

# Balsam Lake, Washburn County 2018 Rhodamine Dye Study Report LEAPS, 2019

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## **Introduction**

In the Red Cedar Chain of Lakes (Balsam, Red Cedar, and Hemlock lakes) curly-leaf pondweed (CLP) was first documented in 1978 in an individual's request for a chemical treatment permit application, but it was not quantified in any way until 2009 when the entire system was surveyed by the Beaver Creek Reserve. The 2009 survey showed the CLP to be more widespread than the Red Cedar Lakes Association (RCLA) had expected which prompted them to begin the process of evaluating management options for CLP.

In 2011, aquatic plant surveys found 14 CLP beds on the Red Cedar Lakes. These beds ranged in size from 1.5 to 25.3 acres and totaled 152.6 acres (Figure 1). During that survey, 15.3 acres of CLP were mapped in Balsam Lake; 71.5 acres mapped in Red Cedar Lake; and 53.8 acres were mapped in Hemlock. Surveyors noted that while the CLP is widespread throughout the system, most of the growth was uniform, with light CLP growth and small patchy areas of moderate to dense growth. The areas of moderate to dense growth covered about 17.86 acres in all three lakes. Subsequent spring CLP bedmapping in 2012 completed by RCLA volunteers with guidance from their consultant – Lake Education and Planning Services (LEAPS) documented 10.7 acres in Balsam, 65.3 acres in Red Cedar, and 83.3 acres in Hemlock. In 2012, areas of moderate to dense growth CLP increased 3.4 times (340%) to 61.52 acres when compared to 2011 despite the overall CLP acreage in all three lakes only increasing by 13% (Table 1).



Lake	Bed #	Area (acres)
Balsam	1	5.1
	2	4.5
	3	5.7
Mud	4	12.0
Red Cedar	5	1.5
	6	6.0
	7	20.7
	8	2.0
	9	20.7
	10	17.1
Hemlock	11	3.5
	12	25.3
	13	13.9
	14	14.6
<b>Total Area</b>		<b>152.6</b>

Figure 1: 2011 CLP Beds and Acreage (FSS, 2011)

Table 1: 2011 (FSS) and 2012 (RCLA) Bedmapping Totals and Density Ratings

Lake	Year	Total Acres	Low Acres (RHD-1)	Mod/Dense Acres (RHD 2 or 3)
Balsam	2011	15.30	22.64	1.61
	2012	10.69	3.71	6.98
Red Cedar	2011	71.50	64.20	7.30
	2012	65.29	19.07	46.22
Hemlock	2011	53.80	44.85	8.95
	2012	83.30	74.35	8.32

The rapid increase in CLP density raised concern with the RCLA and a 3-yr CLP chemical treatment program was proposed and an Aquatic Invasive Species Control of an Established Infestation (ACEI) Grant applied for in February 2013. The ACEI grant was awarded and management of two areas of dense growth CLP, one in Red Cedar Lake and one in Hemlock Lake, was started in 2013 (Figure 2, Table 2). No chemical management of CLP was proposed in Balsam Lake despite it having one of the most dense

areas in the entire system (Bed 1 in Figure 1) due to concerns about water flow and an area of wild rice “downstream” of what could have been a chemical treatment area (Figure 3).



Figure 2: 2013 CLP Chemical Treatment Areas (SEH, 2013)

Table 2: 2013 CLP Chemical Treatment Details (SEH, 2013)

Name	CLP Density	Substrate	Acres	Mean Depth (feet)	Target a.i. (ppm)	Aquathol K (liquid) Application (gal)
Red Cedar	Moderate-low	Muck, gravel	10.29	8.2	1.90	102.10
Hemlock	Moderate	Muck, gravel	8.51	7.4	1.90	76.20
<b>TOTAL</b>			<b>18.80</b>			<b>178.30</b>
Treated at 1.9 ppm a.i. = 1.21 gal/ac-ft						



Figure 3: Wild Rice in Balsam (Mud) Lake

It was the intent of the original APM Plan that if CLP management was started in a particular area, it would be continued for three years with the goal of not only reducing visible CLP growth, but to also reduce the number of CLP turions found in the sediment that could regrow in subsequent years. As a result of pre-treatment aquatic plant survey work done in the spring of 2014, the original treatment area in Red Cedar Lake was reduced by 7.69 acres for a total in the two areas of 11.11 acres (Table 3). The chemically treated areas were modified again in 2015 with a 15.15 acre treatment area. In this case, the amount treated in Hemlock went down slightly while the amount in Red Cedar went back up (Table 4).

Table 3: 2014 Final CLP Chemical Treatment Details (LEAPS, 2014)

Name	CLP Density	Substrate	Acres	Mean Depth (feet)	Acre-ft	Target a.i. (ppm a.e.)	Super K (granular) Application (lb)
Red Cedar (RC1-14)	Moderate-low	Muck, gravel	2.15	8.2	17.6	1.90	147.39
Red Cedar (RC2-14)	Moderate-low	Muck, gravel	0.45	8.2	3.7	1.90	30.85
Hemlock (H1-14)	Moderate	Muck, gravel	8.51	7.4	63.0	1.90	526.46
<b>TOTAL</b>			<b>11.11</b>		<b>84.3</b>		<b>704.7</b>
Treated at 1.9 ppm a.i. = 8.36 lbs/ac-ft							

Table 4: 2015 Final CLP Chemical Treatment Details (LEAPS, 2015)

Name	CLP Density	Substrate	Acres	Mean Depth (feet)	Acre-ft	Treatment a.i. ppm	Aquathol K (liquid) application (gal)	NOTES
Red Cedar (RC1-15)	Moderate-low	Muck, gravel	7.14	9.3	66.4	2.00	88.31	Previously Treated in 2013 and 2014
Hemlock (H1-15)	Moderate-low	Muck, gravel	8.01	7.5	60.1	2.00	79.90	Previously Treated in 2013 and 2014
<b>TOTAL</b>			<b>15.15</b>		<b>126.5</b>		<b>168.21</b>	
Treated at 1.50 ppm a.i. = 6.6 lbs/ac-ft								

## CLP Bedmapping from 2013 to 2017

Additional CLP bedmapping was completed by RCLA volunteers in 2013, 2014, 2015, 2016, and 2017. Results showed that three years of chemical management of CLP along with physical removal reduced the amount of CLP in the two main treatment areas in Red Cedar and Hemlock lakes. 2017 survey work showed that while CLP distribution and density was increasing in other areas of all three lakes, it remained low to non-existent in the two areas that were treated for three consecutive years (Figure 4). However, annual bedmapping showed that the amount of moderate to dense growth CLP in areas outside of those chemically treated from 2013-2015 continued to increase particularly in 2016 and 2017 (Figure 5).

This occurrence has increased concerns on the part of the RCLA that if left unmanaged, the amount of moderate to dense growth CLP will continue to increase in all three lakes and that management in all three lakes should be reconsidered. Since no CLP management other than physical removal has been done in Balsam Lake, a rhodamine dye study was proposed and funded through an I Aquatic Invasive Species Education, Prevention, and Planning grant applied for and awarded to the RCL in February 2018.

