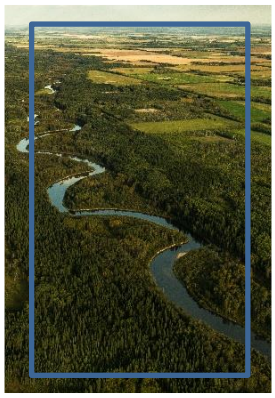
BEAVER RIVER INTEGRATED WATERSHED MANAGEMENT PLAN

SUMMARY DOCUMENT



LICA
ENVIRONMENTAL STEWARDS

ACKNOWLEDGEMENTS

LICA would like to thank the IWMP Committee, technical provincial, municipal, First Nation, and Métis staff advisors, and all stakeholders for their contribution to the Beaver River IWMP.

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1.0 BACKGROUND

LICA Environmental Stewards (LICA) initiated the Beaver River Integrated Watershed Management Plan (IWMP) to help guide watershed management activities and support the vision of "*A healthy Beaver River watershed for the future*".

An IWMP is a guidance document and planning tool for resource managers, including governments, planners, First Nations, the Métis, other stakeholders, and landowners who manage water and land resources. The plan identifies goals for improving and/or maintaining watershed health, and makes 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 engaged 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 document summarizes the key content from the Beaver River IWMP. The final Plan can be found on LICA's website at https://lica.ca/watershed/iwmp/. Readers are encouraged to refer to the full IWMP for additional context, maps, figures, recommendations, implementation actions, and literature used to develop the plan.

2.0 PURPOSE, INTENT, AND AUTHORITY

The Beaver River IWMP provides broad guidance for watershed management, and sets out a clear direction that will result in consistent, specific actions for integrated management of land and water resources to support long-term watershed health. The IWMP will not replace the existing authorized CLBR WMP, but rather augment it with aspects not previously considered.

While the watershed plan is not legally binding, developing the plan collaboratively means it is more likely to be supported and implemented by decision-makers in the Beaver River watershed.

2.2 Legislative Policy; Planning Context

The development of the Beaver River IWMP was guided in part by the Framework for Water Management Planning, the Guide to Watershed Planning in Alberta and the *Water for Life Strategy*. The IWMP:

- Was developed within the context of existing federal, provincial, and municipal legislation, policies, and regional plans.
- Acknowledges and adheres to the commitments outlined in the Inter-provincial Master Agreement on Apportionment (1969) as administered by the Prairie Provinces Water Board.
- Reflects current policies and practices in place since the CLBR WMP was completed in 2006.
- Encourages the advancement of policies and practices for continued efforts to steward the Beaver River watershed.

2.3 Scope

The Beaver River IWMP:

- Encompasses the entire Beaver River watershed within Alberta.
- Reflects all stakeholder concerns, including First Nations and the Métis.
- Improves municipal influence by providing recommendations related to municipal development planning.
- Creates a comprehensive plan by broadening the focus from a specific sector (i.e., oil/gas) to address additional resource management objectives.
- Addresses wildlife and fisheries management.

The IWMP will not:

- Gather new information to fill data gaps.
- Formulate legislation, policy, or regulations.
- Address air quality unless it relates to other watershed issues.
- Consider the watershed area in Saskatchewan.

3.0 PLANNING AREA

3.1 The Watershed

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). 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 which flows into Hudson Bay.

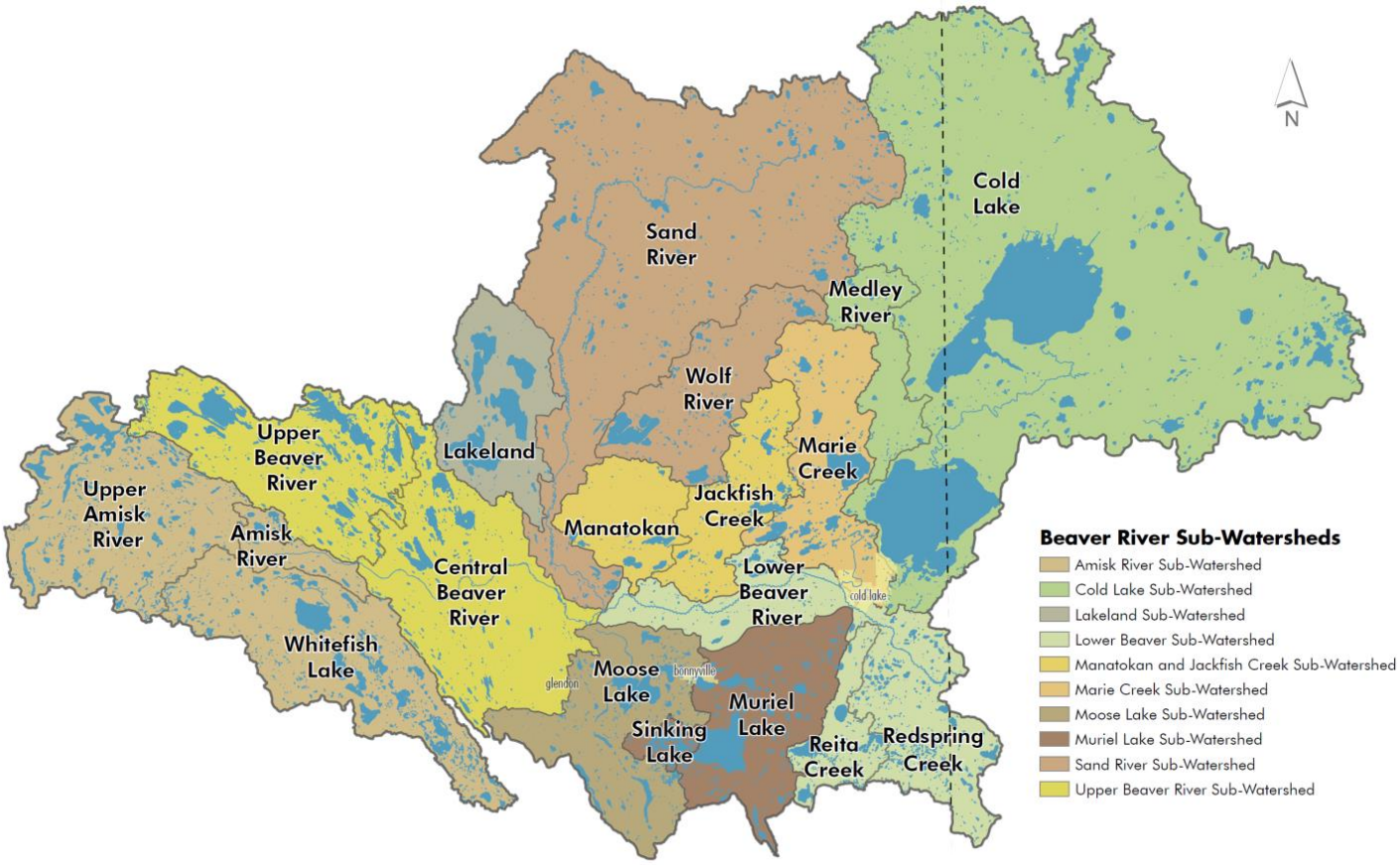

Figure 1. Map of the Beaver River watershed planning area (BRWA 2013).

3.2 Human Footprint

3.1.1 First Peoples

Human presence in the watershed dates back to time immemorial. Prior to the arrival of Europeans, the Cree and Dené had established an independent and organized society that included a nomadic lifestyle. The land provided everything that was required for people's mental, physical, spiritual, and emotional well-being[1]. Specifically, the Beaver River watershed and surrounding area provided abundant trapping, hunting, fishing, berry picking, plant harvesting, collection of medicines, and camping opportunities. A network of trails was established to reach important places throughout the watershed. Knowledge and traditions were passed down through generations.

