

IMPACTS OF CATTLE GRAZING AND SUBDIVISIONS
ON GRANT CREEK UNGULATES

By

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ABSTRACT

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Impacts of Cattle Grazing and Subdivisions on Grant Creek
Ungulates (100 pp.)

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Elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*O. virginianus*) have used foothill pastures, north of Missoula, Montana, as winter range. Grant Creek Ranch grazed cattle on these pastures during the summer for the last 30 years. The ranch was purchased for subdivision development and, subsequently, 284 ha of winter range was donated to the National Wildlife Federation. This provided an opportunity to study impacts of cattle grazing and subdivisions on a traditional winter range. Baseline data were obtained on elk and deer populations, concentration areas, and migration routes prior to subdivision activities. Permanent transects were established to measure forage production, range condition, and forage utilized by cattle, elk, and deer. Radio-marked elk and deer followed the main system of ridges between Grant and Rattlesnake creeks for migration routes between summer and winter ranges. Winter concentration areas were on timbered north aspects and on upper slopes of south and west aspects of adjacent open grasslands. During the last 10 years, 27 houses were built within 0.5 km of the National Wildlife Federation's Grantland Nature and Wildlife Reserve, primarily along the forested northern end. Approximately 250 additional houses are planned for construction, mostly along the west and open south sides. Extensive developments are planned for the west side of the ranch. Subdivision activities were largely non-existent during this study. Differences in wild ungulate numbers and use patterns between winters were attributed to influences of weather and not cattle grazing or subdivision activities. Recommendations include: placing housing and roads as far and as much out-of-sight as possible from elk and deer concentration areas; maintain strict control of dog and human trespass during winter and spring; and continue to graze cattle in a manner similar to past practices.

INTRODUCTION

Elk (Cervus elaphus), mule deer (Odocoileus hemionus), and white-tailed deer (O. virginianus) historically occupied the foothills of the Rattlesnake Mountains north of Missoula, Montana, during winter and early spring. The elk, mule deer and, to some extent white-tailed deer, usually spent the summer and fall at higher elevations. Some white-tailed deer remained on the foothills and in creek bottoms. All 3 species congregated on the foothills when snow and severe weather forced them to lower elevations. The wild ruminants were often visible on the west and south facing grassy slopes of the foothills along Grant and Rattlesnake creeks.

The Grant Creek Ranch, primarily a commercial and registered beef cattle operation, was situated on 1862 ha of bottomland and foothills along Grant Creek. Cattle grazed these foothill pastures each year from approximately 1 May into October or November from 1956 to 1978. Elk using these same pastures were observed by Ranch personnel for about the last 30 years (R. Marbut, pers. comm.).

In 1978, Grant Creek Associates, Ltd. (GCA) purchased the Ranch for housing development, approximately 1/3 was planned for development. Both the former Ranch owners and developers were concerned about the tremendous wildlife values of the area, especially winter range for elk and deer. The developers donated approximately 284 ha of critical winter range to the National Wildlife Federation (NWF). The NWF set

aside the parcel as the Grantland Nature and Wildlife Reserve (GNWR) and appointed a 7 member local management committee.

Subdivisions and other human activities have encroached on the lower-elevation edges of the winter-spring range, especially during the last 5-10 years. This encroachment has extended the period of winter stress by preventing animals from grazing the lower slopes that green-up first during spring. Green-up coincides with the time of most rapid fetal growth and prepares cows and does for the extreme drain of lactation. To minimize the impacts of subdivisions, the Montana Cooperative Wildlife Research Unit and Montana Department of Fish, Wildlife and Parks were approached to provide expertise and to study the present status of the elk and deer.

Subdivisions on or near winter ranges present a tremendous problem to western wildlife management agencies. Careful development near Vail, Colorado, indicated some ill effects of subdivisions on wildlife could be reduced (Summer 1974). The cluster development planned on Grantland, with winter ranges and a migration corridor reserved and managed for big game, should disrupt wildlife less than an unplanned development.

Livestock grazing on big-game winter ranges also presents problems for western game managers. Intuitively, forage taken by livestock could mean less for big game. However, elk preference for winter ranges moderately grazed during summer by cattle to those left ungrazed was documented in northeastern Oregon (Anderson and Scherzinger 1975).

