



# LESSER SLAVE INTEGRATED WATERSHED MANAGEMENT PLAN

## KEY CONTENTS from the WORKING DRAFT

OCTOBER 2016

### 1.0 BACKGROUND

The Lesser Slave Integrated Watershed Management Plan builds on community consultations and scientific studies conducted during the past few years by the Lesser Slave Watershed Council. The watershed plan is being developed in collaboration with the broader community of the Lesser Slave watershed, including local governments, First Nations and Métis communities, the provincial government and stakeholders.

The Lesser Slave watershed plan is a guidance document and planning tool for resource managers. It identifies issues, sets out common goals and objectives for the long-term management of land and water

resources in the basin, and then makes recommendations on how to meet those goals and objectives.

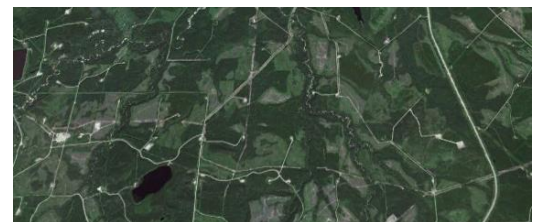
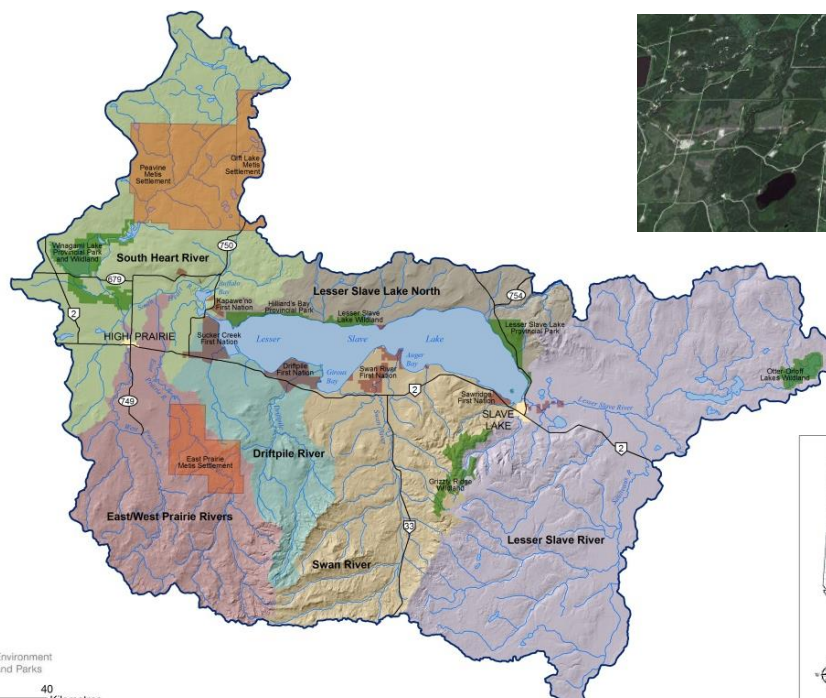
The plan will align with provincial planning initiatives and municipal plans and policies. The Lesser Slave Watershed Council will actively provide direction throughout the planning process and pursue partnerships with other agencies to implement the plan.

This document summarizes key content from a more comprehensive Lesser Slave watershed plan working draft. It was created to support engagement during the fall of 2016.

### 2.0 PLANNING AREA

The Lesser Slave watershed is comprised of seven sub-basins. The sub-basins that contribute flow to Lesser Slave Lake are the South Heart River, West Prairie River, East Prairie River, Driftpile River, Swan River, and the Lesser Slave Lake North basin (drained by Straw Creek

and Narrows Creek). Lesser Slave Lake is drained by the Lesser Slave River. Sawridge Creek and the Otauwau Salteaux, Driftwood, and Fawcett rivers are several tributaries that flow into the Lesser Slave River before it joins the Athabasca River.



## 3.0 SCOPE OF ISSUES

The following issues were identified at previous stakeholder workshops and documented in reports commissioned by the Lesser Slave Watershed Council.