The Denesųłiné (Dené, people of Cold Lake First Nations) and the Cree (people of Beaver Lake First Nation, Frog Lake First Nation, Kehewin First Nation, Saddle Lake Cree Nation, and Whitefish (Goodfish) Lake First Nation #128) continue traditional practices of trapping, hunting, fishing, and gathering, along with spiritual and cultural practices today.

[1] AB Regional Professional Development Consortium N.D.

3.1.2 Treaty Rights and Métis Harvesting Rights

First Nations have traditional values and rights, constitutional rights and key principles embodied in the Treaties which guide their way of life and jurisdiction in the Beaver River watershed. Treaty rights are recognized and affirmed in the Constitution Act (S. 35), 1982. The 2018 Métis Harvesting in Alberta Policy (GOA 2019) ensures that Métis people who are entitled to harvesting rights as guaranteed by the Constitution Act (s. 35), 1982, have the ability to hunt, fish, and trap for subsistence (food).

3.1.3 European Settlement, Current Conditions

Land use began to change in 1781 with the migration of European Settlers to the area and the establishment of the first trading post. These settlers were traditionally farmers who found the rich soils suitable for crop production and raising livestock for subsistence.

The Beaver River watershed continues to be rich in natural resources that support First Nations and Métis traditional land use and cultural practices, as well as a variety of industries that contribute to the local, regional, and provincial economy (e.g., oil and gas, agriculture, mining, forestry, development, tourism and recreation).

4.0 ROLES AND RESPONSIBILITIES

Watershed management planning and implementation of recommendations is a shared responsibility that 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.

5.0 INFORMATION ASSEMBLED

LICA worked closely with the IWMP Committee and technical advisors to compile relevant plans, policies, and technical reports for the Beaver River watershed. The Beaver River State of the Watershed Report (2013), LakeWatch Lake Monitoring Reports (ALMS), and Riparian Intactness Assessments (Fiera Biological 2021a and 2021b) were considered. In some instances, raw data and Provincial spatial data were accessed, summarized, or mapped and used to support stakeholder engagement and recommendations. Refer to the complete Beaver River IWMP for a list of literature cited in the development of the plan.

6.0 MATTERS, GOALS, AND OBJECTIVES

6.1 Matters

The scope of matters addressed in the IWMP includes the valued ecosystem components: water quantity, water quality, riparian areas, wetlands, biodiversity, land use, climate change, and knowledge and understanding. The matters reflect concerns expressed by the community during the engagement process (Section 8.0), and the best available science. The matters considered in the Plan may not apply to all areas of the watershed, and include, but are not limited to:

- **Surface Water Quantity**: Fluctuating water levels (in lakes and wetlands) and streamflows caused by climate change, climate variability and or development that can: impact water availability, increase risk of flooding or drought, impact infrastructure and/or recreation activity, or alter habitat and land use.
- **Surface Water Quality**: Water quality in lakes and streams does not meet the desired end uses in some areas due to soil type and geology, climate change and variability, and or influx of point and non-point source pollution
- **Riparian Areas and Wetlands:** Loss of riparian areas and wetlands and their respective functions.
- **Biodiversity:** Fragmented and poor-quality habitat and changing abundance and/or size of certain fish and wildlife species.
- **Land Use:** Cumulative impact of development and industry on watershed resources.

6.2 IWMP GOALS AND OBJECTIVES

6.2.1 Overarching Goal

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

6.2.2 Specific Goals and Objectives

Specific goals and objectives were formed to provide a clear direction of purpose for the Beaver River IWMP. The goals are broad statements that reflect the main concerns for natural resource management in the basin; the goals emphasize what the IWMP will accomplish (the outcomes of the Plan). Objectives were established to guide the planning process and achieve the goals.

Table 1. Specific goals and objectives for the Beaver River IWMP.

Value	Goal (Outcome)	Objective
Water Quantity	Secure, reliable water supplies are available for desired uses (i.e., environmental, First Nations and Métis, municipal, agricultural, industrial and recreational).	1. Review and determine the status of existing Water Conservation Objectives in the original Cold Lake Beaver River Water Management Plan (Alberta Environment 2006a). 2. Review the need to establish Water Conservation Objectives for streams and lakes outside of the original CLBR WMP planning area. 3. Recommend strategies to address fluctuating water levels at priority lakes where human impacts contribute to flooding or low water levels in the watershed. 4. Recommend strategies that encourage water conservation. 5. Understand the status of current surface water and groundwater initiatives and recommend strategies to better manage the resource.
Water Quality	Surface water and groundwater quality that is protected from contamination, maintained within the range of natural variability, and meets end-use criteria.	1. Establish Water Quality Objectives that are compatible with the Surface Water Quality Management Framework for watercourses having sufficient data. 2. Establish Water Quality Objectives for major recreational lakes. 3. Identify stormwater management targets and Low Impact Development strategies to minimize development impacts on water quality (and quantity). 4. Identify appropriate land use, management and stewardship strategies to maintain and/or improve water quality.
Riparian Areas and Wetlands	Healthy riparian areas and wetlands contribute to watershed resiliency with respect to flood and drought, quality water, and critical habitat.	1. Establish riparian[2] setbacks[3] and management objectives/targets that can be applied consistently throughout the watershed. 2. Recommend actions that contribute to healthy riparian areas and wetlands.

[2] **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 widths and extent both above and below ground.
[3] **Setback:** A minimum distance that must be maintained between a land use or development activity and a waterbody/watercourse.

Value	Goal (Outcome)	Objective
Biodiversity	Fish, wildlife, and plants are healthy and resilient to changing environmental conditions. Their ecological, social, and cultural roles in the watershed are sustained.	1. Identify appropriate land use targets and thresholds to better understand and track cumulative impacts on aquatic and terrestrial habitats. 2. Recommend best management practices and actions that improve wildlife habitat, health, and biodiversity. 3. Recommend appropriate actions to address the risks associated with invasive species.
Land Use	Cumulative effects of diverse land uses are reduced or mitigated to maintain and/or improve ecosystem health.	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.
Climate Change	Climate change considerations are central to all watershed-related planning and decision-making processes.	1. Recommend climate actions and climate change mitigation and adaptation strategies related to watershed management for consideration by decision-makers, resource managers and residents.
Knowledge and Understanding	Indigenous Knowledge and scientific research guide decision-making.	1. Assess and prioritize knowledge gaps in the Beaver River watershed. 2. Recommend outreach materials and other tools to disseminate Indigenous Knowledge and scientific research related to watershed health.

7.0 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 easily measurable attributes that reflect the underlying condition or state of watershed health (e.g., nutrient concentrations, riparian health scores) (ESRD 2012b). In the IWMP, indicators are identified for major watershed values, and expand on indicators that were used to assess the watershed condition in the Beaver River State of the Watershed Report (BRWA 2013).

Indicator targets and thresholds are numerical (quantitative) or written (qualitative) statements that reflect desired or achievable watershed conditions.

Targets are used to determine how valued watershed components (e.g., water quality) compare to acceptable or desired ratings and/or conditions. Refer to the complete Beaver River IWMP for the established list of indicators, targets, and thresholds.

