

# BEAVER RIVER INTEGRATED WATERSHED MANAGEMENT PLAN



## SUMMARY OF TERMS OF REFERENCE

### INTRODUCTION

LICA is a community-based, non-profit association that is the Watershed Planning and Advisory Council (WPAC) for the Beaver River watershed. As a designated provincial WPAC, LICA reports on watershed health, leads collaborative planning, and facilitates education and stewardship activities. LICA initiated the Beaver River Integrated Watershed Management Plan (IWMP) process to help guide watershed management activities in support of the vision “A healthy Beaver River watershed for the future”.

An IWMP is a guidance document and planning tool for resource managers, including governments, planners, Indigenous communities, other stakeholders, and landowners who manage water and land resources. The plan will identify goals for improving and/or maintaining watershed health, and will make recommendations on how to reach those goals.

LICA established an IWMP Committee to help oversee the development of the plan. LICA and the IWMP Committee are committed to engaging with stakeholders, First Nations and the Métis in the watershed throughout the development of the plan to ensure that it is relevant and reflects local and regional concerns.

This summary document highlights key elements of the draft Beaver River IWMP Terms of Reference (TOR), including a description of the planning area, issues, goals and objectives that may be addressed in the plan, and an overview of engagement. The full draft TOR is available on LICA’s website ([www.lica.ca](http://www.lica.ca)) and includes background information regarding historic planning initiatives, the purpose, intent and scope of work that will be undertaken as part of the planning process, and schedule and timelines.

### BEAVER RIVER IWMP

#### Planning Area

The Beaver River watershed is located in east-central Alberta and west-central Saskatchewan, in Treaty 6, 8 and 10 territories and the Métis homeland northeast of Edmonton (Figure 1). A watershed is the area of land where all runoff from rain and snowmelt drain to a common body of water, in this case, the Beaver River. The Beaver River originates near the Town of Lac La Biche as the outflow from Beaver Lake and flows easterly into Saskatchewan to join the Churchill River at Île à-la-Crosse to flow into Hudson Bay. Although the Beaver River watershed spans Alberta and Saskatchewan, the IWMP will only apply to the Alberta portion.



