

AUTUMN DIETS OF ELK IN THREE AREAS OF SASKATCHEWAN

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Versatility in habitat use and diet has enabled elk or wapiti (*Cervus elaphus*) to successfully inhabit many different regions of North America.^{6 2} The diverse nature of the diet of elk is amply demonstrated by Kufeld's review of 48 studies of elk food habits in which more than 300 plants eaten by elk are listed.⁴ Collection of elk rumen samples in autumn from three areas in Saskatchewan provided an opportunity to investigate elk diets in this season and to determine if diet versatility was a feature of elk in different parts of their provincial range.

Study Areas and Methods

From 1972 to 1975, samples of rumen contents were taken from 51 elk from the West Block of the Cypress Hills Provincial Park, Moose Mountain Provincial Park, and the Porcupine Provincial Forest in Saskatchewan (Fig. 1). The West Block of the Cypress Hills Provincial Park has been described as 70% grassland dominated by rough fescue (*Festuca scabrella*), 20% forest dominated by lodgepole pine (*Pinus contorta*), trembling aspen (*Populus tremuloides*), and white spruce (*Picea glauca*), and the remaining 10% made up of willow (*Salix* spp.) communities, sedge (*Carex* spp.) meadows, and marsh communities.⁷ Moose Mountain Provincial Park, in southeastern Saskatchewan, is primarily a poplar forest with aspen the predominant species. Also

present are balsam poplar (*Populus balsamifera*), white birch (*Betula papyrifera*), and traces of green ash (*Fraxinus campestris*) and Manitoba maple (*Acer negundo*). The Porcupine Provincial Forest in east-central Saskatchewan is largely a hardwood forest of aspen, balsam poplar, and white birch although extensive mixedwood stands of aspen and white spruce also occur.

The rumen samples were from one male calf, 26 adult males, three female calves, 20 adult females and one animal of unknown sex and age. The distribution of the samples by area and year is given in Table 1. Samples were collected in the period 15 October to 18 November with most samples from elk killed during sporthunting seasons in the last week of October and the first week of November.

A 1.1 liter aliquot of rumen content was washed through a 5.66 mm mesh screen and the material remaining on the screen separated into its component fractions. Rumen components were identified macroscopically to the lowest taxonomic level possible; grasses were identified only to family (Gramineae) and fine material was sorted by forage class as unidentified herbaceous material or unidentified woody material. Volumes of the components were determined by water displacement for the 1972 and 1973 Cypress rumens; dry weights of the

