

ANNUAL REPORT | 19-20



| Board of Directors, and Partners and Sponsors | 3 |
|---|----|
| Message from the Executive Director | 4 |
| Monitoring Alberta's Landscapes and Biodiversity | 6 |
| Science Innovation | 8 |
| Working Collaboratively | 12 |
| Knowledge Translation and Engagement | 14 |
| Operational Excellence | 16 |
| ABMI-wide Publications for 2019–2020 | 18 |
| Financial Statements | 20 |

Thanks to our Board of Directors



John Kolk
Chair
AFFILIATION:
AGRICULTURE



Dave Pryce
Secretary/Treasurer
AFFILIATION:
PRYCE CONSULTING SERVICES



Tom Davis

Director

AFFILIATION:
ALBERTA ENVIRONMENT AND PARKS



Matina Kalcounis-Ruepell

Director

Affiliation:

UNIVERSITY OF ALBERTA



Simon Dyer

Director

AFFILIATION:
PEMBINA INSTITUTE



Krista Phillips

Director

AFFILIATION:

CANADIAN ASSOCIATION OF PETROLEUM PRODUCERS



Ray Cloutier

Director

AFFILIATION:
ALBERTA-PACIFIC FOREST INDUSTRIES



Bob Demulder

Director

Affiliation:

NATURE CONSERVANCY OF CANADA

...and our Partners and Sponsors

Alberta Innovates (formerly Al-Bio)

Alberta Agriculture and Forestry (formerly ALMA)

Alberta-Pacific Forest Industries

Athabasca Oil Corporation

BC Oil and Gas Research and Innovation Society

British Columbia Hydro and Power Authority

Blood Tribe/Kainai First Nation

Buffalo Lake Métis

Canada's Oil Sands Innovation Alliance

Canadian Natural Resources Limited Cenovus Energy

CNOOC Petroleum North America ULC

Cold Lake First Nation

Edson Forest Products

Government of Alberta

Government of Canada**

Government of British Columbia

Government of Northwest Territories

Government of Saskatchewan

The Habitat Conservation
Trust Foundation

Imperial Oil

InnoTech Alberta*

Mackenzie County (NWSAR)

MEG Energy

Métis Nation of Alberta Association Fort McMurray Local Council 1935

Miistakis Institute**

Nature Canada**

Oil Sands Monitoring Program

Okanagan Indian Band

Ontario Ministry of Natural Resources**

Royal Alberta Museum*

Sahtú Renewable Resources Board

Suncor Energy

Tetra Tech Canada

Town of High Level (NWSAR)

Town of Okotoks

University of Alberta*

University of Calgary*

University of Manitoba

West Fraser Timber

Wildlife Infometrics

*Delivery partner **Via WildTrax

Message from the Executive Director

The ABMI demonstrated progress and innovation in several significant areas in 2019-20: environmental monitoring, relationship-building, and financial stability.

We helped to advance environmental monitoring by investing in a range of programs including biodiversity baseline surveys, geospatial applications, and open data infrastructure. Advancement in each of these major program areas benefited from collaboration and cooperation with experts across the province and Canada; please look for highlights of these collaborations throughout the report. To each of our collaborators, we are very proud and thankful to be working with you.

Relationships are one of the keys to the success of the ABMI. We hope these relationships we contribute to provide net benefit to all involved, and ultimately foster success in the field of environmental monitoring overall. Our Members represent diverse perspectives-perspectives that are critical to ensuring our programs deliver value now and into the future. Further, our Delivery Partners have long been champions of the ABMI and of province-wide biodiversity monitoring. We have worked hard to improve relationships with our current Members and Delivery Partners as well as to recruit new Members. In addition, relationship building with First Nations and Métis communities throughout the province is an ongoing area of focus for the ABMI. Given that we live and work on the traditional territories of First Nations and Métis, we need to continue to develop respectful relationships and incorporate cultural knowledge into all ABMI program areas.

Finally, we established stable funding agreements with the Government of Alberta and the Oil Sands Monitoring Program. Though work remains, these agreements bring increased financial stability to the ABMI that facilitates longer-term planning. We look forward to strengthening the value of our programs and ensuring alignment with the information needs of funders, Members, and Albertans.

This annual report highlights some of the key accomplishments of the ABMI in 2019-20 and is organized around:

- 1. Monitoring Alberta's Landscapes and Biodiversity
- 2. Science Innovation
- 3. Working Collaboratively
- 4. Knowledge Translation and Engagement
- 5. Organizational Excellence

While not highlighted in this report, I would be remiss if I didn't mention the challenges the ABMI faced with the arrival of COVID-19. My sincerest thanks to our management team and staff for the safe and professional way that you handled adjustments and all-out pivots in program delivery because of the pandemic.

