

Sturgeon River Watershed Alliance

Watershed Technical Studies



Presented by:

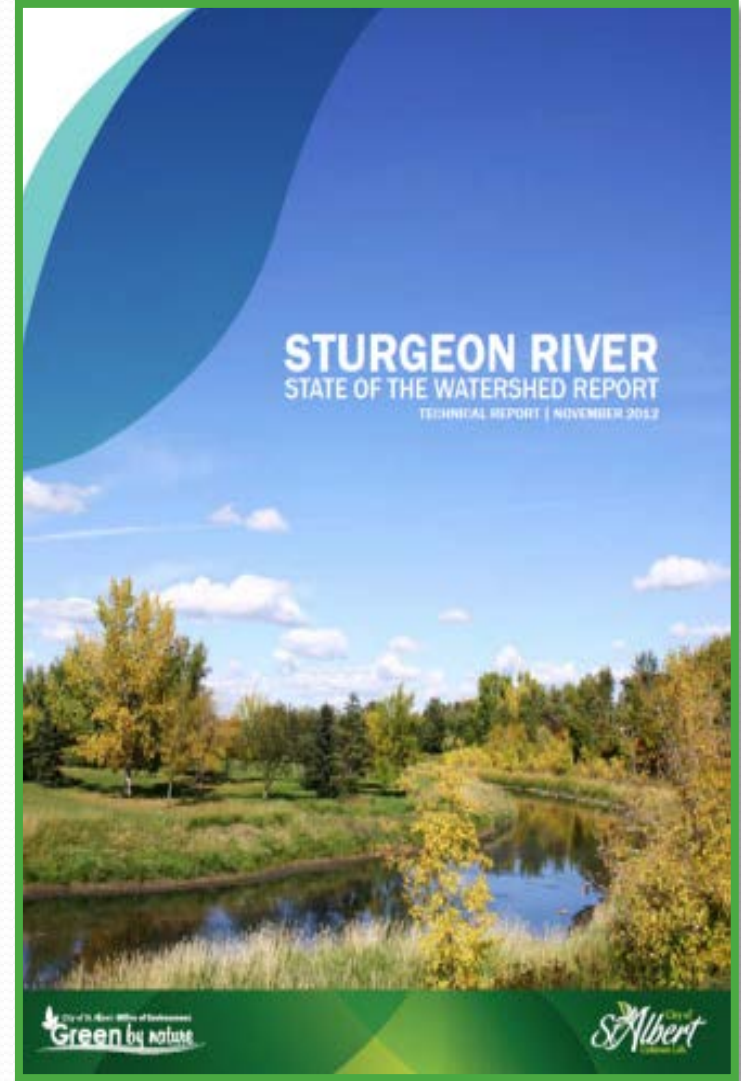
*Leah Kongsrude, Executive Director
North Saskatchewan Watershed Alliance*

Sturgeon River Watershed Alliance



State of Report

- Completed in 2012 by the City of St. Albert.
- Assessed overall ecological health using 15 indicators and gave an overall grade of **FAIR**.
 - ✓ Establish a municipally led watershed group
 - ✓ Fill information gaps by completing technical studies
 - ✓ Develop an Integrated Watershed Management Plan



Information Gaps

- SRWA partnership secured over \$500,000 in grants
- NSWA coordinated grants and consultants for 8 technical studies and 3 technical bulletins
- All reports available on www.nswa.ab.ca



Information Gaps



1. Surface Water Quantity
2. Groundwater Overview
3. Water Quality and Aquatic Health
4. Riparian Areas
5. Land Planning Tools

Surface Water Quantity

 North Saskatchewan Watershed Alliance

ASSESSMENT OF EXISTING WATER SUPPLY AND DEMAND
DATA FOR THE STURGEON RIVER BASIN



May 2016

Findings:

- Annual flow variability follows decadal weather pattern
- Water Licences show a net allocation of 13% of annual flows
- Instream flow needs may not be met in summer months (July-August) almost every third year

Surface Water Quantity

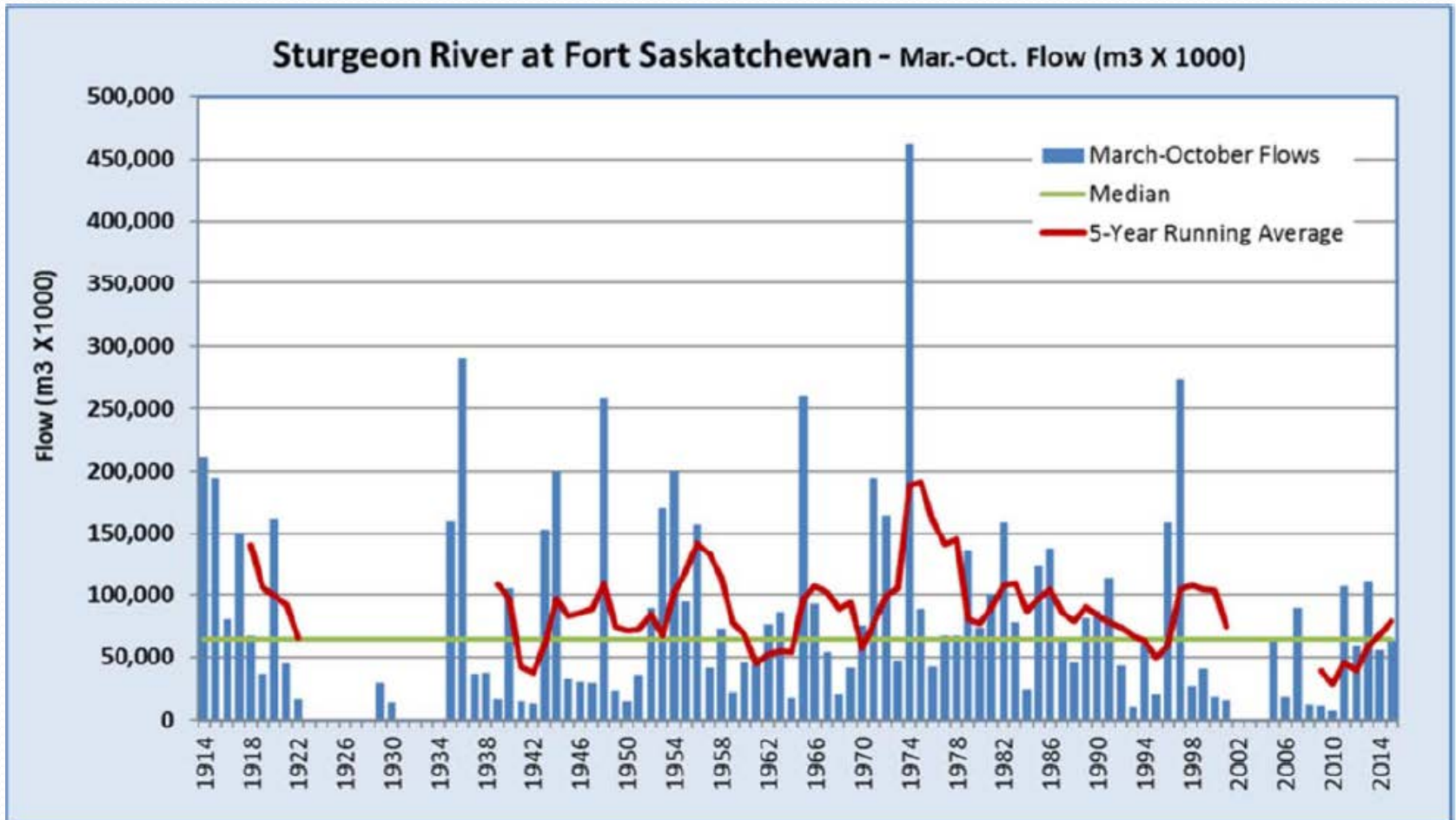


Figure 3. Annual flow volumes at the mouth of the Sturgeon River, near Fort Saskatchewan. Data from Alberta Environment and Parks.

