

# Curlyleaf Pondweed Management in the Red Cedar Chain 2019 Pre/Post Data Report & Analysis

## Sampling Methods

The Red Cedar Lake Association identified 21 plots with curlyleaf pondweed (CLP) spread across the three main lakes in the chain (Hemlock, Red Cedar, and Balsam; see map on page 2). To assess the response of CLP and native plants in herbicide-treated plots, we conducted pretreatment (May 23) and posttreatment (Jun 18) point-intercept plant surveys in each of the potential management plots. Both of these surveys incorporated assessments at the same set of sample points, arranged on a uniform grid with 27-m interpoint spacing (~6 points per acre). This yielded a total of 323 sample points across the 21 plots, with a range of 3 to 41 points in each plot (see table below).

On each surveyed date, we collected plants at each sample point using a double-sided, 14-tine rake on a pole or a weighted rake on a rope, as described in the Wisconsin DNR sampling guidance document (Hauxwell et al. 2010). For each sample, we recorded the plant species retrieved on the rake (presence/absence) and assigned density ratings for each species and for all retrieved plants collectively.

## Plot Identification & Metrics

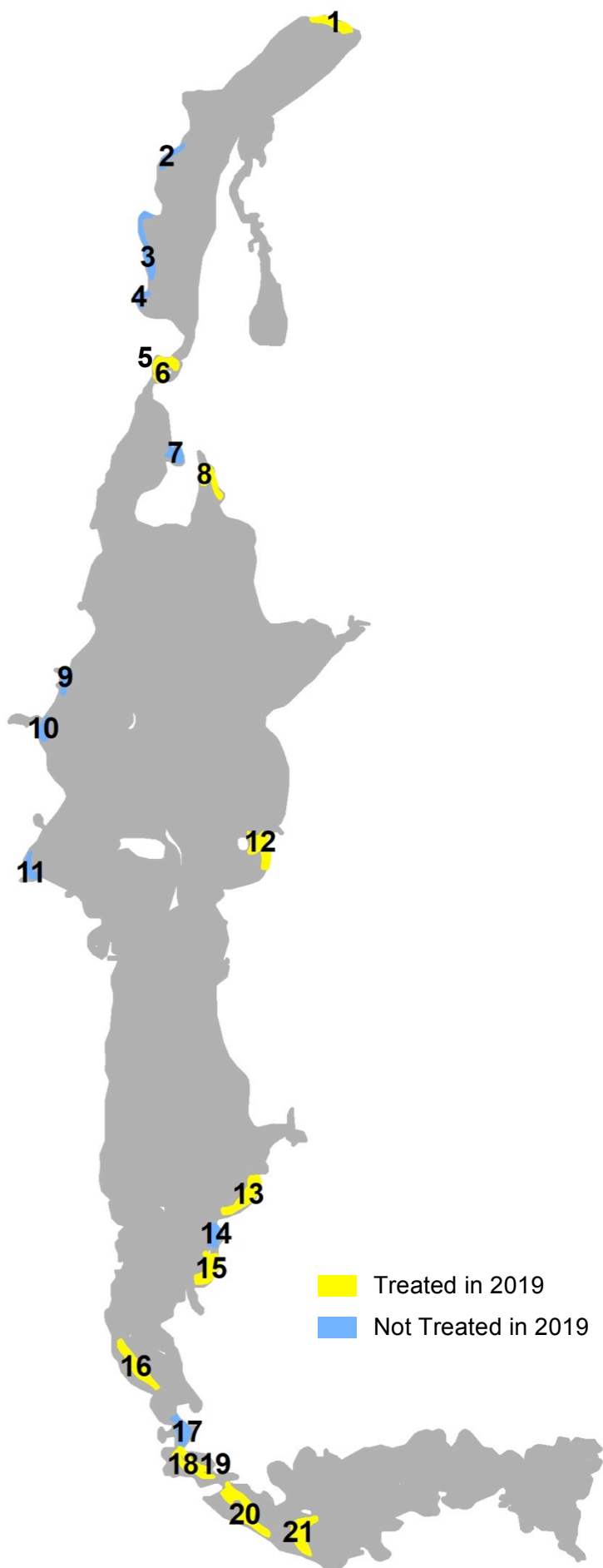
ID	Map Number	Lake	Acres Surveyed	Points Surveyed	Acres Treated	Mean Depth (ft)	Aquathol K (ppm)
BL-1-19	6	Balsam	1.30	7	1.95	4.5	2.0
BL-2-19	5	Balsam	1.37	8	1.08	5.5	2.0
BL-3-19	4	Balsam	5.36	31	Not Treated		
BL-4-19	3	Balsam	6.85	41	Not Treated		
BL-5-19	2	Balsam	0.83	4	Not Treated		
BL-6-19	1	Balsam	2.55	12	0.91	7.0	2.0
HL-4-19	21	Hemlock	2.19	13	3.78	7.3	1.5
HL-5-19	20	Hemlock	2.01	8	6.90	7.0	1.5
RC-1-19	18	Red Cedar	1.91	11	1.84	8.0	2.0
RC-2-19	19	Red Cedar	1.84	12	1.37	8.0	2.0
RC-3-19	17	Red Cedar	1.67	10	Not Treated		
RC-4-19	16	Red Cedar	1.55	10	1.10	4.5	1.5
RC-7-19	15	Red Cedar	4.58	24	1.82	7.3	1.5
RC-8-19	14	Red Cedar	4.64	29	Not Treated		
RC-9-19	13	Red Cedar	1.44	8	3.29	5.5	1.5
RC-12-19	12	Red Cedar	5.12	29	2.61	6.8	1.5
RC-13-19	11	Red Cedar	2.95	15	Not Treated		
RC-14A-19	10	Red Cedar	0.83	3	Not Treated		
RC-14B-19	9	Red Cedar	1.15	7	Not Treated		
RC-16-19	8	Red Cedar	2.30	14	1.28	7.0	1.5
RC-17-19	7	Red Cedar	5.22	27	Not Treated		

