

Recommendations for a Wetlands Research Strategy for Alberta

**Prepared by the
Alberta Land Institute**



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INTRODUCTION

The Government of Alberta currently collects monetary payments in-lieu of on-site habitat as compensation for human-caused loss of natural wetlands across the province. While the majority of these funds are used to offset these losses through the restoration of wetlands, the new provincial wetland policy provides direction to use a portion of these fees to support wetland research initiatives. It is hoped that the knowledge gained through this research will support more effective implementation of the wetland policy and may ultimately result in better conservation outcomes for wetlands in the province.

To make the best use of these research funds, the government is developing a new Wetlands Research Strategy. As an independent research institute, the Alberta Land Institute, in collaboration with Alberta Innovates Bio Solutions and Alberta Innovates Energy and Environment Solutions, has assisted with the facilitation of the government's stakeholder engagement process. Assembling a steering committee whose members possess a wide range of expertise (page 25), the Institute and its partners have engaged stakeholders from numerous sectors, gathering feedback to inform the strategy's design. Upon analysis of this feedback, the steering committee developed a series of recommendations for the design and implementation of a research strategy in this report (page 4).

STAKEHOLDER ENGAGEMENT WORKSHOP

On Thursday, April 14th, 2016, the Alberta Land Institute hosted a workshop to gather feedback intended to inform the development of Alberta's Wetland Research Strategy. Between 8:30 AM and 3:30 PM on the University of Alberta's North Campus, approximately 40 representatives from the academic community, government, industry, municipalities, and NGOs participated in the session.

The purpose of this workshop was to gather input from a broad range of experts and stakeholders, which would inform the government's development of an effective research framework. Feedback was gathered through a facilitated process based on a backgrounder and workbook (see appendix) that was circulated to participants in advance of the session. The following aspects of the research strategy were explored:

- Scope
- Prioritization
- Applicant eligibility
- Criteria for project selection and eligibility
- Selection committee composition
- Administration
- Evaluation

THIS REPORT

This document begins with a series of recommendations related to the design of Alberta's Wetlands Research Strategy (page 4) based on background analysis and the outcomes of the stakeholder engagement workshop. In support of these recommendations, notes that summarize the workshop's

findings are provided to give more detailed information about each discussion session (pages 7-23). The working documents used at the workshop can be found in the Appendix (page 24).

Please note that this workshop did not involve First Nations or Metis people, and thus may not reflect their views on this issue. A separate discussion process is being used to engage these perspectives.

RECOMMENDATIONS: A WETLANDS RESEARCH STRATEGY FOR ALBERTA

For the Wetlands Research Strategy to make best use of funds received as compensation for the loss of wetlands, **the Government of Alberta must determine and prioritize aspects of wetland research regarding retention, restoration and loss mitigation that should receive research attention.**

Different aspects of wetland restoration and loss mitigation will necessarily require the involvement of researchers from a variety of disciplines, sectors, and institutions, and could lead to a variety of research projects and programs. To ensure that the strategy is properly designed to commission, fund, and evaluate the research it undertakes, clear priorities must be established from the outset. These priorities should be directly linked to the policy priorities of the Government of Alberta and the gaps in science / research required to address them. Priorities should be re-evaluated in light of past and ongoing work before each research competition so that continuous improvement of the research process occurs.

Beyond the question of strategic priority outlined above, and based on the input gathered from the stakeholders, this steering committee makes the following recommendations:

Scope

A large number of potential research themes could be considered by the Wetlands Research Strategy, necessitating a formal system for establishing scope. After determining which aspects of wetland conservation, restoration and loss minimization / mitigation it wishes to focus upon, the Government of Alberta should develop a process or mechanism (such as an expert advisory body) to identify key knowledge gaps related to specific policy initiatives in that area. This mechanism can then be relied upon to identify specific, manageable research questions and resulting projects that may constructively inform policy.

Potential research themes which might be considered by the mechanism could include:

- Urban wetlands
- Wetland science (e.g., structure, function, composition)
- Conservation (e.g., what, where, when and how much)
- Replacement practices
- Economic and social value (multiple dimensions of value)
- Policy relevance (including development of beneficial management practices and operational issues)

More discussion about each potential theme can be found in the session notes (page 8).

Eligibility

Because of the diversity of potential research, only one criterion should limit potential applicants for research funding: the applicant must be a legal entity, with appropriate accounting procedures and the ability to receive funds and meet accountability and audit obligations. All entities meeting those criteria should be permitted to submit projects for consideration.

Criteria for Project Selection

Criteria for the selection of projects should be developed based on the specific requirements of a given research question. As such, potential research questions and projects should be classed within different categories, such as:

- Natural Science / Engineering
- Social Science / Economics
- Legal
- Interdisciplinary

Research questions related to each of these categories (or in the case of *interdisciplinary*, multiple categories), should be assessed by standards relevant to the academic fields with which they engage.

Once the class of research question under consideration has been considered, each project should be assessed based on a number of factors, including:

- Merit of the research proposal and ability to contribute to achieving the objectives or strategic priorities
- Strength and capability of the research team
- Opportunities afforded for collaboration
- Communications plan
- Fiscal management
- Project management
- Research relevance
- Capacity building
- Policy alignment

Each of these factors may be assigned a different level of importance for a given research question or research class, at the discretion of the Selection Committee.

Selection Committee

It is important that each committee possesses the ability to critically assess both whether a potential research team has the capability to complete a project, and whether that project is truly relevant based on the contemporary priorities of the strategy. As such, project selection and evaluation committees for the Wetlands Research Strategy should be formed based on the expertise required to address specific research questions and different classes of research projects. Each committee should consist of subject matter experts with the knowledge, skills, and practical experience to assess the merits of individual applications. Committees should also include generalist perspectives, and members with the capacity to view the relevance of submitted projects within the broader context of Alberta's policy framework.

Prioritization

At a high level it would be beneficial for the government to implement a balanced research portfolio, that engages a variety of research disciplines and addresses a variety of priority research themes. To avoid over-emphasis in a single area, the government should implement a process to ensure the research portfolio adapts to evolving conditions by prioritizing different fields at appropriate times.

Evaluation

Criteria, indicators and metrics for the evaluation of projects should be determined at the same time that research questions are being developed. It is necessary for any project to be launched with an understanding of how its success might be measured, and that those measurements be taken periodically over the life of each project.