Surface Water

- 1682 licences
- Total allocations 24,000,000 m³
- Use/Losses 16,500,000 m³
- Return Flow 7,500,000 m³

Groundwater

- 959 Licences
- Total allocations 9,500,000 m³
- Use/Losses 4,000,000 m³
- Return Flow 5,500,000 m³

Average recorded flow
86,580,000 m³

Sturgeon River

Surface Water
• 1,682 licences
• 24,000,000 m³



Use + losses
16,500,000 m³

Return Flow
7,500,000 m³

Use + losses
4,000,000 m³



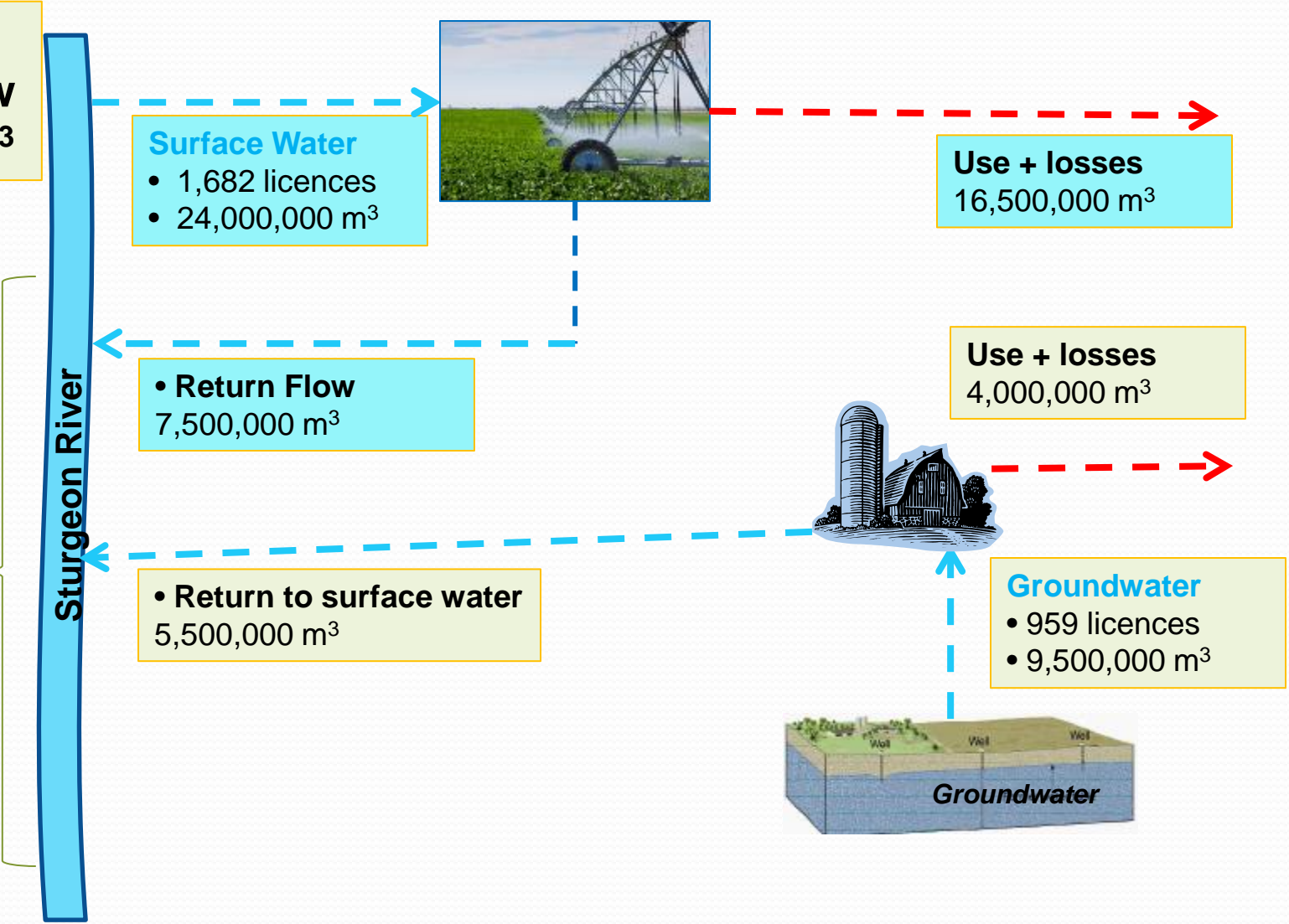
Net Use
11,000,000 m³
~ 13% of average recorded flow

Return to surface water
5,500,000 m³

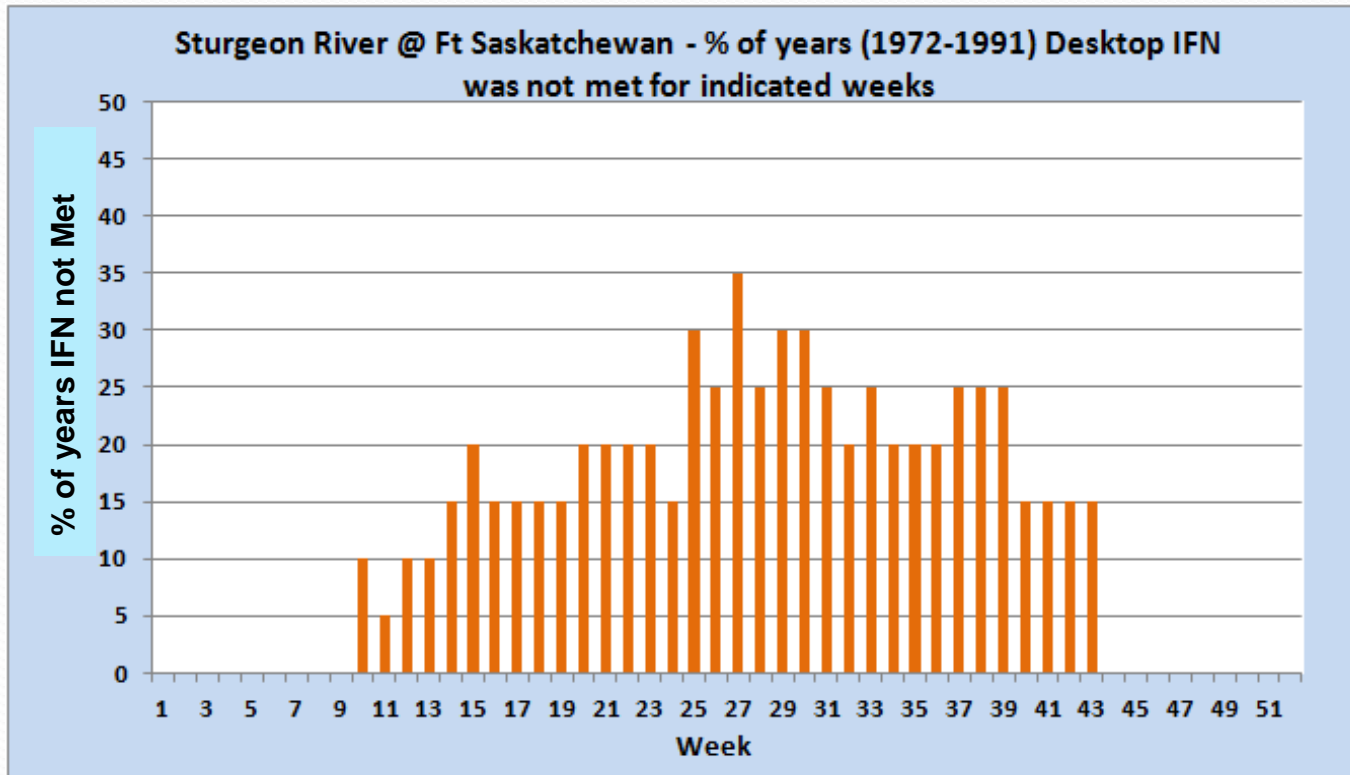
Groundwater
• 959 licences
• 9,500,000 m³



