Alberta Biodiversity Monitoring Institute

ANNUAL REPORT 17/18

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“Thanks to our Board of Directors

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Message from the Executive Director

2017–18 was an eventful year for the ABMI. After 15 years as Executive Director, Kirk Andries retired during the year. We sincerely thank Kirk for overseeing the ABMI's growth from concept to the global leader in biodiversity monitoring that it is today.

To mark 10 years of formal operations, we conducted a major review of the ABMI's programs and deliverables over the last decade. This year-long process was guided by two questions: To what extent has the ABMI met its scientific and stakeholder engagement goals? And, how can it deliver more value to partners, stakeholders, and citizens in general? Feedback from independent external reviewers was highly positive. For example, the Science Expert Committee stated "ABMI's progress to date is a monumental achievement and its comprehensive approach is unique in the world." As expected, the review process also highlighted areas for continued improvement, particularly around engagement and outreach, and specifically the need to return to longer-term strategic relationships with industry, public, and governmental stakeholders. We are actively tackling these recommendations, and a complete summary of the review process, its findings, and our responses, will soon be available online.

The positive reviews received from the ten-year review are thanks in large part to the ongoing dedication and innovation of the ABMI's six Centres and their staffs, which you'll learn more of in the pages that follow. Tremendous advances have been made in science, automation, and deployment (e.g., our Mapping Portal, online systems, ARUs, Camera traps, NatureLynx and WildTrax...) making the ABMI's growing inventory of relevant data more accessible to all interested stakeholders.

The program's successes are even more impressive given that the ABMI has faced, and continues to face, real turbulence over the past five years. Specifically, significant changes to Alberta's regulatory and administrative environment have resulted in a shared experience of uncertainty among many affected organizations.

As just one example, prior to 2013, the ABMI enjoyed a direct relationship with energy industry stakeholders—a core source of both program funding and strategic and operational direction. With the establishment of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring (JOSM), the Alberta Environmental Monitoring, Evaluation and Reporting Agency (AEMERA) began to serve as an intermediary between industry sponsors and environmental agencies, including delivery partners such as the ABMI. Whatever its other merits, this reorganization resulted in fewer opportunities for the ABMI to engage directly with key partners in industry and government.

In 2016, AEMERA was folded and rolled into the Government of Alberta's Environmental Monitoring and Science Division (EMSD.) As various agencies inside and outside of Government responded to the change, service providers like the ABMI lost direct budgetary and operational contact with many key stakeholders and funders. For the ABMI, this led to unpredictability in the annual budget and a shift from proactive long-term planning to a more reactive, year-to-year budgeting process.

The ABMI has been, and is, weathering this period by focussing on its core strengths—monitoring and reporting—and continuing to build additional value for its clients and stakeholders wherever it can through technology and

partnership. The results of the ten-year review process strongly affirm our success in this respect, but caution of the need to re-establish key relationships and support.

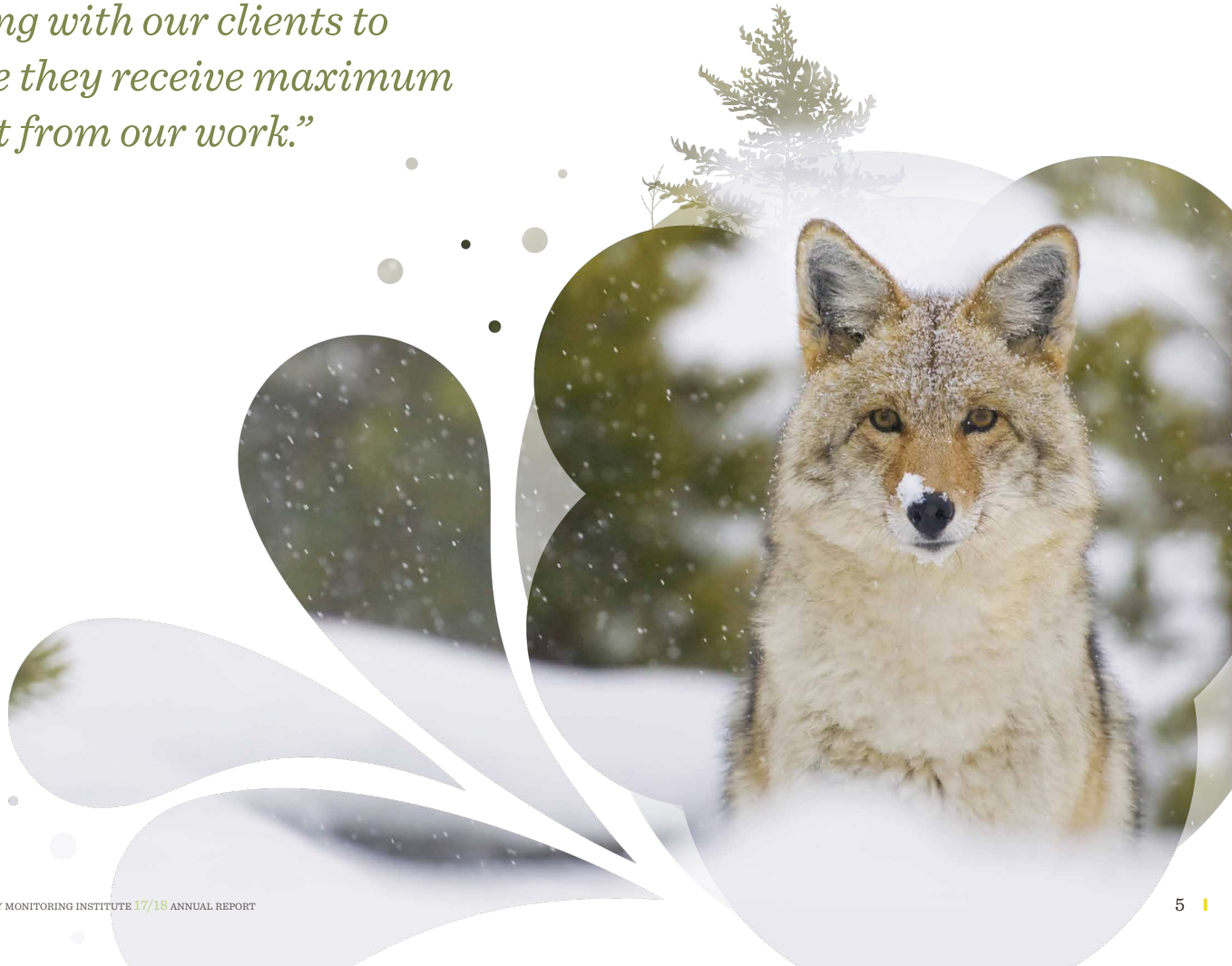
Amid the uncertainty, we continue to deliver high-quality data and data products, from our online Data and Mapping Portals, to our region-specific summary reports, to our rapidly expanding geospatial inventories. The depth and quality of the ABMI's data and expertise are an Alberta success story—a true value to Alberta, and to our clients. We will continue to optimize and expand value through increased engagement, knowledge translation, and cultivation of direct, lasting relationships with our partners, stakeholders, and customers. Key to this will be the re-establishment of longer-term strategic and funding horizons that will allow the ABMI to build out its business in the way that multiple stakeholder groups have told us they want. We have already begun this process over the past year, and nurturing these longer-term relationships, both old and new, will be a core focus of the ABMI going forward.