On behalf of ABMI Management, I would again like to thank our Members, Board of Directors, Delivery Partners, funders, and collaborators. As we collectively work to improve our understanding and appreciation of Alberta's biodiversity, I hope that we can achieve a greater sense of community while pushing the science of environmental monitoring forward. It is important that we build a strong foundation of knowledge that has value today and for future generations.

"Our Members represent diverse

perspectives—perspectives that

are critical to ensuring our

programs deliver value now and

into the future."



Jim Herbers

Executive Director,

Alberta Biodiversity

Monitoring Institute



Monitoring Alberta's Landscapes and Biodiversity

From the boreal forest in the north to the grasslands in the south, the ABMI monitors the state of Alberta's biodiversity.

As part of our ecosystem health program, we conduct annual biodiversity surveys in various regions throughout the province using a systematic approach to capture data on the status of a wide range of Alberta's species and their habitats, in both upland and wetland locations. This effort

contributes to the accumulation of a species-level data set that lets scientists, and policy-makers, understand species-habitat relationships and determine how human activity on the landscape is affecting the abundance and distribution for hundreds of species.



in the southwest of the province, which were surveyed in partnership with Lethbridge College.

At each survey location, technicians record the species that are present, and measure a variety of habitat characteristics. Increasingly, remote cameras and autonomous sound recording units (ARUs) are also being used, with more than 600 paired cameras and ARUs deployed and retrieved during the 2019-20 field season. Some sites, such as those in the FAP, are monitored only with cameras and ARUs. In 2019-20, for example, we collected nearly 700,000 images of mammal species alone.

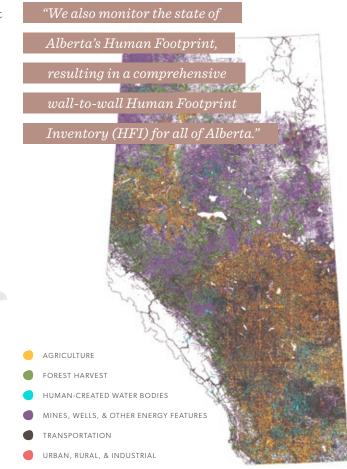
For species that cannot be identified in the field (e.g., mites and lichens), ABMI taxonomists at the Royal Alberta Museum sort, identify, and archive samples to complete our species-level data set. Including data from our 2019-20 monitoring season, we've now accumulated data on well over 3,000 species in Alberta.

We also monitor the state of Alberta's Human Footprint, resulting in a comprehensive wall-to-wall Human Footprint Inventory (HFI) for all of Alberta. As of 2019-20, this data set extends from 2000 to 2018 and is now updated annually to reflect changing human footprint conditions across Alberta. The current HFI contains 117 feature types and 20 individual sublayers including linear features like seismic lines, harvest areas, roads, and pipelines. New for 2019-20,

we produced an "enhanced" version of the Human Footprint Inventory (HFIe) for the Oil Sands Region (OSR), which includes more detailed information on age and sector-type attribution, as well as information on light pollution and post-disturbance revegetation.

ABMI human footprint data benefit from a longstanding partnership with the Government of Alberta (Alberta Environment and Parks [AEP]) through the Alberta Human Footprint Monitoring Program (AHFMP).

The ABMI's monitoring activities are made possible by the support and partnership of many organizations, gratefully acknowledged above, as well as through the expertise and experience of countless collaborators. We are also indebted to the many landholders across the province who allow our technicians onto their land.



Science Innovation

At the ABMI, we are proud to help advance the science behind environmental monitoring by leveraging data, expertise and partnerships. We look to improve the way that environmental science is conducted in Alberta by improving existing field methods, testing and adopting new technologies, and working to refine data analysis. Working closely with our partners, we seek to publish original research while also focusing on the information needs of resource managers in our province. Our work helps support understanding, innovation, and effective decision-making in Alberta and across the broader monitoring community.

Below, we present some key areas of scientific innovation focus for the ABMI in 2019-20. For a complete overview of the ABMI's research, please visit abmi.ca

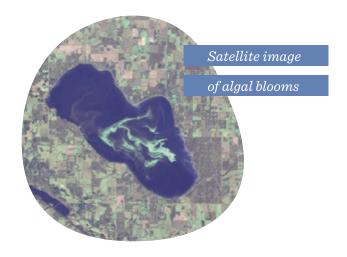
ALPHA-S/ALPHA-SG

Working with Alberta Environment and Parks (AEP), we continue to respond to the need for a consistent, comprehensive, and up-to-date landcover inventory for all of Alberta with the ongoing development of the Advanced Landcover Prediction and Habitat Assessment (ALPHA) program. This program has two product lines: ALPHA-S and ALPHA-SG.