Groundwater



Instream Flow Needs



Desktop Instream Flow Needs:

- Not met in up to 35% of years,
- Most significant in weeks 25-30 (June-July)
- Second most significant in weeks 31-39 (Aug-Sept)

Groundwater

Findings:

- High density of groundwater wells in subwatershed
- Surficial geology connects groundwater to surface water and influences river flow and lake levels more than thought
- Recharge/Discharge areas, and their influence on surficial groundwater levels, are important to consider when planning development

Summary of Groundwater Conditions in the Sturgeon River Basin



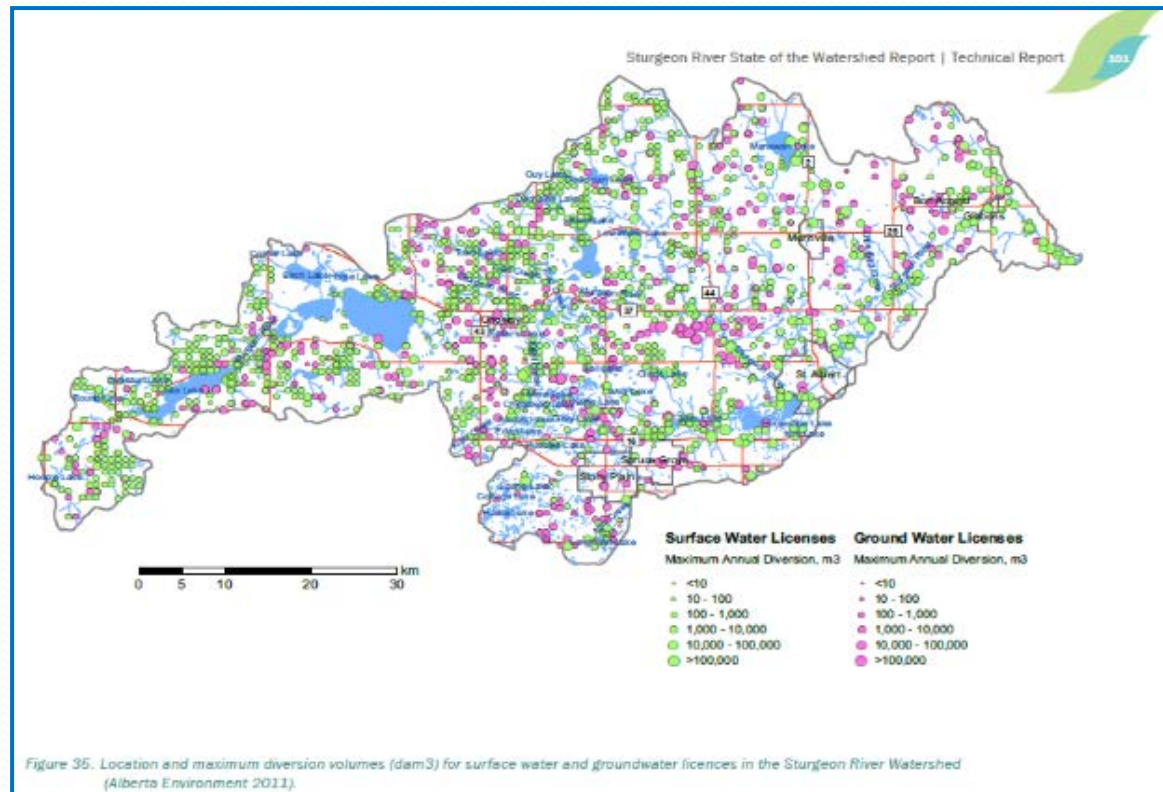
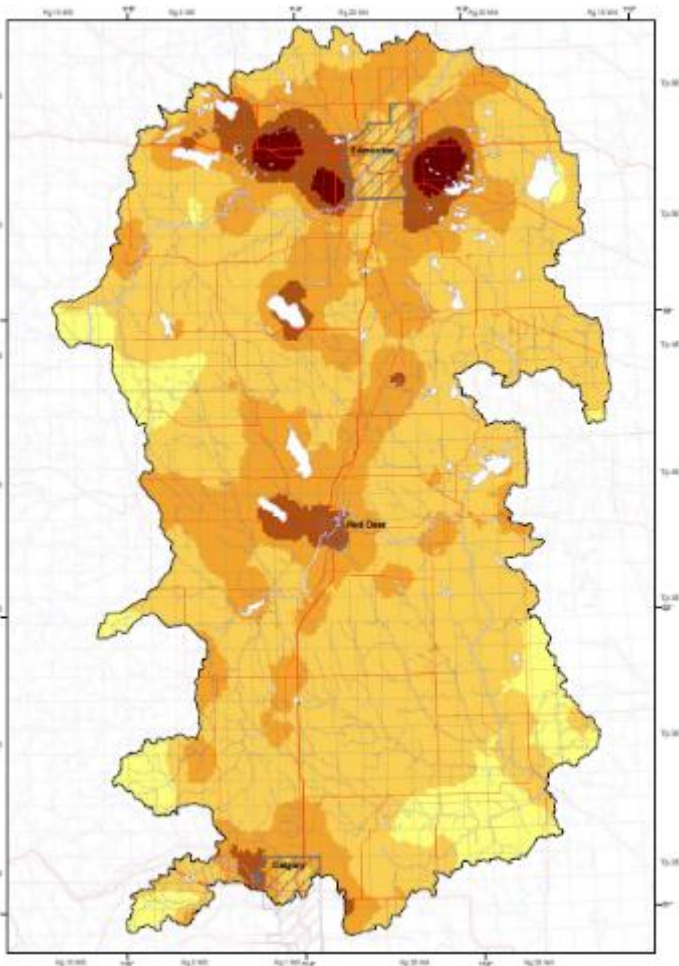
Clifford E. Lee Nature Sanctuary

By: Alex Oiffer, M.Sc., P.Geol.