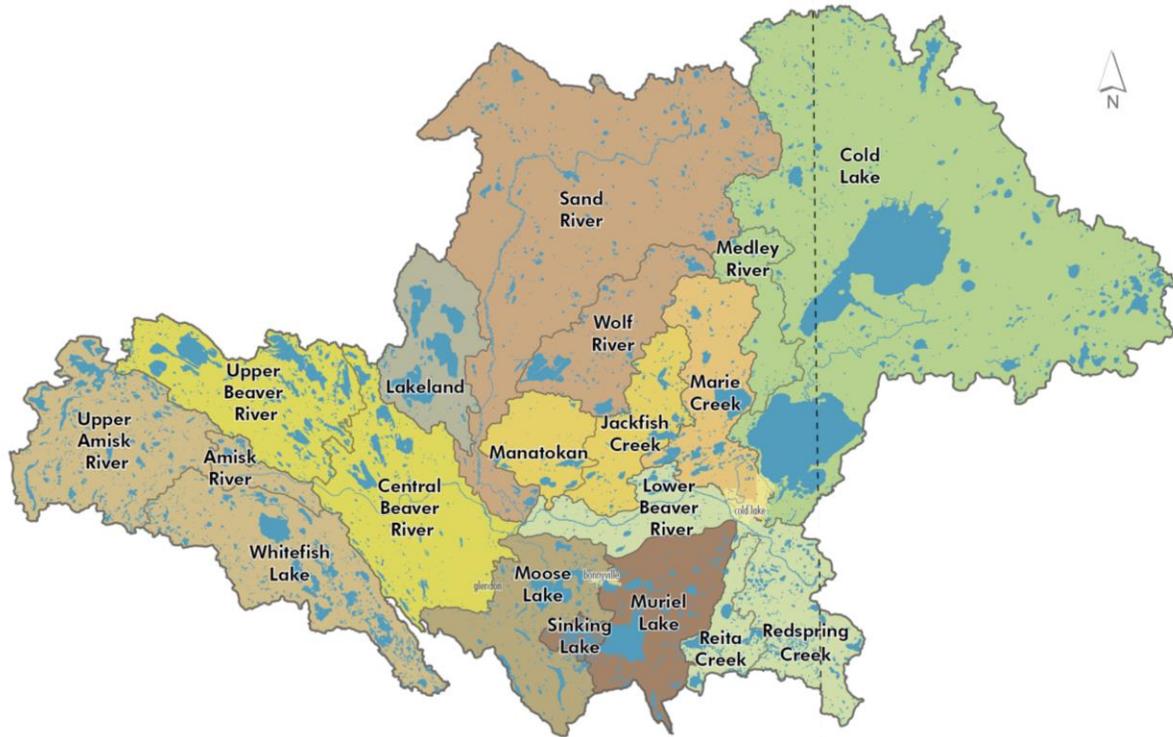


Figure 1. Map of the Beaver River watershed and its main sub-watersheds (LICA 2021).

## Watershed Issues

The following issues, objectives and outcomes were compiled by synthesizing stakeholder feedback from 2014-15, subject matter experts, the IWMP Committee, and available literature. This list of issues will be finalized after incorporating feedback from stakeholders, First Nations, and the Métis that will be collected through engagement in 2021-22.

### Surface Water

#### Quantity

- Fluctuating water levels (lakes and wetlands) and streamflows caused by climate change and variability (e.g., precipitation, etc.) that can:
  - Impact water availability for municipal water supplies, agricultural uses, and First Nations and Métis
  - Increase risk of flooding, and impacts associated with drought
  - Impact recreation activity
  - Alter aquatic, riparian and upland habitat
  - Alter land use (e.g., cultivation, development) around wetlands and ephemeral streams (watercourses that flow

briefly in direct response to rainfall or snowmelt (USEPA 2015)).

- Surface water withdrawals.
- Altered drainage patterns and/or discharges of treated effluent, and stormwater.

#### Quality

- Water quality in lakes and streams does not meet desired end uses (e.g., drinking water, contact recreation, agriculture, Indigenous traditional practices, and/or wildlife and aquatic species needs ) in some areas due to soil type and geology, climate change and variability, and/or influx of point and non-point source pollution from adjacent lands (e.g., nutrients, sediment).
- The influx of nutrients originating from external sources, and the internal natural cycling of nutrients, contributes to eutrophication<sup>1</sup> in many lakes in the watershed.

<sup>1</sup> Eutrophication: Enrichment of aquatic ecosystems by plant nutrients (e.g., phosphorus and nitrogen);

## Groundwater

### Quantity

- Uncertainty regarding groundwater quantity resulting from climate change and variability, and withdrawals for human and industrial use.
- Limited understanding of the impact that groundwater withdrawals have on aquifer dynamics (e.g., shallow/deep aquifer interactions) and on lake water levels and streamflows.

### Quality

- Human health concerns related to naturally occurring and/or human-caused mobilization (e.g., thermal mobilization<sup>2</sup>) of trace metals (i.e., arsenic and uranium) in concentrations above drinking water guidelines.
- Concerns related to land use, including potential contamination from improperly abandoned water wells, landfills, agricultural activity, septic fields and, oil and gas activity (casing failures).

## Wetlands and Riparian Areas

- Loss of wetland and riparian areas and their respective functions:
  - Water storage (absorptive capacity, flood control) and water balance in lakes/streams
  - Groundwater recharge
  - Water quality (retention of nutrients, sediment, soil and associated contaminants)
  - Biodiversity
  - Ecological services<sup>3</sup> (recreation, carbon sequestration, stormwater treatment)

## Biodiversity

- Fragmented and poor-quality habitat, due to increased road density, access, recreational

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characterized by increased growth of plants and algae. The process of eutrophication can be accelerated by human activity (e.g., effluent disposal, land drainage), and can have negative impacts on aquatic health.

<sup>2</sup> Thermal mobilization: Mobilization of trace metals when heat or steam is used to assist in the recovery of heavy oil

<sup>3</sup> Ecological services: The direct and indirect benefits ecosystems provide for humans.

activity, industrial activity (e.g., pipelines, well-sites, mining [sand and gravel]), and other developments.