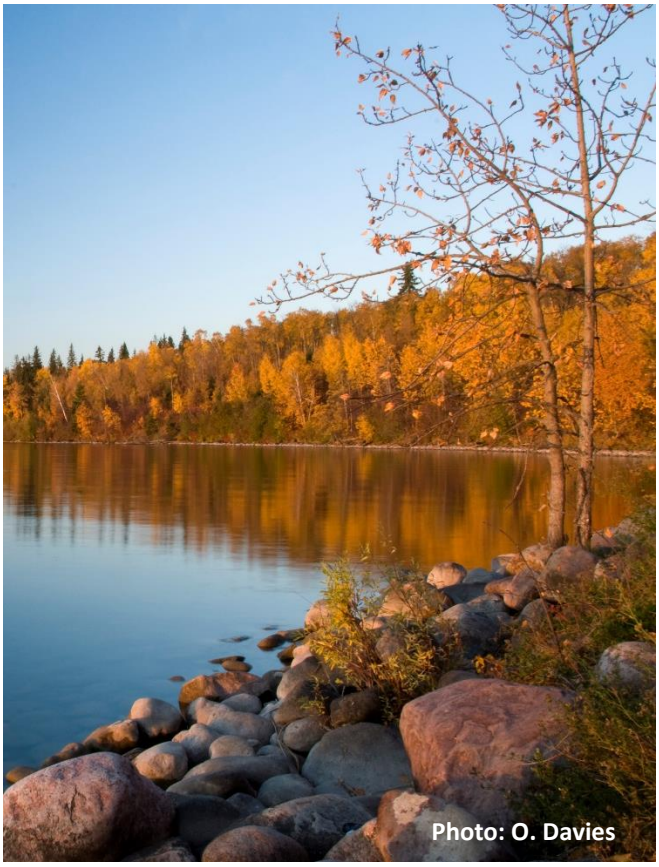
Photo: O. Davies

8.0 ENGAGEMENT PROCESS

Watershed stakeholders, First Nations, and the Métis were encouraged to participate in the development of the Plan to ensure relevancy, long-term viability, and collaborative implementation. The IWMP Committee met with stakeholders during scheduled engagement sessions hosted at key stages in the development of the IWMP (Figure 2). Stakeholders had the opportunity to provide input at virtual and in-person workshops, through online response forms, and by written letter or email submitted to LICA or the IWMP Committee during the designated time periods. What We Heard Summary documents were prepared and are available on LICA's website (https://lica.ca/watershed/iwmp/).

Figure 2. Key stages in the development of the Beaver River IWMP.

9.0 RECOMMENDATIONS AND IMPLEMENTATION

Recommendations are put forward to address issues and achieve the goals and objectives established in Section 6.2. Relevant recommendations from existing plans were carried forward to this Plan. New recommendations were developed collaboratively to address new matters, and to align with current initiatives, directions, and values. The recommendations in the tables below are a summary of recommendations in the complete Beaver River IWMP; the numbering corresponds to those found in the complete document. Refer to the full Beaver River IWMP for additional background information, context, and detailed implementation actions.

Watershed management is a shared responsibility. There are numerous governments, agencies, organizations, and industries represented in the Beaver River watershed; all have varying levels of responsibility for land and water resource management. In addition to the recommendations, the tables in each of the following sections indicate who has a role (responsibility) for implementation.

A priority timeline is suggested for the implementation of recommendations, where:

- High (H) priority recommendations should be considered in 2023-2025.
- Medium (M) priority recommendations should be considered in 2026-2028.
- Low (L) priority recommendations should be considered in 2029-2032.

9.1 Plan Administration

The goals, objectives, and desired outcomes in the Beaver River IWMP should be adopted by all stakeholders. LICA will track the progress of the Beaver River IWMP implementation and report on actions regularly. As a living document, the plan will be reviewed and updated periodically to reflect current knowledge and activities in the watershed.

9.2 Water Quantity

Goal: *Secure, reliable water supplies are available for desired uses (i.e., environmental, First Nations and Métis, municipal, agricultural, industrial, and recreational).*

Recommendations and Priority		Responsibility
9.2.3.1 Low streamflows and lake water levels		
Consistently apply the SWAD (H)	a) In the absence of a Ministerial Order (specific advice or objectives), the Surface Water Allocation Directive (GOA 2021) should be used to provide consistent, predictable provincial water allocation guidance.	Alberta Environment and Parks (AEP)[4]
Dams (H)	b) No new dams (as per the 1985 CLBR Water Management Plan) should be constructed for water storage and multiple uses in the planning area.	AEP
Hydrologic processes and connectivity (M)	c) As much is practicable, maintain hydrologic processes and connectivity to minimize the potential to isolate lakes and wetlands from their catchment. Where water level drivers are understood, effort should be made to remediate hydrologic processes.	Alberta Transportation (AT); Municipalities; Cold Lake Air Weapons Range (CLAWR); Industry; Alberta Energy Regulator (AER)
9.2.3.2 Groundwater		
Refine groundwater models (H)	a) Continue to refine groundwater models in the CLBR area as information from the CLBR groundwater monitoring network becomes available. Future efforts may consider: i. An integrated modelling tool to assess long-term trends and predict cumulative effects on water resources in the future. ii. Sub-watershed-scale groundwater models to refine current understanding of hydrological processes near key surface water features.	Alberta Geological Survey (AGS); AEP; AER; Industry; LICA; CLFNS (Cold Lake First Nations); Municipalities
Deep groundwater availability map (M)	b) The mapping for deep groundwater availability and non-saline water use (south of Cold Lake) in the CLBR Basin should be completed.	AER; AGS
GOWN wells (M)	c) Continue to monitor Groundwater Observation Well Network (GOWN) wells, by collecting continuous water level data and annual water quality data. Report on long-term trends and disseminate findings.	AEP
9.2.3.3 Lake Water Levels		
Improve understanding of hydrologic processes (H)	a) Improve understanding of hydrological processes and drivers of fluctuating water levels for lakes and associated catchments to aid land use decision-making and stewardship.	AEP; LICA
Monitor lake water levels of interest to First Nations and Métis (H)	b) Explore opportunities to implement collaborative lake level monitoring programs with First Nations and the Métis, particularly where increased recreational use is proposed and/or fish habitat restoration is a priority.	First Nations; Métis; AEP; LICA
9.2.3.4 Flood Mapping		
Flood mapping (H)	a) Flood maps should be created for watercourses and lakes where development is occurring or planned using methods consistent with Provincial standards, and include the full extent of the floodplain. The flood maps should be used as an early planning tool for municipal planners, to inform infrastructure design, and to educate landowners and land managers about the risk of development in a floodplain.	AEP; Municipalities

[4] In October 2022, following the completion of the Beaver River IWMP, Alberta Environment and Parks (AEP) became Alberta Environment and Protected Areas (AEPA). To be consistent with the full Beaver River IWMP, this Summary document will continue to apply the previous name and acronym; Alberta Environment and Parks (AEP).

