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2015 Assessment of Aquatic Plants in Treated Plots

Spring Endothall Treatment to Control Curlyleaf Pondweed

Red Cedar Lake *(#2109600)* and Hemlock Lake *(#2109800)*
Barron County, WI

Pretreatment Surveys – April 23, 2015
Posttreatment Surveys – June 1, 2015
Sediment Turion Surveys – Oct 22, 2015

Surveying, Analysis, and Reporting by:
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Funding Provided by:
Red Cedar Lake Association (Mikana, WI) with grant assistance from the Wisconsin DNR

Summary

Purpose of Surveys

Two plots, one in Red Cedar Lake and one in Hemlock Lake, were treated with endothall on May 8, 2015 to control curlyleaf pondweed (*Potamogeton crispus*; henceforth referred to as "CLP"). We conducted point-intercept vegetation surveys in both treatment plots prior to treatment (April 23, 2015; "pretreatment") and again about 1 month after treatment (June 1, 2015; "posttreatment"). These surveys were designed to assess whether the treatments effectively controlled CLP in the treated plots and to document any changes in the frequency and abundance of native aquatic plants. In addition, we collected sediment samples from both plots on Oct 22, 2015 to assess the abundance and distribution of curlyleaf pondweed turions (reproductive buds).

Summary of Findings

Pretreatment

1) <u>CLP:</u> Although these plots had received 2 consecutive years of treatment prior to this survey, we still found widespread but sparse CLP growth during the pretreatment surveys. This is consistent with my past studies conducted on Minnesota Lakes; CLP remained widespread in those lakes after 2 to 3 years of treatment, but the density of the growth was greatly reduced after 2 years of treatment.

2) <u>Native Plants:</u> Overall, most native aquatic plants did not appear to be growing actively in the proposed plots at the time of the pretreatment survey. We found coontail (*Ceratophyllum demersum*) at many of the sampled locations (70% occurrence in Red Cedar; and 75% in Hemlock). Robbin's pondweed (*Potamogeton robbinsii*), was also very common in both plots (62% in Red Cedar; and also 62% in Hemlock), but these retrieved specimens were clearly older growth (from previous year) with very little new growth apparent. In the Red Cedar plot, canadian waterweed (*Elodea canadensis*), white-stem pondweed (*Potamogeton praelongus*), and northern watermilfoil (*Myriophyllum sibiricum*) were fairly common and showed early signs of active growth (green tips of plants). As seen in past years, white-stem pondweed was particularly active in the Red Cedar plot, with new growth sprouting from old stems. Other native plants in the Red Cedar plot were present at lower frequency (generally <5%), and none showed signs of active growth beyond a few small shoots. In the Hemlock plot, coontail, fern-leaf pondweed, and *Elodea* were widespread, but only *Elodea* showed signs of active growth.

Posttreatment

3) <u>CLP:</u> During the posttreament surveys, we found widespread but sparse CLP plants in both plots, suggesting that the treatments were not as effective as seen in past years. In the Red Cedar plot, the amount of CLP was roughly the same as seen during the pretreatment survey (~30%), and although we saw no areas of denser growth, we did observed a low level of turion production on some of the standing plants. In the Hemlock plot, the remaining CLP plants generally appeared to be new sprouts (very small) and we did not see any new turion production on these plants. Based upon these observations, it appears that the treatments likely prevented turion production in Hemlock and suppressed turion production to some degree in Red Cedar, but CLP plants remained in both plots.

4) <u>Native Plants:</u> The frequency and abundance of fern-leaf pondweed decreased substantially between the Apr and Jun surveys, but other native plant species generally remained stable or increased (Table 2).

Survey & Analysis Methods

Point-Intercept Surveys

Freshwater Scientific Services, LLC completed pretreatment (April 23, 2015) and posttreatment (June 1, 2015) aquatic plant surveys in both of the treated plots using the point-intercept method described by Madsen (1999). These surveys incorporated assessments at a total of 140 sample points (77 in the Red Cedar plot, 63 in the Hemlock plot; Fig 1). We generated these sample points using desktop GIS software and the MDNR *Random Sample Generator* extension to project a grid of points over maps of the proposed treatment plots. We then loaded the selected sample locations onto a handheld GPS unit (Garmin GPSMAP-78) to enable navigation to each point while in the field.

At each designated sample location, we collected plants using a double-headed, 14-tine rake on a pole (for sites <10 ft deep) or a similar rake on a rope (for sites ≥10ft deep). For each rake sample, all of the retrieved plants were piled on top of the rake head and assigned density ratings from 1 to 3 (Fig 2) for each species individually, and for all plants collectively. At each location, we also documented water depth, overall plant height.

We used desktop GIS software to map the distribution and abundance of plants in each plot for each survey. We then calculated the frequency (% occurrence) and mean rake density for each encountered plant species (Tables 1 and 2).

Figure 1. Map showing the proposed treatment plots for CLP in 2015 and sampled locations in the Red Cedar Lake and Hemlock Lake plots.

