ECOLOGICAL TEAM FALL 2017:
CANADA WARBLER RESPONSE TO REGENERATING LINEAR FEATURES

Boreal Ecosystem Recovery & Assessment
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Project summary

Cumulative effects of energy sector growth in Northern Alberta have implications for species at risk in the boreal forest due to habitat removal, degradation and fragmentation. Linear features (LFs) – seismic lines and pipelines – make up a large component of these effects. My thesis examines the behavioral response of Canada Warblers (CAWA) to LFs at different stages of recovery, the bioacoustic techniques used to measure this response at the local scale, and the population level impacts of LF density at multiple scales. Specifically, the objectives are to: (1) Determine how CAWAs use space around regenerating LFs, (2) identify whether novel approaches to bioacoustic analysis are necessary to determine responses at a local scale, and (3) determine how CAWA populations are impacted by LF density and how scale of observation influences this interpretation. To address the first two objectives, grids of autonomous recording units (ARUs) were set up in 3-5 rows parallel to and centered on a LF. This design allowed the use of both acoustic triangulation and the relative FRMS amplitude between units to localize singing events. Big Grid data will be used to address the 3rd objective; this includes 10x10 ARU grids with 600m spacing, each covering a SAGD lease at a different disturbance level and lidar data to assess vegetation height. Preliminary results show tolerance of linear features with tall shrub regeneration and a sharper negative relationship between abundance and linear density at greater observational scales.

Progress to date

Local scale bioacoustic and vegetation data was collected from 2016-2017. 105 rapid point counts were conducted, and 47 triangulation grids were deployed with detailed vegetation surveys on each site. To date, recording and location data has undergone post-processing and review. Recording data has been run through a species-specific recognizer and validated for CAWA vocalizations; 29 triangulation grids have confirmed singing events detected. Triangulation on prioritized sites has begun and it is to be complete by early January. Multiple time periods are being targeted for each site to accurately capture movement around the feature. Recognizers are currently processing 2017 Big Grid data; overall 11 grids have CAWA detections.

Management implications

Linear features are a challenge to environmental managers because of their unnatural design and extensive footprint. The resulting lag between the creation and restoration of linear features causes a persistent disturbance on the landscape which will continue into the conceivable future. Species conservation requires that critical habitat be defined within the industrialized zone to promote mindful land-use planning concurrent with industry growth. Understanding edge use by Canada Warblers will contribute to this goal and inform reclamation standards by helping to define when a linear feature is recovered from an ecological perspective.

Geographic location

Study sites are in deciduous or mixed-wood upland forest around Lesser Slave Lake and Lac La Biche, Alberta