4. ELK AND LIVESTOCK GRAZING OVERLAP

Areas where elk and livestock grazing overlapped, either spatially or temporally, were mapped for both the North Crow and Kimber EHUs. Elk/cattle overlap occurs in every pasture of every cattle allotment within the WMU, in the Phase II study area. ERG utilized a GIS exercise to analyze the more than 10,000 elk locations (provided by MTFWP) and all of the data collected during the Phase II of the Elkhorn Vegetation Study to quantify overlap into catagories of low, medium, and high. The two EHUs studied during Phase II experienced drastic differences in the degree of overlap. The North Crow EHU has more rangeland that is used by wintering elk, a higher percentage of rangeland compared to timbered areas, and nearly half of the stocking rates per acre than the Kimber EHU. With this in mind, it is obvious that if elk/cattle overlap was going to result in problem areas, it would first show on the Kimber EHU. This section will first describe elk and cattle distribution and will then identify areas of elk and cattle overlap.

4.1 ELK DISTRIBUTION

MTFWP manages all wildlife within the project area (Hunting District 380), and has monitored the elk populations in the project area since the early 1960s. Each winter MTFWP employees fly an aerial survey of the elk populations. These numbers, stratified by elk herd units, provide a trend for the elk population changes from year to year, rather than an estimate of total population size. Population trends provide an index, while census counts provide a total population. A general assumption for aerial survey trend counts is that 15% of the animals present could be overlooked (Lyon, 2004). Figure 4.1-1 presents the trend in elk population changes (1961–2005) for the two herd units of focus for Phase 2 of the Elkhorn Vegetation Study. The population trends for the two herd units increased steadily since 1978 and peaked during the winter of 1996.

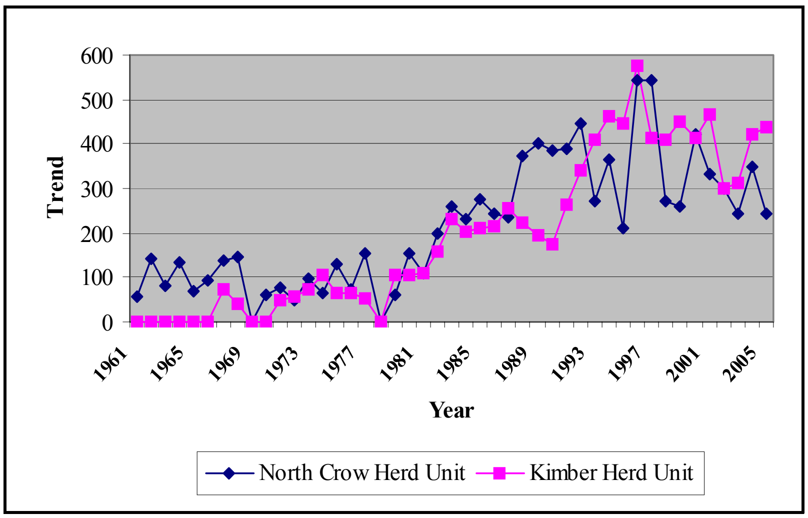

Figure 4.1-1 Elk Winter Trend (1961-2004) for Kimber and North Crow Elk Herd Units

Elk trends on the North Crow EHU have increased from a low average population size during the 1970s to a peak in 1996. Since 1996 trend counts have decreased 36% to the 2005 level. Elk trends on the Kimber EHU have also increased from the average during the 1970s to the peak in 1996. Since 1996, trend counts have decreased 27% to the 2005 level. The elk population trends in these two herd units is characteristic of the rest of the elk herd units in the Elkhorn Mountains (See Phase I Final Report).

Winter trend counts (Table 4.1-1) have increased for both elk herd units between the 2003 and the 2004 winter aerial trend survey. The North Crow EHU increased by 42% from 2003 to 2004, while the Kimber EHU increased by 35% during the same time period. For 2005, Kimber's trends continued to rise while North Crow trends went down.

Table 4.1-1 2003–2005 Elk Winter Trend Comparison

Elk Herd Unit	2003 Trend	2004 Trend	2005 Trend
North Crow	244	348	244
Kimber	312	422	439

The first step in determining where elk and livestock grazing overlapped was to identify areas of elk use. Elk distribution by season was determined using 10,224 elk locations collected via radiotelemetry by DeSimone for the Elkhorn Mountains Wildlife Monitoring Program (1982–1989). Each elk location was stratified by the season in which it was collected. In general, these distributions entirely overlapped the cattle allotments in both EHUs.

To further quantify areas of elk use, ERG considered different methods to identify areas preferentially selected by elk within each EHU. After extensive exploration and consideration, ERG decided to quantify the areas preferred by elk using elk location densities compared to the hypothetical situation in which elk are distributed uniformly (no variation in density). This approach relies on the assumption that the areas in which a higher number of elk are located (via radiotelemetry surveys) are the areas preferentially selected by elk, compared to those areas with fewer elk locations which are assumed to be non-preferential areas.

Elk density grids were created using the kernal density function in ESRI's Spatial Analyst GIS software. Kernal densities are influenced most heavily by points near the center of the density search radius and have the effect of smoothing the data. A search radius of one mile and a grid cell size of 10 meters was selected for the analysis and the results were clipped to the boundary of the EHUs. The resultant density grids represent the number of elk locations per square. Density grids were developed for each season and for all points combined regardless of season.

To compute the density of a uniform distribution of elk relocations (i.e. no preferential selection of areas), the number of relocation points falling within the boundary of the Extended WMU (a delineation created by ERG during Phase I) was divided by the number of square miles (432) of Extended WMU. The resultant value is the expected elk location density per square mile for a uniform distribution.