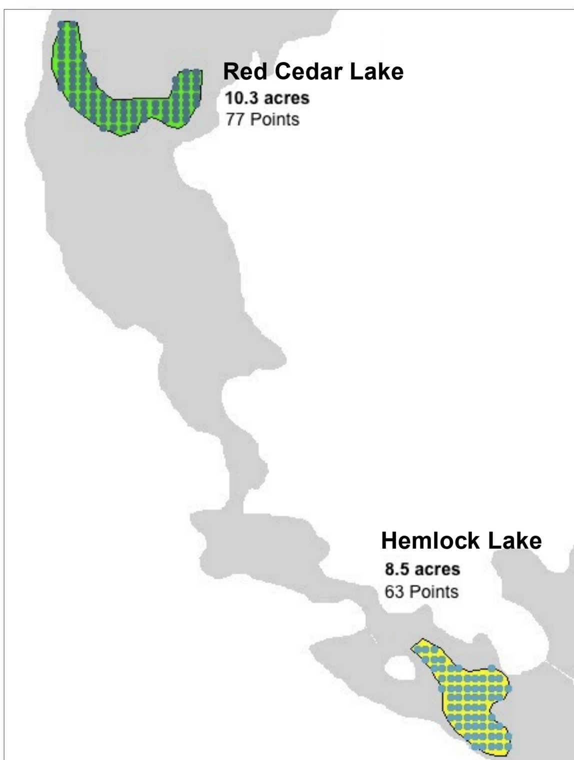


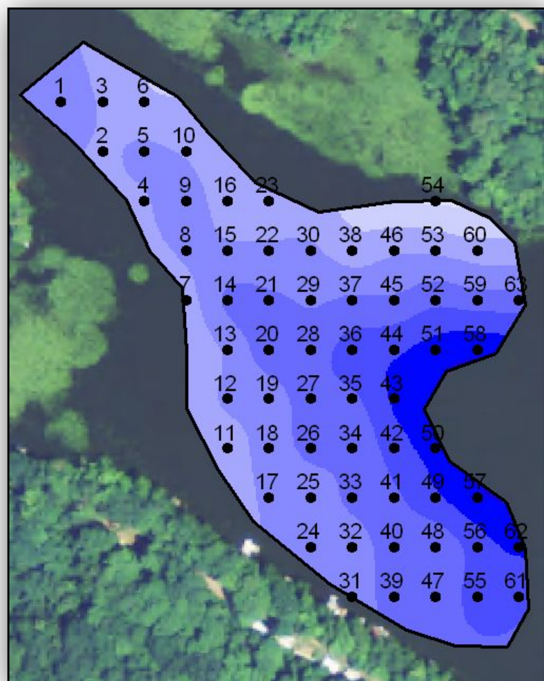
Figure 2. Density ratings based upon rake coverage

Density Rating	Rake Coverage	Description
1		Only a few plants retrieved
2		Plants cover full length of rake head, but do not cover the tines completely
3		Plants completely cover rake head and tines

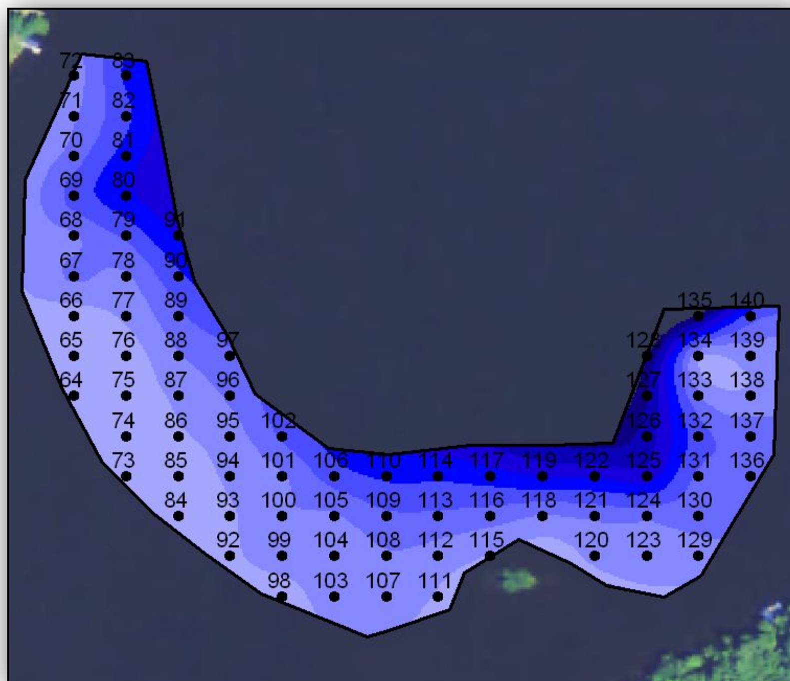
Hemlock & Red Cedar Lake: 2015 Endothall Treatment Plots

Survey Points & Water Depth

Hemlock Lake Treatment Plot



Red Cedar Lake Treatment Plot



Surveyed Locations

• Surveyed Points

Water Depth (ft)

- 6-7
- 7-8
- 8-9
- 9-10
- 10-11
- 11-12
- 12-13

Surveyed: Apr 23 and Jun 1, 2015
Surveyor: JA Johnson
Affiliation: Freshwater Scientific Services
Methods: Rake, Sonar, Depth Rod

N

0 200 ft

See Table 3 for detailed point descriptions

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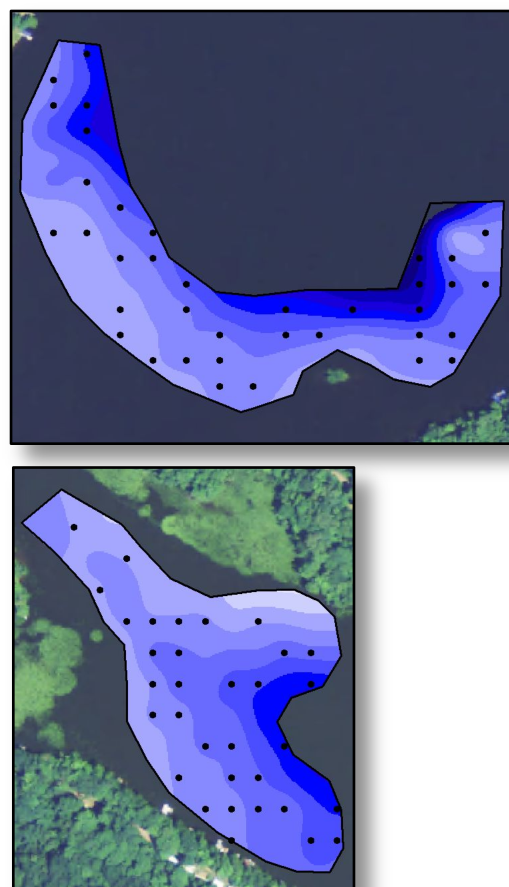
Sediment Turion Surveys