NEXT GENERATION WALL-TO-WALL LANDCOVER PRODUCTS (ALPHA-S)

ALPHA-S products support regulator and land practitioner business needs by providing seamless, consistent geospatial data across Alberta. In 2019, using a novel approach that combines open access satellite data, cloud computing, and machine learning, we released a wetland inventory for most of Alberta at a resolution of 10 m. Similarly, we will be applying this deep-learning approach to the production of an updated map of upland habitat classifications for Alberta.

Another major project in the ALPHA-S program focuses on the dynamic nature of water bodies. We are collaborating with the Alberta Lake Management Society, the Pigeon Lake Watershed Association, AEP, and the University of Alberta to monitor algal blooms and cyanobacteria pigments using satellite data. The project was planned and initiated in 2019, and field work by our collaborators will occur in the summer of 2020 to calibrate statistical models. We hope to generate near-real-time predictions of cyanobacteria and algae pigments at 10 m and 300 m scales for Pigeon Lake (and beyond) for timely water quality management decisions by lake communities. All of our ALPHA-S products are freely available on our website.





HIGH-RESOLUTION VEGETATION STRUCTURE AND RECOVERY (ALPHA-SG)

New for 2019-20, the ALPHA-SG program builds on the ALPHA-S and HFI programs to provide high-resolution information that supports a range of business applications for our forest, energy, and agriculture stakeholders. Using photogrammetry and LiDAR data, we are able to generate detailed inventories of habitat, landforms, and human footprint. These data sets let us extract highly detailed information on vegetation, wetlands, and the state of revegetation of human footprint features.

As part of the ALPHA-SG pilot project, in 2019, we acquired high resolution aerial imagery for a region of northeastern Alberta that falls within the boundaries of the Oil Sands Region, and covers parts of three municipalities, three Forest Management Agreement Areas, one caribou range, and multiple ABMI monitoring sites. Some of the key derived products from the data processing activities—including Normalized Difference Vegetation Index (NDVI) raster maps, classified landcover types, and individual tree measurements—have great potential to further enhance human footprint, vegetation, and landcover inventories.

Funding: OSM.

ASSESSING HUMAN PRESSURES BEYOND VISIBLE LANDSCAPE TRANSFORMATIONS (HFIe)

One of Alberta's flagship geospatial products is the comprehensive wall-to-wall HFI for all of Alberta. To date, the HFI has only included data on visible land disturbance. To capture additional stressors that could have an impact on animal behaviour and populations, we have been working to include data on industrial light intensity and noise pollution, as well as post-disturbance revegetation. Released in 2019, the HFIe (circa 2018) for the OSM area is the first human footprint product to incorporate this kind of information.

Collaborators: AHFMP; Don Page, Tom Churchill, Faye Wyatt, Mina Nasr. Funding: OSM.



FURTHERING THE SCIENCE OF FOOTPRINT RECOVERY

To date, the HFI has not accounted for the ecological recovery of temporary successional human footprint features (e.g., due to reclamation or regeneration). To address this knowledge gap, in 2019, we conducted research on the use of satellite-based information for calculating and assessing spectral regeneration in temporarily disturbed areas. Spectral regeneration refers to the return of spectral signals from Earth surfaces—the reflection of wavelengths of light from these surfaces, which varies with surface type—to pre-disturbance levels. Changes in spectral signals can be used to assess surface changes such as the return and growth of vegetation due to succession or in response to reclamation, and thus data on spectral regeneration show promise as a potential way to remove footprint features from inventories. To date, our research has largely focused on forest harvest areas, while the application of these techniques to other footprint types is being explored.

SCIENCE OF CARIBOU RECOVERY

Woodland caribou are in decline across western Canada. A core goal of the ABMI's Caribou Monitoring Unit (CMU) is to understand the mechanisms that contribute to these declines and provide scientific information to those involved with effective caribou recovery. In 2019-20, we continued our work with partners from government, academia, and industry to collect and analyse data from Saskatchewan, Alberta, British Columbia and the Northwest Territories on human habitat-alteration. primary productivity, moose, wolves, and caribou. The goal of this research is to discriminate among hypotheses about the effect of habitat alteration on caribou population growth and provide insight into the cascading impacts of habitat alteration. The success of this program has been, and continues to be, contingent on combining efforts across multiple jurisdictions and research partners.

Partners: Government of British Columbia, Government of Alberta, Government of Saskatchewan, Government of Northwest Territories, University of Alberta, University of Saskatchewan, Regional Industry Caribou Collaboration.