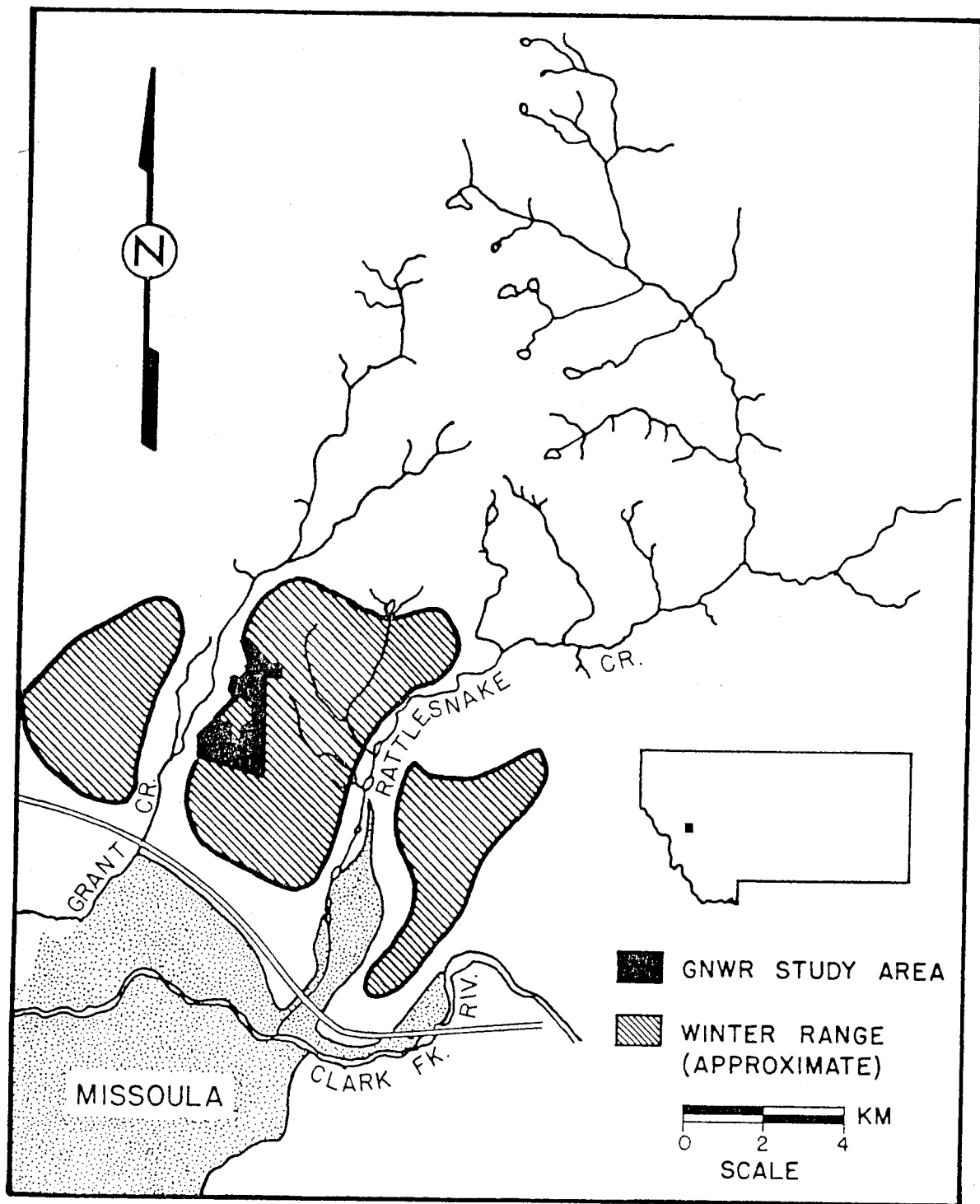


Figure 1. Grantland Nature and Wildlife Reserve (GNWR) and primary winter ranges.

RESULTS

Elk and Deer Populations

The minimum numbers of elk using the GNWR were derived from visual observations; 34 were seen in 1981 and 28 in 1982 (Table 1). Elk were observed between 25 January and 16 April 1981 and 6 January and 10 April 1982.

Mule deer were seen 43 times in 1981 (Table 1), the largest group was 61 on 26 April. In 1982, 30 groups were observed, and 59 on 4 April was the largest group. The average group size was 10 in 1982 compared with 15 in 1981.

White-tailed deer were seen throughout the year in creek bottoms and on side hills. Numbers varied, but groups of 3 to 7 were common. During 1981, the largest group observed on the winter range was 27, and from 56 observations during winter, the average group size was 7 (Table 1). In 1982, 12 observations were made. The largest group was 7 animals and the average was 3.