The elk density values for each density grid were compared to the uniform density value. An area was determined to be selected preferentially if the elk density exceeded the uniform density. The reasoning behind this calculation is as follows: if elk are present at a greater density than expected for a uniform spatial distribution, it was inferred that elk prefer the area, and they are said to be "clustered" in that area. On the contrary, if elk are present at a lower density than expected for a uniform distribution, they do not prefer the area as much as one would expect with a uniform distribution; and they are said to be "dispersed."

Figures in this section show areas of elk density classified as clustered (termed "significant" for purposes of this study), dispersed, or zero (not present). The densities listed in Table 4.1-2 show the expected density for a uniform spatial distribution. These values provide the threshold from which densities are classified as clustered (less than or equal to the threshold) or dispersed (greater than the threshold).

Table 4.1-2 Expected Uniform Density of Elk Relocations Per Season

Season	Elk Relocations	Expected Uniform Density (Number of Points/ Area)
Spring	1990	4.60
Summer	3019	6.99
Fall	2463	5.70
Winter	2752	6.37
Full Year	10,224	23.67

It is important to recognize that the study relocated radio-collared elk multiple times per year; therefore, these numbers represent relocation density rather than actual elk numbers. These density numbers represent the average number of relocations per square mile for all eight years of the DeSimone study (1982–1989) within the North Crow EHU.