SCIENCE OF MAMMAL MONITORING USING CAMERAS

To help improve estimates of the density of wildlife populations, the CMU continued collaborations with researchers at the University of Victoria and University of British Columbia (Joanna Burgar, Cole Burton, Jason Fisher) to compare methodologies on estimating mammal density using remote cameras—Spatial Capture (SC) and Random Encounter and Staying Time (REST)—in Alberta's boreal forest. Preliminary analyses in 2019-20 showed substantial differences in results between the two methodologies. This work highlights the importance of understanding the assumptions of each method, and the need for external validation and continued improvement in these new avenues of research.

UNDERSTANDING ALBERTA'S FLORA AND FAUNA

Taxonomic specialists at the Royal Alberta Museum continue to help generate the ABMI's species-level datasets, while archiving enormous collections of specimens for verification and future research. To date, our teams have identified more than 750,000 aquatic invertebrates. bryophytes, lichens, soil mites, and vascular plants, including some very significant additions to Alberta's known species lists. For example, in 2019, we discovered (and confirmed) the existence of Cutleaf Vipergrass (Scorzonera laciniata, Asteraceae) in Cypress County. Previously unknown in Canada, this species was introduced for erosion control in Colorado and New Mexico, but has been spreading throughout the Rocky Mountain states. It is listed as a noxious species under the Utah Noxious Weed Act and could pose a potential risk to Alberta's dry mixed grasslands and cultivation activities. As a result, we have been working to raise awareness of this early detection of Cutleaf Vipergrass in Canada, while supporting landowners and local officials with ongoing monitoring and control efforts.

Working Collaboratively

We take pride in collaboration, in supporting the needs of partners, stakeholders, and Indigenous communities, and in sharing our work for broader benefit. The resulting data and expertise represent a living, growing wealth of accessible information for Albertans, and for researchers and land managers across Canada and beyond.

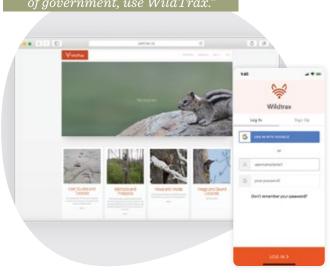
Below, we spotlight several examples of where and how the ABMI is working collaboratively to further the goals and outcomes of environmental monitoring in Alberta and beyond. For more information, please visit abmi.ca.

ENVIRONMENTAL SENSOR DATA PROCESSING AND MANAGEMENT

In November 2019, the ABMI, in partnership with the Bioacoustic Unit at the University of Alberta, launched WildTrax, an online platform for organizations, researchers, and individuals looking to process and manage environmental sensor data. The platform currently supports two environmental sensor types: autonomous

communities, and various levels

of government, use WildTrax."



recording units (ARUs) and remote wildlife cameras. To date, 40 organizations, from industry, academia, Indigenous communities, and various levels of government, use WildTrax. Over 340 camera and ARU projects are in the system spanning a decade of sensor data from across the country. WildTrax continues to grow to provide more tools, features and services for managing "big data", and, by facilitating access to an ever-growing biological data set, furthers the analysis of environmental data to support decision-making objectives related to land use and conservation. Development of the tools and digital infrastructure associated with the acoustic component of WildTrax has been primarily supported—with funding and expertise-by the Canadian Wildlife Service at Environment and Climate Change Canada.

SCIENTIFIC SUPPORT FOR BMF INDICATOR DEVELOPMENT

Biodiversity Management Frameworks (BMF) are a component of land-use planning in Alberta that will establish a system for monitoring, reporting on, and managing cumulative effects on biodiversity at a regional scale. The ABMI provides ongoing support for the development of various BMF indicators, including species, community, and habitat indicators. In addition, we deliver essential geospatial data such as the HFI, which is used extensively in indicator development and sub-regional planning. In 2019-20, we worked with the

BMF Science and Technical Committee to advance an indicator to measure stream or lotic connectivity. The indicator measures the connectivity of aquatic stream and river habitats for aquatic biota such as small-bodied fish, invertebrates, and microorganisms. It assesses the connections between stream segments and habitat types within the stream network by identifying and evaluating artificial barriers, such as culverts. The data and metrics being developed for the BMF will ultimately contribute to sustainable and informed management of biodiversity for the province.

SUPPORTING INDIGENOUS COMMUNITY PRIORITIES

In 2019-20, we collaborated with a number of Indigenous communities across the province to support Indigenous-led community-based monitoring activities, with a focus on the use of ARUs and remote cameras to track culturally important species. One such collaboration was with Kainai Nation, wherein we facilitated training on the use of ARUs and cameras, and contributed to species identification as part of monitoring and research initiatives led by the community. We continue to engage and work with Indigenous communities to gain a better understanding of

monitoring needs and how traditional ecological knowledge can be used to provide a more comprehensive picture of biodiversity in Alberta.