Pellet group counts were conducted in 1980, 1981, and 1982 (Table 2); however, only elk pellets were counted in 1980. The number of days of use for elk ranged from 1260 to 2100. The number of elk using the GNWR was estimated at 42 in 1980, 50 in 1981, and 70 in 1982, assuming they spent 30 days on the GNWR of 150 days on winter range.

Table 1. Estimated numbers of elk and deer using the GNWR.

	Visual Observations					
	1981			1982		
	Largest Group Size	Mean Group Size	Number of Groups Seen	Largest Group Size	Mean Group Size	Number of Groups Seen
Elk	34	22	19	28	11	17
Mule deer	61	15	43	59	10	30
White-tailed deer	27	7	56	7	3	12

Table 2. Estimated numbers of elk and deer using the GNWR from pellet groups.

	1980		1981		1982	
	Animal Days	Number of Animals	Animal Days	Number of Animals	Animal Days	Number of Animals
Elk	1,260	42	1,500	50	2,100	70
Deer	--	--	2,580	86	2,193	73

Mule and white-tailed deer pellets were not separated. Days of use by deer were 2580 in 1981 and 2190 in 1982. An estimated 86 deer in 1981 and 73 in 1982 used the GNWR.

Trapping and Radio Monitoring

Thirteen elk, 29 mule deer, and 10 white-tailed deer were trapped during 1981 and 1982. Radio collars were fitted on 6 elk and a mule deer in 1981 and 5 elk and 6 mule deer in 1982 (Table 3). Animals trapped but not collared were too young, not needed, or escaped before traps were approached by handlers. Two mule deer were recaptured in 1982, 1 was recaptured twice.

A second transmitter with an identical frequency was used after the original failed in July 1981. This bull elk (M01) was seen on the GNWR during winter 1981-1982. A radio marked spike was shot in November 1981 during the hunting season. The collar was returned and used on another animal.

Radio monitoring began in April 1981 and continued through the end of February 1983, 241 relocations were recorded from 35 flights and 294 relocations from 66 ground-tracking trips (Table 4). Flights were not randomly timed, most took place between 0600 h and noon. Ground tracking trips were restricted to the winter range and daylight hours.

Big Game Concentration Areas and Migration Corridor

Elk and deer concentrations were mapped in relation to major land ownership using pellet group counts and radio relocations (Fig. 3). Spring and fall radio locations of elk and deer were plotted, identifying the major migration corridor (Fig. 4). The distance between summer and winter range is short, approximately 12 km. Elk traveled to and from the winter range between October and January. In the spring, some animals left as early as April while others stayed until June.

Several elk traveled to the more distant areas of Finley Creek, Middle Fork of the Jocko River, and to Sunflower Mountain near the Blackfoot River. Deer relocations were scattered, a male and a female mule deer stayed on the winter range all summer while others traveled widely. Although 7 deer were radio collared, many transmitters either malfunctioned within a few months or the deer moved from the area and were not located.

Permanent Transects

Permanent transects were established on a silty range site in a 38-48 cm precipitation zone (Figs. 5-9). All transects were on gentle slopes with primarily a west (transects 1-4) or south (transect 5) aspect (Fig. 10). Appendix B lists the specific location, methodology, and results.