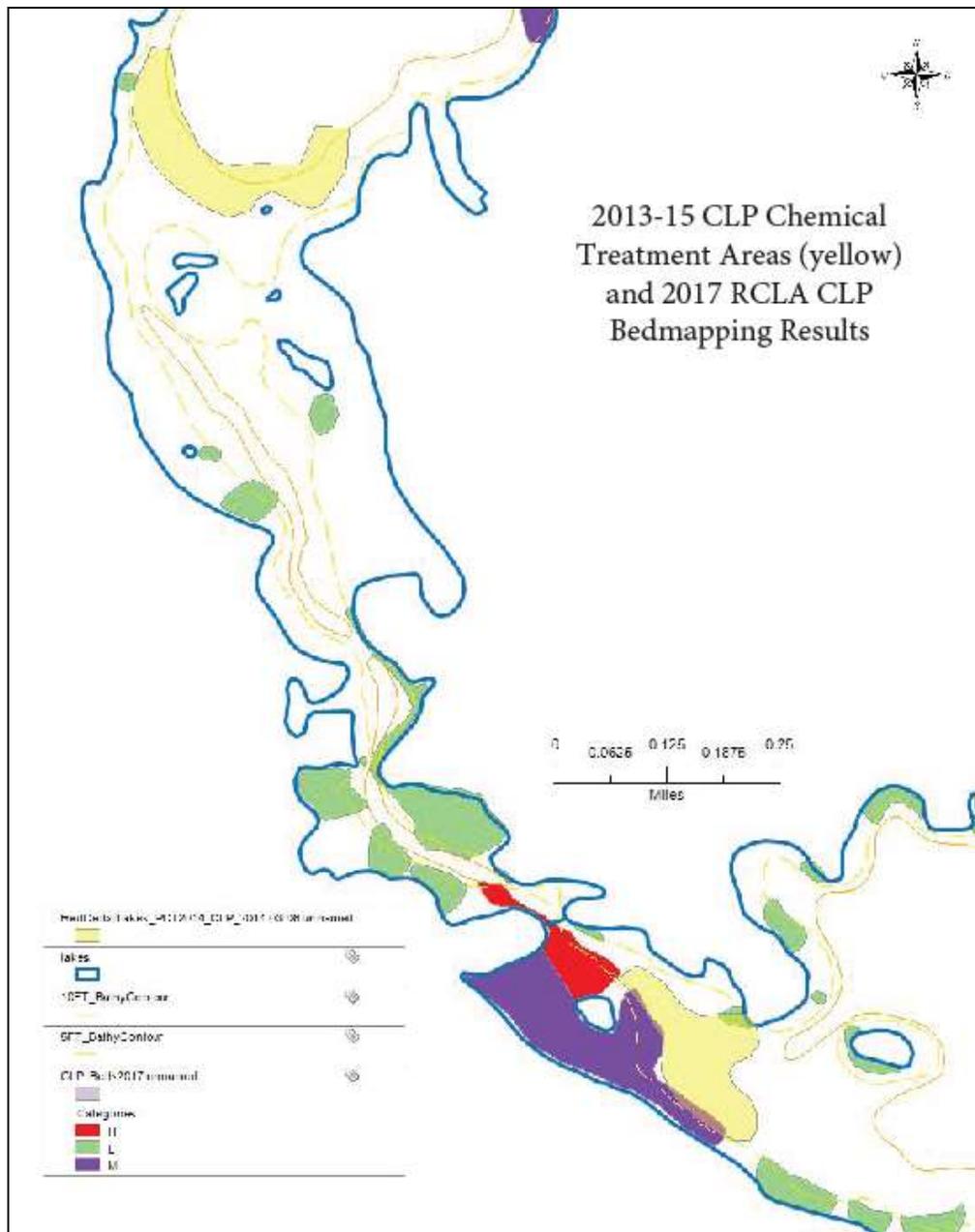


Figure 4: 2013 to 2015 Treatment Areas in Relation to 2017 Bedmapping (LEAPS, 2018)

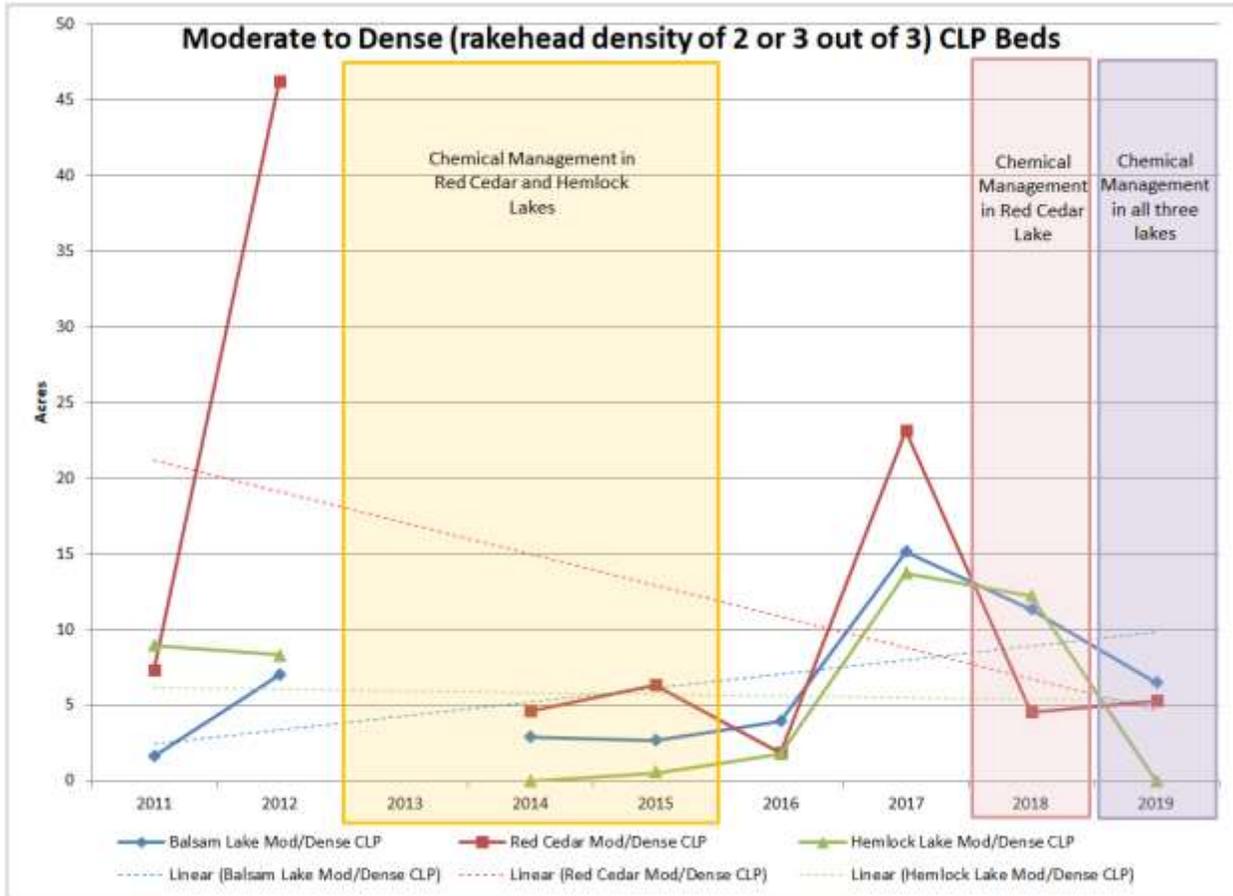


Figure 5: Moderate to Dense CLP Growth in the Red Cedar Lakes. Documented by RCLA Volunteer Bedmapping (LEAPS, 2019)

## 2018 Rhodamine Dye Survey – Balsam Lake

One of the keys to controlling aquatic plants with an herbicide is to understand how water exchange within a treated area might affect performance of the product. In Balsam Lake, this question comes up when considering chemical management of CLP anywhere in the lake, but particularly up on the north end where the Red Cedar River comes in from Birch Lake. Water movement in this area may impact the success of any herbicide applied in this area. In addition, this area is upstream of an area of wild rice (at the mouth of Mud Lake to Balsam) so knowing whether or not the herbicide will make it to the rice beds if applied is also of great importance.

A method was needed to predict the movement of an herbicide in a waterbody before it was applied, thus reducing the risk of unexpected results. Based on this need, Rhodamine dye (Appendix A) was used in the role of an herbicide. This dye can be applied at a known concentration, and easily measured with a fluorimeter. Sampling grids can be set up within the treated area and outside of the area to monitor how long the dye remains, where it goes, and what concentration it keeps.

Rhodamine dye provides a decent comparison to the use of endothall (the active chemical most used to control CLP) as both have low degradation rates in sunlight. Endothall is broken down more by microbial actions than sunlight, with an expected half-life in water of about 5-10 days (WDNR – Endothall Chemical Fact Sheet – Appendix A). Rhodamine dye disperses quickly in water but is resistant to absorption on most suspended matter in fresh and salt water and compared some other dye products, is significantly more resistant to degradation by sunlight (Appendix B).

As a part of the 2018-19 AEPP grant that was submitted a plan for a Rhodamine Dye Study was developed by LEAPS. Calculations were completed that determined that 6.93 lbs of liquid Rhodamine dye would be needed to mimic a comparable chemical treatment application on a 7.6 acre bed of CLP identified in the north end of Balsam Lake in the spring of 2018 (Figure 6, Table 5).



Figure 6: Dye Application Area (yellow line)

Table 5: Dye Application Details

Dye Requirements Balsam Lake (LEAPS 3-26-2018)						
Treatment Site	Treatment Area (Acres)	Mean Depth (ft)	Treatment Volume (acre-feet)	Dye Requirement (liters)	Dye Requirement (gallons)	Dye Requirements (lbs)
Northern Inlet	7.60	7.13	54.19	2.71	0.72	6.93
Total	7.60		54.19	2.71	0.72	
				Target Concentration= 10 ppb		
Rhodamine Dye WT 20% concentration						
Specific Gravity of Rhodamine Dye = 1.16						
1 gallon of water (Specific gravity = 1.0) weighs 8.343 lbs						
Specific gravity of rhodamine dye (1.16) multiplied by 8.343 lbs = 9.68 lbs						
1 gallon of rhodamine dye weighs 9.68 lbs						
0.72 gallons of rhodamine dye weigh 6.93 lbs.						
7.0 x \$35/lb = \$245.00						

A monitoring plan was prepared that included 16 sampling sites: 2 within the proposed treatment area; 10 outside the treatment area but still in Balsam Lake; and 4 in Red Cedar Lake (Figure 6). After application, dye concentration readings were taken at 7 time intervals (1,3,5,8,24,48,&72 hours after treatment) with a fluorimeter borrowed from the WDNR.

