



Miistakis
Institute

Bow Basin Municipal Wetland Datasets:

*A strategy for securing
accessible, usable, current,
consistent wetlands data*

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**Bow Basin Municipal
Wetland Datasets:
A strategy for securing
accessible, usable, current,
consistent wetlands data**

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June 2020

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Introduction

Despite the widely-recognized importance of wetlands, the continuing loss of wetlands, efforts to restore wetlands, and the impact that land use decision-making has on wetlands, municipalities and other stakeholders in southern Alberta do not have access to wetlands data and information that serves their planning and decision-making needs.

Based on several formal and informal discussions with Alberta municipalities, the Miistakis Institute believes there is a need for a 'wetlands data strategy', one that can support maintenance and restoration of the region's wetlands by ensuring there is standardized wetlands data, in a form usable for municipal planning and programming, extending across the Bow River Basin, publicly accessible and sustainably current over time. This requires a coordinated, regional approach to developing and maintaining such a data source.

As municipalities are the primary drivers of land-use planning, Miistakis feels the proposed strategy would need to engage affected municipalities in the Bow River basin around and upstream of Calgary. However, other organizations play critical roles in both creating and using wetlands data, including watershed groups (especially the Bow River Basin Council), stewardship groups, friends-of groups, land trusts, industrial operators, agricultural producers, and – critically – Alberta Environment and Parks.

A Wetlands Data Issue

It is not the case that wetlands data do not exist for the Bow River basin. There is, in fact, a plethora of associated data sources ranging from wet areas imagery, to the Alberta Merged Wetland Inventory, to drained wetland inventories, to site-specific biophysical assessments. In specific areas, detailed inventories, assessments, and modelling have taken place.

However, when a municipality comes to use (or require the use of) wetlands data, there is a mix of standards and accuracy, patchy accessibility, wide variations in the currency of data, and a lack of understanding of what is available. These circumstances lead to a low level of trust in the data in general. Neighbouring municipalities are often basing wetland-related decisions on vastly different information sets.

As well, municipalities do not have data in a form that is usable for their type of decision making: for example, simple wetland maps with arbitrary buffers are routinely contested by development proponents, wetland restoration programs do not have the data to prioritize limited resources, and storm management ponds or dugouts may not be differentiated from multi-function wetlands. These issues are exacerbated by the

increasing need to understand and plan for wetland complexes at a regional (multi-municipality) scale.

Purpose of this document

This document's primary purpose is to articulate a strategy that will improve Bow Basin municipalities' ability to secure accessible, usable, current, consistent wetlands data. Nested within that purpose is the objective of sketching two proposals, one for engaging the basin's municipalities, and one for engaging the Government of Alberta.

To further clarify that overarching purpose, each element of the purpose can be characterized as such:

Accessible – not hidden behind paywalls; not withheld by provincial government; not hidden behind non-disclosure or other restrictive agreements; publicly available to any party who requests it

Usable – supports municipal planning and conservation programs; supports municipal spatial data systems; at a resolution and projection appropriate for municipal-scale decision making; contains the necessary wetland class and supporting information

Current – is up to date, and has a mechanism to stay up to date

Consistent – is similar between municipalities; uses data standards consistent with the province, industry, and other municipalities; uses consistent classes and sub-classes

It should also be clear that the desired goal for the proposed *Bow Basin Wetland Datasets* is to raise the bar of the lowest common denominator, ensuring all areas have access to quality, consistent wetlands Data. It is not the goal to supplant or demean existing datasets. In many cases, the Bow Basin Wetland Datasets will be used to compare to or help truth other datasets, or indicate where much more site-specific and detailed work may be needed.

Regional Wetland Data Strategy project

In 2019, the Miistakis Institute initiated the *Regional Wetlands Data Strategy* project seeking to address the above issues by developing a clear understanding of:

- The municipal needs for wetlands data,
- The opportunities and challenges with the existing data,
- A pragmatic method for collecting / creating / maintaining data and information that municipalities can use in wetland conservation and restoration.

The project was made possible through grant funding from Alberta Innovates' Water Innovation Program: <https://albertainnovates.ca/programs/water-innovation/>

The tasks in the project have included:

- Surveying and interviewing municipal personnel in the Bow River Basin as to the issues they see with their ability to access and use wetlands data, and the related needs they have.
- Cataloguing wetlands data sets that are currently in use by, or are available to, municipalities in the Bow River Basin.
- Convening a workshop to:
 1. Confirm that the conclusions of the initial issues, needs, and data surveys are correct;
 2. Raise awareness as to the existing and potential opportunities for municipalities regarding wetlands data; and
 3. Identify potential elements of a collaborative strategy for securing wetlands data that serves their need.

The Municipal wetland data Workshop took place on February 13, 2020 at Mount Royal University, with 25 people in attendance, representing 12 municipalities in the Bow Basin, as well as the Bow River Basin Council, the Oldman River Regional Services Commission, and the Nose Creek Watershed Partnership. Presentations were made by the Miistakis Institute, as well as two invited experts in wetlands, data, and municipalities: Dr. Irena Creed, Professor and Associate Vice-President Research, University of Saskatchewan; and Dr. Shari Clare, Director and Senior Biologist, Fiera Biological Consulting.

The workshop record, presentations, and background reports are all available on a purpose-built website: <https://www.wetlanddataworkshop.ca>

Strategy Background

As noted above, the Regional Wetland Data Strategy involved several tasks that have informed the development of this strategy.

Municipal Wetland Data Issues and Needs

One of the first steps in developing this strategy was to survey municipalities within the Bow River Basin to coarsely assess their views on the most relevant issues and needs for wetlands data. The survey was administered using an online platform (SurveyMonkey), and received fifteen responses.

Respondents declared themselves as 'planning staff member/manager' (50%), 'Conservation/parks/environment staff member/manager' (29%), 'Other' (14% - which respondents described as a combination of several listed roles), and 'GIS staff member/manager' (7%). There was no intention to derive a statistically-valid survey, so the results should not be construed as such. The intent was only to provide some coarse baseline information to inform the Municipal Wetlands Data Workshop (ultimately held on February 13, 2020).

Although a detailed content analysis was not completed, some preliminary trends did emerge:

- All municipalities have heard of the major available datasets, but only 1/3 to 1/2 of the respondents indicated using any of them.
- Wetlands data is primarily used for development decisions (93%), environment / conservation planning (60%) and stormwater management (47%)
- The Government of Alberta is the primary source of wetlands data (73%) followed by the development proponent/their consultant (60%), or directly from a consultant (53%)
- In general, there is rarely a mechanism in place for updating data
- Municipalities rely on their MDP to set the policy direction for wetlands management
- Approximately a third (36%) have protected wetlands in some way, and over a quarter (29%) have a wetland policy
- Principal challenges include:
 - Cost of acquisition
 - Outdated data
 - Not purpose fit
 - Limited municipal capacity/expertise
- Primary needs include:
 - Supporting site-specific planning

- Showing size, dimensions, boundaries
- Informing wetland connectivity and protection
- Class designations and ecological information
- All wetlands data needs/uses offered were rated high, with only 'provide dollar values' being notably lower

For further information on this survey, please see the full report *Wetlands Data Needs and Issues: A Survey of Municipalities in the Bow River Basin*, available on the Municipal Wetlands Data Workshop website (<https://www.wetlanddataworkshop.ca/>).