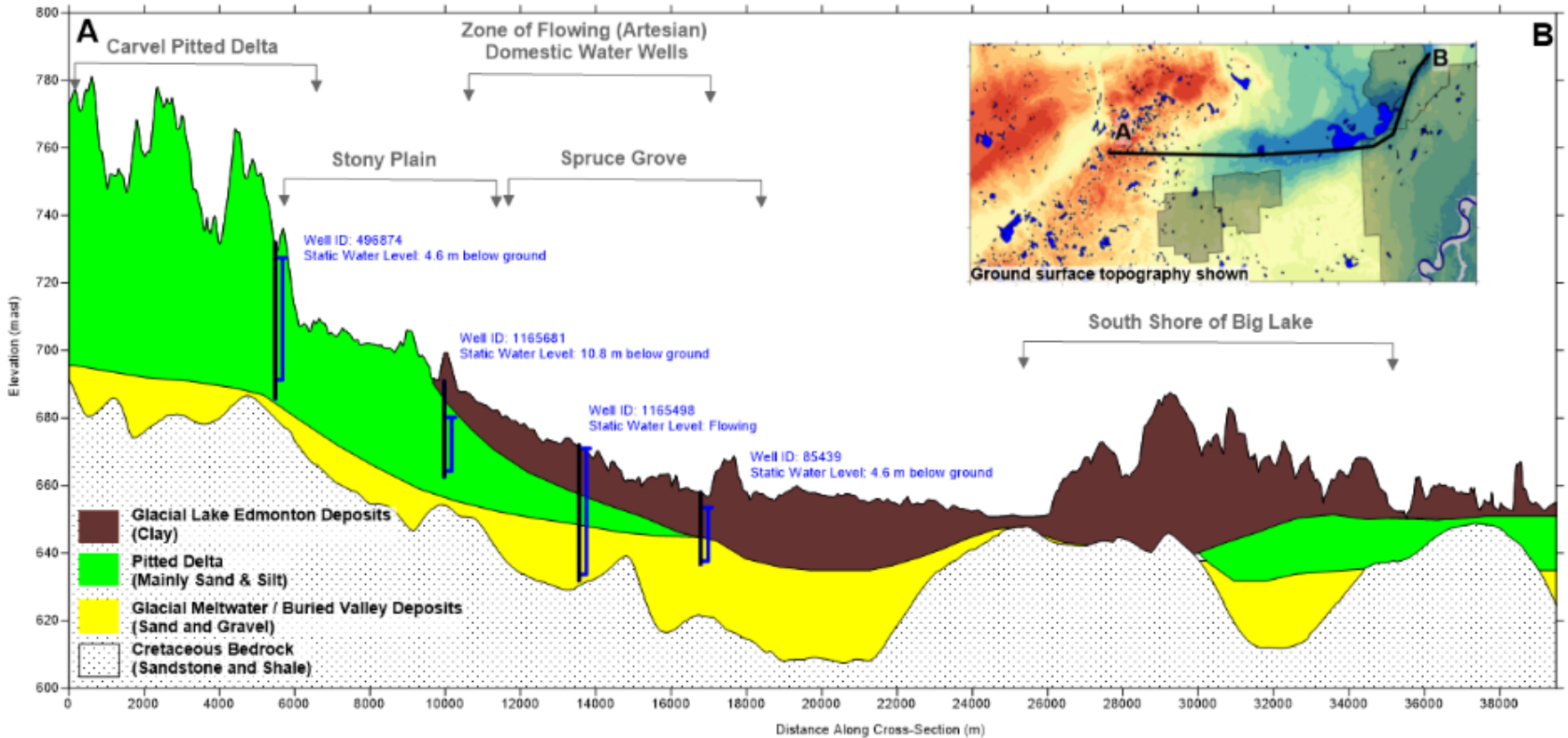
January 2019

Groundwater

- Significant groundwater well density
- Rural drinking water wells



Groundwater

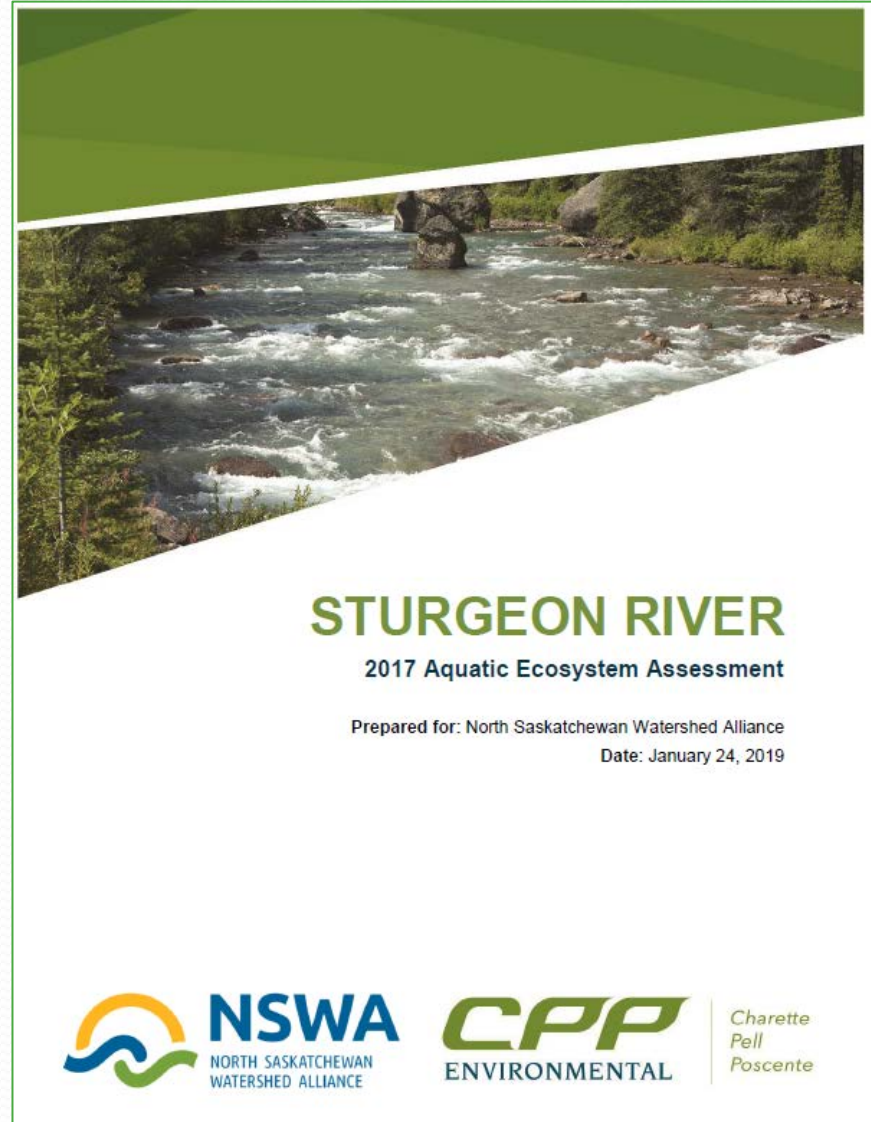


- Surficial Geology creates complex interaction between groundwater and surface water
- Carvel pitted delta / Buried Valley deposits / Lake Edmonton deposits

Surface Water Quality







Findings:

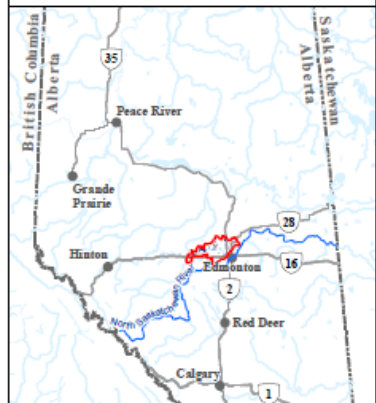
- River/lakes are nutrient rich
- Oxygen levels poor in upper and lower reaches
- High level of salinity / salts at some sites
- Macroinvertebrates and fish diversity reflex habitat variation and oxygen levels
- Human health issues (blue green algae, bacteria, fish consumption)



NSWA Sturgeon River Study

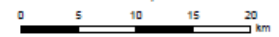
Figure 1: Overview Map

-  Sturgeon River Sampling Stations (M1 - M12)
-  Tributary Water Quality Stations (T1 - T8)
-  City/Town Boundary
-  County Boundary
-  Subwatershed Boundary
-  First Nation Reserve