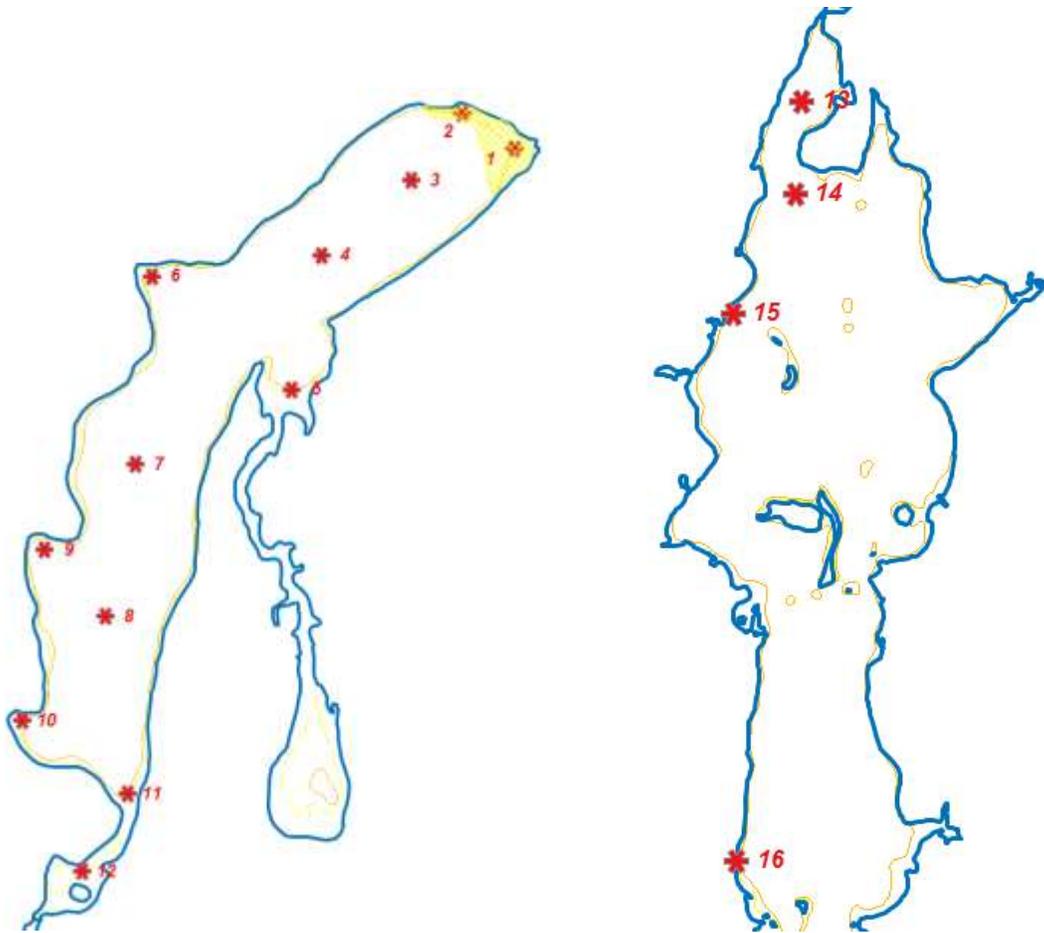


Figure 7: Rhodamine Dye Sampling Sites on Balsam (left) and Red Cedar (right) Lakes

A Turner Designs Cyclops 7 submersible sensor attached to a DataBank® handheld datalogger (Figure 7) was used to take measurements of the dye concentration in the lake water after application. Measurements were recorded by volunteers on data recording sheets developed by LEAPS (Appendix C) and then that data was analyzed by LEAPS. Meter readings of dye concentration over time were converted to parts per billion (ppb or  $\mu\text{g/L}$ ) and compared to a planned application rate of 10 ppb. During several sampling runs, actual water samples were collected at each site in case there were issues with data analysis.



Figure 8: Turner Designs Cyclops 7 submersible sensor and DataBank® handheld datalogger used to record dye concentrations in the lake water (borrowed from the WDNR in Spooner, WI)

It is expected that this study would accomplish several things. First it would help determine how water movement in Balsam Lake would likely impact herbicide application. Based on this information, it can be determined if any herbicide placed in the area where water comes into Balsam Lake will stick around and for how long. Second, since one of the sampling sites is located where wild rice grows at the mouth of Mud Lake to Balsam Lake, it would show if and how much herbicide makes it to that point. Finally it would help create a more accurate treatment proposal that will only use as much herbicide as needed to reduce CLP in the targeted area.

## Implementation

A WDNR permit for chemical application was prepared and sent to the WDNR in early 2018 (Appendix D). The permit covered the area to be treated and the dye to be applied by Northern Aquatic Services (NAS).

NAS applied the dye on June 6, 2018 using sub-surface injection. Application took place between 8:00am and 9:00am. At the time of application the wind speed was 2-3 mph out of the north. Water temperature was 69 degrees F and the air temperature was 72 degrees F. At the time of application, coontail, CLP, common waterweed, white water lily, and filamentous algae were present in the treatment area. The chemical application treatment record is included in Appendix E.

