HOME RANGE SIZE AND HABITAT USE BY WILD HORSES

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Historically, management and development of much of our public rangeland have been single-use oriented. However, within approximately the last 15 years, federal legislation has mandated that public land management be shifted more toward optimum development of the land's many potentials. Management under this policy demands an intimate knowledge of an area's resources and an understanding of the requirements, utilization patterns, and impacts of the various users present on each piece of ground.

The federal protection granted wild horses (Equus caballus) in 1971 forced management agencies to assume responsibility for wild horses with only a scattering of information available for consideration in management and policy making. The Bureau of Land Management's Vale District was faced with this problem in the Three Fingers Rock area where cattle (Bos spp.), wild horses, mule deer (Odocoileus hemionus hemionus), and California bighorn sheep (Ovis canadensis californiana) have access to common grazing lands. This paper will review efforts to document wild horse home ranges and activities, as well as slope and water use patterns.

PROCEDURES

The study area is situated approximately 40 miles south of the town of Vale in southeast Oregon and borders the east bank of the Owyhee Reservoir. Total area was approximately 145 square miles and the area was divided into three pastures by fencing and natural boundaries. Wild horse home range estimates were based on repeated relocations of radio equipped or easily identified horses. A coordinate grid was superimposed on a map of the area and appropriate X and Y values recorded when animals were sighted. Resolution of the coordinate system placed animals in a 40 acre area. Home ranges were defined by constructing a 90 percent confidence ellipse about relocation points (Koeppl et al., 1975), thus enabling one to define the probability of finding an individual or group of animals in a given area (Harrson, 1958).

Simultaneous with animal relocations, data on activity and percent slope were noted. Horse watering patterns were monitored with time-lapse cameras placed over developed water holes. Slope availability data were derived from U.S. Geological Survey topographic maps. Horse watering patterns and slope use data were analyzed by Chi square procedures as outlined by Marcum and Loftsgaarden (1980).

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[1] This work was funded by the Bureau of Land Management and the Eastern Oregon Agricultural Research Center.

RESULTS AND DISCUSSION

Home range sizes were estimated for 14 bands and nine studs (Table 1). Average home range size was 10.91 square miles for bands and 9.95 square miles for studs, with no significant differences between the two.

Table 1. Number of relocations, span of months observed, and 90 percent confidence ellipse estimates of home range size for 14 bands and nine studs

	Number relocations	Number months observed	Ellipse areas (square miles)
Band			
A	56	23	6.55
B	30	17	4.35
C	24	20	5.15
D	17	19	5.44
E	14	19	6.02
F	16	19	5.02
G	18	18	5.13
H	23	22	6.16
K	15	7	4.54
K	10	15	28.11
L	23	23	20.87
N	15	15	23.43
P	10	17	17.70
S	14	14	14.29
Mean	20.4	17.7	10.91
Standard deviation			8.27
Stud			
1	49	22	7.84
2	47	21	8.51
5	29	24	8.91
6	11	3	3.14
8	13	22	10.25
11	17	22	14.70
12	16	22	12.80
26	14	20	5.78
28	10	17	17.65
Mean	22.9	19.2	9.95
Standard deviation			4.49

Horses did not appear to be confined by fences, as no home range encompassed the entire area within a pasture. With few exceptions, both bands and studs showed remarkable fidelity for their home ranges. No seasonal shifts in use areas were detected. Only one animal, a stud, appeared unwilling to settle in a defined area The home range estimate for this horse was 91.5 square miles. As this value seemed atypical, and inflated the mean substantially, it was dropped from the data summary.

One band and two studs made permanent shifts to new home ranges during midstudy. Band K moved approximately 5.3 miles south and east and established a new home range (K'). Two studs who were in an area by themselves moved into a pasture occupied by other horses and remained for the duration of the study. This was a move of about 3.0 miles.

Band and stud home ranges overlapped substantially on the area and in many cases were nearly superimposed. Harem studs defended a small perimeter in the immediate vicinity of their bands, but no territorial behavior was observed. Miller (1980) defined a horse herd which consisted of bands and studs having overlapping and similar movement patterns, intergroup recognition, and an intergroup dominance hierarchy. This concept appeared quite applicable on the area. Six herds were defined, and bands and studs making up each herd habitually remained within well defined areas with very few interherd exchanges or encounters occurring (Figure 1). Herd boundaries consisted of fences and major drainages, however, no physical restraints continuously impeded horse movements. Gates were often left open, and natural boundaries were quite passable. No horses were observed breaching or jumping fences even when left behind by other animals. Herd E utilized two pastures through gates which allowed a single water hole to service both pastures.

