

# Detroit Lakes 2015 Pre-Treatment Survey: Summary and Treatment Recommendations

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## Summary:

Between June 19-22 Mississippi State University and Pelican River Watershed personnel surveyed sites in Detroit Lake, Lake Sallie, and Lake Melissa for the presence of flowering rush (*Butomus umbellatus*). Sites surveyed were the same as those surveyed in 2014 (Figs 1 & 2). This study is designed to 1) continue monitoring infested sites and 2) determine if the existing herbicide treatment protocol can be relaxed on sites with minimal flowering rush. To that end a series of treatment thresholds were established to determine the number of diquat herbicide treatments to be used on each site (Table 1).

## Point Intercept Sampling:

In 2015, point intercept sampling has two roles: 1) to assess the community impact of submersed diquat treatments and 2) to establish treatment thresholds for diquat treatments in 2015. Point intercept sampling was done on all treated plots and reference plots (Table 1). The grid interval was no less than 25 m. Treatment thresholds were based on data collected during a pre-treatment point intercept survey of sites treated in 2014 (Figs 1 & 2).

## Treatment Thresholds:

Treatment sites with 5% or less flowering rush should go untreated for one year (Table 2). Sites with greater than 5% flowering rush should receive at least one treatment (Table 3). Sites with greater than 20% flowering rush should receive two treatments as in years past (Table 4).

The following year all sites should be resurveyed for the presence of flowering rush (three surveys per year) and the appropriate treatment protocol implemented.

## Core Sampling:

In order to quantify effects of diquat treatments (one treatment vs. two) on above and below ground flowering rush biomass 360 core samples will be pulled from nine sites (40 per site): three untreated reference sites, three sites receiving one diquat treatment, and three sites receiving two diquat treatments (Table 5).

## Treatment/Survey/Core sampling Schedule:

Those sites receiving two treatments should be treated in June and July. Those sites receiving one treatment should be treated in July. Flowering rush surveys should be conducted in June (pre-treatment one), in July (pre-treatment two), and in August (post-treatment two). Pre-treatment surveys should occur immediately prior to herbicide treatments. Treatments should be separated by four weeks as in years past (Table 6). Surveys should also be separated by four weeks (Table 6).

Table 1. Flowering rush percentages and treatment recommendations for treatment sites on Detroit, Sallie, and Melissa Lakes in the Pelican River Watershed District, MN. Bold type percentages are those sites that will receive none or one treatment in 2015.

SITE	TREATMENT RECOMMENDATION	TOTAL PTS	FR POINTS	% FR
CL-REF-1	–	14	6	42.3
CL-DIQ-1	June & July	9	5	55.6
CL-DIQ-3	June & July	33	21	63.6
DL-REF-1	–	21	2	9.5
DL-DIQ-1	June & July	20	13	65
DL-DIQ-2	July	24	3	<b>12.5</b>
DL-DIQ-3	June & July	25	11	44
DL-DIQ-4	July	33	5	<b>15.2</b>
DL-DIQ-5	June & July	20	9	45
DL-DIQ-6	June & July	34	8	23.5
DL-DIQ-7	July	25	5	<b>20</b>
DL-DIQ-8	July	43	6	<b>13.9</b>
DL-DIQ-9	June & July	20	6	30
DL-DIQ-10	July	26	4	<b>15.4</b>
DL-DIQ-11	June & July	23	16	69.6
LS-REF-1	–	34	30	88.2
LS-DIQ-1	June & July	44	23	52.3
LS-DIQ-2	June & July	5	2	40
LS-DIQ-3	June & July	26	7	26.9
LM-DIQ-1	July	20	4	<b>20</b>
LM-DIQ-2	July	20	3	<b>15</b>
LM-DIQ-3	NONE	32	1	<b>3.1</b>
LM-DIQ-4	June & July	31	8	25.8
LM-DIQ-5	June & July	27	7	25.9

Table 2. Treatment sites receiving no herbicide treatments in 2015.

<b>SITE</b>	<b>TREATMENT RECOMMENDATION</b>	<b>TOTAL PTS</b>	<b>FR POINTS</b>	<b>% FR</b>
LM-DIQ-3	NONE	32	1	3.1

Table 3. Treatment sites receiving one herbicide treatment in 2015.

<b>SITE</b>	<b>TREATMENT RECOMMENDATION</b>	<b>TOTAL PTS</b>	<b>FR POINTS</b>	<b>% FR</b>
DL-DIQ-2	July	24	3	12.5
DL-DIQ-4	July	33	5	15.2
DL-DIQ-7	July	25	5	20
DL-DIQ-8	July	43	6	13.9
DL-DIQ-10	July	26	4	15.4
LM-DIQ-1	July	20	4	20
LM-DIQ-2	July	20	3	15

Table 4. Treatment sites receiving two herbicide treatments in 2015.

<b>SITE</b>	<b>TREATMENT RECOMMENDATION</b>	<b>TOTAL PTS</b>	<b>FR POINTS</b>	<b>% FR</b>
CL-DIQ-1	June & July	9	5	55.6
CL-DIQ-3	June & July	33	21	63.6
DL-DIQ-1	June & July	20	13	65
DL-DIQ-3	June & July	25	11	44
DL-DIQ-5	June & July	20	9	45
DL-DIQ-6	June & July	34	8	23.5
DL-DIQ-9	June & July	20	6	30
DL-DIQ-11	June & July	23	16	69.6
LS-DIQ-1	June & July	44	23	52.3
LS-DIQ-2	June & July	5	2	40
LS-DIQ-3	June & July	26	7	26.9
LM-DIQ-4	June & July	31	8	25.8
LM-DIQ-5	June & July	27	7	25.9

Table 5. Sites used for statistical analysis of herbicide treatments. Core samples will be pulled at the same time as surveys are done.

<b>SITE</b>	<b>TREATMENT RECOMMENDATION</b>	<b>Number of Core Samples</b>
CL-REF-1	Untreated Reference	40
DL-REF-1	Untreated Reference	40
LS-REF-1	Untreated Reference	40
DL-DIQ-2	July	40
DL-DIQ-4	July	40
DL-DIQ-8	July	40
DL-DIQ-1	June & July	40
DL-DIQ-11	June & July	40
CL-DIQ-3	June & July	40

Table 6. Treatment and survey schedule for 2015.

Week	June	June	June/July	July	July	July	July	July/Aug	Aug
Survey	X				X				X
Core Sampling	X				X				X
Treatment		X				X			



Figure 1. Map of treatment sites in Detroit Lake, MN. Sites are the same as those treated in 2014.



Figure 2. Map of treatment sites in Sallie and Melissa Lakes, MN. Sites are the same as those treated in 2014.