COLLABORATIVE ECOSYSTEM MONITORING CAMERA PROGRAM

The Collaborative Ecosystem Monitoring Camera Program was initiated by the CMU in 2017 in partnership with the RICC, the Government of Alberta, and the University of Alberta. The goal of the program is to monitor changes in the abundance and activity levels of mammals in caribou ranges across Alberta. This is achieved using clusters of camera grids within each caribou range, placed along latitude and habitat gradients in order to understand multi-species responses to management actions over time. In 2019-20, the Northwest Species at Risk (NWSAR) Committee partnered with the ABMI to expand this monitoring initiative to include sampling in northwestern Alberta; the Alberta Trappers Association coordinated local trappers to deploy remote wildlife cameras in the Chinchaga and Caribou Mountains caribou ranges. The collaborative implementation of this standardized program across multiple jurisdictions will allow for consistent and comparable analyses across ranges to better inform an accurate understanding of how mammals respond.



Knowledge Translation and Engagement

Alberta's biodiversity is a living heritage fund for all Albertans. From ecosystem services like water purification, to recreational opportunities, to the province's identity as a place of rich natural beauty, we understand how much Albertans value their living resources. That's why the ABMI is committed to responding to our users' needs, building connections to reach new and underrepresented audiences, and ensuring our work is accessible, understandable, and engaging to all.

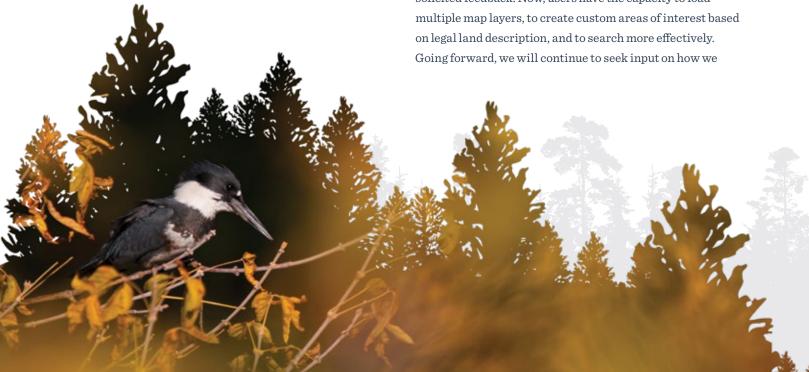
Here, we highlight several examples of the ABMI's commitment to knowledge translation and engagement. For more information on the ABMI's outreach activities, please visit abmi.ca.

RESPONSIVENESS TO USER NEEDS

Over the past ten-plus years, we have accumulated a significant biodiversity-related data asset—data on Alberta's species and their habitats, as well as data on the state of our land base and how it's changing over time. We release various information products to make the data meaningful to land managers, from "status of biodiversity" reports to project reports to an online data portal for easy data access and download. Over the last few years, we've

deliberately sought out feedback on these products and how we might improve them to increase their value to end users. In 2019, we rolled out a new template for online reports (see alpacreport.abmi.ca) designed to be engaging and interactive for any reader interested in the state of Alberta's environment, while also providing the scientific details sought after by more technical readers.

Over the past year, we've also significantly enhanced our online mapviewer (abmi.ca/maps) in direct response to solicited feedback. Now, users have the capacity to load



can continue to improve useability and functionality of our various online platforms as part of our commitment to be responsive to user needs.

EXPANDING ENGAGEMENT OPPORTUNITIES

In 2019, the ABMI made a concerted effort to increase its engagement activities, certainly to increase awareness of the ABMI's available products and services, but also to better understand the biodiversity information-related challenges and opportunities of various organizations, sectors, and communities. We launched an ABMI webinar series, with topics such as "Introduction to WildTrax: a platform for managing environmental sensor data", often accompanied by follow-up surveys on the value of these webinars and how we could improve. We held a variety of face-to-face meetings with Alberta municipalities and Indigenous communities to begin to build relationships and identify opportunities of mutual benefit. Leading or participating in these kinds of in-person or virtual activities has opened up significant opportunities for the ABMI to engage in meaningful dialogue with various parties, and, as such, will be an area of growth for the ABMI.