Horse watering activities were concentrated in the early and late hours of daylight. Only 20 percent of their watering efforts occurred during the central portions of the day. Generally, groups of horses moved rapidly to and from water and spent very little time lounging in the vicinity of water. Average time spent at water was 16.1 minutes, with drinking efforts averaging 6.3 minutes. No aggressive behavior by horses toward other species was observed at water or elsewhere on the area.

Daily horse activity patterns are depicted by Figure 2. Feeding efforts averaged 68 percent of their daylight activities. Three peaks of feeding: morning, midday, and evening. Feeding was most intense during evening, when 95 percent of the animals were involved. Resting averaged 18 percent of daylight activities and was most intense in early afternoon. Other activities, primarily traveling and drinking, accounted for an average of 14 percent of the day.

Horses on the area generally had an affinity for high benches and gently sloping ridgetops. The average grade for horse sightings was 11.2 percent. They favored slopes between 0 and 19 percent and showed no preference or avoidance for slopes in the 20 to 29 percent category (Table 2). Thirty percent or greater grades were avoided by horses, with the 50 to 59 percent category being the upper limit of use.

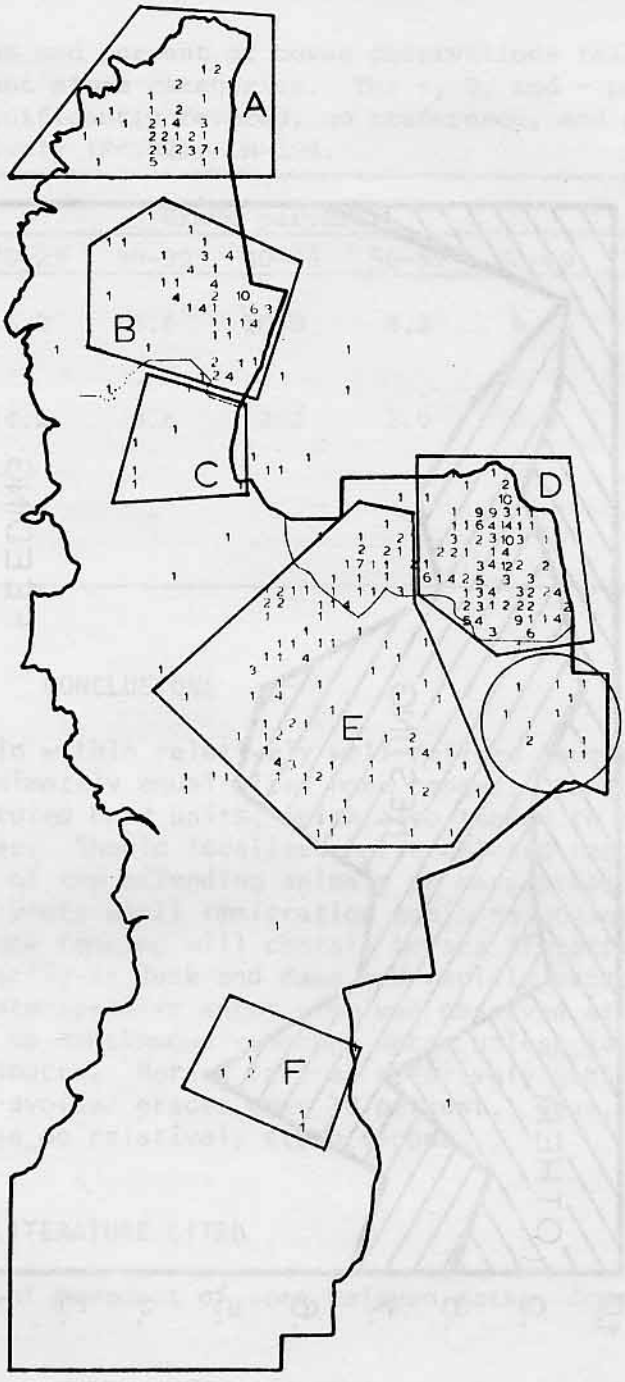

Figure 1. Distribution of six horse herds on the Three Fingers study area. The circled area designates relocations for two studs prior to a permanent move north into the next pasture. Approximate scale 1:253440.