In addition to the assessment of individual projects, it will also be important for the research program as a whole to receive regular reviews to determine whether the research portfolio is meeting the objectives of the broader strategy. Because the funds being dedicated to research would otherwise be allocated directly to the restoration of wetlands, it will be important to understand the relative return on investment.

Administration

The administration of the Wetlands Research Program should be carried out by a body possessing the following capabilities and characteristics:

- Credibility and independence
- Transparency
- Access to research expertise, the innovation community network, and funding
- Robust administrative and support infrastructure
- Capacity, expertise and knowledge of systems and processes to support administration and evaluation
- Access to relevant data
- Awareness of and alignment with policy priorities

It should be noted that, under the Alberta Research and Innovation Act, the Alberta Innovates corporation was developed:

“to meet the research and innovation priorities of the Government, including fostering the development and growth of new and existing industries and supporting a balanced long-term program of research and innovation directed to the discovery of new knowledge and the application of that knowledge to improve the quality of life of Albertans.” (Alberta Research and Innovation Act, Section 2, January 2010)

This suggests that an arm’s-length administrative body possessing the above noted characteristics and the expertise to manage the Wetlands Research Strategy exists, subject to the development of an appropriate governance and partnership structure.

SUMMARY NOTES: WORKSHOP FINDINGS

Below is a brief overview of the workshop participants' comments about each aspect of the research strategy. Detailed notes about each discussion can be found in subsequent pages.

Scope

Participants identified the subjects of wetland science, conservation, replacement practice, economic and social value, development of beneficial management practices (BMPs) and policy relevance as being important to establishing the scope of the strategy. They also highlighted the importance of including urban wetland research within the scope.

Applicant Eligibility

Participants believed that it was not necessary to restrict applicant eligibility, but instead emphasized the assessment of projects based on the selection and eligibility criteria.

Criteria for Project Selection and Eligibility

Participants suggested that proposed research projects be assessed based on the strength and capability of their research teams, opportunities afforded for collaboration, the presence of a communications plan, fiscal management, and project management. The opportunity for the project to build research capacity and its relevance to advance policy and practices were deemed equally important.

Administration

Participants compared the strengths of a Government of Alberta-administered program and one managed by an arm's-length administration. A government-led program was thought to benefit from close alignment to policy, infrastructure, and available data. An arm's-length program was thought to be superior in terms of credibility and transparency, connections to the research and stakeholder communities, leveraging research funding, and independence from the political process.

Prioritization

Participants found that prioritizing results-driven research could lead to the support of shorter-term projects designed to have immediate impacts on multiple research disciplines. However, they also highlighted the significant value of longer, more complex projects. In addition, the importance of cost-effectiveness was noted, and the value of alignment with the Wetland Policy was considered a significant factor.

Evaluation

Participants defined success for the Wetlands Research Strategy on a number of levels. At the highest level, the successful restoration of wetlands in Alberta was considered the most significant sign of success. In immediate terms, success could be measured when supported research was integrated into policy, and if the quality of supported research contributed to the research community's broader understanding of wetlands.

FACILITATOR'S DISCUSSION NOTES: SCOPE

For the workshop's first discussion, participants were invited to identify research concepts and issues that should be considered within the scope of the research strategy. Following this activity, a consensus-based approach was used to classify similar concepts and issues together under an overarching research area. Below are the resulting research areas with their corresponding concepts and issues that should be included within the scope of the research strategy.

Questions: What are the parameters for the Wetland Research Strategy? What should be included in the Wetland Research Strategy?

Summary of Responses:

Urban Wetlands

- Integration of natural wetlands in urban context/setting
- Risk mitigation for wetland innovation in urban centers
- How to integrate wetlands into urban development?
- Incentives for wetland retention/avoidance/minimize in urban context
- Valuation of wetlands in urban environment
- Sustaining wetlands in urban environment (groundwater)
- Constructed wetlands in urban context
- Urban wetlands retention and restoration

Monitoring and Inventory

- Long term monitoring
- Community based monitoring (Citizen Science)
- Support modeling, evaluation, monitoring and reporting
- Wetland inventory (common standards, present and lost)
- Developing monitoring parameters and conducting sensitivity analysis around monitoring methods
- Development of methods and tools that contribute to an effective monitoring framework

Policy and Governance

- Address policy, planning, management, monitoring issues and their linkages
- Relevant to: Legislative, Regulatory and Policy, as well as the social-environmental context
- Strategy should/must support policy goal
- Proactive ways to get policy goal implemented throughout government functions (not just approval stage)
- Improves governance of wetland system incl. jurisdictional fragmentation
- Demonstrates linkages to other outcomes and initiatives (broader context – e.g., Regional Plan implementation, Tailings Management Framework, etc.)

Landscape Context

- Landscape scale linkages and considerations
- Cumulative effects of wetland loss on as watershed level
- Effective buffers in different land use contexts

- Wetland management issues at multiple scales

Social Values

- Behaviour/attitude research related to wetlands (urban and rural)
- Strong connection to outreach and communication = knowledge translation
- Quantification of social and environmental benefit (urban and rural)
- How does the wetland policy affect land-owners?
- Education around perceptions of wetland value/efficacy of the wetland policy
- Impact of wetland removal/replacement on impacted communities
- Wetland education, capacity, networking
- Recognition, research on diversity of values surrounding wetlands
- Traditional knowledge (Aboriginal) of wetland value

Wetland Replacement and Science Practice

- Development and testing of practical reclamation and restoration technology
- Constructed wetlands: methods of evaluating success; form versus function
- Restoration effectiveness (urban and rural)
- Reduce barriers to on-site wetland restoration
- Constructed wetland design guidelines
- Effectiveness of restoration
- Assessing relative restoration value

Wetland Conservation

- Metrics to support wetland prioritization /protection
- Improve avoidance and land management decisions
- Retention strategies

Adaptation and Climate Change

- Adaptation strategy – invasive species in wetlands
- Restoration with climate change
- Wetland resilience/vulnerability to climate change

Economic Values

- Economic aspects of restoration
- Private landowner's economic value in relation to wetlands
- Economics of wetlands within croplands
- Science based changes to economic valuation tools
- Market value and nonmarket valuation
- Quantify economic benefit of wetlands

Research Approaches / Principles

- Applied research focus
- Must be scalable
- Integrated interdisciplinary research and application
- Leads to the development / implementation of BMPs

Wetland Science

- Defining wetland function and value
- Hydrology, function and biodiversity
- Water balance and water quality (natural science understanding)
- Natural functions of wetlands

Analysis:

The workshop discussion highlighted numerous elements that may be considered when establishing the scope of the Wetland Research Strategy, including criteria such as wetland science, conservation, replacement practice, economic and social value, and relevance to the wetland policy.