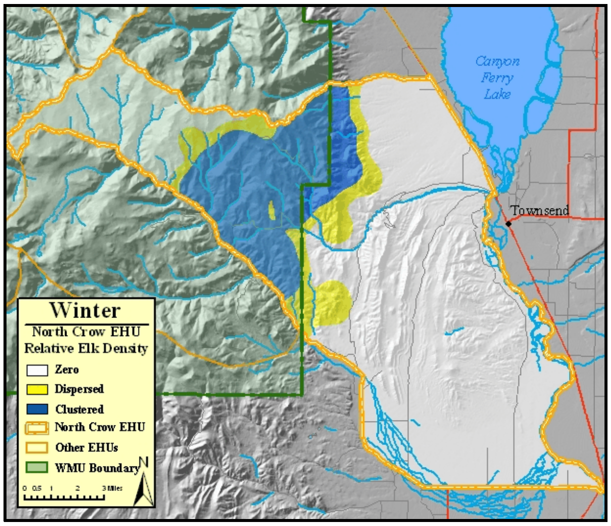

Figure 4.1.1-1 North Crow EHU Winter Elk Densities

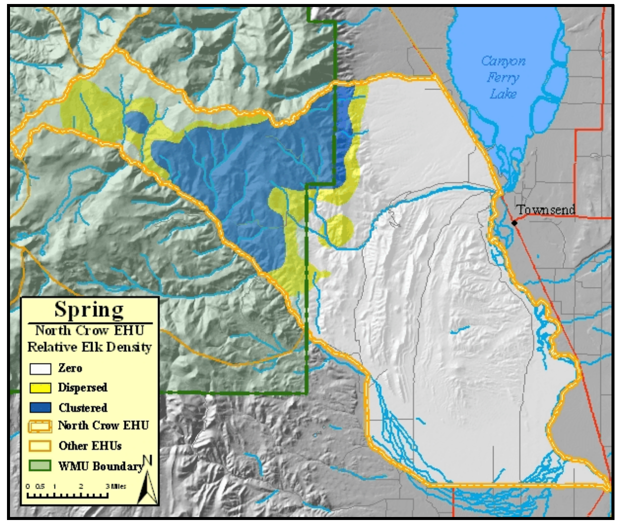

Figure 4.1.1-2 North Crow EHU Spring Elk Densities

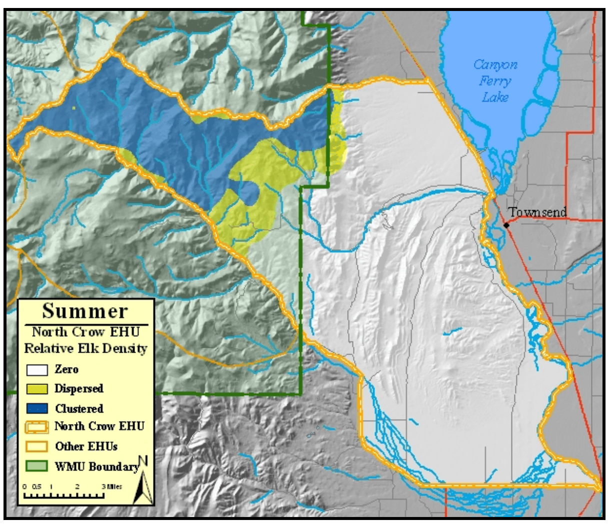

Figure 4.1.1-3 North Crow EHU Summer Elk Densities

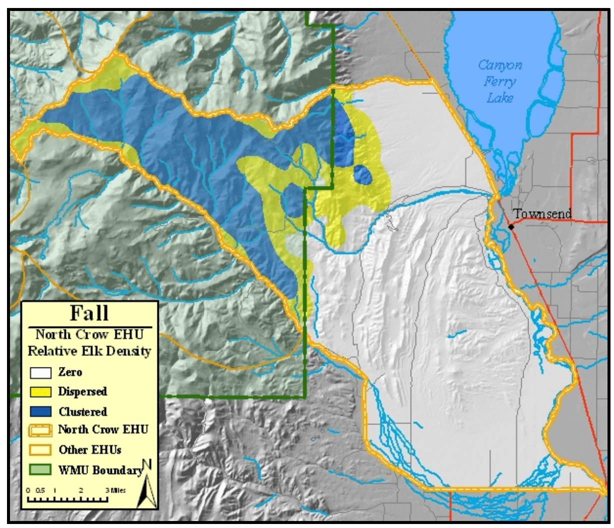

Figure 4.1.1-4 North Crow EHU Fall Elk Densities

4.1.1 North Crow EHU

Figures 4.1.1-1 through 4.1.1-4 present the results for elk density analysis by season for the North Crow EHU. Table 4.1.1-3 presents the winter trend counts for elk in the North Crow EHU for the years 1982–1989 (the years the elk location data were used to determine density) and how they relate to present day winter trend counts. The average winter trend for the North Crow EHU for 1982–1989 was 278, compared to the 2004 (the year North Crow was surveyed by ERG) winter trend of 348. As of 2004, it appears that elk numbers are up 25% of the average in the 1980s. During the last two years of DeSimone's study, 1988 and 1989, the winter trend counts were higher than the 2004 trend count.

The data collected during the Elkhorn Mountains Wildlife Monitoring Program is 15 years old. Nonetheless, the current seasonal distribution is likely very similar today in spite of the higher elk populations, based upon the high level of fidelity that elk have to their home range within a given herd unit (MTFWP, 1993).

Table 4.1.1-3 Winter Trend Counts for the North Crow EHU

Year	Winter Trend Counts
1982	200
1983	259
1984	231
1985	277
1986	243
1987	236
1988	373
1989	402
2004	348
Average of 1982–1989	278
2004 Increase from Average (1982–1989)	+70 (+25 %)

Intensified concentrations of wintering elk in the North Crow EHU extend from the southwest facing slopes in the Crow Creek drainage north into Eagle basin and east to where the foothills of the Elkhorns meet the Missouri River valley. From summer to winter the only areas of seasonal overlap occur in the small interspersed parks in the Eureka Creek drainage. These parks have seasonal elk overlap in all seasons. Other areas receiving elk overlap between all seasons are in the upper portions of the Shep's and Ribedeau pastures of the North Crow Allotment, as well as a majority of the Diorite Allotment.

In the fall and winter, elk migrate back to the lower elevation areas within the boundaries of the North Crow Allotment. Winter elk locations are strongly influenced by deep snowpack at higher elevations; however, this is not the case in fall. Fall elk densities have the widest range of all seasons and extend throughout all pastures of the North Crow Allotment. These fall through spring elk densities seem to follow the regrowth of grasses stimulated by summer utilization by cattle, as described by Anderson and Schertzinger (1975), Frisina and Keigley (2004), DeSimone at al.(1984), and Short and Knight (2003).