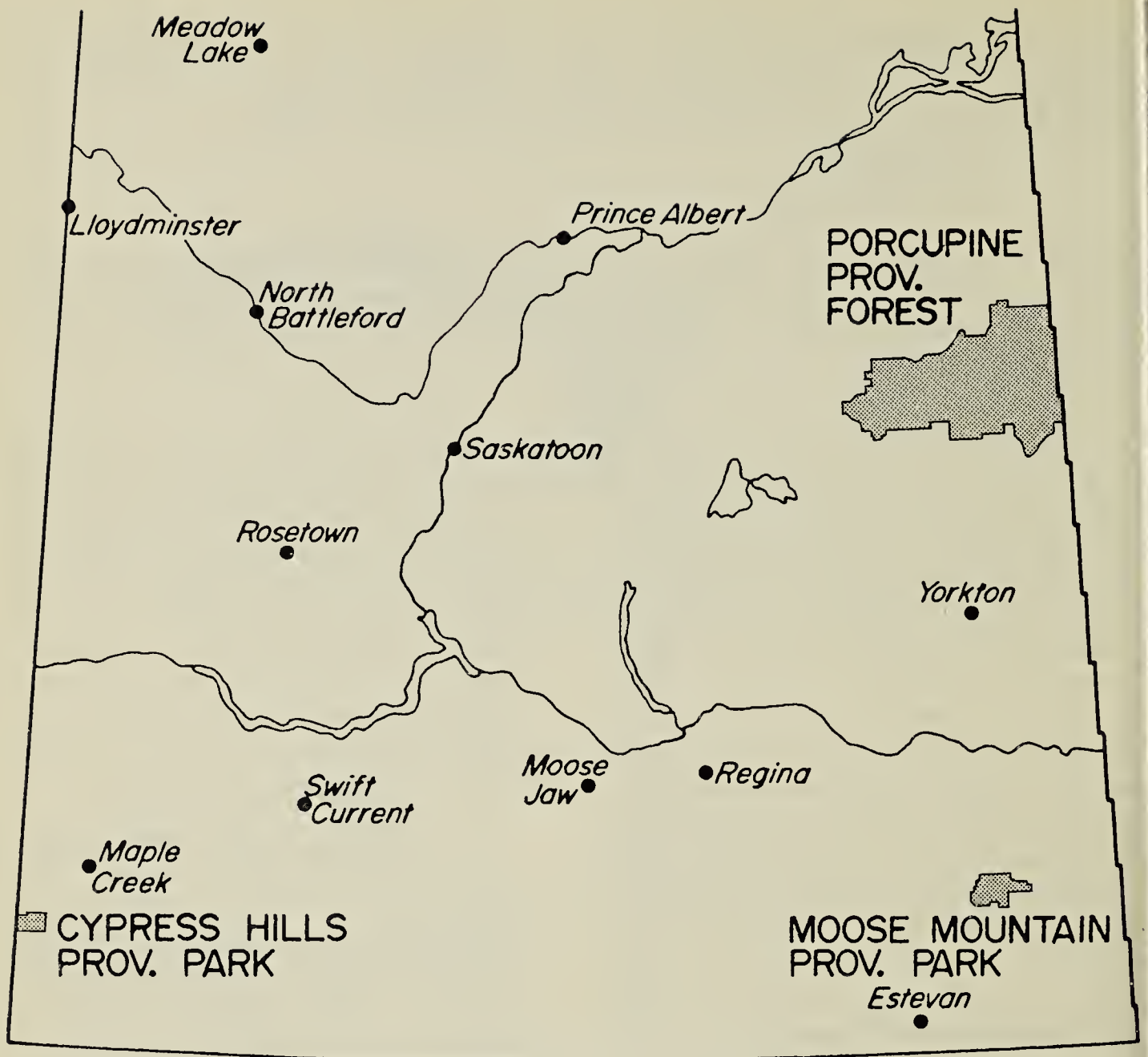


Figure 1: Location within Saskatchewan of the three study areas.

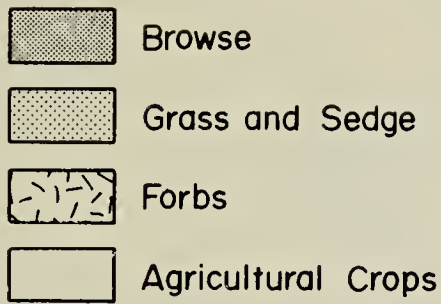
components were recorded for all other ruminants after drying for 24-48 hours at 70°C.

Data for identified portions of the samples were grouped according to region by the aggregate percentage method regardless of sex or age class and method of component percentage determination.⁵

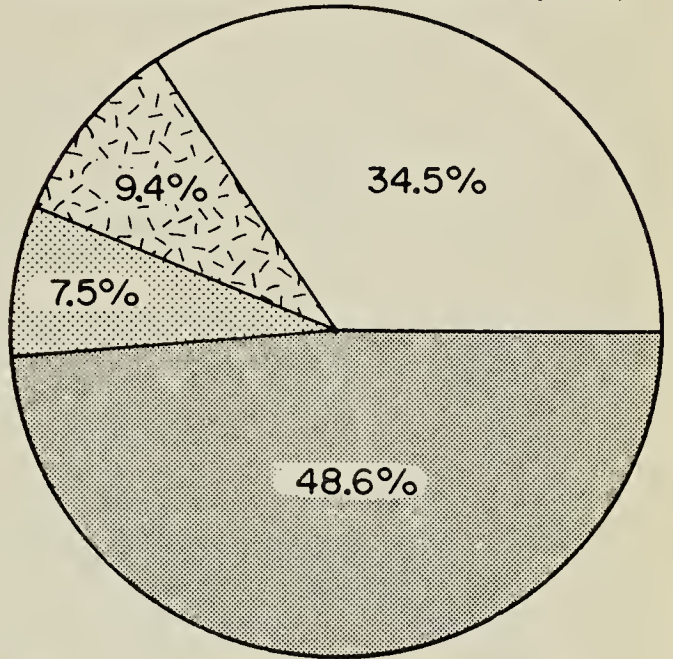
Results and Discussion

Graminoids (grasses, sedges) comprised over half the autumn diet of elk in the Cypress Hills but formed only a relatively minor part of the autumn diet of Moose Mountain and