- Changing abundance and/or size of certain fish and wildlife species in the watershed.
- Potential threat of terrestrial and aquatic invasive species (e.g., quagga mussel) in and adjacent to waterbodies in the watershed.
- Berries, plants and animals are safe to eat.

## Land Management

- Cumulative impact of development<sup>4</sup> and industry<sup>5</sup> on water resources, ecosystem and landscape function, biodiversity, and First Nations and Métis traditional land use<sup>6</sup>.

## Climate Change

- Impacts of climate change as it relates to:
  - Water availability and quality
  - Increased risk of drought, fire and floods,
  - Pest management (forest insects, diseases)
  - Altered landscapes and habitat conditions
  - Risks to fish, wildlife, and vegetation.

## Knowledge and Understanding

- Gaps in knowledge and understanding of natural conditions and human-caused impacts on watershed function.
- Limited public understanding or use of First Nations and Métis Rights, Indigenous Knowledge<sup>7</sup> and Practices in the development and implementation of plans and policies.

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<sup>4</sup> Development: Includes urban and recreation developments.

<sup>5</sup> Industry: Generally, oil and gas, forestry, agriculture, and sand and gravel extraction, among others

<sup>6</sup> Traditional Land Use: Includes the Treaty right to hunt, fish, and trap for food, but may also include plant harvesting and/or spiritual ceremonies.

<sup>7</sup> Indigenous Knowledge: Knowledge held by First Nations, Inuit and Métis peoples that emerges from a complete knowledge system, past and current, including history, law, spirituality, agriculture, environment, science, medicine, animal behaviour and migration, art, music, dance, craft, among others (University of Alberta 2020; Government of Canada 2020b).

## Beaver River IWMP Goal and Objectives

The following goal was set for the Beaver River IWMP:

*Collaborative management of land and water resources  
that results in a healthy Beaver River watershed.*

### Draft objectives for the Beaver River IWMP.

Component	Objectives
<b>Water Quantity</b>	<ol style="list-style-type: none"> <li>1. Review and determine status of existing Water Conservation Objectives in the original Cold Lake Beaver River Water Management Plan (CLBR WMP 2006).</li> <li>2. Review the need to establish water Conservation Objectives for streams and lakes outside of the original CLBR WMP planning area.</li> <li>3. Recommend strategies that encourage water conservation.</li> <li>4. Understand the status of current surface water and groundwater initiatives and recommend strategies to better manage the resource.</li> </ol>
<b>Water Quality</b>	<ol style="list-style-type: none"> <li>1. Establish Water Quality Objectives for the Beaver River and select tributaries that are compatible with the Surface Water Quality Management Framework.</li> <li>2. Establish Water Quality Objectives for major recreational lakes.</li> <li>3. Identify stormwater management targets and Low Impact Development strategies to minimize development impacts to water quality (and quantity).</li> <li>4. Identify appropriate land use, management and stewardship strategies to maintain and/or improve water quality.</li> </ol>
<b>Biodiversity</b>	<ol style="list-style-type: none"> <li>1. Identify appropriate land use targets and thresholds (e.g., stream crossings and linear features to better understand and track cumulative impacts on aquatic and terrestrial habitat.</li> <li>2. Recommended best management practices and actions that improve wildlife habitat, health, and biodiversity.</li> <li>3. Recommend appropriate actions to address the risks associated with invasive species.</li> </ol>
<b>Riparian Areas and Wetlands</b>	<ol style="list-style-type: none"> <li>1. Establish riparian<sup>8</sup> setbacks<sup>9</sup> and management objectives/targets that are applied consistently throughout the watershed.</li> <li>2. Recommend actions that contribute to healthy riparian areas and wetlands.</li> </ol>
<b>Land Management</b>	<ol style="list-style-type: none"> <li>1. Recommend appropriate water and land management practices that mitigate impacts of industry and development (i.e., urban, recreation, agriculture, oil and gas, forestry, and sand and gravel extraction), and maintain and/or improve ecosystem health.</li> </ol>
<b>Climate Change</b>	<ol style="list-style-type: none"> <li>1. Recommend climate actions and climate change mitigation and adaptation strategies related to watershed management for consideration by decision-makers, resource managers and residents.</li> </ol>
<b>Knowledge and Understanding</b>	<ol style="list-style-type: none"> <li>1. Assess and prioritize knowledge gaps in the Beaver River watershed.</li> <li>2. Recommend outreach materials and other tools to disseminate Indigenous Knowledge, and scientific research related to watershed health.</li> </ol>

<sup>8</sup> Riparian: Riparian lands are transitional areas between upland and aquatic ecosystems that have soil and vegetation characteristics that reflect the influence of water. They have variable width and extent both above and below ground.