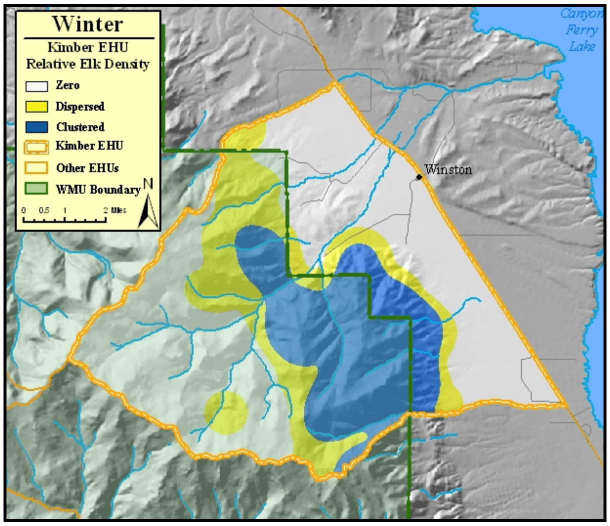

Figure 4.1.2-1 Kimber EHU Winter Elk Densities

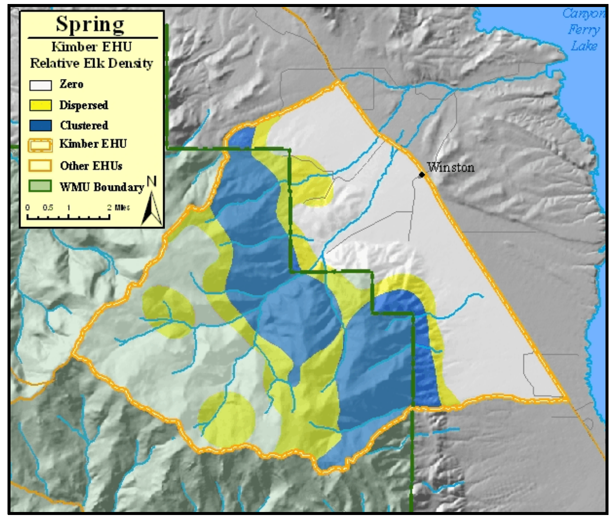

Figure 4.1.2-2 Kimber EHU Spring Elk Densities

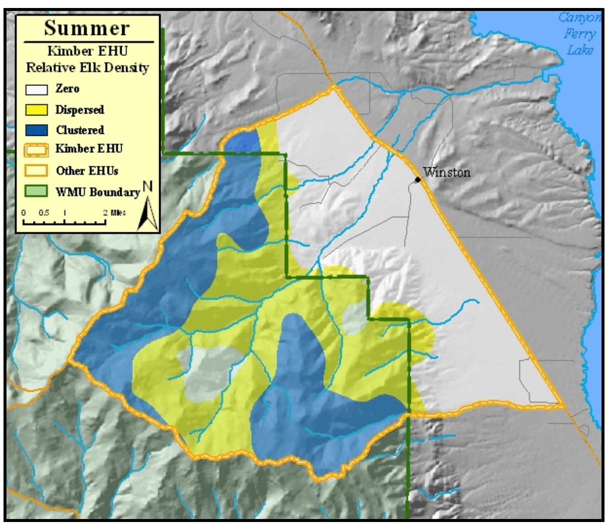

Figure 4.1.2-3 Kimber EHU Summer Elk Densities

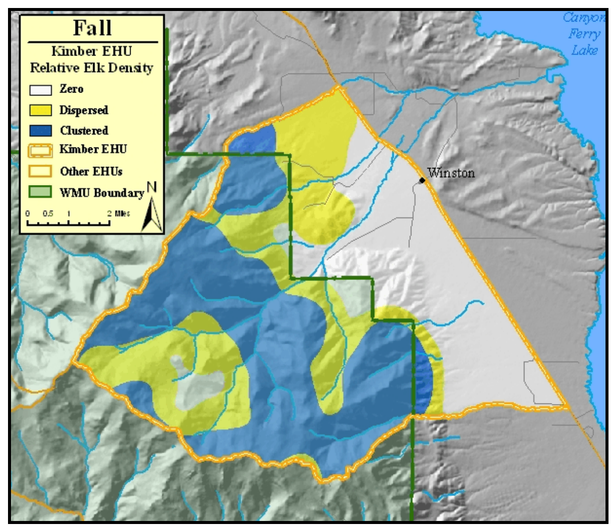

Figure 4.1.2-4 Kimber EHU Fall Elk Densities

4.1.2 Kimber Elk Distribution

Figures 4.1.2-1 through 4.1.2-4 present the results for clustered and dispersed elk distribution by season for the Kimber EHU. Table 4.1.2-1 presents the winter trend counts for elk in the Kimber EHU for the years 1982–1989 (the years the elk location data were used to determine density) and how they relate to present day winter trend counts. The average winter trend for the Kimber EHU for 1982–1989 was 211, compared to the 2005 winter trend of 439. As of 2005, it appears that elk numbers are up 108% of the average in the 1980s.

Elk densities in the Kimber EHU during the winter rarely extend past the foothills, with clustered densities all within the Elkhorn Mountains and their foothills. Winter clustered densities extend from Kimber Ridge, west through the rangelands on either side of Weasel Creek, and north to the Pole Creek rangelands. Spring elk densities shift toward the east into higher elevations, as the snowpack recedes. The exception is Kimber Ridge, which in part has clustered densities during all seasons.

Table 4.1.2-3 Winter Trend Counts for the Kimber EHU

Year	Winter Trend Counts
1982	158
1983	230
1984	202
1985	209
1986	213
1987	256
1988	223
1989	195
2005	439
Average of 1982–1989	211
2005 Increase from Average (1982–1989)	+228 (+ 108 %)

Elk densities, during the summer have the least overlap outside of the WMU, with clustered densities in the higher elevations. During the grazing season each cattle allotment within the WMU has portions of clustered elk densities.

Fall densities show the most overlap outside of the WMU, but are considered by ERG to be effected by hunting pressures. The area where the fall elk densities extend outside the boundary of the WMU correspond to the irrigated pastures and hay fields. The rest of the Kimber and the North Crow EHUs do not have any irrigated areas in such close proximity to the extended WMU.

ERG field personnel noted a resident elk herd on Kimber Ridge. This was also captured in the seasonal elk densities, with portions of Kimber Ridge having significant elk densities during all four seasons. Both the Kelly Gulch and the Kimber Ridge Private utilization sites captured elk use during the cattle grazing season, using the fecal pellet count transects (See Section 3).

4.2 CATTLE DISTRIBUTION

Within the boundary of the North Crow and Kimber EHUs there are six grazing allotments administered by the Townsend Ranger District of the Helena National Forest and parts of 12 allotments administered by the Butte Field Office of the Bureau of Land Management (see Figure 4.2-1). In 2003 there were 4,183 AUMs (actual use) by cattle in the North Crow EHU in two USFS allotments and nine BLM allotments. For the Kimber EHU, in 2003 there were 862 AUMs (actual use) by cattle in four USFS allotments and three BLM allotments.

