

# DRAFT

## Estimates of Present Biological and Social Constraints on Elk Numbers and Feedgrounds (August 30, 2004)

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**Introduction.** A brucellosis infection in a cattle herd near Boulder, Wyoming is thought to have resulted from elk/cattle mixing facilitated by the nearby Muddy Elk Feedground. Wyoming Governor, Dave Freudenthal appointed a coordination team to identify pertinent issues, describe current best practices, and make specific recommendations about a variety of questions related to brucellosis in wildlife and cattle. All options for addressing the problem are open for discussion and coordination team appointees are varied in their assessment of the situation. One option may be the elimination of one or more elk feedgrounds. Given present biological and social constraints, a reduction in elk numbers would be necessary before eliminating feeding at any or all of the feedgrounds. This would affect economic and recreation opportunities in northwest Wyoming. The magnitude of reduction in elk populations is largely subjective. This paper brings together information from various sources in an attempt to estimate the number of elk that might be supported on native winter ranges if elk feedgrounds were eliminated.

### METHODS

Philosophies vary greatly regarding feedgrounds and their management. Information used in determining the number of elk that could be supported on native forage without feedgrounds came from Wyoming Game and Fish Department (WGFD) annual reports (Job Completion Reports and Feedground Reports) and knowledge and experience of WGFD field personnel. Ideas and information was sought from individuals that are directly involved in either elk population or habitat management, i.e., habitat biologists, wildlife biologists, game wardens, and feedground personnel. They were asked to provide their ideas and judgments regarding winter elk populations without feedgrounds given present day management constraints and/or to provide estimates of forage availability. These were compared to elk counts during the last 10 years in the Jackson-Pinedale Region (JPR), which includes Sublette, Teton, and portions of Lincoln Counties in Wyoming. The Targhee Elk Herd was not included in this analysis since those elk are not associated with feedgrounds.

Research Based Estimates. Estimates of the potential number of elk that could free range can be based on forage production or availability on native ranges. An analysis of forage production, consumption rates, and estimates of nutritional needs could indicate the potential of a given area to support elk. The Bureau of Land Management (BLM), the United States Forest Service (USFS), and WGFD terrestrial habitat biologists were asked

to provide information on forage production. This information could describe upper limits on the number of elk that could theoretically free range in the JPR. This would also provide an estimate of the amount of forage to sustain elk during the winter. These estimates would have limitations inherent with carrying capacity estimates, because fluctuating environmental and climatic conditions vary. The conventional approach utilizes a range of objective data to formulate subjective judgments on what is possible on the average.

Estimates Based on Elk/Cattle Mixing and Damage Issues. Game wardens and feedground personnel provided estimates of winter elk numbers based upon their observations, experience, and best judgment for landowner tolerances of elk on private lands. These estimates were based primarily on experience and knowledge of elk behavior/movements and the location of livestock operations and potential conflict sites. They tended to be more conservative, coinciding with years when fewer elk wintered away from feedgrounds.

Estimates Based on General Biological Parameters. Wildlife biologists made estimates of elk numbers that could free range with an emphasis on general biological parameters. This was based on their knowledge of population parameters and forage availability, and tended to be more liberal.

Estimates Based Existing Levels of Free Ranging Elk. The final method used to estimate the number of elk that could free range was a determination of the number of elk that have historically free ranged in the Region as reported in Department annual reports. This estimate reflects present management conditions and corresponding management practices (hunting seasons, damage and elk/cattle mixing prevention efforts, habitat improvements, etc.), social/economic considerations, population dynamics, etc. that drive elk management in the JPR.

## **RESULTS**

Elk counts on feedgrounds and away from feedgrounds are presented by herd unit (Table 1 and Fig. 2-8) from 1994-95 through 2003-04. The combined elk population objective for herds included in this analysis is 25,553. The average number of elk fed during the analysis period was 21,988 (range 20,276 to 25,703). The average number of elk using native forage was 5,840 (range 4,389 to 7,126).

Information on forage production for winter ranges was only available for Jackson Elk (Hobbs, et al., 2003). The BLM in Pinedale offered to provide “percent utilization” data taken from their sample sites, but that information alone cannot be used to make productivity estimates. The USFS has summer forage production estimates for Pinedale Elk, but those did not address winter forage availability. Information collected by the WGFD is scant, and was not offered for this evaluation.

Table 1. Elk Counts in the Jackson-Pinedale Region (Excluding Targhee Elk), 1995-2004.

<b>Herd (Objective)</b>	<b>Feedgrounds</b>			<b>Off Feedgrounds</b>		
	<b>Low</b>	<b>Avg.</b>	<b>High</b>	<b>Low</b>	<b>Avg.</b>	<b>High</b>
Jackson (11,029)	7,817	9,014	12,683	2,484	3,352	4,543
Fall Creek (4,400)	3,480	4,035	4,965	125	374	940
Hoback (1,100)	433	736	910	22	69	144
Afton (2,200)	1,344	1,718	1,969	362	758	1,414
Piney (2,424)	1,559	2,113	2,294	293	560	787
Green River (2,500)	725	1,770	2,136	148	522	1,405
Pinedale (1,900)	1,385	1,860	2,065	25	205	430
All Years (25,553)	20,276	21,988	25,703	4,389	5,840	6,826

Feedgrounds were classified by type of range where they were located (i.e., summer, transitional, or winter (Table 2). Snow depth is a major factor in determining habitat availability during winter months. Other evaluations of elk wintering on native ranges indicate that elk migrate to lower elevations when snow depths exceed 18 inches (Thomas and Towell, 1982). Historical contexts and land uses are sometimes difficult to parse. Present herd unit boundaries may or may not accurately describe historical herd distributions. Successional vegetative changes may also have greatly influenced how elk use habitat in a given area.

The Jackson Elk Herd includes three feedgrounds in the Gros Ventre (Alkali, Cabin, and Fish Creek) and the National Elk Refuge (NER). The Gros Ventre continues to serve as winter range for some elk, but elk winter migrations from there to the NER are also documented, and serves as transition range for those elk. The four feedgrounds in the Fall Creek herd unit (Dog Creek, Horse Creek, Camp Creek, and South Park) were considered winter ranges. The National Elk Refuge is considered winter range. Hoback Elk Herd feedgrounds (Dell Creek and McNeel) and Afton Elk Herd feedgrounds (Forest Park and Alpine) are considered to be primarily summer range. Most of the Piney Elk Herd (Finnegan, North Piney, Jewett, and Franz Feedgrounds) is situated on summer ranges. Bench Corral is an exception and is located on transitional range, but could support a reduced number of elk during average winters. The Green River Elk Herd includes three feedground (Green River Lakes, Black Butte, and Soda Lake). Green River Lakes feedground and nearby Pinion Ridge which lie in a snow shadow, and south facing slopes winter several hundred elk in some years. Soda Lake is considered transitional range on most years. Pinedale Elk feedgrounds (Muddy, Scab Creek, and Fall Creek) are located on transitional range.

