



PLM Lake & Land Management Corp.

Northern Division

P.O. BOX 424 Ewart, MI 49631

800-382-4434 ext. 2200 (o) 231-372-5900(f)

www.plmcorp.net

On-Site Lake Evaluation Record

Lake Name: Six Mile Lake

County: Antrim/Charlevoix

Evaluated by: Mitch Hiler

Reviewed by: Bre Grabill

Date: 10 September 2015

Purpose of evaluation: End of season survey

Evaluations Performed

Aquatic Vegetation Evaluation

- ☒ Aquatic vegetation survey
- ☐ Aquatic vegetation brief check

Vegetation evaluation methods

- ☒ Visual evaluation
- ☒ Sample collection with rake
- ☐ Sonar profiling
- ☐ GPS-mapped sample locations

x Water quality sampling

- ☒ On-site (Temperature, DO, Secchi disk)
- ☒ Water samples collected for
_____TP, TN, ALK_____ analysis

☐ GPS data collection

- ☐ Depth survey
- ☐ Shoreline mapping
- ☐ Reference point location

☐ Other _____

Overall Condition of Lake

- ☐ excellent (no problems or developing problems noted)
- ☒ very good (no immediate action required)
- ☐ fair (management required soon)
- ☐ poor (management needed as soon as possible)
- ☐ very poor (management action past due—IMMEDIATE response required)

Problems Noted

- ☒ Growth of exotic plants (mark locations on map)
 - ☒ Eurasian watermilfoil
 - ☐ curlyleaf pondweed
 - ☒ other Variable leaf milfoil
- ☒ Excessive growth of native plants (note plant species and mark locations on map)
- ☐ Excessive filamentous algae growth (mark location on map)
- ☐ Poor water clarity
- ☐ Blue-green algal blooms



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RECOMMENDATIONS

- X Monitoring Program:
Continue monitoring program next season: ☒ Yes, ☐ No
- X Herbicide application: Continue Program Next Season
Need for herbicide treatments next season: ☐ urgent, ☒ serious, ☐ moderate, ☐ slight
- X Algaecide application: Continue Program Next Season
Need for algae treatments next season: ☐ urgent, ☐ serious, ☒ moderate, ☐ slight

NOTES

Six Mile Lake was surveyed on 10 September 2015. Water quality samples were collected at this time as well. The 2015 water quality report is issued with the spring results on a separate report.

Six Mile Lake was surveyed multiple times throughout the season to monitor and track exotic plants as well as native growth in the lake. In 2015, in addition to treatments for milfoil species, treatments for algae occurred as required. Algae growth will vary seasonally and is impacted daily with weather and available nutrients. Filamentous algae is permitted to be treated in developed shoreline areas of the lake. Algae was treated on Six Mile Lake on 6/16, 6/30 (partial treatment), 7/1 (partial treatment), and 7/29. Algae may need to be treated in 2016 and is only recommended for treatment when it is causing a recreational, navigational or aesthetic issue on the lake. The need for algae control will vary, as it wasn't required in previous years to the degree it was in 2015.

Eurasian watermilfoil and variable leaf milfoil were targeted for control on 6/16 and again on 8/4. Since the initial treatment, very little milfoil has been found growing. As the milfoil continues to resurge and become more evident in the water column, treatment recommendations may change; however, based on the current growth found, the treatment program has been very effective. It is recommended to continue to survey and spot treat for milfoil as found in the lake. Based on the size of the treatment beds, depth, hybrid species, etc; treatment rates have increased over the last few years and may increase again in the future. New research is showing that hybrid milfoil requires a higher application rate than its parent biotype, Eurasian watermilfoil. Currently, all treatments have fallen within and below budget and the 2016 proposed budget should be sufficient based on previous growth.

Native plants were present in the lake and by mid to late season, some plants are causing a nuisance in certain areas of the lake. Having a diverse and dense native plant community post milfoil treatment supports the selectivity and success of the treatments performed. Residents are encouraged to rake their beaches and remove debris and floating boat chop. If and when native plants become an issue requiring additional control, management options can be worked into the treatment program.

It is recommended to continue to monitor Six Mile Lake with both surveys and water quality monitoring in 2016. Management focus should remain on exotic submersed plants and if approved in the future, terrestrial plants. Additional treatment for algae and/or other concerns can again be incorporated into the program if required and approved throughout the season.