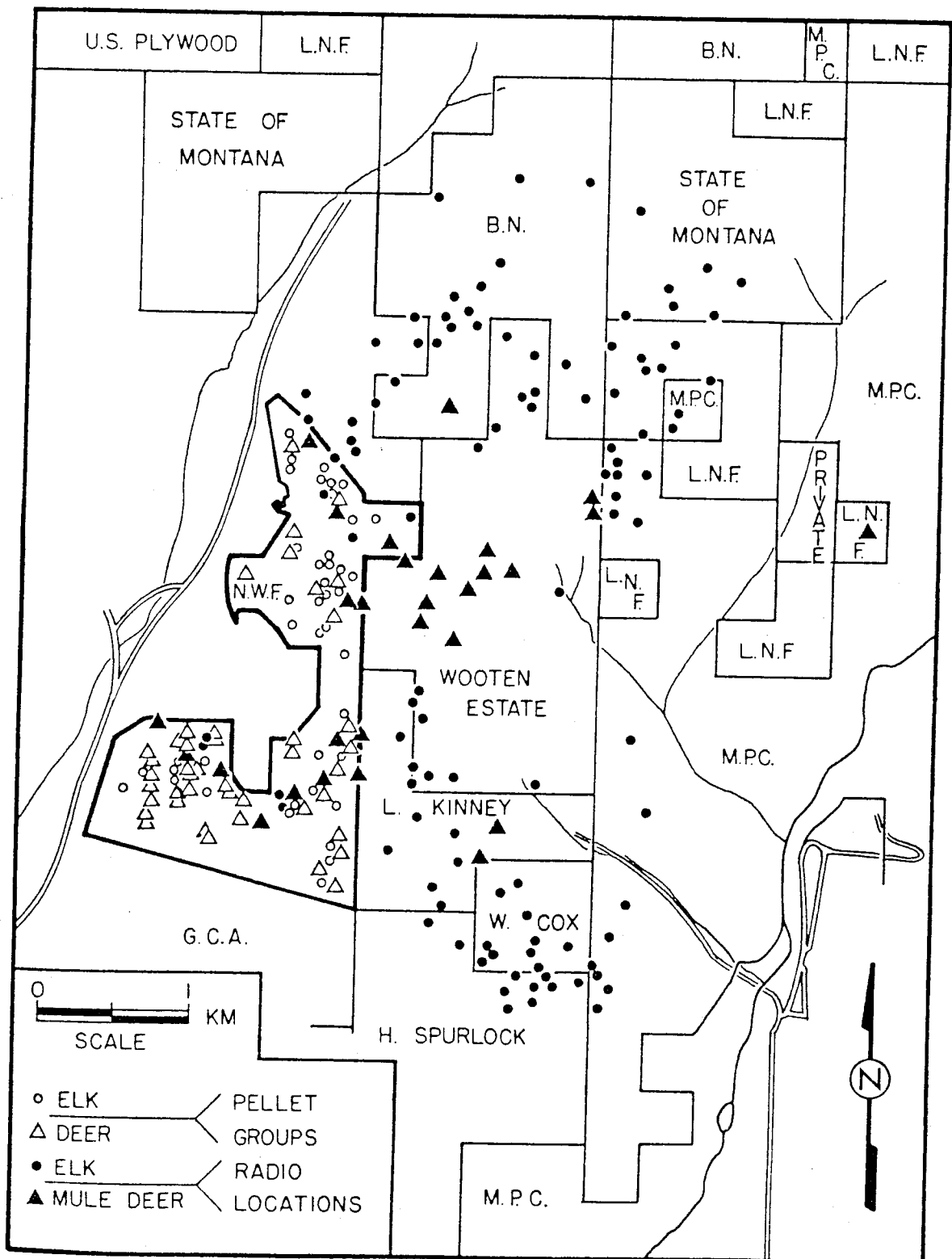


Figure 3. Concentration areas of elk and mule deer from radio locations and pellet groups, in relation to land ownership: BN, Burlington Northern; GCA, Grant Creek Associates, Ltd.; LNF, Lolo National Forest; MPC, Montana Power Company; and NWF, National Wildlife Federation.