Currently Available Wetland Data

Another critical background step prior to the workshop and development of this strategy was to create a catalogue of existing wetlands datasets available to municipalities in the Bow River Basin. Miistakis developed this catalogue using two approaches. First, a rough digital footprint of the Bow River Basin was created, and Miistakis gathered the wetlands datasets known or presumed to be used for identifying wetlands in this area. Second, to crosscheck that list, most municipalities in the Basin were contacted and asked which datasets they used.

For each dataset, the following information was compiled:

- *Last Updated* – the most recent known update to the dataset
- *Coverage* – the extent of the dataset relative to the derived Bow River Basin outline
- *Classes* – the wetland classes developed for or used by the dataset
- *Other information* – any additional relevant information included in the dataset
- *Comments* – Observations relevant to the use the data in a municipal planning context

The available datasets were categorized as regional or sub-regional datasets.

Regional Datasets

- Alberta Merged Wetland Inventory (Government of Alberta)
- Alberta Wetland Relative Value Evaluation Tool
- Canadian Wetland Inventory (Ducks Unlimited)
- ABMI (Alberta Biodiversity Monitoring Institute) Wetland Inventory

Sub-regional Datasets

- City of Calgary/Rocky View County Wetlands
- City of Calgary/Rocky View County Historic Wetland Inventory
- City of Calgary/Rocky View Impact Wetland Inventory (Drained Wetland Inventory)
- Other Sub-Regional Datasets Identified
 - *City of Calgary Storm Ponds* – Last updated in 2019

- Wheatland County – Wetland Inventory completed in 2016
- *Ducks Unlimited Misc* – Ducks Unlimited has various datasets including Engineered Wetlands, Western Canada Wetland Inventory (2009) and Alberta and Quebec Wetland Inventory (2014)
- *Rocky View County / Town of Cochrane* – Wetland Inventory for Town of Cochrane and some of Rocky View County completed in 2011
- *Town of Cochrane* – Wetland Inventory for one neighbourhood in Cochrane completed in 2009
- *City of Calgary* – Wetland inventory created by Fiera Biological Consulting updated in 2015.

For further information, please see the full report *Wetlands Datasets in the Bow River Basin: A preliminary Catalogue of Wetlands Datasets Available to Municipalities*, available on the Municipal Wetlands Data Workshop website (<https://www.wetlanddataworkshop.ca/>), as well as *Appendix 2: Bow River Basin Wetlands Data Catalogue Summary*.

Policy Rationale

Of course, the imperative for a new approach to wetland data in the Basin, one that involves municipalities, does not come only from Miistakis' consultations with municipalities for this project. There are several examples of existing policy imperatives regarding both wetland conservation/restoration and the development of supporting datasets. These exist at the provincial, regional, and collective-municipal levels (*NB: all bolded italics are the author's*)

For a more detailed catalogue of the policy rationale sources, see *Appendix 3: Policy Rationale Detail*.

Government of Alberta

South Saskatchewan Regional Plan (2018)

The South Saskatchewan Regional Plan (SSRP) acknowledges that "*Degradation of riparian lands and loss of wetlands across the Prairies have been widespread leading to altered flow regimes and degraded water quality.*" (p.25). It states that "The Government of Alberta is also ***committed to increasing knowledge and mapping of wetlands***, including standardizing and updating the existing wetland inventory and working with partners where appropriate." (p.48)

The SSRP's Implementation Plan (Strategy 4.4) commits to "Continue to increase knowledge and improve management of wetland areas within the region", and more specifically to

“Continue to **facilitate the advancement of wetland knowledge, data systems** and science in the region.” (p.84)

A draft Biodiversity Management Framework has been created under the SSRP. In its current form, it envisions a Wetland Habitat indicator that would reflect “the state of both number and area of standing water (lentic) wetlands in the region.”

Alberta Wetland Policy (2013)

The Alberta Wetland Policy states its goal is “To conserve, restore, protect, and manage Alberta’s wetlands to sustain the benefits they provide to the environment, society, and economy,” and one of its key outcomes is that, “Wetlands are managed by avoiding, minimizing, and if necessary, compensating for impacts.”

To facilitate that outcome, the Policy outlines the ability of proponents of activities deemed eligible to impact wetlands to provide an “in-lieu fee payment” to a wetland restoration fund. That fund allows a portion of the proceeds to be devoted to “Non-restorative” Replacement activities that support the maintenance of wetland value, including “Specified research into wetland restoration measures, **“Specified wetland inventory work and data acquisition”**, and “Landscape level wetland health assessments.” (p.18).

Guide to Watershed Management Planning (2015)

The Government of Alberta created a Guide to Watershed Management Planning to help WPACs (Watershed Planning and Advisory Councils) in the creation of management plans for their basin. In their description of who should be involved and in what role, they state that the “Government of Alberta is responsible for water and land-use management in the province. **It brings relevant information and data** and connects other relevant planning initiatives to the planning process.”

Water for Life Renewal (2018)

In the renewal guidance for it’s foremost policy regarding the province’s water (*Water for Life*), the Government of Alberta reiterated the Alberta Water Council’s recommendations, including “the need to be proactive, accelerating our actions to protect our water sources now rather than waiting until later. This includes clarifying roles and accountabilities, **improving data collection and analysis**, and increasing public awareness about water and water resources to build a shared commitment with Albertans.”

Alberta Urban Municipalities Association (AUMA)

Municipal Water Policy on Wetlands (2013)

The Alberta Urban Municipalities Association (AUMA) has long maintained an interest in wetland policy on behalf of their members. In their current policy on wetlands, the specifically identify the new for a wetland inventory that is usable for municipalities.

*It is essential for municipalities, the provincial government and other wetlands stakeholders to have a solid understanding of the extent, location and function of Alberta's wetlands in order to make sound management decisions. **While a handful of municipalities have conducted wetlands inventories, most do not have the expertise or financial resources to complete one on their own let alone keep it up to date.** The Government of Alberta has conducted a province-wide inventory available at GeoDiscover Alberta. However, the accuracy of the inventory could be improved along with the accessibility and ease of use of the information.*

2. The AUMA water policy includes the following statements:
 - a. AUMA urges the Government of Alberta to:
 - b. Continuously **improve the accuracy of the Provincial Wetland Inventory and make the data more user friendly and accessible.**
 - c. Expand the inventory to include information on wetland function.
 - d. Identify provincially/ecologically significant wetlands that require enhanced protection including the identification of compensatory wetland habitat.
3. That the AUMA work with the Government of Alberta and other wetland experts to develop a guide for municipalities to use in partnering with developers and land owners to conduct more detailed localized wetlands inventories to better integrate protection of wetlands into land use and sustainability plans.

Bow River Basin Council (BRBC)

The Bow River Basin Council is the government-designated Watershed Planning and Advisory Council (WPAC) for the Bow Basin. They are mandated to provide advice to the Government of Alberta on watershed management issues in the basin, and develop programs for Education and Outreach, Environmental Stewardship, Watershed Evaluation and Reporting, and Watershed Management Planning.