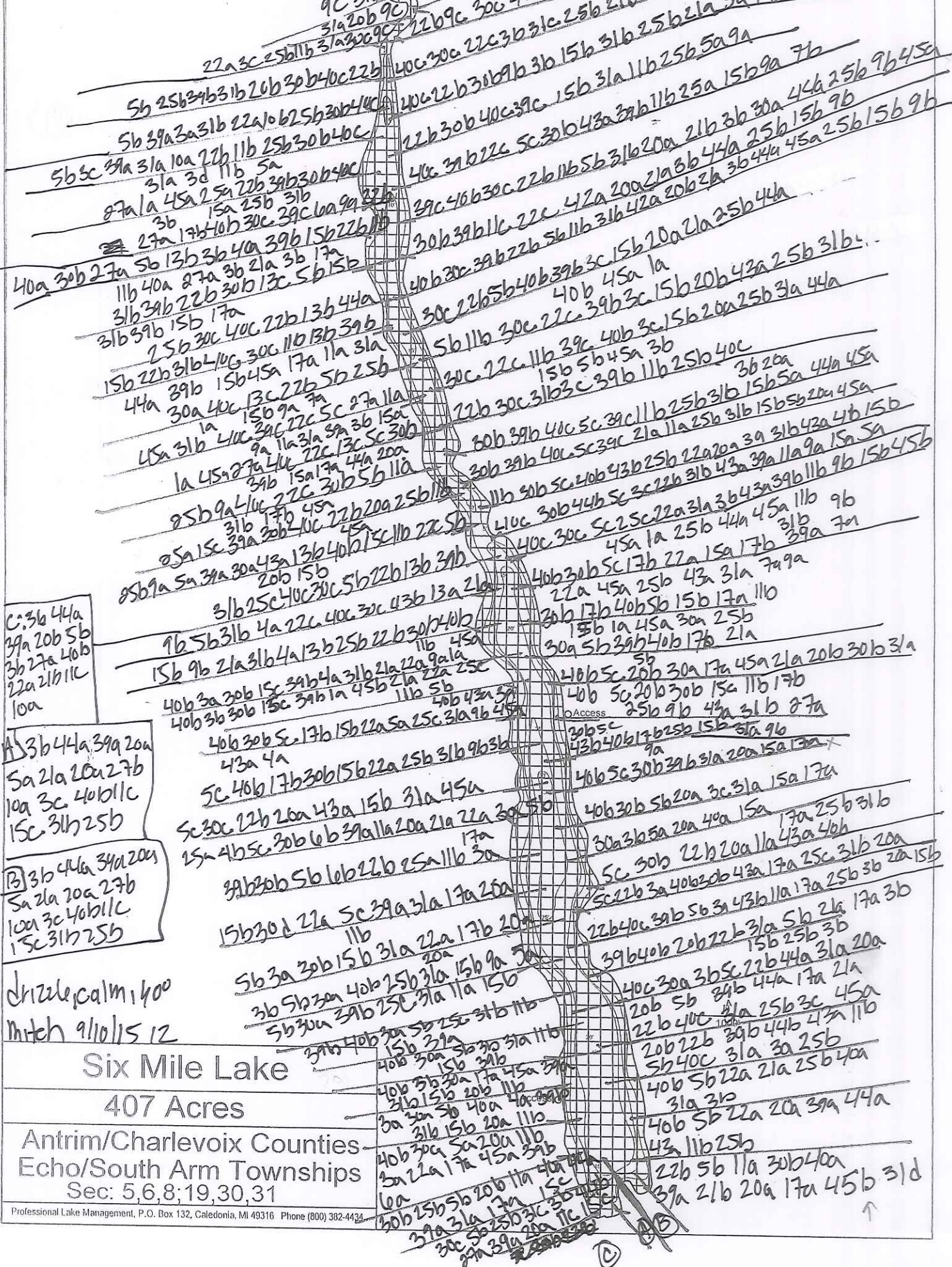
Please contact me with questions or concerns.