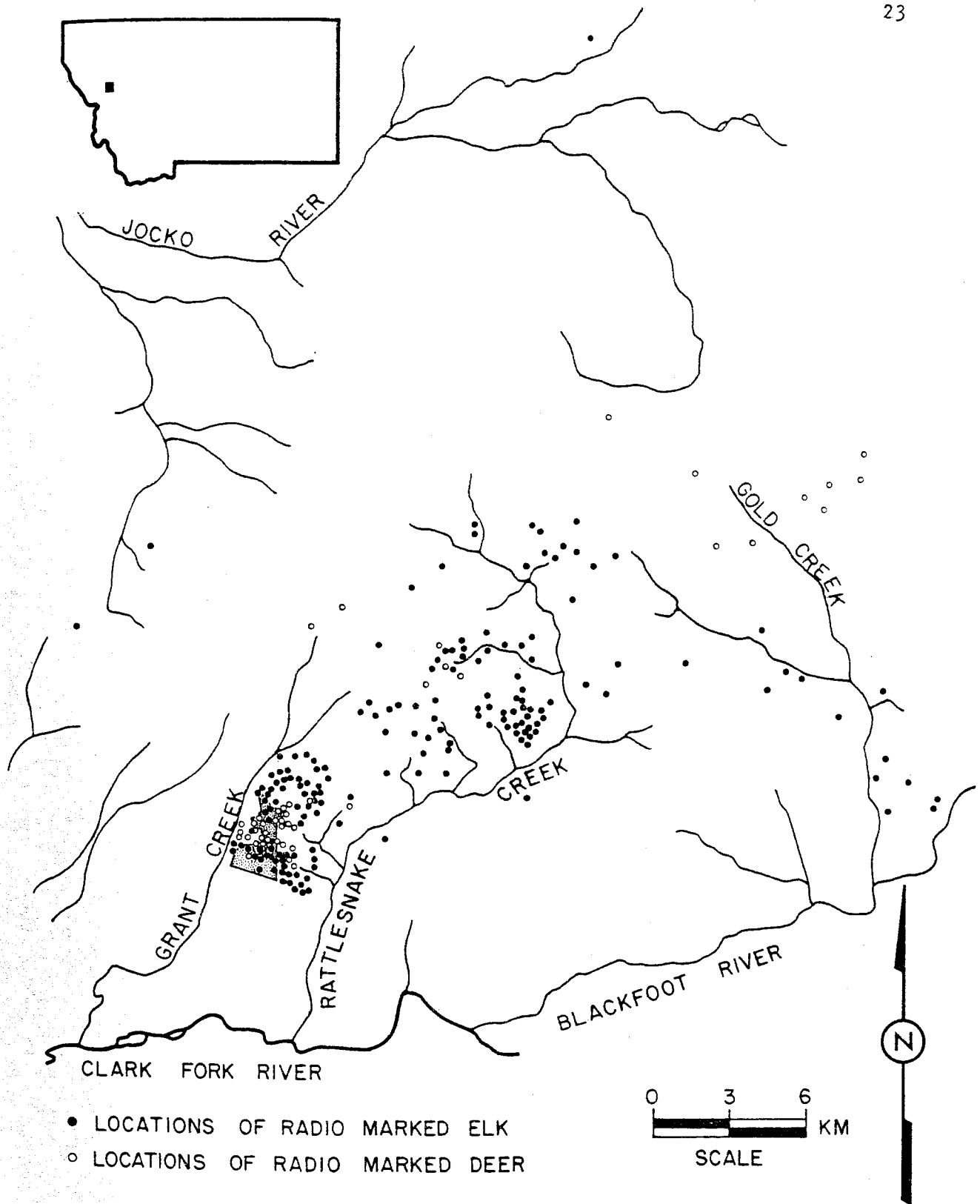


Figure 4. Locations of radio-marked elk and mule deer, showing relation of the main winter range on and around the GNWR, the main summer range on the upper drainage of Rattlesnake Creek, and the primary travel corridor between Grant and Rattlesnake creeks.

DISCUSSION

Elk and Deer Populations

Elk are gregarious animals, particularly on winter range (Murie 1951). Mule deer (Geist 1981) and to some extent white-tailed deer also congregate at that time (Halls 1978). The open southern and western exposures enabled observation of the animals while they were in large groups. The minimum populations of 34 and 28 elk seen during the winters of 1980-81 and 1981-82, respectively, were comparable to observations by residents during the last 30 years, indicating a stable population.

This elk herd seems distinct from the herd on elk ridge, east of Rattlesnake Creek. On 1 April 1981, 30 elk were observed on the GNWR and another herd of 27 were seen on elk ridge. Elk movement across Grant Creek towards Butler Creek was not detected during this study. Residents did report observations of elk on the ridge between Butler and Grant creeks during the winter of 1981-1982.

The minimum population of 61 mule deer on the GNWR in 1981 compared closely to the 59 observed in 1982. Generally, mule deer were in small groups scattered over the range, as was suggested by the mean group sizes of 15 in 1981 and 10 in 1982. The decrease of 33% in the mean group size during 1982 probably reflects factors such as weather, changing seasons, behavior, and observability. Mackie (1970) found that

observed numbers of mule deer did not reflect population changes, and the same proportion of the population was not seen at a given season during different years.

White-tailed deer were seen in scattered bands of 3-7, particularly along the valley bottom and associated draws. A minimum population estimate of 27 in 1981 and only 7 in 1982 also indicates variations in behavior, responses to weather, and observability. Deep, crusty snow during winter 1982 made travel difficult on the south aspects, so deer did not use these areas as in 1981. Visual observations of animals scattered through the timber did not reflect the total population numbers. Care needs to be taken using these population numbers, even as an index.

Population estimates from pellet group counts appear to overestimate the herd size. Pellet group counts have several weaknesses when used to estimate populations. Primarily, the number of days spent on the winter range must be known to calculate population numbers, this was, at best, a crude guess.