Freshwater Scientific Services, LLC conducted a sediment turion survey in both of the treatment plots on Oct 22, 2015 to assess the abundance and distribution of curlyleaf turions in the lake's sediments. For this survey, we collected sediment samples with a petite Ponar dredge (225 cm^2 basal area, Fig 3) at 33 locations in the Hemlock plot and 37 location in the Red Cedar plot. These turion sample locations were randomly selected from the set of points used for the 2015 vegetation surveys (Fig 4). Upon retrieving each sediment sample, we removed any plants and debris from the outside of the closed Ponar dredge, emptied its contents into a sifting bucket (1-mm screen), and gently sifted the sample in the field to remove fine sediment. The contents remaining in the bucket after sifting were placed into a labeled plastic bag and stored in a cooler while in the field. In the lab, we manually sorted turions from other debris and recorded total turion counts for each sample. Small turion fragments that did not included a portion of a central turion stem and severely decayed turions that did not retain their shape when lightly squeezed were discarded and were not included in the final turion counts. Turion counts from each sample were divided by the sampled area (0.0225 m^2) to yield sediment turion abundance (turions/m^2) for each sampled site (Table 2, page 9-10).

Figure 3. JA Johnson (Freshwater Scientific Services) preparing to collect a sediment sample with the Ponar dredge.

Figure 4. Locations where we collected fall sediment samples in the Red Cedar (top) and Hemlock (bottom) plots in 2015.



Results

2015 Statistical Summary of CLP and Native Aquatic Plants

Table 1. Frequency (% occurrence) and abundance (mean rake density rating) of plant species found during the pretreatment (April 23, 2015) and posttreatment (June 1, 2015) surveys in endothall-treated plots of Hemlock and Red Cedar Lakes. % Occurrence and mean density calculated using all surveyed points in each plot. Species are grouped by whether their frequency increased (+), remained stable (•), or decreased (–) after treatment. Statistical significance of changes (+/–) in frequency (chi-squared test) are indicated by +/– for $p<0.05$ and ++/– – for $p<0.01$.

HEMLOCK LAKE 2015

Plant Species	Common Name	% Occurrence Pre	% Occurrence Post	% Occurrence +/–	Density Pre	Density Post
All Vegetation		**94**	**95**	**•**	**1.3**	**1.5**
Potamogeton crispus	Curlyleaf Pondweed	54	27*	–	0.5	0.3
Ceratophyllum demersum	Coontail	70	70	•	0.8	0.7
Potamogeton robbinsii	Robbins' Pondweed	62	24	– –	0.7	0.2
Elodea canadensis	Canadian Waterweed	43	71	++	0.5	1.0
Nitella sp.	Nitella	11	35	++	0.1	0.4
Aquatic Moss	Aquatic Moss	11	8	•	0.1	0.1
Potamogeton amplifolius	Large-leaf Pondweed	3	3	•	<0.1	<0.1
Lemna trisulca	Star Duckweed	-	6	+	-	0.1
Bidens beckii	Water Marigold	2	3	•	<0.1	<0.1
Myriophyllum sibiricum	Northern Watermilfoil	-	3	•	-	<0.1
Potamogeton praelongis	White-stem Pondweed	2	-	•	<0.1	-
Nuphar variegata	Spatterdock	-	2	•	-	<0.1

* During posttreatment survey of Hemlock, curlyleaf plants were present, but were clearly damaged by herbicide (decaying and no turions)