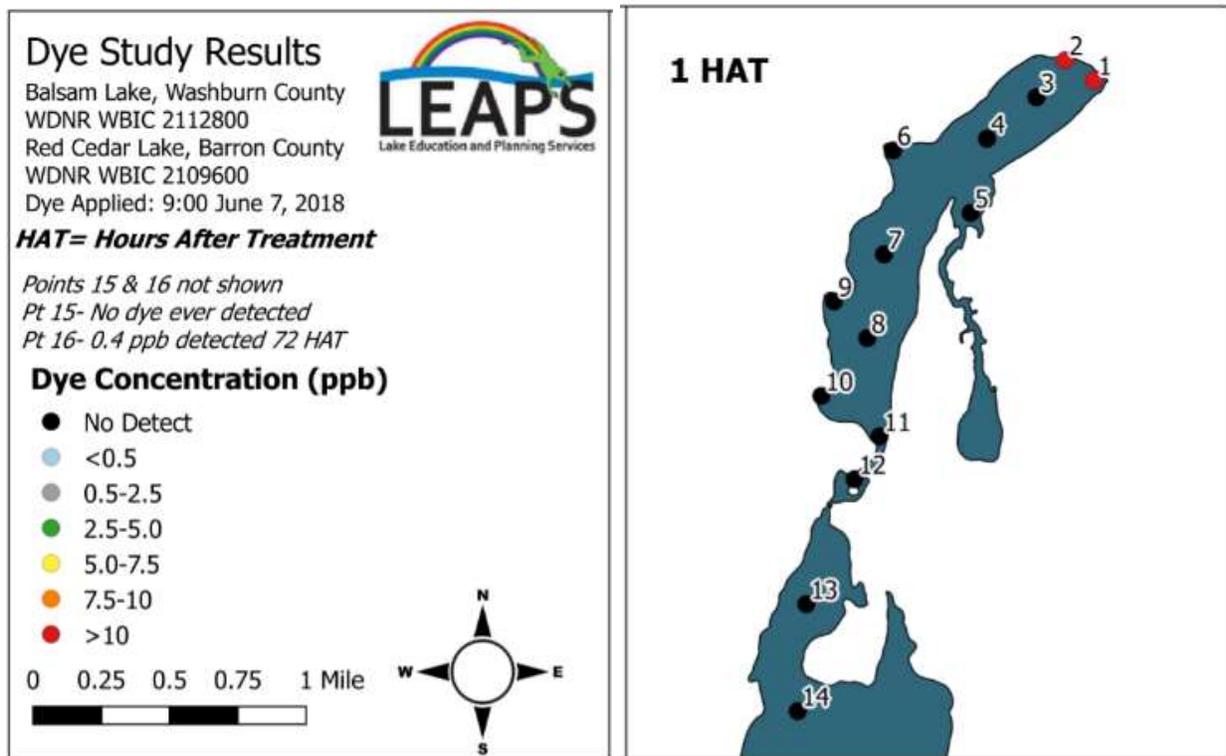
## Results

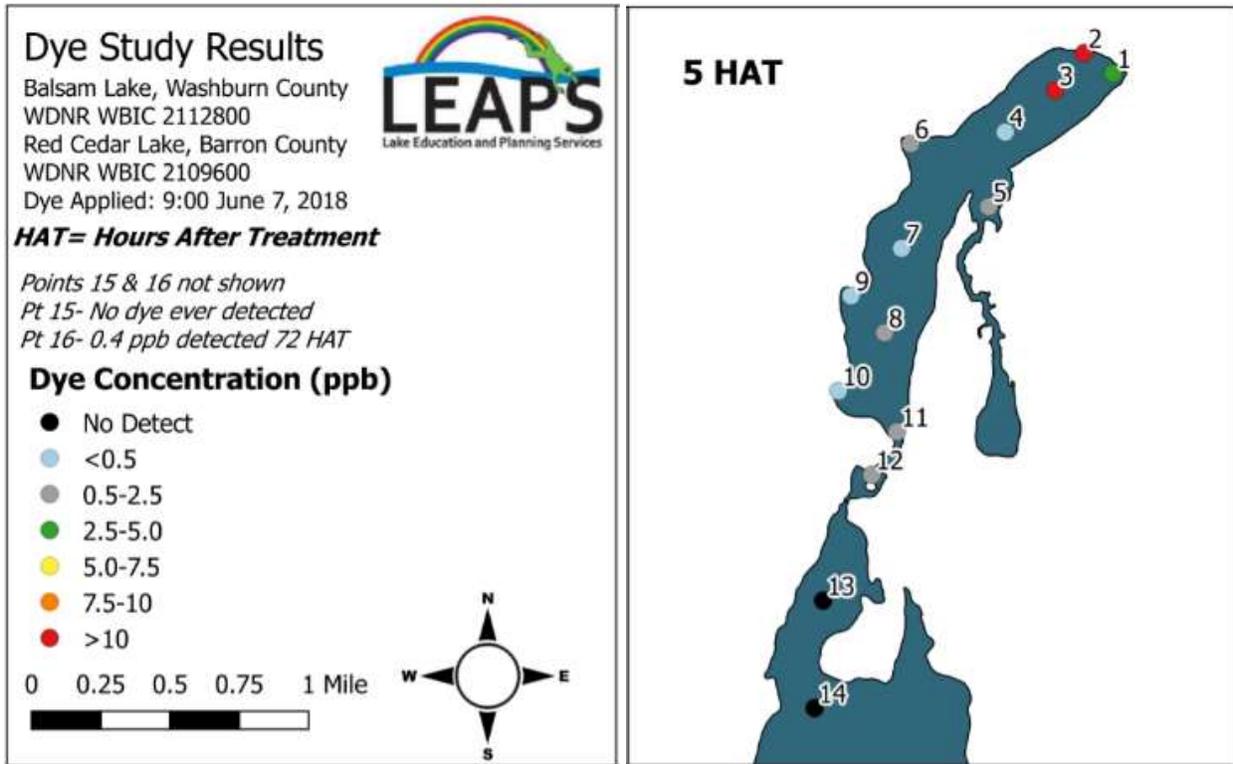
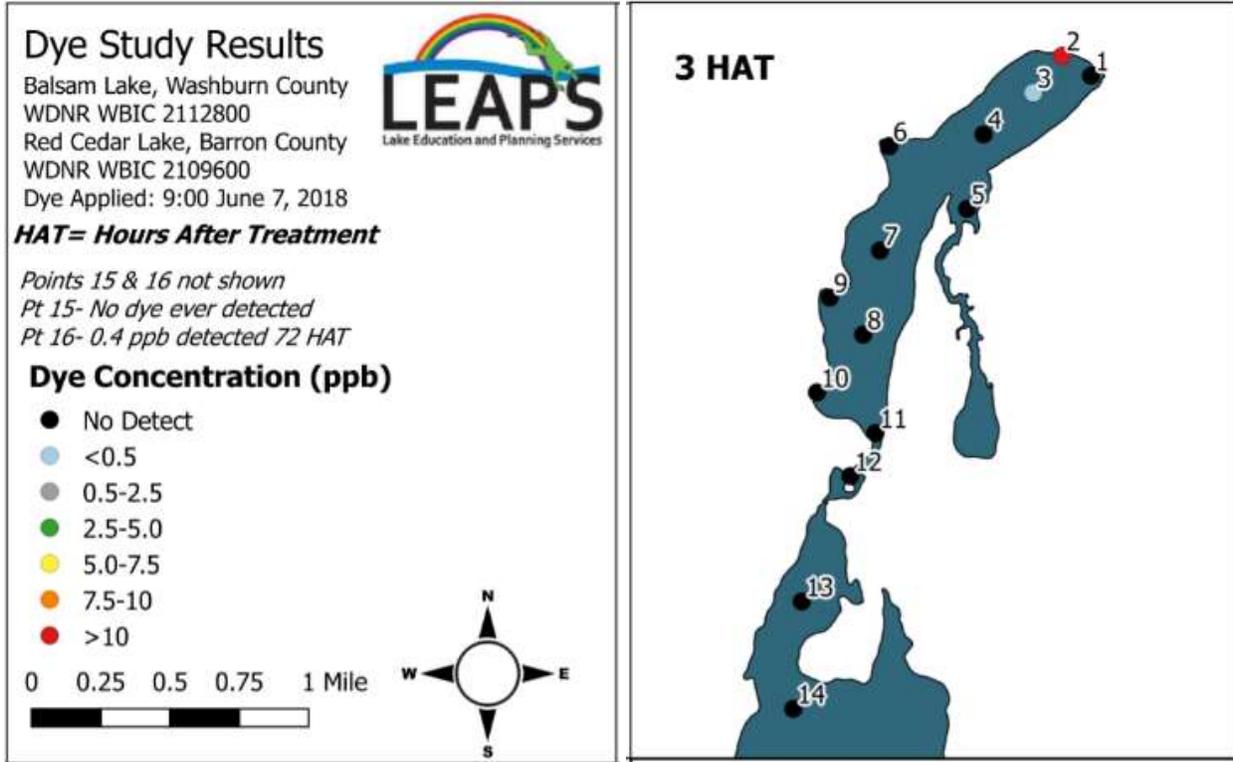
The following figures show the movement of dye through Balsam Lake over a 72 hour period (Figure 9). As expected the dye moved through Balsam Lake and into Red Cedar Lake. Five hours after treatment (HAT) the dye had reached every point being monitored in Balsam Lake. However it took between 48 and 72 hours for the dye to reach Red Cedar Lake in any measureable concentration. The highest concentrations in the main body of Balsam Lake were reached between 24 and 48 HAT, but still remained at around only 50% of the planned application rate. After 48 hours the concentration of dye

