Rising to the challenge of long-term research: introducing the Calling Lake Fragmentation Experiment

"Quick, three beers!"

"Sweet-sweet-sweet, I'm so sweet!"

"See! See, all the big trees!"

What do these exclamations have in common?

—They are tricks that birders and bird researchers use to identify male birds by their songs!

These recognizable songs are the foundation for much of the bird research that is conducted around the world. In dense habitats like the boreal forest, a researcher can hear and identify dozens of birds that would otherwise go unseen.

At the **Calling Lake Fragmentation Experiment** in northeastern Alberta, these songs have had the attention of careful observers every year for the past 25 years. This story, told through birdsong, has allowed researchers to document the effects of forest management and how these effects change over time. This post will help you get to know the Calling Lake Experiment, setting the stage for future posts where we'll explore some of the exciting findings from this long-term experiment.

Olive-sided Flycatcher ("Quick, three beers!")

Yellow Warbler ("Sweet-sweet-sweet, I'm so sweet!")

Brown Creeper ("See! See, all the big trees!")

The Calling Lake Fragmentation Experiment: a long-term study

In 1991, a University of British Columbia PhD student named Fiona Schmiegelow undertook an ambitious project. With a team of partners from the University of Alberta and Alberta-Pacific Forest Industries Inc. (Al-Pac), she established a large-scale forestry experiment on the Al-Pac forest management tenure. The project allowed her to study the effects of specific harvest patterns—namely, the **size and connectivity of forest patches**—on bird communities.

The Calling Lake Fragmentation Experiment, aerially photographed in 1994. Photo courtesy Alberta-Pacific Forest Industries Inc.

Forestry experiments like this are rare. Normally, researchers look to existing or planned forest harvests and try to find harvested areas that will help them answer their questions. The Calling Lake Fragmentation Experiment flipped the formula by having researchers work with foresters to design a harvest pattern together. This collaboration allowed Schmiegelow to answer very specific questions about the short-term responses of birds to forest harvesting that would otherwise be very hard to study. But that was just the beginning.

The Calling Lake Experiment set itself apart from all but a few research projects by being **designed to support long-term research**. Since its initiation 25 years ago, birds breeding in the area have been surveyed annually at 300 permanent sample points under the direction of Dr. Schmiegelow and Dr. Erin Bayne of the University of Alberta.

Optional Box: How do researchers survey birds?

For decades, scientists have studied birds using a range of techniques, most commonly the "point count" method. To conduct a point count, a researcher must be at their survey points when male birds are singing most frequently: during the spring, between sunrise and mid-morning. This careful timing increases the probability that if a bird is there, the researcher will detect it.

In recent years, audio recording and computer recognition technologies have developed to the point where it is possible to conduct point counts remotely using autonomous recording units (ARUs). By deploying ARUs across a study area, it is possible to not only collect a far larger sample than is possible for humans, but also to collect more detailed information like how birds are located in space. At Calling Lake, researchers currently survey birds in-person while recording the survey using an ARU at the same time.

Informing forest management

The research being conducted in and around the Calling Lake Fragmentation Experiment provides a rich vein of information to inform forest management on the Al-Pac forest management tenure and beyond.

This is no accident: part of the reason for the experiment was to ensure that these results do more than sit on a shelf. Instead, they are used to inform practice for the benefit of bird populations on the managed landscape.

The birds singing out from the trees at Calling Lake may not realize it, but they are part of something big. The information their songs provide will benefit generations of birds to come by informing forest management planning, harvest and silviculture.

In future blog posts, we will explore some of the key findings from the Calling Lake Fragmentation Experiment. The long-term dataset, for example, has helped fill important gaps in our understanding of how birds respond to forest management over time.

Throughout this blog series, we will explore how these research findings provide forest managers with tools and knowledge to help them manage for biodiversity values like birds on the landscape.

Alberta-Pacific Forest Industries Inc. (Al-Pac) is located near Boyle, Alberta, where they manage one of the largest Forest Management Agreement (FMA) areas in the province. Al-Pac has a long history of collaborating with researchers and using their results to improve environmental outcomes on their FMA. This series looks at recent research conducted by Dr. Erin Bayne and his students, based at the University of Alberta.