The ABMI continues to accumulate a wealth of biodiversity data and expertise—a unique and growing 'heritage fund' of knowledge. As we look ahead, we remain committed to providing data and data products of the highest quality, and to working with our clients to ensure they receive maximum benefit from our work. By doing so, we will continue to serve as a global leader in biodiversity monitoring.

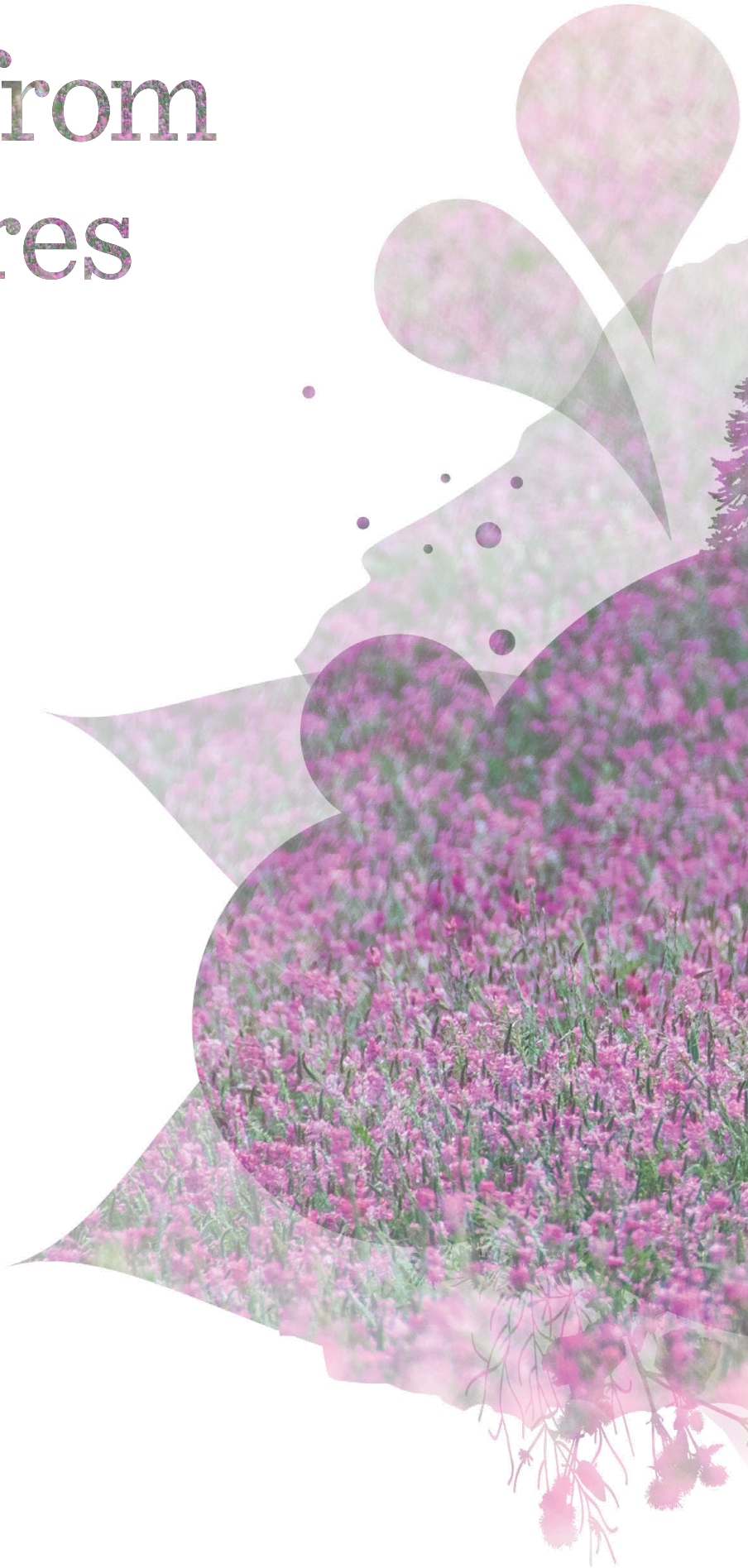
With thanks to the ABMI's Board and staff for everything they do,

Stephen Lougheed
Executive Director,
Alberta Biodiversity Monitoring Institute

"We remain committed to working with our clients to ensure they receive maximum benefit from our work."



