

IMPROVEMENT OF ELK HABITAT IN THE NORTH GRANDE RONDE VALLEY

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SUMMARY

Prior to European settlement, the Grande Ronde Valley of northeastern Oregon provided complete habitat for Rocky Mountain elk (*Cervus elaphus nelsonii*) and mule deer (*Odocoileus hemionus hemionus*). The valley floor infrequently had deep snow cover and offered a variety of cover and forage habitat. Highest elk and deer use probably occurred during winter and early-spring seasons. Non-forested bunchgrass rangeland surrounding the valley floor provided spring-fall transitional habitat, with high quality forage offered by spring and fall growth of forage plants. Forested uplands at higher elevation offered summer habitat with an abundance of cover and forage.

Settlement, accompanied by conversion of fertile bottomlands of the valley floor to cropland, grazing of the surrounding bunchgrass rangeland, and grazing, timber harvest, and recreation on the forested uplands, changed the natural habitat of the valley. Habitat can no longer be considered as being complete for large wild herbivores. However, the extirpation of elk and reduction of deer on much of their northeastern Oregon range, which accompanied settlement, largely precluded habitat change as being a major factor influencing elk and deer populations.

Establishment of hunting seasons and enforcement of hunting regulations accompanied the reintroduction of elk to northeastern Oregon. As elk and deer populations increased and expanded throughout the region, incomplete habitat for elk, and to a lesser extent for deer, has created a conflict situation. The valley is now private land used primarily for crop agriculture. Elk, because of their visibility and tendency towards herd-size social groups, are perceived by farmers and ranchers as the cause of damage to crops and soils. Damage caused by trampling crops during travel, bedding in areas of growing crops, damage to fences, compaction of wet or moist soils; and consumption of forage, fodder and food crops are attributed to elk.

The relatively recent trend to convert marginal agricultural land into smaller properties consisting of a few acres and a residence is also rapidly changing the status of habitat use by elk and deer. Different perceptions of land use exist between large and small property owners. Also, management of elk and deer populations is made more difficult as the dynamics of land ownership and property size change.

Large numbers of elk customarily use agricultural land of the valley floor as winter habitat, especially during severe winter weather events. However, elk are now resident in the valley throughout the year. While resumption of elk use of the valley as winter habitat has annoyed private landowners, but winter use is generally accepted by landowners. Landowners, especially landowners engaged in large-scale crop agriculture, are less accepting of a resident elk population that includes agricultural cropland as a major habitat component.

METHODOLOGY

Landowner complaints in regard to resident elk depredation of crops and private property prompted the Oregon Department of Fish and Wildlife and the Eastern Oregon Agricultural

Research Center (EOARC) to initiate a joint study in 1993. The goal of the five-year study was to determine ways to alleviate conflict over large wild herbivore use of agriculture land in the North Grande Ronde Valley. Elk were to be trapped during winter by the ODFW and removed from the North Grande Ronde Valley. EOARC would initiate habitat improvements in bunchgrass rangeland surrounding the valley, and on upland forested summer rangeland to determine the effectiveness of using habitat improvements to encourage elk to move to public or commercial land on upland summer habitat.

Observation of elk and deer use of the North Grande Ronde Valley was initiated to determine if removal of elk through trapping and/or habitat improvements changed the dynamics of elk use of agricultural habitat. Seasonal elk numbers and habitat use were observed for a total of 5 years. Two years of observation occurred prior to and after implementation of habitat improvements. Habitat improvements were implemented during the third year of observations. Habitat improvements consisted of: (a) establishing 24-permanent salt stations on USDA-Forest Service, and Boise Cascade Corporation forested rangeland; (b) establishing three new water sources on Boise Cascade Corporation forest land; (c) applying fertilizer to bunchgrass rangelands and old fields located on, or adjacent to, summer forested habitat; and (d) seeding fields with types of forage palatable to elk and deer.

Observational data collected from established vehicular routes consisted of elk and deer numbers, land type being used, animal activity, soil condition, weather condition, and temperature at time of observation. If agricultural land was being used, land type was further separated into different classes of agricultural land.

Elk and deer use of habitat before and after habitat treatment will be compared to determine if habitat improvement and winter trapping influenced herbivore use of agricultural land in the North Grande Ronde Valley. High-density elk and deer use areas will be defined and spatially displayed. The data reported here addresses elk use of North Grande Ronde Valley habitat during the third "treatment" year and the two years following implementation of habitat improvements.

RESULTS

Number of Elk Observed

Elk using the valley floor and surrounding environs were counted 3-times weekly from road transects (Table 1). The highest number of elk observed using valley habitat occurred during winter (December through February). Total elk observed remained high during spring (March through May). During the summer (June through August), elk numbers decreased by approximately two-thirds, even though the number of observations remained high. During the fall (September through November), elk numbers and the number of observations were few. The high number of elk observed during the winter and spring seasons was expected since most severe weather events occur on upland habitat during these seasons. Both seasons are also periods during which nutritional stress may influence elk to seek foraging opportunities on agricultural land of the valley floor. The decline in number of elk observed during the winter and spring seasons in 1996 and 1997 may result from the relatively mild winters and the early snow melt that occurred both years. Elk, observed during the summer season, showed no definite trend other than more elk were observed in the valley, and more observations of elk were made

following habitat improvements in 1995. The few elk observed during the fall season are expected as crop-harvest activity increases, and the annual hunting seasons begin.