Flood Mitigation Discussion Paper (2014)

The BRBC's post-2013 flood mitigation advice regarding watershed integrity suggested that implementation of the Alberta Wetland Policy "should **foster and support wetland (watershed) preservation as a key component of flood (and drought) mitigation.**" A key

opportunity, they suggest is to, "**Locate and obtain the best, up-to-date data** and then employ that data in the application of existing modeling tools. They also recognized that "Current discussions should more fully explore a fundamental **challenge around input data**. The best model in the world is completely compromised if there is a lack of reliable input data in real time."

Five Key Watershed Management Policies for the Growth Region (2019)

In their submission to the newly-established Calgary Metropolitan Region Board (CMRB), the emphasized the link between the region's municipalities and the watershed's health, specifically including wetlands, and emphasized the need for data on these resources. Their 5 recommended watershed management policies included:

1. Know the water resources within your region and within each municipality

*"Every municipality has a number of distinctive water resources located within its geo-political boundaries. **We recommend that any municipal development plan or area structure plan submitted by a participating municipality identify, assess the status of, and map these water resources.**"*

5. Upstream and downstream impacts:

*The CMRB and participating municipalities must plan with recognition and mitigation of potential impacts of land use within the growth region as a whole, or within municipal boundaries, on upstream and downstream municipalities. The Bow watershed is a complex, dynamic system and everything is connected. For example, the **removal of wetlands** and long corridors of riparian vegetation, or systematic stripping and grading of riparian land and aggregate removal along the Bow or its tributaries **may not affect the watershed or water resources within the municipality where they are located, but the social, economic and environmental impacts may be felt upstream or downstream of the development.***

Calgary Metropolitan Region Board (CMRB)

The newly-formed Calgary Metropolitan Region Board (CMRB) includes the municipalities that encircle the City of Calgary, and is mandated with developing a legally-binding regional growth plan.

Interim Growth Plan and Interim Regional Evaluation Framework (2018)

While the full growth plan is being created, the CMRB developed an Interim Growth Plan. This included the region-wide policy (3.2.3) that "All statutory plans shall: (b) adhere to the provincially identified wetland classification system, and **incorporate measures to minimize**

and mitigate adverse impacts on wetlands.” The Interim Regional Evaluation Framework reinforced this in its evaluation criteria (6.1) asking “Does the proposed statutory plan or existing statutory plan amendment: ... adhere to the provincially identified wetland classification system, and incorporate measures to minimize and mitigate adverse impacts on wetlands.”

Environmentally Sensitive Areas Background Study (2019)

The CMRB’s enabling regulation requires it create policies regarding environmentally sensitive areas. To facilitate this, they commissioned a background study to inform the Regional Growth Plan. The consultant recognized the data limitations municipalities in the region faced and recommended that:

“the CMRB develop a well-maintained regional database of potential and confirmed ESAs over time, with clear standards for data collection and dissemination ... this database would be used to inform municipal planning processes.”

And further that, *“the CMRB investigate implementation and monitoring options for the creation and maintenance of such a regional database”* arguing this work could: *“Provide a forum to develop, critique, and update spatial environmental datasets (such as **wetland and watercourse inventories, land cover datasets, wildlife habitat, and human footprint and disturbance impacts**), to align with regional definitions and standards.”*

Nose Creek Watershed Partnership (NCWP)

The goal of the Nose Creek Watershed Partnership¹ is *“To protect the riparian areas and improve water quality in the Nose Creek watershed.”* One of their aims in creating the Nose Creek Watershed Management Plan is to *“Identify and address data gaps (e.g., monitoring, new science)”*.

Their Plan includes recommendations for an updated wetland inventory for the watershed (6.4.4 a), and one of their chosen indicators involves measuring wetlands as a percentage of the watershed area, and tracking wetland loss

¹ The NCWP is comprised of the Calgary Airport Authority, the City of Airdrie, Rocky View County, the City of Calgary, the Town of Crossfield, and the Bow River Basin Council.

Dataset Development

Dataset Methodology

A vital part of this strategy is, of course, determining what technical approach to take in the creation of a new wetland dataset for the Bow Basin municipalities. Or put more simply - what do we mean by “data” and how would one go about creating it?

The main factors considered were:

Source data availability — because the new dataset would be derived from other inputs (satellite imagery, air photos, existing inventories, survey-derived data, etc.), are these inputs readily available?

Cost — is it achievable to gather the input data, conduct the processing, and repeat the exercise at reasonably frequent intervals?

Renewal - will the methodology be so onerous (and expensive) that repeating it will be functionally unworkable

Municipal utility - will the data be in a form that integrates well with existing municipal processes and programs?

User access - will limits on the source data, complexity, user-interface, etc. mean the resultant datasets will not be accessible to the intended users?

Coverage - will the source (input) data extend over the entire basin in a consistent way, and will it address existing data gaps?

Potential Approaches

To assess the potential approaches, the Miistakis undertook several tasks under the Regional Wetland Data Strategy.

Data catalogue - as described in the Strategy Background section, Miistakis conducted a review of all wetland datasets for the Basin

Discussions with stakeholders - as described in the Strategy Background section, Miistakis conducted surveys and discussions with municipalities, partnership groups, and wetland data experts regarding existing options and needs.

Workshop - the most critical step was the Municipal Wetland Data Workshop, where wetland data experts presented and municipal representatives discussed the data needs and opportunities.

Chosen Methodology

One part of one presentation at the Municipal Wetlands Data Workshop described a method for using LiDAR 15 and SPOT-6/7 data, already owned by the Government of Alberta, and accessible via the local WPAC. This combination of topographical and multi-spectral data is used to create a suite of cost-accessible, comprehensive, repeatable, medium-resolution, datasets for the entire basin.

This method, created by Fiera Biological Consulting out of Edmonton, would yield:

- Current wetland inventory
- Wall-to-wall land cover
- Restorable wetlands
- Historical wetlands

More complete detail on these methods is in *Appendix 4: Appendix X: 'Bow River Basin Wetland Inventory' outputs (Fiera proposal)*.

These data would be created with a 0.04 ha resolution, and a target class accuracy of 80%, matching the draft wetland data standards created by Alberta Environment and Parks. The cost would be approximately \$420,000 for all four datasets across the entire basin.

These four datasets are being referred to collectively as the *Bow Basin Wetland Datasets*.

Accessibility

A dataset that you cannot access is arguably worse than no dataset at all. Access is a function of coverage, awareness, imposed limitations, cost, and physical means of entry.

Extent of Coverage

With regard to coverage, current wetland datasets often follow ecological boundaries, understandably. However, as can be seen from the list of Bow Basin Municipalities (see *Appendix 1: Bow River Basin Municipalities*), this often creates a usability issue in that a given dataset extent may only cover a portion of the municipality.

For this reason, the boundary of these derived datasets will encompass all municipalities where even a portion of the municipality is within the generally-accepted ecological boundary of the Bow River Basin.

Data Serving

This strategy envisions the Miistakis Institute being responsible for serving the data, using a mechanism with the following characteristics

- Available via web-based interface
- An online data viewer as well as GIS-ready downloads
- No cost for access
- Made available through GNU licence² meaning no limitations on use
- No data-sharing agreement required

Sustainability

The sustainability of the Bow Basin Wetland Datasets will be a function of its ability to be renewed regularly, the cost model, and whether municipalities engage with them.

Renewal

This strategy envisions the 'Current wetland inventory' and the 'Wall-to-wall land cover' components of the Bow Basin Wetland Datasets being renewed every three (3) years.

