Alberta Biodiversity Monitoring Institute Strategic Plan

2023–2026

September 21, 2023

ABMI ALBERTA BIODIVERSITY MONITORING INSTITUTE

Introduction

The ABMI is a not-for-profit, non-regulatory, arm's-length institute that is delivered jointly by the University of Alberta, InnoTech Alberta, and the University of Calgary. Since 2007, we have been implementing and managing science-based programs to monitor and report on the changing state of biodiversity throughout the province of Alberta. We are a member-based organization, and our Voting Members provide strategic advice to help us set priorities, elect Board Directors, and vote on governance matters (e.g., financial statements and bylaws). Our Voting Members and Board Directors (https://abmi.ca/home/about-us/governance-funding.html) include representatives from diverse organizations and sectors: the Government of Alberta; environmental non-governmental organizations; forestry, energy, and agriculture sectors; and the research community.

This strategic plan takes a three-year view of our future. The plan contemplates our stakeholder needs, while integrating important and emerging themes in biodiversity monitoring. It includes strategic goals and measurable outcomes that reflect the evolving needs of Albertans. It also reflects the many voices and input from our Voting Members, Board of Directors, partner organizations, colleagues, sector leaders, and others from across the province.

Our Mission

We track changes in wildlife and their habitats across Alberta, working collaboratively to provide ongoing, relevant, and scientifically credible information about our living resources.

Our Vision

ABMI advances biodiversity monitoring to inform responsible resource management and land stewardship, now and for future generations.

Our Operating Principles

We pride ourselves on being:

- **Independent.** We operate at arm's length from government and industry; our information is objective and presented without bias.
- **Scientifically Credible.** Our approaches are objective, documented, tested, and validated through peer review.
- **Relevant and Accessible.** We develop information products to meet stakeholder and rights holder needs; information is publicly available and easily understood.
- **Transparent.** Our governance and operations are open to scrutiny, to promote engagement and accountability.
- **Collaborative.** We seek to develop and implement provincial monitoring in cooperation and collaboration.

Our Values

- **Leadership.** We seek to motivate and enable others (organizations and individuals) to amplify responsible resource management in Alberta.
- **Accuracy.** Our work is done with care and precision.
- **Ingenuity.** Our new ideas fuel better products, services, and processes.
- **Passion.** We care deeply about our work and the impact it has on Alberta.
- **Personal Initiative.** We value initiative and each individual's contribution to the shared success of the organization.
- **Teamwork.** We listen to, respect, and work cooperatively with each other.
- **Personal Development.** Learning, feedback, coaching, and mentoring are core to our team.

Context and Emerging Themes

The following section presents a summary of the background research conducted to prepare for this plan. Context and emerging themes were gathered largely through research, reviewing documents, and review and feedback from key stakeholders. It provides an overview of the emerging themes considered during the plan's development, which offer valuable insights into potential opportunities and challenges, while the context provides a broader understanding of the factors and circumstances influencing the plan.

Context

The task of managing biodiversity is the shared responsibility of different agencies and industrial sectors. As a result, biodiversity management has been built into the business activities of all of Alberta's major natural resource managers and developers. Successful management of biodiversity therefore requires strong coordination built from high-quality and scientifically credible data and information products.

This strategic plan has been influenced by a range of inputs, including recent international, national, provincial, regional, and sub-regional agreements, plans, and priorities. Notably, it aligns with major global initiatives, including the Kunming-Montreal Global Biodiversity Framework resulting from the 15th Conference of the Parties (COP15) to the United Nations Convention on Biological Diversity. The work outlined here also supports multiple provincial initiatives that require large-scale biodiversity datasets and analyses, such as land-use planning, wildlife management, and environmental reporting. In addition, it reflects Government of Alberta policies, including the environmental, social, and governance (ESG) criteria and the Alberta Emissions Reduction and Energy Development Plan.