Of the 23 feedground locations indicated, five (22%) are considered winter range, and elk have little or no opportunity to move to lower elevations as snow depths increase. The remaining 18 (78%) feedgrounds would offer elk migration opportunities to lower elevations to escape deep snow (Table 2).

Table 2. Elk feedground locations classified as summer, transition, and winter ranges and judgments on mixed range status.

<b>Summer</b> -----	<b>Transition</b> -----	<b>Winter</b>
	Fish Creek	National Elk Refuge
Dell Creek	Alkali Creek	Dog Creek
McNeel	Patrol Cabin	South Park
Forest Park		Horse Creek
Alpine		
Franz		Camp Creek
Finnegan	Black Butte	
North Piney		Green River Lake
Jewett		Soda Lake
	Fall Creek	Bench Corral
	Scab Creek	
	Muddy Creek	

Figure 1 shows the total number of free ranging elk in the JPR. An average of the past 10 years shows that 5,840 elk (range of 4,389 to 7,351) utilized native winter range in the JPR.

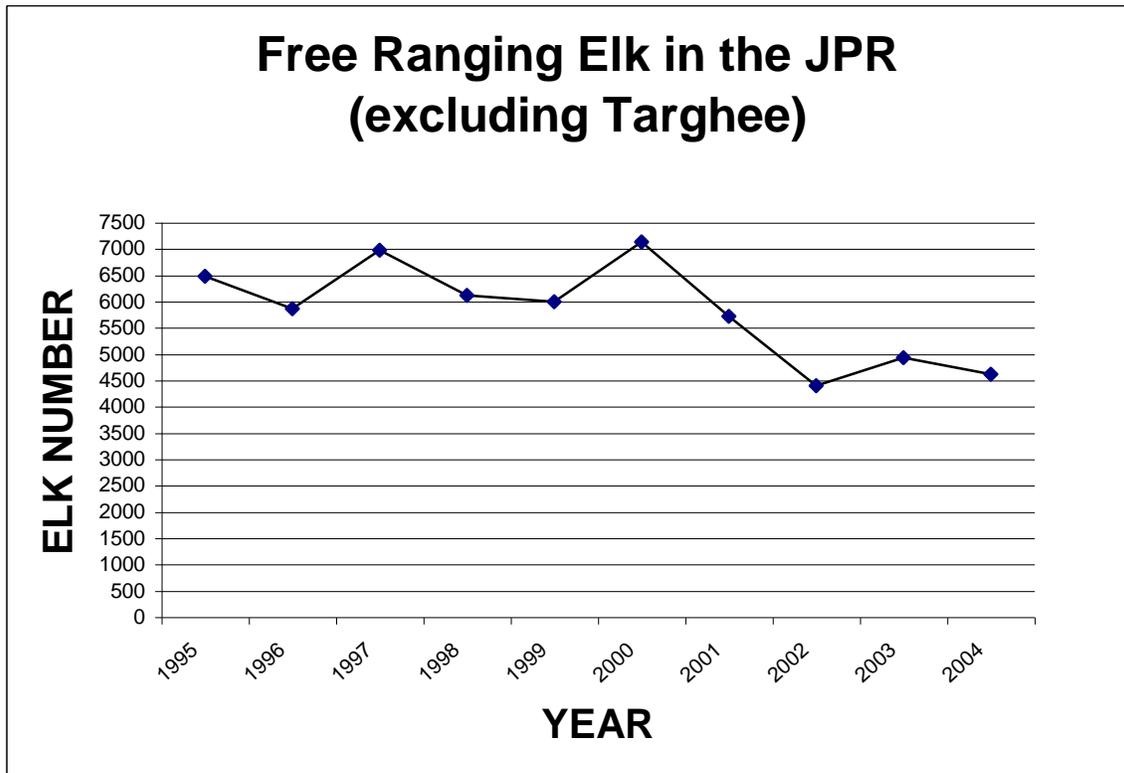


Figure 1. Number of elk utilizing native winter forage in the Jackson-Pinedale Region.

## JACKSON HERD UNIT

In the Jackson Herd Unit a total of 8,715 elk were fed during the 2003-04 winter and an additional 3,380 remained on native range. An average of 9,014 elk were fed annually between 1994 and 2004 and an average of 3,352 elk foraged on native range during this same time. Although an average of 82 percent of the elk population objective are fed on feedgrounds, damage to private lands is a persistent problem. During winter 2003-04, a total of 150 elk were moved by helicopter from private lands in Spring Gulch to the National Elk Refuge. Another 90 elk were frequenting a private feedline in the Buffalo Valley. An additional 300 elk frequented private feed lines at three different locations in the Gros Ventre drainage.

Hobbs, et al. (2003), using a computerized model, estimated that 8,000 elk could be supported in this herd unit during a severe winter without supplemental feeding. This included the 2,550 elk quota (established by Wyoming Game and Fish Commission Policy) on feed in the Gros Ventre drainage, and 5,450 additional elk on native range. The forage accounting model does not consider elk conflict on private lands and during mild winters indicates that there is enough forage for elk numbers to exceed the population objective of 11,029 elk. Past and present elk managers do not believe the present number of elk wintering in the Gros Ventre could do so without feeding. According to the model, if the Gros Ventre feedgrounds were eliminated, the elk reduction necessary would be 5579 (5,450 elk subtracted from the population objective), or about 51% of the present population objective (Hobbs, et al., 2003).

The Gros Ventre drainage includes Alkali, Cabin and Fish Creek feedgrounds. For this analysis they were treated as one unit (Gros Ventre) because of the ease with which elk move between feedgrounds. Historical numbers show the Gros Ventre wintering more elk on native range than any other area in the JPR. However, records also show the greatest winter losses have occurred there historically. Also complicating the estimate of how many elk could winter in the Gros Ventre without conflict is the movement of elk from the Gros Ventre to the NER. Efforts to reduce elk numbers to minimize elk feeding on the NER would be hindered if large numbers of additional elk migrate from the Gros Ventre to the NER.

The average number of elk on native range in the Gros Ventre since 1966 is 1203 elk. It is estimated that as many 3142 elk wintered out during the very mild winter of 1980-81 without significant starvation or damage. During the winters of 1976-77 and 1980-81, no elk came to the feeding sites and as a result, none of the feedgrounds were started. The average number of elk using native forage in Spread Creek and the Buffalo Valley from 1999 to 2004 was 810. It is important to understand that many of these elk move to the NER in deep snow years, and remaining elk are involved in conflicts with agricultural operations. Emergency elk feeding occurred during the winters of 1996-97 and 1997-98 to manage conflict.

