



**South Saskatchewan River
Watershed Stewards**

Love Your Lake

Pike Lake, Saskatchewan



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Background

Pike Lake is an oxbow lake that is approximately 9.5 km long and 4.5 km wide and has been cut off from the meandering South Saskatchewan River. The South Saskatchewan River is approximately 3 kilometers east from the south end of the lake and approximately 1.5 kilometers east from the north end of the lake.



Figure 1. Map of Pike Lake

Pike Lake is located approximately 35 km southwest of Saskatoon. With its proximity to Saskatoon, Pike Lake is almost exclusively a recreational lake used for:

- Nature appreciation
- Socializing
- Swimming
- Cross-country skiing
- Hiking
- Power boating
- Fishing
- Ice fishing
- Canoeing or kayaking
- Ice skating
- Pontoon boating
- Sailing
- Snowmobiling
- Paddle boating
- Mountain biking
- Snowshoeing
- ATVs
- Wind surfing
- Hunting
- Water skiing/Wake boarding
- Scuba diving
- Jet skiing
- Camping

Recreational activities are important year round, thus, the water quality of the lake is vital for its prosperity. In recent years, aquatic weeds have flourished making the lake aesthetically unappealing to its annual visitors and permanent residents.

Pike Lake is characterized as being a shallow oxbow lake with a maximum depth of 3 meters. Since this is a shallow lake, fish species such as the Northern Pike live in this lake. Other species of fish such as Rainbow Trout and Yellow Perch can be found in Pike Lake as well. The abundance of aquatic vegetation in the lake is becoming a concern for maintaining the recreational fishery. Too many weeds can contribute to winter fish kills, thus decreasing fish biodiversity and recreational fishing opportunities on the lake.

Filtration of the lake is sustained by water flowing into the south end of the lake from a creek and flowing out from the north end of the lake to Moon Lake. The creek located at the south end of the lake has had problems with flooding due to beaver dams. The water level is maintained for recreational purposes by the Saskatchewan Watershed Authority's Operations division. It is maintained by a control structure at the north end of the lake. There are numerous artesian wells found around the lake.

A boy scout's camp is located on the north end of the lake. At the southwest end of the lake, Pike Lake Provincial Park has a campground, a beach area, a swimming pool, a mini golf course, and a convenience store. The lake has numerous cabins and homes that rely on the health of the lake. To combat the weeds, the Pike Lake Cottage and Watershed Association possess a weed harvester in attempt to alleviate weed growth. It is operated by volunteers who harvest the weeds throughout the summer months. In association with the South Saskatchewan River Watershed Stewards Inc., a source water protection plan has been implemented at Pike Lake.

Lake Ecology

An ecological description of Pike Lake is important in understanding the dynamics of the lake. Pike Lake is located in the prairie ecozone and the moist mixed grassland ecoregion of the province. The mean annual temperature of this region is approximately 2.5°C. The mean summer temperature is 15.5°C and the mean winter temperature is -11°C. This ecoregion marks the northern extent of open grassland in the province, and is closely correlated with semi-arid moisture conditions and dark brown soils. Most landscapes are comprised of glacial till, and have short, steep slopes and numerous undrained depressions or wetlands, although several large, level glacial lake plains also occur. Native vegetation is confined largely to non-arable pasture lands, where speargrasses and wheatgrasses, along with deciduous shrubs such as snowberry, rose, chokecherry, and wolf willow are among the more common species.

The moist mixed grassland ecoregion comprises a broad plain that is interrupted by deep, scenic valleys and subdued, hilly uplands. The primary slope of the plain is downward to the north and east, in accordance with the slope of the bedrock surface. Most of the region has a cover of glacial drift that is sufficiently thick to obscure the underlying topography. Secondary slopes from the uplands to drainage systems such as the South Saskatchewan, Qu'Appelle, and Souris rivers occasionally break the general northeastward slope of the plain. Level to gently undulating glaciolacustrine and glacial till plains that seem almost endless typify this ecoregion,

but hummocky morainal uplands, sand dunes, and local badlands provide diversity. The plains generally lie between 500 and 600 m. the uplands protrude 50 to 200 m above the adjacent plain, with the Neutral and Bear hills reaching elevations of 700 m and more. Although the break from the plains to the uplands is usually gradual and unspectacular, prominent escarpments such as the Missouri Coteau are striking features. The valleys of the Souris, Qu'Appelle, and South Saskatchewan rivers, sometimes entrenched 100 m or more into the plain, are major contributors to the geography of the region. These river valleys form part of the Nelson River drainage basin.

This ecoregion has dark brown chernozemic soils that are characteristic of this region. This soil type has formed due to the large amounts of organic matter in the mixed grassland and slower rates of decomposition in this cooler part of the mixed-grass prairie. Dark brown soils have a dark colored surface layer that is higher in organic matter than those in the brown soil zone, but lower than in the black zone. Soils tend to be thin and lower in organic matter on upper slopes, becoming progressively thicker and higher in organic matter on mid and lower slopes, in response to an increased supply of soil moisture and plant growth. Brown soils occur on prominent south-facing local and regional slopes where more arid conditions result in reduced growth. Black soils occur on prominent north facing slopes and in lower slope positions on steeply sloping topography, where fescues and other grasses that typify the aspen parkland prevail.

Small aspen groves are typically found around wetlands and are a characteristic feature of the landscape, particularly as compared to the drier Mixed Grassland ecoregion which is largely treeless. The prairie potholes or wetlands provide a valuable habitat for waterfowl. Mule deer and white-tailed deer are conspicuous wildlife species. Other notable species include coyote, red fox, badger, Richardson's ground squirrel and jack rabbit.