RED CEDAR LAKE 2015

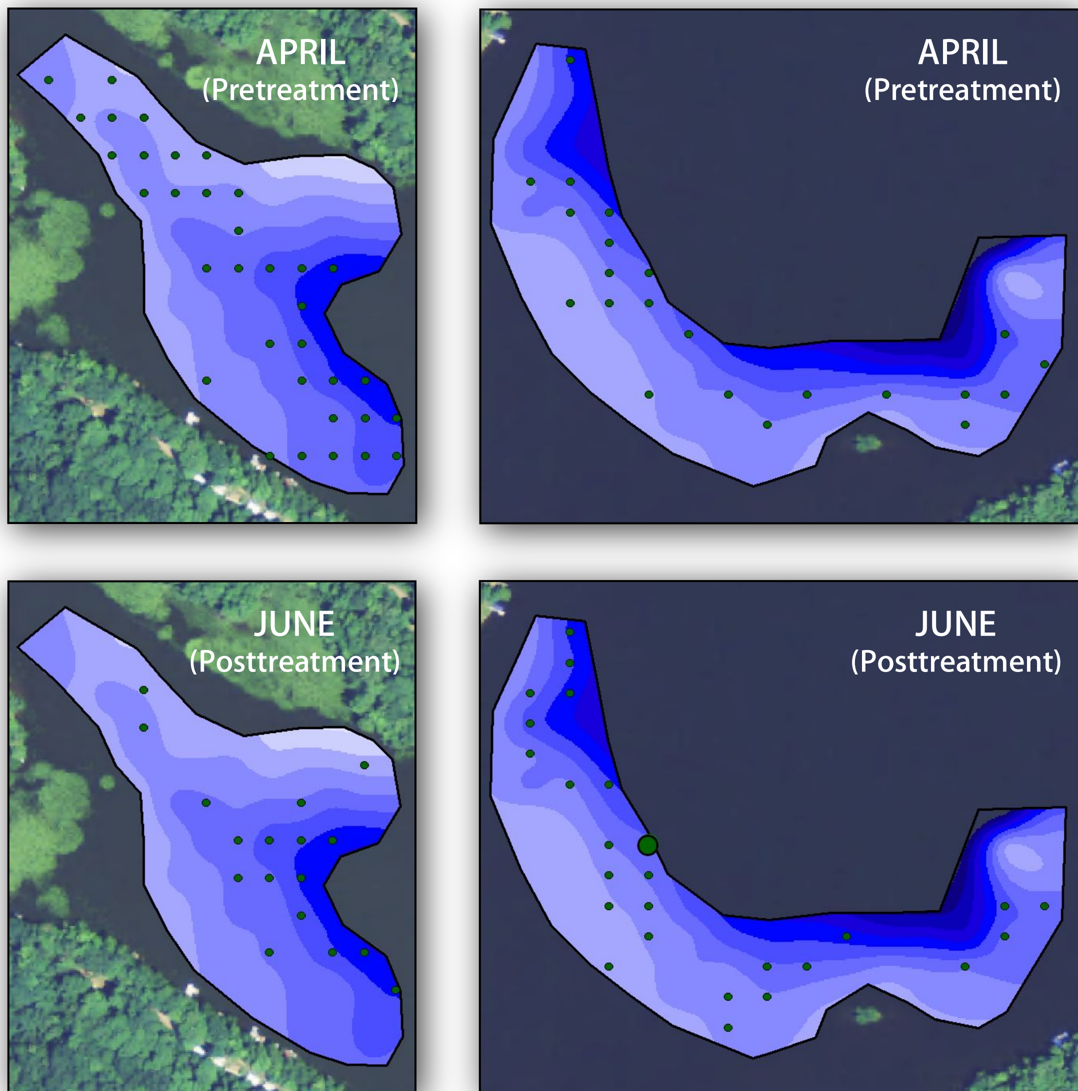
Plant Species	Common Name	% Occurrence Pre	% Occurrence Post	% Occurrence +/–	Density Pre	Density Post
All Vegetation		**84**	**87**	**•**	**1.6**	**1.7**
Potamogeton crispus	Curlyleaf Pondweed	29	34*	•	0.3	0.4
Ceratophyllum demersum	Coontail	75	70	•	0.8	1.0
Potamogeton robbinsii	Fern-leaf Pondweed	62	18	– –	0.3	0.3
Myriophyllum sibiricum	Northern Watermilfoil	21	34	+	0.2	0.5
Potamogeton praelongis	White-stem Pondweed	19	32	+	0.2	0.3
Lemna trisulca	Star Duckweed	16	17	•	0.2	0.2
Potamogeton zosteriformis	Flat-stem Pondweed	10	30	++	0.1	0.3
Aquatic Moss	Aquatic Moss	10	17	•	0.1	0.2
Elodea canadensis	Canadian Waterweed	10	16	•	0.1	0.2
Megalodonta beckii	Water Marigold	-	1	•	-	<0.1
Potamogeton amplifolius	Large-leaf Pondweed	5	3	•	<0.1	<0.1
Vallisneria americana	Wild Celery	-	4	+	-	<0.1

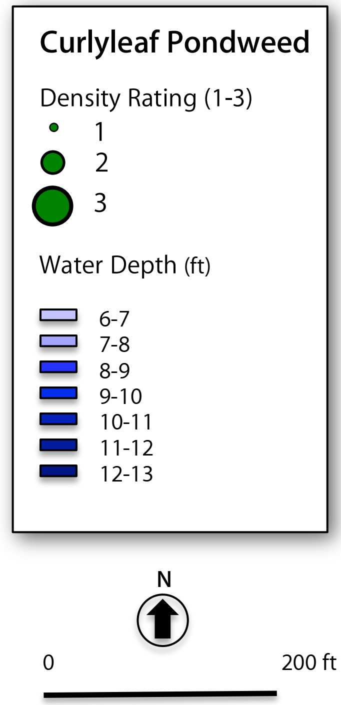
* During June survey of the Red Cedar plot, we found widespread curlyleaf plants at low density with many CLP plants showing signs of active growth and some turion production. No areas of nuisance-density CLP growth observed.

Hemlock & Red Cedar Lake: 2015 Endothall Treatment Plots

Change in Curlyleaf Pondweed Abundance *(Rake Density Rating)*

Hemlock Lake 2015 Red Cedar Lake 2015





Date(s): Apr 23 and Jun 1, 2015
Surveyor: JA Johnson
Affiliation: Freshwater Sci. Serv.
Methods: Point-Intercept Survey