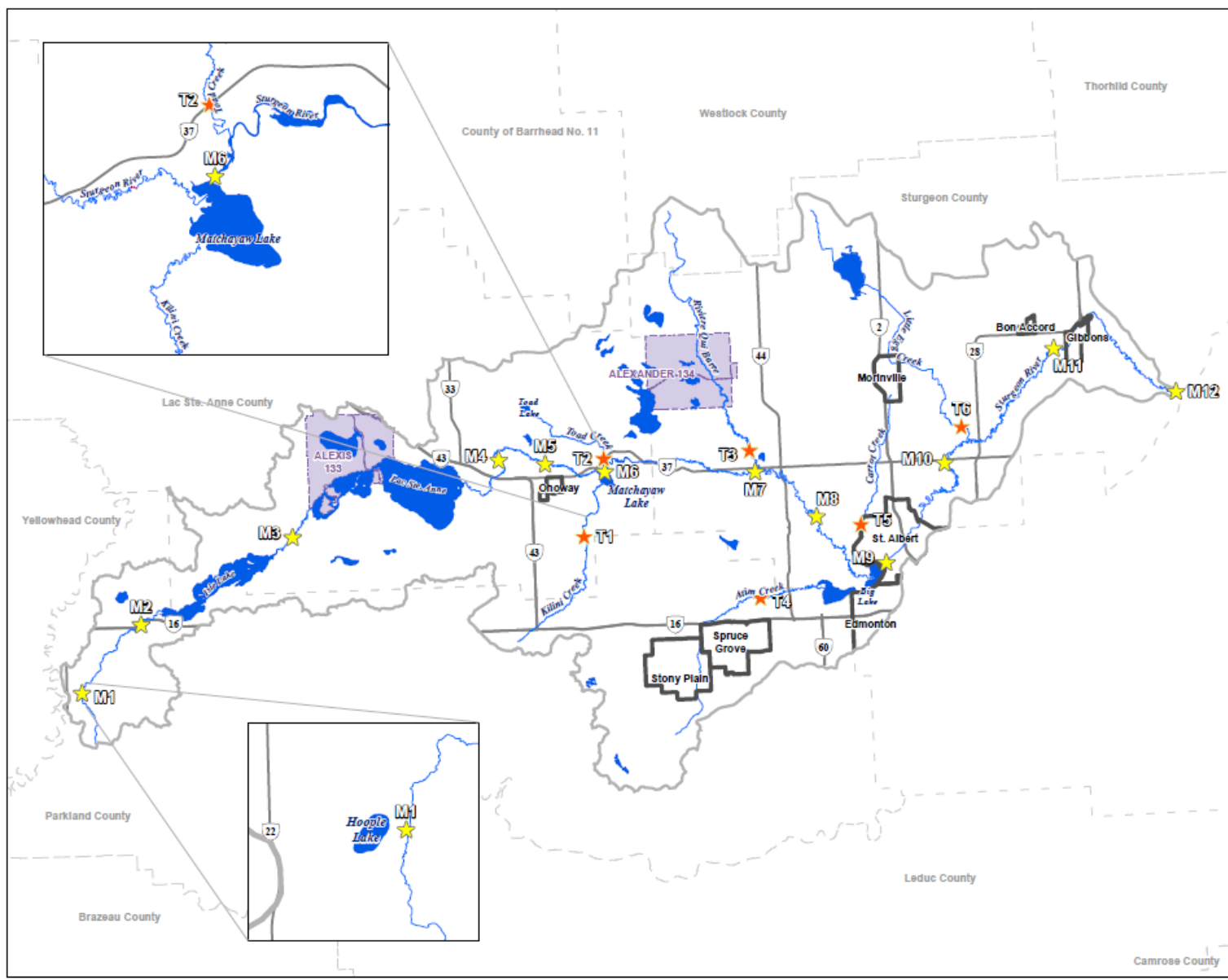
Source: Contains information licensed under the Open Government Licenses - Canada and Alberta
 Coordinates system: NAD 1983 UTM Zone 11N