Reports from the Centres



Alberta is home to more than 80,000 species including plants, animals, arthropods, bacteria, fungi, and algae.

> *The ABMI painstakingly collects, analyzes and reports on the status of more than 2000 of these species. To do this, the ABMI surveys 1656 site locations systematically located – every 20 km – across the province.*

At each location, we collect data on both terrestrial and aquatic ecosystems. We also track changes in habitat structure and human development.

Over the years the ABMI's values have not changed: we deliver scientifically credible, value-neutral, independent, and publicly accessible data. Our purpose is to inform government, industry, environmental communities, First Nations and the public about what is happening in our environment so that they can make informed decisions and plan for the future.


80,000
SPECIES IN ALBERTA

Executive Office

The Executive Office ensures that the program is being run efficiently and effectively, and is the primary interface between the ABMI, its Board of Directors, and stakeholders. During 2017–18, our Executive Director, Kirk Andries, decided to retire. Kirk was one of those involved in the initial idea and establishment of the ABMI, and we owe him a tremendous debt of gratitude for the passion and dedication he brought to the role. He has most certainly laid the groundwork for an organization with a vision that is practical and valued. His leadership will be sorely missed as our organization continues to grow and mature. One of our Board Directors, Mr. Stephen Lougheed, recused himself from his Board role while he took over as Interim Executive Director. In 2017–18, the Executive Office continued to ensure that operational deliverables met Board expectations. We achieved the following results:

FINANCIAL RESOURCES

Sufficient funds were secured for our targeted operations this fiscal year (e.g., core program grant, JOSM agreement); however, we continue to require additional and secure funding for the ongoing growth and maintenance of the program to achieve full capacity. This remains our number one long-term priority.

PROVINCIAL MONITORING SYSTEM

The ABMI continued to work with Alberta Environment and Parks to support provincial monitoring in Alberta. For the Executive Office, that work included collaborating on the development of grant agreements, negotiations to achieve a long-term Memorandum of Agreement, and supporting discussions with oil sands monitoring stakeholder groups. All of these interactions and relationships continue to grow and mature.

PARTNER AGREEMENTS

The success of the ABMI has largely been due to the involvement and long-term dedication of our partner organizations. 2017–18 marked the final year for the existing multi-year agreements with our partner organizations; therefore, new master agreements were negotiated and executed with each of our partners, to take effect in the 2018–19 fiscal year.

COMMUNICATION AND OUTREACH

We continued to engage with a variety of audiences, including elected officials, industry, and other stakeholder groups, to emphasize the importance of the ABMI as part of Alberta's resource management and monitoring systems. The Executive Office led all government relations activities, and identified and promoted program applications to enhance the ABMI's value. We also reviewed and approved all publicly-directed reports, engaged with stakeholders in the release of these reports, and provided oversight of all marketing materials. A key element of the outreach program in 2017–18 related to the ABMI's Ten-year Program Review. We were very pleased with the level of stakeholder engagement and quality of responses received. Further details about the review are outlined in other sections of this report.

BOARD OF DIRECTORS

A key element of the Executive Office's work involves supporting our Board of Directors. In 2017–18, we held four Board meetings and our Annual General meeting. We also supported the Board as they considered recruiting additional Board members.

OVERVIEW OF THE ABMI'S CENTRES AND BASES OF OPERATION

EXECUTIVE OFFICE

University of Alberta

MONITORING CENTRE	PROCESSING CENTRE	INFORMATION CENTRE	SCIENCE CENTRE	GEOSPATIAL CENTRE	APPLICATION CENTRE
InnoTech Alberta	Royal Alberta Museum	University of Alberta	University of Alberta InnoTech Alberta University of Calgary	University of Alberta InnoTech Alberta University of Calgary	University of Alberta

Monitoring Centre

The Monitoring Centre is responsible for the ABMI's complex system of biodiversity data collection throughout the province. As the primary function of the ABMI, data collection activities receive the dominant share of program resources. In the field, we implement spring and summer terrestrial surveys, summer wetland surveys, and have completed our transition to new technology for the collection of bird and mammal information. During the 2017–18 season we achieved the following results:

PROJECT MANAGEMENT

InnoTech Alberta's Vegreville location continues to serve as the Monitoring Centre's year-round base of operations. InnoTech provides 2700 sq.ft. of office space, over 500 sq.ft. of heated storage, and 7000 sq.ft. of covered outdoor storage for over 60 ATVs, Argos, snowmobiles, and other field related gear for exclusive use by the ABMI. We are grateful for their support.

2017 provided the program an opportunity to look back over its first 10 years and chart a path for the future. The past decade has seen many changes in the way the Monitoring Centre collects field data. This is perhaps most dramatically reflected in the role technology is playing in species monitoring. Collecting data around birds and mammals, in particular, was a significant challenge. While technology was deployed in 2007 to collect bird data, it was large and cumbersome: at each survey site, technicians carried 40 lbs. of equipment to 9 separate locations to record 10-minute point counts. This work had to be completed within 6 hours of sunrise, and many crews had to leave camp by 4 am. By contrast, current autonomous recording units (ARUs) weigh less than 3 lbs. and are deployed in the late fall/winter, to be picked up months later during our summer visits to the sites. These devices collect almost 40 minutes of data every day for the up-to-8 months they are deployed. Technology has also changed the way we collect mammal data. Whereas we previously hiked hundreds of 10-km transects per season, we now deploy automated cameras that can capture tens of thousands of images during a single deployment. And finally, technology has had a significant impact on the format in which our data is collected. All data is now input electronically via a field data collection tablet, allowing for strict standardization and even better quality control. Overall, technology has dramatically reduced errors and processing time.