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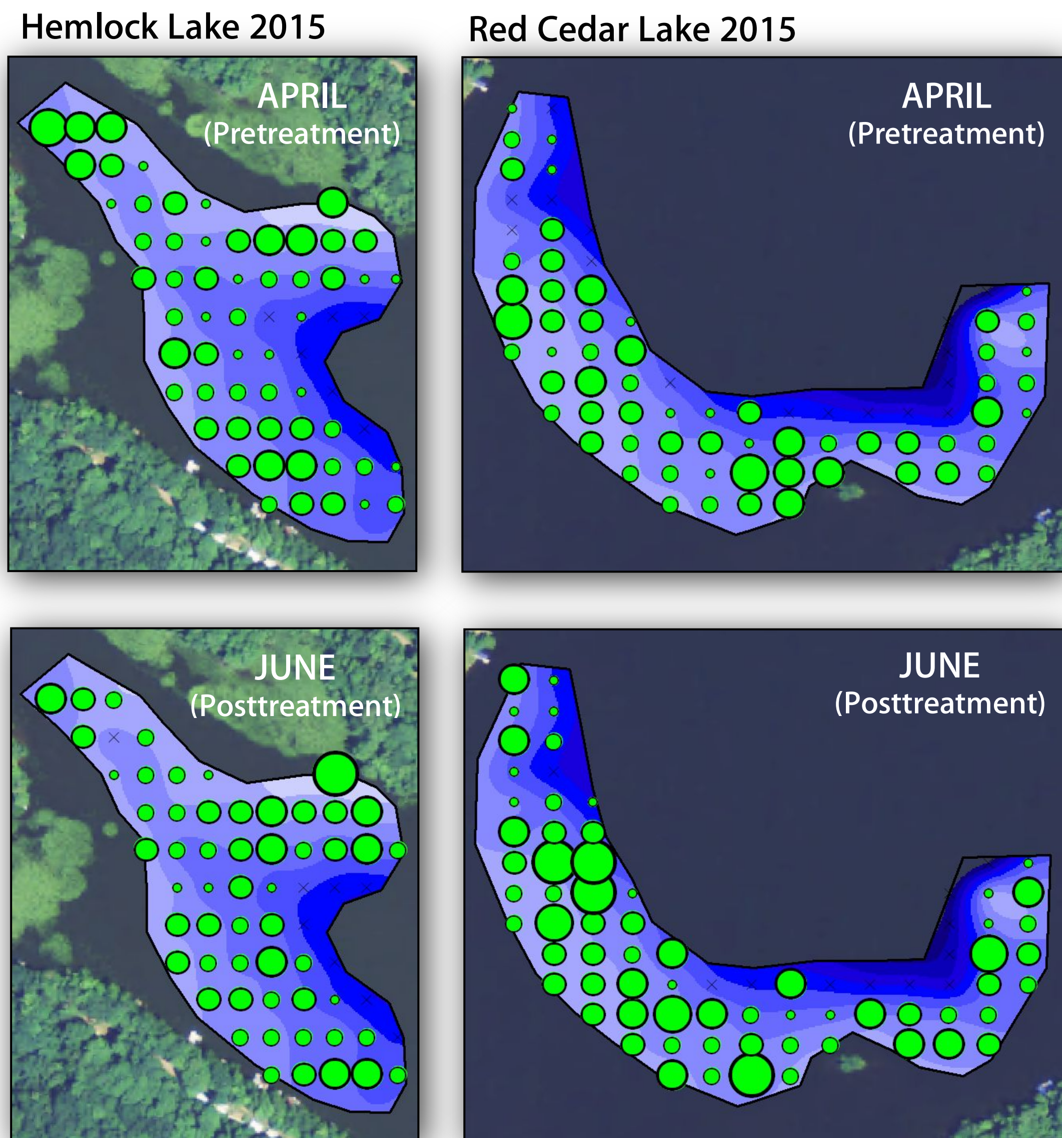
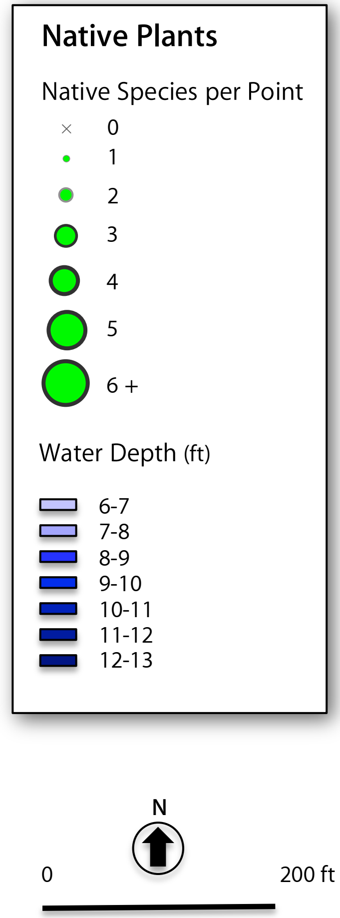
Hemlock & Red Cedar Lake: 2015 Endothall Treatment Plots

Native Aquatic Plant Diversity *(Native Species per Point)*





Date(s): Apr 23 and Jun 1, 2015
Surveyor: JA Johnson
Affiliation: Freshwater Sci. Serv.
Methods: Point-Intercept Survey

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2015 Plant Community Metrics

Plot	Survey	Area *(acres)*	Avg # Natives per Point	Mean Plant Height *(ft)*	%BioVolume
Hemlock	Pre	8.5	2.2	0.5	6
	Post	8.5	2.3	1.4	18
Red Cedar	Pre	10.3	2.0	0.8	9
	Post	10.3	2.4	2.2	27

Curlyleaf Pondweed Turion Production on Plants

During the posttreatment surveys, we inspected curlyleaf plants in each sample to assess whether new turions were produced on standing plants. In Hemlock Lake we found only a few small curlyleaf plants with no new turions, but in Red Cedar Lake, we found fairly widespread but sparse curlyleaf growth, with roughly half of the curlyleaf plants in Red Cedar having a few small new turions attached. Based upon past turion sprouting studies (Johnson et al. 2012), it is likely that these new turions in Red Cedar were viable. However, the number of new turions produced on each plant in Red Cedar was much less than typically seen on plants in untreated lakes (Johnson et al. 2012). This suggests that the 2015 treatments effectively reduced turion production in the Red Cedar plot and prevented turion production in the Hemlock plot. The fact that we did not see a decrease in curlyleaf after treatment and observed some turion production in the Red Cedar plot suggests that the herbicide concentration and contact time in that plot were not sufficient to completely kill curlyleaf in 2015.