Government of Alberta

The Government of Alberta has identified environmental monitoring, evaluation, and reporting as a core business. The Office of the Chief Scientist plays a significant role in the coordination and delivery of Alberta's Environmental Science Program, including condition-of-the-environment reporting. This reporting includes provincial scale updates on trends in biodiversity and ecosystems (e.g., wetland status and trends), which require supporting environmental monitoring data and analyses.

The Government of Alberta remains committed to land-use planning and environmental monitoring (*https://www.alberta.ca/biodiversity-in-alberta.aspx*), and the ABMI has received multi-year commitments from Alberta Environment and Protected Areas (EPA). We continue to work with EPA to ensure clarity in roles and responsibilities, while optimizing how we plan and coordinate with other provincial monitoring initiatives (e.g., Alberta Human Footprint Monitoring Program; geospatial, wetland, and terrestrial biological monitoring components of the Oil Sands Monitoring Program). Government of Alberta leadership sees the ABMI as a valued partner; translation of this intent to operating practice is progressing well.

Oil Sands Monitoring Program

In December of 2017, the Government of Alberta and the Government of Canada signed a memorandum of understanding (MOU) that renewed their commitments to monitor environmental impacts of oil sands development through the Oil Sands Monitoring (OSM) Program. The MOU acknowledges the treaty and aboriginal rights of Indigenous people, while establishing mutual intentions of both governments to collaborate and be accountable for the design and implementation of an integrated monitoring, evaluation, and reporting system.

In the spring of 2018, the Operational Framework Agreement was established outlining the vision, principles, objectives, and desired outcomes of the OSM Program. The Operational Framework Agreement established an inclusive approach for the oversight and management of the OSM Program, involving the provincial and federal governments along with Indigenous and industry representatives. Today there is a collective commitment to shared governance and implementation that ensures Indigenous peoples are partners in the OSM Program and that they have certainty around the governance and decision-making processes.

The ABMI participates in multiple components of the OSM Program, including terrestrial, wetland, and geospatial monitoring, to support the program's mandate to monitor the environmental changes associated with oil sands stressors. Recently, ABMI has increased our involvement in the Indigenous community-based monitoring component of OSM, with an emphasis on building wildlife camera monitoring programs with Indigenous partners across the oil sands region.

Funding to the ABMI for the OSM Program is administered by the Oil Sands Secretariat within EPA's Resource Stewardship Division. Funding to the ABMI is conditional on annually approved work plans, which may vary.

COP15 Global Biodiversity Framework

COP15 was an international conference that occurred in 2023 where governments from around the world gathered to agree on a set of goals to guide global action on biodiversity. The COP15 meeting culminated in adoption of the Kunming-Montreal Global Biodiversity Framework (link to framework), which presents goals and targets intended to safeguard global biodiversity and its associated ecological, social, and economic benefits. To accomplish the headline goal of conserving at least 30% of the world's lands, inland waters, coastal areas, and oceans, the framework calls on all nations to conserve, restore, proactively manage, and reduce threats to biodiversity. To do this, the framework emphasizes the importance of environmental monitoring; democratization of biodiversity information; and respect for the rights, experience, and knowledge of Indigenous Peoples and communities.

Emerging Themes

Below we identify eight emerging themes that were identified through background research in preparation for strategic planning. These themes do not represent final ABMI priorities; they were background information for consideration in developing the plan.

Political Leadership. A new provincial government was formed in 2023. This creates a level of opportunity to work with ministries and the Office of the Chief Scientist in support of their new mandate letters.

Climate Change and Adaptation. The ability to separate the effects of climate change on biodiversity in the larger context of cumulative effects is critical for scientific, management, and economic considerations. In Alberta, the provincial government recently released the Emissions Reduction and Energy Development Plan with a goal of achieving a carbon-neutral economy by 2050. Reliable data, analyses, and knowledge are needed to inform effective policy and efficient management. With its existing datasets and monitoring capabilities, the ABMI is well positioned to inform climate change impacts on biodiversity and provide recommendations for potential mitigations in Alberta and beyond.

