INTRODUCTION

As forest management in British Columbia transitions from first- to second-pass harvesting intervals, the landscape will increasingly be represented by a matrix of mid-seral stands. This is particularly true of forests inhabited by mountain caribou where high levels of precipitation inhibit large-scale wildfires and naturally favour older age-class distributions. These older forests are preferred by mountain caribou (Apps et al. 2001), to the point where their exclusive winter food source, arboREAL lichen, are most abundant in these stands.

Altered age-class distributions can pose significant challenges to mountain caribou for several reasons. First, it is thought that caribou have difficulty moving through densely stocked mid-seral stands (Stevensen et al. 2001). Thus, isolated patches of old forest would be less available to individual caribou because of reduced permeability through adjacent, mid-seral stands. Second, at a larger scale, populations could become more fragmented because the habitats they favour are less contiguous. Increased population fragmentation has been documented by Wittmer’s et al. (Submitted) analysis of caribou populations in British Columbia. Finally, harvesting old forests can alter predator-prey relationships by promoting habitat for deer and moose and their associated predators. More predators can mean more incidental predation on caribou, which is considered the proximate cause for recent declines of mountain caribou (Wittmer 2004).

This project deals with the smallest scale of fragmentation – the selection of attributes within mid-seral stands. Our objective was to determine if there are attributes within mid-seral stands that are favoured by mountain caribou for movement between patches of old forest. Using snow tracking we compared the paths used by mountain caribou through mid-seral stands to parallel paths through the same stands. As a related objective, we wanted determine if stand tending activities such as spacing or pruning improved movement through mid-seral stands. The results of this study could be incorporated into silviculture prescriptions that can be implemented by forestry companies operating within caribou habitat.

STUDY AREA

Our study is taking place in the Upper Columbia and North Thompson watersheds (Fig. 1). Two biogeoclimatic zones were sampled: The Interior Cedar-Hemlock (ICH) and the Engelmann Spruce-Subalpine Fir (ESSF). The ICH subzone is dominated by mature and old forests of western redcedar (Thuja plicata), western hemlock (Tsuga heterophylla) and Douglas-fir (Pseudotsuga menziesii). The ESSF landscape includes mature to old coniferous forests of Engelmann Spruce (Picea engelmannii) and subalpine fir (Abies lasiocarpa). Extensive forest harvesting occurs throughout both zones.
METHODS

We conducted aerial telemetry on our sample of radio-collared mountain caribou approximately once every 10 days. During the flight, we noted if caribou were in or near mid-seral (20 to 80 yrs) stands. If so, the location was investigated on the ground the next day. When caribou tracks were found, they were followed to see if they went into mid-seral stands. Once in a mid-seral stand, we located a 5.64-m radius plot every 50 m along the caribou trail. In the plots we recorded snow depth, canopy cover, shrub cover, structural stage (FMDTE 1998), general habitat type, and noted any stand-tending activities. We also recorded the density of 3 classes of trees: 1) &gt;1.3 m tall and &gt;7.5 cm DBH, 2) &gt;1.3m tall but &lt;7.5 cm DBH, and 3) &lt;1.3 m tall. For the first class, we estimated the DBH and decay class for each stem, and recorded the tree species. For the 2 smaller classes we simply tallied the number of trees by species.

We attempted to follow tracks as long as possible with the goal of linking movement between patches of old forest. To make matched “within-stand” comparisons of attributes that are used by caribou relative to what is available in the environment, we located an
equal number of availability plots in each stand by following an “availability” trail that paralleled the caribou trail at a distance of 50 m.

Analyses

No formal analyses have been conducted, in part because sampling was ongoing as of March 15 and too few trails have been followed to perform meaningful analyses. However, we plan on conducting univariate analyses matching the caribou use plots with the available plots in each stand type. We will compare stem density, tree size, canopy and shrub cover between the 2 plot types. To investigate and account for interactions among variables, we will also conduct multivariate comparisons using logistic regression and treating use plots (=1)/available plots (=0) as the dependent variable, and variables collected within plots as covariates.

RESULTS AND DISCUSSION

We followed 8 caribou trails in mid-seral stands and collected a total of 104 use and 104 availability plots. Three of the trails were in regenerating clearcuts 20-30 years old, 1 was in a regenerating burn with green-tree residual patches, and 4 were in high-elevation partial cuts with 10-20% green-tree retention. Each of those 3 stand types would have to be analysed individually and as such sample size will have to increase in each of those strata. In March 2004 we doubled our sample of radio-collared caribou, to the point where we now have approximately 40 animals that we regularly monitor. This means that we will be able to investigate many more caribou trails associated with early-seral stands. It may take 2-3 more years of sampling before enough samples are collected in clearcut and partially-cut stands to offer reliable results.

Numerous high elevation cutblocks in the North Thompson study area were harvested with a component of residual tree patches. These patches contain lichen and caribou were observed moving through harvested areas to the patches of residual trees. These complex stands meant that we have adjusted our methods to distinguish between residual trees and regenerating trees within cutblocks. Doing so will provide forest managers with information that will help them plan for stand-level caribou movement so that: 1) caribou can access small patches of trees that contain lichen within cutblocks; and 2) so that caribou can move between larger patches of old forest through partially cut and clearcut stands.

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LITERATURE CITED