Table 1. Number of elk observed seasonally in the North Grande Ronde Valley (1995-1997).

Season Year	Winter		Spring		Summer		Fall	
	No. Elk	No./Obs	No. Elk	No./Obs	No. Elk	No./Obs	No. Elk	No./Obs
1995	510.50	10.50	446.34	18.33	74.67	6.33	11	2
1996	435.50	14.50	306.67	18.67	210.17	14.17	34	3
1997	405.00	12.83	387.00	12.00	133.00	11.66	-	-
Aver.	450.33	12.61	380.00	16.33	139.28	10.72	22.5	2.5
Stdev.	54.29	2.01	70.10	3.76	67.97	4.00	16.26	0.71

Average numbers of elk observed in the North Grande Ronde Valley over the 3 years were highest during winter and spring. Relatively few elk were observed during the summer (14 percent), compared to winter (46 percent), and spring (38 percent). However, the relatively high number of elk observed during the spring when soils are wet or moist and crop growth is initiated indicates the potential for elk to damage growing crops. The lower number of elk observed during the summer indicates the relative difference between numbers of migratory elk and resident elk. Least elk (2 percent) were observed during the fall. Although further analysis is required, there is an indication that elk damage to crops during the spring may be caused by migratory and summer resident elk, while only resident elk cause summer crop damage.

Grazing was the major activity of elk during daytime (only daytime observations were made) in all seasons (Table 2). Grazing was highest during the summer and spring, comprising 75- to 80 percent of observed elk activity. Grazing during winter and fall seasons comprised between 55- and 60 percent of observed elk activity. During the winter season, "bedded" comprised over 30 percent of elk activity. Elk may be conserving energy during winter through longer inactive periods. During the fall season, grazing and travel comprised almost all observed elk activity.

Table 2. Seasonal elk activity in the North Grande Ronde Valley (average of 1995 to 1997).

Season	Activity		
	Graze	Travel	Bed
Winter	57.73	9.45	32.82
Spring	76.99	7.59	15.76
Summer	80.96	14.15	4.88
Fall	58.34	41.67	0.00

Elk were observed during all seasons to use rangeland more than any other land type in the North Grande Ronde Valley (Table 3). During winter, spring, and fall seasons, between 75- to 85 percent of elk were observed in rangeland habitat. However, during the summer season,

almost as many elk (40 percent) were observed in agricultural habitat. Although elk numbers resident in the valley are much lower in summer than during the winter and spring seasons, a major shift by elk from rangeland habitat to agricultural habitat is indicated. Little use by elk of forested habitat or improved pasture was observed. The presence of forest cover was obviously a constraint to observing elk in forest habitat.

Table 3. Seasonal elk use of different land types in the North Grande Ronde Valley (average of 1995 to 1997).

Season	Land Type			
	Range	Cropland	Forest	Im. Pasture
Winter	77.67	13.57	4.91	3.84
Spring	81.66	12.83	2.82	2.71
Summer	43.29	39.54	4.35	12.84
Fall	79.18	16.67	0.00	4.17

Hay land was the type of agricultural land observed to receive the greatest use by elk in the North Grande Ronde Valley during spring and summer seasons (Table 4). During the winter elk were observed almost equally in hayland, stubble, and grass seed fields. Between 20- and 30 percent of elk were observed in grain fields during spring and summer. Very few elk were observed in fallow fields during any season. Grass seed and fields planted to winter grain offer winter foraging opportunities to elk. During spring, hay and grain offer high quality foraging opportunities to elk as spring growth is initiated. Little elk activity is expected in fallow fields during any season and stubble fields are only available after grain harvest. Elk presence in different types of agricultural land indicates that elk are maximizing opportunities to obtain a high quality diet from different agricultural crops during different seasons.

Table 4. Seasonal elk use observed in different agricultural land types in the North Grande Ronde Valley.

Season	Cropland				
	Hay	Stubble	Worked	Grain	Grass Seed
Winter	25.00	29.17	0.00	4.17	25.00
Spring	66.67	2.78	0.00	30.56	0.00
Summer	74.77	0.00	2.78	20.61	1.85
Fall	0.00	25.00	0.00	0.00	0.00

DISCUSSION

Elk are definitely present in the North Grande Ronde Valley in large numbers during the winter and spring seasons. During these seasons, migratory and resident elk are using all habitat,

including agricultural habitat. Other data will be evaluated to determine if elk use of agricultural habitat is occurring during periods of time when crops are initiating growth, or soils are unstable.

Elk and deer use of habitat before and after habitat treatment will be compared to determine if habitat improvement and winter trapping influence herbivore use of agricultural land in the North Grande Ronde Valley. High-density elk and deer use areas will be defined and spatially displayed. The information presented here addresses elk use of North Grande Ronde Valley habitat during the third "treatment" year and the two years following implementation of habitat improvements. Conclusions about the value of habitat improvements and winter trapping as methods to reduce conflict over different uses of habitat will be discussed in a comprehensive final report.