DATA COLLECTION

The Monitoring Centre had another successful year in 2017, collecting data at 174 core terrestrial and wetland sites along with an additional 12 targeted, or 'directed research', sites. Directed research sites strengthen the analysis of ABMI data by supplementing the database with information on habitat types that do not frequently occur on the core sampling grid.

In addition to our full time and contract staff, we recruited 43 part-time staff to undertake our summer monitoring program in 2017.

Finally, post-field-season activities included processing field data, completing quality checks, and preparing for the 2018–19 field season. Part of that preparation is the deployment

of cameras and ARUs to sample locations that will be visited in the next field season. The Monitoring Centre deployed over 900 cameras on the core grid to support field work in 2018–19. In addition to these deployments and in conjunction with the Dr. Erin Bayne lab at the University of Alberta and the ABMI Application Centre, a further 130+ cameras and 500 ARUs were deployed at directed research sites.

Processing Centre

The ABMI Processing Centre, located at the Royal Alberta Museum (RAM), helps to generate the institute's species-level datasets while archiving thousands of specimens for verification and future research. Our dedicated team of highly specialized scientists and technicians provides the institute's support network of laboratory, taxonomic and curatorial expertise. Key responsibilities of the Processing Centre include:

- receiving, tracking and sorting field samples;
- species-level specimen identification and data generation;
- research and advancement of taxonomic expertise;
- training new taxonomic specialists;
- providing specialized taxonomic training for the ABMI's field technicians;
- developing interactive, user-friendly species identification tools; and
- curating specimens for long-term verification and future research.

CENTER OVERVIEW

In 2017–18, Processing Centre teams sorted and identified 84,947 specimens including mites, vascular plants, lichen, bryophytes and aquatic invertebrates—a modest increase over the previous year. Once again, our teams supported the specialized taxonomic training of the ABMI's field technicians and then, in preparation for more detailed taxonomic work throughout the year, successfully led this work force through the month-long, post-season sorting of field samples. In addition, as scientific ambassadors of both the ABMI and the RAM, Processing Centre teams contributed 22 presentations, workshops and guest lectures along with 15 written publications, helping to raise awareness of the ABMI's work and the general importance of monitoring biodiversity throughout Alberta.

This year, the ABMI Processing Centre focussed strongly on adapting to change while continuing to deliver high quality service to the Institute. All staff, operations and collections were successfully moved to the new RAM, located in Edmonton's downtown core, with minimal operational disruption. The new facility offers vastly increased collections storage space along with state-of-the-art laboratories and equipment (e.g., a scanning electron microscope) which will help us continue to provide high quality taxonomic support to meet the current and growing needs of the ABMI.

TEN-YEAR PROGRAM REVIEW

Processing Centre teams played a valuable role in assisting with the ABMI's Ten-year Program Review, particularly with respect to the ABMI's field and laboratory protocols, by participating in workshops and providing taxonomic information. As the program adapts to the changing needs of its stakeholders, our teams have been called on to support (and sometimes lead) refinements to the ABMI's sampling protocols while constantly seeking new ways to support improved training methods, sample handling, and data management.

Looking back over the past decade of operations is both gratifying and humbling. The total number of specimens that have been sorted, identified and archived by the ABMI Processing Centre now exceeds 1.24 million, spanning more than 3000 species. Over 150 of these species were previously unrecorded in Alberta and 40 were entirely unknown to science. Despite illustrating how much we have learned about Alberta's flora and fauna over the years, they also illuminate just how much we still need to learn. We continue to find new things almost every day, just by the nature of looking. Each sample delivered by the Monitoring Centre teams from the field brings new anticipation about what we might find—and that remains just as exciting today as it did 10 years ago.

Beyond helping to generate 10 years of species-level datasets, much else has been accomplished. Since 2007, more than 25,000 specimens have been sent on temporary loan or gifted to various institutions throughout Canada (and beyond). Non-target species found in ABMI samples have been used to support several graduate student projects. Experts from around the world have been engaged through the RAM's network to assist with the identification of particularly challenging species. In a very broad sense, the partnership between the ABMI and the RAM has helped advance the growth of taxonomic understanding. This endeavour has provided stable employment for numerous taxonomists and taxonomic technicians, enabling them to hone, advance and share their skills and enthusiasm. At a time when the global need for taxonomic resources like reference collections and skilled individuals far exceeds their availability ("the taxonomic impediment"), the significance of this investment—an investment in people, knowledge, and collaborative spirit—should not be underestimated.

Science Centre

The Science Centre is responsible for maintaining and continuously improving scientific excellence in all aspects of the ABMI. The Science Centre works closely with other ABMI Centres to improve data collection, apply quality control, advance data analysis and interpretation, and ensure the ABMI's communication products meet the needs of decision makers. Our integrated team ensures that the scientific credibility of the Institute remains world class. During 2017–18 we achieved the following:

DATA COLLECTION

In collaboration with other ABMI Centres, we reviewed and updated field protocols based on sampling that was done throughout the year. To improve efficiency, data processing methods for cameras and ARUs were tested and revised. We are continuing to develop and test methods to rapidly survey vascular plants and aquatic invertebrates. The wall-to-wall map of land cover was updated to incorporate geospatial information that became available during the year.

STATUS AND CUMULATIVE EFFECTS FOR SPECIES

For more than 900 species (including mammals, birds, vascular plants, mosses, lichens, and mites), we updated information on species distribution, habitat associations, and predicted abundance under reference and current conditions. In addition, we determined the cumulative effects of current human development on each species, and evaluated how each of the major sectors (energy, forestry, agriculture, and urban infrastructure) influenced the species' abundance. New field information collected during 2016 was incorporated into the analyses, along with updated information about vegetation and human disturbance throughout Alberta. Analysis methods and results for wetland vascular plants and aquatic invertebrates are being developed and tested.