Cost Model

There are two aspects of the Datasets' cost: up-front development, and on-going renewal. It is estimated that the full suite of four datasets will cost approximately \$420,000, and that renewal of the 'current wetland inventory' and 'wall-to-wall land cover' will be approximately \$200,000 (or \$66,000 per year).

Because the Alberta Wetland Policy allows for a portion of these funds to be spent on "wetland inventory work and data acquisition", this strategy envisions that the up-front cost could be covered by the wetland replacement fees that have already been collected in the Bow Basin, especially those still held by the City of Calgary.

Similarly, this strategy envisions that the on-going costs of data renewal could be covered by an allocation of wetland replacement fees.

² GNU General Public License (v3) as published by the Free Software Foundation. Such licence will be held by Miistakis and will allow all parties to freely use, modify, or convey the data, but not commercialize it, provided they credit its origins.

Municipal engagement

While sustainable 'creation' of the datasets is dependent on the factors above, sustained 'use' of the datasets is dependent on the degree to which Basin municipalities are engaged. This strategy envisions the Municipal Advisory Committee (proposed in the 'Municipal Engagement' section of this document) playing a critical role in providing awareness and information regarding the datasets, and informing assessments and improvements.

Data Coordination

The Bow Basin Wetland Datasets initiative involves gathering data, creating data, and disseminating data. This effort will involve 17 municipalities, the Government of Alberta, as well as other partners. Several of these municipalities/partners already have or use some form wetlands data.

Therefore coordination of the data-related tasks and parties is central to this strategy.

Intermunicipal coordination

This strategy envisions the creation of an advisory group of affected municipalities, potentially with support of others, including the Government of Alberta. This group could be structured in a variety of ways, but would depend on the preference of the Basin municipalities.

Options would include:

- A free-standing committee organized by the municipalities
- A new standing or ad hoc committee of the Bow River Basin Council
- Integration of the mandate into an existing committee of the Bow River Basin Council
- A committee of the AUMA and/or RMA

The proposed mandate of this group would be to:

- Identify issues or unmet needs related to the datasets
- Facilitate communication between municipalities
- Facilitate communication with the Government of Alberta regarding the Bow Basin Wetland Datasets

Municipalities with existing wetland inventories

The goal of the Bow Basin Wetland Datasets is to raise the bar of the lowest common denominator, ensuring all areas have access to quality, consistent wetlands Data. It is not the goal to supplant or demean existing datasets. In many cases, the Bow Basin Wetland Datasets will be used to compare to or help truth other datasets, or indicate where much more site-specific and detailed work may be needed.

Several municipalities in the Basin already have wetland inventories, including the City of Calgary, the City of Airdrie, the City of Chestermere, and Wheatland County. The Bow Basin Wetlands Initiative will use existing datasets to “train” the modelling, ensuring that the accuracy efforts of basin municipalities are translated into the new datasets.

Engagement

Municipal Engagement

There are 18 incorporated municipalities in the Bow River Basin (see *Appendix 1: Bow Basin Municipalities*) who need to be further engaged in this strategy. The *Regional Wetland Data Strategy* project has to date directly engaged 12 of those municipalities, surveyed representatives from all of them, and consulted associations represented multiple municipalities.

However, “talking a person at a municipality” is not engaging them, and this strategy envisions further, more direct, and on-going engagement in order to see the Bow Basin Wetlands Datasets used effectively.

Municipal Advisory Committee

Even after the initial datasets are developed, there will be a need for municipal representatives from the Bow River basin to provide input as to whether the datasets have been effective, and what changes might need to occur in the future. This strategy envisions the Committee having roles such as:

- Advising on emerging issues
- Bringing municipal issues to the notice of all
- Speaking to the Government of Alberta with regard to the datasets

In an effort not to duplicate efforts or to create a standing committee that will have a small amount of work, this strategy envisions the Committee being a sub-committee under the Bow River Basin Council. The BRBC is already the go-to organization for municipalities with regard to water and environment issues

Messaging package

Individual personnel within municipalities, even those with great commitment to the ideas of conserving wetlands and creating associated datasets, will need support in framing messaging that can be used internally.

The *Messaging* information at the end of this section is intended to support those people.

Presentations

In cases where there is no internal champion (and even in cases where there is), it would be valuable to visit each municipality separately to present the around

- Wetland data issues, needs, and availability
- Benefits of data coordination
- Proposed strategy details
- Municipal action needed

These presentations could be made to whatever level (staff, management, council) or stakeholders the individual municipality suggests.

Training

After the datasets are developed, this strategy envisions training sessions with each municipality. These would be in-person (or Zoom) meetings where the details of the datasets are presented, and – most importantly – scenarios and information on how the datasets could be used for wetland conservation and restoration.

Government of Alberta Engagement

The Government of Alberta is mandated to collect wetland data, as directed via a number of policies and regional plans (see Policy Rationale). The Alberta Merged Wetland Inventory is an example of their efforts to do so, and is referenced by many different parties. The AMWI is a collection of the best available data, but varies in currency, resolution, and accuracy from location to location.

The strategy considers it critical for the Bow Basin Wetland Datasets initiative to coordinate with the Government of Alberta in at least the following ways:

- Provide the resultant data to Alberta Environment and Parks for direct integration into the AMWI
- Coordinate with Government of Alberta (Alberta Environment and Parks) ongoing initiative to create wetland data standards

It should be noted that the data methodology contained in this proposed strategy (created by Fiera Biological Consulting) was created with reference to these standards and opportunities.

Partner Engagement

Outside of the Basin's municipalities, there are several partners who will need to be engaged. In some cases, these partnerships will be critical.

Bow River Basin Council (BRBC)

The Bow River Basin Council (BRBC) has been the Watershed Advisory and Planning Council (WPAC) for the Bow River watershed for over 15 years. As such, they play a well-recognized role of convening stakeholders in the watershed, most importantly for this project, the Basin's municipalities.

This strategy envisions BRBC providing the following contributions / functions:

- *Facilitate data acquisition from the Government of Alberta* - The proposed methodology requires receiving LiDAR 15 and SPOT-6/7 from the Government of Alberta. As a WPAC, the BRBC is eligible to receive this data on behalf of its work in the watershed
- *Communication with the Basin's municipalities* - The BRBC already maintains on-going communication with the Basin's municipalities regarding watershed health issues through its regular newsletter and standing and ad hoc committees. This strategy envisions BRBC disseminating messaging and information about the Bow Basin Wetland Datasets.
- *Wetland Datasets Advisory Committee* - If the Basin's municipalities desire it, and the BRBC can facilitate it, the oversight committee envisioned in this strategy could be embedded in the BRBC.

Nose Creek Watershed Partnership (NCWP)

The Nose Creek Watershed Partnership (NCWP) is an inter-municipal group comprised of Rocky View County, the City of Calgary, the City of Airdrie, the Calgary Airport Authority, the Town of Crossfield, and the Bow River Basin Council. Their is to rise above obstacles affecting water quality and conservation, and to work together to achieve their objectives. Their work has included production of a Watershed Management Plan, watershed map, and reverse auction piloting, and currently includes modelling the watershed's hydrology and water quality.

This strategy envisions NCWP providing the following contributions / functions:

- *Data coordination* - As the NCWP pursues their modelling, Bow Basin Wetland Datasets initiative will pursue on-going coordination of wetland data collection and standards.

