



Invasive Plant and Macrophyte Survey Pilot
2014

Sylvan Lake
2014 Macrophyte Survey Results

COMPLETED WITH SUPPORT FROM:



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ACKNOWLEDGEMENTS:

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Report prepared by Alyssa Cloutier

Site Information

Sylvan Lake is a large lake located in the Red Deer River Basin¹. Its shoreline extends 36 km and has an area of 42.8 square km². Lake sediments are mainly composed of inorganic sand, gravel and rock¹. Submerged macrophytes located in previous surveys of the lake include pondweeds (*Potamogeton* spp.), water buttercup (*Ranunculus circinata*), Canada waterweed (*Elodea canadensis*) and *Chara* spp., a macroalgae¹. Emergent species include Bulrush (*Scirpus* spp.) and Cattail (*Typha latifolia*)¹. Sylvan Lake is known for its water clarity with historic secchi disk readings exceeding 4 metres¹. Sylvan is classified as a mesotrophic lake².

Sampling Procedure

Using a dual sided rake, the entire perimeter of Sylvan Lake was sampled mainly in 500 m to 1 km intervals. Initially, transects of four points at four different depths were to be taken at each interval. However, the lack of macrophytes even at the shallowest depth prompted a change in methodology. Areas more dominant in macrophytes were sampled more rigorously, with multiple sampling points, while areas with bare or near bare sediment were sampled only once. Voucher samples were taken for each species observed and submitted for archiving at the University of Alberta herbarium.

General Observations

The lake bottom was visible from most sampling locations with the main exclusion being at the marina, which had obvious changes in water clarity and colour. The benthic (lakebed) region is dominated by macro-algae, *Chara* spp., and few small tuft-like macrophytes not retrievable by rake. Areas with more rock and gravel appeared to have less macrophyte growth.

Survey Results: June

Sampling took place on June 26, 2014. Early in the season the lake was very clear, with a Secchi depth of 4.25 m. Aquatic plants were sampled along the littoral zone in water depths ranging from 0.9 m to 5.9 m. Five species were collected and identified. The two dominant species in June were Sheathing Pondweed (*Potamogeton vaginatus*) and Richardson's pondweed (*Potamogeton richardsonii*)

¹ University of Alberta Department of Biological Sciences. (2005). Atlas of Alberta Lakes. Retrieved 07 22, 2014, from <http://sunsite.ualberta.ca/Projects/Alberta-Lakes/>

² Alberta Lake Management Society. (2012). 2012 Sylvan Lake Report. Retrieved 07 22, 2014, from ALMS Lakewatch: <http://alms.ca/wp-content/uploads/2014/01/Sylvan-2010.pdf>

with 10 and 8 occurrences, respectively. Of 92 sampling locations, there were 23 occurrences of macrophytes. No invasive species were detected.

Table 1.0. Macrophyte species observed in Sylvan Lake on June 26, 2014.

Common Name	Species Name	Number of Occurrences
Northern Water-milfoil	<i>Myriophyllum sibiricum</i>	3
Richardson's Pondweed	<i>Potamogeton richardsonii</i>	8
Sheathing Pondweed	<i>Potamogeton vaginatus</i>	10
Fan-leaf Water Crowfoot	<i>Ranunculus circinatus</i>	1
Bladderwort	<i>Urticularia vulgaris</i>	1

Survey Results: July

The second sampling trip occurred on July 23, 2014. A secchi disk reading of 4.5 m was observed in the center of the lake. Sampling locations occurred at depths ranging from 0.5 m to 4.2 m. The dominant species in found in June were also the dominant species in July. Over the month of growth, there was an increase in diversity as well as number of occurrences. A larger diversity and density of macrophytes was noticeable in the area just outside the marina, as well as the area in the north portion of the lake where the creek enters. Six more species were observed in July than in June. Of 78 sampling locations there were 62 occurrences of macrophytes (this may include multiple species observed in a single location). Eleven different species were observed; no invasive species were detected.

Table 2.0. Macrophyte species observed in Sylvan Lake on July 23, 2014.

