EFFECT OF SHEEP GRAZING ON BIG GAME HABITAT IN OREGON'S COAST RANGE

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Forests within the Coast Range of western Oregon are known for their tremendous biotic productivity. These forests form some of the highest timber-producing areas in the world. Following harvesting of a tree crop, large amounts of herbaceous and shrubby vegetation, while providing soil stabilization and wildlife habitat, are generally considered detrimental to the regeneration of commercially valuable trees. Sheep grazing on Douglas fir (Pseudotsuga menziesii) plantations has been proposed as a means to suppress unwanted vegetation, while simultaneously providing a resource base on which red meat can be produced.

Oregon's Coast Range also supports large populations of black-tailed deer (Odocoileus hemionus columbianus) and Roosevelt elk (Cervus canadensis roosevelti). Plantations within the forests provide frequent and important feeding grounds for these two species. Therefore, a reduction in the quantity of forage and/or alteration of forage quality could have significant impacts on the value of these areas as big game habitat. The objective of this study was to evaluate the effect of sheep grazing on big game habitat in Oregon's Coast Range.

EXPERIMENTAL PROCEDURES

The study area is located on the Alsea Ranger District, Siuslaw National Forest, approximately 10 miles west of Alsea, Oregon. Elevations range from 500 to 1500 feet. The area receives approximately 100 inches of precipitation annually.

Five plantations were chosen for study. Douglas-fir seedlings on the plantations ranged from three to six years old. Before grazing began, a 100-foot-by-100-foot exclosure was constructed on each plantation. This allowed comparisons and observations to be made on adjacent areas which were grazed and ungrazed.

Bands of approximately 600 ewes with lambs and 900 dry ewes grazed the forest in 1981 and 1982, respectively. The sheep were on the forest from May to September both years. Each season, a series of approximately 40 plantations were grazed according to a predetermined schedule. Within this schedule, study plantations were grazed once each year, with the exception of one plantation which was grazed twice each year.

Two sampling periods, October and March, were chosen as important times of evaluation. Vegetational biomass was estimated by clipping current year's growth within randomly selected 4.8 ft^2 plots, both inside and outside the exclosures. From each study plantation, selected forage

species were collected, dried and ground for forage quality determinations. The ground samples were analyzed for percent crude protein and *in vitro* dry matter digestibility (IVDMD). Data presented in Tables 1 and 2 represent means across all five study plantations.

RESULTS AND DISCUSSION

In general, sheep grazing reduced October standing crop (Table 1). However, in March, there was generally more standing crop in the grazed areas than in the ungrazed areas. This was especially true of herbaceous vegetation.

Table 1. Mean standing crop (lbs/ac) from grazed (G) and ungrazed (U) areas, and the difference between them (D).

	Plant Type								
	Herbaceous			Browse			Total		
Date	G	U	D	G	U	D	G	U	D
Oct. 1981	660	1111	451	318	572	254	978	1683	705
March 1982	455	354	101	43	33	10	498	387	111
Oct. 1982	1044	288	434	434	834	400	1190	1878	688

In both years, the effect of grazing on IVDMD of species collected in October seemed to be more pronounced in herbaceous species than in browse species (Table 2). In general, herbaceous plants from grazed areas had higher IVDMD values than plants from ungrazed areas. Browse species tended not to change in IVDMD in response to grazing either year. There appeared to be no meaningful trends in differences in IVDMD between plants from grazed areas versus plants from ungrazed areas in March.

The effect of grazing on levels of crude protein in herbaceous species collected in October was similar to that for IVDMD (Table 2). Most species from grazed areas had higher crude protein values than samples from ungrazed areas, both in 1981 and 1982. Browse species which were grazed also tended to have higher levels of crude protein than those which were not grazed. The trend of crude protein levels of samples collected in March was similar to that for IVDMD in that there were no consistent differences between plants from grazed areas and plants from ungrazed areas.

Table 2. Mean percent crude protein (CP) and percent *in vitro* dry matter digestibility (IVDMD) of selected forage species.

Date	Species	CP		IVDMD	
		G	U	G	U
Oct. 1981	Herbaceous:				
	bentgrass	8.0	4.3	45	27
	pearly everlasting	9.4	5.5	44	26
	velvetgrass	7.1	5.2	41	28
	Browse:				
	vine maple	7.4	5.1	43	35
	thimbleberry	8.1	7.8	36	35
	salmonberry	9.0	8.3	34	33
March 1981	Herbaceous:				
	bentgrass	17.6	18.0	69	76
	pearly everlasting	21.9	20.0	65	59
	velvetgrass	16.5	16.0	69	71
	Browse:				
	vine maple	--	--	--	--
	thimbleberry	22.5	25.2	47	47
Oct. 1982	Herbaceous:				
	bentgrass	11.6	4.3	52	37
	pearly everlasting	11.4	5.8	42	30
	velvetgrass	11.3	7.8	54	43
	Browse:				
	vine maple	7.6	6.0	34	35
	thimbleberry	9.0	8.2	31	33
	salmonberry	8.6	6.9	24	23

These data suggest that sheep grazing can improve big game habitat in the Coast Range. Though grazing in the spring and summer tends to reduce total forage biomass present in autumn, it increases forage quality. Winter diets of deer in the Coast Range are probably deficient, not in forage quantity, but in forage quality. Forage must be approximately 7 to 10 percent crude protein during the winter in order to meet the nutritional needs of black-tailed deer. Many of the ungrazed plants collected in October would barely meet this minimum criterion. However, higher crude protein values observed for plants from grazed areas should assist animals in selecting a diet which more nearly meets their minimum nutritional needs. Similarly, higher IVDMD of grazed plants should help deer and elk meet their energy requirements.

Grazing also appears to enhance big game habitat in the spring. At this time, most of the forage present on the forest is past year's growth and is of very low quality. However, new growth which occurs in the spring is of high quality in terms of both digestibility and crude protein. Our data suggest that in March there is more high quality forage in the grazed areas than in the ungrazed areas. This was especially evident in herbaceous vegetation, an important component in the diets of deer and elk at this time of the year.

CONCLUSIONS

These data suggest that sheep grazing can increase the amount of high quality forage available to big game during the critical fall through early spring period in the Coast Range. If quality rather than quantity of forage determines the nutritional status of big game animals in the Coast Range, then sheep grazing should improve big game habitat in this area.