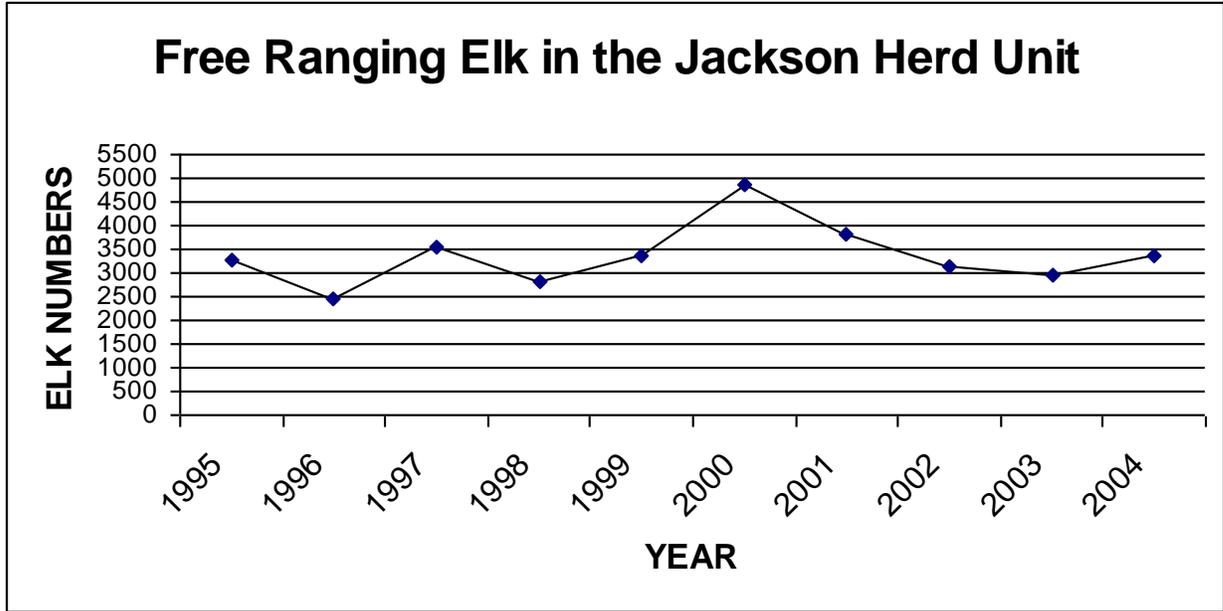


Figure 2. The number of free ranging elk in the Jackson Herd Unit.

**Unit Summary.** Counts indicate that an average of about 1,200 and 800 elk winter away from feedgrounds in the Gros Ventre and near Spread Creek, respectively. Higher elk numbers could free range in the Gros Ventre if competition with other winter ungulates, commingling/damage issues, and possible elk movements to the NER and private property in the lower Gros Ventre (below Kelly) are not considered. When commingling/damage concerns are present, the WGFD is reluctant to allow free-ranging elk and begins feeding when significant elk numbers are present. The Red Rock Ranch has significant commingling/damage problems nearly every winter. During 2004 approximately 200 elk frequented the Red Rock Ranch. The Red Hills Ranch and Glenn Taylor ranches also experience some commingling/damage on most years. During 2004 each ranch had up to 40 elk near livestock feed lines. These ranchers voiced frustration with damage and concern for elk mixing with livestock. When commingling/damage risks are present, the WGFD estimate that the number of elk that could exist in the Gros Ventre without feedgrounds is about the number that currently free range.

Table 3 shows estimates of elk reductions believed necessary if feedgrounds were eliminated. Summarized in the table are estimated numbers by which the herd's population objective would be decreased to accommodate the lowest, average, and highest number of elk wintering away from feedgrounds in the last 10 years.

Table 3. Elk Numbers and Estimates of Reductions Necessary to Population Objectives if Feedgrounds were eliminated.

Elk Herd (Population Objective)	Estimates of Reductions Necessary with Elimination of Feedgrounds (Based on Population Objectives)		
	Highest	Average	Lowest
Jackson (11,029)	8,545 (77%)	7,667 (70%)	6,486 (59%)
Fall Creek (4,400)	4,275 (97%)	4,026 (85%)	3,460 (79%)
Hoback (1,100)	1,078 (98%)	1,031 (94%)	956 (87%)
Afton (2,200)	1,838 (84%)	1,442 (65%)	786 (36%)
Piney (2,424)	2,131 (88%)	1,864 (77%)	1,637 (68%)
Green River (2,500)	2,352 (94%)	1,978 (79%)	1,095 (58%)
Pinedale (1,743)	1,875 (99%)	1,695 (89%)	1,470 (77%)
Total (25,553)	22,094 (86%)	20,073 (79%)	15,890 (62%)

Using lowest, average, and highest numbers of elk wintering away from feedgrounds (Table 1), provides estimates of necessary population objective reductions by 77, 70, and 59 percent, respectively. Hobbs et al. (2000) estimated a 51 percent reduction would be necessary if feeding terminated. His estimate included planned improvements for irrigated forage on the NER. Elk manager estimates were for a 70 percent necessary herd reduction.

#### FALL CREEK HERD UNIT

These feedgrounds are located in traditional wintering areas and probably offered elk some of the best native range in Jackson Hole prior to human settlement. However, most of this area was placed in private ownership by homesteading and the amount of area currently available to elk, without conflict, is greatly reduced. There is movement of elk between feedgrounds and estimates regarding the number of elk that could free-range without conflict are based on the herd unit rather than individual feedgrounds.

Prior to 1998-99, the number of elk that free ranged in this herd unit exceeded 400 on most winters. Since that time, the number of elk counted off feedgrounds has decreased and estimates for the number of free ranging elk has varied from 240 to 497 (Fig. 3). Many of the elk observed away from feedgrounds during the late 1980s and early 1990s were fed on private feedgrounds, and likely could not be considered free ranging. Elk feeding by private individuals ceased during the late 1990s. Additionally, it is unclear whether drought, less survey effort because of reduced flight budgets, or a combination of all three is responsible for present low elk numbers observed away from feedgrounds.

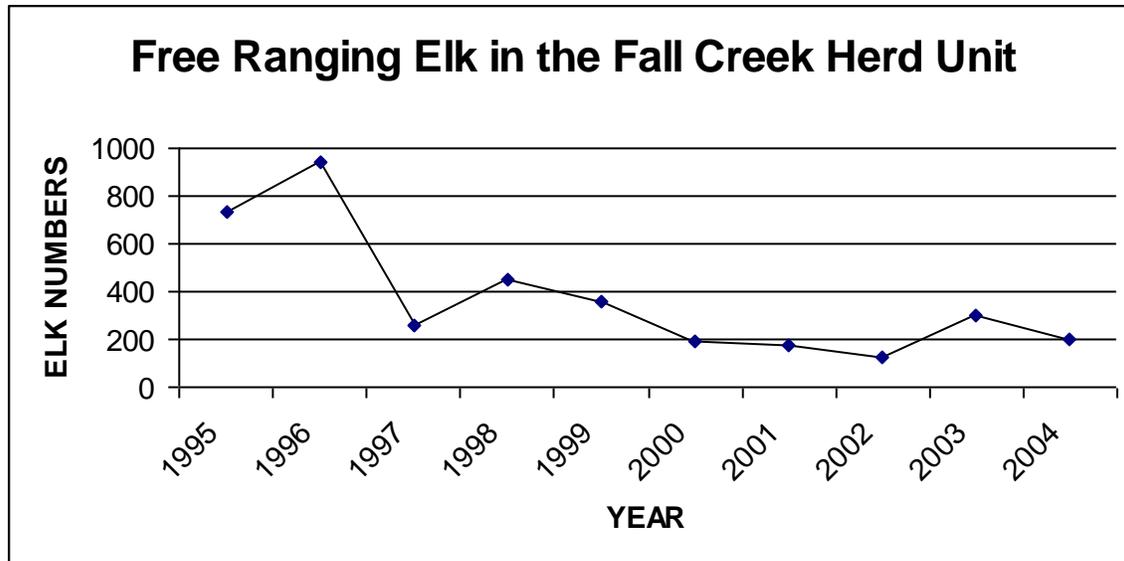


Figure 3. The number of free ranging elk in the Fall Creek Herd Unit.