Curlyleaf Pondweed Turion Abundance in Sediment

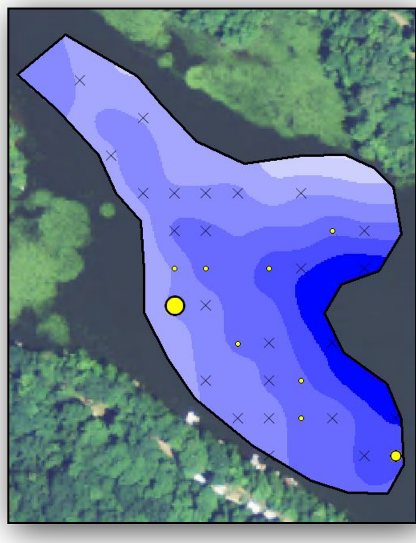
Sediment turion abundance decreased substantially in both plots between the pretreatment survey in 2012 and the posttreatment survey in 2015 after 3 consecutive years of treatment (Table 2, Fig 5). Furthermore, the percentage of sites where turions were found was reduced from 100% pretreatment to 27% posttreatment; note that this % occurrence of turions is very similar to the % occurrence of CLP plants in 2015. Although the pretreatment turion surveys were not as intensive as the posttreatment surveys (substantially fewer samples in the pretreatment survey), these results are consistent with what I found while researching endothall treatments in Minnesota lakes (Johnson et al. 2012). In that study, the general pattern in treated lakes was a large reduction of turion abundance in the first year of treatment (~50% reduction), less substantial reductions in subsequent years of treatment (~10% per year), and persistence of viable turions in the sediment.

Table 2. Summary of curlyleaf pondweed turion abundance in the Red Cedar and Hemlock plots on Oct 25, 2012 (pretreatment) and Oct 22, 2015 (after 3 years of treatment).

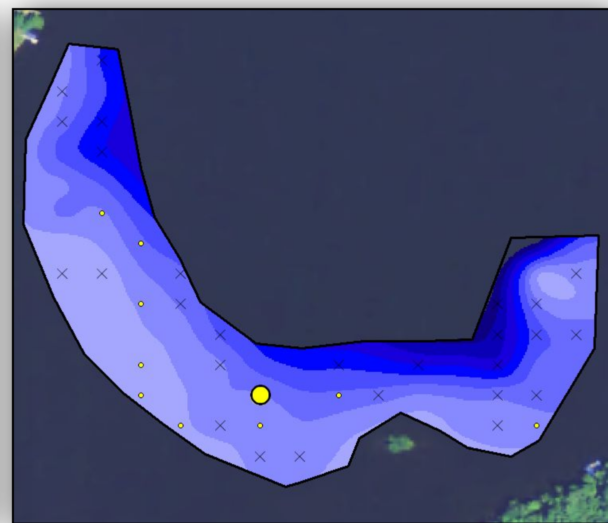
	Red Rock Plot		**Hemlock Plot**	
	Pre	*Post*	*Pre*	*Post*
# Samples	7	37	4	33
% Sites with Turions	*100%*	*27%*	*100%*	*27%*
Mean Turions/m^2	133	16	145	18
Std Error	33.6	5.5	33.5	6.4
Max Turions/m^2	311	178	222	178

Sediment Turion Abundance

Hemlock Lake – Oct 2015



Red Cedar Lake – Oct 2015



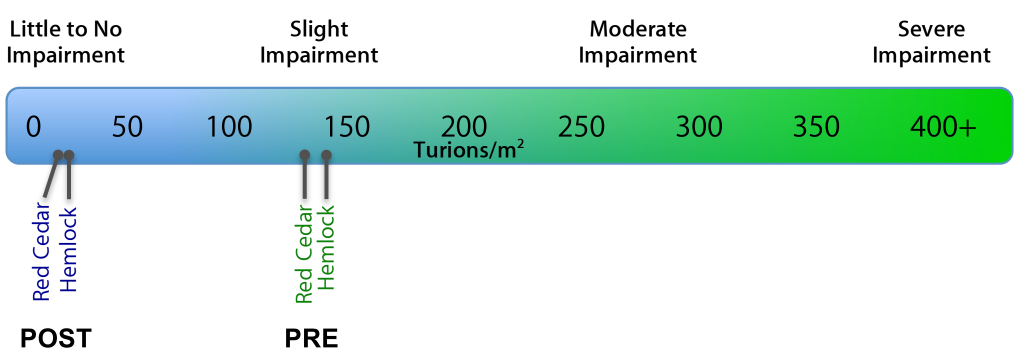
Turion Abundance

Turions / m^2

- X None
- 1-50
- 50-100
- 100-200

Surveyed: Oct 22, 2015
Surveyor: JA Johnson
Affiliation: Freshwater Scientific Services
Methods: Sediment Sampling/Ponar grab

Figure 5. Pre and posttreatment turion abundance (average turions/m^2 in each plot) and estimated curlyleaf pondweed nuisance potential in the Red Cedar and Hemlock plots. Ranges for impairment potential were estimated from subjective assessments of nuisance level (Low, Med, High) and turion abundance data from Johnson et al. 2012.