### Water Quantity

- Low flows in tributaries to Lesser Slave Lake and the Lesser Slave River due in part to decreased precipitation associated with climate change and limited water storage capacity on the landscape.
- Low streamflows contributing to low water levels in Lesser Slave Lake that result in source water supply and boating access concerns for communities. Low lake water levels reduce important habitat for various life stages of fish (i.e., spawning and rearing habitat).
- The lack of general knowledge on groundwater resources in the watershed.

### Water Quality

- High nutrient concentrations in Lesser Slave Lake that contribute to algal growth. Nutrients originate from internal lake sources and from external inputs (e.g., the atmosphere, surface runoff from surrounding land, municipal treated effluent, leakage from septic systems, and stormwater from developed areas).
- Suspended sediment transported to Lesser Slave Lake that:
  - Carries nutrients to the lake
  - May settle out and bury important spawning grounds
  - Is deposited in the lake limiting access to some areas

Sources of sediment include stream crossings associated with resource access roads, recreational activity, agricultural practices, reduced forest cover, and streambank erosion.

- Accumulation of sediment in the Lesser Slave River upstream of the weir.
- Channelization (straightening) of natural rivers that reduces channel length, increases erosion, reduces flooding and sediment deposition in the floodplain.

### Wetlands

- The degradation and loss of wetlands due to land use activity.

- The lack of knowledge about rate of loss of wetlands and the impact of that loss.
- Concern regarding the lack of protection for the Buffalo Bay and Horse Lakes wetland complex.

### Riparian Areas

- Declining riparian health due to industry activity (e.g., agriculture, forestry, and oil and gas), large scale bank erosion, and recreational activity (off-highway vehicle use in streams and on stream banks).
- Declining riparian health along lake shorelines due to land clearing for development, and removal of riparian vegetation by property owners.
- Lack of understanding of the importance of riparian functions to lake and river streamflows and water quality.

### Biodiversity

- Declining density of key fish species in rivers and lakes due to sport fishing pressure, and degradation and loss of habitat (including spawning and rearing areas).
- Cumulative habitat degradation, loss and fragmentation from forestry (cut blocks, linear disturbance), oil and gas (facilities, well sites, linear disturbance, pipeline rights-of-way), and agriculture (land clearing).
- Operation of a hazardous waste treatment facility in the upper watershed with potential negative impacts on fish, wildlife and native plant communities.
- Lack of technical, scientific information, and consideration of Traditional Ecological Knowledge to adequately assess biodiversity in the watershed.
- Atmospheric deposition of pollutants from forest fires and industrial releases.
- Threat and occurrence of terrestrial and aquatic invasive species, particularly impacts on the local fishery.

### Lake Management

- Lack of coordination and policy for lake management, including water quality, beach access, and general lake access.

## 4.0 GOALS AND OBJECTIVES

Goals and objectives were developed for five main themes identified by the Lesser Slave Watershed Council: water quantity, water quality, riparian areas and wetlands, and biodiversity.

Goals and objectives provide clear direction of purpose for the Lesser Slave Integrated Watershed Management Plan. Goals are broad statements that emphasize what the plan will accomplish (outcomes of the plan). Objectives guide the planning process and offer the mechanism to achieve the goals.

Theme	Goal (Outcome)	Objective
Water Quantity	1. Surface water and groundwater are managed in a way that supports communities, aquatic ecosystems, recreation, wildlife and economic opportunities.	Recommend management strategies for water levels in Lesser Slave Lake and streamflows in the Lesser Slave River (tool may be an Approved Water Management Plan under the <i>Water Act</i> ).
		Recommend water conservation strategies that promote efficient use of water.
		Undertake initiatives to better understand groundwater.
Water Quality	2. Water quality is maintained or improved to support communities, aquatic ecosystems, recreation, wildlife and economic opportunities for future generations.	Establish interim water quality objectives for nutrients and sediment in Lesser Slave Lake, its major tributaries, and Lesser Slave River.
		Recommend a long-term water monitoring strategy for the watershed.
		Establish the framework for a lake management plan to guide sustainable development adjacent to Lesser Slave Lake.
		Recommend setbacks for development and other activities to reduce streambank erosion and maintain functioning riparian areas and wetlands. Also supports Goal 4 and 5.
		Identify beneficial management practices and other actions that can be applied to improve and maintain water quality in Lesser Slave Lake and its major tributaries.
		Promote a stewardship ethic among watershed residents and users.
Riparian Areas	3. Healthy riparian areas stabilize banks and shorelines, improve water quality, reduce sedimentation, provide habitat and promote biodiversity.	Recommend strategies to conserve and enhance riparian areas in the watershed and identify priority areas for restoration.
Wetlands	4. Wetlands are kept intact to provide flood and drought mitigation, improved water quality and habitat.	Recommend wetland conservation strategies that are in line with, or that improve on, Alberta's Wetland Policy, and promote wetland and riparian education and stewardship.
Biodiversity	5. Sustainable land use practices take place in the watershed that maintain and support biodiversity.	Recommend beneficial management practices for land use that will conserve and enhance biodiversity in the watershed.