Industry Needs. Industries in Alberta, such as energy, agriculture, and forestry, require biodiversity monitoring to comply with regulations, meeting certification standards, risk management, sustainable development, and supporting research initiatives. Monitoring biodiversity can help demonstrate a commitment to environmental stewardship and understanding impacts on local ecosystems, and industry recognizes the importance of this kind of work. As the green energy sector grows, the ABMI will consider further expanding our biodiversity monitoring.

Indigenous Community Leadership. There is a growing recognition of the rights of Indigenous peoples, as well as the deep knowledge and understanding of biodiversity and land management that they hold and the value that their experience and expertise brings. This recognition is reflected in initiatives such as the Kunming-Montreal Global Biodiversity Framework agreed to at COP15, the United Nations Declaration on the Rights of Indigenous Peoples, and the National Truth and Reconciliation Commission. To address concerns about the impacts of human activities on culturally significant species, community-based monitoring can quantify and understand these impacts while providing communities with a stronger voice in related discussions. The ABMI values its current relationships with Indigenous communities and, if desired, can offer flexible and efficient support for community-led monitoring initiatives.

Water and Food Security. Water and food security are recognized as basic human rights by the United Nations, and Alberta has generally had high levels of both due to abundant water sources and successful food production. However, climate change poses threats to these resources, with extreme weather events such as flooding and droughts affecting water availability and impacting crop and livestock production. The ABMI has the potential to provide insight into indicators such as algal blooms, wetland status, and land-use trends, which can inform conversations about food and water security.

Soil Health. Soil biodiversity plays a critical role in soil health, which in turn affects food production, water filtration, and carbon storage. As a result, soil health is at the intersection of several emerging themes, including food and water security and climate change. Soil organisms, including those monitored by the ABMI's Ecosystem Health Monitoring Program, are essential for providing various ecosystem services, such as nutrient transformation, soil fertility improvement, and environmental sustainability. As such, monitoring biodiversity in soils is crucial for understanding the health of ecosystems and ensuring the provision of these critical services. The ABMI can continue leading in this area and improve soil monitoring through new technologies such as genomics.

Technology Driving Change. Biodiversity monitoring has seen shifts towards the use of autonomous technology, such as remote cameras and autonomous recording units, to record sound and images instead of relying on human observers. At the same time, more and more remote sensing data are available through programs like Copernicus and Planet. These advancements result in unprecedented volumes of data available for monitoring. Machine learning and artificial intelligence have become essential tools for processing such generally large datasets, as they can detect patterns and process information at speeds beyond human capacity. However, expertise is still needed to interpret the outputs and determine their ecological and biological meaning. Emerging technologies have the potential to change the ways biodiversity is monitored dramatically, and there is opportunity for ABMI to create (develop and test) and implement new tools and data products.

Data Management Principles. Data management is a foundational component of data stewardship, discovery, use, and integration. There can be many dimensions to how data are shared openly. Understanding how to make data accessible, along with the human dimension of ownership, must be considered in data management practices. Guiding principles and best practices outlined within FAIR (findability, accessibility, interoperability, and reusability), CARE (collective benefit, authority to control, responsibility, and ethics) and OCAP (ownership, control, access, and possession) can help organizations and researchers achieve these standards and best practices as they relate to open data. In 2016, the FAIR guiding principles for scientific data management and stewardship were published. These principles aim to remove the barriers associated with open-data discovery and reuse. In alignment with the FAIR principles, but with greater focus on data stewardship, are the CARE principles for Indigenous data governance, which were published in 2019. The CARE principles complement the FAIR principles and seek to empower people and purpose. They represent and highlight the human dimension of data as it relates to Indigenous Peoples' rights, well-being, and interests. Lastly, the OCAP principles were developed to acknowledge data ownership and rights of First Nations communities in Canada in response to the open data movement and to promote data sovereignty. To facilitate the inclusion of FAIR, CARE, and OCAP principles into regular practice, data management plans (DMPs) are becoming more frequently created for organizations and research. It is now a requirement to submit a DMP with any tri-agency funding. Following best practices to "be FAIR and CARE" will be important when promoting and considering open data initiatives and collaborations.