SUPPORTING CITIZEN SCIENCE

In 2019-20, the ABMI continued to support citizen science in Alberta with our citizen science platform,

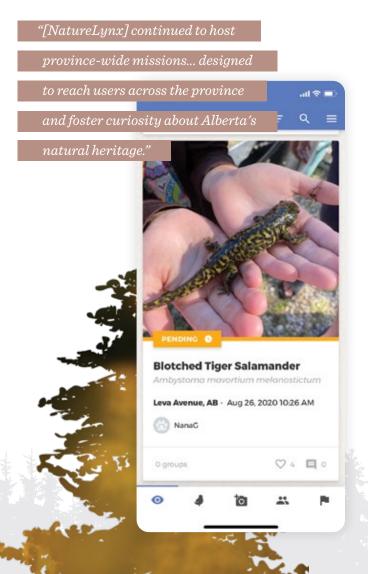
NatureLynx™. Officially launched in July 2018, NatureLynx is a smartphone and web-based app that lets users share photographs of biodiversity sightings across the province.

Sightings are "verified" by a community of online experts, allowing users to learn more about their observations while providing quality control on identifications. Sighting metadata is collected and can be used to support monitoring efforts throughout the province.

Groups and missions can be used to meet specific user needs. In 2019-2020, we continued to host province-wide

missions on NatureLynx. These initiatives were designed to reach users across the province and foster curiosity about Alberta's natural heritage. In the spring, we collaborated with Alberta PlantWatch—a 30-year citizen science project tracking the annual bloom of plants in Alberta—to host a Saskatoon phenology survey. In the fall, we hosted the second annual "Hare Hunt" to document the seasonal colour change of snowshoe hares.

A variety of groups leveraged NatureLynx to host their own initiatives across the province. The Town of Okotoks continued to host their urban deer counts, the Ellis Bird Farm hosted a photo contest, and the Alberta Conservation Association adopted NatureLynx to support their Amphibian Volunteer Mapping Project. The ABMI is happy to support the growth of citizen science in Alberta and looks forward to future collaborations and initiatives using NatureLynx.



Operational Excellence

Successful organizations maintain strong fiscal, management, and quality controls. We are consistently working to create improvements in our operations, including in how we attract and retain talented employees; engage and work with our Board of Directors, Members and stakeholders; innovate and collaborate; and respond to stakeholder needs.

The 2019-20 operating year ended with the arrival of the COVID-19 global pandemic, which significantly impacted how and where we work. The ABMI successfully navigated the early days of uncertain times and accompanying work planning challenges, and will continue to adapt for the good of our staff and organization as this global situation unfolds.

ENHANCE MEMBER ENGAGEMENT

We believe that our science programs have more impact when they are informed by a broad spectrum of interests. Our Voting Member organizations occupy an important seat at the table, and 2019-20 saw us enhance our Member engagement process. Members now have formal opportunities throughout each year to provide meaningful input to our annual strategic and operational planning cycle. Through appointing Board Directors, and by voting as per our bylaws, they also help to establish ABMI priorities, and ensure that their sector's views are fairly and accurately represented.

CONTINUAL ASSESSMENT AND IMPROVEMENT OF QA/AC

"Scientific credibility" is a guiding principle of the ABMI's operations. To ensure we live up to this principle, we constantly evaluate how to integrate and/or refine existing quality assurance and quality control (QA/QC) processes and measures as our programs evolve. We have a variety of

purpose-built online "workbenches" used to update protocol descriptions and taxonomic designations, as needed, to assure our users that we're delivering up-to-date data and associated metadata. Integral to the development of our client-focused information systems, such as WildTrax, is the inclusion of QA/QC checks throughout the various data onboarding, processing, and management processes. These steps are critical in maintaining confidence in overall data quality and integrity. To communicate the various data quality management activities we undertake at the ABMI, we maintain an institutional Quality Management Plan, the second update of which was released in 2019.

"Members now have formal

opportunities throughout each year

to provide meaningful input to our

annual strategic and operational

planning cycle."

FINANCIAL ACCOUNTABILITY TO SPONSORS

Sound fiscal management is also a cornerstone of our operations. While the ABMI always operates within a balanced budget, longer-term funding stability has consistently been an issue. We were very pleased that

this year, we signed multi-year funding agreements with the Government of Alberta and the Oil Sands Monitoring program. In support of both of those agreements, we have established additional engagement and rigorous reporting systems to assess and manage progress against deliverables.



ABMI-wide Publications

for 2019-2020

We publish research on a wide range of topics each year. Below is an excerpted list of peer-reviewed publications from 2019-20 for which our researchers were authors or co-authors, as well as a selection of technical documents. User guides, project reports and additional publications from third parties using ABMI data are not listed.