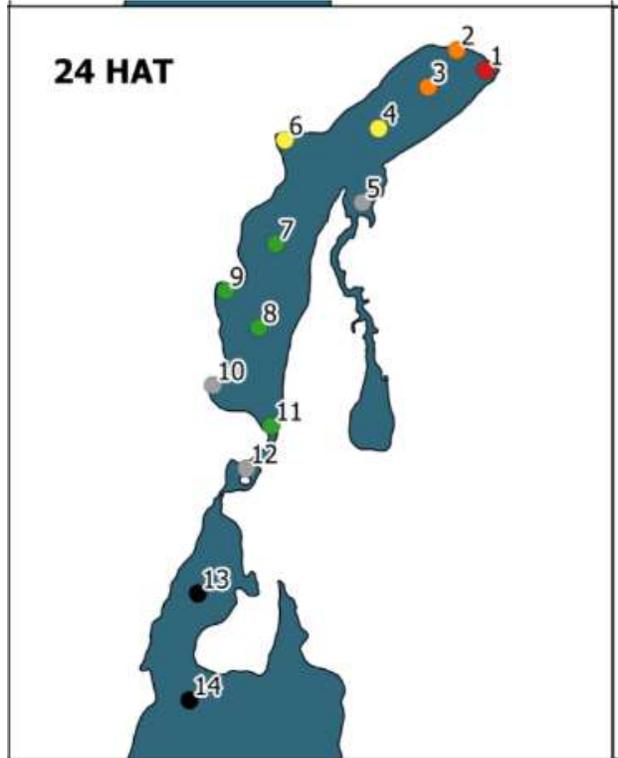
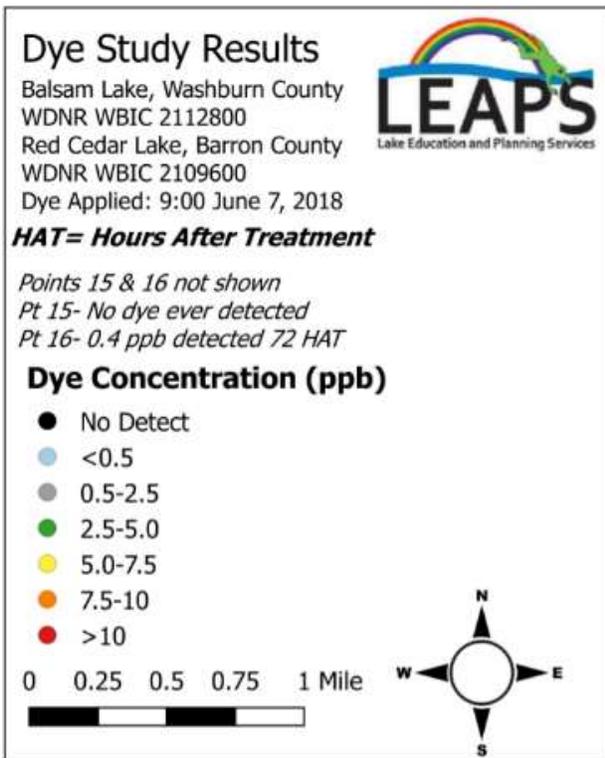
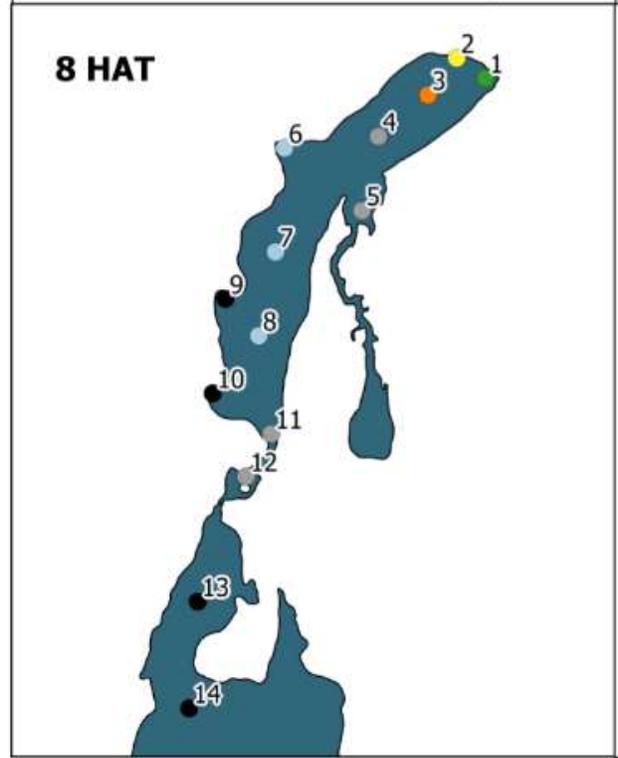
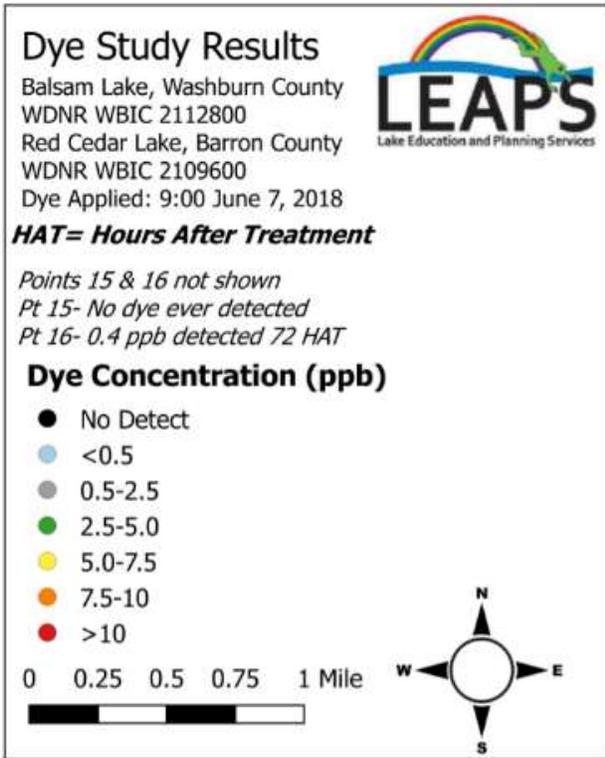
decreased, although it was still present in the lake at 72 HAT. In the simulated chemical treatment area (points 1 & 2), 1HAT the concentration of dye reached or exceeded the application rate. It stayed at this level at point 2 through 5HAT. However at point 1, where most of the flow coming into the lake passes through, the concentration of dye quickly dissipated to the point it was undetectable at 3HAT. However it came back up over a 24 hour period actually getting back to the target concentration at 24HAT. What this suggests is that where the water enters Balsam Lake, a backwater swirl is created that catches and holds water for at least a 24 hour period. The combination of reaching the target level and maintaining it for 24 hours or more at point 2 and the swirling/trapping effect at point 1, suggests that application of herbicide could be effective in the treatment area assuming herbicide is not placed directly in the channel coming in.

Near the wild rice beds at the mouth of the Mud Lake channel to Balsam Lake, point 5, it took 5HAT for the herbicide to be measurable. At 5HAT the concentration of dye was at up to 25% of the application rate on the north end. It remained at that low concentration through 24HAT, but sometime between 24 and 48HAT it increased to about 50% of the original application on the north end. It remained at that level through 72HAT. Since no sampling was done past 72HAT, it is not known how fast the dye dissipated after that.

One difference between dye and actual herbicide is other forms of degradation. While rhodamine dye is resistant to rapid degradation, endothall is not. As mentioned it has a half-life of 5-10 days in water, so combined with dispersion and dilution, if this experiment had been done with actual herbicide, the concentrations recorded would likely be less., having less impact on non-treated areas.







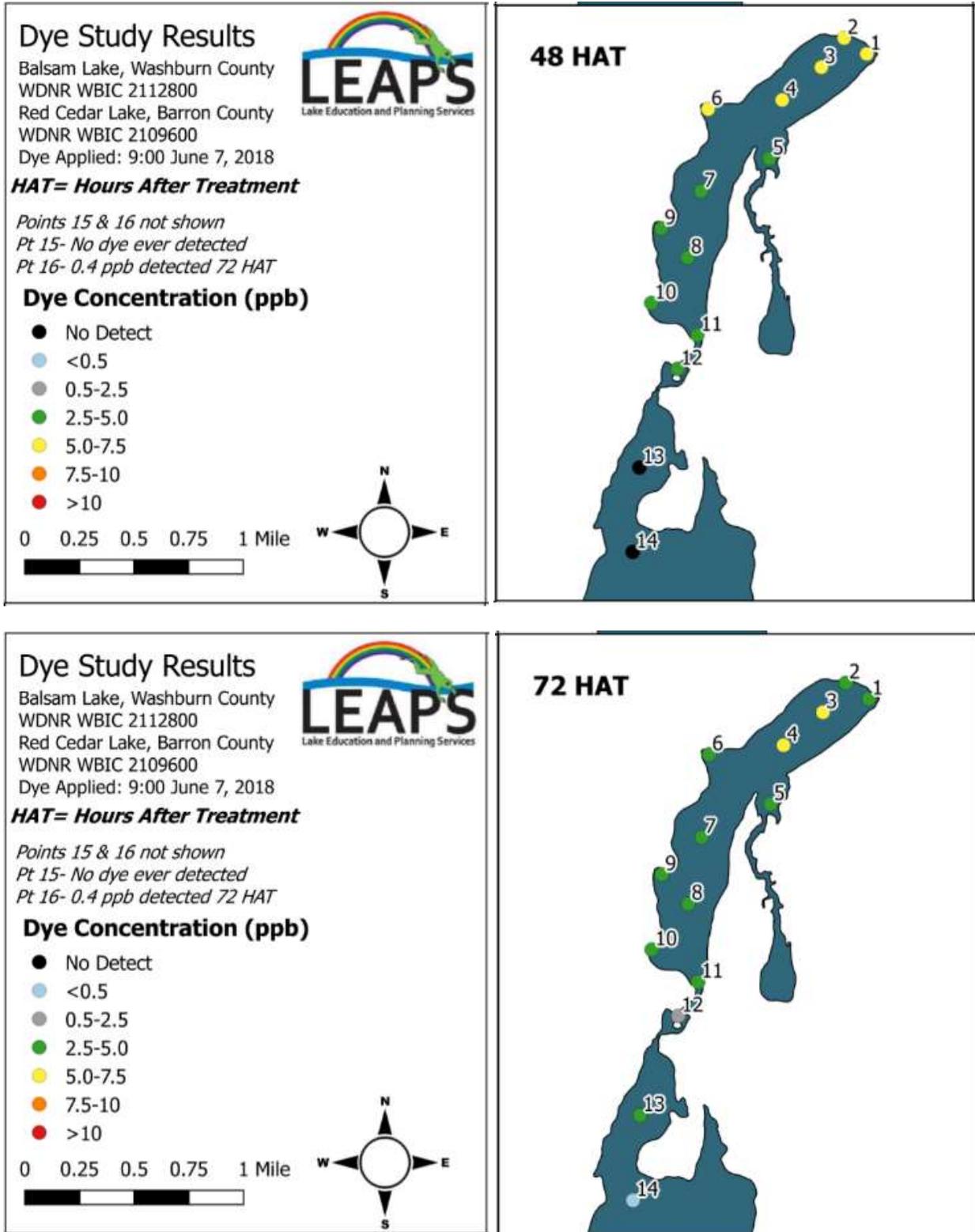


Figure 9: Hourly Dye Calculation and Dispersal for all Sampling Points (no dye was recorded at Pts 15 & 16 in Red Cedar Lake)