Strategic Issues

The major strategic issues facing us have been identified through communication with our Board, Voting Members, funders, delivery partners, and staff.

1. **Diversified Revenue:** While our funding mix has changed over the course of our operations, the Government of Alberta remains the dominant source of ABMI financial support. Diversifying our revenue base while adding value to existing investments remains important to us.
2. **Fluctuating Budgets:** Monitoring budgets are inconsistent, while the need for environmental assurance remains strong. All environmental monitoring programs compete for limited financial resources. The ABMI's financial position could be strengthened.
3. **Business Applications:** Specific information tools (e.g., biodiversity applications that support natural resource decision-making for a specific business or sector) remain underdeveloped. Monitoring systems should seek to support resource management more effectively in Alberta.
4. **Collaboration:** Environmental monitoring and management communities are overly compartmentalized. We need to leverage our funding and relationships to coordinate monitoring investments that meet multiple needs.
5. **Engagement and Awareness:** Our membership base is narrow and the story of biodiversity is inconsistently told. There is an opportunity to improve awareness of the work of the ABMI and to increase engagement in our data, products, and programs.
6. **Adapting to Meet Needs:** We steward some long-term, provincial-scale monitoring programs, and there is demand for flexibility to improve how we address other knowledge needs. It is important that we strike the right balance between developing new programming and maintaining long-term programs.

ABMI Strategic Direction

The above context, emerging themes, and strategic issues were used as background information that informed development of our strategic priorities. The following pages outline those priorities and related goals, areas of focus, and measurable outcomes.

Strategic Priorities

The ABMI has five guiding priorities, which form high-level guideposts to ensure strategic effort is put towards each of these areas:

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

Priority 1: Monitoring Alberta's Landscapes and Biodiversity

Rationale

Meeting the needs of decision-makers by acquiring high-quality scientific data supports environmental reporting and management.

Goals

1. Implement field and geospatial data collection programs that meet stakeholder and funder needs.
2. Improve application of and access to environmental data.

Areas of Focus

- Field and geospatial data collection
- Taxonomic expertise that is nationally valued
- Open and accessible data

Measurable Outcomes (by 2026)

1. Complete and update Wetland Ecosystem Health Program review.
2. Implement collaborative field program to address stakeholder and/or funder needs.
3. Collect specimens and data, and release resulting province-wide upland and wetland data layers, human footprint, and field-based species data.
4. Significantly increase financial investment ($2.5 million over three years) in field species monitoring and support for laboratory services.
5. Integrate recovery metrics into the Alberta Human Footprint Inventory.
6. Implement one new protocol to support investigation of climate change effects.
7. Implement remote-sensing-based habitat monitoring.
8. Contribute ABMI data to two external data systems (e.g., Global Biodiversity Information Facility, ESRI Living Atlas).

Priority 2: Science Innovation

Rationale

Advancing the science of biodiversity and land-cover monitoring and implementing operational programming based on new knowledge improves relevance and drives efficiency.

Goals

1. Use new technologies and data sources to monitor biodiversity.
2. Incorporate the impact of climate change into provincial monitoring and modelling.

Areas of Focus

- Innovative field monitoring solutions
- Province-wide species models
- Province-wide land cover products
- Province-wide human footprint monitoring
- Taxonomic research
- Science of cumulative effects, stressor-response, and human footprint recovery
- Climate change
- Soil health

Measurable Outcomes (by 2026)

1. Improve and calibrate technology/protocols used to assess species abundance.
2. Develop one project proposal for climate change and biodiversity monitoring.
3. Review and report on recent advances in scientific approaches and new data availability for application in species modelling.
4. Apply DNA analysis (e.g., DNA barcoding, environment DNA, next generation sequencing).
5. Develop two new protocols to support geospatial and remote sensing data.
6. Develop satellite or airborne data applications to measure human footprint recovery (one publication).
7. Publish taxonomic research to improve understanding of Alberta's flora and fauna (three publications).
8. Co-produce a biodiversity monitoring case study in collaboration with an Indigenous partner.
9. Develop one new project proposal for soil health.

