

Ecological Monitoring Committee for the Lower Athabasca



Annual Report 2013-14

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EMCLA
Ecological Monitoring Committee
for the Lower Athabasca

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2013-14 Summary

The EMCLA's third year of operations was highly successful. Major achievements for the year included:

- Second year of ARU (automated recording unit) based field work for monitoring vocalizing species, with a focus on owls, amphibians, and the yellow rail. A more targeted yellow rail design resulted in a record 60 detections from the 2013 monitoring season.
- Development and testing of automatic recognizers for barred owl and yellow rail.
- Second year of field work to evaluate new methods for monitoring rare plants using an adaptive sampling model to optimize locations for rare plant detections. Rare plant fieldwork included collaborations with Environment Canada on seed bank diversity and with ABMI (Alberta Biodiversity Monitoring Institute) on the effects of survey length and observer on detection levels.
- Published paper on Sampling Plant Diversity and Rarity at Landscape Scales: Importance of Sampling Time in Species Detectability.
- Completion of a study on the effects of predicted future development on movement of woodland caribou. Final steps involved collecting data from above-ground pipeline camera trap monitoring to incorporate into the analysis.

Structure and Operations

Two changes to the EMCLA's structure occurred in 2013-14:

- Addition of a new non-voting member, COSIA (Canada's Oil Sands Innovation Alliance).
- Transitioned from a calendar to an Apr-Mar fiscal year to align with planning and funding cycles under the Joint Oil Sands Monitoring program and the Alberta Environmental Monitoring, Evaluation and Reporting Agency.

Members of the EMCLA include companies active in the oil sands industry in the Lower Athabasca, Alberta Environment and Sustainable Resource Development, and Environment Canada. The ABMI and COSIA are represented in a non-voting capacity to provide unbiased scientific and technical support. The ABMI's Regional Monitoring

Coordinator oversees the Committee's administrative functions and serves as Project Manager for the EMCLA's activities.

List of EMCLA Members for 2013-14

Government Members

- Alberta Environment and Sustainable Resource Development
- Environment Canada – Canadian Wildlife Service

Industry Members

- Albion Sands Energy/Shell Canada
- Athabasca Oil Sands
- Brion Energy
- Canadian Natural Resources Ltd.
- Cenovus Energy Inc
- Connacher
- ConocoPhillips Canada
- Devon Canada
- Hammerstone Corporation
- Husky Energy Ltd
- Imperial Oil Resources
- Ivanhoe
- JACOS
- Laricina
- MEG Energy
- Nexen Canada Inc.
- Southern Pacific
- Statoil
- Suncor Energy
- Sunshine Oil Sands
- Syncrude Canada Limited.
- Teck Resources Limited
- Total E&P Canada

Non-voting members

- Alberta Biodiversity Monitoring Institute
- Canada's Oil Sands Innovation Alliance

2013-14 Project Summaries

In 2013-14, the EMCLA sponsored three monitoring and research projects:

- Developing a regional monitoring system for rare plants
- Developing regional monitoring methods for rare and elusive animal species (owls, amphibians, and the yellow rail)
- Woodland caribou and movement

This Annual Report provides summaries of each project's activity in 2013-14. Detailed reporting documents for all three of these projects can be found on the EMCLA's website (www.emcla.ca) or by contacting the EMCLA directly.

Rare Plants: A model-based adaptive rare plant sampling and monitoring design for the Lower Athabasca Region of Alberta

The Rare Plants project entered into its 2nd year of data collection in 2013, with sampling locations based on statistical models developed from existing plant observations. These predictive models identify "rare plant hotspots" and use an iterative process that improves the predictions over time with increased data.

The 2013 field program resulted in the successful collection of detailed plant inventories at approximately 200 field sites. Field crews collected over 9000 plant observations, comprised of 450 individual species observations. One hundred and fourteen of these observations were rare species (S1, S2, or S3). When a rare plant species was observed, a detailed datasheet was completed and submitted to ACIMS (Alberta Conservation and Information Management System).

The rare plants team also collaborated on data collection for a couple of additional studies. At a subset of the rare plant sites, soil was collected and sent to scientists at Environment Canada for soil chemical analyses that are being used in a seed bank study to evaluate below-ground plant diversity. In addition, EMCLA crews surveyed 5 ABMI sites as part of an evaluation of the importance of survey length and observer effects in species detections.

The team also finalized and submitted a manuscript evaluating the importance of sampling effort in vegetation monitoring. This study used EMCLA 2012 and 2013 plant data to identify the number of species lost when surveys are limited to different time intervals. For example, across the Lower Athabasca, if surveys were limited to 20 minutes in length, 61 species would be missed. An additional report was released in early 2014 summarizing rare species detection levels.