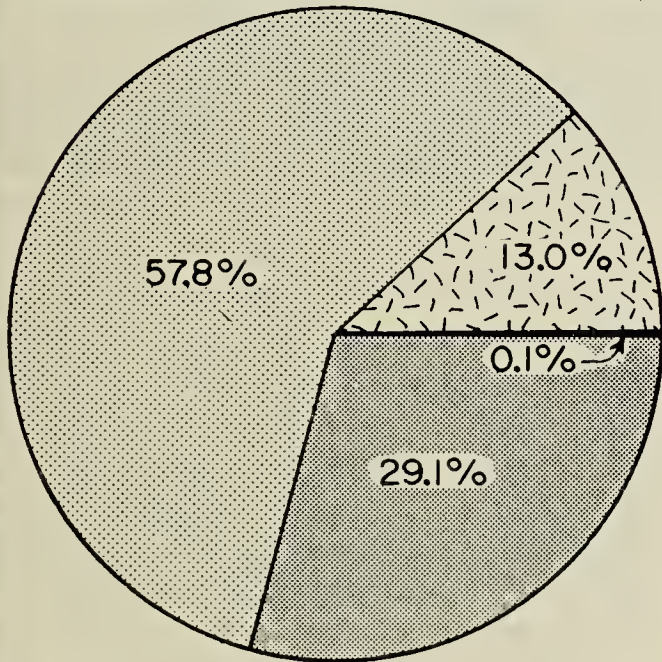
Porcupine Forest elk (Fig. 2). Woody browse was the principal component of the diet of Porcupine Forest and Moose Mountain elk making up about one-half and two-thirds, respectively, of the rumen contents; browse comprised slightly less than one-third of the diet of elk from the Cypress Hills. Agricultural crops constituted the second most important forage class for both the Moose Mountain and Porcupine Forest elk but were almost absent from the diet of Cypress Hills elk. Forbs comprised a minor portion of the diet of elk in all three areas.



PORCUPINE PROV. FOREST (n=12)



CYPRESS HILLS PROV. PARK (n=21)



MOOSE MTN. PROV. PARK (n=18)

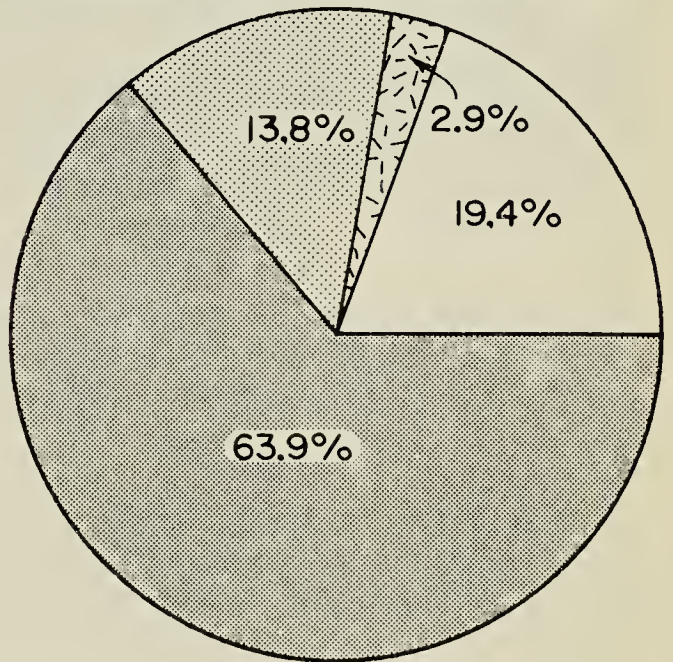


Figure 2: Composition of rumen contents from elk in autumn from three areas in Saskatchewan.

The predominance of grasses in the autumn diet of elk in the Cypress Hills resembles Kufeld's synthesis of elk diets in autumn for most of the western United States.⁴ High woody browse utilization by elk in Moose Mountain and the Porcupine Forest is similar to browse used by elk in Riding Mountain National Park in Manitoba.¹ The Manitoba study and one from Saskatchewan, the only investigations of elk diet in the Boreal Forest Region of Canada, both

demonstrated woody browse was the preferred forage of elk in the boreal forest throughout much of the year.¹³ This contrasts to grasses being the major diet component of elk in the western United States.⁴

Within the broad forage classes, some food items were common to the three areas but for the most part, the individual components in the autumn diets differed significantly from area to area. Aspen, balsam

TABLE 1: Distribution of rumen samples by area and year.