Common Name	Species Name	Number of Occurrences
Mare's tail	<i>Hippuris vulgaris</i>	1
Northern Water-milfoil	<i>Myriophyllum sibiricum</i>	7
Slender-leaf Pondweed	<i>Potamogeton filiformis</i>	1
Fries' Pondweed	<i>Potamogeton friesii</i>	2
White-stem Pondweed	<i>Potamogeton praelongus</i>	1
Richardson's Pondweed	<i>Potamogeton richardsonii</i>	21
Sheathing Pondweed	<i>Potamogeton vaginatus</i>	22
Fan-leaf Water Crowfoot	<i>Ranunculus circinatus</i>	3
Arrowhead	<i>Sagittaria cuneta</i>	1
Bulrush	<i>Scirpus</i> spp.	2
Bladderwort	<i>Utricularia vulgaris</i>	1

Map of Survey Results

The map below depicts the locations that were sampled and had a positive presence of macrophytes. Blue flags indicate June survey points; green flags indicate July survey points. Refer to the Appendix for a complete listing of species observed and their locations.

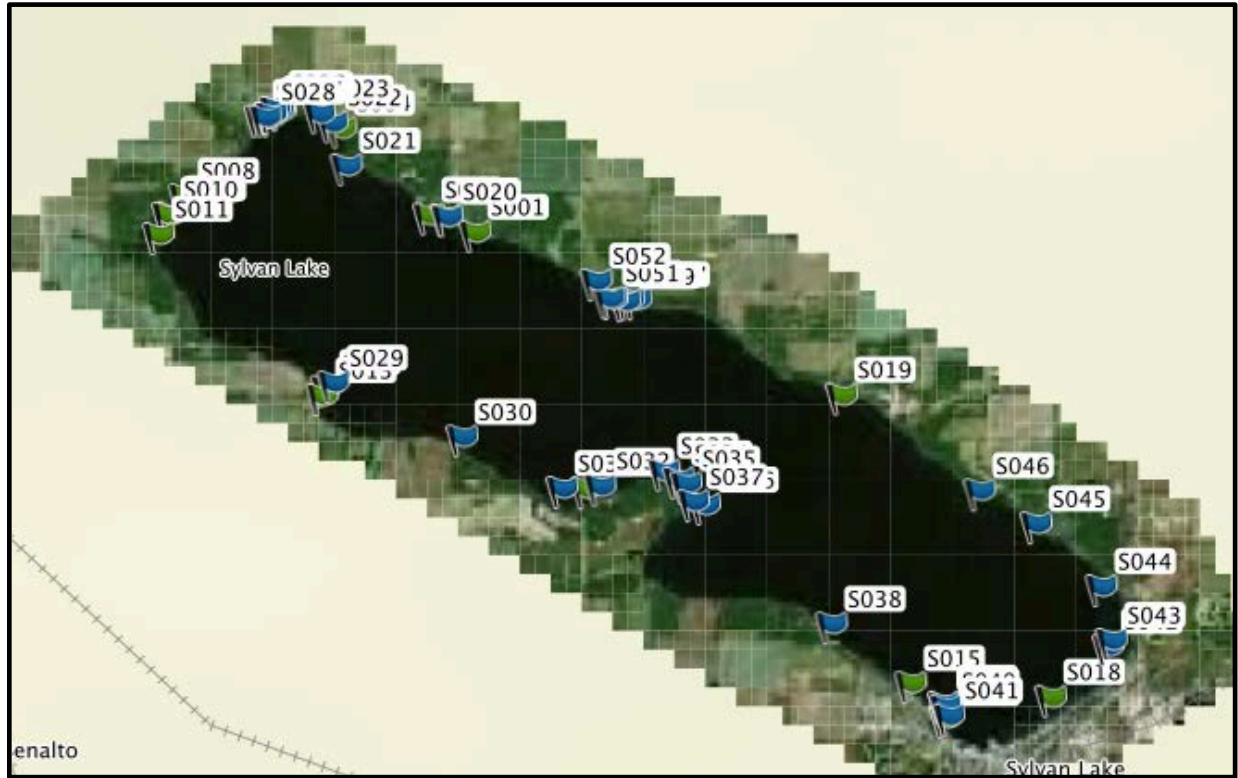


Figure 3.0. Locations sampled with a presence of macrophytes.

Appendix

Table A.1. Complete listing of plant species present in Sylvan Lake throughout June and July surveys.