One notable topic identified by participants was *wetlands and urban centers*. Research exploring how wetlands should be treated within an urban context, where municipalities are constantly growing to meet citizen needs, would be of great use to a wide variety of those represented at the workshop.

The importance of aligning the scope of the research strategy with policy and implementation guidelines was also highlighted.

FACILITATOR'S DISCUSSION NOTES: APPLICANT ELIGIBILITY

The second aspect of the research strategy addressed by participants was applicant eligibility. Discussion on this subject proceeded quickly, with participants rapidly reaching a broad consensus that eligibility should be assessed based on projects, not applicants. Participants also emphasized the importance of collaboration by applicants to ensure comprehensive and diverse research takes place.

Ultimately, participants concluded: *why should we limit who can apply?* However, there was agreement that the applicant must be a legal entity, with appropriate accounting procedures and the ability to receive funds and meet accountability and audit obligations.

However, there was general input on examples of likely applicants who should be eligible:

- P.S.I. (Post-Secondary Institutions)
- WPAC's (Watershed Planning and Advisory Councils)
- Industry
- Municipalities
- Consulting Companies
- N.G.O.'s

FACILITATOR'S DISCUSSION NOTES: CRITERIA FOR PROJECT SELECTION AND ELIGIBILITY

The third area of discussion related to the criteria for project selection. Participants were invited to list items and requirements which they felt should be considered when projects are being deemed eligible for funding, and competing for research funds. This list was then classified under overarching criteria through consensus from the group.

Question: What should the criteria for project selection and eligibility be within the process?

Summary of Responses:

Scientific Merit

- Scientific merit & rigor of projects
- Scientific merit of research question

Expertise & Capacity of Project Team

- Interdisciplinary (“not-silo’d” approach)
- Qualified personnel/team with demonstrated experience and expertise
- Resources and capacity to do the research
- Management infrastructure in place (data, financial, etc.)
- Multi-disciplinary team of experts

Financial Feasibility & Control

- Financial management structure
- Cost-sharing, in-kind, leverage of funds
- Feasibility with regards to request for funds/reasonable budget
- Demonstrates financial control and efficient use of funds

Appropriate Collaboration

- Appropriate partnerships & collaboration to ensure relevance
- Demonstrated support network
- For some projects, individual research is appropriate
- Community / science partnerships, multi-stakeholder teams (i.e.: municipalities, industry, academia)
- Partnership including problem owner(s)

Communication & Outreach

- Presence of communication strategy and plan for disseminating results
- Outreach program to deliver results to public
- Publicly available results
- Built in a structure of communication & collaboration

Actionable Management & Policy Outcomes

- Consistent with strategic plan (demonstrably linked to implementation needs)
- Contributes to better wetland policy implementation
- Demonstrates Innovation
- Outcomes need to be relevant to wide range of stakeholders
- Demonstrates co-benefits (environmental / econ / social)
- Value added to wetland governance & management
- Practical application of research results
- Plan for implementation potential
- Long-term sustainable application of research results

Research Relevance

- Alberta-focused or applicable
- Regional context prioritization
- Decision needs (e.g. development pressures) based on “pressures” (e.g. demand)
- Meets research priorities / gaps
- Project to fit into identified research priorities/call for proposal
- Clearly focused on knowledge gaps
- Scalable / generalizable
- Consider “living lab” (ability to grow and monitor)

Building Capacity

- Alberta-centric HQP’s
- Capacity building / training (e.g. HQP)

Project Management

- Adaptive management of research program based on feedback
- Connections to stakeholders
- Data management considerations e.g. QA / QC
- Defined tasks, milestones & deliverables
- Appropriate project timelines

Analysis:

Participants identified both research-related criteria and essential supporting criteria for project eligibility and selection. Key considerations included: a capable research team, opportunities for collaboration, communications plans, financial management, building capacity, and project management. Additional criteria identified by participants related back to scope, such as research relevance, policy outcomes, and relevant knowledge.

FACILITATOR'S DISCUSSION NOTES: COMPOSITION OF SELECTION COMMITTEE

Participants were next asked to identify what types of knowledge, skills, and perspectives should be possessed by individuals appointed to the project selection committee.

Question: What should be the composition of the selection committee, and what essential skills/qualifications should its members possess?

Summary of Responses:

Knowledge

Disciplines

- Biodiversity
- Biology/ Ecology
- Climate change
- Economics
- Ecosystem services
- Geomatics
- Geomorphology (landscape hydrology)
- Interdisciplinary science / team approach to research
- Land use
- Landscape ecology
- Landscape planning
- Modelling
- Natural science background
- Social science background
- Sociology
- Soil Science
- Statistics
- Technical – restoration, bio-physical, ecological
- Urban storm water management
- Water resources engineering
- Watershed science
- Wetland design and construction
- Wetland regulation, law, policy
- Wetland science - ecology, hydrology, function (wetland impacts / trends and the drivers of them)

Sectoral

- Policy context
- Research Institutes
- DUC, AWC, wetland organizations
- Impacted sectors – agriculture, industry, forestry, cities, municipal
- Interprovincial SK, MB knowledge
- Indigenous (Treaty 6, 7, 8) values & expertise

Policy

- Policy and Implementation
- Policy implications (Fed, Prov, Muni)
- Knowledge of AB wetland policy and relevant government policy
- Jurisdictional coordination / policy
- Integration of levels of policy
- Limitations of existing policy (based on experience)

Research

- Strong working knowledge of existing research
- Knowledge of linkages to global, national research on wetlands
- Experimental design
- Context dependent knowledge (if applied research)
- Familiar with most recent, up-to-date wetland research & issues
- AB's science & innovation system
- Scientific process (How good research is conducted)