Big Game Concentration Areas and Migration Corridor

Elk pellet group counts during 3 years indicate concentrations on the north end of Upper Toner, LKP-Baldhill, LKP-3 Peaks and the ridge at the north end of the GNWR. This corresponds to visual observations from the ground and air. Although much of the GNWR is used at some time, particularly by deer, elk primarily used forested areas and adjacent

open areas (Fig. 3). Severe weather, primarily snow depth, is sometimes responsible for movements on winter ranges, but lack of forage also forces movements according to Severinghaus (1947) and Edwards (1956). Elk and deer moved on and off of the GNWR throughout the winter, traveling about the winter range.

Radio-location flights were flown at varying times and intervals, depending on weather and schedules. Locations from flights reflect morning feeding and bedding locations and do not represent use during other periods of the day. Ground tracking, also at varying intervals, reflect use during daylight hours. Many location points on Figure 3 represent several readings at that location because the computer printed them on top of each other.

The area between Grant and Rattlesnake creeks was the primary migration corridor between summer and winter ranges (Fig. 4). Animal locations along the migration corridor were in a wide variety of habitats.

Migration of elk and deer from summer range took place during late fall and early winter. Factors triggering fall migrations vary as much as the patterns of migration themselves. Searches for food, snow accumulation, snowstorms, and temperature have been suggested as triggering mechanisms (Russell 1932, Rasmussen 1941, Edwards 1942, Murie 1951, Brazda 1953, Anderson 1954, Edwards and Ritcey 1956). Although elk and mule deer left winter range from April through June, elk traveled between winter and summer ranges throughout summer and fall.

most by wildlife was separated by distance or physical barriers from residential areas.

Subdivisions

The effects of subdivision development on elk and deer numbers and movements were minimal at the time of this study because of market conditions. Some evidence exists that elk used the west side of the 3-Peaks hill for grazing and for north and south travel before houses were placed on the Gary R. Marbut property. The area east of the 3-Peaks is now used as a north/south travel corridor. This is based on observations by local residents, the lack of new pellet groups on the west side, and the presence of recent pellet groups on the east side. Other changes from past use have been noted by residents. Whether these are major changes or due to weather, forage availability, forage preference, or behavioral adjustments is speculation. Elk have been observed grazing on the top and southern aspects of 3-Peaks, as well as the meadow area to the south during each year of the study. I have not observed major changes in population numbers or patterns of use by elk or deer during this study.

The related impacts of humans dwelling near the GNWR are probably limited to disturbances by occasional hikers, skiers, and hunters passing through the area and by dogs harassing deer and elk on the range. Hunters were seen crossing the southeast corner of the GNWR once, they did not appear to be hunting at the time. A hiker and 4 sets

of ski tracts were observed, a low rate of trespass for the 2 3/4 years of this study. Dogs were seen running loose on the GNWR, occasionally chasing deer. Dogs have not been a big problem on the GNWR and the local residents seem to make a genuine effort to restrain pets and seek out strays.

Deer and elk loss and injury due to dogs is difficult to document accurately. In a nation-wide survey of agricultural, wildlife, and natural resource agencies, Denny (1974) estimated 20,000 deer were killed in the 32 states that responded. Dogs were blamed for losses up to 8% of the known deer loss. Lyon (1969) found that large packs of domestic dogs killed 4 elk during a period of 3 weeks in Idaho. He found elk and deer were more vulnerable to dogs on winter range because of snow accumulations, reduced energy reserves, and the proximity of winter ranges to human habitation. Also, dogs became adept at avoiding humans and were difficult to discourage or control because of abundant escape cover and rugged terrain. Hayden (1975) thought deer populations would be permanently displaced from their home ranges if dogs continued to roam free on those ranges.

MANAGEMENT RECOMMENDATIONS

1. Fence the remaining GNWR boundary and develop water on pastures to provide better control of cattle grazing.
2. Continue differential cattle grazing to simulate past grazing practices and to provide a consistent cause/effect relationship for comparison with future changes in housing developments. In the future, management may be varied to test influences of various levels of grazing.
3. Continue to monitor cattle grazing to protect the range and to ensure sufficient winter forage for elk and deer.
4. Promote landowner/NWF relations to encourage cooperation with dog and trespass control.
5. Repeat this study in 5 years (1988) to monitor increased subdivision development and its impact on elk and deer.