**South Park/Dog Creek.** These two feedgrounds are grouped to accommodate the reporting of free ranging elk. It is estimated that about 1,800 elk free ranged during the winter of 1976-77 while a low of 61 elk were counted in 1979-80.

The South Park Unit is nearly surrounded by human development. Elk moving to and from the area usually cross Highway 189, livestock operations, pasturelands, and/or subdivisions. Damage problems occur every winter.

Some areas adjacent to the Dog Creek feedground receive minimal snowfall and would theoretically be capable of wintering some elk. Warm thermal areas located on the valley floor near Astoria and Highway 189 comprises much of the native winter range. Snow depths are minimal in this area and green vegetation is commonly available to elk throughout the winter. This area would serve as an attraction to free ranging elk, which would put them on or near the highway and the large volume of vehicle traffic during dawn, dusk, and night. During the mid 1990s elk managers attempted to delay start of feeding, which resulted in increased elk highway crossings and vehicle collisions. Also, private properties are adjacent to these potential wintering areas (golf course, horse ranches, homes). This area already serves as primary wintering habitat for a local population of mule deer. While forage and snow conditions would allow for some free ranging elk in the area, it is unlikely that many could survive without conflicts. In years with deep snowfall, most all of these elk would be on or near Highway 189 or private property. During the light snowfall winter of 1976-77, an estimated 740 elk wintered away from this feedground.

**Horse Creek/Camp Creek.** These two feedgrounds were analyzed as one complex because of the significant interchange. A considerable amount of winter range is adjacent to these feedgrounds. During the winter of 1976-77, all elk (approximately 2,000 from feedgrounds) utilized native ranges. Conversely, during the winter of 2001-02 only 46 elk were documented on native range in this area. This area provides elk forage during the

early winter, but eventually elk move to lower elevations. An elk fence provides some protection for private property for short periods of time when the elk migrate to and from the Horse Creek feedground (early winter and spring). However, if not fed, these elk readily move westerly around the elk fence (horse feed lines), to the south (highway conflicts) or to the north (subdivisions). Attempts to delay feeding starts in the mid 1990s at Camp Creek resulted in increased elk highway crossings and vehicle collisions.

**Unit Summary.** The number of elk utilizing native range has declined the past 6 years (Fig. 2). Counts of low, average, and high numbers of elk wintering away from feedgrounds since 1994 were 125, 374, and 940, respectively (Table 1). Estimates of population objective reductions necessary if feedgrounds were eliminated were 97, 85, and 79 percent, respectively (Table 3). Elk managers believed it would not be desirable or possible to manage for any but small numbers of elk without feedgrounds.

**HOBACK HERD UNIT**

This herd unit encompasses the deepest snow area in the JPR and these feedgrounds are located on traditional summer range. The herd boundaries do not meet established closure criteria (less than 10 % movement between other herds). In most years, elk that summer in the Hoback Herd winter on Franz Feedground in the Big Piney Herd. The number of elk that free range during the winter in this herd unit since 1994 is the smallest of any herd unit in the region and has varied from a low of 22 in 2000 to a high of 144 in 2002 (Fig. 5). This is the only herd unit that did not show a large reduction in the number of elk fed during the mild winters of 1976-77 and 1980-81, but elk at both feedgrounds reduced hay consumption, indicating that they acquired greater portion of their diets from native forage during those years. There are livestock operations in the immediate vicinity of both feedgrounds and elk damage occurs nearly every year.

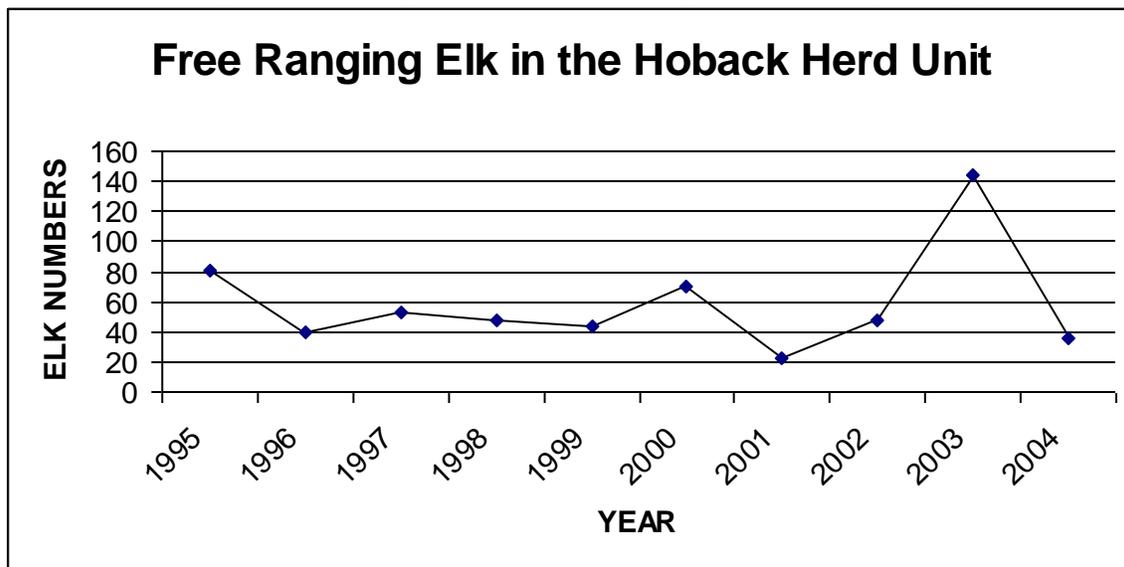


Figure 5. The number of free ranging elk in the Hoback Herd Unit.

**Dell Creek.** Given the deep snow cover during the winter in Bondurant and the close proximity of the large cow-calf cattle operation on the Little Jenny Ranch, it is unlikely

that any elk would survive winter at this location without either starving to death or mixing with livestock.

**McNeel.** This feedground is situated on the valley floor of the Hoback River drainage. Livestock operations are located both above and below the feedground. These locations are more distant from the feedground than are those at Dell Creek. However, given the deep snow during the winter months, the majority of these elk would likely either starve or find a livestock feedline. Delayed initiation of elk feeding in the late 1990s caused elk to move over the Hoback Rim. They caused conflicts with livestock operations north of Daniel. Some of these elk mix with Piney Elk at Franz Feedground.