BreAnne Grabill, Environmental Scientist
Northern Lakes Manager
PLM Lake & Land Management Corp. North
breg@plmcorp.net

		Total number of AVAS's for each Density Category				Calculations				Sum of Columns 5-8	Total No. of AVAS	Col 9 divided by Col 10
Code		A	B	C	D	A x 1	B x 10	C x 40	D x 80			
No	Plant Name	1	2	3	4	5	6	7	8	9	10	11
1	Eurasian watermilfoil	8	0	0	0	8	0	0	0	8	78	0.10
2	Curly leaf pondweed	0	0	0	0	0	0	0	0			
3	Chara	12	28	11	1	12	280	440	80	812	78	10.4
4	Thinleaf pondweed	5	2	0	0	5	20	0	0	25	78	0.32
5	Flatstem pondweed	14	40	21	0	14	400	840	0	1254	78	16.08
6	Robbins pondweed	2	2	0	0	2	20	0	0	22	78	0.28
7	Variable pondweed	3	2	0	0	3	20	0	0	23	78	0.29
8	White stem pondweed	0	0	0	0	0	0	0	0			
9	Richardsons pondweed	12	12	4	0	12	120	160	0	292	78	3.74
10	Illinois pondweed	4	1	0	0	4	10	0	0	14	78	0.18
11	Large leaf pondweed	12	32	6	0	12	320	240	0	572	78	7.33
12	American pondweed	0	0	0	0	0	0	0	0			
13	Floating leaf pondweed	1	6	3	0	1	60	120	0	181	78	2.32
14	Water stargrass	0	0	0	0	0	0	0	0			
15	Wild celery	8	37	9	0	8	370	360	0	738	78	9.46
16	Sagittaria (submersed)	0	0	0	0	0	0	0	0			
17	Northern watermilfoil	21	11	0	0	21	110	0	0	131	78	1.68
18	Green watermilfoil	0	0	0	0	0	0	0	0			
19	Two-leaved watermilfoil	0	0	0	0	0	0	0	0			
20	Coontail	30	14	0	0	30	140	0	0	170	78	2.18
21	Elodea	18	4	0	0	18	40	0	0	58	78	0.74
22	Bladderwort	17	30	10	0	17	300	400	0	717	78	9.19
23	Mini Bladderwort	0	0	0	0	0	0	0	0			
24	Buttercup	0	0	0	0	0	0	0	0			
25	Naiad	5	42	8	0	5	420	320	0	745	78	9.55
26	Brittle naiad	0	0	0	0	0	0	0	0			
27	Sago Pondweed	9	2	0	0	9	20	0	0	29	78	0.37
28	Cabomba	0	0	0	0	0	0	0	0			
29	Starry stonewort	0	0	0	0	0	0	0	0			
30	Water Lily	15	36	17	1	15	360	680	80	1135	78	14.55
31	Spatterdock	28	31	2	1	28	310	80	80	498	78	6.38
32	Water shield	0	0	0	0	0	0	0	0			
33	Lemna minor	0	0	0	0	0	0	0	0			
34	Greater duckweed	0	0	0	0	0	0	0	0			
35	Watermeal	0	0	0	0	0	0	0	0			
36	Arrowhead	0	0	0	0	0	0	0	0			
37	Pickereelweed	0	0	0	0	0	0	0	0			
38	Arrow arum	0	0	0	0	0	0	0	0			
39	Cattail	18	35	7	1	18	350	280	80	728	78	9.33
40	Bulrush	8	36	26	0	8	360	1040	0	1408	78	18.05
41	Iris	0	0	0	0	0	0	0	0			
42	Swamp loosestrife	2	0	0	0	2	0	0	0	2	78	0.03
43	Purple loosestrife	15	4	0	0	15	40	0	0</			

44-Water Margold

Outflow



Six Mile Lake

407 Acres

Antrim/Charlevoix Counties
Echo/South Arm Townships
Sec: 5, 6, 8, 19, 30, 31

Professional Lake Management, P.O. Box 132, Caledonia, MI 49316 Phone (800) 382-4434

03/22/16

Accrual Basis

PLM Lake and Land Management
Sales by Customer Detail
 January through December 2015