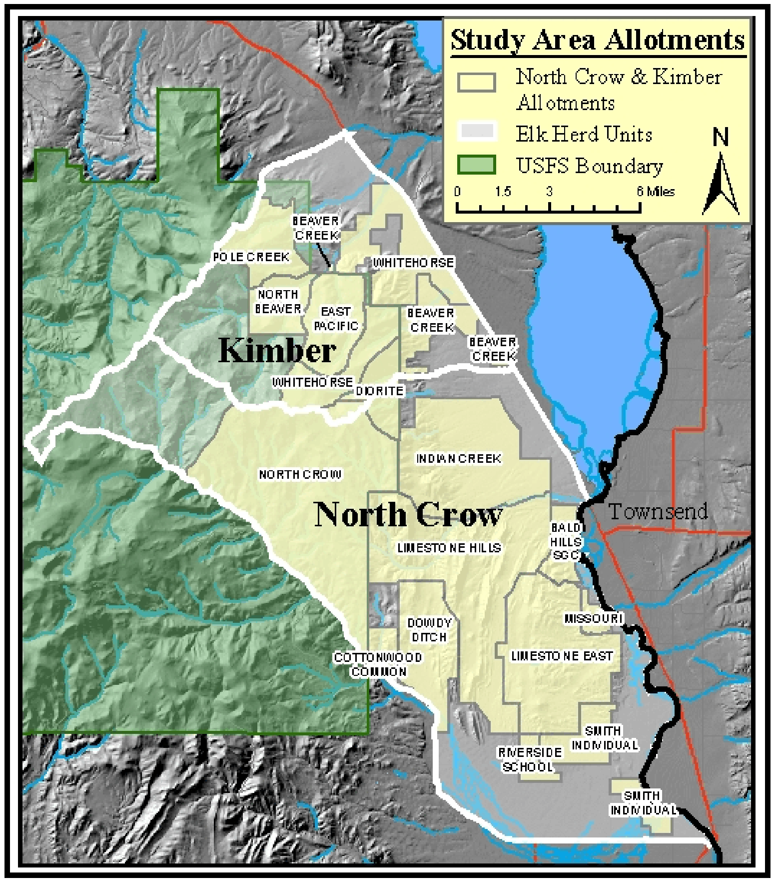

Figure 4.2-1 Cattle Allotments in Kimber and North Crow Elk Herd Units

There are stark differences between the allotments in the North Crow and Kimber EHUs. In the North Crow the percentage of rangeland to timber is much higher than in the allotments in the Kimber EHU. The North Crow Allotment is larger than all of the USFS allotments on the Kimber and permits more AUMs annually than all of the USFS Kimber allotments combined, but receives the lightest stocking rates. Table 4.2-1 presents the acres (divided into range and timber), the permitted AUMs, and the stocking rates (given in AUMs/acre).

Table 4.2-1 Stocking Rate Comparison for Allotments within the WMU

Allotment	Acres		Percent Rangeland	Permitted Stocking Rate[2] (AUMs)	AUMs/acre	
	Range[1]	Total			Range	Total
Diorite	535	1,615	25	174	0.33	0.11
East Pacific	1,474	3,629	40	560	0.38	0.15
North Beaver	223	2,294	10	107	0.48	0.05

Allotment	Acres		Percent Rangeland	Permitted Stocking Rate[2] (AUMs)	AUMs/acre	
	Range[1]	Total			Range	Total
North Crow	8,602	18,923	45	1,780	0.21	0.09
Pole Creek	333	3,157	11	258	0.77	0.08
Whitehorse	1,160	3,261	36	544	0.47	0.17
Total	**12,327**	**33,478**	**37**	**3,423**	**0.28**	**0.10**

[1] Range determined from large scale digitizing by ERG.
[2] Stocking rates set by USFS.

All allotments receive fairly low stocking rates compared to the suggested stocking rates provided in the *Technical Range Site Descriptions*, however the rangeland habitats in the Kimber EHU received higher levels of use and had lower percentages of rangeland compared to timber than those in the North Crow EHU. The allotments on the Kimber EHU depend on cattle utilizing forage in timbered areas more than in the North Crow EHU, notice the percent rangeland differences between the two EHUs. During the two field seasons of the Elkhorn Vegetation Study, there were more problem areas (areas receiving very high levels of use) noted by field personnel in the rangeland habitats in the Kimber than in the North Crow EHU.

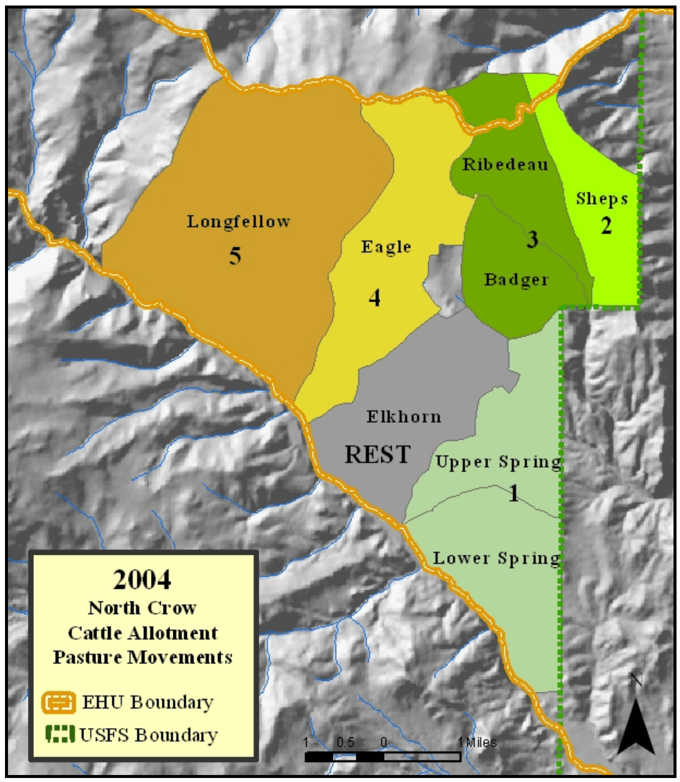

Figure 4.2-2 North Crow Allotment 2004 Rest-Rotation Schedule

During the 2004 season the North Crow Allotment received 1,392 AUMs by 348 cow/calf pairs, and the Diorite received 151 AUMs by 63 cow/calf pairs (Douthett, 2005). Actual use for 2004 on the North Crow Allotment was 22% less than the amount permitted. Actual use for 2004 on the Diorite Allotment was 34% less than the amount permitted. In 2005 the North Crow Allotment received 1,284 AUMs by 321 cow/calf pairs, representing a 28% reduction from permitted levels (Williams, 2005). The Diorite Allotment received 152 AUMs by 58 cow/calf pairs and two bulls, representing a 13% reduction from permitted levels (Johnson, 2005).

ERG met with allotment permittees and USFS managers to gain additional insight as to operation and the movements of cattle within allotments. The North Crow Allotment is divided into eight pastures, with one pasture being rested each year. However, Upper and Lower Spring pastures are grazed together, as are Badger and Ribedeau pastures (Williams, 2004). Combining these pastures, the North Crow Allotment is treated as having only six rather than eight. Beyond that, during 2004 Eagle and Longfellow were treated as one pasture as well. This effectively brings the total number of pastures to five.