<sup>9</sup> Setback: A minimum distance that must be maintained between a land use or development activity and a waterbody/watercourse.

## Indicators, Targets and Thresholds

Indicators, targets and thresholds will be used to measure success in achieving watershed goals, objectives, and desired outcomes. Indicators refer to an easily measurable attribute that reflect one aspect of the underlying condition or state of watershed health (AEP 2008). Criteria used to establish indicators will include: relevance to the watershed, importance to residents and stakeholders, and measurability. Targets and thresholds are numerical (quantitative) or written (qualitative) statements that reflect desired or achievable conditions of attributes used to measure watershed health. Targets are used to determine how valued components in the watershed rate or compare to acceptable or desired ratings and/or conditions. Examples of indicators include nutrient concentrations and riparian health scores.



## Recommendations and Implementation Strategy

Recommendations will be developed collaboratively to address issues and to achieve the objectives outlined in Table 1. An Implementation Strategy will accompany the Beaver River IWMP to support the implementation of recommendations presented in the plan. The strategy will summarize implementation actions, identify roles and responsibilities, and suggest a preliminary timeline related to the main aspects of watershed management in the IWMP.

## STAKEHOLDER, FIRST NATIONS AND MÉTIS ENGAGEMENT

LICA and the IWMP Committee will provide stakeholders, First Nations and the Métis opportunities to participate in the development of the Beaver River IWMP to ensure relevancy, long-term viability and collaborative implementation of the plan. The main objectives of engagement are to:

1. Obtain input at key stages in the development of the IWMP; consider this information alongside best scientific information and Indigenous Knowledge
2. Share information about the IWMP, the Beaver River watershed, and progress related to IWMP development
3. Identify and gather existing technical and scientific material to support the development of the IWMP
4. Facilitate and establish a common public understanding of the hydrological, ecological, socio-cultural and economic state of the Beaver River watershed and associated issues
5. Promote communication between agencies responsible for watershed management to maximize collaboration and effective stewardship of the Beaver River watershed.



## Engagement Schedule and Participation

LICA will schedule four engagement sessions to gather input into the Beaver River IWMP regarding:

1. Intent, Scope, Current Watershed Condition and Description of Issues, Goals and Objectives, Roles and Responsibilities, Work Plan and Schedule
2. Indicators, Targets and Thresholds, Preliminary Recommendations
3. Recommendations and Implementation Strategy
4. Presentation of the final IWMP and next steps

Engagement sessions related to each of the four key stages in the planning process will be organized for the following individual stakeholder groups, First Nations and the Métis:

- First Nations
  - Beaver Lake Cree Nation
  - Cold Lake First Nations
  - Kehewin Cree Nation
  - Whitefish First Nations
- General public, including youth
- Industry – Oil and gas, agriculture, forestry, sand and gravel
- Local municipal governments - staff, appointed Council members
- Provincial and Federal government agencies
- Provincial/Regional Associations, Non-Government Organizations and Academia
- The Métis
  - Buffalo Lake Métis Settlement
  - Elizabeth Métis Settlement
  - Fishing Lake Métis Settlement
  - Kikino Métis Settlement
  - Métis Nation of Alberta - Regions 1 and 2

## ROLES AND RESPONSIBILITIES

Watershed management planning and implementation of recommendations is a shared responsibility, and requires the collaboration of multiple levels of government, various industries (e.g., agriculture, oil and gas), non-government organizations, landowners, leaseholders, and residents in the watershed. The planning process is considered successful when stakeholders recognize and support their individual or shared responsibility for achieving the collective goals and objectives of the IWMP.

The IWMP will be successful when:

- It is fully implemented through the collaboration of all stakeholders.
- Targets and thresholds are achieved and/or measurable improvements are observed for established indicators.



## FOR MORE INFORMATION

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