The western meadowlark, eastern kingbird, yellow-headed blackbird, sharp-tailed grouse and Franklin's gull are typical birds. Agriculture is by far the dominant land use, with cereals being the main crop. Feed grains, forage crops and oilseeds are also grown, but to a lesser extent than in the Aspen Parkland.

Introduction to Program

The Love Your Lake program was developed in Ontario by the Canadian Wildlife Federation and Watersheds Canada. This program was developed to assess lake shorelines and determine ways that property owners can improve their shorelines to benefit the overall health of the lake. The objective of this program is to improve shorelines and overall lake health by identifying shoreline issues and providing property owners with stewardship options. In 2016, the South Saskatchewan River Stewards Inc. implemented this program for Pike Lake. The 2016 program was introduced to the Pike Lake Cottage and Watershed Association at their annual general meeting on June 4th. On July 4, 14, 18, 25, 27 and August 5th, shoreline assessments

took place. After each parcel of land has been assessed by boat on the lake, the data was entered into a database to use for making personalized property reports for each property owner.

Methodology

There were a number of things that had to be done in order to make sure that this program would be successful at Pike Lake. First of all, we arranged two meetings so that we could notify the public that we were planning on doing this program. The first meeting was the Annual General Meeting, June 4, 2016 for the Pike Lake Cottage and Watershed Association where we engaged the public and answered questions and listened to their concerns about the program. The Annual General Meeting, June 15, 2016 for the Pike Lake Harvester Group was also attended. Prior to conducting the shoreline assessments, surveys were sent out to all of the property owners around the lake. We mailed out 150 surveys on June 13, 2016 and received 36 surveys back. The survey data was then compiled in an excel spreadsheet. Once the surveys were sent out and we secured a boat driver, start the shoreline assessments using the Saskatchewan Love Your Lake shoreline assessment protocols and forms. The boat driver that we had also had a part time job so we had to schedule the assessments around his work schedule. We completed a total of 140 assessments on Pike Lake.

Results and Conclusion

A total of 140 assessments were done at Pike Lake. Based on the data that was collected and the assessments that were done on Pike Lake there are some results that can be drawn from this data. It can be noted that a large majority of properties around Pike Lake are either natural or regenerative which is best for the health of the lake. Pike Lake properties also have a lot of rip rap along the shoreline, this is to prevent shoreline erosion and also to prevent muskrats from digging in the shorelines. There is also excellent growth of vegetation along the shorelines, however, in Pike Lake's case there is excessive aquatic vegetation growth within the lake. A total of 150 surveys were sent out to property owners and 37 were completed. After receiving the completed surveys, the data was compiled on spreadsheet in excel to analyze the results of the data. The survey responses that were assessed were taken from the following questions:

Question 6: How long have you and your family been on your lake? (Years)

Question 9: What do you see as the top three issues facing your lake and your lake use?

Question 10: Please identify the top three actions you believe should be undertaken to benefit your lake and lake community.

Question 11: Describe your lake's water quality.

Question 13: Are you interested in learning more about how your activities as a shoreline property owner can affect water quality, wildlife habitat, and the overall health of your lake?

Question 14: Would you be interested in participating in stewardship projects/activities related to your lake?

Table 1. Summary of Pike Lake Survey Results

Average Years on Lake:	Top 3 Concerns:	Top 3 Actions That Should be Taken to Benefit the Lake and Lake Community:
23	Water quality (86%)	Engage in a septic reinspection program (41.6%)
	Water levels (83%)	Undertake a lake management plan (41.6%)
	Faulty and poorly maintained septic (27.7%)	Undertake more water quality testing (38.8%)
	Boating (19.4%)	Provide education materials to property owners on a variety of subjects (25%)
	Shoreline development (13.8%)	Engage more property owners in lake activities (19.4%)
	Weeds (13.8%)	Limit boat wakes near shore (16.6%)
	Cottage conversions (11.1%)	Improve communication between property owners and lake association (16.6%)
	Fish populations (11.1%)	Plant trees and shrubs along shore (11.1%)
	Noise pollution (8.3%)	Create or enforce stricter rules for new development (5.5%)
	Wildlife (8.3%)	Create or enforce stricter rules for redevelopment (5.5%)
	Light pollution (2.7%)	Stop mowing grass close to shore (2.7%)
How People View the Water Quality:	Learning More about Impacts to Shoreline:	Stewardship Participation:
Poor (50%)	Yes (77.7%)	Yes (44.4%)
Good (23%)	No (22.2%)	No (52.7%)
Don't know (13.8%)		Maybe (2.7%)
No answer (11.1%)		

Table 2. Summary of Shoreline Observations

Shoreline Assessment: General Observations	
Good:	Bad:
Natural shorelines have been maintained	Fences placed along shoreline
Regenerative shorelines	Erosion due to development
	Poor water quality



Photo 1. Weeds that have been cut by the harvester.



Photo 2. An example of a natural/regenerative shoreline on Pike Lake.

In conclusion, the water quality of Pike Lake is a management concern with the increase of aquatic weed growth. The 2016 shoreline assessments revealed that some shoreline degradation has occurred due to erosion and cottage development. In an attempt to help improve the lake's water quality, we will be conducting nutrient and septic assessments next summer. Since the majority of the properties along Pike Lake have a natural shoreline or a regenerative shoreline, shoreline enhancement, such as the Natural Edge Program, will not occur at this lake in the near future.

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References

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