Fieldwork in 2014 will focus on a second iteration of the adaptive sampling model, evaluation of the potential to incorporate meander and plot data into regional analyses of rare plants, and establishment of EMCLA plots on lease sites.

Project Partners:

- Alberta Biodiversity Monitoring Institute
- Alberta Innovates Technology Futures
- Alberta Tourism, Parks, and Recreation
- Ducks Unlimited
- Environment Canada
- Royal Alberta Museum
- University of Alberta

Leveraged Funds:

- NSERC Canada Graduate Scholarships Masters Program (CGSM): \$23,000
- NSERC Collaborative Research and Development Grant (CRD): \$50,000
- Alberta Conservation Association (ACA) Grant: \$25,000

Rare and Elusive Animal Species: Recommendations for an Owl, Yellow Rail, and Amphibian Study in Northeastern Alberta

With a focus on owls, amphibians, and yellow rail, the rare animals project entered its 2nd year of data collection in 2013 to further build out the capabilities of ARUs for monitoring vocalizing species. ARUs are programmable recorders that are installed at remote locations for extended periods of time and record anything that makes a sound.

The field season began in late March for owls, and continued until the end of August to encompass a number of species that vocalize at different times of the year. The survey methods aligned with ABMI protocols, in which 5 recorders were grouped together at one site and moved as a unit periodically throughout the season. Over the course of the summer, 42 sites were surveyed for owls, and 65 sites were surveyed for yellow rail. In addition, 27 opportunistic stations were deployed to survey for amphibians. This resulted in the collection of over 9 TB of data, or over 2.5 years of recordings.

To address the processing requirements of such a large amount of data, the team developed and tested automatic recognizers for yellow rail and barred owl. The use of the yellow rail recognizer contributed to a highly successful yellow rail program in 2013. More yellow rail were detected in one season than in 15 years prior—over 60 individual detections. These detections have refined our understanding of yellow rail habitat preferences, indicating that rails have a preference for meadow marsh and graminoid rich fen habitats. In addition to yellow rail, the ARU program resulted in detections of 129 other vocalizing species.

ARUs were also successfully piloted in a number of existing monitoring programs in 2013; the rare animals team worked with 6 energy companies to coordinate their on lease ARU monitoring programs. This coordination allowed for on lease monitoring to align with regional monitoring. ARUs were also tested at a subset of ABMI's core monitoring sites.

The rare animals project will continue into 2014 with return visits to select owl and yellow rail sites to determine inter-annual variability, as well as targeted new sites to further refine habitat associations.

Project Partners:

- Alberta Biodiversity Monitoring Institute
- Alberta Conservation Association
- Alberta Innovates Technology Futures
- Beaverhill Bird Observatory
- Bird Studies Canada
- Boreal Avian Monitoring Project
- Ducks Unlimited
- University of Alberta

Leveraged Funds:

- NSERC Industrial Post-Graduate Scholarships (IPS): \$100,000
- NSERC Collaborative Research and Development Grant (CRD): \$50,000
- Alberta Conservation Association (ACA) Grant: \$25,000
- Northern Science Training Program: \$10,000
- Science Horizon—EC: \$13,000
- Science and Technology Training Program—EC: \$13,000

Woodland Caribou and Movement: Assessing the Influence of Industrial Development on Caribou Movement in the Lower Athabasca Planning Region

The EMCLA initiated this project to address uncertainty over the effects of above-ground pipelines and associated linear features on caribou movement and the extent to which those effects might limit caribou populations. The 2013 work focused on an expansion of the 2012 study on the effects of simulated future in situ development patterns on simulated caribou movements.

The 2012 analysis involved testing for effects of simulated future (i.e. 50 years from now) and current in-situ oil sands developments (ISDs) on simulated caribou

movements. Simulations involved variations in the spacing and permeability of ISDs and the presence of protected areas. The project team used t-tests and a generalized linear model to test for the effects of these factors on caribou step lengths (i.e., the distance between two successive locations) and annual home ranges, key metrics of small and large spatiotemporal scales of movement, respectively.

In 2013, the team gathered existing camera trap data to measure current caribou crossings of above-ground pipeline (AGP) features of ISDs. The current crossing rate was compared to expected caribou crossing rates based on present-day caribou movement simulations. Current crossing rates were evaluated within the context of predicted future crossing success rates necessary to maintain caribou step lengths and home ranges.