General

- Include generalists and specialists
- Knowledgeable of subject matter – not required to be academic
- Communication – media, web updates
- Knows what they don't know

Skills

- Policy
- Budget, data & timeline management
- Project management
- Research & innovation program / project evaluation
- Familiarity with call / request for proposal evaluation
- Ability to link research to policy implications (practical person who can participate)
- Board governance
- Implementation of research / extension
- Financial management – business
- Communication of criteria / transparency
- Big picture thinking
- Background in research
- Knowledge exchange / communication, outreach / extension
- Objective
- Critical thinking
- Knowledge exchange / translation
- Intellectual property / legal aspects
- Communication
- Project proposal evaluation experience
- Analytical & critical approach

- Lateral thinking
- Able to weigh many factors
- Leadership / business
- Clear feedback and critique, communicate with applicant
- Ability to communicate with other committee members
- Good judgment, impartial, ethical
- Systems thinking (social, economic or ecological science)
- Ability to see / analyze from multiple perspective
- Collaborative
- Proposal writing / review
- Stakeholder engagement
- Problem identification

Perspectives

What kind?

- Strong network connections (knows who's who in wetlands)
- Balanced
- Common sense
- Open-minded and fair
- Practical
- Collaborative
- Objective / constructive
- Holistic
- Experienced
- Effective Communications
- Passionate
- Lack of bias/conflict of interest
- Scientific
- Social justice/impact
- Understanding of wider implications of decisions
- Open to innovation – encouraging of innovation
- Broad understanding of relevant issues
- Understanding of the value and many aspects of wetland research
- Forward- thinking, future proofing ideas / projects
- Awareness of existing players and projects
- Conservation ethic: focus on biodiversity & ecological value
- Grasps the big picture / critical thinking
- Program (building, implementing, evaluating programs, including grant programs)
- Understanding of how policy impacts development
- Academic rigour and application of results to existing literature
- Science to policy understanding & application at “good level”

From where?

- Policy balanced committee
- Municipal government (Urban and Rural)

- Provincial government
- Citizens at large (public member)
- Industry - agriculture, forestry, oil & gas
- First Nations / aboriginal perspectives / traditional knowledge
- External to wetland research in Alberta
- Landowner
- Academia
- Policy / planner
- ENGOs: DUC, AWC, others
- Impacted sectors – i.e. agriculture, industrial, forestry, cities, municipal
- Interprovincial – SK & MB
- University / research institutes
- Urban development

Analysis:

Participants identified numerous qualifications that were consistent across the categories of *Knowledge*, *Skills*, and *Perspective*. Critical abilities that relate to all three of these areas include: policy knowledge, comprehensive understanding of wetlands and the research process, a unique perspective on the issue, and communication and collaboration skills.

Participants also indicated that a diversity of perspectives should be represented on the committee, with different members bringing specializations in areas such as knowledge of policy, financial management, communication, research approaches, and indigenous aspects of wetland research. This diversity would equip the committee to properly assess project proposals from a wide variety of disciplines, and different types of research teams.

FACILITATOR’S DISCUSSION NOTES: GOVERNMENT OR ARM’S LENGTH ADMINISTRATION

The purpose of this discussion was to determine how the Wetland Research Strategy could be governed and administered/managed, either from within the Government of Alberta, or through an arm’s length organization. Participants were asked to identify the advantages of each administrative structure, and by extension, the strengths of each structure against the other.

Question: What are the advantages of a Government of Alberta versus an Arm’s-Length run administration structure?

Summary of Responses:

General comments:

- The structure that is ultimately adopted must be able to evolve over time.
- The overall goal should be the creation of a wetland management system that can ‘run itself out of work’ — conduct research that ultimately leads to the reduction of scarcity of wetlands.

GoA Process Advantages	Arm’s Length Process Advantages
Should be easier to get policy aligned	Transparency
Ability to navigate GoA processes	Trust
More economical – existing structures in place	Lack of bias
Opportunity to evaluate & re-align	Credibility
Results should be easier to integrate into policy and decision-making	Flexibility
Easier to communicate to / between stakeholders	May be more economical & easier to communicate to stakeholders
Access to many related departments – creation of a “HUB”	Less red tape – more nimble
Accountability to/for GoA more clear	AB Innovates already exists and has science tradition (potential model)
Research can be more responsive to needs and gaps due to proximity to GoA	Appealing optics
GoA has lots of & access to human capital	Less interference from “political cycle”
Already existing data management programs	Consistency
More effective decision-making – can make final decision	There is a single defined mandate to deliver
	Scale linked to demand
	Potential to tap into other funding schemes
	Have networks to tap into other relevant networks
	Experts already in research & innovation
	Evaluation process is objective

Analysis:

Participants generally agreed that strengths could be found in both types of administrative structure.

A Government of Alberta-managed research program was expected to benefit from close linkages to policy, stability, and the availability of resources and infrastructure. Clear accountability and ease of access to data were viewed as particularly helpful.

An arm's-length managed research program was seen to be advantageous because it would not be subject to some of the particular constraints often faced by government, including compressed timelines, pressure from outside political factors, and access to research funding mechanisms.

An arm's length process was also widely thought to be more transparent and credible, and to provide better linkages to the research community. It was noted that infrastructure of this kind is already in place, thanks to the Alberta Innovates system.

FACILITATOR'S DISCUSSION NOTES: PRIORITIZATION

To examine the question of how research projects and areas of study could be prioritized for funding, participants were separated into small groups and asked to develop criteria, considerations, or methods for prioritization. These criteria were then assembled into a single list of key considerations

Question: What are the elements to be considered within a project application to make it a priority?

Summary of Responses:

- Alignment to criteria, linkage to policy
- Cost benefit analysis of contribution
- The project's ability to add (broader) value to other issues
- Fills key research gap
- Linkage to activity/place-based, addresses local needs
- Project benefits within province
- Distribution of HQP / Building capacity within Alberta
- Balance between short/long term research
- Align with other research and jurisdiction
- Employ pre-existing infrastructure
- Ability to address issues quickly / rapid implementation of results
- Application of results on landscape
- Public acceptance of wetlands policy and research approach
- Triple bottom line approach (social/economy/environment)
- Continuous improvement
- Does money stay within province where work is done?
- Funding structure (leverage, etc.)
- Addresses multiple policies (Federal, provincial, municipalities priorities)
- Strong program evaluation component
- Preventative versus restorative

Analysis:

Participants identified criteria that can be grouped around three themes: results-driven research, value, and alignment.