Management Context

Curlyleaf Pondweed

The persistence of sparse CLP in the treated plots after 3 consecutive years of treatment is consistent with my research on similar treatments in Minnesota lakes (Johnson et al. 2012). However, the observed production of new turions in the Red Cedar plot suggests that the 2015 treatment in Red Cedar was not completely effective. Although the amount of turion production we saw in the Red Cedar plot was clearly less than typically seen in untreated lakes, spring endothall treatments typically reduce turion production to a much greater degree than observed in Red Cedar.

To be effective, endothall treatments must be timed to coincide with optimal water temperatures (50-60 °F) and the target herbicide concentration must be maintained in the treated area for an adequate amount of time to kill the curlyleaf plants. Unlike the Hemlock plot, the Red Cedar plot is adjacent to a large area of deep water that makes dilution and dispersion of herbicide at that site more likely. Furthermore, the water temperature at that site may fluctuate drastically in the spring if wind pushes warm surface water toward or away from the site. For these reasons, it is not surprising that the 2015 treatment in Red Cedar was less effective than in past years. If treatments are continued at this site, some variability in the effectiveness of treatments should be expected.

Native Plants

Although the overall response of the native plant community suggests that most native plants have fared well through the repeated spring treatments, the substantial reduction of fern-leaf pondweed in both plots in 2015 is a little concerning. This native plant forms a dense “armor” that appears to retard the expansion of CLP into shallower areas of the Red Cedar Lakes. In past plant surveys, the densest curlyleaf was often found in deeper water where fern-leaf pondweed growth was less dense. Fern-leaf pondweed is sensitive to endothall, but is typically dormant in the early spring. When we see substantial reductions of native plants like fern-leaf, it is usually an indication that the concentration and contact time in the treated areas was too great. However, in this case, we also saw a lack of control on CLP in Red Cedar. These two findings contradict eachother somewhat. Based upon this contradiction, I suspect that the reduction in fern-leaf pondweed was not due to overly-aggressive treatment. Instead, it appears to me that spring water temperature fluctuations in 2015 may have triggered active growth in the fern-leaf prior to treatment, making it more susceptible to herbicide damage. Without additional information on the concentration of herbicide in the plots, it is difficult to determine why this year’s treatment affected fern-leaf pondweed more than seen after treatments in 2013 and 2014.

Future Treatments

Past studies have shown that the greatest reductions in curlyleaf abundance and turion density occur during the first 2-3 consecutive years of treatment (Johnson et al. 2012). Although additional years of treatment have typically resulted in additional reductions, the rate of reduction slows substantially. If treatments are not continued in the Red Cedar and Hemlock plots, CLP will almost certainly reestablish but would likely take multiple years to reach pretreatment densities. Alternatively, if treatments are continued, it should be expected that sparse CLP will remain in the plot for years.

References

Johnson JA, Jones AR, Newman RM. 2012. Evaluation of lakewide, early season herbicide treatments for controlling invasive curlyleaf pondweed (*Potamogeton crispus*) in Minnesota lakes. Lake and Reserv Manage **28:** 346-363.

Madsen JD. 1999. Point intercept and line intercept methods for aquatic plant management. Aquatic Plant Control Technical Note MI-02. Vicksburg, MS, U.S. Army Engineer Research and Development Center: 16 pp.

Table 3. GPS coordinates for surveyed points (Hemlock Lake and Red Cedar Lake).

Point ID	Lake	Lat	Long
1	Hemlock	45.5678884	-91.5803203
2	Hemlock	45.5676615	-91.5800581
3	Hemlock	45.5678851	-91.5800525
4	Hemlock	45.5674345	-91.5797960
5	Hemlock	45.5676581	-91.5797904
6	Hemlock	45.5678818	-91.5797848
7	Hemlock	45.5669839	-91.5795396
8	Hemlock	45.5672075	-91.5795339
9	Hemlock	45.5674312	-91.5795283
10	Hemlock	45.5676548	-91.5795227
11	Hemlock	45.5663096	-91.5792887
12	Hemlock	45.5665333	-91.5792831
13	Hemlock	45.5667569	-91.5792775
14	Hemlock	45.5669806	-91.5792718
15	Hemlock	45.5672042	-91.5792662
16	Hemlock	45.5674278	-91.5792605
17	Hemlock	45.5660827	-91.5790266
18	Hemlock	45.5663063	-91.5790210
19	Hemlock	45.5665299	-91.5790154
20	Hemlock	45.5667536	-91.5790097
21	Hemlock	45.5669772	-91.5790041
22	Hemlock	45.5672009	-91.5789984
23	Hemlock	45.5674245	-91.5789928
24	Hemlock	45.5658557	-91.5787645
25	Hemlock	45.5660793	-91.5787589
26	Hemlock	45.5663030	-91.5787532
27	Hemlock	45.5665266	-91.5787476
28	Hemlock	45.5667502	-91.5787420
29	Hemlock	45.5669739	-91.5787363
30	Hemlock	45.5671975	-91.5787307
31	Hemlock	45.5656287	-91.5785024
32	Hemlock	45.5658524	-91.5784968
33	Hemlock	45.5660760	-91.5784911
34	Hemlock	45.5662996	-91.5784855
35	Hemlock	45.5665233	-91.5784799
36	Hemlock	45.5667469	-91.5784742
37	Hemlock	45.5669706	-91.5784686
38	Hemlock	45.5671942	-91.5784629
39	Hemlock	45.5656254	-91.5782347
40	Hemlock	45.5658490	-91.5782291
41	Hemlock	45.5660727	-91.5782234
42	Hemlock	45.5662963	-91.5782178
43	Hemlock	45.5665199	-91.5782121
44	Hemlock	45.5667436	-91.5782065
45	Hemlock	45.5669672	-91.5782008
46	Hemlock	45.5671909	-91.5781952
47	Hemlock	45.5656220	-91.5779670
48	Hemlock	45.5658457	-91.5779613
49	Hemlock	45.5660693	-91.5779557

