

Lakes of the Stony Plain Region - 2021 Survey Proposal

Background

There are several dozen small kettle lakes located on the post-glacial landscape of Parkland County known as the *Carvel Pitted Delta*. These unique lakes and their watersheds primarily drain into the Sturgeon River sub-watershed; some portions drain directly south towards the North Saskatchewan River. There are approximately 25 named lakes and 70 unnamed lakes in this area. These small lakes and their associated landscapes are considered to have unique ecological value by local and provincial governments, as well as by conservation agencies. They provide ecosystem services and habitat to support fish, wildlife and waterfowl populations. They also provide extensive opportunities for nature pursuits and outdoor recreation.

Their small watersheds continue to change, mostly as the result of human encroachment. The lakes are now surrounded by varying proportions of forested, agricultural and recreational land, and by rural residential development. Some lakes have been impacted by human activities while some on private lands remain relatively pristine. These “hummocky” landscapes and lakes also play a significant role in regional groundwater recharge patterns, as described in a recent report entitled “*Hydrogeology of the Sturgeon River Watershed*” by Oiffer (2019):

<https://www.nswa.ab.ca/resource/groundwater-conditions-sturgeon-river-basin/> bullets

Although five named lakes had been sampled by the Alberta Lake Management Society (ALMS) in recent years, there is a general lack of current water quality and hydrologic data for most lakes. Only eight named lakes are monitored for summer water levels and water balances have only been prepared for three lakes. Some lakes have exhibited declining lake levels, while others have maintained more consistent levels. There is limited current information related to aquatic ecosystem health and sportfish capability, although a few lakes do have managed sport fisheries.

The 2020 Lake Survey Project

A preliminary project to update lake water quality and groundwater information was conducted by local volunteers in 2020, supported by ALMS, U. of A., and the MLMA. During summer 2020, twelve lake basins (4 named, 8 unnamed) were sampled to assess midsummer water quality. During winter 2021, 18 basins were sampled to assess late winter dissolved oxygen conditions; these included 13 previously unsampled, unnamed lakes located on private lands. The preliminary work conducted during summer 2020 has been summarized by Trew (2020) and a draft research paper has been prepared by Von Gunten et al. (2021):

<https://www.mayatanlake.ca/files/DTrewpres.pdf>

Von Gunten, K., D.O. Trew, B. Smerdon, D. Alessi. (2021). Phosphorus stability and natural controls of the glacial landscape for small lakes in central Alberta, Canada. (Submitted for publication).

The 2021 Lake Survey Proposal

The lakes of the Carvel Pitted Delta collectively form a significant regional water resource that has not been systematically investigated. The MLMA now proposes to work with several partners in summer 2021 (ALMS, NSWA, LSCC, SPFG/WGC, U. of A., Parkland County and private landowners) to conduct an expanded regional survey of these small lakes. The primary goal will be to develop an updated and improved regional overview of lake water quality. This preliminary initiative would be followed by further lake and watershed assessments during 2022-24. This updated information will support future land and water management decisions, and will be used to encourage local conservation and stewardship activities.

This project aligns strongly with the major Outcomes of the *Sturgeon River Watershed Management Plan (2020)*, specifically: Improved Water Quality; Healthy Aquatic Ecosystems; and Well-Managed Groundwater:

<https://www.nswa.ab.ca/resource/sturgeon-river-watershedmanagement-plan/>

This project also aligns strongly with the Goals of the *Mayatan Lake Watershed Management Plan (2016)* specifically: Management Direction 2.0 (Improve Aquatic Ecosystem Health); Direction 2.4 (Increase Public Knowledge and Understanding); and Direction 3.0 (Understanding Groundwater):

[\(https://www.nswa.ab.ca/resource/mayatan-lake-watershedmanagement-plan/\)](https://www.nswa.ab.ca/resource/mayatan-lake-watershedmanagement-plan/)

Proposed Activities Year One (2021)

1. Summer synoptic water quality survey (August): 20-25 lakes
2. Characterize general chemistry, T/DO and mixing characteristics.
3. Characterize trophic status and recreational water quality.
4. Collaborate with hydrogeologists to gain further insights into groundwater/surface water connections.
5. Evaluate data with local partners
6. Prepare summary technical report and public communications/educational products

Proposed Activities Years Two to Four (2022-2024)

1. Work with regional partners to evaluate watershed conditions, riparian health and hydrology.
2. Consolidate watershed delineation data for each lake
3. Consolidate bathymetric data for each lake: Surface Area/Volume
4. Investigate sportfish capability and overwintering potential.
5. Investigate landscape and water resource changes since European settlement.

6. Work with regional partners to improve community awareness of lake conditions and understanding of ecosystems good and services provided by these lakes.
7. Promote educational and research opportunities
8. Promote stewardship and conservation initiatives
9. Evaluate data with local partners
10. Prepare technical reports and public communications/educational products

Preliminary Listing of Lakes

NTS Map Sheet 83 G/9: 17 named lakes

Spring, Cottage, Mink, Star, Johnny's, Hubbles, Eden, Soldan, Glory, Gerharts (Roi)

Kettle, Chickakoo, Sauer, Byers, Mere, Cameron, Bell (+ 45 unnamed lakes)

NTS Map Sheet 83 G/8: 5 named lakes

Mayatan, Jackfish, Hasse, Longhurst, Whale (+ 22 unnamed lakes)

NTS Map Sheet 83 H/12: 3 named lakes

Gladu, Muir, Atim,