## 5.0 INDICATORS

Environmental indicators are used to assess watershed condition through time. The Lesser Slave Integrated Watershed Management Plan will identify indicators and associated measures (summarized in the table below) to track watershed condition and to evaluate success in achieving watershed management goals and objectives.

The plan will also set targets and thresholds for indicators to determine how valued components in the watershed compare to acceptable or desired ratings.

Targets can be either numerical or written statements. When a value falls below a target or threshold, management actions are triggered to bring the indicator back into acceptable range.

The Lesser Slave Watershed Council is currently establishing targets and thresholds in collaboration with a watershed planning consultant and members of a Technical Advisory Committee.

Theme	Indicator	Measure	Significance
Water Quantity	Water Supply	Annual streamflow measurements	Streamflows should reflect a normal range of condition and support channel processes (erosion/building), aquatic life, the riparian environment and communities.
		Lake water levels	Maintaining appropriate water levels supports: local water supplies, recreation, tourism, and aquatic life.
	Water Allocation and Use	Water licences and registrations	Water supplies support aquatic life, communities and economic activity
		Industrial water use reports	
Water Quality	Lake Trophic Status	Phosphorus, chlorophyll <i>a</i> , and secchi disc depth	Deviation of quality from natural condition suggests a degrading (or improving) trend. Surface water quality should support designated or desired end uses.
	Deviation from baseline/normal concentration or load	Water Quality Objectives for nutrients, sediment, bacteria, and other parameters as data allows	
Riparian Areas	Riparian Function	Riparian Health Assessment	Functioning riparian areas and wetlands contribute to water supply, water quality, river channel stability, and biodiversity.
Wetlands	Wetland cover	Percentage of watershed area	
Biodiversity	Fish, Wildlife and Vegetation, including Species at Risk	Species composition	Aquatic and upland systems that support a diverse group of fish, wildlife, and plant species is more resilient to ecological adversity or changes to environmental condition.
		Population (a variety of seasonal, resident species)	
		Invasive, disturbance and rare plants	
		Land cover (anthropogenic footprint, linear disturbance, critical habitat)	

Recommendations in the watershed plan will be reviewed using a social and economic filter. Indicators of social and economic condition may be considered in the plan, including population and stewardship activity (i.e., participation in programs like the Environmental Farm Plan and Growing Forward II). Watersheds should be livable places and support thriving communities. These programs help residents, landowners and leaseholders take an active role in stewardship to maintain and improve watershed conditions.



## 6.0 Early draft RECOMMENDATIONS

**Note to Reader:** At this early stage in planning, all recommendations are considered draft. They are intended to form the basis for further discussion with the broader watershed community. These early draft recommendations may be refined or removed based on further discussions. Additional recommendations will likely be proposed.

Watershed management is a shared responsibility. There are numerous governments, agencies, organizations, and industries represented in the Lesser Slave watershed; all have varying levels of responsibility for land and water resource management. An Implementation Strategy will accompany the plan and highlight who is responsible for the recommendation and the timeline for implementation.

