me to hear the public complain about livestock on public domain. The people with livestock permits pay for the forage their livestock consumes. It's been estimated that up to 70 percent of the forage that big game consumes come off private land. In this area the limiting factor on big game is winter range. It would be interesting to know what percent of the Sand Creek elk herd is wintering on private land. I think if the Fish & Game would point this out to the public it would help the relationship between public and private segments. It will be a sad day for all of us if livestock is removed from public land and in retaliation the private land owner removes big game off their land. If this happens everybody ends up losers.

I feel the INEEL should extend the distance that the hunters can hunt on their lands. In a lot of cases the hunters do more damage to private property than the game animals. I feel the Fish and Game should have no right to open the season on private land without permission of the land owner unless they are prepared to pay for all damages done by hunters. After all the fish and game is the only ones that get any revenue off the hunts.

I am convinced if the Fish & Game would develop some watering facilities over on the Birch Creek drainage that it would nearly eliminate our late summer and early fall depredation problems. The animals come into our farms for water.

The domestic animals and the big game animals combined eat less than half the forage on the INEL and probably much less than half. The problems seem to occur when dry years cause the forage to be less palatable. Not because of a lack of forage but because the irrigated forage around the site is better. Problems also occur with heavy crusted snows.

We love to have the animals here. Crop damage is not important to us. We are more concerned about the great numbers of deer and antelope that are destroyed by coyotes, bobcats and mountain lions than we are by all the damage done by the big animals. We used the Site area long before the BLM or the Department of Energy were created. I was state legislator more than 28 years.

There is absolutely no reason for me to answer the questions on your survey since I do not farm my land, ranch my land, nor even live on my land in Atomic City, Idaho. I bought the land several years ago but have only set foot on it 3 times since then, so have no idea whatsoever as to what animals–if any–go on my land, or when, or for how long. All I can say is that I am an animal lover, so any and all wild animals are welcome on my land anytime. I am 100% in favor of letting wild animals do whatever they have to do to survive. I do not hunt wild animals–and am against their being hunted–because there is more than enough commercial meat to be had so that no one really needs to destroy any wild animal for either food or sport. (Killing animals is sport????) Sorry I cannot be of help in your survey. P.S.: Did answer a few questions from my point of view.

I don't believe there has been any significant loss.

I have no problem with elk and deer. They don't come on my farm. Antelope a few come on farm maybe every 5 years, eat a little feed & leave. No problems. Thanks.

All of our property is empty lots. No damage to them.

The government doesn't keep the river alive. How about fishing? Box Canyon etc. BLM should be a better steward of the people's land and not kowtow to we permittees. Quit letting sage be destroyed and over-grazing in general. Man-made burns to BLM is a national tragedy.

Our loss in 96 was not as extensive as 94 & 95. We do not know the reason for this. We have excellent fences around our property and the elk like to tear it down. Hard to estimate cost of labor & time repairing.

Hunting should have been allowed much more when there were so many & not left to do damage and die. Fish & Game should control antelope numbers by allowing hunting as needed. Just go talk to ranchers with farm land close. No helicopters, please.

I hunt elk & deer on the edge of the farm ground. I do not own any ground that I crop. I do believe that the elk need to be controlled, also the pronghorn. I saw the die-off back years ago.

I enjoy big game animals as much as anyone but I cannot afford the constant crop damage with the tremendous water costs that it takes to grow it. Also the cost and time it takes to fix and mend and replace irrigation equipment & fences. The elk really take a toll on our crops in the summer because there is a large number in practically every night but they leave by daylight. The antelope stay most all the time. In the fall the elk and antelope eat the biggest percent of our fall pasture.

I have not estimated damage to date, but the future if numbers increase and herds invade the land where crops are raised and fences around place are torn up. We will start estimating the damage.

My land and crops have been damaged by elk, antelope and some by deer. We have never estimated the damage up to date. The future years may prove to be more damaging as the herds of elk, antelope and deer increase in numbers. My son who has a ranch next to mine has severe damage to crops, fences, sprinkler lines. He said

the damage was estimated around $40,000 each year. So I absolutely feel we must control elk, antelope and deer, not to get into uncontrollable numbers.

I've seen very few animals on my farm. Less than 10 over the last 20 years.

If they would let us hunt the Site which borders our farm we would have less trouble. Some years we have serious problems and others no problem. Thank you for your concerns.

I feel the Dept. of Energy should be required to take an active interest in maintaining the animals & providing water, etc. I work at the INEEL and the sage grouse used to come on the lawns all summer in large flocks. We saw about 6 this year & last. There should be a minimum stream flow to provide water for the animals. The INEL could provide marvelous preserve for animals in Idaho. This is such a heavy farm state, animals seem to have no consideration given them.

We should be able to set up feeding programs to take care of these problems. There are some farmers and ranchers getting animals set back on their ranches and farms, that should be contributing to this factor. There is hay ground set back but is left for the grasshoppers to feed on. For several years, I have volunteered to feed elk & deer. But have been stopped.

All God's creatures require food and water and have always been welcome on my farm's CRP. For many years a large irrigation ditch was along the west side of Section 30 filled with water from a well I hired drilled on the southwest corner of Sec 30. It provided water for God's creatures and watered our crops.

My husband did farm it and many more acres before his death 30 years ago. My land lies idle, is grazed some by neighbor's cattle.

I regret that I am unable to contribute, with any degree of accuracy, to your "Survey of Farmers and Ranchers around the Idaho National Engineering Laboratory." As you may have noticed from my address I am residing at some distance from the land that I own in Idaho. This substantial distance severely restricts my visibility of the Idaho area. Additionally, the amount of land that I own is hardly sufficient to qualify me as a farmer or rancher.

