Ranching with Wapiti and Moose in Alberta?

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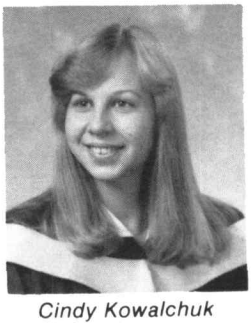

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Habitat is defined as "the area or type of environment in which an organism or biological population normally lives or occurs." Why do they live there? Obviously, because all their life requirements—food, cover, and water—are met. What are the requirements of moose and wapiti (elk), and where is there conflict? Maybe the conflict is minimal and moose and elk can inhabit the same local area. The life requirements of both moose and elk will be compared to examine the possibility of co-existence between the two for the purpose of game ranching.

Population and Distribution

Moose were originally found in all the forested sections of Alberta. Then, according to Webb (1959), their numbers dwindled to an extreme low by the year 1900. The species actually became extinct in the southern foothills and subalpine zones. Population increases in the northern mixedwood and foothills regions after the turn of the century preceeded a southward drift of moose to the southern foothills regions. By 1920, moose began to reappear in the south and, following a series of severe fires, reached high densities in the late 1930's.

Elk or wapiti were formerly abundant over almost the whole of the province. A series of severe winters in the late 1800's changed the picture greatly. They were almost exterminated. By 1907, there was only an estimated 1,000 left in three regions of the province. Around 1920, the tide began to turn once more, and elk began to become more numerous. Native herds increased and were re-introduced to the National Parks and Cypress Hills.

Present populations of moose in Alberta are 250,000, and of elk are 20,000.

Moose spend the majority of their time foraging in the Boreal forest area of Alberta. They also occur in the Boreal-Cordilleran Transition Zone, and in the Sub-alpine Forest.

The highest densities of elk occur in the foothills and subalpine cover types where they graze the grassy slopes of the Fescue-Wheatgrass Zone in the winter. In early spring, the majority of the elk move off the Fescue-Wheatgrass Zone and use the snow-free openings within the Douglas-Fir Zone. During the summer months, the majority of the elk feed at lower elevations in the Fescue-Wheatgrass Zone.

Habitat Location by Foraging Preferences

Moose are primarily browse feeders and must have a plentiful supply of succulent willow, birch, or aspen twigs (Webb 1959). The highest occurrence of browsing and most preferred browse species were observed in the tall shrub habitat. Moose browsing does occur in cutovers, though most browsing takes place within 80 meters of cover, according to Hamilton et al. (1979). Terrestrial feeding forms the bulk of the summer diet in dry weight, but aquatic habitat is a very important element of summer moose diet. Aquatic feeding is much more common in June than later in the summer, and somewhat more common during the morning and evening than in the afternoon.

Elk are largely grass feeders, and spend approximately 70% of their time in timbered areas, and 30% in open areas. Elk habitat is on a continuum, ranging from almost totally covered to almost totally open. Elk individually select for and adapt to slightly different habitats or niches. This is a highly efficient way to "fill up" the available environment and is an example of the broad ecological amplitute of elk (Stelfox and Taber 1969).

Browse was the major component in the diet of elk in winter in this study. Elk ate a variety of browse species, aspen being the most important both in proportion and frequency, according to Hunt (1979). Willows are the second most frequent browse species. In early spring, elk feed on the new flush of upland grasses. In summer, elk feed on green forbs and grasses. In late summer, elk forage in the aspen forests on foliage; and in early winter, grasses and fallen leaves predominate in the diet (Hudson 1981).

Grasses are most important in the summer, and sedges are of minor importance in each season. Forbs are of moderate importance in the diet of elk. Agricultural crops are eaten when available in the autumn and are particularly important for maintenance of good body condition prior to winter (Hunt 1979).

Habitat Location by Season

Moose have been observed to restrict winter activity to the thickest available cover. The combination of heavy cover and abundant browse contribute to moose preference for the tall shrub habitat, especially in winter. Moderate weather during spring and summer and reduced needs for closed shelter contribute to the increased use of off-river habitats during the summer.

Stelfox and Taber (1969) have reported that elk habitat components may (or may not) be used during different seasons for different reasons. In summer, elk prefer small wet parks and broken parks. These areas provide nutritional forage and high quality thermal cover. During fall, use areas and preferences change. Use of all timbered types increases, especially those stands with an interspersion of small, dry parks which are used as foraging areas. The highly preferred stands are mature, with good hiding cover. As age of stand increases, elk use increases.

About the Author: Cindy grew up in a small farming community in Manitoba. She received a Bachelor of Science degree, University of Alberta, in the spring of 1982 with a major in plant science and range management. Her main interest is in the maximization of output and income from agricultural resources. She is currently back at the University of Alberta working the Master of Public Management program.

Aquatic feeding habitat of moose within close proximity to aspen cover.

Habitat Location by Snow Depths

Hamilton et al. (1979) have noted snow hampers moose movements, and moose may only travel as far as necessary into a cutover to meet their browsing requirements. The effects of snow depth, however, only come into play after a critical level is reached, usually thought to be around 75 cm. Moose seek coniferous cover when snow depths reach 76–86 cm.

To avoid deep snow, elk also seek coniferous cover and do not venture into open areas. Snow depths of 45–50 cm will cause elk to move to areas with shallower snow, even at the expense of leaving better forage behind. During the deepest snow cover, Leege and Hickey (1977) have observed elk in creek bottoms utilizing waterways for ease of maneuvering.