### Water Quantity

- a) Water Conservation Objectives should be developed for tributaries to Lesser Slave Lake and for main tributaries to the Lesser Slave River. To support the setting of Water Conservation Objectives, a detailed Instream Flow Needs (IFN) Study is required that considers aquatic life, riparian areas, water supply, waste assimilation and recreational needs. The IFN assessment should refine the minimum flow required to meet human needs and maintain aquatic ecosystem health in the Lesser Slave River.
- b) Investigate historical streamflow and lake water levels beyond 100 years.
- c) Update information on water use in the Lesser Slave watershed to determine how water use is changing in the basin.

### Water Quality

- d) Implement a comprehensive Long-Term Water Monitoring Strategy for the Lesser Slave watershed.
- e) Site-specific water quality objectives are set to prevent detrimental changes to algal and aquatic plant communities, aquatic biodiversity, oxygen concentration, and recreational quality. Water quality can be compared to water

quality objectives through time to identify if water quality is degrading, improving or stable.

Interim water quality objectives should be adopted for the main tributaries to Lesser Slave Lake and for the Lesser Slave River.

- f) A review of septic and sewage discharges to Lesser Slave Lake and Lesser Slave River should be completed.
- g) Address the sources and transport of excess sediment in the watershed to manage the transport of associated contaminants, including phosphorus and metals.
  - Apply industry beneficial management practices for agriculture, forestry, oil and gas and mining



### Riparian Areas and Wetlands

- h) Adopt riparian health targets for the Lesser Slave watershed.
- i) Riparian health inventories should be completed in representative reaches of each major tributary to Lesser Slave Lake.
- j) Appropriate setbacks should be applied to maintain riparian function.
- k) Wetlands provide flood protection and mitigate the impacts of drought through water storage, filter water to maintain water quality, and

provide habitat for an abundance of wildlife in the watershed.

A policy of no further net loss of wetlands should be adopted for the Lesser Slave watershed.

- l) A minimum setback should be applied adjacent to all wetlands.
- m) Connectivity between wetlands and natural drainages (e.g., ephemeral and intermittent watercourses) should be maintained and restored where possible.
- n) Land that is marginally productive for annual crops should be converted into long-term forage production or retain this land in its natural state (e.g., ephemeral wetlands).

### Biodiversity

- o) Establish a landowner stewardship program to enhance conservation of shoreline habitat.
- p) Water quality should be maintained to preserve a diverse fish population and a healthy sport and subsistence fishery in Lesser Slave Lake and its tributaries.

- q) For Lesser Slave Lake:
  - i. Continue to identify critical spawning and rearing areas for Walleye, Lake Whitefish, Northern Pike and Yellow Perch.
  - ii. Establish lake management zones to direct development in the vicinity of spawning and rearing areas (e.g., retaining walls, docks, cottages, homes, marinas or other infrastructure).
  - iii. Protect the littoral zone as important fish spawning and rearing habitat.
- r) Strategies should be adopted to mitigate the potential for aquatic invasive species such as zebra mussel, quagga mussel, flowering rush, Prussian Carp, and Eurasian milfoil to enter Lesser Slave Lake and the larger watershed.
  - Post signs at all access points around the lake to increase awareness of the threat.
  - Include information regarding aquatic invasive species in advertisements for fishing tournaments.
  - Make a boat-wash station available at all major access points, particularly during fishing tournaments and the peak summer season.

## 7.0 NEXT STEPS

The next steps to complete the Lesser Slave watershed plan are:

- i. Consider input from stakeholder workshops, local government meetings, an online response form, meetings with First Nations and Métis communities, and the Technical Advisory Committee.
- ii. Complete the draft watershed plan and an Implementation Strategy to accompany the

plan. The Implementation Strategy will outline, who is responsible for the recommendations, the timeline for implementation, resources, and costs where required.

- iii. Seek online input on the completed draft plan.
- iv. Final approval of plan by the Lesser Slave Watershed Council.
- v. As a living document, the plan will be reviewed and updated periodically to reflect current knowledge and activities in the watershed.

## 8.0 FOR MORE INFORMATION

Meghan Payne  
LSWC Executive Director  
Box 2607, High Prairie, AB T0G 1E0  
Phone: 780-523-9800  
Email: [meghanpayne@lswc.ca](mailto:meghanpayne@lswc.ca)

This document was prepared by:



Palliser Environmental Services Ltd.