**Unit Summary.** It would not be possible to manage elk in this herd if feedgrounds were eliminated (Table 3).

#### AFTON HERD UNIT

These feedgrounds are located on traditional summer range and serve different purposes, i.e., co-mingling/damage prevention (Alpine) and starvation prevention (Forest Park). The total number of elk to free range in this herd unit since 1994 has varied from a low of 332 in 2004 to a high of 1,414 in 1997, with an average of 758 (Fig. 4). Most elk that free range in this herd unit are located in Star Valley. An average of 446 elk have wintered off the feedground in Star Valley since 1994-95. Isolated small groups free range on both sides of the Star Valley. However, most of the elk that winter off feedgrounds in Star Valley either mix with livestock and/or cause damage. Conflicts occur each year, and years with heavy snow are usually worse. On some years, especially those with considerable snowfall, several hundred elk migrate from summer and transitional ranges in Idaho to winter in Wyoming, generally in situations where mixing with livestock and damage are major issues. The Department implemented emergency feeding during 1996-97 and 2003-04 winters to manage damage and livestock mixing conflicts. During the mild winters of 1976-77 and 1980-81, approximately one half of the elk that normally wintered on the Alpine feedground utilized native habitat.

**Alpine.** The north end of Star Valley receives large amounts of snowfall. Depths are rarely less than two or three feet on the valley floor. An elk fence that runs from east of Etna to the town of Alpine provides some protection to private property (livestock and homes) on the east side of valley. There is not sufficient available forage on native ranges above the fence to support the numbers of elk attending the feedground. They would eventually migrate around the ends of the fence and mix with livestock on the south end or enter the town of Alpine and be on Highway 89 on the north end.

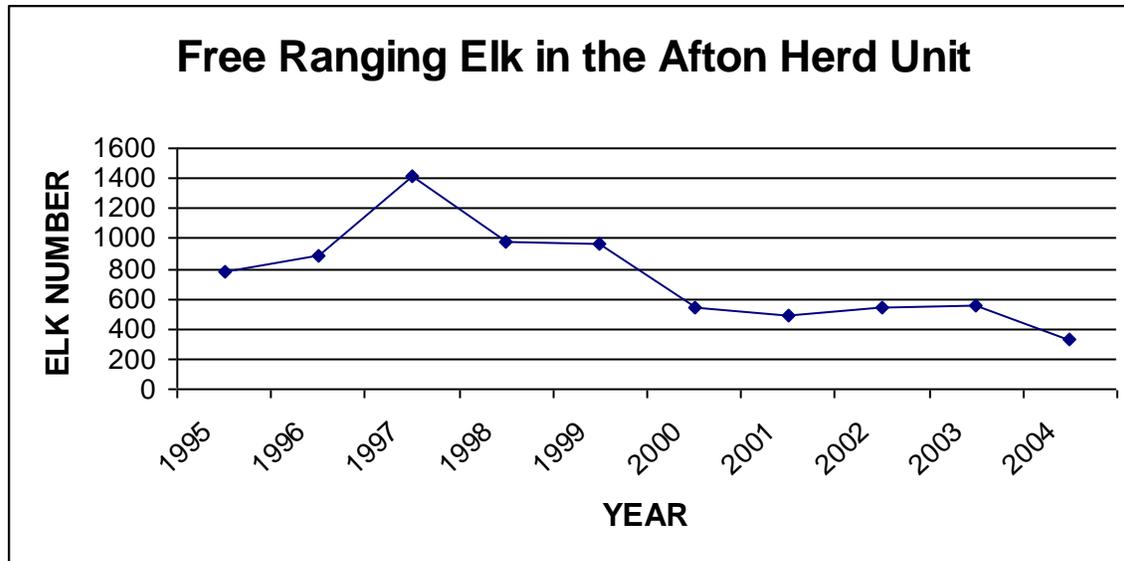


Figure 4. The number of free ranging elk in the Afton Herd Unit.

**Forest Park.** This feedground is situated in deep snow country best described as summer range. Snow on the valley floor usually exceeds three or four feet. This feedground does not serve as a damage prevention tool, but rather was established to reduce elk starvation. Prior to the feedground, most of the elk that survived the winters did so foraging on willows and vegetation on the banks of streams that were not snow covered. The number of elk that survived most winters in the Forest Park area was commonly 100-120 head.

**Unit Summary.** The low, average, and high number of elk wintering away from feedgrounds since 1994 was 362, 758, and 1,414, respectively (Table 1). Estimates of population objective reductions necessary if feedgrounds were eliminated were 84, 65, and 36 percent, respectively (Table 3). The WGFD believes 36 percent is an unrealistically low reduction. During the winter, 1,414 elk were reported on native range and did not attend a WGFD feedground. However, many of these were present on several livestock feed lines and in haystacks, and could not realistically be considered wintering out elk. The current number of elk that free range in Star Valley is unacceptable to landowners, and the WGFD has not been completely successful in preventing damage and mixing with livestock. Elk managers agree that a population objective reduction of about 72 percent would be necessary if feedgrounds were eliminated.

#### PINEY HERD UNIT

This herd unit has a wide variety of conditions, varying from the deep snow areas of Jewett and Franz to Bench Corral at a lower elevation. Most of these feedgrounds are located in summer ranges. The Bench Corral feedground is considered transition range for most winters, even though it could winter some elk on mild winters. Most of the elk that free range in this herd unit are located on Deadline Ridge, and are not influenced by feedgrounds.

Reducing the dependency on supplemental feed and preventing damage problems have received considerable attention and effort over the years in this herd unit. Efforts to move elk to the desert from the South and Middle Piney drainages were attempted for several years in the late 1940's and early 1950's. Elk were driven to the desert with airplanes and fed at Reardon Canyon. This effort ultimately did not solve damage problems and was discontinued. Elk from North Piney Feedground were baited to the sagebrush benches west of Bench Corral Feedground during the winter of 1995-96. Elk have made this migration on their own in subsequent years, decreasing the number of days these elk are fed and reducing elk concentrations during their third trimester. Elk conflicts associated with elk at Bench Corral and the Cottonwood Ranch have increased, and the WGFD could anticipate that other significant changes in feedground management would be controversial. The winter of 1996-97 was preceded by numerous mild winters, and a group of about 200 elk established itself on transitional ranges between the North Piney and Finnegan feedgrounds. These elk were not associated with any feedground, and when snow conditions forced them to lower elevations, extensive conflicts ensued. Hundreds of man-hours were spent in conflict management, and those 200 elk destroyed more hay during several weeks than is typically fed to 400 elk during an entire season. It was an important illustration of why feedgrounds became a damage management solution.