SHARING ANALYSES AND RESULTS

Information on how species use native and human-created habitats, and how these habitats change over time, are key inputs into resource management in Alberta. To ensure managers and the general public can easily access ABMI information, we updated information on the ABMI website (abmi.ca/data). Each species has its own web page describing its unique distribution, habitat associations and the effects of industrial sectors on the species, along with tabular and GIS summaries that can be downloaded for additional analyses. In addition, maps of species richness, uniqueness, intactness and other multi-species summaries are presented.

SUPPORT FOR ENVIRONMENTAL MANAGEMENT IN ALBERTA

A wide variety of ABMI information on species and landscapes has been incorporated into the Government of Alberta's Biodiversity Management Framework, and is used to describe the state of Alberta's environments and how these are changing over time. A multi-organization collaboration has also been launched to create a web-based system that facilitates storing, managing, and sharing camera and ARU data collected in Alberta.

ABMI 10-YEAR REVIEW

The Science Centre played a significant role in supporting the ABMI's 10-year review process by helping to summarize the ABMI's scientific output and accomplishments for review. Over 2017, a group of independent external scientists (10-year Science Expert Committee) and Alberta stakeholders (10-year Stakeholder Advisory Group) reviewed the full suite of ABMI products and services. Both committees strongly endorsed the ABMI. The Science Committee, in its opening comments, stated "ABMI's progress to date [is] a monumental achievement [... and] its comprehensive approach (taxonomic breadth, spatial scale of monitoring and temporal scale of monitoring) to environmental monitoring is unique in the world". The 10-year Review Steering Committee reiterated the committees' strong endorsement, and identified 11 recommendations for the ABMI Board to consider. Many of the recommendations from the Steering Committee have already been incorporated, and the remainder are being tackled. The Science Centre is proud to have contributed to the ABMI's success, and will continue to do its part to ensure that the ABMI remains a global leader in biodiversity monitoring science.

SCIENTIFIC PROFILE

Science Centre staff, and associated researchers, published more than 25 papers in peer-reviewed journals (more than 15 further manuscripts in submission), helped produce 3 ABMI reports, created a 150-page summary document and more than 30 technical reports to support the 10-year Review, presented more than 5 papers/projects at international conferences, and participated in dozens of management workshops across Alberta. Three research collaborations were initiated, and 8 continued from previous years.

Geospatial Centre

The ABMI's Geospatial Centre is responsible for supporting and continuously improving operational and integrated applications of geospatial technologies for use by the ABMI and other resource managers and planners in Alberta. These efforts include creating province-wide, sample-based information and data products for human footprint and vegetation, developing and maintaining GIS layers for use by the ABMI and public, and collaborating on geospatial research and development with various partner and stakeholder organizations.

2017–18 was a chance to reflect on the Geospatial Centre's expanding role within the ABMI. As the ABMI reviewed its first 10 years of operation, the Geospatial Centre celebrated its fourth year. Our Centre is mature for its age: the rapid advance of remote sensing technologies, coupled with the growing demand for geospatial products by industry, academics, and governments of all levels, has provided new value both within the ABMI and to our stakeholders. Innovation is exciting, and we look forward to continuing to leverage emerging geospatial technologies to support the ABMI's program.

HUMAN FOOTPRINT MAPPING

We completed updates for the 2015 and 2016 wall-to-wall Human Footprint Inventories in March of 2018. We also mapped detailed sample-based human footprint information for each of the ABMI's 1656 3 × 7-km sites for 2016 conditions. This information was added to the ABMI's time-series (now standing at 1999–2016; available on abmi.ca) of human footprint in Alberta, which is used to assess change over time. Human footprint features were also mapped for the ABMI's 2016 wetland and terrestrial site locations. Linear human footprint features (cutlines, roads, pipelines, etc.) in the Oil Sands region of northern Alberta were continually updated and added to the Alberta base features layer. In addition, we continued to update GIS-based Least-Cost-Path (LCP)-adjusted seismic lines for Boreal Alberta.

DETAILED VEGETATION MAPPING

We updated a GIS layer describing detailed Vegetation and Landcover on the ABMI's sample sites by mapping vegetation information for 106 sites, 19 of which were visited for ground-truthing. These highly-detailed (98% accurate based on an external audit) vegetation cover layers (also available on abmi.ca) are used to validate mapping outputs for Alberta's Land-use Planning Regions to support regional and sub-regional planning in the province. A total of 33 photo-plot sites were interpreted for the North Saskatchewan Region; 18 sites for the South Saskatchewan Region; 15 sites for the Upper Athabasca Region; 15 Sites for the Red Deer Region; 10 sites for the Lower Peace region; 10 sites for the Upper Peace region; and five sites for the Lower Athabasca Region. In addition, the data have been successfully applied to various research areas, including boreal bird studies and vegetation responses

to well-pad restoration. To further advance application and awareness of this dataset, we delivered the updated 2017–2018 information to the National Forestry Inventory.

SUPPORT FOR LAND-USE PLANNING

During the past year, our staff directly supported methods development to analyze human footprint and land cover information in support of regional and sub-regional planning, as well as reporting against regional land-use targets established by government (e.g., Biodiversity Management Framework). Development of the ABMI's ALPHA (Advanced Landcover Prediction and Habitat Assessment) system for near-real time prediction of landcover and vegetation was initiated in 2017–2018. Under ALPHA, several new sub-layers were prototyped and operationalized, including: 1) operational production of an AB-wide Hydro Temporal Variability layer; 2) a Current Surface Water layer for Boreal Alberta; 3) a Probability of Mineral Wetland Cover layer for Boreal Alberta; 4) a Probability of Peatland Cover layer for Boreal Alberta; 5) a Probability of Fen Cover layer for Boreal Alberta; and 6) a Probability of Bog Cover layer for Boreal Alberta.