Hauxwell, J., S. Knight, K. Wagner, A. Mikulyuk, M. Nault, M. Porzky and S. Chase. 2010. **Recommended baseline monitoring of aquatic plants in Wisconsin: sampling design, field and laboratory procedures, data entry and analysis, and applications.** Wisconsin Department of Natural Resources Bureau of Science Services, PUB-SS-1068 2010. Madison, Wisconsin, USA.

## 2019 Curlyleaf Pondweed Plots

Map Number	Plot ID
1	BL-6-19
2	BL-5-19
3	BL-4-19
4	BL-3-19
5	BL-2-19
6	BL-1-19
7	RC-17-19
8	RC-16-19
9	RC-14B-19
10	RC-14A-19
11	RC-13-19
12	RC-12-19
13	RC-9-19
14	RC-8-19
15	RC-7-19
16	RC-4-19
17	RC-3-19
18	RC-1-19
19	RC-2-19
20	HL-5-19
21	HL-4-19

 Treated in 2019



# Comparison of %Occurrence: Pre/Post Treatment 2019

Plot (Map Number)	Points Sampled	TREATED											UNTREATED									
		1	5	6	8	12	13	15	16	18	19	20	21	2	3	4	7	9	10	11	14	17
		12	8	7	14	29	8	24	10	11	12	8	13	4	41	31	27	7	3	15	29	10
Natives per Point	PRE	2.2	3.3	2.4	1.8	3.6	3.8	2.3	3.8	2.8	3.0	2.4	3.1	2.8	3.0	1.9	3.0	2.6	0.7	2.1	2.0	1.8
	POST	3.3	3.0	2.7	2.2	4.7	3.8	3.1	4.8	4.4	3.3	3.3	3.5	3.8	3.4	2.4	4.0	4.1	3.0	3.1	1.9	2.2
<i>P. crispus</i>	PRE	17	13	-	7	7	38	21	100	-	33	13	15	-	56	35	19	14	-	7	14	-
	POST	33	-	-	14	-	-	29	50	-	-	-	8	50	27	35	30	14	33	-	24	10
<i>B. beckii</i>	PRE	-	-	-	-	3	-	-	10	-	-	-	-	-	7	-	-	-	-	-	3	10
	POST	-	-	-	14	31	13	4	20	9	17	13	8	-	7	-	-	29	33	7	-	-
<i>C. demersum</i>	PRE	67	75	43	57	83	100	54	100	73	75	50	69	100	85	61	59	100	67	53	38	40
	POST	92	63	43	64	83	75	50	80	45	58	50	38	100	66	68	56	57	67	67	48	40
<i>Chara sp.</i>	PRE	-	13	-	-	21	-	-	-	-	-	15	-	7	-	-	-	-	-	-	-	
	POST	-	-	-	-	28	-	-	-	-	-	13	15	-	2	-	-	-	-	-	-	-
<i>E. acicularis</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	8	-	2	-	-	-	-	-	-	-	-
<i>E. canadensis</i>	PRE	17	38	57	7	79	38	21	20	45	50	50	15	-	54	42	41	29	-	67	48	-
	POST	42	13	57	7	83	38	21	-	36	25	25	31	25	44	52	26	14	33	40	31	10
<i>H. dubia</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	17	-	4	-	18	-	-	-	-	7	-	4	-	33	7	-	-
<i>L. trisulca</i>	PRE	-	-	-	7	14	75	8	50	-	-	13	15	-	32	6	-	-	-	-	-	-
	POST	-	-	-	14	24	63	17	80	36	8	13	8	-	15	3	-	14	-	-	-	10
Aquatic Moss	PRE	-	-	-	7	3	-	-	-	-	-	-	-	-	10	6	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	14	33	-	-	-