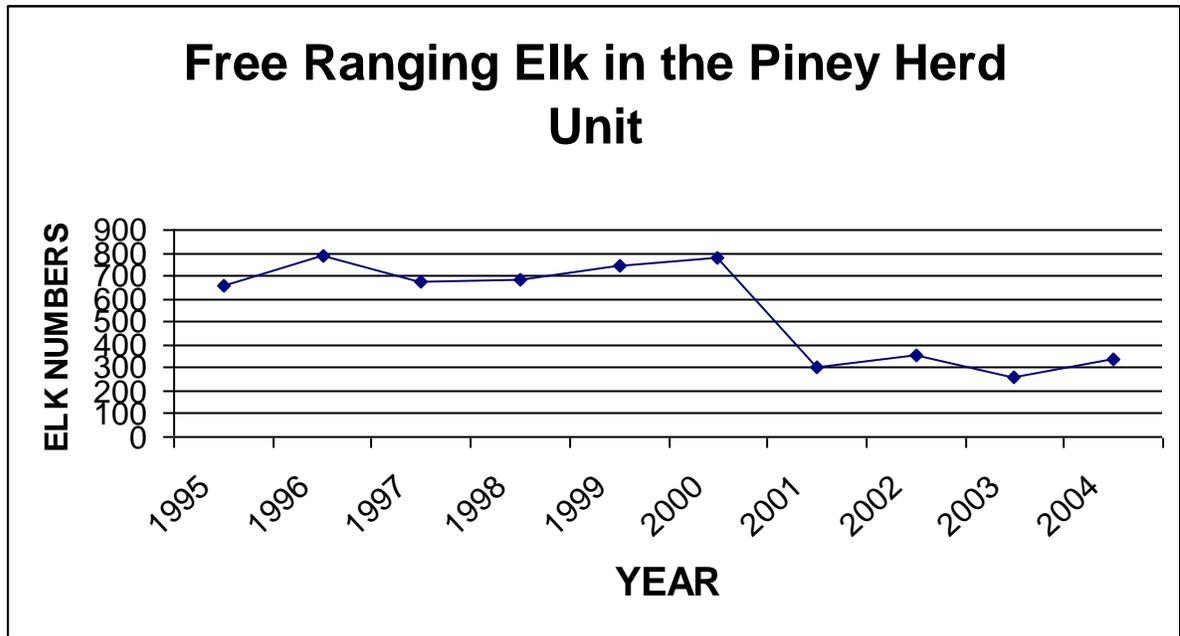


Figure 8. The number of elk to free range in the Piney Herd Unit.

**Finnegan.** The Finnegan feedground is adjacent to lower elevation private property and serves to prevent damage by attracting elk before they migrate to lower elevations. This area does not offer much opportunity for free ranging elk.

**North Piney.** This feedground sets in the valley bottom of North Piney Creek. There are livestock ranches below this feedground. The feedground attracts elk moving down the drainage and holds them. In recent years, once the elk have gathered on the feedground and remained there for about a month, they move to the Bench Corral

feedground. Opportunities for elk to free range in the vicinity of the North Piney feedground are minimal, but this feedground is useful in gathering elk before they complete their migration to Bench Corral.

**Bench Corral.** Bench Corral Feedground was started in the early 1970's and has served to attract elk that moved below the feedgrounds at higher elevations. The number of elk that presently winter in this area commonly exceeds 800 animals (since our 1995-96 management change to winter North Piney Feedground elk here). There is not enough forage to hold this number of elk for the entire winter and if not fed, elk move onto nearby cattle ranches.

**Jewett.** This feedground is located at a higher elevation where snow depths do not allow many elk to free range. During the mid 1990s there was an attempt to delay feeding starts at Jewett, and elk immediately moved to lower elevations and created conflicts with ranches. Elk that have learned to migrate to lower elevations have continued depredations in subsequent years.

**Franz.** This feedground is located on the Rim where snow accumulations are deep. Elk at this location are commonly fed more days than at any other feedground. Opportunities for elk to use native forage are minimal. During the mid 1990s there was an attempt to delay feeding starts at Franz, with the same result described for Jewett Feedground.

**Unit Summary.** Up to 300 elk winter away from feedgrounds on Deadline Ridge, and are believed to never associated with any feedground. One hundred to 150 elk could winter during most years near Bench Corral, making a total of about 400-450 elk foraging on native ranges possible (Table 1). Low, average, and high counts of elk wintering away from feedgrounds since 1994 were 293, 560, and 787 elk, respectively. Estimates of population objective reductions necessary if feedgrounds were eliminated were 88, 77, and 68 percent, respectively (Table 3).

## GREEN RIVER HERD UNIT

This herd unit contains a wide variety of conditions for elk wintering on the east side of the Green River. It varies from the winter range on Pinion Ridge, where 300-500 elk winter on some years, to the Black Butte area where very few, if any elk could free range. The Green River feedground site is in a snow shadow that could be alternately considered winter, transition, or summer ranges. The Black Butte feedground is located on transitional range and Soda Lake would be considered transitional range on many years, although some elk could winter there on mild winters. The number of free ranging elk in this unit has varied from a low of 148 in 2002 to a high of 1,405 in 1994 (Fig. 6). During the mild winters of 1976-77 and 1980-81, only Soda Lake showed a reduction in elk numbers on feed. However, all three feedgrounds showed reductions in the amount of hay fed.

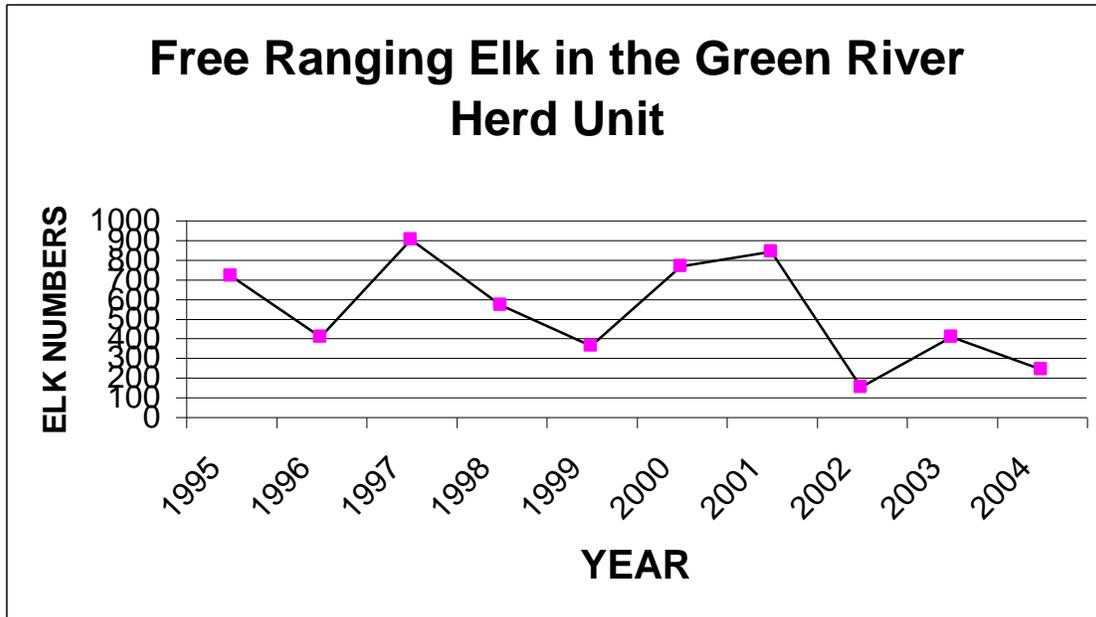


Figure 6. Number of free ranging elk in the Upper Green River Herd Unit.