Recommendations and Priority		Responsibility
9.2.3.5 Water Conservation		
Water conservation by all sectors (H)	a) Encourage water conservation by all sectors to achieve Water for Life Strategy goals for Conservation, Efficiency and Productivity.	Alberta Water Council (AWC); Industry; Agriculture
Reduce household water use (H)	b) Encourage actions to reduce household water use through the Keep Our Lakes Blue campaign.	Municipalities; LICA; Landowners; Residents
Actual water use (L)	c) Consider a study to investigate actual water used through Household Statutory Rights and Traditional Agricultural Use to inform water conservation efforts.	AWC; Municipalities; LICA


Photo: M. Unrau

9.3 Water Quality

Goal: *Surface water and groundwater quality that is protected from contamination, maintained within the range of natural variability, and meets end-use criteria.*

Recommendations and Priority		Responsibility
9.3.3.1 Maintain and Improve Water Quality		
Reduce external nutrient and sediment inputs (H)	a) Maintain and/or improve water quality conditions in lakes and streams by reducing external nutrient and sediment inputs through best (beneficial) management practice (BMP) implementation and land use strategies appropriate to each sector.	AEP; AER; Alberta Agriculture and Forestry (AAF); Municipalities; Industry; Landowners
Adopt riparian targets and setbacks (H)	b) Adopt riparian health targets and apply riparian setbacks to maintain functioning riparian areas and wetlands that contribute to improved water quality, stable streambanks, and reduced erosion in the watershed.	GOA; Municipalities; Industry

Recommendations and Priority		Responsibility
Retain wetlands, mitigate loss (H)	c) Retain wetlands. Mitigate the loss or degradation of wetlands, and replace wetlands according to the Alberta Wetland Policy to maintain water quality.	GOA; Municipalities; All Industry
Assess septic and sewage discharge (H)	d) Assess septic and sewage discharges to the Beaver River, tributaries, and lakes; upgrade systems that contribute to external nutrient loading to surface water using incentives where possible.	Alberta Health Services (AHS); LICA; Municipalities; Landowners
Municipal services in new developments (H)	e) For new developments, municipalities should strongly consider municipal sewer and water for properties adjacent to lakes, as opposed to septic tanks or fields.	Municipalities
Source Water Protection Plans (H)	f) Assess the need and interest for community source water protection plans to protect the quality and quantity of local water supplies as land use and climate changes.	AWC; LICA; Municipalities; First Nations; Métis
9.3.3.2 Monitoring and Evaluation		
Monitoring the Beaver River and its tributaries (H)	a) Implement a water monitoring program for major rivers that includes the mainstem Beaver River upstream of Hwy 28, and its major tributaries.	Prairie Provinces Water Board (PPWB); LICA; AEP; Watershed Stewardship Groups (WSGs); Industry; Academia
Lake water quality (H)	b) Continue to monitor lake water quality and consider expanding the program to monitor lakes where community interest is high. Integrate the Indigenous Lake Monitoring Program generation.	Alberta Lake Management Society (ALMS); AEP; LICA; WSGs; Academia
Lake tributary water quality (H)	c) Implement a lake tributary monitoring program.	LICA; AEP; WSGs; Industry; Academia; Water Survey of Canada (WSC)
Monitoring public beaches (H)	d) Alberta Health Services (AHS) should implement consistent monitoring programs and increase monitoring frequency at public beaches.	AHS; LICA; Municipalities
Water quality indicators (H)	e) In addition to water chemistry, monitoring programs should consider other water quality indicators, including fish and benthic invertebrates.	LICA; AEP; WSGs; Industry; Academia
Knowledge sharing (H)	f) Consider the sharing of First Nations and Métis knowledge to inform programs and stewardship activity in the watershed.	First Nations; Métis
9.3.3.3 Lake Stewardship		
Support stewardship initiatives (H)	a) Explore opportunities to support lake stewardship initiatives that improve and maintain water quality with residents and rural landowners. Keys areas of focus may include: i. Adopting programs such as Keep Our Lake Blue. ii. Winter recreation impacts. iii. Hosting Septic Sense Workshops. iv. Tree planting or shoreline restoration. v. Promoting the use of BMPs by all sectors.	Municipalities; Summer Villages; WSGs; LICA
9.3.3.4 Groundwater		
Groundwater quality indicators (M)	a) Consider monitoring water quality parameters that pose the highest risk to human health (e.g., arsenic).	Oil and Gas Industry; AHS; Academia; LICA
Community-based monitoring (M)	b) Explore opportunities for community-based groundwater monitoring in areas where water level and/or water quality data is limited.	Academia; LICA; Industry
Address abandoned water wells (M)	c) Assess the number of domestic abandoned water wells in the watershed and develop a plan to decommission sites with incentives.	LICA; AEP; AAF (Alberta Agriculture and Forestry)[5]; AHS; Municipalities; WSGs

[5] In October 2022, following the completion of the Beaver River IWMP, Alberta Agriculture and Forestry (AAF) became Alberta Agriculture and Irrigation (AAI). To be consistent with the full Beaver River IWMP, this Summary document will continue to apply the previous name and acronym; Alberta Agriculture and Forestry (AAF).

Recommendations and Priority		Responsibility
Water well workshops and well decommissioning (M-H)	e) Host 'Working Water Well' workshops. As part of the program, teach rural residents how to properly maintain and/or abandon (decommission) water wells.	LICA; AEP; AAF; AHS; Municipalities; WSGs
Industrial reclamation (H)	f) Industrial remediation and reclamation activities should meet end-use criteria according to current requirements outlined in the Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines.	AER; Industry


Photo: K. Hellum

9.4 RIPARIAN AREAS

Goal: *Healthy riparian areas and wetlands contribute to watershed resiliency with respect to flood and drought, quality water, and critical habitat.*

Recommendations and Priority		Responsibility
9.4.3.1 Riparian Area Condition		
Adopt targets and thresholds (H)	a) Adopt the riparian area extent and condition targets. Efforts should focus on decreasing the percentage of riparian area in the 'very low + low intactness' and 'unhealthy' categories and increasing the percentage of sites in the 'high intactness' and 'healthy' categories in priority areas through time.	AEP; AAF; AER; Municipalities
Riparian condition monitoring (H)	b) Establish a riparian condition monitoring strategy that includes: • The completion of a riparian intactness assessment for each of the main sub-watersheds. • Periodic re-visits to monitor riparian health at previously assessed sites to determine progress in achieving watershed goals.	Municipalities; WSGs; LICA

Recommendations and Priority		Responsibility
9.4.3.2 Riparian Protection		
Development Setbacks (H)	a) At the time of subdivision, development setbacks should be applied consistently to waterbodies and watercourses to maintain important riparian functions in the watershed. Setbacks should be applied to new developments at the time a development permit is issued by the municipality. A minimum setback of 50 m should apply from the top-of-bank of waterbodies and watercourses. This should consist of a 30 m Environmental Reserve dedication, with the balance of 20 m taken as Environmental Reserve, Municipal Reserve, and/or conservation easement.[6] • The 30 m should commence from the 1 in 100-year flood line unless a discernable top of bank exists beyond this. • The embankment is often geotechnical containment and therefore the 50 m setback shall commence beyond this. • To enable the determination of top-of-bank setbacks, a top-of-bank survey for the subject watercourse is a condition of a development permit.	Municipalities; Realtors; Lawyers; Landowners
Development in the floodplain (H)	b) Development in the floodplain should be discouraged. Consider developing flood maps, that includes a GIS overlay delineating the Environmental Reserve and Municipal Reserve at the lakeshore to support application review processes and decision-making.	Municipalities
Riparian policy (H)	c) Municipalities should develop riparian policies to maintain functioning (healthy) riparian areas in the watershed. Riparian policies should indicate activities that may be permitted or restricted in riparian areas.	Municipalities
	d) Except for permitted activities, no further development (including stormwater ponds) or site alteration should be permitted within the riparian setback.	
Industry setbacks (H)	e-g) Adhere to established and regulated setbacks for agriculture, forestry and oil and gas (Appendix H in the complete Beaver River IWMP)	AAF; AER; Industry
Cold Lake Subregional Plan (CLSRP) setbacks (H)	h) Continue to seek clarification regarding the implementation of the CLSRP setbacks (GOA 2022a).	AEP
Regional and lot level shoreline protection policy (H)	i) At the lake or stream level, a shoreline protection policy should be implemented that protects ≥75% of the shoreline (Table 12 in the complete Beaver River IWMP). j) At the lot level, a shoreline protection policy and regulation should be implemented to protect trees and other natural vegetation on ≥75% of the land area within a 30-metre shoreline setback (or other recommended width) on new residential lots. Encourage this practice on existing residential lots.	AEP; Municipalities
9.4.3.3 Riparian Conservation		
Riparian conservation (H)	a) Consider policy, planning and conservation measures to conserve high-quality riparian areas (where intactness scores are >90%). Consider the following conservation recommendations (from Fiera 2021): i. Incentivize voluntary conservation of riparian habitat on private land through payment for ecosystem services, changes to tax regimes, or other BMP programs. ii. Develop education and outreach programs to encourage stewardship and conservation of riparian habitats on private land. iii. Secure high conservation priority riparian habitats through purchase or other land securement mechanisms available to conservation groups, land trusts, or municipalities. iv. Develop provincial, municipal and/or First Nation development setback and riparian land management policies.	GOA; Municipalities