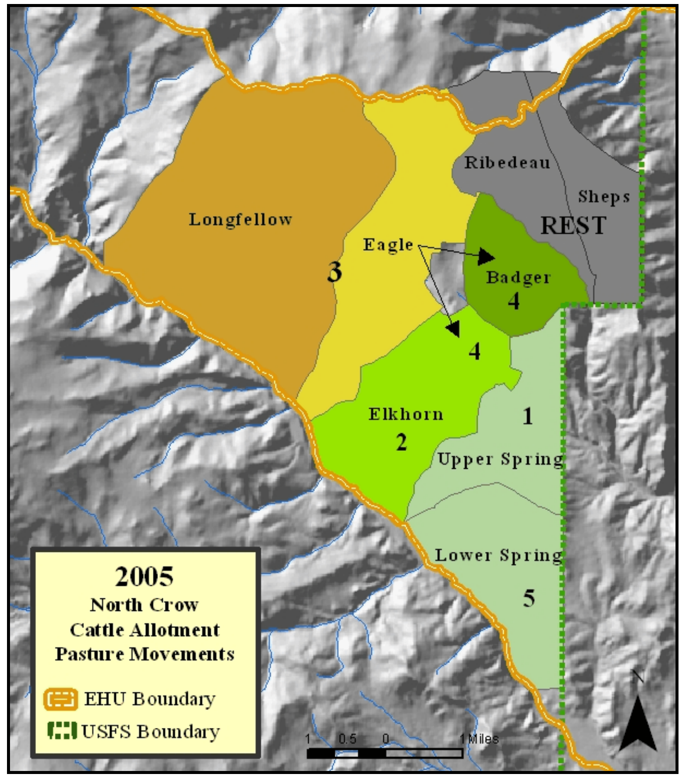

Figure 4.2-3 North Crow Allotment 2005 Rest-Rotation Schedule

Figure 4.2-2 presents the eight pastures for the North Crow Allotment and the rotation used during the 2004 season, and Figure 4.2-3 presents North Crow's 2005 schedule. During the two years of the Elkhorn Vegetation Study 5,226 acres of the North Crow Allotment received an entire year of rest from cattle grazing. In 2004 the Elkhorn pasture was rested, while in 2005 the Shep's and Ribedeau pastures received rest. The North Crow Allotment only has a couple of pastures that are ready at the beginning of the permitted season of use, this is due to the elevations of these pastures compared to the other pastures.

Table 4.2.-2 on the following page presents actual use for 2004 and 2005 for all of the allotments within the WMU for the North Crow and Kimber EHUs.

Table 4.2-2 Actual Use Summary for 2004 and 2005 for Allotments within the WMU

Allotment	2004 Actual Stocking Rate (AUMs)	Acres per AUM 2004		2005 Actual Stocking Rate (AUMs)	Acres per AUM 2005	
		Total	Range		Total	Range
Diorite	151	0.28	0.09	152	0.28	0.09
East Pacific	372	0.25	0.10	353	0.24	0.10
North Beaver	63	0.28	0.03	74	0.33	0.03
North Crow	1,392	0.16	0.07	1,284	0.15	0.07
Pole Creek	176	0.53	0.06	180	0.54	0.06
Whitehorse	296	0.26	0.09	306	0.26	0.09
Total	**2,450**	**0.20**	**0.08**	**2,349**	**0.19**	**0.07**

Interviews with ranchers helped ERG gain valuable insight as to the operational systems in these allotments, but they did not provide enough site specific cattle distribution information to create a complete grazing distribution map. Basically, livestock in these two allotments have a season of use long enough to utilize a majority of the rangeland habitats within the boundaries. Out of the 18,923 acres (8,602 non-forested acres) within the North Crow Allotment, up to 1,780 AUMs (permitted amount) can be distributed each year. In 2004, 1,392 AUMs and in 2005, 1,284 AUMs were utilized by cattle in the North Crow Allotment (see Table 4.2.4-1).

4.2.1 Allotment Management Systems

The cattle allotments in the North Crow are managed with a rest rotation grazing system. The Kimber EHU adheres to a deferred rotation grazing system. The North Crow Allotment is divided into eight pastures, with one pasture being rested each year. However, North Crow only has three pastures in which the cattle can begin their rotation, due to the delayed green up of higher elevation pastures.

Even though the USFS Diorite Allotment is considered to be a USFS allotment, it is grazed as one pasture, in conjunction with adjacent BLM and private lands, collectively known as the Kimber-Diorite Allotment. This arrangement was made possible by a conservation easement between MTFWP and private land owners in 1998.

Allotments in the Kimber EHU all adhere to deferred rotation grazing systems; this is mainly due to the smaller size of the allotments and the smaller percentages of rangeland when compared to the North Crow

Allotment (See Table 4.2-1). The Kimber allotments also have fewer pastures, which reduces the ability to rest a pasture for the entire grazing season. The allotments in the Kimber EHU also exhibit greater elevational gradients between pastures, reducing the ability of varying the timing of use that a pasture receives from year to year.

4.2.2 Season of Use

All of the USFS cattle allotments within the Kimber and North Crow EHUs have a four month season of use, with grazing being permitted from the middle of June to the middle of October. The BLM cattle allotments have a wide range in season of use; however the BLM allotments adjacent to the WMU boundary have a five month season of use, with grazing being permitted from the beginning of June to the end of October.