<i>M. sibiricum</i>	PRE	8	13	43	21	3	38	21	20	9	25	-	46	50	29	3	59	43	-	47	28	40
	POST	17	13	29	36	17	38	38	40	27	17	38	31	50	22	10	78	57	-	67	17	50
<i>Nitella</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	13	-	-	-	-	-	-	-	-	-	-	-	12	10	-	-	-	-	-	-
<i>N. odorata</i>	PRE	-	-	-	-	-	-	-	-	-	-	13	-	-	7	-	-	-	-	-	-	-
	POST	-	38	-	7	3	13	-	30	36	25	25	8	-	39	-	-	-	-	-	-	-
<i>N. variegata</i>	PRE	-	13	-	-	-	-	-	-	27	8	-	-	-	22	-	-	-	-	-	-	-
	POST	-	25	-	-	3	-	4	10	9	8	13	-	-	20	-	-	14	-	-	-	-
<i>P. amplifolius</i>	PRE	-	-	14	-	14	13	4	-	9	25	-	8	-	17	19	7	-	-	-	3	10
	POST	8	-	14	7	-	13	13	10	-	25	13	15	25	17	19	15	29	-	7	-	10
<i>P. friesii</i>	PRE	-	-	-	7	3	-	8	20	18	-	-	15	-	7	-	37	14	-	-	17	10
	POST	-	-	14	-	-	-	4	-	27	-	-	15	-	2	-	22	29	-	-	-	-
<i>P. gramineus</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	14	7	-	-	4	10	-	-	-	15	-	2	-	7	-	-	13	-	10
<i>Polygonum sp.</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	7	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
<i>P. praelongus</i>	PRE	-	13	-	-	3	13	8	20	9	-	-	8	-	12	3	11	14	-	-	-	-
	POST	-	-	-	-	7	-	-	20	-	17	-	15	-	7	13	41	-	-	7	-	-
<i>P. pusillus</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	-	-	-	2	6	-	-	-	-	-	-
<i>P. richardsonii</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	25	-	43	7	21	25	29	40	64	-	-	8	25	7	-	67	57	-	27	14	30
<i>P. robbinsii</i>	PRE	50	75	57	29	69	63	54	30	27	92	50	62	25	59	45	19	43	-	7	10	30
	POST	58	63	29	14	66	75	54	50	18	67	38	46	25	56	45	7	43	33	7	-	10
<i>P. zosteriformis</i>	PRE	50	38	14	21	45	13	46	50	27	17	38	38	25	37	6	59	14	-	20	34	30
	POST	58	38	29	21	52	13	63	30	36	42	25	54	75	32	6	56	57	33	27	41	50
<i>R. aquatilis</i>	PRE	25	25	14	21	14	25	-	60	36	8	25	15	75	22	-	7	-	-	20	17	10
	POST	33	13	-	14	28	-	4	60	27	17	-	38	50	12	6	22	-	33	40	24	-
<i>Sagittaria sp.</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	3	-	-	-	18	-	-	-	-	2	-	-	-	-	-	-	-
<i>U. minor</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	13	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-
<i>U. vulgaris</i>	PRE	-	25	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-
	POST	-	13	-	-	-	-	-	-	9	8	63	-	-	10	-	-	-	-	-	-	-
<i>V. americana</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	3	13	-	-	-	-	-	-	-	7	-	-	-	-	-	14	-