[6] City of Cold Lake LUB 382-LU-10

Recommendations and Priority		Responsibility
	v. Create a municipal habitat conservation and restoration fund to allow for the securement of high-priority riparian conservation areas.	
Unnamed lakes (M)	b) Unnamed Lakes (located on Crown Land) generally have high riparian intactness. These lakes should be mapped in provincial and municipal planning documents and provided special designation through planning, policy, and conservation tools.	GOA
Ecological Goods and Services (M)	c) Explore Ecological Goods and Services Programs to encourage riparian area and wetland conservation (e.g., Alternative Land Use Services [ALUS] program, Land Trusts, conservation easements) in agricultural areas.	LICA
9.4.3.4 Riparian Restoration		
Restoration to achieve targets and thresholds (M-H)	a) For existing developed areas, explore opportunities to restore shorelines to meet watershed targets and thresholds (Table 12 in the complete Beaver River IWMP).	AEP; WSGs; LICA Municipalities; First Nations; Métis
Refine restoration priorities (H)	b) Measures should be taken to improve streambank and shoreline vegetation at priority lakes and watercourses, particularly those that did not meet the riparian intactness target and threshold (Table 13 in the complete Beaver River IWMP). Consider the following criteria to further refine priorities for restoration: i. Riparian areas that are of spiritual or cultural significance to First Nations and support the exercise of Treaty Rights (e.g., gathering plants, trapping). ii. Riparian areas or littoral zones that support key fish habitats. iii. Degraded riparian areas are known to contribute to poor lake water quality. iv. Riparian areas that do not meet the target and threshold values. v. Resource availability.	LICA; WSGs; Municipalities
Riparian health assessment/ inventory (H)	c) Use field validation methods such as riparian health inventory to determine site details contributing to low condition ratings at priority sites.	Cows and Fish; WSGs; LICA
Explore administrative tools (H)	d) Explore the use of the following tools to achieve restoration goals: i. Incentives for riparian habitat restoration on private land through payment for ecosystem services, changes to tax regimes, or BMP programs (Fiera 2021a). ii. Education and outreach programs to encourage private land restoration. iii. Partnerships with conservation organizations to promote and encourage restoration activities on private lands. iv. Creating a municipal habitat conservation and restoration fund to pay for riparian habitat restoration on public lands.	LICA; Municipalities
Industry support for community restoration projects (M-H)	e) Industry should consider the list of restoration priorities and support community initiatives to restore sites.	LICA; All; LICA's Industry Steering Committee


Photo: A. Kjarsgaard

9.5 WETLANDS

Goal: *Healthy riparian areas and wetlands contribute to watershed resiliency with respect to flood and drought, quality water, and critical habitat.*

Recommendations and Priority		Responsibility
9.5.3.1 Wetland Inventory and Valuation		
Detailed wetland inventory (M)	a) Complete a detailed wetland inventory for the watershed using the enhanced wetland classification method.	LICA; AEP; Ducks Unlimited Canada (DUC); Lac La Biche County
Wetland valuation (M)	b) Identify tools to assist with wetland valuation, considering the Alberta Wetland Policy and criteria established in the ABWRET-A. Establish a comprehensive inventory of high-valued wetlands in the watershed based on hydrological, ecological, and cultural values.	CLAWR; AEP; AAF; DUC; LICA; Municipalities
Biodiversity values (M)	c) Consider the Biodiversity Valuation Calculation Matrix (DUC 2017) to examine the biodiversity value of specific wetland types to species-at-risk in the watershed.	DUC
9.5.3.2 Wetland Retention		
Maintain high-valued wetlands (H)	a) To maintain high-valued wetlands, adopt a policy to avoid impacts on wetlands. If avoidance cannot occur, minimize impacts to the greatest extent possible using mitigation strategies. Replacement should apply when wetlands are permanently lost according to the Alberta Wetland Mitigation Directive (GOA 2018c). To the extent possible and as the highest priority, encourage that wetland replacement is applied in the same sub-watershed relative to where the loss occurred (GOA 2018c).	AEP; LICA; Municipalities
Development setbacks (H)	b) Apply appropriate development setbacks to maintain hydrologic function (flood and drought protection), water quality, and biodiversity functions on the landscape.	All
Carbon credit system (L)	c) Explore opportunities to establish a carbon credit system as a tool to retain wetlands on the landscape.	Industry

Recommendations and Priority		Responsibility
9.5.3.3 Wetland Mitigation		
Road construction (H)	a) Consider resource road construction and maintenance practices that mitigate impacts on wetland environments (Ptartington et al. 2016) such as: i. Size and space culverts to promote hydrologic connectivity. ii. Apply minimal disturbance practices by crossing wetlands when soils are frozen. iii. Use wide tires on gravel trucks to reduce compaction and improve load-bearing capacity. iv. Source fill materials from outside wetlands to maintain wetland hydrology. v. Monitor and repair roads.	GOA; Industry; Municipalities
Agricultural activity (H)	b) In agricultural areas, minimize impacts to wetlands: i. Retain temporary wetlands in pastures and cropland to provide early spring breeding habitat for wildlife. ii. Maintain or restore permanent cover (e.g., perennial forage) in wet areas to provide habitat. iii. Avoid cultivating near the edge of wetlands. iv. Maintain, restore, or enhance riparian vegetation for flood and drought mitigation, water quality, and wildlife habitat. v. Delay mowing/haying of grassed waterways and other wet areas until mid-July to reduce nesting losses and fawn mortality. Use a flushing bar when haying. vi. Provide alternative water to livestock to deter the use of wetlands by livestock, and to prevent soil compaction in low-lying areas. Use temporary or permanent fencing around wetlands.	Agriculture Industry

9.6 BIODIVERSITY

Goal: *Fish, wildlife, and plants are healthy and resilient to changing environmental conditions. Their ecological, social, and cultural roles in the watershed are sustained.*

Recommendations and Priority		Responsibility
9.6.3.1 Fish Habitat		
Determine local and regional goals for fisheries (H)	a) Determine local and regional goals, and update fisheries management objectives for lake fisheries through conversations with First Nations, the Métis, anglers, and the public.	AEP; WSGs; Municipalities; LICA
Sportfish regulations (H)	b) Implement effective sport fishing regulations, with goals of recovering fisheries and providing more sport fishing opportunities. Consider the potential to develop a 'catch-and-keep' fishery to support tourism and recreation and the economy.	AEP
Fall Index Netting (FIN) (H)	c) FIN programs should include additional key species in lakes (e.g., Burbot, Yellow Perch, Whitefish) that are captured during the fishing effort.	AEP
Fishery monitoring (H)	d) Consider other methods to monitor fish populations. Complete angler effort surveys to understand angling pressure and harvest from key lakes of interest in the watershed (e.g., creel surveys), and consider electrofishing in streams.	AEP; Academia; Alberta Conservation Association
Fish education (H)	e) Increase knowledge and understanding among land managers and lake users about the relationships between development, water quality, and healthy ecosystems to support the conservation of clean water and healthy fisheries.	LICA
9.6.3.2 Fish Habitat and Restoration		
Water temperature monitoring (H)	a) Continuous water temperature data should be collected at several locations in the Beaver River to assess current fish habitat conditions.	WSGs; LICA
Key drivers of water temperature (H)	b) Identify key drivers of high water temperature and develop a strategy to mitigate the impact.	LICA