1:400,000

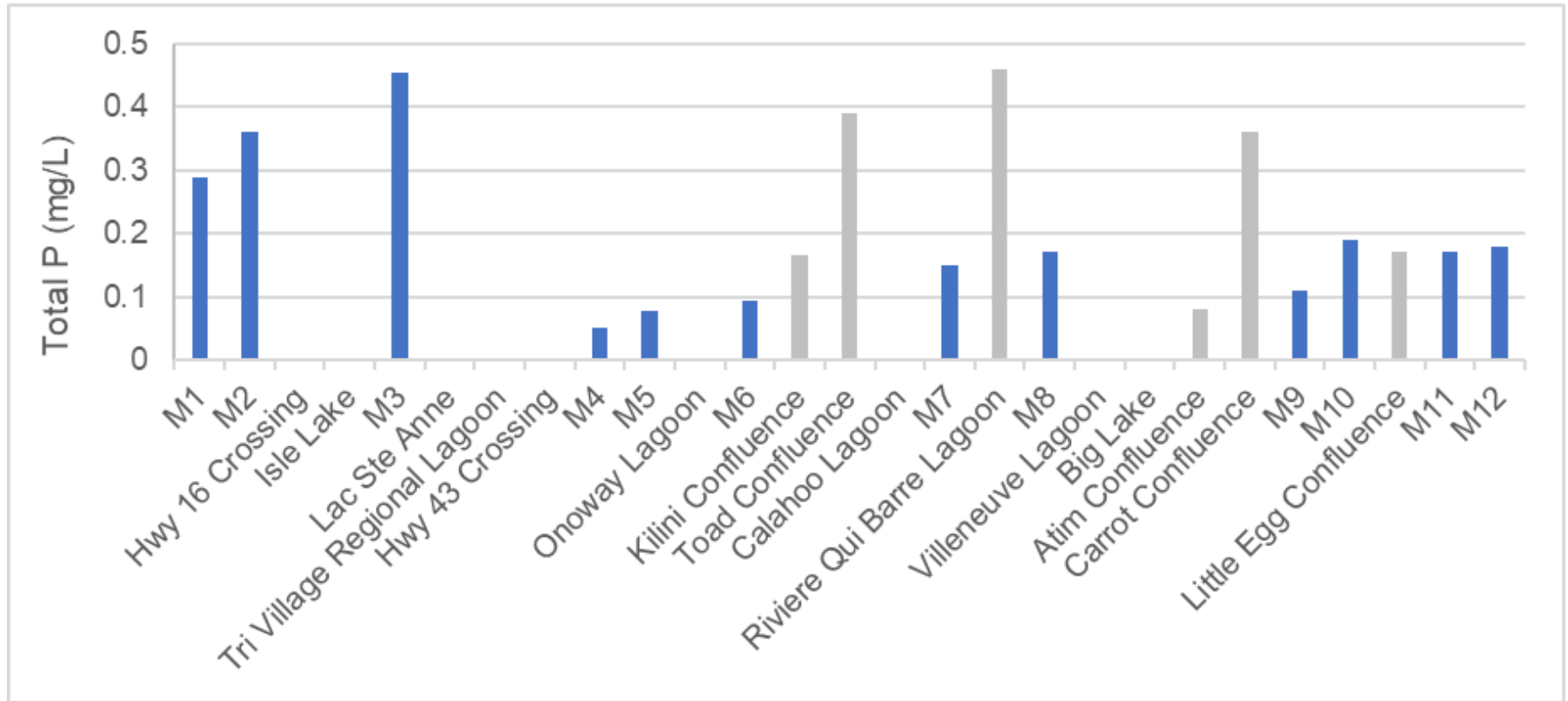


Date: November 9, 2018

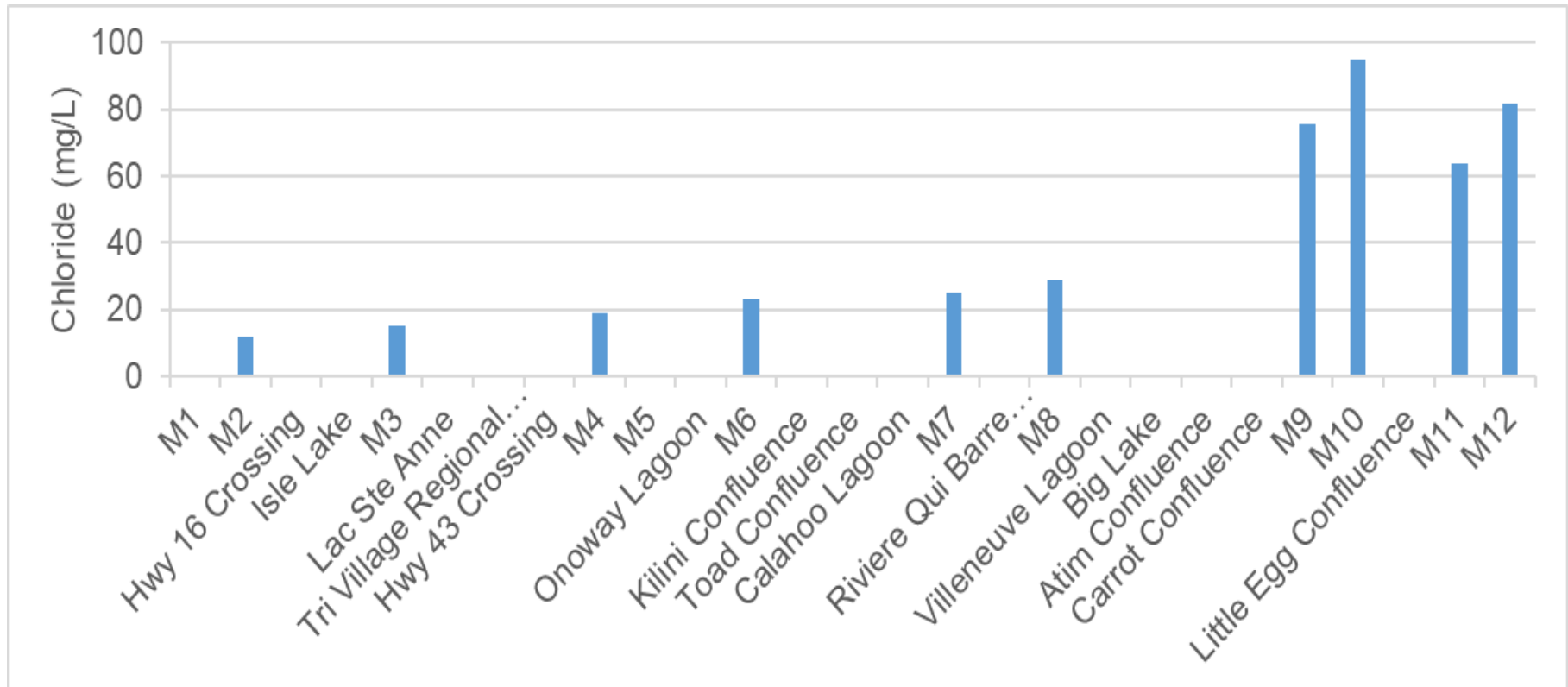
Prepared by: R. Ok



Water Quality – Nutrients (Spring)



Water Quality – Salts (Winter)



Aquatic Health

Factors Assessed:

- River morphology
- Aquatic Vegetation
- Macroinvertebrates
- Fish Assessment



White sucker (*Catostomus commersoni*) at M5

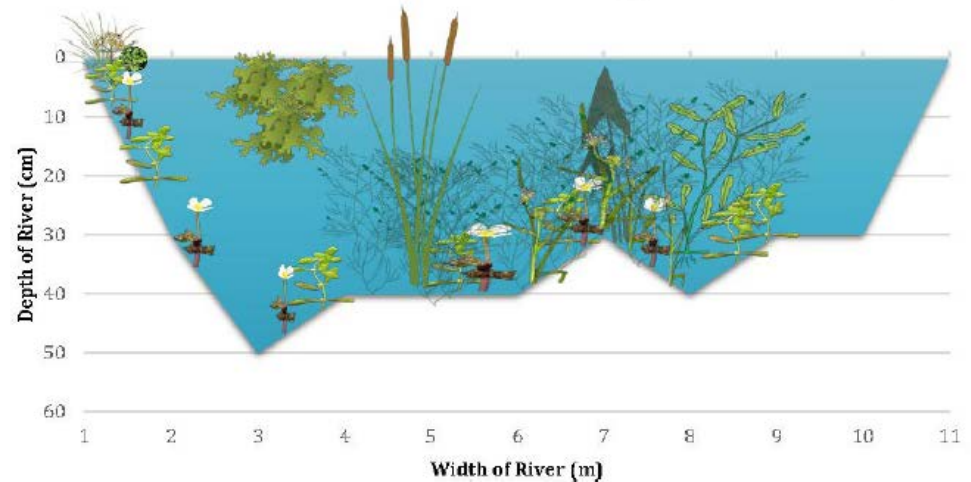


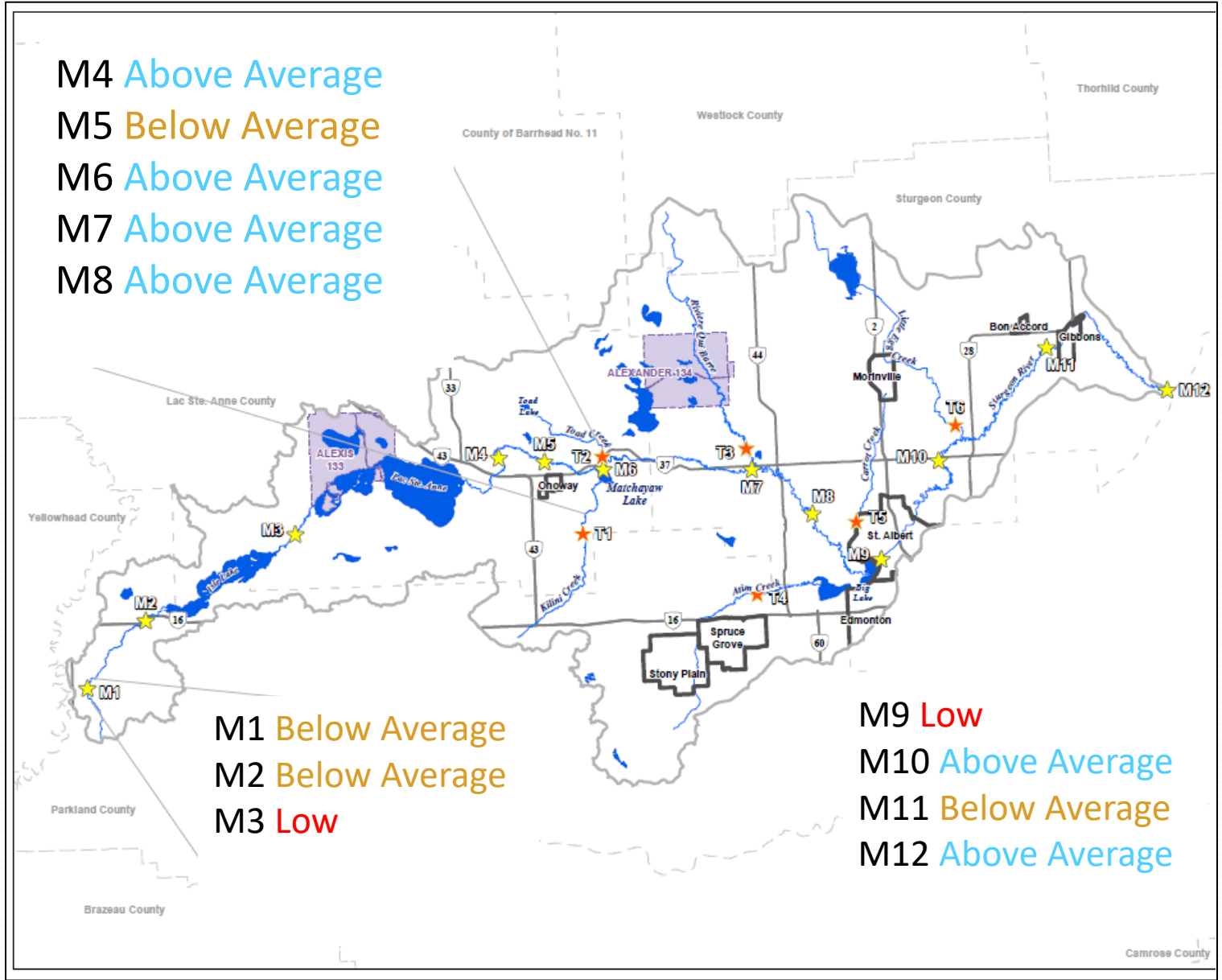
Figure C-2: Cross-section of transect 2 at Station M2.

Aquatic Ecosystem Assessment

Metric	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Shade	2	2	1	2	1	1	2	2	2	1	2	1
Macrophyte cover	2	2	1	3	2	2	2	3	1	3	2	2
Bank undercutting	2	2	1	1	2	2	3	1	1	1	1	1
Organic substrate	2	2	2	3	2	3	1	2	1	3	2	3
Habitat diversity	2	2	2	3	1	1	2	2	2	3	2	3
Total phosphorus	1	1	1	2	2	3	3	3	2	2	2	2
Total nitrogen	1	1	1	3	3	2	2	3	1	2	2	3
Dissolved oxygen	1	3	1	2	3	3	3	3	2	2	3	3
Total score	13	15	10	19	16	17	18	19	12	17	16	18
Score relative to maximum possible score of 24%¹	31	44	13	69	50	56	63	69	25	56	50	63

Note. ¹ Red = 1-25% (low quality); Orange = 26-50% (below average quality); Yellow = 51-75% (above average quality); Green (not present) = 76-100% (high quality).