## Change in %Occurrence (Pre/Post)

  = significant increase (p<0.05; Chi-Square)

  = significant decrease

Map Number	Plot	Acres Treated	Aquathol (ppm)	N	<i>P. crispus</i>	<i>B. Beckii</i>	<i>C. demersum</i>	<i>Chara sp.</i>	<i>E. acicularis</i>	<i>E. canadensis</i>	<i>H. dubia</i>	<i>L. trisulca</i>	<i>Aq Moss</i>	<i>M. sibiricum</i>	<i>Nitella sp.</i>	<i>N. odorata</i>	<i>N. variegata</i>	<i>P. amplifolius</i>
Treated	1	BL-6-19	0.9	2.0	12	+17	-	+25	-	+25	-	-	-	+8	-	-	-	+8
Treated	5	BL-2-19	1.1	2.0	8	-13	-	-13	-13	-25	-	-	-	+0	+13	+38	+13	-
Treated	6	BL-1-19	2.0	2.0	7	-	-	+0	-	+0	-	-	-	-14	-	-	-	+0
Treated	8	RC-16-19	1.3	1.5	14	+7	+14	+7	-	+0	-	+7	-7	+14	-	+7	-	+7
Treated	12	RC-12-19	2.6	1.5	29	-7	+28	+0	+7	+3	+17	+10	-3	+14	-	+3	+3	-14
Treated	13	RC-9-19	3.3	1.5	8	-38	+13	-25	-	+0	-	-13	-	+0	-	+13	-	+0
Treated	15	RC-7-19	1.8	1.5	24	+8	+4	-4	-	+0	+4	+8	-	+17	-	-	+4	+8
Treated	16	RC-4-19	1.1	1.5	10	-50	+10	-20	-	-20	-	+30	-	+20	-	+30	+10	+10
Treated	18	RC-1-19	1.8	2.0	11	-	+9	-27	-	-9	+18	+36	-	+18	-	+36	-18	-9
Treated	19	RC-2-19	1.4	2.0	12	-33	+17	-17	-	-25	-	+8	-	-8	-	+25	+0	+0
Treated	20	HL-5-19	6.9	1.5	8	-13	+13	+0	+13	-25	-	-	-	+38	-	+13	+13	+13
Treated	21	HL-4-19	3.8	1.5	13	-8	+8	-31	+0	+8	+15	-8	-	-15	-	+8	-	+8
Untreated	2	BL-5-19	-	-	4	+50	-	+0	-	+25	-	-	-	+0	-	-	-	+25
Untreated	3	BL-4-19	-	-	41	-29	+0	-20	-5	+2	-10	+7	-17	-7	-7	+12	+32	-2
Untreated	4	BL-3-19	-	-	31	-	-	+6	-	+10	-	-3	-6	+6	+10	-	-	-
Untreated	7	RC-17-19	-	-	27	+11	-	-4	-	-15	+4	-	-	+19	-	-	-	+7
Untreated	9	RC-14B-19	-	-	7	-	+29	-43	-	-14	-	+14	+14	+14	-	-	+14	+29
Untreated	10	RC-14A-19	-	-	3	+33	+33	+0	-	+33	+33	-	+33	-	-	-	-	-
Untreated	11	RC-13-19	-	-	15	-7	+7	+13	-	-27	+7	-	-	+20	-	-	-	+7
Untreated	14	RC-8-19	-	-	29	+10	-3	+10	-	-17	-	-	-	-10	-	-	-	-3
Untreated	17	RC-3-19	-	-	10	+10	-10	+0	-	+10	-	+10	-	+10	-	-	-	-