Photo: LICA

Recommendations and Priority		Responsibility
Fish spawning habitat survey (H)	c) Conduct fish spawning surveys to identify lake areas that should be protected from future development, and/or recreation activity during critical spawning periods.	AEP; LICA; WSGs
Assess long-term lakes closures (H)	d) Lakes that have been closed to fishing should be assessed to determine the cause of the fishery decline and if the cause of impact has been resolved. Consider restoring a fishery at these lakes if habitat conditions are suitable (link to 9.6.3.1 b), or enhancing habitat conditions where feasible.	AEP; LICA; WSGs; First Nations; Métis; Municipalities
9.6.3.3 Watercourse Crossings and Stream Connectivity		
Manage watercourse crossings (H)	a) Limit new stream crossings, particularly culverts, and improve existing crossings to ensure fish passage according to the Watercourse Crossings Management Directive[9].	AEP; Municipalities; AT; Industry
Monitor watercourse crossings (M)	b) Engage stakeholders and land users in the monitoring of watercourse crossings using the Alberta Watercourse Inventory (ABWCI) App to improve the inventory in the Beaver River watershed.	AEP; WSGs; LICA; Industry
Remediate watercourse crossings (M)	c) Create and implement a watershed-wide stream crossing remediation plan including inspection and assessment, fish passage ratings, sediment/erosion assessment, restoration/ replacement priorities, planned remedial work, and timelines (AEP 2020).	
9.6.3.4 Shoreline Management (Littoral Zone)		
Shoreline habitat inventory (H)	a) Shorelines (the littoral zone) should be inventoried and managed to maintain critical habitat, particularly spawning areas and identified Important Bird Areas.	AEP; WSGs; LICA Municipalities
Administrative tools (M)	b) Administrative tools should be identified and implemented to manage lakeside development and limit the future loss of shoreline habitat. The location and type of development should be assessed alongside shoreline function. Tools may include: i. Master planning, shoreline zoning, and development plan review that considers dynamic shoreline processes and protects ecological functions. ii. Development setbacks and vegetated buffers adjacent to streams, wetlands, and lakes (link to Section 9.4.3). iii. Limits on continuous hard surfaces (e.g., retaining walls) to minimize erosion of neighbouring properties. iv. Requirements for restoration of littoral zones where necessary. v. Lot clearing criteria for new developments. vi. Encourage yard management that maintains shoreline functions. vii. Identify and promote best practices for marinas.	AEP; Municipalities
Shoreline erosion (M-H)	c) Manage human-induced shoreline erosion by establishing wake-free zones and/or posting speed limits in areas most vulnerable (e.g., shallow water adjacent to the exposed shoreline). Maintain a near-shore speed limit to reduce the suspension of bottom sediments and shoreline erosion induced by wave action.	AEP; Residents and lake users

Recommendations and Priority		Responsibility
9.6.3.5 Beavers		
Determine occurrence (M-L)	a) Determine the occurrence (distribution/abundance) of beavers where there is a community concern.	LICA; Municipalities; Cows and Fish
Explore management tools (M)	b) Explore tools to manage beaver activity where it has impacted infrastructure and hydrologic connectivity. Prior to removal, beaver dams should be assessed by a qualified professional to understand potential impacts and recommend management strategies.	
Cormorant management (L-M)	a) Determine cormorant numbers in the watershed (the current program extent is the Bonnyville area), and establish a management program to reduce the population size in problem areas, as needed.	AEP; Municipalities; WSGs; LICA
	b) Complete fish community assessments (in addition to Moose Lake) to determine fish numbers, size, and population trends.	
	c) Strive to better understand cormorant population dynamics and life strategies: i. Complete movement surveys to determine where cormorants are coming from and where they are feeding ii. Collect and analyze cormorant diet samples to determine food sources iii. Identify other birds that co-nest with cormorants; inventory and implement mitigation measures to prevent their disturbance	
9.6.3.7 Key Wildlife and Biodiversity Zones		
Key wildlife and biodiversity zones (H)	a) The Beaver River, Sand River, and other areas are indicated as key wildlife and biodiversity zones and should be managed to maintain quality habitat: i. Avoid development in key wildlife and biodiversity zones ii. Minimize and mitigate impacts from future development when it cannot be avoided iii. Plan future tourism and recreation to avoid sensitive areas iv. Implement riparian and wetland management recommendations	AEP; Industry; Municipalities
Habitat restoration (H)	b) Efforts should be made to restore habitats where human footprint has already encroached on sensitive areas within key wildlife and biodiversity zones.	AEP; WSGs; LICA Municipalities
9.6.3.8 Aquatic Invasive Species (AIS) and Disease		
Himalayan balsam (M-H)	a) Spread of Himalayan balsam occurs mostly from the dispersal of seeds from landscape plantings. Consider the following to help control its spread: i. Avoid the selling or purchase of plants for ornamental purposes. ii. Minimize the potential to spread seed by minimizing soil disturbance and erosion in riparian areas. iii. Control plants by hand-pulling. Incinerate or bag for landfill. iv. Explore biological control options.	Municipalities; LICA; Lakeland Agricultural Research Association (LARA); WSGs
Strategies to mitigate potential for Aquatic Invasive Species (AIS) (H)	b) To minimize the potential to spread AIS, consider: i. Posting signage at all access points to increase awareness. ii. Making boat wash stations available at key access points. iii. Reinstating provincial highway inspection stations for watercraft. iv. Reducing the number of unmanaged boat launches where possible.	AEP; Municipalities

9.7 Land Use

Goal: *Cumulative effects of diverse land uses are reduced or mitigated to maintain and/or improve ecosystem health.*

Recommendation		Responsibility
9.7.3.1 Urban Development		
Development setbacks (H)	a) Development setbacks should account for natural variability in the hydrologic cycle and be established with consideration for flood and drought conditions, and for riparian health.	Municipalities
Manage stormwater release rates and volumes (M-H)	b) Stormwater inputs from urban areas to lakes should be managed to maintain the natural variability of flow rate and volume in each system.	Municipalities

Incorporate Low Impact Development (LID) practices (M-H)	c) Low impact development (LID) practices should be incorporated, wherever feasible, in all new developments and/or areas of redevelopment according to the best available science. LID practices may include, but not be limited to:
	• A reduction in hard surface area
	• Retention of natural areas
	• Standards for maximum footprint per lot/land area
	• Absorbent landscaping
	  ▪ Increased topsoil depths in new developments (e.g., 300 mm minimum or other appropriate depth as determined through local assessment)
	  ▪ Micro-depressions in yards
	  ▪ Gentle grades and cross-cut slopes to reduce flow rates
	• Bioretention, including rain gardens and grass swales
	• Stormwater capture and use
	• Stormwater retention ponds where runoff can be stored/treated and released at an appropriate rate
	• Dry riverbed and swales to direct runoff to treatment areas
		Municipalities