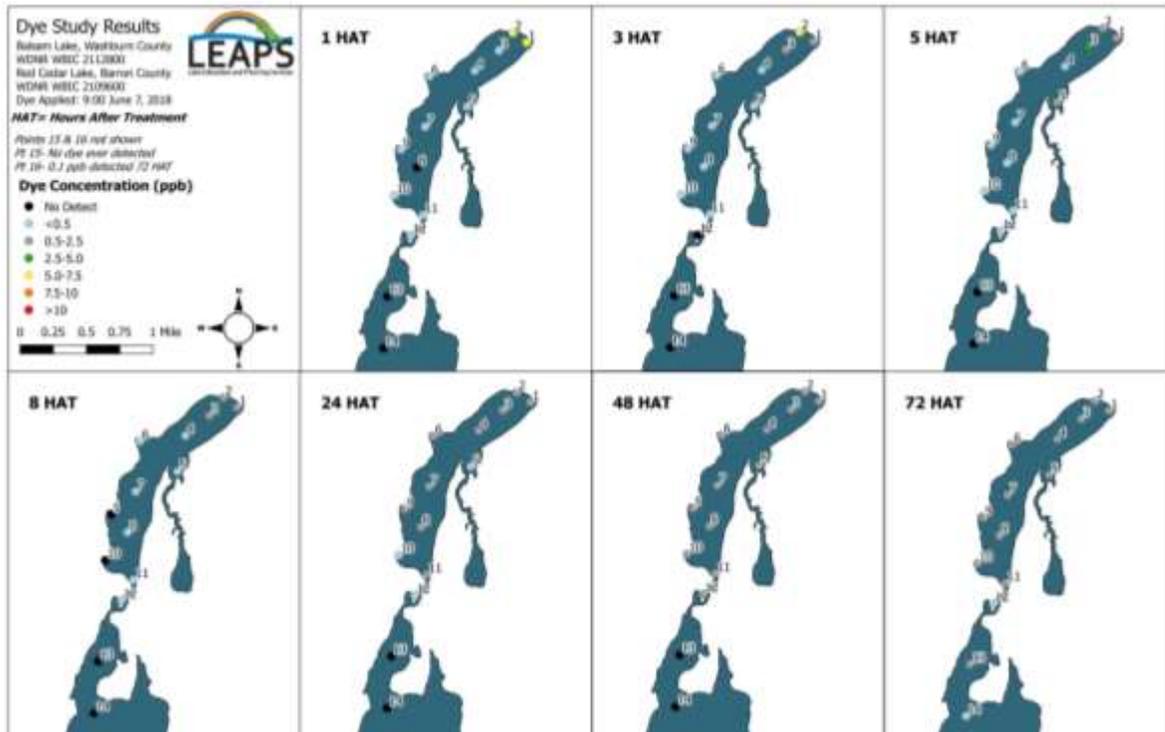


Figure 10: 2018 Rhodamine dye study results

The results of the 2018 dye study on Balsam Lake suggest that CLP treatment using endothall could be effective. As such, a plan for chemical treatment in Balsam Lake in 2019 was prepared.

Written by: Dave Blumer, LEAPS



# Appendix A - WDNR – Endothall Chemical Fact Sheet

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# Endothall Chemical Fact Sheet

## Formulations

Endothall is the common name of the active ingredient endothal acid (7-oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid). Endothall products are used to control a wide range of terrestrial and aquatic plants. Both granular and liquid formulations of endothall are available for aquatic use in Wisconsin. Two types of endothall are available: dipotassium salt (such as Aquathol®) and monoamine salts (such as Hydrothol 191). Trade names are provided for your reference only and are neither exhaustive nor endorsements of one product over another.

## Aquatic Use and Considerations

Endothall is a contact herbicide that prevents certain plants from making the proteins they need. Factors such as density and size of the plants present, water movement, and water temperature determine how quickly endothall works. Under favorable conditions, plants begin to weaken and die within a few days after application.

Endothall products vary somewhat in the target species they control, so it is important to always check the product label for the list of species that may be affected. Endothall products are effective on Eurasian watermilfoil (*Myriophyllum spicatum*) and also kill desirable native species such as pondweeds (*Potamogeton* spp.) and coontail (*Ceratophyllum* spp.). In addition, Hydrothol 191 formulations can also kill wild celery (*Vallisneria americana*) and some species of algae (*Chara*, *Cladophora*, *Spirogyra*, and *Pithophora*).

Endothall will kill several high value species of aquatic plants (especially *Potamogeton* spp.) in addition to nuisance species. The plants that offer important values to aquatic ecosystems often resemble, and may be growing with those plants targeted for treatment. Careful identification of plants and application of

endothall products is necessary to avoid unintended harm to valuable native species.

For effective control, endothall should be applied when plants are actively growing. Most submersed weeds are susceptible to Aquathol formulations. The choice of liquid or granular formulations depends on the size of the area requiring treatment. Granular is more suited to small areas or spot treatments, while liquid is more suitable for large areas.

If endothall is applied to a pond or enclosed bay with abundant vegetation, no more than 1/3 to 1/2 of the surface should be treated at one time because excessive decaying vegetation may deplete the oxygen content of the water and kill fish. Untreated areas should not be treated until the vegetation exposed to the initial application decomposes.

## Post-Treatment Water Use Restrictions

Due to the many formulations of this chemical the post-treatment water use restrictions vary. Each product label must be followed. For all products there is a drinking water standard of 0.1 ppm and can not be applied within 600 feet of a potable water intake. Use restrictions for Hydrothol products have irrigation and animal water restrictions.

## Herbicide Degradation, Persistence and Trace Contaminants

Endothall disperses with water movement and is broken down by microorganisms into carbon, hydrogen, and oxygen. Field studies show that low concentrations of endothall persist in water for several days to several weeks depending on environmental conditions. The half-life (the time it takes for half of the active ingredient to degrade) averages five to ten days. Complete degradation by microbial action is 30-60 days. The initial breakdown product of endothall is an amino acid, glutamic acid, which is rapidly consumed by bacteria.

## Impacts on Fish and Other Aquatic Organisms

At recommended rates, the dipotassium salts (Aquathol and Aquathol K) do not have any apparent short-term effects on the fish species that have been tested. In addition, numerous studies have shown the dipotassium salts induce no significant adverse effects in aquatic invertebrates (such as snails, aquatic insects, and crayfish) when used at label application rates. However, as with other herbicide use, some plant-dwelling populations of aquatic organisms may be adversely affected by application of endothall formulations due to habitat loss.

In contrast to the low toxicity of the dipotassium salt formulations, laboratory studies have shown the monoamine salts (Hydrothol 191 formulations) are toxic to fish at dosages above 0.3 parts per million (ppm). In particular, the liquid formulation will readily kill fish present in a treatment site. By comparison, EPA approved label rates for plant control range from 0.05 to 2.5 ppm. In recognition of the extreme toxicity of the monoamine salt, product labels recommend no treatment with Hydrothol 191 where fish are an important resource.

Other aquatic organisms can also be adversely affected by Hydrothol 191 formulations depending upon the concentration used and duration of exposure. Tadpoles and freshwater scuds have demonstrated sensitivity to Hydrothol 191 at levels ranging from 0.5 to 1.8 ppm.

Findings from field and laboratory studies with bluegills suggest that bioaccumulation of dipotassium salt formulations by fish from water treated with the herbicide is unlikely. Tissue sampling has shown residue levels become undetectable a few days after treatment.



## Human Health

Most concerns about adverse health effects revolve around applicator exposure. Liquid endothall formulations in concentrated form are highly toxic. Because endothall can cause eye damage and skin irritation, users should minimize exposure by wearing suitable eye and skin protection.

At this time, the EPA believes endothall poses no unacceptable risks to water users if water use restrictions are followed. EPA has determined that endothall is not a neurotoxicant or mutagen, nor is it likely to be a human carcinogen.

## For Additional Information

Environmental Protection Agency  
Office of Pesticide Programs  
[www.epa.gov/pesticides](http://www.epa.gov/pesticides)

Wisconsin Department of Agriculture, Trade,  
and Consumer Protection  
<http://datcp.wi.gov/Plants/Pesticides/>

Wisconsin Department of Natural Resources  
608-266-2621  
<http://dnr.wi.gov/lakes/plants/>

Wisconsin Department of Health Services  
<http://www.dhs.wisconsin.gov/>

National Pesticide Information Center  
1-800-858-7378  
<http://npic.orst.edu/>



# Appendix B – Rhodamine Dye Chemical Fact Sheet

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## Section 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

**Product name:** KEYACID™ RHODAMINE WT LIQUID

**CAS number:** 37299-86-8

**Product code:** 703 010 27

**Synonyms:** ACID RED 388

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Use of substance / mixture:** Industrial Colourant

### 1.3. Details of the supplier of the safety data sheet

**Company name:** Keystone Europe Ltd©  
Units 1-2 Beckview Business Parks  
Leeds Rd  
Huddersfield  
HD2 1UR

**Tel:** 01484 341 466

**Fax:** 01484 341 544

**Email:** [reach@keystone-europe.co.uk](mailto:reach@keystone-europe.co.uk)

### 1.4. Emergency telephone number

**Emergency tel:** +1 813 248 0585

## Section 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification under CHIP:** Xi: R36

**Classification under CLP:** This product has no classification under CLP.

### 2.2. Label elements

**Label elements:** This product has no label elements.

### 2.3. Other hazards

**PBT:** This substance is not identified as a PBT substance.

## Section 3: Composition/information on ingredients

### 3.1. Substances

**Chemical identity:** KEYACID™ RHODAMINE WT LIQUID

**Contains:** CAS No 528-44-9 Trimellitic Acid

Sodium Monochloride CAS No.7647-14-5

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KEYACID™ RHODAMINE WT LIQUID

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**Section 4: First aid measures**

**4.1. Description of first aid measures**

- Skin contact:** Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Consult a doctor.
- Eye contact:** Bathe the eye with running water for 15 minutes. Consult a doctor.
- Ingestion:** Wash out mouth with water. Do not induce vomiting. If conscious, give half a litre of water to drink immediately. Consult a doctor.
- Inhalation:** Remove casualty from exposure ensuring one's own safety whilst doing so. Consult a doctor.