Date	Num	Memo	Qty	Sales Price	Amount
Six Mile Lake - Echo Township					
06/16/2015	146465	Discount South Arm Portion (56.61%)	-0.5661	13,240.68	-7,495.55
06/16/2015	146465	Milfoil Treatment of Lake Using Renovate OTF at 200lbs/acre	15	755.00	11,325.00
06/16/2015	146465	Algae Treatment of Lake	43	40.00	1,720.00
06/16/2015	146465	Fuel Surcharge	0.015	13,045.00	195.68
06/30/2015	146649	Echo Township Portion (43.39%)	-0.5661	533.00	-301.73
06/30/2015	146649	Algae Treatment of Lake	13	40.00	520.00
06/30/2015	146649	Fuel Surcharge	0.025	520.00	13.00
07/01/2015	146790	Discount Echo Township Portion (43.39%)	-0.5661	1,552.00	-878.59
07/01/2015	146790	Algae Treatment of Lake	38.8	40.00	1,552.00
07/29/2015	147495	Discount (South Arm Portion 56.61%)	-0.5661	1,407.60	-796.84
07/29/2015	147495	Algae Treatment of Lake	34.5	40.00	1,380.00
07/29/2015	147495	Fuel Surcharge	0.02	1,380.00	27.60
08/04/2015	147648	Discount Echo Township Portion (43.39%)	-0.5661	18,549.99	-10,501.15
08/04/2015	147648	EWM Treatment of Lake Using Renovate OTF at 200lbs/acre	23.6	755.00	17,818.00
08/04/2015	147648	EWM Treatment of Lake Using Sculpin G at 200lbs/acre	1	548.33	548.33
08/04/2015	147648	Fuel Surcharge	0.01	18,366.33	183.66
09/10/2015	149523	AVAS Survey of Lake	1	1,030.00	1,030.00
09/10/2015	149523	Water Quality Program	1	615.00	615.00
09/10/2015	149523	Discount for South Arm Portion (56.61%)	-0.5661	1,669.68	-945.21
09/10/2015	149523	Fuel Surcharge	0.015	1,645.00	24.68
12/14/2015	14163	Reimbursement for 2016 Permit Application Fee	1	650.85	650.85
Total Six Mile Lake - Echo Township			168.5884		16,684.73
TOTAL			168.5884		16,684.73

03/22/16

Accrual Basis

PLM Lake and Land Management
Sales by Customer Detail
 January through December 2015

Date	Num	Memo	Qty	Sales Price	Amount
Six Mile Lake - South Arm Township					
06/16/2015	146466	Discount Echo Township Portion (43.39%)	-0.4339	13,240.68	-5,745.13
06/16/2015	146466	Milfoil Treatment of Lake Using Renovate OTF at 200lbs/acre	15	755.00	11,325.00
06/16/2015	146466	Algae Treatment of Lake	43	40.00	1,720.00
06/16/2015	146466	Fuel Surcharge	0.015	13,045.00	195.68
06/30/2015	146656	Discount South Arm Portion (56.61%)	-0.4339	533.00	-231.27
06/30/2015	146656	Algae Treatment of Lake	13	40.00	520.00
06/30/2015	146656	Fuel Surcharge	0.025	520.00	13.00
07/01/2015	146795	Discount South Arm Portion (56.61%)	-0.4339	1,552.00	-673.41
07/01/2015	146795	Algae Treatment of Lake	38.8	40.00	1,552.00
07/29/2015	147494	Discount (Echo Township Portion 43.39%)	-0.4339	1,407.60	-610.76
07/29/2015	147494	Algae Treatment of Lake	34.5	40.00	1,380.00
07/29/2015	147494	Fuel Surcharge	0.02	1,380.00	27.60
08/04/2015	147661	Discount South Arm Township Portion (56.69%)	-0.4339	18,549.99	-8,048.84
08/04/2015	147661	EWM Treatment of Lake Using Renovate OTF at 200lbs/acre	23.6	755.00	17,818.00
08/04/2015	147661	EWM Treatment of Lake Using Sculpin G at 200lbs/acre	1	548.33	548.33
08/04/2015	147661	Fuel Surcharge	0.01	18,366.33	183.66
09/10/2015	149524	AVAS Survey of Lake	1	1,030.00	1,030.00
09/10/2015	149524	Water Quality Program	1	615.00	615.00
09/10/2015	149524	Discount for Echo Township Portion (43.39%)	-0.4339	1,669.68	-724.47
09/10/2015	149524	Fuel Surcharge	0.015	1,645.00	24.68
Total Six Mile Lake - South Arm Township			168.3816		20,919.07
TOTAL			168.3816		20,919.07