Assess Stormwater quality (M)	d) Assess stormwater quality generated from different development types to determine variability in water quality and potential impacts on surface water quality.	Municipalities; LICA
Strategies to improve stormwater quality (M)	e) Implement strategies to improve the quality of urban stormwater discharged to surface water. Consider the following: i. Inventory stormwater outfalls and place a sign at each site with the outfall number/name. ii. Ensure proper storage, handling, and application of road salt in winter, dust suppression, and herbicides and pesticides during the growing season. iii. Stockpiled snow, when melting, can be a significant source of contaminants. Care should be taken to stockpile snow away from surface water. iv. Consider the use of oil/grit separators to remove solids prior to discharge to surface water. v. Use stormwater ponds and low impact development practices that manage stormwater volume and release rate to improve stormwater quality. vi. Educate residents about their role in stormwater management. vii. Engage partners to implement programs in schools (e.g., Stream of Dreams).	Municipalities; AT

Recommendations and Priority		Responsibility
9.7.3.2 Agriculture		
Environmental Farm Plan	a) Encourage agricultural producer participation in the Environmental Farm Plan (EFP) program.	Municipalities; LARA; LICA; EFP Company
Agricultural BMP implementation (H)	b) For livestock operations, consider BMPs to protect and maintain water quality: i. Provide off-stream watering to prevent livestock from wading in lakes, streams and wetlands. Off-stream watering has proven to increase weight gain, and reduce scours and hoof problems in livestock. ii. Manage stocking rate, timing and duration of livestock on grazing lands to maintain healthy upland pastures. iii. Use temporary or permanent fencing adjacent to lakes, watercourses and wetlands to maintain healthy riparian areas, when the management of stocking rate, timing, and duration on grazing lands cannot be met. iv. Develop grazing management plans that promote healthy riparian areas identified by stable streambanks and supported by deep-rooted vegetation. v. Use bioengineering techniques to stabilize and restore eroded streambanks, where possible.	Farmers; Ranchers; Municipalities (ASBs); AAF
	c) For farm operations, consider BMPs to protect and maintain water quality: i. Apply fertilizer at an appropriate rate to avoid excess ii. Practice soil conservation on cropped lands to reduce soil erosion, conserve topsoil and protect water quality. iii. Minimize or eliminate the use of herbicides and fertilizers adjacent to watercourses. Apply according to AOPA.	
Increase collaboration (H)	d) Increase collaboration between municipal Agricultural Service Boards (ASBs) and local agricultural organizations to promote the use of BMPs that protect, maintain, and improve water quality, riparian areas, wetlands, and biodiversity.	LICA; LARA; Municipalities (ASBs)
Ecological Goods and Services (M)	e) Consider ecological goods and services incentive programs that provide payment for maintaining riparian buffers and wetlands through strategic partnerships.	LICA; Landowners; Municipalities
9.7.3.3 Forestry		
Apply forestry industry standards (H)	a) Apply forest industry standards to harvest practices according to the Alberta Timber Harvest Planning and Operating Ground Rules (GOA 2022b) and the Timber Harvest Planning and Operating Ground Rules: Northeast Alberta Regional Area-Specific Addendum (GOA 2022c): i. Avoid excessive soil disturbance through careful planning. ii. Avoid construction or harvest near ephemeral draws, tributaries, and source water areas. Maintain adequate buffers next to watercourses and wetlands. iii. Conduct proper road construction, maintenance, and reclamation. Culverts should be properly sized and installed correctly so as not to affect the natural flow of water or increase soil erosion. iv. Minimize the number of roads that cross streams and wetlands, and use clear-span bridges on fish-bearing streams where practical. v. Avoid steep slope road construction or logging activity.	AAF; Forestry Industry


Photo: N. Gillis


Photo: R. Bretzlaff

Recommendations and Priority		Responsibility
9.7.3.4 Oil and Gas		
9.7.3.4.1 General		
Apply oil and gas industry standards (H)	a) Industry should strive to reduce well density, linear fragmentation and overall 'footprint' by using innovative approaches to development and minimal disturbance practices. Apply industry standards and practices according to 'Integrated Standards and Guidelines: Enhanced Approval Process (EAP)' (GOA 2012c), *Oil and Gas Conservation Act*, and applicable AER Directives.	Oil and Gas Industry; AER
Road construction and stream crossings (H)	b) Assess strategies to reduce water quality impacts from road construction and stream crossings, including: • Use of existing roads and horizontal drilling techniques to access resources. • Collaborations with other industry sectors on road development planning.	Oil and Gas Industry
9.7.3.4.2 Remediation and Reclamation		
Environmental Assessment (H)	a) Environmental site assessments will be completed at decommissioned sites to determine if remediation measures are required prior to initiating reclamation work. Sites will be remediated to meet end-use criteria established in the Alberta Tier 1 and 2 Soil and Groundwater Remediation Guidelines (AEP 2019b; AEP 2022).	Oil and Gas Industry
Reclamation (H)	b) Reclamation activity will occur as per the Alberta Reclamation Criteria, and is regulated under the *Environmental Protection and Enhancement Act* (*EPEA*) and the Conservation and Reclamation Regulations.	
Reclamation certificates (H)	c) Reclamation certificates (issued by the AER) will be received by proponents when they have demonstrated the site has been reclaimed to equivalent land capability as per the Alberta Reclamation Criteria. The Indian Oil and Gas Commission Reclamation and Remediation and Surrender Process and the Alberta Reclamation Criteria will be adhered to for projects on First Nation Reserves.	AER; Indian Oil and Gas Commission
9.7.3.4.3 Emergency Response Plans		
Emergency Response Plans (H)	a) Industry is responsible for having emergency response plans in place to respond to the possible occurrence of releases into the environment. Companies must develop plans in accordance with Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry (AER 2017). Industry should continue to act in accordance with the Directive.	AER; Oil and Gas Industry
Community Emergency Response (H)	b) Municipalities should explore the need for a community emergency response plan in the event that they are notified of a release.	Municipalities
9.7.3.4.4 Orphan Wells		
Assess the extent of orphan wells (M-H)	a) Assess the extent of orphan wells in the watershed. Complete an inventory and prioritize reclamation work.	AER; Oil and gas Industry
Recommend wells for reclamation (M-H)	b) Recommend wells to the Orphan Well Association (OWA) for reclamation.	AER; Landowners; Oil and Gas Industry; OWA

Recommendations and Priority		Responsibility
9.7.3.5 Tourism and Recreation		
Recreation management plan (H)	a) Prior to developing a recreation management plan for the area, consider: i. Inclusion of the entire Beaver River watershed in the planning area to ensure that proposed activity considers the existing tourism and recreation footprint. ii. Indigenous land use and traditional rights. iii. Review riparian condition assessment data for Crown Land. Develop a riparian conservation policy (in addition to the setback established in the CLSRP). iv. Develop and/or refine fisheries management objectives with the community. v. Identify/assess critical fisheries habitat and spawning areas. vi. Collect user data as a socio-economic performance indicator. vii. Consider existing plans for increasing tourism and recreation in the area: • The expansion of the Kinosoo Ridge Snow Resort. • Development of access points to the Beaver River at appropriate locations.	GOA
Trails (H)	b) Trail networks should: i. Avoid sensitive and ecologically important species-at-risk and bird habitats, and culturally significant areas; Make use of existing, linear disturbances. ii. Have interpretive signage. iii. Be equipped with washroom facilities and tamper-proof garbage cans.	GOA
Infrastructure supports (L-M)	c) Maintain infrastructure (e.g., roads) to support a healthy tourism and recreation economy in the watershed.	GOA
Bridges on trail network (M)	d) Collaborate with OHV clubs and trappers to construct bridges at watercourses on main trail systems.	AEP; LICA; Trail Users; Municipalities
Stewardship education resources (H)	b) Develop and provide educational stewardship resources for specific tourism and recreational users (e.g., OHV clubs, campgrounds and resorts, and ice fishermen).	LICA; WSGs