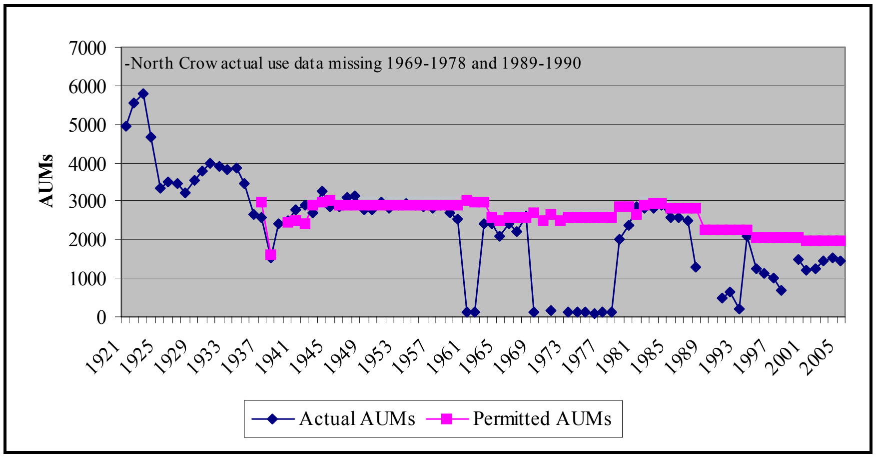

Figure 4.2.3-1 Cattle Grazing History (1921-2005) for USFS Allotments in the North Crow Elk Herd Unit

4.2.3 Actual Use Background for Cattle Allotments Inside the WMU

Figure 4.2.3-1 presents actual and permitted AUMs for the USFS allotments within the North Crow EHU. The Diorite Allotment was included in the North Crow EHU figure, even though the allotment straddles the boundary between the Kimber and the North Crow EHUs. Until 1960, Diorite was part of the North Crow Allotment.

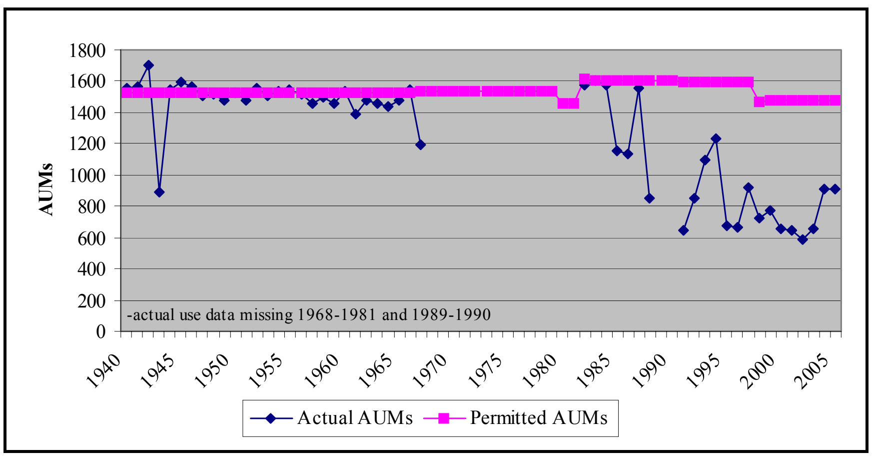

Figure 4.2.3-2 Cattle Grazing History (1940-2005) for USFS Allotments in the Kimber Elk Herd Unit

Figure 4.2.3-2 presents actual and permitted AUMs for the

USFS allotments within the Kimber EHU. These allotments include Pole Creek, North Beaver, East Pacific, and Whitehorse.

The North Crow EHU has two USFS cattle grazing allotments, the North Crow Allotment and approximately half of the Diorite Allotment. The North Crow Allotment is on a deferred rotation grazing system, with eight pastures, and permits 445 cow/calf pairs of cattle for four months (June 15–October 15) and stipulates not to exceed 1,780 AUMs (USDA USFS, 1995). The North Crow Allotment, with its abundance of pastures, is run as a rest rotation allotment; via the use of adaptive management, one pasture receives rest each year. The Diorite Allotment is grazed as one pasture in a six pasture deferred rotation grazing system, in conjunction with adjacent BLM and private lands. The Diorite Allotment permits 58 cow/calf pairs for three months with a variable season of use, for a total of 230 AUMs permitted (USDA USFS, 2001). The AMP stipulates a variable season of use to allow for yearly changes in the deferred rotation grazing system.

4.2.4 Cattle Suitability Determination

ERG used GIS to characterize suitable acres for cattle grazing. The rating system is classified as one through four, where one is excellent, two is good, three is fair, and four is poor or basically unsuitable. To accomplish this, the following methods were used. A 30-meter Digital Elevation Model (DEM) was classified into slope categories and SILC3 coverage was classified into canopy cover classes as shown in table 4.2.4-2.

Table 4.2.4-2 Cover Class Catagories from SILC3 Coverage

ERG Classification	Slope	Canopy Cover
1	0–15%	0–9%
2	16–30%	10–24%
3	31–60%	25–44%
4	>60%	>44%

The two reclassified grids were then added together, yielding values of 2 through 8 for the combinations listed in Table 4.2.4-3 in the column "Result from Adding Two Grids." All values were then divided in half. For instance, where two ones were added to make two, the value was halved and reclassified as a one. All intermediate numbers of 1.5, 2.5, and 3.5 were rounded down in order to weight the result toward the more suitable end of the spectrum. Methodology for determining cattle suitability from slope and canopy cover are presented in Table 4.2.4-3.

