

RESEARCH BRIEF

Dynamic patterns in winter ungulate browse succession in Boreal Plains of Alberta

The research outlined in this brief is not affiliated with the ARCKP and the content below provides a high-level summary of some of the key findings and discussion points. For full details, please view the full research report.

Summary

Post-wildfire conditions contribute to browse conditions favourable to moose and white-tailed deer. As a result, these generalist ungulate populations increase, leading to increased wolf populations and unsustainable predation of woodland caribou, a threatened species in Alberta. This study sought to improve the understanding of moose and white-tailed deer winter browse succession. It explored how moose and white-tailed deer use browse over a 150-year post-wildfire period (chronosequence design) in upland and lowland forests in the Boreal Plains of northeastern Alberta. Better understanding the duration of post-wildfire browse availability can help manage primary prey species, which is critical to woodland caribou conservation.

Key findings and implications to management

Change in winter browse consumed by moose and white-tailed deer in the first 150-years post-wildfire was best explained by landcover (e.g., upland forests or lowland bogs and fens). In upland mixedwood forests, the number and proportion of deciduous shrubs and saplings peaked at 10-25 years post-wildfire and again at 90 years. This means wildfires can contribute to increased ungulate forage in Alberta's upland forests for longer than originally thought, potentially attracting more moose and white-tailed deer. Lowland forests had the highest winter browse density and abundance. However, browse species in these areas were of lower foraging quality to moose and white-tailed deer and demonstrated lower levels of consumption. This suggests that even though lowland forests are capable of providing forage to these ungulates, they are not as desirable as the adjacent upland habitat. However, if surrounding upland areas are lacking in high quality forage, moose and white-tailed deer could potentially utilize lowland areas in greater proportions.

Methods

A total of 164 field plots were visited between June and August 2019. Sites were selected based on drainage class, landcover type, stand age and proximity to roads, and spanned upland and lowland forests ranging from 0 to 150 years post fire. Field plots were 50 m belt transects selected based on forest type and age. Browse species were measured for the level of ungulate browsing and classed into four palatability categories (low, medium, high and preferred). Winter use was assessed by evaluating the percentage or severity of ungulate browse against fixed effects like winter browse species, stand age and landcover types (e.g., various upland forest types or lowland bogs and fens).

Limitations or remaining uncertainties

The researchers recommend examining ungulate winter diet at a finer scale. This could include fecal analysis to better identify the specific species of browse being consumed by both moose and white-tailed deer. This will advance our knowledge and management of high-quality ungulate habitat in woodland caribou ranges. There is also a need for more research on the bottom-up effects of wildfires on ungulate habitat selection and foraging ecology.



Authors

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Project Completion Date

2019 (published in 2021)

Research Theme

Post-wildfire condition of browse availability in northeastern Alberta and browse levels of moose and white-tailed deer.

Study Area

An 81,162 km² area of boreal upland and lowland complex located in the Lower Athabasca Region of northeastern Alberta.

Link to Full Article

[Read the full report](#)