Map Number	Plot	Acres Treated	Aquathol (ppm)	N	<i>P. fritesii</i>	<i>P. gramineus</i>	<i>Polygonum sp.</i>	<i>P. praelongus</i>	<i>P. pusillus</i>	<i>P. richardsonii</i>	<i>P. robbinsii</i>	<i>P. zosteriformis</i>	<i>R. aquatilis</i>	<i>Sagittaria sp.</i>	<i>U. minor</i>	<i>U. vulgaris</i>	<i>V. americana</i>
Treated	1	BL-6-19	0.9	2.0	12	-	-	-	-	+25	+8	+8	+8	-	-	-	-
Treated	5	BL-2-19	1.1	2.0	8	-	-	-	-13	-	-13	+0	-13	-	+13	-13	-
Treated	6	BL-1-19	2.0	2.0	7	+14	+14	-	-	+43	-29	+14	-14	-	-	-	-
Treated	8	RC-16-19	1.3	1.5	14	-7	+7	+7	-	+7	-14	+0	-7	-	-	-	-
Treated	12	RC-12-19	2.6	1.5	29	-3	-	-	+3	+21	-3	+7	+14	+3	-	-	+3
Treated	13	RC-9-19	3.3	1.5	8	-	-	-	-13	+25	+13	+0	-25	-	-	-	+13
Treated	15	RC-7-19	1.8	1.5	24	-4	+4	-	-8	+29	+0	+17	+4	-	-	-	-
Treated	16	RC-4-19	1.1	1.5	10	-20	+10	-	+0	+40	+20	-20	+0	-	-	-	-
Treated	18	RC-1-19	1.8	2.0	11	+9	-	-	-9	+64	-9	+9	-9	+18	-	+9	-
Treated	19	RC-2-19	1.4	2.0	12	-	-	-	+17	-	-	-25	+25	+8	-	+8	-
Treated	20	HL-5-19	6.9	1.5	8	-	-	-	-	-	-13	-13	-25	-	-	+63	-
Treated	21	HL-4-19	3.8	1.5	13	+0	+15	-	+8	+8	-15	+15	+23	-	-	-	-
Untreated	2	BL-5-19	-	-	4	-	-	-	-	+25	+0	+50	-25	-	-	-	-
Untreated	3	BL-4-19	-	-	41	-5	+2	+2	-5	+2	+7	-2	-5	-10	+2	+7	+2
Untreated	4	BL-3-19	-	-	31	-	-	-	+10	+6	-	+0	+0	+6	-	-	-
Untreated	7	RC-17-19	-	-	27	-15	+7	-	+30	+67	-11	-4	+15	-	-	-	-
Untreated	9	RC-14B-19	-	-	7	+14	-	-	-14	+57	+0	+43	-	-	-	-	-
Untreated	10	RC-14A-19	-	-	3	-	-	-	-	-	+33	+33	+33	-	-	-	-
Untreated	11	RC-13-19	-	-	15	-	+13	-	+7	+27	+0	+7	+20	-	-	-	-
Untreated	14	RC-8-19	-	-	29	-17	-	-	-	+14	-10	+7	+7	-	-	-	+14
Untreated	17	RC-3-19	-	-	10	-10	+10	-	-	+30	-20	+20	-10	-	-	-	-