In addition, the Centre's staff supported the delivery of mapping outputs for the Regional Industry Caribou Collaboration (RICC) and the ABMI's Caribou Monitoring Unit. Specifically, the Centre's staff has been directly involved in developing methods to assess and map cumulative impacts of human disturbance on Boreal Caribou in Alberta.

Information Centre

The Information Centre is responsible for knowledge translation, information management, and land access at the ABMI. These activities include ensuring ABMI data meet the highest quality standards, developing and maintaining information delivery platforms, producing reports and other publications, building stakeholder relationships, and ensuring the ABMI has access to private and public lands to conduct our biodiversity surveys. During 2017–18 we achieved the following:

ABMI 10-YEAR SCIENCE AND PROGRAM REVIEW

Information Centre staff were heavily involved in the ABMI 10-year Science and Program Review, which was launched in April 2017. The objective of the 10-year Review was to evaluate the extent to which the ABMI has met its scientific and stakeholder engagement goals, as established at the initiation of the ABMI's formal operations in 2007. The Information Centre focussed its activities on the latter goal and implemented a Stakeholder Needs Assessment (SNA) program throughout 2017–18 to evaluate whether the ABMI successfully:

» Created data and information products that are relevant and accessible to stakeholders;

» Continuously engaged stakeholders to determine whether ABMI data and information products meet stakeholder business needs, and mobilize stakeholder feedback into the product development process.

The SNA involved establishing a Stakeholder Advisory Group (SAG) with membership across multiple stakeholder groups, running face-to-face interviews with SAG members regarding their biodiversity-related information needs, running stakeholder needs workshops customized for each stakeholder group, and conducting online surveys with workshop participants. The results of the SNA were synthesized and communicated to the SAG, as well as the Steering Committee of the 10-year Review, to elicit recommendations for the ABMI program to improve or adapt its stakeholder engagement activities.

SURVEY SITE ACCESS

For the 2017 field season, the ABMI successfully gained access to 182 terrestrial core sites (sites associated with our systematic grid) and 174 wetland core sites. With respect to the terrestrial sites, 85 of these sites were established on private land or grazing dispositions in the White Zone; 51 sites were new sites; and 131 were revisits (i.e., sites that had been previously surveyed). Access was also obtained for an additional 16 and 12 off-grid sites (sites chosen to support ABMI scientific analyses) for terrestrial and wetland locations, respectively.

The access team distributed over 170 information packages to landowners and disposition holders visited in the 2016 field season, providing them with information about the ABMI's findings on their land. The access team also worked closely with numerous representatives from national, provincial and municipal jurisdictions to negotiate long-term access to Alberta's land bases.

To support the 2018 field season, the ABMI must gain access to 217 core survey sites and assist with accessing 100 off-grid,

targeted sites. The use of cameras and ARUs to monitor mammals and vocalizing species, respectively, is now integral to the ABMI monitoring program. In 2018, Cameras and ARUs will also be deployed at revisited wetland locations for the first time. These technologies have been well received by all landholders, and we look forward to providing 2017's landowners with access to the photos captured on their land. By March 31, 2018, an estimated 90% of the required access work was complete.

DATA MANAGEMENT

Throughout 2017–18, the ABMI's data management systems continued to undergo development and refinement. Associated activities include:

» Addition of various enhancements to the ABMI field tablet to improve the workflow and data validation capabilities of multiple field protocols.

» Updates to the ABMI field tablet to accommodate new field protocols associated with our focal species monitoring program.

» Addition of new functions to the ABMI remote camera image processing website which include, for example, implementation of context-based automatic tagging to reduce the number of images being processed manually.

» In collaboration with the Bioacoustic Unit at the University of Alberta, completion of the basic functionality of the Bioacoustic Information System to manage and analyze acoustic data. The BIS is designed to improve the efficiency of acoustic file transcription by providing transcribers 1) a visual representation (a spectrogram) of what they're hearing as they process each sound file, and 2) the ability to easily tag the spectrogram with species names as they identify individual species.

» Completion of the user interface for WildTrax, an online environmental sensor network, with full implementation expected in fall 2018. WildTrax will host both the remote camera and bioacoustic processing platforms (described above) with a view to accommodating additional sensors in the future. WildTrax provides a secure and user-friendly environment to support data storage, data management, processing, and reporting for the ABMI and third parties (partners, stakeholders, and citizens) that currently collect or have an interest in collecting data on Alberta's wildlife.

WEBSITE AND DATA ACCESSIBILITY

On April 20, 2017 the ABMI publicly released its Data and Analytics Portal (abmi.ca/data), a one-stop shop for ABMI data and information products. The ABMI Data & Analytics portal comprises three modules: Data Download, Biodiversity Browser, and Mapping Portal. From the Data Download module users can continue to access ABMI raw data, as well as GIS data layers on human footprint and land cover. Newly available for download are GIS biogeoclimatic layers, satellite and aerial data, and a range of species-level data sets. On the Biodiversity Browser, users can browse over 300 individual complete species profiles, with information on species-habitat associations, impacts of human footprint, and relative abundance maps. Hundreds of additional profiles are available with partial information. Finally, the Mapping Portal allows users to display various ABMI data layers (e.g., Total Human Footprint) and then obtain summary information (when available) related to the data layer for a variety of administrative areas (e.g., Natural Regions) within Alberta. This is the first instance when users can interact with ABMI data layers within a web-based platform.

The ABMI's 2017–18 field-collected habitat and species data will be made publicly available in fall 2018 via the Data and Analytics portal.