Point ID	Lake	Lat	Long
50	Hemlock	45.5662930	-91.5779500
51	Hemlock	45.5667402	-91.5779387
52	Hemlock	45.5669639	-91.5779331
53	Hemlock	45.5671875	-91.5779274
54	Hemlock	45.5674112	-91.5779218
55	Hemlock	45.5656187	-91.5776992
56	Hemlock	45.5658424	-91.5776936
57	Hemlock	45.5660660	-91.5776879
58	Hemlock	45.5667369	-91.5776710
59	Hemlock	45.5669606	-91.5776653
60	Hemlock	45.5671842	-91.5776597
61	Hemlock	45.5656154	-91.5774315
62	Hemlock	45.5658390	-91.5774258
63	Hemlock	45.5669572	-91.5773976
64	Red Cedar	45.5810572	-91.5916250
65	Red Cedar	45.5812396	-91.5916205
66	Red Cedar	45.5814219	-91.5916159
67	Red Cedar	45.5816042	-91.5916113
68	Red Cedar	45.5817865	-91.5916068
69	Red Cedar	45.5819688	-91.5916022
70	Red Cedar	45.5821511	-91.5915977
71	Red Cedar	45.5823334	-91.5915931
72	Red Cedar	45.5825157	-91.5915885
73	Red Cedar	45.5806885	-91.5912964
74	Red Cedar	45.5808708	-91.5912918
75	Red Cedar	45.5810531	-91.5912872
76	Red Cedar	45.5812354	-91.5912827
77	Red Cedar	45.5814177	-91.5912781
78	Red Cedar	45.5816000	-91.5912736
79	Red Cedar	45.5817823	-91.5912690
80	Red Cedar	45.5819646	-91.5912644
81	Red Cedar	45.5821469	-91.5912599
82	Red Cedar	45.5823292	-91.5912553
83	Red Cedar	45.5825115	-91.5912508
84	Red Cedar	45.5805020	-91.5909631
85	Red Cedar	45.5806843	-91.5909586
86	Red Cedar	45.5808666	-91.5909540
87	Red Cedar	45.5810489	-91.5909495
88	Red Cedar	45.5812312	-91.5909449
89	Red Cedar	45.5814135	-91.5909403
90	Red Cedar	45.5815958	-91.5909358
91	Red Cedar	45.5817781	-91.5909312
92	Red Cedar	45.5803155	-91.5906299
93	Red Cedar	45.5804978	-91.5906254
94	Red Cedar	45.5806801	-91.5906208
95	Red Cedar	45.5808624	-91.5906162
96	Red Cedar	45.5810447	-91.5906117
97	Red Cedar	45.5812271	-91.5906071
98	Red Cedar	45.5801291	-91.5902967
99	Red Cedar	45.5803114	-91.5902922
100	Red Cedar	45.5804937	-91.5902876
101	Red Cedar	45.5806760	-91.5902830
102	Red Cedar	45.5808583	-91.5902785

Point ID	Lake	Lat	Long
103	Red Cedar	45.5801249	-91.5899589
104	Red Cedar	45.5803072	-91.5899544
105	Red Cedar	45.5804895	-91.5899498
106	Red Cedar	45.5806718	-91.5899453
107	Red Cedar	45.5801207	-91.5896212
108	Red Cedar	45.5803030	-91.5896166
109	Red Cedar	45.5804853	-91.5896120
110	Red Cedar	45.5806676	-91.5896075
111	Red Cedar	45.5801166	-91.5892834
112	Red Cedar	45.5802989	-91.5892788
113	Red Cedar	45.5804812	-91.5892743
114	Red Cedar	45.5806635	-91.5892697
115	Red Cedar	45.5802947	-91.5889411
116	Red Cedar	45.5804770	-91.5889365
117	Red Cedar	45.5806593	-91.5889319
118	Red Cedar	45.5804728	-91.5885987
119	Red Cedar	45.5806551	-91.5885941
120	Red Cedar	45.5802863	-91.5882655
121	Red Cedar	45.5804686	-91.5882609
122	Red Cedar	45.5806509	-91.5882564
123	Red Cedar	45.5802822	-91.5879277
124	Red Cedar	45.5804645	-91.5879232
125	Red Cedar	45.5806468	-91.5879186
126	Red Cedar	45.5808291	-91.5879140
127	Red Cedar	45.5810114	-91.5879095
128	Red Cedar	45.5811937	-91.5879049
129	Red Cedar	45.5802780	-91.5875900
130	Red Cedar	45.5804603	-91.5875854
131	Red Cedar	45.5806426	-91.5875808
132	Red Cedar	45.5808249	-91.5875762
133	Red Cedar	45.5810072	-91.5875717
134	Red Cedar	45.5811895	-91.5875671
135	Red Cedar	45.5813718	-91.5875625
136	Red Cedar	45.5806384	-91.5872430
137	Red Cedar	45.5808207	-91.5872385
138	Red Cedar	45.5810030	-91.5872339
139	Red Cedar	45.5811853	-91.5872293
140	Red Cedar	45.5813676	-91.5872248