PEER-REVIEWED PUBLICATIONS

Saving endangered species using adaptive management

AUTHORS: SERROUYA R, SEIP DR, HERVIEUX D, MCLELLAN BN, MCNAY RS, STEENWEG R, HEARD DC, HEBBLEWHITE M, GILLINGHAM MP, BOUTIN S

JOURNAL: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

2019-03-26

New Waterboatman Record for Alberta, Corisella inscripta (Hemiptera: Corixidae)

AUTHORS: TEBBY C, HINCHLIFFE R, COBB T

JOURNAL: ENTOMOLOGICAL NEWS

2019-06-01

Survey of Cattle and Pasture Management Practices on Focal Pastures in Alberta

AUTHORS: BAO T, CARLYLE CN, BORK EW, BECKER M, ALEXANDER MJ, DEMAERE C, SOUZA DM, FARR D, MCALLISTER TA, SELIN C, WEBER M, CAHILL JF

JOURNAL: CANADIAN JOURNAL OF ANIMAL SCIENCE

2019-06-03

Moose, caribou and fire: have we got it right yet?

AUTHORS: DEMARS CA, SERROUYA R, MUMMA MA, GILLINGHAM MP, MCNAY RS, BOUTIN S

JOURNAL: CANADIAN JOURNAL OF ZOOLOGY

2019-06-07

Large-scale probabilistic identification of boreal peatlands using Google Earth Engine, open-access satellite data, and machine learning

AUTHORS: DELANCEY ER, KARIYEVA J, BRIED J, HIRD J

JOURNAL: PLOS ONE 2019-06-17

New Record of Neohaemonia melsheimeri (Lacordaire, 1845) (Coleoptera: Chrysomelidae) from Alberta, Canada

AUTHORS: LAPIERRE A, HINCHLIFFE R, TEBBY C, COBB T

JOURNAL: THE COLEOPTERISTS BULLETIN

2019-06-21

Reproductive ecology of impoverished pinweed (Lechea intermedia var. depauperata), a fire-associated narrow endemic from the boreal forest

AUTHORS: CRISFIELD VE, HAUGHLAND DL, PYLE LA

JOURNAL: BOTANY 2019-07-11

Assessing the provision of carbon-related ecosystem services across a range of temperate grassland systems in western Canada

AUTHORS: IRAVANI M, WHITE SR, FARR DR, HABIB TJ, KARIYEVA J, FARAMARZI M

JOURNAL: SCIENCE OF THE TOTAL ENVIRONMENT

2019-08-25

Beef production and ecosystem services in Canada's prairie provinces: A review

AUTHORS: POGUE SJ, KRÖBELA R, JANZEN H, BEAUCHEMIN KA, LEGESSE G, MAIA DE SOUZA D, IRAVANI M, SELIN C, BYRNE J, MCALLISTER TA

IOURNAL: AGRICULTURAL SYSTEMS

2019-08-31

Slowing down wolves to protect boreal caribou populations: a spatial simulation model of linear feature restoration

AUTHORS: SPANGENBERG MC, SERROUYA R, DICKIE M, DEMARS CA, MICHELOT T, BOUTIN S, WITTMANN MI

JOURNAL: ECOSPHERE

2019-10-22



Species richness is a surrogate for rare plant occurrence, but not conservation value, in boreal plant communities

AUTHORS: CRISFIELD VE, DENNETT JM, DENNY CK, MAO L, NIELSON SE

IOURNAL: BIODIVERSITY AND CONSERVATION

2019-10-30

2019-11-11

Effects of linear features on resource selection and movement rates of wood bison (Bison bison athabascae)

AUTHORS: DEMARS CA, NIELSEN S, EDWARDS M

JOURNAL: CANADIAN JOURNAL OF ZOOLOGY

The Synergistic Use of RADARSAT-2 Ascending and Descending Images to Improve Surface Water Detection Accuracy in Alberta, Canada

AUTHORS: DELANCEY ER, BRISCO B, CANISIUS F, MURNAGHAN K, BEAUDETTE L, KARIYEVA J

IOURNAL: CANADIAN IOURNAL OF REMOTE SENSING

2019-11-26

Comparing Deep Learning and Shallow Learning for Large-Scale Wetland Classification in Alberta, Canada

AUTHORS: DELANCEY ER, SIMMS JF, MAHDIANPARI M, MAHONEY C, KARIYEVA J

JOURNAL: REMOTE SENSING

2019-12-18

Uncovering traits in recovering grasslands: A functional assessment of oil and gas well pad reclamation

AUTHORS: LUPARDUS RC, AZERIA ET, SANTALA K, AUBIN I, MCINTOSH ACS

JOURNAL: ECOLOGICAL ENGINEERING: X

2020-01-01

Predicting the effects of restoring linear features on woodland caribou populations

