



Boreal Ecosystem
Recovery & Assessment
An NSERC Collaborative Research & Development Program

ECOLOGICAL TEAM FALL 2017: ***THE EFFECT OF UNDERSTORY PROTECTION HARVESTING ON BROWN CREEPERS IN ALBERTA'S MIXEDWOOD FORESTS***

Connor Charchuk, M.Sc.

University of Alberta, Department of Renewable Resources
ccharchu@ualberta.ca

Research Team:

Erin Bayne, University of Alberta, Department of Renewable Resources



Project summary

Timber harvesting has resulted in a decline in old growth representation in managed forests relative to natural forests. Harvesting strategies that maintain a degree of “old-growthness” on the landscape are becoming increasingly popular. In Alberta, understory protection is a form of retention harvesting that has yet to be assessed for its contribution of habitat to old growth species. To assess the old-growthness of understory protection, we assessed an indicator species, the Brown Creeper (*Certhia americana*). Using autonomous recording units (ARUs) and automated computer recognizers, we surveyed for Brown Creepers in 25 understory protection sites and 39 unharvested control sites. By using recognizers to analyze over 1000-minutes of data for each site, we show that Brown Creepers occupied about 16.0% of understory protection sites, compared to 71.8% in the unharvested controls. We used LiDAR-derived estimates of forest structure including canopy height to assess Brown Creeper habitat associations. Brown Creepers were more likely to occupy unharvested sites with taller canopies, but were more likely to occupy understory protection sites with shorter canopies. By modelling habitat use patterns, we show that this effect is confounded by the proportion of white spruce (*Picea glauca*). Brown Creepers were more likely to use understory protection when there was more white spruce and when the spruce height reached 10-20 meters.

Progress to date

My research has been submitted and defended as chapter 3 in my MSc thesis. The next phase of this project is to prepare the chapter as an independent manuscript for publication. For this purpose, I intend to analyze my 2015 data as well to improve sample size. The written component of the manuscript will need to be improved statistically to ensure it is clearly reproducible. I hope to complete this project within the next two months.

Management implications

Due to the rotational period of harvesting, most managed forests are not given adequate time to return to an old-growth state before being harvested. This has resulted in the loss of forest structure and composition necessary for many species to reproduce. Brown Creepers depend on the flaking bark of mature trees for building nests. These conditions are typically not available in stands under 120-years old. Therefore, Brown Creepers act as a valuable indicator species for old-growth forest structure. The use of understory protection areas by Brown Creepers; therefore, represents a successful harvesting strategy in terms of maintaining existing structure or creating structure that is beneficial to this species. Further research should investigate the utility of understory protection to be used by other species that depend on old-growth forest structure.

Geographic location

My research was conducted throughout the AI-Pac FMA which is located in northeastern Alberta.