**Black Butte.** This feedground is located in a deep snow area. There presently are not any livestock in the immediate area of the feedground. However, given the deep snow depths, elk that are not held by feeding at this location invariably move to other areas where they mix with livestock or cause damage. Delayed feeding starts were attempted during the mid 1990 s, resulting in elk conflicts on ranchlands. In some cases, elk have moved from this feedground to the Soda Lake feedground. While this decreased the length of the feeding season and elk were less concentrated during the third trimester of pregnancy (when spontaneous abortion and brucellosis transmission between elk is most likely), elk were ultimately fed to prevent damage.

**Green River Lake.** Damage prevention is not an issue with this feedground. Feeding elk in this area began in the 1930's in an attempt to reduce winter starvation. The site where elk are fed at this feedground receives a considerable amount of snow and if feeding was discontinued, elk would starve. Pinion Ridge, which is south facing and located about four miles northeast of the feedground routinely winters several hundred elk. These elk and those wintering on the feedground remain separate in most years.

**Soda Lake.** An elk fence along the border of public and private land reduces conflict with ranches during elk migration to the Soda Lake Feedground. This area is considered elk transition range on average winters. Past habitat treatments provide winter range for a limited number elk on the WGFD Wildlife Habitat Management Area (WHMA) and adjacent USFS lands.

**Unit Summary.** Low, average, and high counts of elk wintering away from feedgrounds since 1994 are 148, 522, and 1,405, respectively (Table 1). Estimates of population objective reductions necessary if feedgrounds were eliminated were 94, 79,

and 58 percent, respectively (Table 3). Elk managers estimated a population objective reduction of 67% or more would be necessary.

### PINEDALE HERD UNIT

The three feedgrounds in this herd unit are situated in elk transitional ranges. Some elk may forage on these ranges during mild winters in this herd unit. However, the number is usually low (average of 205 elk have free ranged in this herd unit since 1994; Fig. 7). When forage production is low or when less residual forage remains after livestock grazing, and when snow depths accumulate, elk typically move to lower elevations. Commingling and damage issues have always been significant problems involving the management of this herd and feedgrounds. During the mild winters of 1976-77 and 1980-81, elk numbers on the Fall Creek and Scab Creek feedgrounds were lower because many elk used native forage. This was not the case with the Muddy feedground, which was one of the few feedgrounds that did not have lower elk numbers during those years.

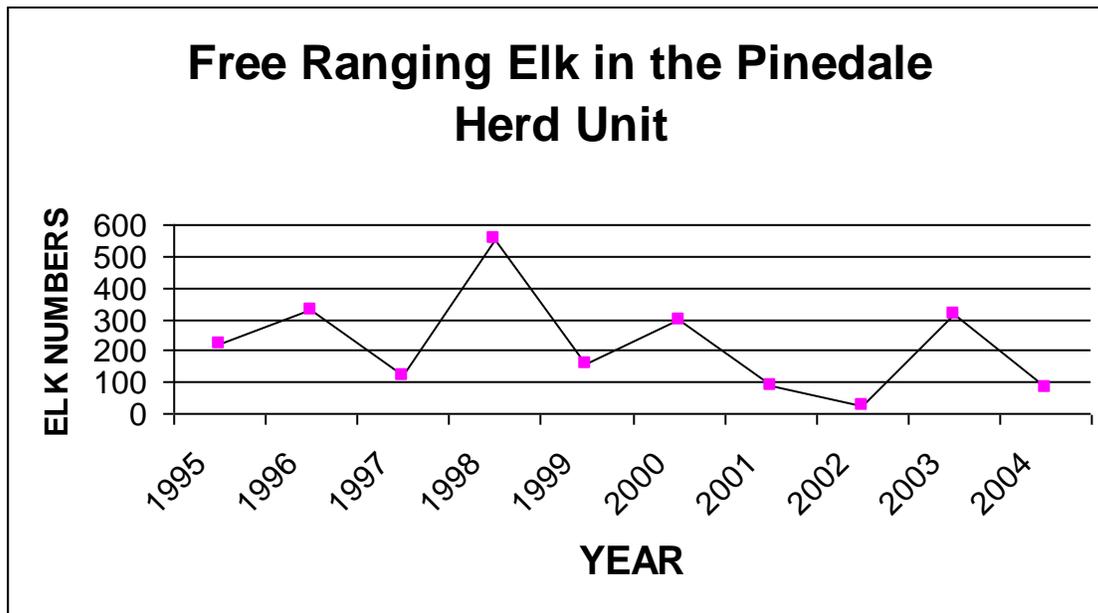


Figure 7. The number of elk free ranging in the Pinedale Herd Unit.

**Fall Creek.** Elk utilizing this area have the opportunity to use the WGFD Half Moon WHMA. The area is excluded from livestock grazing, and manipulations to improve wildlife habitats have occurred. As a result, elk feeding can be delayed during mild winters. However, the risk of commingling and damage preclude this area from supporting the number of elk attending the feedground on most winters.

**Scab Creek.** Native forage in this area has traditionally been grazed by livestock, and at 7800 feet elevation, snow depths force elk movements to lower elevations. Livestock feeding below this feedground limit opportunities for free ranging elk, except in very mild winters.

**Muddy.** This feedground has been moved to different locations in attempts to reduce conflicts with ranches. An elk fence separates it from an adjacent livestock operation. Nearby native ranges are important mule deer and pronghorn antelope crucial winter ranges, and elk would undoubtedly compete with them. The potential for commingling and damage is high on most winters.

**Unit Summary.** Low, average, and high counts of elk wintering away from feedgrounds since 1994 were 25, 205, and 430, respectively (Table 1). Estimates for the population objective reduction necessary if feedgrounds were eliminated were 99, 89, and 77 percent, respectively (Table 3). Elk managers with damage responsibilities estimate a reduction of 87 percent would be necessary, while others without damage responsibilities estimate a reduction of 60 percent would be sufficient. Almost none of the elk counted wintering away from feedgrounds have done so without creating ranch conflicts, or have wintered away from feedgrounds the entire duration.

## DISCUSSION

A number of factors must be considered when evaluating the information provided here.

1. Numbers of existing free ranging elk are based on numbers counted. Not all animals will be seen during surveys and as a result, our counts represent minimum estimates.
2. Estimates varied based on management responsibility and years of experience. Estimates from individuals that were directly responsible for managing conflict were more conservative than those from individuals that did not. Also, estimates from individuals that have worked in the Region for several years and have dealt with elk during a wide variety of conditions gave more conservative estimates than did those that are new to elk management in the Region.
3. Elk counts (both feedgrounds and wintering out) are made at a single point in time. In most winters some, or even all of the elk counted as “wintering out” move to feedgrounds.

There are a number of factors that affect estimates of free ranging elk that are subject to debate.