AUTHORS: SERROUYA R, DICKIE M, DEMARS CA, BOUTIN S

JOURNAL: ECOLOGICAL MODELLING

2020-01-15

Estimating Coarse Woody Debris Volume Using Image Analysis and Multispectral LiDAR

AUTHORS: QUEIROZ GL, MCDERMID GJ, LINKE J, HOPKINSON C, KARIYEVA J

JOURNAL: FORESTS 2020-01-25

First recorded co-occurrence of Valvata lewisi Currier 1868 and Valvata lewisi ontariensis Baker, 1931 (Gastropoda: Valvatidae) from Alberta, Canada with notes on morphometric and genetic variability

AUTHORS: HINCHLIFFE R, TEBBY C, COBB T

2020-03-01

METHODS AND PROTOCOLS

Terrestrial Field Data Collection Protocols (Abridged Version)

AUTHORS: ABMI

2019-04-10

Wetland Field Data Collection Protocols (Abridged Version)

AUTHORS: ABMI

2019-07-02

Terrestrial ABMI Autonomous Recording Unit (ARU) and Remote Camera Trap Protocols

AUTHORS: ABMI

2019-12-21

Summarized Financial Statements

of the Alberta Biodiversity Monitoring Institute

Year Ended March 31, 2020



ALBERTA BIODIVERSITY MONITORING INSTITUTE

Statement of Financial Position March 31, 2020

| | | 2020 | 2019 |
|--|----|-----------|--------------|
| | | | (Revised) |
| ASSETS | | | |
| CURRENT | | | |
| Cash | \$ | 589,394 | \$ 1,642,277 |
| Accounts receivable | | 1,527,648 | 1,165,093 |
| Goods and services tax recoverable | | - | 8,297 |
| Prepaid expenses | | 9,188 | 10,951 |
| Advance to the University of Alberta | | 128,692 | |
| | | 2,254,922 | 2,826,618 |
| CAPITAL ASSETS | | 376,568 | 521,606 |
| LONG TERM INVESTMENTS | | | 200,068 |
| | \$ | 2,631,490 | \$ 3,548,292 |
| LIABILITIES AND NET ASSETS CURRENT | | | |
| Accounts payable and accrued liabilities | \$ | 715,179 | \$ 1,319,398 |
| Goods and services tax payable | | 12,724 | - |
| Deferred contributions | | 579,677 | 886,037 |
| Advance from the University of Alberta | - | - | 1,941 |
| | | 1,307,580 | 2,207,376 |
| NET ASSETS | | 1,323,910 | 1,340,916 |
| | \$ | 2,631,490 | \$ 3,548,292 |

| ON BEHALF OF THE BOARD | |
|------------------------|---------|
| An white. | Directo |
| Dairy / | Directo |
| | |

INDEPENDENT AUDITOR'S REPORT

To the Members of Alberta Biodiversity Monitoring Institute

Opinion

We have audited the financial statements of Alberta Biodiversity Monitoring Institute (the Institute), which comprise the statement of financial position as at March 31, 2020, and the statements of revenues and expenditures, changes in net assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Institute as at March 31, 2020, and the results of its operations and cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of the Institute in accordance with ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with ASNPO, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error

In preparing the financial statements, management is responsible for assessing the Institute's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Institute or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Institute's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures
 that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the
 effectiveness of the Institute's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or

conditions that may cast significant doubt on the Institute's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Institute to cease to continue as a going concern.

Evaluate the overall presentation, structure and content of the financial statements, including the
disclosures, and whether the financial statements represent the underlying transactions and events in
a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Edmonton, Alberta September 3, 2020 Coyle & Company CHARTERED PROFESSIONAL ACCOUNTANTS





CONTACT US

Alberta Biodiversity Monitoring Institute

www.abmi.ca 780 248 1592 abmiinfo@ualberta.ca



f Alberta Biodiversity

Monitoring Institute

abbiodiversity

EDMONTON OFFICE

CW 405 Biological Sciences Building University of Alberta Edmonton, Alberta Canada, T6G 2E9

VEGREVILLE OFFICE

c/o InnoTech Alberta Bag 4000 Vegreville, Alberta Canada, T9C 1T4

PHOTOGRAPHY CREDITS

Front & Back Covers: Marion Trudel, ABMI. Page 2: ABMI. Page 5: Jon Dickson. Page 6 & 7: Kirstan Tereschyn. Page 8: ABMI. Page 9: Kieran Lehan. Page 10 & 11: Hans Mohr. Page 13: ABMI. Page 14 & 15: Nick Parayko. Page 17: Jaimie Forest. Page 20: Dave Evans. Page 23: Dave Evans.