Point name	GPS Location	Species Present	Total Species
S001	11 U 691375 5807388	<i>P. vaginatus</i>	1
S002	11 U 691021 5807639	<i>P. richardsonii</i>	2
S003	11 U 690810 5807644	<i>P. richardsonii</i>	1
S004	11 U 689693 5809008	<i>P. richardsonii</i>	1
S005	11 U 688821 5809203	<i>M. sibiricum</i> <i>R. circinatus</i>	2
S006	11 U 688850 5809158	<i>P. vaginatus</i>	1
S007	11 U 688710 5809150	<i>P. richardsonii</i>	1
S008	11 U 687851 5807839	<i>P. vaginatus</i>	1
S009	11 U 687707 5807548	<i>P. vaginatus</i>	1
S010	11 U 687654 5807531	<i>P. richardsonii</i>	1
S011	11 U 687558 5807208	<i>P. richardsonii</i>	1
S012	11 U 689680 5804807	<i>P. vaginatus</i>	1
S013	11 U 689637 5804675	<i>P. vaginatus</i> <i>M. sibiricum</i>	2
S014	11 U 692894 5803288	<i>P. vaginatus</i> <i>P. richardsonii</i>	2
S015	11 U 696941 5800297	<i>P. richardsonii</i>	1
S016	11 U 697376 5799792	<i>M. sibiricum</i>	1
S017	11 U 697389 5799749	<i>P. vaginatus</i>	1
S018	11 U 698642 5800145	<i>P. vaginatus</i>	1
S019	11 U 695915 5804930	<i>P. vaginatus</i>	1
S020	11 U 691029 5807621	<i>H. vulgaris</i> <i>P. richardsonii</i> <i>P. vaginatus</i>	3
S021	11 U 689783 5808403	<i>S. cuneata</i>	1
S022	11 U 689583 5809094	<i>P. richardsonii</i> <i>M. sibiricum</i>	2

S023	11 U 689425 5809236	<i>M. sibiricum</i> <i>U. vulgaris</i>	2
S024	11 U 688952 5809255	<i>P. richardsonii</i> <i>P. vaginatus</i> <i>M. sibiricum</i>	3
S025	11 U 688936 5809286	<i>P. richardsonii</i> <i>P. vaginatus</i> <i>R. circinatus</i>	3
S026	11 U 688891 5809295	<i>P. vaginatus</i> <i>M. sibiricum</i>	2
S027	11 U 688844 5809199	<i>P. richardsonii</i> <i>R. circinatus</i>	2
S028	11 U 688772 5809152	<i>P. richardsonii</i>	1
S029	11 U 689763 5804882	<i>P. vaginatus</i> <i>Scirpus</i> spp.	2
S030	11 U 691350 5804067	<i>P. richardsonii</i>	1
S031	11 U 692592 5803284	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S032	11 U 693054 5803343	<i>P. vaginatus</i>	1
S033	11 U 693822 5803615	<i>P. richardsonii</i>	1
S034	11 U 693995 5803498	<i>P. richardsonii</i>	1
S035	11 U 694093 5803418	<i>P. richardsonii</i> <i>P. vaginatus</i> <i>M. sibiricum</i> <i>Scirpus</i> spp.	4
S036	11 U 694330 5803085	<i>P. vaginatus</i>	1
S037	11 U 694194 5803130	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S038	11 U 695942 5801218	<i>P. richardsonii</i>	1
S039	11 U 697349 5799996	<i>P. praelongus</i> <i>P. vaginatus</i>	2
S040	11 U 697377 5799946	<i>P. filiformis</i>	1
S041	11 U 697421 5799798	<i>P. friesii</i> <i>P. richardsonii</i> <i>P. vaginatus</i> <i>M. sibiricum</i> <i>R. circinatus</i>	5
S042	11 U 699306 5800995	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S043	11 U 699340 5801093	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S044	11 U 699188 5801958	<i>P. vaginatus</i>	1
S045	11 U 698354 5802938	<i>P. vaginatus</i>	1
S046	11 U 697648 5803444	<i>P. vaginatus</i>	1
S047	11 U 693365 5806369	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S048	11 U 693279 5806359	<i>P. friesii</i> <i>P. richardsonii</i> <i>M. sibiricum</i>	3

S049	11 U 693234 5806336	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S050	11 U 693082 5806362	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S051	11 U 693045 5806380	<i>P. richardsonii</i> <i>P. vaginatus</i>	2
S052	11 U 692879 5806654	<i>P. vaginatus</i>	1