Year	Area		
	Cypress	Moose Mountain	Porcupine
1972	5	—	—
1973	5	—	—
1974	—	5	—
1975	11	13	12
TOTAL	21	18	12

poplar, willow, saskatoon (*Amelanchier alnifolia*), rose (*Rosa* spp.), and snowberry (*Symphoricarpos* spp.) were eaten by elk in all three areas but only aspen was of particular importance in all areas in terms of frequency of occurrence and proportion of rumen contents. Snowberry appeared frequently in rumens from all areas but comprised a major part of the browse consumed only in Moose Mountain. Saskatoon was important in Moose Mountain and the Porcupine Forest, rose important only in the Cypress Hills, and balsam poplar and willow important only in the Porcupine Forest.

Other browse items and most forbs occurred in rumens from, or formed a significant part of the diet in, only one locale. Bearberry (*Arctostaphylos uva-ursi*), hoary sagebrush (*Artemisia cana*), and lodgepole pine were restricted to Cypress Hills rumens whereas bur oak (*Quercus macrocarpa*) and silverberry (*Elaeagnus commutata*) were restricted to Moose Mountain rumens. High-bush cranberry (*Viburnum trilobum*) and pin cherry (*Prunus pensylvanica*) were important forages only in the Porcupine Forest as was red-osier dogwood (*Cornus stolonifera*), although dogwood appeared in the Cypress Hills rumens as well. The only forbs to appear in rumens from all areas was American vetch (*Vicia americana*) although many forbs oc-

curred in rumens from two areas. Several forbs typical of the Cypress Hills such as everlasting (*Antennaria* spp.), low larkspur (*Delphinium bicolor*), and small bedstraw (*Galium trifidum*) appeared only in the rumens from that area.

Agricultural crops comprised a significant part of the autumn diet of elk in both Moose Mountain and the Porcupine Forest; alfalfa (*Medicago sativa*), barley (*Hordeum vulgare*), and oats (*Avena sativa*) were the preferred forages common to both areas. Alfalfa was the only agricultural crop found in rumens from all areas. The lack of agricultural crops in Cypress Hills rumens is due to an almost complete absence of cultivated land in the extensive rangelands surrounding the West Block of the Cypress Hills. The high degree of utilization of agricultural crops in autumn by Moose Mountain and Porcupine Forest elk demonstrates the potential, and often real problem of elk depredation of crops in the surrounding cultivated lands, especially when harvesting is delayed by weather.

In general terms, elk in the West Block of the Cypress Hills Provincial Park in autumn can be described as grazers while elk in Moose Mountain Provincial Park and the Porcupine Provincial Forest are browsers. Differences in the relative proportions of the four broad forage classes



Elk

Gary W. Seib

and in the individual food items presumably reflect differences in forage availability that result from habitat differences between the three areas. This diet versatility facilitates elk utilization of many diverse types of habitat.

Acknowledgements

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¹BLOOD, D. A. 1966. Range relationships of elk and cattle in Riding Mountain

National Park, Manitoba. Can. Wildl. Serv., Wildl. Manage. Bull., Ser. 1, No. 19. 62 pp.

²FLOOK, D. R. 1970. Causes and implications of an observed sex differential in the survival of wapiti. Can. Wildl. Serv. Rep. Ser., No. 11. 71 pp.

³HUNT, H. M. 1979. Summer, autumn, and winter diets of elk in Saskatchewan. Can. Field-Nat. 93(3):282-287.

⁴KUFELD, R. C. 1973. Foods eaten by the Rocky Mountain elk. J. Range Manage. 26(2):106-113.

⁵MARTIN, A. C., R. H. GENSCH and C. P. BROWN. 1946. Alternative methods in upland gamebird food analysis. J. Wildl. Manage. 10(1):8-12.

⁶MURIE, O. J. 1951. The elk of North America. Stackpole Co., Harrisburg. 376 pp.

⁷NEWSOME, R. D. and R. L. DIX. 1968. The forest of the Cypress Hills, Alberta and Saskatchewan, Canada. Am. Midl. Nat. 80(1):118-185.