- *Learnings* – The NCWP data collection and modelling efforts will produce datasets that can be used by the Bow Basin Wetlands Datasets initiative to inform methods and train models

Municipal associations (AUMA, RMA)

The Alberta Urban Municipalities Association (AUMA) and Rural Municipalities of Alberta (RMA) are the largest and most comprehensive of the municipal associations in the province. They take a lead role in coordinating collective municipal interaction with the Government of Alberta, providing education and awareness materials, and both have policies and resolutions related to municipal use of wetland data.

This strategy envisions the AUMA and RMA providing the following contributions / functions:

- *Communication support* - Both associations maintain regular, popular newsletters, which often speak to conservation and policy issues, and which could include information about the Bow Basin Wetland Datasets.
- *Endorsement, letter of support* - As the Government of Alberta (especially Municipal Affairs) views these associations as the voices of Alberta municipalities, this strategy envisions seeking endorsement of the Bow Basin Wetland Datasets initiative from both, possibly with letters of support.

Ducks Unlimited Canada

Ducks Unlimited Canada (DUC) has been working to conserve Canada’s wetlands and their associated uplands since 1937, and work extensively with Alberta municipalities. As well as private land conservation work, and their recent stint as a wetland restoration agency in Alberta, DUC is developing a Canadian Wetland Inventory which currently has partial coverage of the Bow Basin.

This strategy envisions DUC having the following roles:

- *Data coordination* - Though it is unclear how the DUC Canadian Wetland Inventory datasets might practically coordinate with Bow Basin Wetland Datasets initiative, this strategy envisions reaching out to explore.

Calgary Metropolitan Region Board (CMRB)

The Calgary Metropolitan Region Board (CMRB) consists of representatives from 10 municipalities mandated to develop a long term plan for managed, sustainable growth in the Calgary Region. As part of the current effort to create a growth plan, the CMRB is exploring their legal requirement to include policies regarding environmentally sensitive areas.

This strategy envisions the CMRB having the following role:

- Coordination of information - As the CMRB develops their regional growth and servicing plans, this strategy envisions them being regularly updated as to the status and opportunities of the Bow Basin Wetland Datasets initiative

Messaging

The two proposals envisioned by this strategy (see *Proposal to Municipalities* and *Proposal to Government of Alberta*) will need to be underlain by consistent and compelling messaging. Based on the background information and perspectives gathered during Miistakis' *Regional Wetland Data Strategy* project, the following message sets have been developed to support those proposals.

Wetland benefits

The retention and restoration of wetlands provide the following benefits for municipalities and the communities they represent:

- Flood water storage
- Groundwater storage
- Water filtration, nutrient storage
- Provision of habitat
- Support for municipal goals of
 - *Flood mitigation*
 - *Drought mitigation*
 - *Water quality maintenance*
 - *Biodiversity retention*

Municipal wetland data issues

- Existing data suffers from being of low or inconsistent quality to support municipal needs
- Existing data can be difficult for municipalities to access and use
- Existing data is often out-of-date, or a 'snapshot in time' that does not support on-going planning
- Wetland data used can vary between neighbouring municipalities, causing both municipalities and development proponents to feel like the 'rules are different' for different municipalities
- Costs for higher-quality wetland data can be prohibitive for municipalities
- Often only acquire higher-quality wetland data when required from development proponents making proactive conservation planning challenging

- Several provincial policies require municipal consideration of wetlands, with an assumption of sufficiently high quality wetland data to support that
- Individual municipalities are unlikely to convince the Government of Alberta to provide them the wetland data they need

Data Acquisition Opportunities

- Potential to use wetland replacement fees to develop datasets
- Datasets can be designed to meet municipal needs
- Can even out the capacity inequities that arise because wetland restoration opportunities and development activities are generally not sited in the same locations across the Basin
 - I.e., areas with the development pressure can generate more wetland replacement fees, but places with extensive wetlands have limited funds for data acquisition
- Rural landowners can determine where wetlands are before having to undertake expensive inventories
- Uniform base wetland dataset across basin municipalities provides consistency for developers and consultants
- Basin-wide dataset can be used to supplement or crosscheck existing inventories
- Can provide clarity on provincial-jurisdiction wetlands

Municipal Program Opportunities

- New wetland datasets can support
 - Wetland / ecological restoration activities
 - Flood mitigation planning
 - Drought mitigation planning
 - Development siting (ASPs, concept plans, growth management)
 - Stormwater management planning
 - Biodiversity strategies
- Preparation for offset market opportunities
- Support municipalities with program/policy requirements by the provincial government
 - Regional planning, BMFs, wetland policy, etc.
- Consistent source data for inter-municipal modelling

No cost to municipalities

- Current opportunity is to fund this through the wetland replacement fees
- On-going opportunity to fund through the wetland replacement fees
- Data itself will be cost-free for municipalities, freely downloadable from web-accessible server

What we mean by “Bow Basin Wetland Datasets”

The ‘Bow Basin Wetland Datasets’ refers to:

- Current Wetland Inventory
- Wall-to-Wall Land Cover
- Restorable Wetland Inventory
- Historical wetland Inventory

See further details in *Appendix 4: ‘Bow River Basin Wetland Inventory’ outputs (Fiera proposal)*.

Proposals

At the core of this strategy are two proposals being presented to two different audiences: Bow River basin municipalities, and the Government of Alberta (Alberta Environment and Parks).

Proposal to Basin Municipalities

This strategy envisions presenting a proposal to the Bow River basin municipalities for their collective support in creating the Bow Basin Wetland Datasets, and in presenting a proposal to the Government of Alberta.

Proposal contents

The key context elements for the proposal are contained in this strategy under Strategy Background, and would include appropriate elements from the Messaging section. The Proposal itself would have two distinct elements: letter of support, and consideration of the Bow Basin Wetlands Datasets.

- Letter of support
 - The Bow Basin Wetlands Datasets initiative will be approaching the Government of Alberta for support; this will be done on behalf of the municipalities in the Bow River basin
 - Such as request would be disingenuous without the express support of a critical mass of the basin's municipalities.
 - The Municipalities Proposal would request the Bow River basin municipalities to sign on to the GoA Proposal.
- Consideration of the Bow Basin Wetlands Datasets
 - The Bow Basin Wetlands Datasets will be a standardized suite of wetland datasets made available to Bow River basin municipalities for their voluntary use in planning for, protecting, and restoring wetlands within their boundaries.
 - The maintenance of the datasets will be undertaken by the Miistakis Institute, and the its use, renewal, and delivery overseen by an Advisory Committee made up primarily of municipal personnel
 - The Municipalities Proposal would request the Bow River basin municipalities to make these datasets available internally, (in some cases) commit a person from the municipality to the Advisory Committee, and make themselves available for training on the use of the datasets.

Although there is a request for active consideration of the developed datasets, it will be made clear that there is no ‘requirement’ to use the datasets — they are to be supportive and enabling, not prescriptive. Likewise, participating in the training will not require a municipality to commit to using the datasets, or using them in a certain fashion.

As part of this proposal, the Bow Basin Wetlands Datasets initiative would commit to the Bow River basin municipalities to:

- Provide the Bow Basin Wetland Datasets to the municipalities in the Bow River basin with no limitations on their use, and no fees.
- Make the data easily accessible via a web-based interface.
- Seek funding to provide training to municipalities in the basin at not cost.
- Provide the Bow Basin Wetland Datasets to the municipalities partners and constituents (including consultants, community groups, and landowners) with no limitations on their use, and no additional fees.