Table 4.2.4-3 Methodology for Determining Cattle Suitability from Slope and Canopy Cover

ERG Final Classification	Result from Adding Two Grids	Slope	Canopy
1	2	0–15% (1)	0–9% (1)
	3	0–15% (1)	10–24% (2)
	3	16–30% (2)	0–9% (1)
2	4	0–15% (1)	25–44% (3)
	4	16–30% (2)	10–24% (2)
	4	31–60% (3)	0–9% (1)
	5	0–15% (1)	>44% (4)
	5	16–30% (2)	25–44% (3)
	5	31–60% (3)	10–24% (2)
	5	>60% (4)	0–9% (1)
3	6	16–30% (2)	>44% (4)
	6	31–60% (3)	25–44% (3)
	6	>60% (4)	10–24% (2)
	7	31–60% (3)	>44% (4)
	7	>60% (4)	25–44% (3)
4	8	>60% (4)	>44% (4)

Afterward, land classified as rock by TSMRS was verified using DOQs and then added to the grid as a classification of four (poor or unsuitable). Additional forested areas were determined by using TSMRS data with supplemental digitizing from DOQs. Furthermore, expert knowledge of the area was employed to eliminate open areas where cattle do not usually venture, based on communication with local stakeholders. These areas were also added to the grazing suitability grid with a classification of 4 (poor or unsuitable).

A map of cattle grazing suitability is presented on the following page (Figure 4.2.4-1).

Insert Cattle Grazing Suitability map.

Figure 4.2.4-1 Cattle Grazing Suitability Map

4.3 AREAS OF ELK/CATTLE OVERLAP

Deciding how to map Elk-Cattle Overlap (areas of significant dual use) was an intense process that involved communication with local stakeholders, field sampling, GIS analysis, and working with wildlife biologists. Such a large number of factors come into play when talking about impacts to rangelands, it is a challenge to characterize big picture effects without being caught up in all of the tiny details. Conversations about how to map areas of overlap brought up elk density, cattle AUMs, yearly precipitation, slope and aspect, season of use, ecological condition, production, pasture rotation, and much more.

ERG collected comments from stakeholders either verbally described or drawn onto field maps, particularly related to elk-cattle dual use areas. These comments are presented in Figures 4.3-1 and 4.3-2 on the following pages. ERG conducted a related GIS analysis, which included all four seasons of elk density data presented in Section 4.1. Areas of high elk concentration described in stakeholder conversations also showed up during GIS point density analysis of the DeSimone relocation points.

This study is focused not only on where elk and cattle overlap, but on also how the two species use available forage in the overlap areas. Therefore, our analysis did not stop at identifying high concentration areas of animals. A further purpose was to quantify use and determine whether highly used areas could potentially be “problem areas” in terms of forage allocation. Our methods are described below.

The first step toward the final map of elk-cattle overlap was simply intersecting areas used by elk with areas used by cattle. Areas of use by elk were determined by methods similar to those described in Section 4.1, although this exercise was based solely on distribution for the full year (rather than evaluating seasons separately and overlapping them). You may recall from Table 4.1-2 that the threshold indicating a significant distribution of elk for the full year is greater than 23.67 relocations per square mile. This was queried from the full year elk density grid and labeled “areas of elk use.” Cattle use was determined as described in Section 4.2.4. Grazing suitability ratings of one, two, and three were preserved, while the rating of four (poor or unsuitable) was removed from study. Only lands where the areas of elk use and areas of cattle use overlap were used in further study and deemed “dual use areas.” That is not to say that cattle or elk do not graze outside the dual use boundaries, but they do not overlap to an extent deemed significant.

To further qualify the area of significant dual use, percent utilization was overlayed onto the dual use grid and classified into three categories: low 0–10% utilization, medium 11–30% utilization, and high >30% utilization. Utilization data is based on a standardized NRCS methodology which accounts for the majority of factors discussed at the beginning of this section (see Section 3 for further explanation). Also, the

INSERT MAP

Figure 4.3-1 Stakeholder Comments Map

utilization measurements used here make no judgement about what ate the forage, only that it was utilized. This is one way to reach an unbiased conclusion about use in the overlap areas. The final Elk-Cattle Overlap map is presented on the following page (Figure 4.3-2). Our findings qualify the stakeholder comments by taking the information a step further to show actual use beyond mere presence.

Elk/Cattle overlap occurs in all pastures of the North Crow Allotment. Areas receiving "high" concentrations of dual use occur in six of the eight pastures. Areas of elk cattle overlap which extend past the boundary of the WMU are found in western portions of the Kimber-Diorite and Indian Creek BLM allotments.

Longfellow pasture is known to be an area of high elk concentration but low cattle concentration. The area is classified as medium dual use, which seems to make sense on the ground. In Shep's and Badger/Ribedeau pastures where elk are very concentrated and cattle are more than twice as concentrated (less acres per AUM) as in other pastures, classification is medium or high dual use. This too appears to be an accurate characterization. Concern is placed on the Elkhorn pasture where elk are known to concentrate but utilization data show little to no use. This is offset by the fact that Elkhorn was the rest pasture for cattle in 2004, but obviously not for elk.

Elk/Cattle overlap occurs in all pastures of all four cattle allotments within the WMU boundary in the Kimber EHU. Areas receiving "high" concentrations of dual use occur in all of the 11 pastures in these four allotments. Areas of elk/cattle overlap extend further outside of the WMU, in the Kimber EHU than they do in the North Crow EHU. This is most likely due to the nature of the differences between the two EHUs. Table 4.3-1 presents a comparison of the amount of rangeland habitats in each of the two EHUs.

Table 4.3-1 Rangeland Comparison Between Kimber and North Crow EHUs

Elk Herd Unit	Acres Inside the WMU	Rangeland Inside the WMU acres (% of area)	Acres Inside the Extended WMU	Rangeland Inside the Extended WMU acres (% of area)
Kimber	23,648	3,475 (15%)	28,566	8,777 (31%)
North Crow	28,757	8,854 (31%)	39,234	18,515 (47%)

INSERT MAP

Figure 4.3-2 North Crow EHU Elk-Cattle Overlap (Dual Use Areas)