9.8 KNOWLEDGE AND UNDERSTANDING

Goal: *Indigenous Knowledge and scientific research guide decision-making.*

Recommendations and Priority		Responsibility
9.8.3.1 State of the Watershed Report		
Update State of the Watershed Report (H)	a) The 2013 Beaver River State of the Watershed Report should be updated to reflect the current status of the watershed condition, and consider new information collected to support the assessment.	LICA; WSGs
9.8.3.2 Indigenous Knowledge		
Conduct interviews and studies (H)	a) Collaborate with First Nations and the Métis to conduct interviews/studies to document experience and knowledge to support future watershed condition reporting and decision-making.	LICA; First Nations; Métis; Consultant

Recommendations and Priority		Responsibility
Map indicating Indigenous place names (H)	b) Efforts should be made to create a watershed map that includes Indigenous place names. A legend should be created that indicates the name given by the Cree, the Dene and the Métis, along with their meanings.	LICA; First Nations; Métis; Consultant
9.8.3.3 Climate Change, Climate Variability and Adaptation		
Consider climate change in land use planning (H)	a) Climate change and climate variability should be considered in all land use planning activities, particularly as it relates to the aquatic environment.	Municipalities; Alberta Urban Municipalities Association (AUMA)
Assess regional climate (M-H)	b) Assess regional climate for the historic period of record, and the potential impact on the occurrence of fire, flood, and drought. Relate findings to regional infrastructure planning to promote watershed resiliency.	LICA
Publish research findings (M)	c) LICA should publish the current understanding of climate change impacts on the watershed with respect to literature and modelling.	LICA

10.0 PRIORITIES

The IWMP Committee identified five implementation priorities for the recommendations. The priorities listed below have multiple benefits for all stakeholders, First Nations, and the Métis:

1. Prioritize the completion of floodplain maps for watercourses and high-water marks for lakes to support implementation and enforcement of urban development setbacks through policy and planning.
2. Develop and implement a long-term surface water quality monitoring program in collaboration with all stakeholders to leverage resources and achieve mutual goals.
3. Collaborate to implement BMPs and land use strategies to protect water quality and riparian health, particularly where riparian intactness scores are below the target and threshold and water quality is a concern.
4. Seek opportunities to support riparian restoration where assessments indicated health condition does not achieve targets and/or thresholds.
5. Collaborate with stakeholders to prioritize and develop a fishery monitoring program, including key habitats. Update fisheries management objectives prior to tourism and recreation planning.

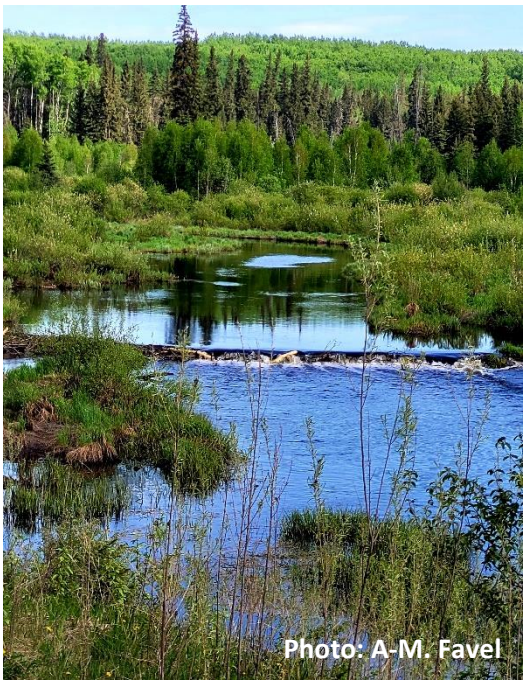
Photo: A-M. Favel

11.0 FOR MORE INFORMATION

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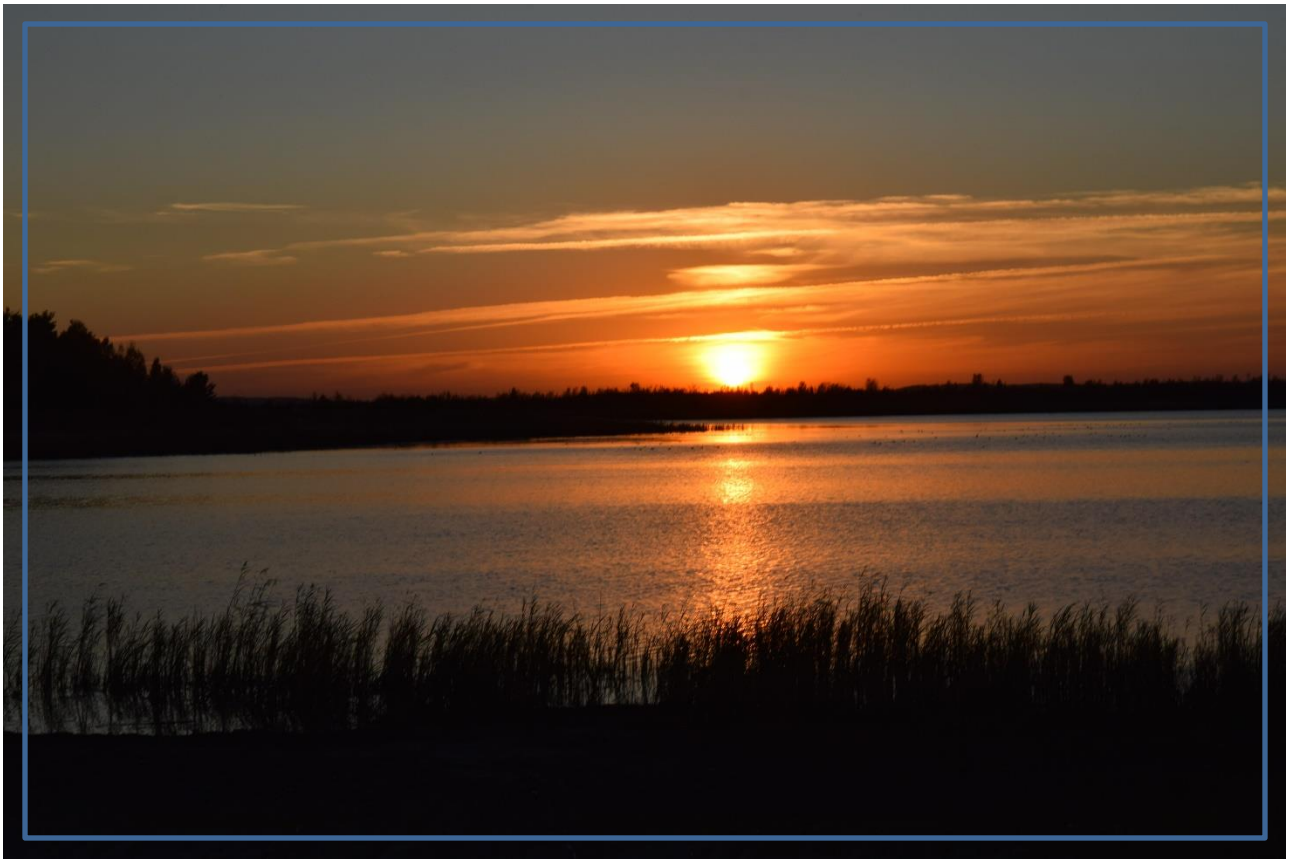
Palliser Environmental Services Ltd.



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LICA Environmental Stewards