PUBLICATIONS

During 2017–18, ABMI staff continued to work on a number of reporting products. Key efforts include:

» On February 9, 2018, the ABMI released its first online report, "The Status of Human Footprint in Alberta." The ABMI has moved to an online reporting environment to facilitate frequent updates, and to provide users with a variety of ways to interact with the content. The online

Information Centre (continued)

report was released simultaneously with a print version that includes a few additional spotlight features to demonstrate the application of human footprint data to land management questions. This content will be migrated to the online platform in future iterations. A media release to promote the report was nationally distributed and led to wide distribution of the associated content.

» In fall of 2017 and spring of 2018, the ABMI began the development and implementation of another online report, "The State of the Environment (land and biodiversity) for the Oil Sands Region of Alberta". The public release of this report is anticipated for fall 2018.

CITIZEN SCIENCE

The Information Centre continued development of a web-based ABMI-branded citizen science application tool called NatureLynx™ for both desktop and mobile computing platforms. The tool allows users to upload their photographs of local flora and fauna and pin their sightings to a Google Map-like responsive mapping program. Users can create their own profiles, join user groups, participate in "missions" and interact with rich biodiversity content. During summer 2017, the ABMI ran two NatureLynx outreach events to test the app in the field and collect user feedback. During the fall 2017 and winter 2018 academic sessions, students enrolled in a field ecology class at the University of Alberta also tested the app as part of their laboratory activities. NatureLynx will be released broadly to the Alberta public on July 21, 2018.

Application Centre

The Application Centre demonstrates the value of the ABMI's biodiversity data, scientific approaches, and know-how. Through applied research and development funded by numerous sponsors, Albertans are increasingly able to manage biodiversity in a changing climate, apply market forces to promote biodiversity conservation and stewardship, and monitor rare plants and animals in the oil sands region.

BIOACOUSTIC UNIT

The Bioacoustic Unit (BU) supports research and development to monitor wildlife populations using autonomous recording units (ARUs). A collaboration between the University of Alberta and the ABMI, the BU has developed protocols for ARU deployment and data processing. A significant focus in 2017–18 was the completion of the Bioacoustic Information System and integration into our WildTrax platform. WildTrax is a publicly available web application for the management, analysis, and dissemination of bioacoustic and camera data. In addition, the BU continued to provide data processing services to a variety of ARU users, includiwng the ABMI's regional monitoring program and government, industry, and NGO programs. The BU processed over 12,000 recordings across multiple projects. Going forward, our emphasis is on automating species identification through machine learning. This year we submitted/published 5 scientific papers documenting how automated processing is most effectively done.

Core funding for development of the Bioacoustic Information System is provided by the Canadian Oil Sands Innovation Alliance.

RARE ANIMALS PROJECT

The Rare Animals project, led by Dr. Erin Bayne at the University of Alberta, has deployed ARUs at local, intermediate, and regional scales in a standardized and centralized fashion to enhance their value for monitoring and research. This work has emphasized understanding how oil sands development influences these species and provided complementary data to overall regional monitoring. Over 3,000 sites in the Oil Sands Region have been sampled since 2012. Field work in the last few years has focused on monitoring Species at Risk like the Yellow Rail, Rusty Blackbird, Olive-sided Flycatcher, Canada Warbler, and Common Nighthawk. In 2017–18, we submitted/published 8 scientific papers and created 10+ short notes and communications.

Core funding is provided by the Oil Sands Monitoring Agreement.

RARE PLANTS PROJECT

The Rare Plants Project, led by Dr. Scott Nielsen at the University of Alberta, developed and implemented a survey protocol and adaptive sampling model to improve the effectiveness of rare plant monitoring activities in Alberta's Oil Sands Region. Between 2012 and 2017, over 600 sites in the Oil Sands Region were sampled. In addition, in the summer of 2017, the team completed two projects: 1) re-visiting historical rare plant populations to determine persistence over time, and 2) a third year of monitoring translocated plants to determine the success of this mitigation technique. Results were released through 3 scientific publications, and 3 short notes.

Core funding is provided by the Oil Sands Monitoring Agreement.

ECOSYSTEM SERVICES ASSESSMENT PROGRAM

The ABMI is developing tools to assess ecosystem services across Alberta, as part of the Ecosystem Services and Biodiversity Network. The project develops and applies simulation models to map and measure ecosystem services on a provincial scale, including forage production, timber production, carbon storage, pollination, water purification, and biodiversity.

Key achievements in 2017–18 include the design of a system to assess and map ecosystem services across Alberta. The approach includes identifying the ecosystem of interest, measuring it with consideration of human benefits, and using simulation models and maps to better understand the supply of ecosystem services and how they are affected by land use. Currently, this program includes an assessment of water purification, pollination, forest timber and carbon, rangeland and carbon, and biodiversity. In 2017–18 we initiated the creation of an ecosystem services mapping portal that will make the assessment outputs publicly available. We also developed a Clean Water Prioritization Tool to help guide municipalities in maintaining and enhancing water-related ecosystem services, and produced or contributed to multiple reports, literature reviews, and workshops.

Core funding is provided by Alberta Innovates.

BIODIVERSITY ASSESSMENT OF ALBERTA'S BEEF INDUSTRY

The Application Centre is leading research to assess the relationship between beef production and biodiversity using biodiversity data from the ABMI and other sources. Key achievements in 2017–18 include the completion of a management practices survey for beef production and grazing practices, analysis of the impacts of human footprint and grazing on biodiversity, and analysis for incorporating biodiversity into a life-cycle analysis of beef production.

The core sponsor of this project is Alberta Agriculture and Forestry, with collaborators from the University of Alberta, Agriculture and Agri-Food Canada, and the Government of Alberta.

CARIBOU MONITORING UNIT

Increasing human disturbance and changes in climate are driving declines in woodland caribou populations. The ABMI's Caribou Monitoring Unit (CMU) was developed to support Woodland Caribou recovery in western Canada. The CMU works with academics, industry, and government to facilitate meaningful research and provide scientific expertise to evaluate and monitor caribou recovery options and provide decision-makers with tools to make ecologically-informed land use decisions.