Proposal presentation

This strategy envisions that a presentation of the sort outlined above be offered to all municipalities in the Bow River basin. That invitation would first be forwarded through municipal personnel who have already been engaged in the Regional Wetland Data Strategy.

Proposal to Government of Alberta (Alberta Environment and Parks)

This strategy envisions presenting a proposal to the the Government of Alberta (Alberta Environment and Parks) for support in creating the Bow Basin Wetland Datasets.

Proposal contents

The key context elements for the proposal are contained in this strategy under Strategy Background, and would include appropriate elements from the Messaging section. The Proposal itself would have three distinct elements: data, support, and funding.

- Data
 - The chosen methodology would use LiDAR-15 and SPOT-6/7 imagery which the GoA currently owns.
 - As a WPAC, the Bow River Basin Council can access this data from the GoA for watershed management planning.
 - The GoA Proposal would request the Government of Alberta make this data available via the BRBC.

- Support
 - The Government of Alberta maintains the Alberta Merged Wetland Inventory, a wall-to-wall dataset comprised of the most readily available wetland data for a given area.
 - The Government of Alberta is currently working on an Alberta Wetland Inventory Standards initiative, an effort to provide consistency for all existing and emerging wetland datasets.
 - The GoA Proposal would request the Government of Alberta integrate Bow Basin Wetland Datasets' Current Wetland Inventory into the AMWI, and keep the Bow Basin Wetland Datasets advised of any evolutions of data standards emanating from the Alberta Wetland Inventory Standards initiative

- Funding
 - The initial cost of developing all four datasets in the Bow Basin Wetlands Datasets will be approximately \$300,000.
 - The cost of renewing the current wetland inventory would be approximately \$100,000, and is proposed by this strategy to occur every 3 years.
 - The GoA Proposal would request the Government of Alberta support use of wetland replacement fees gathered in the Bow River basin to develop the four datasets in the Bow Basin Wetlands Datasets, and support use of those fees on an on-going basis to renew the current wetland inventory, at a cost of approximately \$35,000 per year

Although the Alberta Wetland Policy allows for wetland replacement fees to be used for “non-restorative” replacement activities, including “wetland inventory work and data acquisition”, this strategy envisions both the Government of Alberta and the Bow Basin Wetlands Datasets initiative commit to no more than 10% of these funds being used for “non-restorative” replacement activities.

As part of this proposal, the Bow Basin Wetlands Datasets initiative would commit to the Government of Alberta to:

- Ensure all wetland data development conform to the Government of Alberta's Wetland Inventory Standards.
- Provide the Bow Basin Wetland Datasets to the Government of Alberta with no limitations on their use, and no additional fees.
- Provide the Bow Basin Wetland Datasets to the Government of Alberta's partners and constituents with no limitations on their use, and no additional fees.

Proposal presentation

This strategy envisions this proposal being presented to the following personnel within Alberta Environment and Parks:

- Director, Wetlands and Remediation Section
- Team Lead, Wetlands Wetlands and Remediation Section
- local (Bow River basin) AEP representative who would facilitate the request for the LiDAR 15 and SPOT-6/7 data

Role of the Miistakis Institute

The Miistakis Institute has been working on developing this strategy, with the goal of supporting municipalities of the Bow River basin in their efforts to plan for, protect, and restore their wetlands. More specifically, that has involved — and will continue to involve — the following roles.

Manage Strategy

This strategy has been created by the Miistakis Institute as part of the *Regional Wetland Data Strategy* project. Miistakis will continue to play the role of managing the strategy, which will include:

- Consulting with municipalities in the Bow River basin
- Developing and finalizing the strategy
- Developing and presenting the proposals to the Government of Alberta and the basin municipalities

Dataset management

The Miistakis Institute will take the lead role in managing the development and delivery of the Bow Basin Wetlands Datasets. This will include:

- Coordinating the process of securing the data, including facilitating partnerships, and letting any necessary contracts.
- Developing the data server, including creating a web-based serving mechanism, ideally with an online data viewer, and easy-download capability for GIS-ready data.
- Hosting the data, including ensuring licensing that makes the datasets as available as possible, while still protecting them from commercialization.

Fiscal agent

The Miistakis Institute will play the role of fiscal agent, including the following roles:

- Seeking and receiving grant funds to support data development, hosting, distribution, and municipal training
- Letting any necessary contracts for dataset development, distribution, and renewal, as well as any possible municipal training.

Catalyze municipal advisory committee

The Miistakis Institute will catalyze the creation of a standing Advisory Committee, including:

- Ensuring such a committee is supported by the municipalities in the Bow River basin

- Facilitating creation of the committee, possibly in conjunction with the Bow River Basin Council

Municipal training

The Miistakis Institute will seek to create a training program for municipalities that will allow them to better understand the Bow Basin Wetlands Datasets, and how they could be employed by municipalities. This will include

- Seeking funds to support this training
- Developing the training program for municipalities, in collaboration with appropriate partners
- Delivering the training program, including any contractual arrangements required.

Appendices

Appendix 1: Bow River Basin Municipalities

Municipalities within the generally-accepted boundary of the Bow River Basin:

- City of Airdrie
- City of Calgary
- City of Chestermere
- County of Newell (south half)
- Cypress County (extreme west sliver)
- Foothills County
- Municipal District of Bighorn
- Rocky View County
- Town of Banff
- Town of Black Diamond
- Town of Canmore
- Town of Cochrane
- Town of High River
- Town of Okotoks
- Town of Strathmore
- Town of Turner Valley
- Vulcan County (northernmost third)
- Wheatland County (southernmost half)

However, for the purposes of this strategy – so as not to provide data for only part of a municipality – the geographic extent is considered to be the full area of all of the above-listed municipalities.

Appendix 2: Bow River Basin Wetlands Data Catalogue Summary

Regional Datasets

Dataset	Last Updated	Coverage	Classes	Other Information	Comments
Alberta Merged Wetland Inventory (Government of Alberta)	March, 2017	White Area	Fen, Marsh, Open Water, Swamp	Dataset last updated in March, 2017 but sources of data that make up the Alberta merged Wetland Inventory could be older than that. They also vary in detail and accuracy.	This data is being considered for revamping to allow for more detail and sub classes.
Alberta Wetland Relative Value Evaluation Tool	June 2015	White Area	A, B, C, D	The report details all the 'factors' that went into evaluation	This data is summarized by section, providing number of hectares of each of the different classes per section. The source data is linked to individual wetlands within the Alberta Merged Wetland Inventory, but the Government of Alberta will not release this information.
Canadian Wetland Inventory (Ducks Unlimited)	2006-2017	Partial coverage of Basin	Bog, Fen, Marsh, Swamp, Shallow/ Open Water	Includes extra information, including if its impacted	None

Dataset	Last Updated	Coverage	Classes	Other Information	Comments
ABMI (Alberta Biodiversity Monitoring Institute) Wetland Inventory	June, 2019	Green Area, west side of Bow River Watershed	Open Water, Fen, Bog, Marsh, Swamp, Wetland General	No	Wetland General is wetlands that are not fen, bog, marsh or swamp and is specific to rocky mountains. This combines with AMWI for better overall coverage as AMWI is White Area.