Prioritizing results-driven research would favor projects with the potential to inform multiple disciplines (social, economic, environmental), and research that can have an immediate impact. This might lead to the funding of a larger number of shorter-term projects, though participants noted that complex longer-term projects can provide significant overall benefits.

In terms of value, the participants indicated that cost-effectiveness in projects could play an important part in prioritization. Support was strong for the adoption of an existing funding structure, research infrastructure, and a cost/benefit analysis.

Alignment with the research strategy and the overarching Alberta Wetland Policy was also noted to be an important aspect of prioritization, as research that could inform existing policy would be more likely to provide tangible benefits in the Alberta context.

FACILITATOR'S DISCUSSION NOTES: WHAT DOES SUCCESS LOOK LIKE? (EVALUATION)

In the final session, workshop participants were invited to discuss the measurement of success for the Wetlands Research Strategy. Again working in small groups, they identified metrics for success categorized into five themes: *measurable success, results-oriented, policy outcomes, research outcomes, and program sustainability.*

Question: What does success for the Wetlands Research Strategy look like?

Summary of Responses:

Measurable Success

- More wetlands and no more money arising from compensation for wetland loss (mitigation bucks)
- Net gain in different wetland types
- Total funds leveraged increased
- Number of innovations and technologies developed
- Numbers of HQPs
- Number of projects
- Decreasing rate of wetland loss
- Number of publications produced; academic analytics
- High return on investment
- Greater wetland construction/replacement/restoration success
- Outcomes lead to a reduction in wetland loss

Results-Oriented

- Project results are implemented, effective and successful
- World class in wetland restoration and management
- Clearly defined goals so achieving them and measuring success is straightforward
- Inform decision making (i.e. cumulative effects management)
- Key data gaps are addressed
- Long term data sets are developed
- Economic/social and environmental success
- Possess the ability and resources to deal with emerging and urgent issues facing wetlands
- Outcomes are implemented in practice (practical)
- Process is transparent
- Stakeholder satisfaction
- Recognized, appreciated functional wetlands with enhanced ecosystem services
- Improved public understanding regarding value of wetlands
- Increased public awareness/knowledge moving up the literacy ladder

Policy Outcomes

- Wetland policy is integrated and implemented throughout GoA - increased collaboration and cooperation with stakeholders

- Outcomes of research drive policy success/integrated into policy
- Provide tools to support policy implementation for stakeholders
- The policy will have been adapted as a result of the research
- Supports conservation projection: preservation of wetlands
- Avoid, minimize, replace hierarchy is operationalized

Research Outcomes

- Results are relevant, credible and publically available Effective knowledge translation and exchange processes are in place
- Research has been applied
- Knowledge capacity, expertise will be enhanced
- Design standards to constructing “successful” wetlands Subject matter will be complex but processes are simplified Interdisciplinary outcomes
- Increased research capacity in Alberta
- The ability to discover unknown unknowns

Program Sustainability

- Projects completed on time and budget
- More cost effective restoration process
- Promotes integration with other programs: synergies, catalyst
- Timelines are efficient and realistic
- Integrating and adding value to other programs and related industries

Analysis:

Participants found that success for the Wetlands Research Strategy could be defined on a number of levels. The greatest signifier for success would be tied to real-world outcomes: specifically, a situation in which wetlands are consistently restored across the province, and there is no longer a scarcity of wetlands.

More tangible and immediate goals were noted in two specific areas: policy adoption, and research quality.

Participants felt the Wetlands Research Strategy could be deemed successful if research it supports is ultimately integrated into Alberta’s policy framework.

At the same time, the strategy’s ability to support research of a consistently high quality (greater scientific significance) would be considered a signifier of success, as such work would contribute to a better understanding of the province’s wetlands, and could lead to new and more advanced studies in the future.

APPENDIX



**Wetlands Research Strategy for Alberta
Steering Committee**

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A Wetland Research Strategy for Alberta Workshop
Agenda

University of Alberta
Lister Centre, Maple Leaf Room
Thursday, April 14, 2016
8:30 AM – 3:30 PM

Agenda:

1. 8:30 AM **Welcome and Background**
2. 8:45 AM **Introductions, Agenda, Meeting Guidelines**
 - Facilitators: Joanne Barwise & Rita Stagman (Government of Alberta)
3. 9:00 AM **Discussion: Scope**
 - What is the scope of wetland research in Alberta?
4. 10:15 AM *Break*
5. 10:30 AM **Discussion: Criteria**
 - What should the criteria for project selection and eligibility be within the process?
6. 12:00 PM *Lunch*
7. 12:45 PM **Discussion: Prioritization**
 - How should proposed projects/research areas be prioritized?
8. 2:00 PM **Discussion: Composition of WRS Selection Committee**
 - What should be the composition of the selection committee, and what essential skills/qualifications/perspectives should its members possess?
9. 2:20 PM **Discussion: Evaluation of Program**
 - What does success of the Wetland Research Strategy program look like?
10. 3:20 PM **Next Steps**

Wetlands Research Strategy for Alberta

BACKGROUND & WORKBOOK

**Prepared by the
Alberta Land Institute**

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INTRODUCTION

The Government of Alberta is developing a new Wetlands Research Strategy. As an independent research institute, the Alberta Land Institute, in collaboration with Alberta Innovates Bio Solutions, and Alberta Innovates Energy and Environment Solutions, is coordinating the facilitation of the government's consultation process ahead of the development of this strategy (please note: the strategy itself will be developed by the Government of Alberta, not the Alberta Land Institute).

The purpose of this document, and the facilitated workshop of which it will be a part, is to gather the expertise of numerous stakeholders to help inform the development process.

The Wetlands Research Strategy is being developed in accordance with one of the three strategic directions of the Alberta Wetland Policy: "build effective tools, knowledge and capacity (Government of Alberta, 2013, p.8)." Wetland research will be supported by an allocation fund for non-restorative measures within the policy, and the Wetlands Research Strategy will be expected to contribute to sound rationale, prioritization and criteria for research projects.