M4 Above Average
M5 Below Average
M6 Above Average
M7 Above Average
M8 Above Average



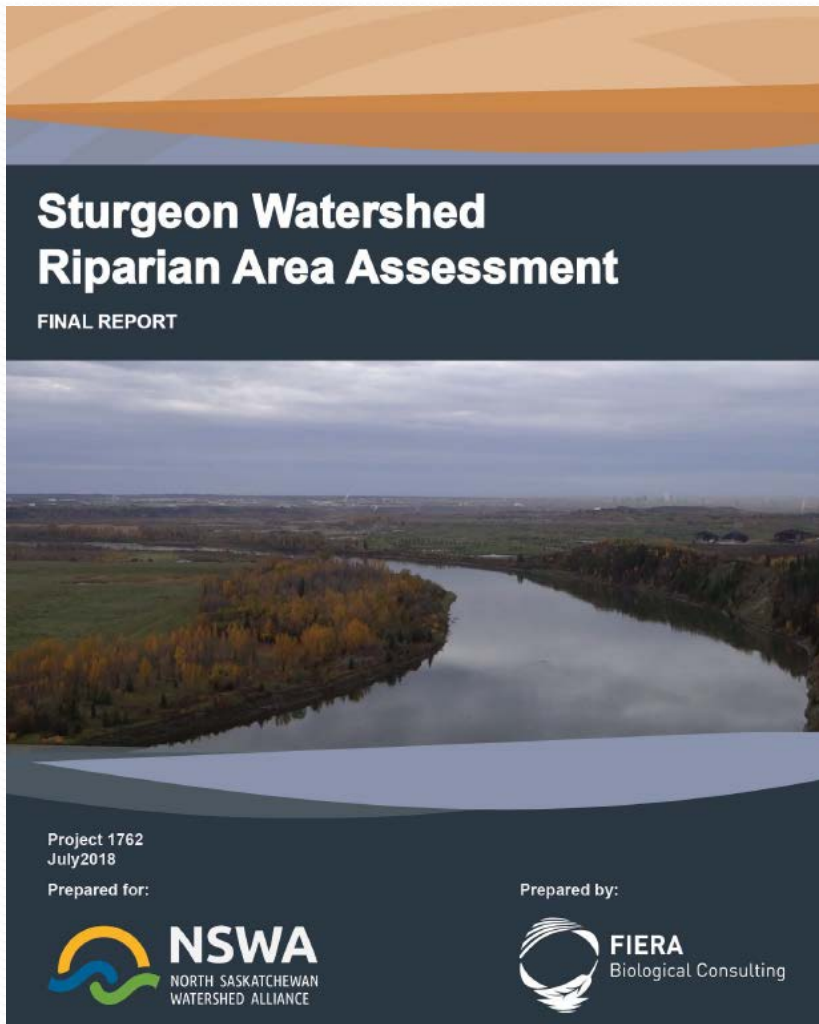
M1 Below Average
M2 Below Average
M3 Low

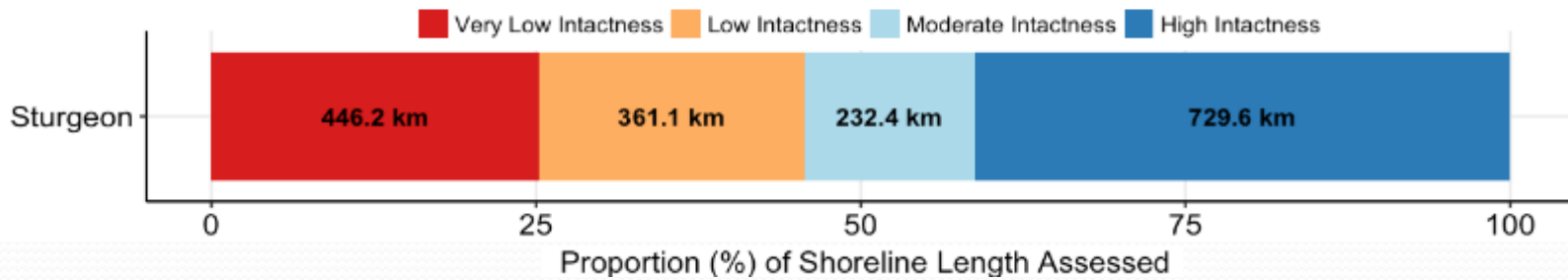
M9 Low
M10 Above Average
M11 Below Average
M12 Above Average

Riparian Conditions

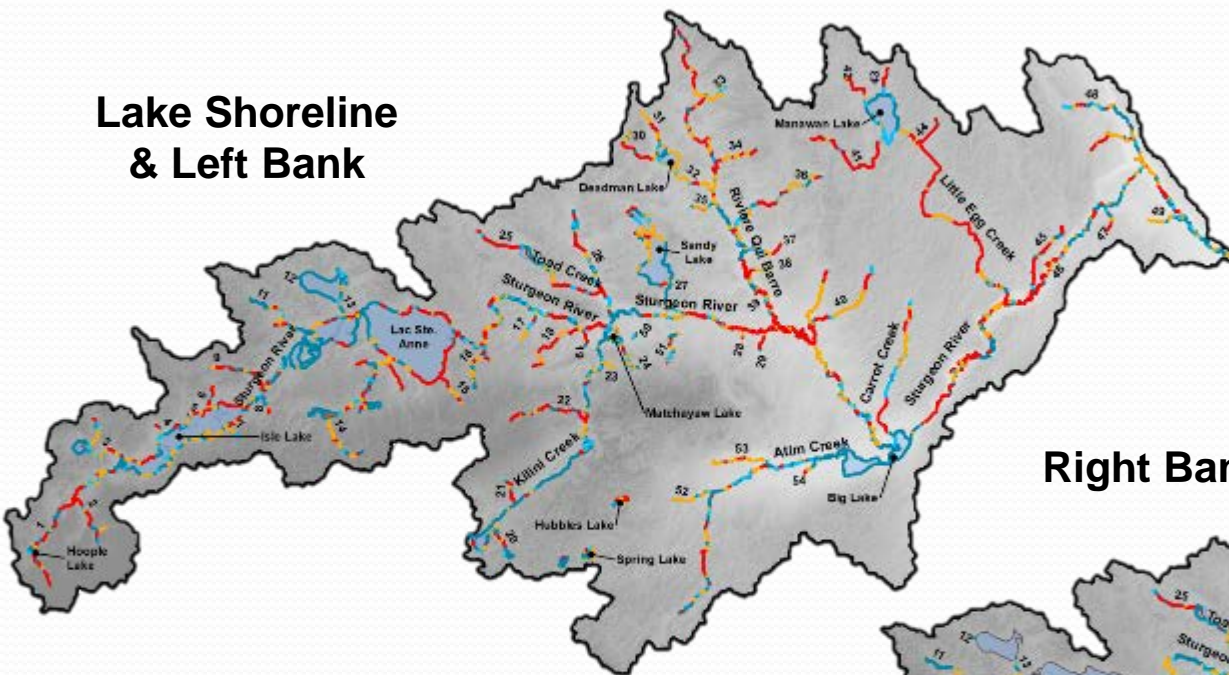
Findings:

- Almost 1800 kms of riparian shorelines assessed
- 45.6% very low or low intactness
- 54.4% moderate or high intactness
- Less healthy riparian area means less water quality filtering capability, less 'sponginess' and less wildlife habitat
- Management tools including riparian setback policies, riparian conservation and restoration efforts, incentive programs for landowners