Sub-Regional Datasets

Dataset	Last Updated	Coverage	Classes	Other Information
City of Calgary/Rocky View County Wetlands	Based on 2005 data	City of Calgary, Rocky View County, west third of Wheatland County, northern tip of Foothills County	Dugout, Headland, Marsh, Marsh Worked, Open Water	<ul style="list-style-type: none"> - Current Wetland Inventory derived from 1:30,000 photography flown in the 2005 growing season for the City of Calgary. - The following wetland classes were collected: <ul style="list-style-type: none"> o Wetland (Emergent Vegetation) - Hydrophytic vegetation occupying wetland basin, o Wetland (Open Water) - Open Water within an intact wetland basin or Open water zone in dry basin, o Wetland (cropped basin) -- Cultivated depression or wetland margin defined by topography and the presence of water or recent evidence of flooding, includes depressional areas altered by agricultural activities. - This dataset is used as the current reference point for the Impact Wetland Inventory.

Dataset	Last Updated	Coverage	Classes	Other Information
City of Calgary/Rocky View County Historic Wetland Inventory	Based on 1962 and 1967 data	City of Calgary, Rocky View County, west third of Wheatland County, northern tip of Foothills County	Dugout, Headland, Marsh, Marsh Worked, Open Water	<ul style="list-style-type: none"> - Historic Wetland Inventory derived from 1962 and 1967 photography jobs. - The following wetland classes were collected: <ul style="list-style-type: none"> o Wetland (Emergent Vegetation) - Hydrophytic vegetation occupying wetland basin, o Wetland (Open Water) - Open Water within an intact wetland basin or Open water zone in dry basin, o Wetland (cropped basin) -- Cultivated depression or wetland margin defined by topography and the presence of water or recent evidence of flooding. - This dataset is used as the historic reference for the Impact Wetland Inventory.
City of Calgary/Rocky View Impact Wetland Inventory (Drained Wetland Inventory)	Unknown	City of Calgary, Rocky View County, west third of Wheatland County, northern tip of Foothills County	Altered, Drained/Altered, Drained/Consolidated, Drained/Lost, Intact	<ul style="list-style-type: none"> - The "Impacts" feature class is the result of a geoprocessing model to characterize the abundance, distribution, and state of wetland resources in the AOI. - In brief, the model compares the historic and current wetland features and assigns an impact category based on changes to wetland extent and the presence/absence of drainage infrastructure.

Other Sub-Regional Datasets Identified

Dataset	Last Updated	Coverage	Other Information
<i>City of Calgary Storm Ponds</i>	2019		
<i>Wheatland County</i>	completed in 2016		Wetland inventory
<i>Ducks Unlimited Misc</i>	2009, 2014		Ducks Unlimited has various datasets including Engineered Wetlands, Western Canada Wetland Inventory (2009) and Alberta and Quebec Wetland Inventory (2014)
<i>Rocky View County / Town of Cochrane</i>	completed in 2011	Town of Cochrane and some of Rocky View County	Wetland Inventory
<i>Town of Cochrane</i>	completed in 2009	One neighbourhood in Cochrane	Wetland Inventory
<i>City of Calgary</i>	Updated in 2015		Wetland inventory created by Fiera Biological Consulting

Appendix 3: Policy Rationale Detail

Government of Alberta - South Saskatchewan Regional Plan (2018)

“Historic and current land uses have placed pressures on the watersheds within the South Saskatchewan Region. Degradation of riparian lands and **loss of wetlands across the Prairies have been widespread leading to altered flow regimes and degraded water quality.**” p.25

“The Government of Alberta is also committed to increasing knowledge and mapping of wetlands, including standardizing and **updating the existing wetland inventory and working with partners where appropriate.**” p.48

4.4 Continue to increase knowledge and improve management of wetland areas within the region.

- Establish regional wetland management objectives as enabled under the Alberta Wetland Policy. The objectives will focus on the wetland values that are of high priority including biodiversity, water quality improvement, flood reduction and human use.
- **Continue to facilitate the advancement of wetland knowledge, data systems and science in the region.** Current efforts in these areas include enhancement of the Merged Alberta Wetland Inventory, development of the Alberta Wetland Classification System and refinement of several wetland assessment tools.

Government of Alberta - Alberta Wetland Policy (2013)

Goal:

- To conserve, restore, protect, and manage Alberta’s wetlands to sustain the benefits they provide to the environment, society, and economy.

Policy Outcomes:

- Wetlands of the highest value are protected for the long-term benefit of all Albertans
- Wetlands and their benefits are conserved and restored in areas where losses have been high
- Wetlands are managed by avoiding, minimizing, and if necessary, compensating for impacts
- Wetland management considers regional context

Wetland Replacement as Per Provincial Policy

‘Non-restorative’ Replacement - activities that support the maintenance of wetland value:

- Research into wetland restoration measures
- Provincial-level wetland monitoring
- **Wetland inventories and data acquisition******
- **Landscape level wetland health assessments******
- Public education programs
- Wetland securement for long term conservation

'Restorative' Replacement - replacement through restoration, enhancement, or construction of another wetland

- In-lieu fee payment
- Permittee-responsible replacement

***AUMA - 2013 Municipal Water Policy on Wetlands: Convention Policy Paper
Wetland Policy Statements***

Wetland Inventory

Concerns of Municipalities

- It is essential for municipalities, the provincial government and other wetlands stakeholders to have a solid understanding of the extent, location and function of Alberta's wetlands in order to make sound management decisions. While a handful of municipalities have conducted wetlands inventories, most do not have the expertise or financial resources to complete one on their own let alone keep it up to date. The Government of Alberta has conducted a province-wide inventory available at GeoDiscover Alberta. However, the accuracy of the inventory could be improved along with the accessibility and ease of use of the information.

Policy

2) AUMA urges the Government of Alberta to:

a) Continuously improve the accuracy of the Provincial Wetland Inventory and make the data more user friendly and accessible.

b) Expand the inventory to include information on wetland function.

c) Identify provincially/ecologically significant wetlands that require enhanced protection including the identification of compensatory wetland habitat.

3) That the AUMA work with the Government of Alberta and other wetland experts to develop a guide for municipalities to use in partnering with developers and land owners to conduct more detailed localized wetlands inventories to better integrate protection of wetlands into land use and sustainability plans.

Bow River Basin Council - 2014 Flood Mitigation Discussion Paper (Submission to the Government of Alberta)

Watershed Integrity - Opportunity 1

To the fullest extent possible the Implementation Plan for the recently released Provincial Wetland Policy should **foster and support wetland (watershed) preservation as a key component of flood (and drought) mitigation.**

Opportunity 4

Locate and obtain the best, up-to-date data and then employ that data in the application of existing modeling tools in order to gain insights on optimum management possibilities using existing infrastructure in Alberta river basins.⁶

Other

- a. "Current discussions should more fully explore a fundamental challenge around input data. The best model in the world is completely compromised if there is a lack of reliable input data in real time"

Bow River Basin Council - 2019 Five Key Watershed Management Policies for the Growth Region (Policy and Legislation Committee Discussion Guide)

Our Five Key Management Policy Recommendations:

1. Know the water resources within your region and within each municipality

- Every municipality has a number of distinctive water resources located within its geo-political boundaries. **We recommend that any municipal development plan or area structure plan submitted by a participating municipality identify, assess the status of, and map these water resources. The Alberta Land Use Policies³ describe "water resources" as: "lakes, rivers, streams, their beds and shores, wetlands, groundwater, reservoirs and canals."** Land use decisions in a watershed do influence water resources, particularly over the long term. Management strategies for land use and water resources are required to achieve the provincial outcome stated in the SSRP: "Watersheds are managed to support healthy ecosystems and human needs through shared stewardship." Recognizing the interactions between land use and water resources and reconciling trade-offs is critical to evolving our approach to watershed stewardship and sustainable development.