While I do not have any direct interest in grazing habits of Elk, Mule Deer, or Pronghorn Antelope I do have some considerable interest in those folks grazing at the public trough. It seems that every time someone says "How will we ever be able to balance the budget" I am presented with yet another example of how our politicians have foolishly elected to spend our money.

I do, however, have considerable empathy for those farmers and ranchers whose livelihood is being eaten away by animals that the government, in their infinite wisdom, has elected to protect at a level well in excess of the protection they provide for the average citizen. Some forty years ago when I lived near the land that I now own elk and deer were never a problem for farmers or ranchers. Antelope were pests but not anywhere near the level that they are today. These animals provided good food for people that needed it and all these people, at least the ones that I knew, respected the animals and the food source and took only what they would use and used all that they took. And thusly there was no overpopulation and the painful, disgraceful winter starvations that now occur. Those people who think that a slow death from starvation is preferable to a quick death from a hunter have never lived among these animals. These are beautiful and noble animals and they deserve a better end.

The eradication of the Sierra Club and their political ilk would, within a few years, completely solve the problems of the farmers and ranchers and eliminate the unnecessary suffering of these animals.

"Fires, floods, and governments know nothing of mercy," I don't remember who said it but this situation is another example of the wisdom of the quotation.

Although I consider it highly unlikely I do hope that your efforts result in better situation for the farmers, ranchers, elk, deer, and antelope.

Elk damage was characterized by knocking down wind break trees.

During the drought years between 1985-1993 we suffered extensive damage to crops, fences, irrigation equipment and hay stacks from antelope coming off of the desert. No government agency offered any help or money for the damages.

I own land in Fremont County grazed heavily by deer & elk, but I'll answer for my land here close to the INEL.

Due to development on adjoining ground my farm is no longer exposed as bad as it was. Those farmers on the edge of INEL have worse problems with depredation.

My farm is too far from the INEL or desert for too many game animals to come on my farm.

Dept. of Energy needs to allow hunters to enter their lands during hunting season in order to get at the depredating elk and deer. The INEL could sign certain danger areas. These animals learn "home free" very fast. It isn't fair to either the land owner nor the sportman not to allow hunting on the INEL.

Occasionally 1 or 2 moose come around and damage fences and crops etc. Would like to occasionally have permit to take a elk or antelope in exchange for having them on the place year after year.

The depredation hunts are good, however, they are very

poorly managed. I have personally talked with ranchers/farmers who have killed 3-4 elk per family (inc.) on the so-called depredation hunts. Why are the permits given to landowners only? With tags & permits getting scarcer & scarcer for elk (in particular), this seems unfair to those who enjoy hunting, but who can't participate. It is not a fair system. It is also my opinion that the BLM & Forest Service have very little to do with the hunts around the INEL.

I feel all land owners making their living mainly off their farm or ranch should be given depredation rights regardless of size. It is now 640 acres. There are some people that have that much ground & don't even use it & get depredation land owner rights. Also more government land should be open during hunt season, like the INEL and Craters of Moon. Signs should also be supplied to the farms and ranchers so they can post their ground for hunting by permission only & probably could be by permits from owners.

For your future info., I don't have any crops and the game that enters my property is almost nil. Sorry I can't help you.

Several years ago we did file a depredation claim. I was very conservative in figuring damage listing only that which I could easily justify. Others on the north end submitted claims that were very high by comparison to mine. Our claim was cut in half and we were sent a check marked final payment. In other words, take this and be happy. I resent that very much and while I enjoy wildlife as much as anyone, if it get that bad again and the animals are not removed, I will shoot them where they stand.

Where our land is located, at the edge of Atomic City, we have no problems with elk, deer or antelope.

The only elk hunting that works on the INEL is night hunting.

The INEL is a poor place for elk because they feed on our farms at night & return to the INEL in the daytime where they are safe from hunting. Either the INEL should be open for hunting which would push the elk back to the moutains or the elk should be trapped or destroyed.

This survey doesn't affect us as our farm is on Pioneer Road with much housing, public building, etc. We do have 40 acres of grazing land on Highway 26 near Tabor but we just let it lay idle. Probably some antelope & deer may use it but no damage to us. The management seems satisfactory to us personally but people farming in that area probably have some problems with wildlife on their property. I have asked to be taken off this mailing list at age 78 I'm trying to limit public involvement.

Fences are gone because of elk, but sprinkler damage is increasing w/ the numbers of elk. When antelope numbers were high in the late 80s they were very hard on the fences. Some cooperation is needed but not financially. These elk will be problems where ever they go. They've been raised on alfalfa since birth.

I don't trust the INEL or any managers there. They could care less about the problems I have w/ depredation and I blame them for most of the problem. The elk are protected on a dry desert and are forced to come to our fields for feed and water when it is scarce on the refuge that they have provided. The BLM considers much of this area winter range for elk & antelope yet they allow cattle to graze some of it most of the winter. That makes a lot of sense. (Today "Jan. 15" I saw several hundred cows on this winter elk range!) Summer is when the depredation has been the most severe and most of the time we never see the elk, just the sign that they have been there and the damage they leave behind.

Elk numbers in our area are at manageable levels. Mule deer numbers are very low & antelope numbers are coming back. At this time our depredation losses are very low. Most of our damage comes from elk knocking down fences which takes more time than money to repair.

In 1960 there was 60 head of elk in Lost River (Little), hardly any in Birch Creek. Now 2,400 in Little Lost, 1,500 in Birch Creek, F&G estimate. If this expansion continues, loss from crops and fences will hurt us financially. Also too many elk for the forage on public land.

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