In order to develop the strategy, the Government of Alberta is consulting with stakeholders and experts to develop an effective research framework. This document provides structure to that discussion, and also functions as a workbook. All workshop attendees are invited to read the information gathered in the following pages, and to consider their answers to the identified questions. Those not able to attend the workshop can use this document to guide responses that can be sent to the Alberta Land Institute for inclusion in the development of the strategy.

Please note: the information presented here serves as an introduction and sets context; there are undoubtedly many aspects related to the development of this research strategy which are not explicitly included. All attendees are asked to share their own specific expertise and experiences in answer to the noted questions — and to identify any questions that have been missed.

Thank you for your contribution to the development of this Wetlands Research Strategy!

Questions:

Before continuing, it is valuable to determine the principles that will guide the research strategy. An example could be simply the goal of the Alberta Wetland Policy, which "is to conserve, restore, protect and manage Alberta's wetlands to sustain the benefits they provide to the environment, society and economy (Government of Alberta, 2013, p.2)."

- **What should the principles of the wetland research strategy be?**
- **Who should take the lead on this? Government or stakeholders? Why?**
- **Should there be consultation on purely the governance of the strategy?**

SCOPE, CRITERIA AND PRIORITIZATION OF WETLAND RESEARCH

This section provides context about the Wetlands Research Strategy in Alberta, as well as information from the literature on considerations for wetland research, the scope of wetland research in Alberta, and the prioritization of wetland research.

Alberta's Wetland Policy

The Wetlands Policy establishes the scope, criteria and prioritization of wetlands research in Alberta. The research strategy will be expected to help fill knowledge gaps while developing the tools and capacity needed to ensure the sustainability of Alberta's wetlands resource. Research into wetland restoration and the application of replacement measures is also called for.

The consideration of existing wetland policies elsewhere is useful both for the development of research areas, and for the application of research findings (Bergh et al., 2004). However, findings need to be supplemented with accounts of market and policy failures in order to be effective, such as poor incentives, lack of monitoring and oversight and property rights issues.

Furthermore, the consideration of stakeholder interests can increase the social feasibility of any policy recommendations derived from the research. Ultimately, policy outcomes are dependent on the set objectives of wetland policy and management, which can include: efficiency, equity, costs, sustainability, and multiple use.

Considerations for Wetland Research

Researchers working on wetland science agree that coordinated efforts between the hydro-ecological process and economic aspects is needed to maintain wetland function and viability (Bergh et al., 2004). The social and natural science aspects of wetlands are generally considered to be the priorities of wetland research. Their coordinated effort can also help solve problems of information and inconsistency among various government policies and academic research.

The literature also cautions that when undertaking wetland research, a number of considerations are relevant (Bergh et al., 2004):

- ✓ A consistent form of appropriate terminology and typology for wetlands, their functions and their values needs to be determined. This avoids confusion between interpretations of terms and concepts by researchers and administrators.
- ✓ The establishment of the range and scale of effects to be analyzed and assess possible thresholds. This determines whether the research adopts a local, provincial or national approach.
- ✓ The reasons behind wetland change, degradation and loss. By distinguishing between immediate and long-term causes, within a historical context, can be helpful in understanding the complexity of wetland change.

- ✓ The selection of research methods is also an important step. There are a variety of methods, such as integrated modelling, spatial modelling, ecological and economic valuation, and performance indicators. The identification of these methods defines the framework of natural and social science concepts and data, and also makes it easier to understand the spatial relationships between elements such as groundwater, surface water, wetland vegetation and their economic values.
- ✓ Finally, the complex task of aggregating economic and environmental indicators should be done through a multi-criteria evaluation process. It is recommended that instead of a fixed aggregation function, spatial aggregation with a choice of weights is preferable as it allows for evaluation on expressed preference by private or public decision makers.

Scope of Wetlands Research in Alberta

The scope of wetlands research can be better understood through existing studies of wetlands in Alberta. Locky's (2011) Green Paper provides an excellent overview of wetlands in Alberta, delineating their different classifications and locations. For example, this includes mineral soil wetlands in the white zone and peatlands in the green zone.

Locky (2011, p.13) also differentiates wetland function and value, where function refers to the science-based "performance" of wetlands and value indicates their socio-economic "usefulness." More clearly, the science-based function of wetlands is presented in existing research strategy proposals to study areas such as biodiversity, hydrology and biochemical cycling (Fiera Biological Consulting, 2014).

A broad scope typically allows for greater research flexibility. How that scope is defined can have a significant impact on the nature of research, and one area of consideration is whether the scope is defined strictly in geographical or scientific terms, or if it also includes 'principles' — such as how a proposed research project addresses relevant knowledge gaps, or is relevant specifically to Alberta.

An example of scope could be taken from Alberta's Wetland Policy through the category of non-restorative wetland replacement. This refers to anything that "...supports the maintenance of wetland value, by advancing the state of wetland science and management," (Government of Alberta, 2013, p.18). Some additional examples could include: being relevant to Alberta, improving policy implementation and addressing knowledge gaps.

Questions:

- **What is the scope of wetland research in Alberta?**

Example of a Prioritization Scheme

Some research agencies have proposed and implemented prioritization schemes for wetland research which might prove informative during the development of this research strategy. Below is an example of how a process in Tampa Bay (Russell et al., 2011) prioritized research areas/projects:

Scope: This process integrated information from ecological science, economic analysis, and social values concerning ecosystem goods and services. Its development sought to maximize the transparency when selecting potential research projects.

Criteria: The researchers established the following objectives for their prioritization scheme: (1) generate information relevant and beneficial to potential end users, (2) advance the scientific understanding of ecosystem goods and services, and (3) foster efficiency and cost-effectiveness for a large, complex research program, (Russell et al., 2011, p.648).

Prioritization: The researchers then used three metrics to measure and prioritize research projects: (1) importance to stakeholders, (2) relative economic value, and (3) availability of scientific information for three broadly defined ecosystem types (terrestrial, wetlands, and open-water) (Russell et al., 2011, p.648).

While this method proved effective in the above-noted case, it may not be applicable to the Alberta Wetlands Research Strategy, depending on how its scope is defined. For instance, another method might be required in order to prioritize projects based in different disciplines (social vs. natural science). Any prioritization process must account for these potential contrasting types of research.