5. Upstream and downstream impacts:

The CMRB and participating municipalities must plan with recognition and mitigation of potential impacts of land use within the growth region as a whole, or within municipal boundaries, on upstream and downstream municipalities. The Bow watershed is a complex, dynamic system and everything is connected. For example, the **removal of wetlands** and long corridors of riparian vegetation, or systematic stripping and grading of riparian land and aggregate removal along the Bow or its tributaries **may not affect the watershed or**

water resources within the municipality where they are located, but the social, economic and environmental impacts may be felt upstream or downstream of the development.

WPAC Program Areas

Program areas

Water for Life provided WPACs with a mandate to support multi-stakeholder collaboration and community engagement within four main program areas:

- Education and Outreach
- Environmental Stewardship
- Watershed Evaluation and Reporting
- Watershed Management Planning

Government of Alberta - Guide to Watershed Management Planning - 2015

Step 1: Identify Who Should be Involved

Participants in watershed management planning should include the following groups.

Government of Alberta is responsible for water and land-use management in the province. It brings relevant information and data and connects other relevant planning initiatives to the planning process.

Government of Alberta - Water for Life Renewal - 2008

Alberta Water council's recommendations for a renewed Water for Life strategy

"The Alberta Water Council also recognized the need to be proactive, accelerating our actions to protect our water sources now rather than waiting until later. This includes clarifying roles and accountabilities, ***improving data collection and analysis***, and increasing public awareness about water and water resources to build a shared commitment with Albertans."

A Roadmap For Action

This strategy outlines the goals and objectives required to protect Alberta's water resources. For the strategy to be successful, a number of key actions need to be undertaken by government. These actions, which include a more thorough examination and analysis of current policies to enhance our ability to monitor, ***analyze and share water data*** and continue to build partnerships, will be outlined in the Water for Life action plan, which is coming early _2009.

Government of Alberta - Enabling Partnerships - Water for Life (2005)

Roles of the Watershed Planning and Advisory Councils

Watershed Planning and Advisory Councils will build long-term partnerships that examine watershed issues, make recommendations to the appropriate water and land use decision-making authorities, and undertake actions that benefit Alberta's watersheds. Although not an exhaustive list, Councils may:

- Undertake "state of the watershed" reporting where indicators of the health of the watershed, the pressures facing it, and the **data and research gaps that need to be addressed** are identified and compared over time.
- In collaboration with its stakeholders, assist in the development and implementation of water conservation, water monitoring, source water protection and **wetland programs**.

Implementation Guidelines

Upon entering into a partnership, **the Government of Alberta will provide support to a Watershed Planning and Advisory Council** in exchange for the Council's commitment to a watershed approach and the principles of inclusiveness and consensus-based decision-making.

Calgary Metropolitan Region Board - Interim Growth Plan - 2018

3.2 Region-wide Policies

3.2.3 All statutory plans shall: (b) adhere to the provincially identified wetland classification system, and incorporate measures to minimize and mitigate adverse impacts on wetlands;

Calgary Metropolitan Region Board - Interim Regional Evaluation Framework - 2018

6 Evaluation Criteria

6.1 When evaluating a new statutory plan or amendment to an existing statutory plan, the Board must consider whether approval and full implementation of the statutory plan or amendment to an existing statutory plan would result in development that is consistent with the Principles, Objectives, and Policies of the IGP using the following evaluation criteria.

3.2 Region-wide Policies

3.2.3 Water, wetlands and stormwater

Does the proposed statutory plan or existing statutory plan amendment: ... adhere to the provincially identified wetland classification system, and incorporate measures to minimize and mitigate adverse impacts on wetlands;

Calgary Metropolitan Region Board - Environmentally Sensitive Areas Background Study - 2019

ESA Policy, Implementation and Monitoring Opportunities

The following opportunities are intended for consideration by the Growth Plan consultant and are not binding to the development of the Growth Plan itself. The list below reflects concerns and practical considerations that have arisen from discussions with TAG members and municipal experts during the development of this background study.

- It is recommended that the CMRB develop a well-maintained regional database of potential and confirmed ESAs over time, with clear standards for data collection and dissemination, to provide a consistent and fulsome inventory of important environmental features. This regional database would aggregate municipal spatial data to identify potential regional ESAs using agreed upon criteria, providing municipalities with a shared understanding of the regional context. This database would be used to inform municipal planning processes and could be used to develop of spatial map of regional assets.
- It is recommended that the CMRB investigate implementation and monitoring options for the creation and maintenance of such a regional database. Completing this work at the regional scale, in collaboration with experts and key stakeholders, could:

Provide a forum to develop, critique, and update spatial environmental datasets (such as wetland and watercourse inventories, land cover datasets, wildlife habitat, and human footprint and disturbance impacts), to align with regional definitions and standards.-

NCWP - Nose Creek Watershed Management Plan 2018

6.4.4 Recommendations to Protect Wetlands (Lentic Systems)

6.4.4 a Update the wetland inventory for the watershed using Alberta's Merged Wetland Inventory data layer (refer to Appendix J-3) in conjunction with field-truthing. Create a map tool to support wetland management.

6.4.4 f Adopt the following strategies to prevent wetland loss in urban areas. i. Identify wetlands to be retained early in the planning process, using results of biophysical assessments, and the wetland value criteria and map tool.

APPENDIX D. Indicators and performance measures for the Nose Creek watershed.

Theme - Wetlands; Indicator; Wetland cover; Measures - Percentage of watershed areas, and tracking wetland loss

Appendix 4: 'Bow River Basin Wetland Inventory' outputs (Fiera proposal)

Current Wetland Inventory

- A current wetland inventory showing the location and class of each wetland. Wetlands will be classified into one of the five classes (Bog, Fen, Marsh, Shallow Open Water, or Swamp) as per the Alberta Wetland Classification System.
- Following the guidance that is currently contained in a draft provincial standard for wetland mapping, the minimum mapping unit will be 0.04 ha, and with a target class accuracy of 80%.

Wall-to-Wall Land Cover

- A wall-to-wall land cover for the Bow River Basin, mapping all land cover types, and fully integrated with the wetland inventory to create a single, seamless spatial product for the basin.

Restorable Wetland Inventory

- If high-resolution air photos of the same (or similar) vintage as the SPOT imagery are available, a restorable wetland inventory can be created for some or all of the basin. This inventory would be integrated into the current wetland inventory, with 'restorable' being identified as either a separate attribute of each wetland and/or as a separate class of wetland.

Historical Wetland Inventory

- A historic wetland inventory could be derived for the Bow River Basin from historic air photos (circa 1950). This inventory would map the historic extent of wetlands in the watershed, and can be used to compare the historic wetland extent to the current extent to highlight areas where the loss of wetland area has been high.