Current CMU programs focus on testing Woodland Caribou recovery options, prioritizing areas for habitat restoration, and predicting the effects of restoration on caribou populations. Specific sub-projects include assessing the effectiveness of regional management strategies, defining criteria for Woodland Caribou restoration guidelines and prioritization, and understanding the relationships among natural habitat, human disturbance, predators, and prey. The CMU continues to develop relationships with stakeholder groups and support efforts to increase the collective understanding of issues facing Woodland Caribou in Western Canada.

Core funding is provided by the Regional Industry Caribou Collaboration, Canadian Oil Sands Innovation Alliance, University of Alberta, Government of Alberta, BC Oil and Gas Research and Innovation Society, Habitat Conservation and Trust Foundation, and the Fish and Wildlife Compensation Program.

SUPPORT FOR REGIONAL PLANNING

In 2017–18, the ABMI provided scientific and logistical support for the development of the Biodiversity Management Frameworks (part of Alberta's Land-use Framework) for the Lower Athabasca, South Saskatchewan, and North Saskatchewan regions, as well as providing technical calculations for all regions in the province. Working closely with the Government of Alberta, the ABMI helped identify and develop key biodiversity indicators that will be used to measure if and how Alberta's species and their habitats are changing in each of these regions. Each indicator must be measurable, cost-effective, and relevant to the diverse needs of stakeholders in both northern and southern Alberta. Through these efforts, Albertans will have the tools to evaluate our collective performance as stewards of Alberta's land and water.

Summarized Financial Statements

OF THE ALBERTA BIODIVERSITY MONITORING INSTITUTE

Report of the Independent Auditor on the Summary Financial Statements

To the Board of Directors
Alberta Biodiversity Monitoring Institute

The accompanying summary financial statements, which comprise the summary statement of financial position as at March 31, 2018, the summary statements of operations and net assets for the year then ended, are derived from the audited financial statements of Alberta Biodiversity Monitoring Institute for the year ended March 31, 2018. We expressed an unqualified opinion on those financial statements in our report dated September 13, 2018. Those financial statements, and the summary financial statements, do not reflect the effects of events that occurred subsequent to the date of our report on those financial statements.

The summary financial statements do not contain all the disclosures required by Canadian Accounting Standards for Not-for-Profit Organizations. Reading the summary financial statements, therefore, is not a substitute for reading the audited financial statements of Alberta Biodiversity Monitoring Institute.

Management's Responsibility for the Summary Financial Statements

Management is responsible for the preparation of a summary of the audited financial statements in accordance with Canadian Audit Standard (CAS) 810.

Auditor's Responsibility

Our responsibility is to express an opinion on the summary financial statements based on our procedures, which were conducted in accordance with Canadian Audit Standard (CAS) 810, "Engagements to Report on Summary Financial Statements."

Opinion

In our opinion, the summary financial statements derived from the audited financial statements of Alberta Biodiversity Monitoring Institute for the year ended March 31, 2018 are a fair summary of those financial statements, in accordance with Canadian Audit Standard (CAS) 810.

Coyle & Company
Chartered Accountants

September 13, 2018
Edmonton, Alberta

ALBERTA BIODIVERSITY MONITORING INSTITUTE

Summarized Financial Statements

As at and for the year ended March 31, 2018

RESULTS FROM OPERATIONS	2018	2017
REVENUE		
Oil Sands Monitoring	$ 5,510,000	$ 6,400,451
Government of Alberta	4,964,867	3,915,847
Application Centre	2,412,556	1,845,886
Private Sector	55,214	520,649
Interest Income	22,782	16,133
Government of Canada	-	26,000
	12,965,419	12,724,966
STAFFING		
Executive Office	400,426	396,540
Science Centre	597,657	586,396
Information Centre	1,064,527	1,065,385
Data Collection Centre	1,920,917	1,773,346
Lab Processing and Identification Centre	1,085,219	947,089
Application Centre	696,704	295,831
Geospatial Centre	1,166,391	1,136,718
	6,931,841	6,201,305
PROGRAM EXPENDITURES		
Executive Office	239,814	217,947
Science Centre	168,253	216,679
Information Centre	480,195	755,910
Data Collection Centre	2,422,588	2,715,580
Lab Processing and Identification Centre	213,171	153,315
Application Centre	1,944,860	2,209,572
Geospatial Centre	270,627	192,536
Expense Recoveries and Other	(49,115)	(102,872)
	5,690,393	6,358,667
EXCESS OF REVENUE OVER EXPENDITURES	343,185	164,994
NET ASSETS - BEGINNING OF YEAR	1,405,141	1,240,147
NET ASSETS - END OF YEAR	$ 1,748,326	$ 1,405,141

FINANCIAL POSITION	2018	2017
ASSETS		
Cash	$ 1,303,162	$ 3,652,567
Short term investment	3,238,582	-
Accounts Receivable	242,269	825,787
Prepaid Expenses	-	6,471
	4,784,013	4,484,825
Capital Assets	368,174	223,446
	$ 5,152,187	$ 4,708,271
LIABILITIES AND NET ASSETS		
Accounts Payable and Accrued Liabilities	$ 2,080,020	$ 1,955,589
Deferred Revenue	1,323,841	1,347,541
NET ASSETS		
Unrestricted	1,748,326	1,405,141
	$ 5,152,187	$ 4,708,271

ON BEHALF OF THE BOARD

_____ Director

_____ Director

Edmonton Office

Alberta Biodiversity Monitoring Institute
CW 405 Biological Sciences Building
University of Alberta
Edmonton, Alberta
Canada, T6G 2E9
780 248 1592
abmiinfo@ualberta.ca

Vegreville Office

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

www.abmi.ca

@ABbiodiversity

Alberta Biodiversity Monitoring Institute

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