Questions:

- **What should the criteria for project selection and eligibility be within the process?**
- **How should proposed projects/research areas be prioritized?**

OVERVIEW OF CALL FOR PROPOSALS MODELS

When a research program wishes to work with multiple partners to achieve certain results, a call for proposals (CFP) is typically launched. In a call, interested parties are invited to submit proposals for research initiatives that will contribute to the achievement of the program's expected results and objectives. The determination of whether these expected objectives should focus on the parent organization's priorities (in this case, broadly advancing the government's wetland research) must be made beforehand.

In order to understand common characteristics typical in peer-reviewed CFPs on wetland and ecosystem research topics, a comparison of the four models (ALI, National Wetland Conservation Fund, Atlantic Ecosystems Initiative, Alberta Conservation Association) was done. The models exhibited in Appendix A (page 13) present both similarities and differences; the notable commonalities in each CFP process' are identified below. It should be noted that some characteristics vary depending on the specific objectives of the research organization. In addition, Pro-Grid™, an evaluation tool, is covered to give participants an idea of the alternatives to a traditional call.

Notable Characteristics of Peer-Reviewed CFP Application

✓ **Background/Program Information**

All models provide background information on the organization and the purpose of funding.

✓ **Who can apply? How to apply?**

All models set qualification standards for applicants (usually including criteria related to research experience). The models also provide instructions about how to apply, and a set of submission guidelines

✓ **Program/Research Priorities**

All models clearly articulate the purpose of the funding and present certain research priorities that the funding seeks to explore (often presented as research topics or research questions).

✓ **Funding Eligibility**

All models include a section which dictates the funding eligibility of submissions. The section is also used to present certain restrictions and activities ineligible for funding.

✓ **Selection Process/ Evaluation Criteria**

All models contain a section which explains the selection process for submissions and the criteria used to evaluate submissions. This includes specific priorities or considerations that are taken into account when evaluating a submission. Furthermore, some models indicate to applicants that a selection body is responsible for evaluating and selecting successful and unsuccessful submissions

✓ **Applicant Instructions**

The models offer different names for this section, but the purpose remains consistent: to establish what content is required for the submission. There are consistently four main sections:

- *Applicant Information*: The “who” of the submission, including the names and information of principal investigators, graduate students and other potential team members. In addition, evidence of research experience and project delivery is often required.
- *Project Description*: The “what” of the submission, including reference to a specific research priority set forth by the CFP, the objectives of the project, location of the project, and the benefits of the project. It can also include reference to how the project builds capacity through training or employment.
- *Project Timeline*: This is the indication of the project start and end date. It can also include a detailed work plan on how the project will meet its timeline.
- *Project Budget*: The project budget indicates any cash or in-kind support and describes project costs in detail (including specific rates, capital assets, salaries, fees, costs etc.).

Pro-Grid Process™

Although the peer-review process is fairly established in research funding competitions, there are limitations. This includes: there is a large volume of applications; there is a need for a wider range of experience of reviewers; there is a need for a higher level of transparency in the review process; and greater consistency when providing feedback to applicants (Marsh et al., 2008). The major complaint against standard peer review is summed up by the term “fatigue” – by both applicants and reviewers. As a result, it is beneficial to consider alternatives that could address some of these deficiencies.

Pro-Grid™ is a software that uses a rigorous and objective method to evaluate grant applications and project proposals (Pro-Grid, 2006). The basis of Pro-Grid is to determine the intangibles, or “evaluating what you can not measure.” The process follows a five-step methodology to evaluate projects and brief explanation of each step is provided.

1. Identifying the Overarching Objectives
 - a. By determining two conflicting objectives and finding resolution between them, a new and higher level of success can be achieved.
2. Defining an Evaluation Matrix of Criteria
 - a. The backbone for evaluating intangible assets and contains criteria central to the evaluation. It addresses both overarching objectives.
3. Establishing metrics through Language Ladders
 - a. Metrics are established through statements for evaluation and illustrating intangibles. This is done by taking observations and assigning them a numerical value on each rung of the ladder, which is a physical representation of the problem. In many cases the highest rung in the ladder represents the most ideal scenario in the evaluation and the lowest rung does not meet evaluation expectations.

4. Evaluating the Intangible
 - a. The software is used to compile the information above and evaluates it.
5. Plotting the results on an Evaluation Grid
 - a. The evaluated data is plotted on a grid and summarizes the strengths and weaknesses of the proposals.

Questions:

- **Should the call be specific or broad in nature?**
- **What are some other characteristics within the CFP process that should be included?**
- **What should the criteria for project selection and eligibility be within the process?**
- **Are there any other proposal evaluation models that should be considered?**

SELECTION COMMITTEE SKILLS AND REQUIREMENTS

A skills and requirements matrix is an appropriate method to assess the core competencies of a selection committee for the Wetlands Research Program. The criteria should be determined based on the needs and objectives of the research strategy. Furthermore, the determination of the selection committee’s skills criteria can be informed through the research strategy’s scope, priorities and criteria. An example of a matrix is shown below.

	Experience/Skill		
	High	Medium	Low
Knowledge Exchange			
Policy/Planning			
Research and Development			
Environmental/Conservation Knowledge			
Traditional Knowledge			
Social/ Natural Sciences Background			
Evaluation/Assessment			
Financial Research Management			

An alternate possibility might see the establishment of two separate matrices, one that evaluates skills and the other for the evaluation of principles. It might also be beneficial to establish a committee including both “generalists” and “experts”, so that specific projects can be evaluated properly. It should also be noted that committee members are generally disqualified from receiving grant money in order to avoid a conflict of interest.

Questions:

- **What should be the composition of the selection committee, and what essential skills/qualifications should its members possess?**
- **What are some additional requirements or skills, in addition to those listed in the table above that should be considered?**
- **Are there other methods available to assess the core competencies of the selection committee?**

RESEARCH PROGRAM EVALUATION

Research program evaluation helps the program's management establish whether the program is proving effective in meeting its objectives.

An important question in developing an evaluation structure is determining who is responsible for this assessment process. The literature often distinguishes between "internal" and "external" evaluators (Bowen, 2015). Internal evaluators are those who are already working with the project, such as the research team. External evaluators are those who do not have an existing relationship with the project that is being evaluated. It is recommended that use of internal evaluators is appropriate for formative evaluation (before or during the project to improve design and performance), and external evaluation for summative evaluation (focused on the outcome of project).