## Comparison of Plant Density Rating: Pre/Post Treatment 2019

Plot (Map Number) Points Sampled		TREATED											UNTREATED									
		1	5	6	8	12	13	15	16	18	19	20	21	2	3	4	7	9	10	11	14	17
		12	8	7	14	29	8	24	10	11	12	8	13	4	41	31	27	7	3	15	29	10
<i>P. crispus</i>	PRE	0.17	0.13	-	0.07	0.10	0.50	0.21	1.10	-	0.33	0.13	0.15	-	0.59	0.39	0.19	0.14	-	0.07	0.17	-
	POST	0.33	-	-	0.14	-	-	0.29	0.50	-	-	-	0.08	0.50	0.24	0.35	0.30	0.14	0.33	-	0.28	0.10
<i>B. beckii</i>	PRE	-	-	-	-	0.03	-	-	0.10	-	-	-	-	-	-	-	-	-	-	-	0.03	0.10
	POST	-	-	-	0.14	0.31	0.13	0.04	0.20	0.09	0.17	0.13	0.08	-	0.05	-	-	0.29	0.33	0.07	-	-
<i>C. demersum</i>	PRE	1.17	0.88	0.57	1.07	1.00	1.38	0.79	1.60	1.00	0.83	0.88	1.08	2.25	0.95	0.84	0.78	1.14	0.67	0.93	0.69	0.60
	POST	1.67	0.75	1.00	1.07	0.93	1.13	0.75	1.00	0.73	0.67	0.88	0.46	2.25	0.88	0.77	0.74	0.71	0.67	1.00	0.72	0.40
<i>Chara sp.</i>	PRE	-	0.25	-	-	0.21	-	-	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	0.31	-	-	-	-	-	0.13	0.15	-	-	-	-	-	-	-	-	-
<i>E. acicularis</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	-	-	-	-	-	-	-
<i>E. canadensis</i>	PRE	0.17	0.38	0.57	0.07	1.00	0.38	0.21	0.20	0.45	0.50	0.50	0.23	-	0.56	0.42	0.52	0.29	-	0.87	0.48	-
	POST	0.42	0.13	0.57	0.07	0.90	0.38	0.21	-	0.36	0.33	0.25	0.31	0.25	0.44	0.68	0.33	0.14	0.33	0.47	0.31	0.10
<i>H. dubia</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	0.17	-	0.04	-	0.18	-	-	-	-	-	0.05	-	0.04	-	0.33	0.07	-
<i>L. trisulca</i>	PRE	-	-	-	0.07	0.14	0.75	0.08	0.50	-	-	0.13	0.15	-	0.24	0.06	-	-	-	-	-	-
	POST	-	-	-	0.14	0.24	0.63	0.17	0.80	0.36	0.08	0.13	0.08	-	0.12	0.03	-	0.14	-	-	-	0.10
Aquatic Moss	PRE	-	-	-	0.07	0.03	-	-	-	-	-	-	-	-	0.02	0.06	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.67	-	-	-
<i>M. sibiricum</i>	PRE	0.08	0.13	0.43	0.21	0.03	0.38	0.21	0.20	0.09	0.25	-	0.46	0.50	0.22	0.06	0.63	0.43	-	0.53	0.28	0.40
	POST	0.17	0.13	0.29	0.36	0.17	0.38	0.46	0.40	0.27	0.17	0.38	0.31	0.50	0.20	0.16	0.93	0.71	-	1.00	0.21	0.50
<i>Nitella</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	0.25	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.10	-	-	-	-	-
<i>N. odorata</i>	PRE	-	-	-	-	-	-	-	-	-	-	0.13	-	-	-	-	-	-	-	-	-	-
	POST	-	0.38	-	0.07	0.03	0.13	-	0.30	0.36	0.25	0.25	0.08	-	0.37	-	-	-	-	-	-	-
<i>N. variegata</i>	PRE	-	0.13	-	-	-	-	-	-	0.27	0.08	-	-	-	0.15	-	-	-	-	-	-	-