**4.2. Most important symptoms and effects, both acute and delayed**

- Skin contact:** There may be irritation and redness at the site of contact.
- Eye contact:** There may be pain and redness. The eyes may water profusely.
- Ingestion:** There may be soreness and redness of the mouth and throat. There may be difficulty swallowing. Nausea and stomach pain may occur.
- Inhalation:** There may be irritation of the throat with a feeling of tightness in the chest.

**4.3. Indication of any immediate medical attention and special treatment needed**

**Section 5: Fire-fighting measures**

**5.1. Extinguishing media**

**Extinguishing media:** Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

**5.2. Special hazards arising from the substance or mixture**

**Exposure hazards:** In combustion emits toxic fumes.

**5.3. Advice for fire-fighters**

**Advice for fire-fighters:** Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

**Section 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

**Personal precautions:** Refer to section 8 of SDS for personal protection details. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Turn leaking containers leak-side up to prevent the escape of liquid.

**6.2. Environmental precautions**

**Environmental precautions:** Do not discharge into drains or rivers. Contain the spillage using bunding.

[cont...]

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KEYACID™ RHODAMINE WT LIQUID

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**6.3. Methods and material for containment and cleaning up**

**Clean-up procedures:** Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

**6.4. Reference to other sections**

**Section 7: Handling and storage**

**7.1. Precautions for safe handling**

**Handling requirements:** Avoid direct contact with the substance.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage conditions:** Store in cool, well ventilated area. Keep container tightly closed.

**7.3. Specific end use(s)**

**Section 8: Exposure controls/personal protection**

**8.1. Control parameters**

**Workplace exposure limits:** Not applicable.

**8.2. Exposure controls**

**Respiratory protection:** Respiratory protection not required.

**Hand protection:** Impermeable gloves.

**Eye protection:** Safety glasses with side-shields. Ensure eye bath is to hand.

**Skin protection:** Impermeable protective clothing.

**Section 9: Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

**State:** Liquid

**Colour:** Dark red

**Solubility in water:** Soluble

**9.2. Other information**

**Other information:** Not applicable.

**Section 10: Stability and reactivity**

**10.1. Reactivity**

**10.2. Chemical stability**

**Chemical stability:** Stable under normal conditions.

**10.3. Possibility of hazardous reactions**

[cont...]

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KEYACID™ RHODAMINE WT LIQUID

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**10.4. Conditions to avoid**

**Conditions to avoid:** Heat.

**10.5. Incompatible materials**

**Materials to avoid:** Strong oxidising agents. Strong acids.

**10.6. Hazardous decomposition products**

**Haz. decomp. products:** In combustion emits toxic fumes.

**Section 11: Toxicological information**

**11.1. Information on toxicological effects**

**Toxicity values:** Not applicable.

**Symptoms / routes of exposure**

**Skin contact:** There may be irritation and redness at the site of contact.

**Eye contact:** There may be pain and redness. The eyes may water profusely.

**Ingestion:** There may be soreness and redness of the mouth and throat. There may be difficulty swallowing. Nausea and stomach pain may occur.

**Inhalation:** There may be irritation of the throat with a feeling of tightness in the chest.

**Section 12: Ecological information**

**12.1. Toxicity**

**Ecotoxicity values:** Not applicable.

**12.2. Persistence and degradability**

**Persistence and degradability:** No data available.

**12.3. Bioaccumulative potential**

**Bioaccumulative potential:** No data available.

**12.4. Mobility in soil**

**Mobility:** Readily absorbed into soil.

**12.5. Results of PBT and vPvB assessment**

**PBT identification:** This substance is not identified as a PBT substance.

**12.6. Other adverse effects**

**Other adverse effects:** No data available.

**Section 13: Disposal considerations**

**13.1. Waste treatment methods**

**NB:** The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

[cont...]

**SAFETY DATA SHEET**  
KEYACID™ RHODAMINE WT LIQUID

Page: 5

**Section 14: Transport information**

**Transport class:** This product does not require a classification for transport.

**Section 15: Regulatory information**

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

**15.2. Chemical Safety Assessment**

**Chemical safety assessment:** A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

**Section 16: Other information**

**Other information**

**Other information:** This safety data sheet is prepared in accordance with Commission Regulation (EU) No 453/2010.

\* indicates text in the SDS which has changed since the last revision.

**Phrases used in s.2 and 3:** R36: Irritating to eyes.

**Legal disclaimer:** The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.



# Appendix C – Balsam Lake Data Recording Sheets

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**2018 Balasm Lake Rhodamine Dye Study**

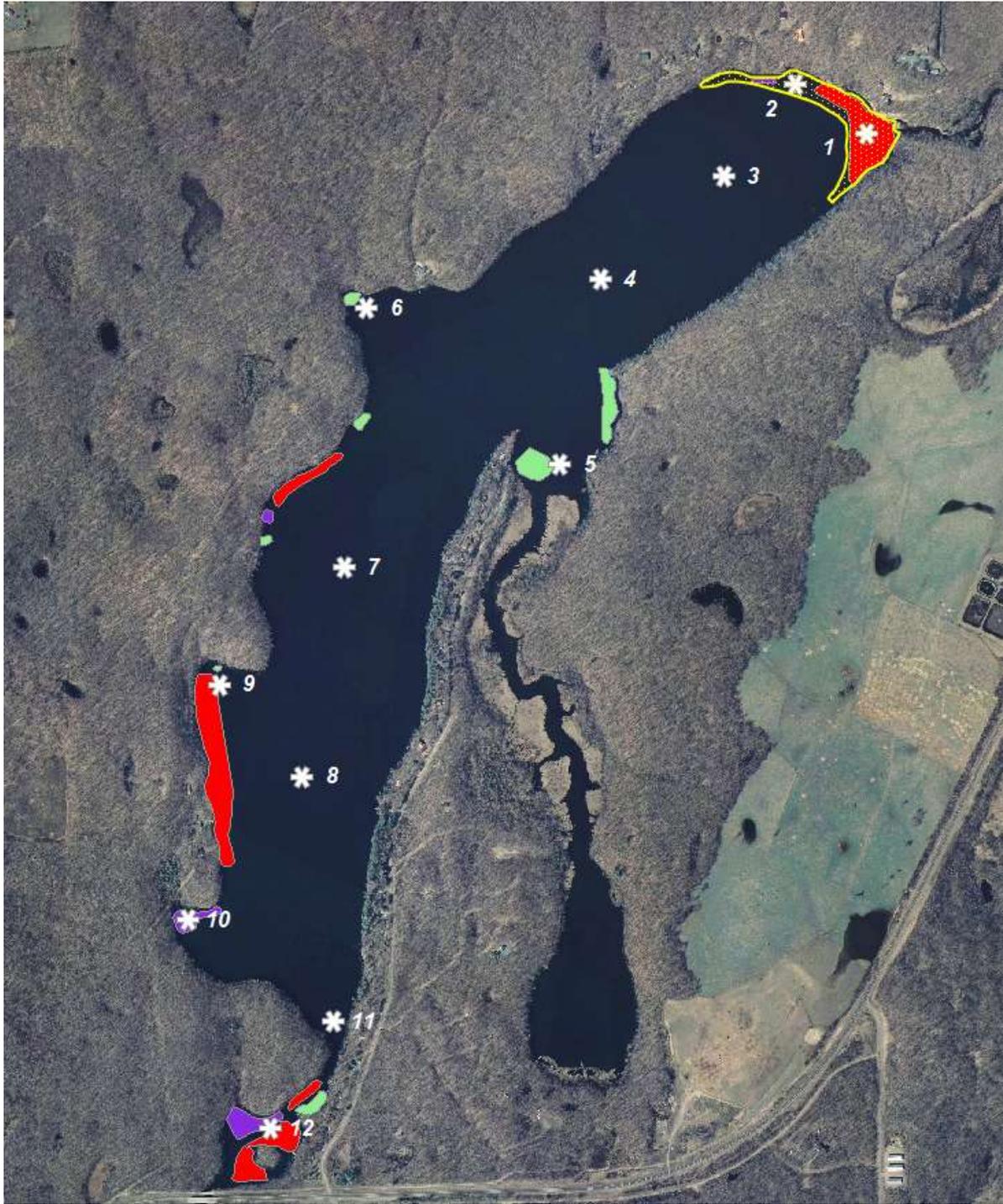
**Dye Application Completion Date and Time: \_\_\_\_\_**