It is also important to understand the different outcomes of the program, and the different types of evaluation that accompany them. For instance, the government may be more concerned about the financial sustainability of the program, whereas the research community is concerned about the research results. These different focuses would lead to different types of outcomes, and different types of evaluations.

One example of how differing outcomes and methods can be reconciled comes from the federal government, because it periodically evaluates its own research programs (Goss Gilroy Inc., 2015, KPMG, 2014). In these certain cases, the program evaluations examine three major themes — *relevance*, *effectiveness*, and *efficiency and economy* — which provide a set of performance measures in the coverage requirements of the federal government's *Policy on Evaluation*. "The objective of this federal process is to create a comprehensive and reliable source of evaluation evidence in support of policy and program improvements, expenditure management, decision making and public reporting" (*Policy on Evaluation*, 2009).

The major themes/criteria evaluated by the federal government (Goss Gilroy Inc., 2015, KPMG, 2014):

Relevance is measured by:

- ✓ The continued need for the research program to foster innovation, and therefore, drives competitiveness and quality of life.
- ✓ How the research program aligns with the priorities of the organization it is under.
- ✓ The strategic outcomes of the parent organization and how the research program aligns with those.

Effectiveness is measured by:

- ✓ How the program's funded research is leading to the creation or extension of knowledge, confirmed by scholarly publications and citations.
- ✓ How funded research facilitated multidisciplinary and multi-sectorial collaborations

- ✓ How the research network actively sought mechanisms to engage with partners by including them in their research projects in innovative and meaningful ways.
- ✓ How the research program has supported the training of high quality personnel that developed their research and knowledge translation skills, typically at the Masters and PhD level.
- ✓ The mobilization of knowledge using refereed and non-refereed publications.
- ✓ The research program having a positive impact on the knowledge base of partner organizations, as well as research and development receptivity, capacity and investment.
- ✓ The long term benefits of the research projects from the program that has led or will likely lead to long-term benefits (economic, social, environmental).

Efficiency and Economy are measured by:

- ✓ Administrative efficiency – the ratio of operating expenses relative to the total amount of grant funds awarded.
- ✓ Perceptions of efficiency and effectiveness – are program stakeholders pleased with the delivery of the research program?

The federal government’s evaluation process may provide a useful example during the development of the wetlands research strategy, though its particular elements may not be fully applicable to requirements in Alberta.

Questions:

- **How should research outcomes be evaluated, along with the research strategy itself?**
- **Is the federal government model a useful benchmark, and are there any other proposal evaluation models that should be considered?**
- **What are some other criteria that should be evaluated?**

FURTHER DISCUSSION

This document has identified a variety of important topics related to Alberta's Wetlands Research Strategy, in order to structure discussion and ensure that stakeholders can contribute to the Government's development process. However, beyond the information and issues already identified, there may be numerous elements for discussion.

All participants in this process are invited to offer comments or questions which they believe might be relevant to the development process. Are there pertinent examples of research strategies from other jurisdictions that are relevant? Are there specific knowledge gaps in the wetlands policy that should be addressed? Has your experience identified research issues that may or may not be accounted for by the development of a strategy? What questions have yet to be identified?

The development of Alberta's Wetlands Research Strategy will benefit from the expertise of many stakeholders. We thank you for your involvement!

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APPENDIX A: CALL FOR PROPOSAL MODELS

Alberta Land Institute	National Wetland Conservation Fund	Atlantic Ecosystems Initiative	Alberta Conservation Association
About/Organization Background	Executive Summary <ul style="list-style-type: none"> - Title and Summary 	Program Information	Grant Information <ul style="list-style-type: none"> - Who can Apply? - How to Apply? - Where to Apply?
Selection Process	Recipient Eligibility	Program Priorities	Funding Eligibility
Requirements	Activities Eligible for Funding	Eligible Activities	Funding Priorities
Timeline	Activities Ineligible for Funding	Geographic Location	Application Instructions <ul style="list-style-type: none"> - Who and How Much? - Project Type - Link with the ACA - Budget Notes - Project Review
Contact	Applicant and Contact Information <ul style="list-style-type: none"> - Applicant Type - Project Lead 	Eligible Project Costs	ACA Research Grants
Research Areas <ul style="list-style-type: none"> - Background - Research Questions - Project Objectives - Project Period - Proposed Budget 	Project Team <ul style="list-style-type: none"> - Project Delivery Experience 	Amount of Funding Available	Application Screening and Decision Process
Project Description <ul style="list-style-type: none"> - Problem Statement - Project Objectives - Literature Review - Methodology/ Data Analysis - Action Plans - Contribution to Policy Development/Analysis - Capacity Building 	Project Overview <ul style="list-style-type: none"> - Project Start and End Date - Project Objectives - Project Description - Target Wetland Description - Federal and/or Provincial Permits 	Overlap with Other Environment Canada Funding Programs	
Research Experience	Project Benefits <ul style="list-style-type: none"> - Planned Performance - Long-term benefits to wetlands 	Evaluation Criteria <ul style="list-style-type: none"> - Required Criteria - Desirable Criteria 	
Policy and Consultation Experience and Plans	Work Plan <ul style="list-style-type: none"> - Annual Work Plan 	Review and Evaluation Process	
Communication Plans	Project Budget and Cash-flow <ul style="list-style-type: none"> - Total Project Funding - Total Project Costs - Use of Environment Canada Funding 	How to Apply	
Report Guidelines	Reporting Obligations	Application Deadline	
	Proposal Evaluation and Project Prioritization	Notification	

Call for Proposal Models - Sources

Alberta Land Institute:

<http://www.albertalandinstitute.ca/research/call-for-proposals>

National Wetland Conservation Fund:

https://www.ec.gc.ca/financement-funding/default.asp?lang=En&n=56914323-1#_06

Atlantic Ecosystems Initiative:

<https://www.ec.gc.ca/financement-funding/923047A0-C8C8-477E-A65E-232C233C04E3/AEI%20Application%20Guidelines%202016-19.pdf>

Alberta Conservation Association:

<http://www.ab-conservation.com/go/default/index.cfm/grants/grant-eligible-conservation-fund/aca-research-grant/>