	POST	-	0.25	-	-	0.03	-	0.04	0.10	0.09	0.08	0.13	-	-	0.17	-	-	0.14	-	-	-	-
<i>P. amplifolius</i>	PRE	-	-	0.14	-	0.14	0.13	0.08	-	0.09	0.33	-	0.08	-	0.10	0.19	0.07	-	-	-	0.03	0.10
	POST	0.08	-	0.29	0.07	-	0.13	0.13	0.10	-	0.25	0.13	0.23	0.25	0.20	0.29	0.15	0.29	-	0.07	-	0.20
<i>P. friesii</i>	PRE	-	-	-	0.07	0.03	-	0.08	0.20	0.18	-	-	0.15	-	-	-	0.37	0.14	-	-	0.17	0.10
	POST	-	-	0.14	-	-	-	0.04	-	0.45	-	-	0.15	-	-	-	0.22	0.29	-	-	-	-
<i>P. gramineus</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	0.14	0.07	-	-	0.04	0.10	-	-	-	0.15	-	-	-	0.11	-	-	0.13	-	0.10
<i>Polygonum sp.</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>P. praelongus</i>	PRE	-	0.13	-	-	0.03	0.13	0.08	0.20	0.09	-	-	0.08	-	0.05	0.03	0.11	0.14	-	-	-	-
	POST	-	-	-	-	0.07	-	-	0.20	-	0.17	-	0.15	-	0.05	0.13	0.44	-	-	0.07	-	-
<i>P. pusillus</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	-	-
<i>P. richardsonii</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	0.25	-	0.43	0.07	0.21	0.25	0.29	0.40	0.64	-	-	0.08	0.25	0.05	-	0.74	0.57	-	0.27	0.14	0.50
<i>P. robbinsii</i>	PRE	0.92	1.25	1.14	0.29	1.00	1.13	0.96	0.40	0.36	2.08	0.50	0.92	0.25	0.88	0.94	0.22	0.57	-	0.07	0.10	0.50
	POST	0.67	0.88	0.43	0.21	0.97	1.00	0.96	0.70	0.27	1.50	0.38	0.85	0.25	0.83	0.77	0.07	0.57	0.33	0.07	-	0.30
<i>P. zosteriformis</i>	PRE	0.50	0.38	0.14	0.21	0.45	0.13	0.46	0.50	0.27	0.17	0.38	0.38	0.25	0.29	0.06	0.59	0.14	-	0.20	0.34	0.30
	POST	0.58	0.38	0.29	0.21	0.55	0.13	0.63	0.30	0.36	0.42	0.25	0.54	0.75	0.29	0.06	0.56	0.57	0.33	0.27	0.41	0.50
<i>R. aquatilis</i>	PRE	0.25	0.25	0.14	0.21	0.14	0.25	-	0.70	0.36	0.08	0.25	0.15	0.75	0.15	-	0.07	-	-	0.27	0.17	0.10
	POST	0.33	0.13	-	0.14	0.28	-	0.04	0.70	0.27	0.17	-	0.38	0.50	0.10	0.10	0.22	-	0.33	0.40	0.28	-
<i>Sagittaria sp.</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	0.03	-	-	-	0.27	-	-	-	-	-	-	-	-	-	-	-	-
<i>U. minor</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	0.13	-	-	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-
<i>U. vulgaris</i>	PRE	-	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	0.13	-	-	-	-	-	-	0.09	0.08	0.63	-	-	-	0.07	-	-	-	-	-	-
<i>V. americana</i>	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POST	-	-	-	-	0.03	0.13	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.14	-