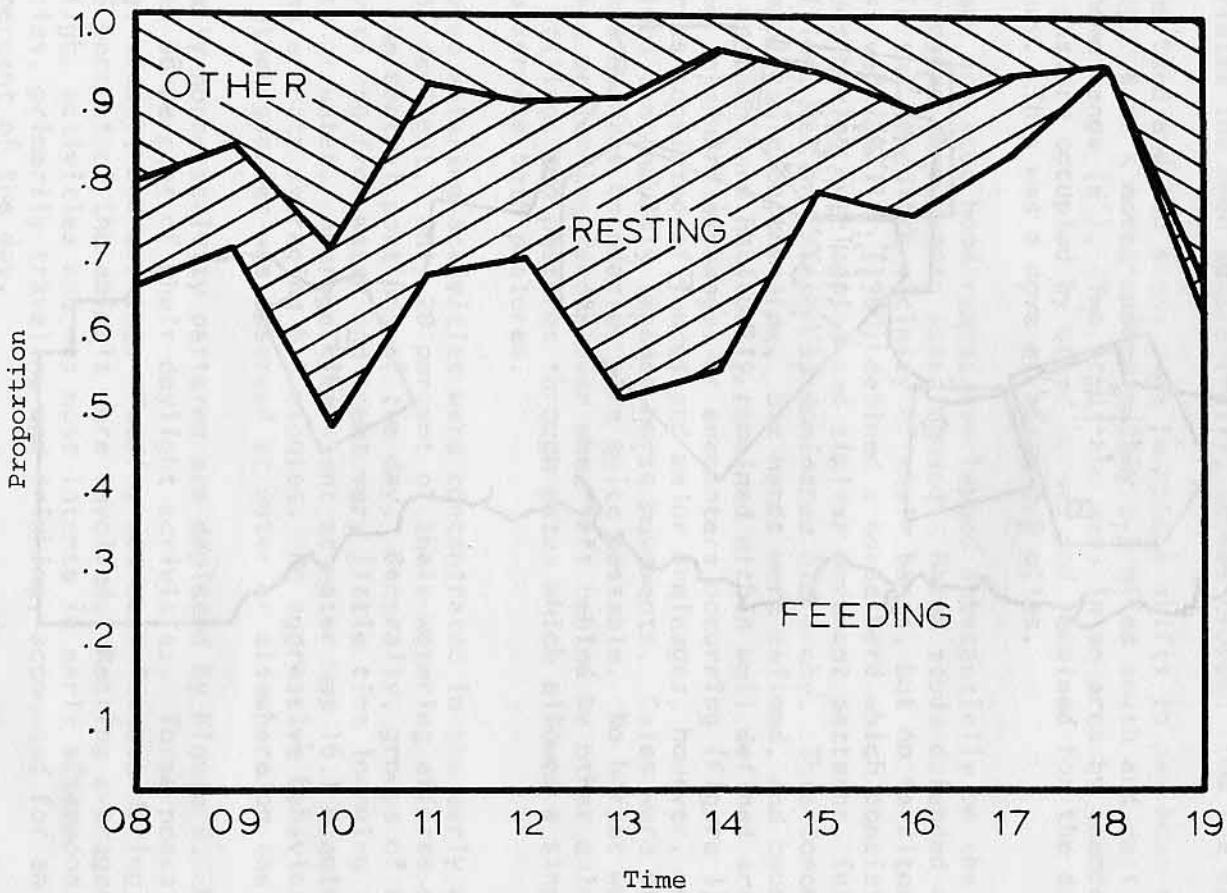

Figure 2. Daily horse activity patterns on the Three Fingers study area.

Table 2. Percent of study area and percent of horse observations falling in progressive 10 percent slope categories. The +, 0, and - preference ratings indicate significantly favored, no preference, and avoided categories, respectively (P<.02). N=394.

	Grade percent								
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Study area percent	15.3	19.2	15.2	13.6	10.8	8.2	8.5	3.0	6.2
Horse obs. percent	42.9	36.0	14.2	3.6	2.3	1.0	0.0	0.0	0.0
Preference rating	+	+	0	-	-	-	-	-	-

CONCLUSIONS

Horses appeared to remain within relatively well-defined boundaries, with bands and studs having approximately equal-sized home ranges. Band and stud ranges overlapped and constituted herd units, which also tended to remain within well-defined boundaries. Should localized horse-related range management problems occur, removal of the offending animals or herd probably would rectify the problem for some years until immigration again repopulated the area. Standard four-wire stock fencing will contain horses if gates are kept closed. Horses watered primarily at dusk and dawn and rapidly vacated water sources when finished. No interspecific antagonism was observed at water and horses would not be expected to continuously occupy water unless large numbers were forced to use a single source. Horses favored relatively gentle slopes between 0 and 19 percent and avoided grades over 30 percent. Thus, one should not expect intensive horse use on relatively steep slopes.

LITERATURE CITED

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