1. “Elk are attracted away from native ranges to feed on hay”. Some managers consider this conclusion valid. While this probably happens to a degree, experience and examination of feedground records indicate that it is a minor factor. Availability of native forage, as affected by snow depths and production, seems to be the force that brings most elk to feedgrounds. If hay was the sole attraction, then most elk would come to feedgrounds annually regardless of winter conditions. However, this is not the case. For example, during the mild winters of 1976-77 and 1980-81, hay was available to elk that attended feedgrounds. In spite of this, elk did not attend six of 21 feedgrounds during 1976-77. There was a reduction of 58% of the elk that were fed on the previous and following winters. Also, the amount of hay fed was reduced by 78%. During the winter of 1980-81, elk attendance was reduced by 35% and the amount of hay fed was reduced by

60%. There have been four years where the elk were either not fed or fed minimal amounts at Bench Corral. This response to forage availability is common, i.e., mild winters translate into less elk attendance at feedgrounds and hard winters result in more elk supplementally fed. This supports the premise that forage availability, not hay availability brings elk to feedgrounds. Elk may be the best measure of range adequacy. Figure 1 shows declines in the number of free ranging elk in the Region. This also coincides with the drought and decreased forage production, which reduces available native forage.

2. “Elk should be encouraged to free range whenever possible”. This is desirable in many respects but ignores why most feedgrounds were initiated (i.e., preventing agricultural conflicts). If managing commingling and damage are important goals, then dispersing elk, which results in elk movements to private property, is undesirable. In many situations, there is only one opportunity to attract elk to feedgrounds. If they are not held at the feedground then, and they migrate to a lower elevation, they are very difficult to move back to a higher elevation. This increases the potential for conflict.
3. Experience indicates if elk winter in a particular area and like it, they frequently attempt to return on subsequent years. These situations were observed in the mid 1990s when elk in the Piney and Pinedale Herds were encouraged to free range by delaying feeding starts. They ultimately began causing damage and commingling problems and it took several years to change their behavior. Elk managers in the Jackson-Pinedale Region have struggled with this problem since the late 1940s, and it is reported in numerous Department reports. Most feedgrounds are situated on summer and/or transitional ranges, and elk instinctively migrate to lower elevations unless they are fed. Snow moves elk to lower elevations, and if elk are not attracted to a feedground when they are moving through an area, it is unlikely that they will return on their own. Managers have failed to haze elk back to feedgrounds in these circumstances, even with the use of a helicopter.
4. “Free ranging reduces the incidence of brucellosis in elk”. Spontaneous abortions are more likely to occur during the late second and the third trimesters of pregnancy (Kreeger, personal communication, 2004). If the peak of elk calving occurs around mid to late May, then late February to mid March is the start of that critical time. Only rarely are free ranging opportunities available during February and March. Most feedgrounds continue into April, and in some years continue into May. To effectively reduce the risk of brucellosis transmission between elk, native habitat must be available during those critical months. While we intuit that risk is reduced by encouraging free ranging elk during their third trimester, and we make considerable effort to kick elk off feedgrounds as early as possible, there is no empirical evidence of our success.

5. “Conservation easements are a viable approach in creating opportunities for free ranging elk.” Although there may be interest and even funding to purchase conservation easements, there must also be a willing seller for that easement. History indicates most viable ranching operations will not sell any of their property rights that limit ranch management practices. If a given feedground has more than one neighboring ranch (and most do), then the first conservation easement probably does not serve a significant management purpose until the last one needed is obtained. Elk managers believe that conservation easements may create a buffer between feedgrounds and livestock operations, but they are skeptical that conservation easements can significantly contribute to eliminating feedgrounds.

## CONCLUSIONS

The number of elk that can be supported without feedgrounds is influenced by many factors (Dean, et al., 2003). Included are seasonal variations in forage production, forage use by other species, snow depths, proximity to potential damage situations, domestic livestock, highways, and predation by wolves (Dean, et al., 2003). Many of the estimates presented in the report are based on present conditions (political, land status, existing livestock operations, present and potential commingling possibilities, and damage situations). Management adjustments would require changes in the existing conditions, and would likely require additional funding, increases in personnel, changes in grazing practices, and increased tolerance for brucellosis transmission risk. Existing conditions are closely tied to land use, and proposals for change are fraught with complexity and personnel opinion. Any proposed adjustments to grazing permits on federal lands must consider the viability of the ranch’s private land base. When ranches sell to developers and/or absentee owners, the Department’s ability to manage elk is usually decreased, not increased. Any proposal to reallocate forage on federal lands must also consider shrub conditions and elk competition with deer and antelope on crucial winter ranges.

Elk feeding became a solution to several problems (damage conflicts, elk starvation, habitat conversions to human uses) in the early 1900s. Most of the conflicts that led to feeding as a solution are still present, or have grown to greater conflicts. The issue of managing the risk of brucellosis transmission from elk to livestock gained importance during the late 1900s. Elk vaccination for brucellosis is only possible in feedground settings, and if vaccination is a desired management tool, feedgrounds will be necessary. Given existing low numbers of elk wintering away from feedgrounds and present land uses, managers are skeptical that present numbers of elk could be maintained if feedgrounds were eliminated.

The best study and only scientifically derived estimate of winter forage availability was made by Hobbs, et al. (2003) as part of the Interior Department’s Jackson Bison and Elk Environmental Impact Statement process. That study estimated that 5,450 elk in the Jackson Herd could survive without supplemental feeding in a severe winter. Given the

herd's population objective of 11,029, a reduction of 51 percent would be necessary. Their study does not consider elk behavior when feeding is delayed. Elk presently leave the National Elk Refuge and cause depredations to stored hay and livestock feed lines on neighboring ranches. Federal and state managers react to significant public pressure to begin feeding when that occurs. If elk moved into residential areas to forage on ornamental shrubs, or if elk mortality was visible on the Refuge and in residential areas, public pressure to solve those problems would intensify. Feeding, or further elk reductions appear to be the only remedies available to manage those conflicts. Management discussions of elk and feedgrounds have attempted to accommodate existing populations objectives. Elk counts for herds associated with feedgrounds (Targhee Elk excluded) totaled 26,603 during winter, 2003-04. Data from the most recent 10 years indicate that about 82% of the elk, in areas influenced by Department feedgrounds, were fed last winter.

A comparison of the various ways of estimating the magnitude of elk population objective reductions without feeding varied from 51 to 99 percent for individual elk herds in the JPR. Low, average and high estimates for the total reduction of the combined population objectives of the entire JPR are 86, 79, and 62 percent, respectively (Table 3). These reductions would provide a combined JPR herd population objective of between 4,000 and 7,000 elk.

Elk consistently leave native ranges in late fall with onset of winter and attend private hay stores and feed lines, or state and federal feedgrounds. Much of the JPR exceeds 7,000 feet elevation, has deep snow, and winds insufficient to create bare ridges. Most elk do not attempt to winter at higher elevations because they cannot. And when they move to lower elevations, conflicts arise. We can intuit that some number of elk could winter on native ranges, and without significant land-use changes that include ranch, residential, oil and gas developments, public land forage allocation, and mule deer and pronghorn antelope management, that the number of elk likely to winter away from conflict would be less than present numbers.

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