With few exceptions, permeability across ISDs was the main factor affecting caribou movement, more important than spacing between developments or protected areas. However, minimal permeability (crossing rates of at least 40%, relative to an undisturbed site) was needed to maintain existing home range size. The relationship between permeability and home range size was non-linear, suggesting that small increases in permeability would provide a disproportionately greater benefit to caribou movement.

The results of this study were summarized in a manuscript for publication in March 2014.

Project Partners:

- Alberta Biodiversity Monitoring Institute
- Alberta Innovates Technology Futures
- Al-Pac Forest Industries
- Salmo Consulting
- University of Alberta

Plans for 2014-15

Working with the project teams, and within the consultative and planning processes of the Joint Oil Sands Monitoring Program (JOSM), the EMCLA determined to move forward its 2 field based programs, while deferring further work on caribou pending the release of Alberta Environment and Sustainable Resource Development's caribou range plans.

Rare Plants Project:

This project will move into its 3rd year of sampling in 2014 and will involve the first year of sampling under the 2nd iteration of the adaptive sampling model. The project will also gather plant data from meander searches (routinely done in Pre-Disturbance Assessments or PDAs) to explore opportunities to use both meander and plot data to assess and monitor regional populations of rare plants.

Rare Animals Project:

Fieldwork in 2014 will focus on a combination of re-visiting previous sites and visiting new sites to determine inter-annual variability and to further refine our understanding of the population status and trends of target species. Additional effort will be placed on density estimation in the field to estimate the "hearing distances" of different recorders.

Woodland Caribou Project:

The EMCLA is deferring further caribou project activities until the Cold Lake range plan is published. The EMCLA will re-evaluate its caribou project annually, striving to align its activities with strategic priorities identified by range plans for caribou herds in the Lower Athabasca Region and with the priorities of the oil sands monitoring program.

Integration with the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring and with the Alberta Environmental Monitoring, Evaluation and Reporting Agency

In February 2012, the governments of Alberta and Canada released the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring (JOSM). The plan outlines a path forward for a coordinated, government-led monitoring program for air, water, land, and biodiversity in the oil sands, with an annual budget of up to \$50 million dollars.

The work of the EMCLA falls within the scope of the Terrestrial Biodiversity and Habitat Monitoring component of the JOSM program. This has caused a fundamental shift in the EMCLA's operations. Previously, the EMCLA operated largely independently, taking input from its members and from regulatory/approvals officials. Now, the EMCLA's work is being integrated with the larger JOSM monitoring system. Therefore, the JOSM program provides the EMCLA with its annual operating budget and program direction.

The JOSM system has established a governance structure that involves joint leadership provided by the federal and provincial governments beginning at the component level and continuing up to provincial and federal Assistant Deputy Ministers (ADMs). For the Terrestrial Biodiversity and Habitat Monitoring component, committees have been established to ensure effective management, program delivery, and stakeholder involvement. The recently established provincial monitoring agency, Alberta Environmental Monitoring, Evaluation, and Reporting Agency (AEMERA) will play a lead role in regional environmental monitoring initiatives moving forward. The EMCLA is monitoring changes in the regulatory system to reflect this new structure and is prepared to adjust its activities and governance in response.

Financial Report

The EMCLA transitioned from a calendar to an Apr-March fiscal year in 2013. Thus, the budget below represents spending from Jan 2013-March 2014.

| | |
|--|---------------------|
| Total Revenues | \$809,034 |
| Expenditures - Caribou | \$46,148.47 |
| Expenditures - Rare Animals | \$283,918.30 |
| Expenditures - Rare Plants | \$255,842.25 |
| Expenditures - Administration and Project Management | \$119,466.97 |
| Expenditures - ABMI Support | \$77,000.00 |
| Total Expenditures | \$782,375.99 |
| Total Funds Remaining | \$26,658.01 |

Funding for the EMCLA in 2013/14 was provided by industry through the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring. The majority of funds were spent directly on the EMCLA's three 2013-14 projects. Administration funds support the full-time EMCLA Regional Monitoring Coordinator (salary, benefits, and travel expenses while representing the EMCLA), running EMCLA monthly meetings, networking and communications costs, and basic infrastructure (phone line, computer) for the Coordinator. The EMCLA provides 10% of its annual budget to the ABMI in return for management of the EMCLA's finances, contracts with service providers, communications and administration. The ABMI also provides the EMCLA with storage and office space.

Unspent funds from 2013-14 are to be kept in a contingency fund that will be used as needed in 2014-15.

EMCLA

The EMCLA is committed to financial transparency; further records are available upon request.