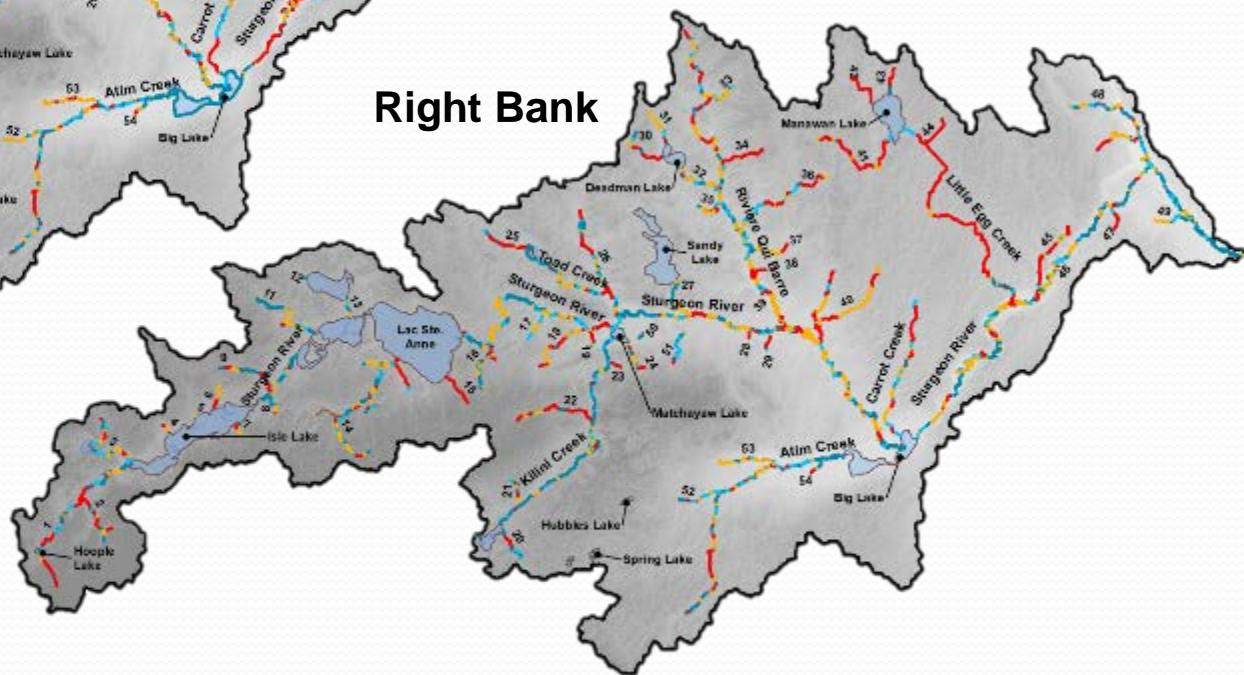




Lake Shoreline & Left Bank

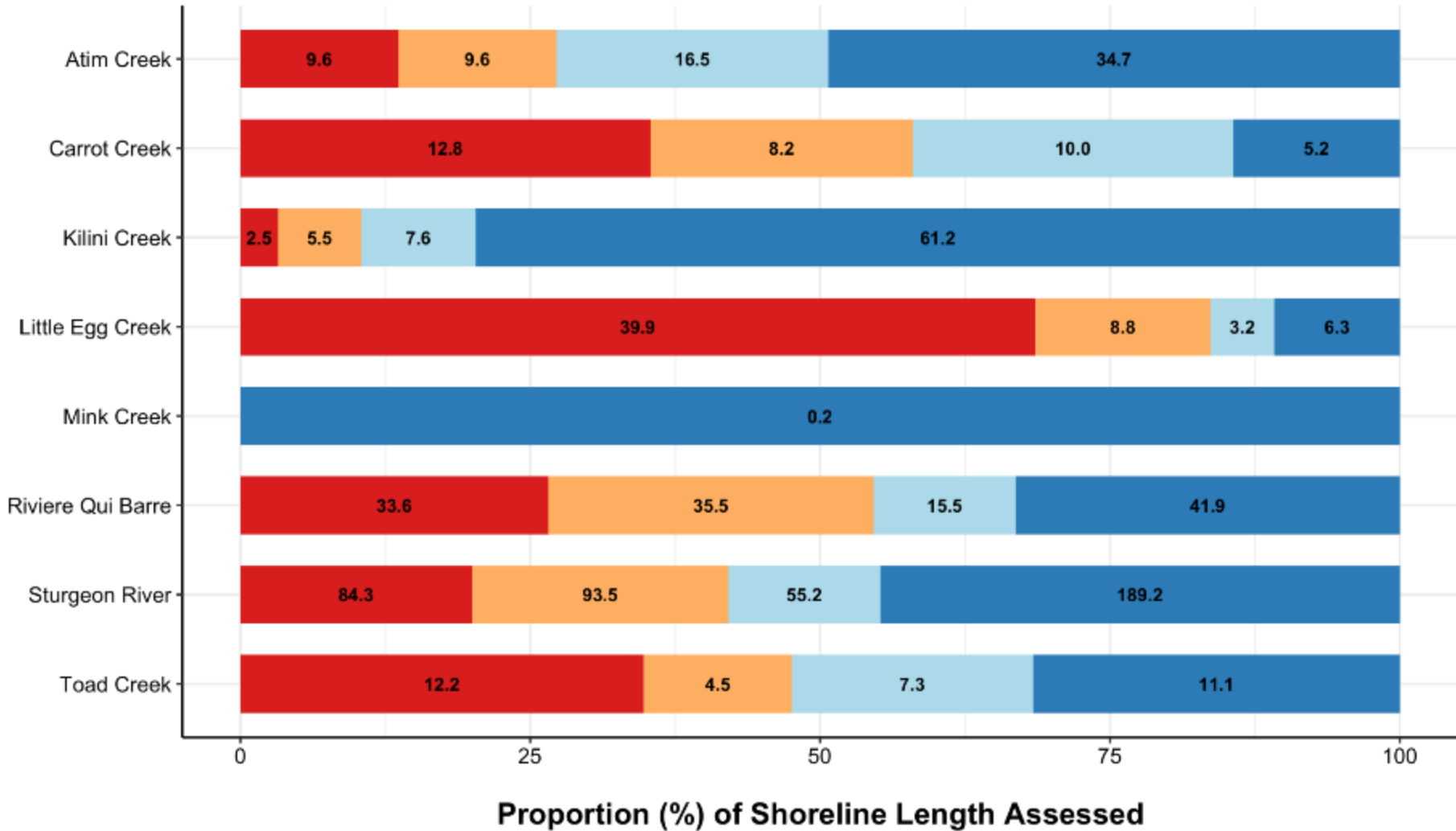


Right Bank



Very Low Intactness Low Intactness Moderate Intactness High Intactness

Waterbody Name



Policy and Plan Alignment

Findings

- Policies, programs, development standards vary between municipalities
- Edmonton Regional Board - Natural Living Systems Objectives
- Developments are often looked at individually, rarely cumulatively or at watershed scale

Key Take Away:

- Opportunities for alignment (floodplains and shorelines, top of bank determinations, riparian setbacks, protection of environmentally sensitive areas such as wetlands)

Planning Tools for the Sturgeon River Watershed



Submitted to:



March 20, 2019

Submitted by:



#605 10080 Jasper Avenue
Edmonton, AB T5J 1V9
Ph: 780.423.6824 Fax: 780.423.6840
email: armin@parioplan.com
www.parioplan.com

Priorities and Next Steps 2021 - 2023

- Riparian and Wetland Conservation and Restoration Strategies
- Water Quality/Aquatic Ecosystem Monitoring Program
- Watershed Planning Alignment and Tools (flood risk areas, riparian setbacks, environmentally sensitive areas, overlay maps)
- Communications and Engagement (Educational forums, workshops, information resources)

Sturgeon River Watershed Alliance

*Thank You !
Questions?*

www.nswa.ab.ca



Sturgeon River Watershed Alliance

