Introduction

Energy sector growth in Northern Alberta has raised concerns about the anthropogenic effects on the biodiversity of boreal forest ecosystems. Steam Assisted Gravity Drainage (SAGD) disturbances makes up a large component of this industry and are a significant challenge to environmental managers. This study focuses on the influence of seismic lines on boreal songbirds.

To best mitigate the long term effects of seismic lines, their ecological impacts must be understood at both a local and landscape scales. Understanding the influence of scale on species-impact relationships, will help to improve model accuracy and define the limits of predictive power.

Methods

**Triangulation Grids:**
Paired grids using SM3 ARUs with time-synchronized GPS units

Recovering seismic lines in upland deciduous or mixed wood forest.

A station will either have an ARU with one microphone directly attached or a single microphone connected via cable to the remaining port on the ARU located at a nearby station.

**Figure 1.** Design for triangulation array with SM3 and external mic adjacent.

**Big Grids:**

Grids of 100 SM2+ and SM3 Song Meters (Wildlife Acoustics Inc., Maynard, MA)

600m spacing between units

They are located on SAGD sites across North eastern Alberta.

**Figure 2.** An example of a Big Grid array deployed in the summer of 2015

Data Analysis:

Triangulation: a minimum of four stations are used to localize a song according to the time offset, latitude/longitude and altitude of each station used and the temperature at the time of recording.

Exploring new methods to decrease processing time.

Preliminary results indicate a change in the relationship between species abundance and linear density with scale.

Higher resolution GIS data will better account for the effect of vegetation type and recovery.

**Figure 3.** Ovenbird detections with linear density at different scales

Significance

Identifying how the species most affected by a disturbance use the affected and edge habitat allows environmental managers to assess recovery at a whole ecosystem level.

Given appropriate consideration to spatial scaling, these relationships can then help to predict regional consequences for species.

This can ultimately lead to the development of spatially relevant thresholds designed to reflect the patterns and processes that promote successful recovery.

References:


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