Priority 3: Working Collaboratively

Rationale

Trust and cooperation in environmental monitoring is important to ensure progress in resource management. Putting collaborations at the centre of our activities allows us to build networks, create communities of practice, and develop capacity for province-wide environmental monitoring.

Goals

1. Establish and maintain collaborations with groups that have complementary and/or similar areas of expertise and capacity.
2. Partner with communities looking to develop their own monitoring initiatives to share expertise and capacity.

Areas of Focus

- Collaboration with monitoring organizations, delivery partners, and the research community
- Online platforms for managing environmental data
- Support for Indigenous community priorities (monitoring needs, training, project development, species identification)
- Support for forestry sector monitoring priorities (biodiversity monitoring needs and coordination)

Measurable Outcomes (by 2026)

1. Create a shared program with one of our delivery partners.
2. Execute an MOU with another group/organization that has shared monitoring/science goals.
3. Participate in 15 collaborative projects annually.
4. Add one new environmental sensor to the WildTrax platform.
5. Complete seven monitoring programs co-developed with Indigenous communities.
6. Submit one joint funding proposal with the forestry sector.
7. Incorporate a collaborator’s data in a report.
8. Integrate three external data sets into our data and analytics tools.

Priority 4: Knowledge Translation and Engagement

Rationale

To increase the impact of biodiversity data and information products, products and services must meet end-user needs. We believe that strong knowledge translation programs are needed to support strong environmental outcomes.

Goals

1. The work of the ABMI is understood and used by the public and in environmental research and planning.
2. Increase engagement with stakeholders throughout the development of our products and services.
3. Develop new ways for end users to access and interact with land cover biodiversity information.

Areas of Focus

- Responsiveness of ABMI products and services to end-user needs
- Appropriate points of engagement with current and prospective partners
- Specific business applications for ABMI data and products
- Leveraging of partner communication platforms
- Online reporting
- Contributions to the development of environmental sustainability indicators

Measurable Outcomes (by 2026)

1. Update and implement our Strategic Communications Plan to align with and support this strategic plan.
2. Enhance and formalize our engagement framework.
3. Regularly distribute content through the communication channels of at least two delivery partners and/or collaborators.
4. Publicly release three online reports.
5. Assess and report on ABMI's ability to support and report against provincial and international biodiversity indicators.
6. Identify, evaluate, and report on new, more accessible ways of communicating the status of biodiversity and land cover.
7. Co-develop two stories that showcase external organizations' use of ABMI data.
8. Assess and implement the national accessibility standards (WCAG 2.0 Level AA) on new public digital tools and platforms.

Priority 5: Operational Excellence

Rationale

Consistent and reliable execution of our strategic plan includes more than being successful in conducting biodiversity monitoring, being scientifically innovative, or effectively sharing knowledge and engagement. The foundation for all that work is ensuring that we maintain a system of sustainable improvement, creating a rewarding and safe place that attracts and retains the right employees, and maintaining strong fiscal responsibility.

Goals

1. Diversify revenue and leverage funding.
2. Maintain a work environment that attracts and retains a talented workforce.

Areas of Focus

- Strong relationships with Voting Members, delivery partners, and funders
- Strong fiscal control
- Revenue diversification
- A safe, diverse, and empowered workforce
- Strong and secure quality management systems

Measurable Outcomes (by 2026)

1. Complete annual planning one month before the start of the next operating year.
2. Broaden funding sources to include 20% from new sources.
3. Increase retained earnings to 10% of annual operations.
4. Receive clean annual financial audits.
5. Add three Voting Member organizations.
6. Receive clean data quality audits.
7. Conduct an annual human resource organizational scan.
8. Maintain annual staff retention at 90% or higher.
9. Receive stable or increasing annual staff satisfaction survey results.
10. Increase project management capacity of the program by two full-time equivalents.
11. Develop and implement an equity, diversity, and inclusion action plan.
12. Develop and start to implement a data modernization plan.
13. Develop and implement cybersecurity policies and procedures.