As well as snow affecting location of elk, it also affects their elevational distribution. During low snowfall winters, most elk use is concentrated at the 1,200 meter elevation level, whereas during severe winters, elk use is greatest at 600 and 900 meters (Leege and Hickey 1977).

Mid-winter localization of moose and elk in the Canadian Rockies is as follows: above the dense coniferous forest in the open-canopy subalpine region, one-third of the elk and moose are found; at the opposite elevational extreme, the transitional prairie zone, two-thirds of the elk are wintered (Stelfox and Taber 1969).

Leege and Hickey (1977) have suggested that ungulates are severely restricted when deep, soft snow exceeds about two-thirds of their chest height. If deep snow prevailed, elk would suffer most under these conditions. Moose would be least affected since they can cope with snow and can reach browse which is generally unavailable to elk (Bouckhout 1971).

Habitat Location by Cover Requirements

A need to avoid hunters and animal predators may motivate moose to avoid browsing far from horizontal cover. Deciduous trees and heavy shrub growth can function as escape cover, which helps to explain the apparent attractiveness to moose of even small deciduous islands. Another reason for keeping close to forest edges may be the desire to avoid exposure to wind. Hamilton et al. (1979) have demonstrated that moose use residual islands as a wind break and appear to derive benefits from shallower snow depths on the lee sides of residual cover stands.

Cover is extremely important to elk, but the type of cover required is variable due to seasonal changes in climate. Elk restrict their movement and primarily use the dense north slope mixed conifer type in response to temperature and forage. During July and August, the use of thermal cover increases with increased daytime temperature and as the upland meadow forage cures and becomes less palatable. During September through November, elk thermal cover requirements decline with moderation in daytime temperatures and elk use the canyon grasslands.

According to Leege and Hickey (1977), elk rarely use mature timber for cover on clear, sunny winter days. When snow depths permit elk to feed in the clearcuts, they will do so. Elk seek shelter under conifers when the wind chill factor

Deciduous trees and heavy shrub growth is used as escape cover by both moose and elk.

approaches minus 30° C and under all temperatures when wind velocity exceeds 50 kph.

Elk require tree and shrub cover for escape (Stelfox and Taber 1969). During the fall hunting season, the highest elk use occurs in stands with low sight distances. This is a reflection of elk preference for high quality hiding cover during the fall, and results in their increased consumption of browse during the winter season.

Summary

The moose is a specialist feeder, with their diet consisting mainly of twigs (browse) of tall and short shrubs in winter, and foliage and wetland grasses and sedges in the summer. The habitat of moose is almost totally restricted to forested areas. In the boreal forest, aquatic plants contribute little energy, but may provide sodium where it is deficient (Hudson 1981).

The wapiti or elk is a generalist feeder, and their diet consists of grasses, sedges, and short and tall shrubs. As the snow deepens, elk begin to browse more as the accessibility of grasses, forbs, and sedges becomes limited. Browse makes up a large part of the elk's diet, but its role is critical in the maintenance and survival of elk and moose during the winter season (Hudson 1981).

The habitat of elk ranges from open areas to forested areas. The compound distributions of moose and elk result in a fairly uniform pattern of browse utilization (Bouckhout 1971). The only conflict which arises is that both moose and elk depend heavily on browse for winter maintenance. Elk are, however, successful competitors because they are flexible and resourceful feeders, exploiting all forage layers and all habitat types.

Conclusion

In the Boreal Forest of Alberta, crop agriculture and livestock production are limited by climate, topography, and the cost of land clearing. The boreal forest has several characteristics which make it valuable for game ranching. These are a relatively shallow snow cover, productive soils, large native populations of ungulates (including moose and wapiti), undulating plain landscape with low hills interspersed with small lakes and marshy areas, and thin-crowned aspen forests (Telfer and Scotter 1974).

Game ranching has excellent potential for integration into schemes for multiple land use. Therefore, there is great potential for elk and moose ranching on this marginal land. Wapiti and moose in the proper combinations can provide a balanced use of the range resources and a high consumptive efficiency. Careful management must be taken so that the stocking rate is low enough to ensure there is enough browse for the winter, as this is the only area of potential conflict in moose and wapiti grazing systems management.

References Cited

Bouckhout, Leo W. 1971. Assessment of browsing conditions in Elk Island National Park, Alberta. Alberta Fish and Wildlife Library.

Hamilton, G.D., P.D. Drysdale, and D.L. Euler. 1979. Moose winter browsing patterns on clear-cuttings in northern Ontario. Alberta Fish and Wildlife Library.

Hudson, R.J. 1981. Agricultural potential of the wapiti. Sixtieth Annual Feeders Day Report, p. 80-86.

Hunt, Hugh M. 1979. Summer, autumn, and winter diets of elk in Saskatchewan, Can. Field-Nat. 93:282-287.

Leege, Thomas A., and William O. Hickey. 1977. Elk snow-habitat relations in the Pete King Drainage, Idaho. Wildlife Bulletin No. 6. Idaho Department of Fish and Game.

Stelfox, John G., and Richard D. Taber. 1969. Big game in the Northern Rocky Mountain coniferous forest. *In:* Coniferous forests of the Northern Rocky Mountains: Preceedings of the 1968 Symposium.

Telfer, Edmund S., and George W. Scotter. 1975. Potential for game ranching in boreal aspen forests of Western Canada. J. Range Manage. 28:172-180.

Webb, R. 1958. Alberta's big game resources. Alberta Department of Lands and Forests. Alberta Fish and Wildlife Library.