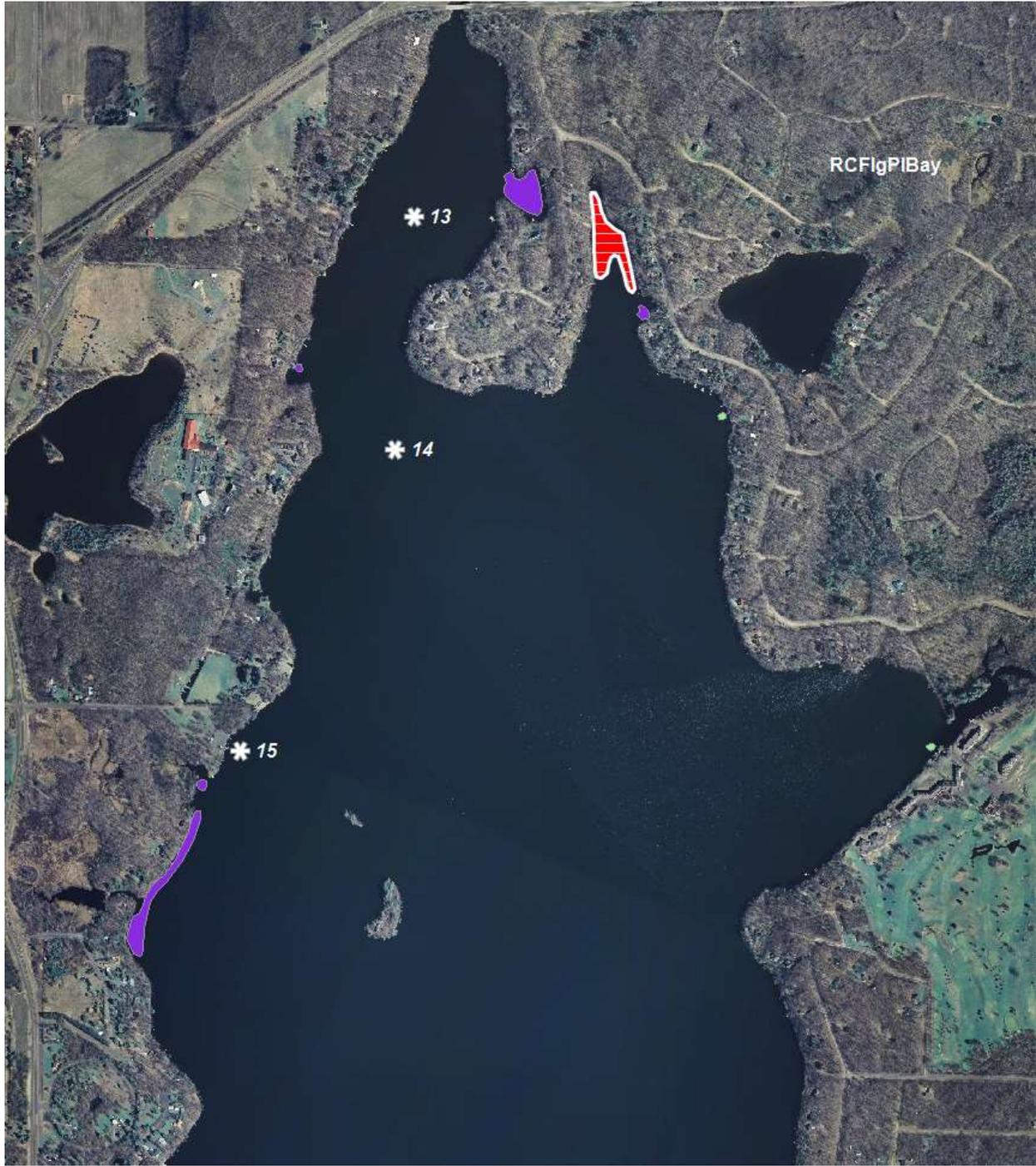
Site	1 HAT	3 HAT	5 HAT	8 HAT
	Time_____	Time_____	Time_____	Time_____
	Date_____	Date_____	Date_____	Date_____
	<i>Wind Direction and Speed_____</i>			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>
<b>HAT</b>	<b>Hours After Treatment</b>			
	<b>Do not sample</b>			

**2018 Balsam Lake Rhodamine Dye Study**

**Dye Application Completion Date and Time: \_\_\_\_\_**

Site	24 HAT	48 HAT	72 HAT	96 HAT
	Time _____	Time _____	Time _____	Time _____
	Date _____	Date _____	Date _____	Date _____
	<i>Wind Direction and Speed _____</i>			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>	<b>Person(s) Sampling</b>









# Appendix D – 2018 WDNR Chemical Application Permit

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May 1, 2018

Red Cedar Association  
Tom Goodwin  
2960 28 7/16 St.  
Birchwood, WI 54817

Permit # NO-2018-66-0735

Dear Mr. Goodwin:

Enclosed you will find your approved Aquatic Plant Management permit for chemical treatment on Balsam Lake in Washburn County. Your application has been approved for the area described and may not be expanded. Details of the approved treatment area are as follows:

Township 37N            Range 10W            Sec. 21

**Specific Project Description** (as shown on application form).

1. One site covering a maximum of 7.6 acres may have Rhodamine Dye added to the water for water flow monitoring to model water movement mimicking a herbicide application.
2. Disturbance of wild rice is prohibited.
3. Application should be scheduled to avoid inclement weather and winds that would hinder efficacy. Treatment should take place when winds are expected to remain below 10 mph.
4. All requirements for notification according to NR 107.07 (3) must be satisfied prior to treatment.
5. All riparian residents within 150 feet of a treated areas must be properly notified per NR107.04(4).

Please note these selected permit conditions (refer to Section NR 107.08 for complete details):

1. Four-day advance notification of treatment is required unless exempted in Section VII of the application.
2. Treatment sites must be posted a minimum of one day or as specified in the use restrictions on the chemical label.
3. The Aquatic Plant Treatment Record must be submitted within 30 days after treatment or by October 1 if no treatment occurs.
4. **All equipment used for the project shall be de-contaminated following the most current protocols for invasive and exotic viruses and species prior to use and after use.**

Thank you for complying with the provisions of Wis. Adm. Code NR 107 concerning the use of aquatic pesticides for plant management. Feel free to contact Mark Sundeen at the Spooner Service Center at 715/635-4074 for further information.

Sincerely,



Mark Sundeen  
Water Resource Specialist  
WDNR  
Spooner, WI

Enc.

Date Mailed May 1, 2018

State of Wisconsin DNR  
DNR Department of Natural Resources  
Water Permit Central Intake - attn. APM  
PO Box 7185  
Madison, WI 53707-7185

### Chemical Aquatic Plant Control Application and Permit Wisconsin Pollutant Discharge Elimination System (WPDES) Pesticide Pollutant Permit Application

Form 3200-004 (R 02/17)

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapters NR 107, 200 and 205, Wis. Adm. Code. This permit application is required to request coverage for pollutant discharge into waters of the state. Personally identifiable information on this form may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

DNR Use Only	
ID Number NO-2018-66-0735	Permit Expiration Date
Waterbody # 2112800	Fee Received \$220

**Section I - Applicant Information** - Name of Permit Applicant. Also indicate names and addresses of all individuals, associations, communities or town sanitary districts sponsoring treatment. Attach additional sheets if necessary.

Home Address	Name Red Cedar Lakes Association- Tom Goodwin			Waterbody Address	Name Tom Goodwin		
	Street Address 2960 28 7/16 St.				Street Address 2960 28 7/16 St.		
	City Birchwood	State WI	ZIP Code 54817		City Birchwood	State WI	ZIP Code 54817
	Phone Number (include area code) Primary: (612) 868-485 Secondary:				Email Address tlgfin1@gmail.com		

**Section II - Aquatic Plant Control Location**

Waterbody to be Treated (waterbody where treatment area is located) Balsam Lake				Lake Surface Area 364 acres	Estimated Surface Area that is 10 Feet or Less in Depth acres
County Washburn	Section	Township 37 N	Range 10	Name of Applicator or Firm Northern Aquatic Services, Dale Dressel	
Latitude		Longitude		Street or Route 1061 240 th Street	
• Is there more than one property owner? <input checked="" type="radio"/> Yes <input type="radio"/> No		• Is there surface water discharge? <input checked="" type="radio"/> Yes <input type="radio"/> No		City Dresser	
• Does the waterbody have public access? <input checked="" type="radio"/> Yes <input type="radio"/> No		If all are no: considered to be a private pond		State WI	
Adjacent Riparian Property Owner Names (attach sheets if necessary)		PoIk		ZIP Code 54009	
1. Lake wide		Email Address		Phone Number (include area code) (715) 495-5252	
2. _____		ddressel@centurytel.net		County	
3. _____		Applicator Certification Number for Category 5 Aquatic Pesticide Application		PoIk	
4. _____		061742		Email Address	
5. _____		Business Location License Number (if applicable)		na	
6. _____		na		Restricted Use Pesticide License Number (if applicable)	
Name of Lake Property Owners' Association Representative or Lake District Representative (if none, please indicate) Tom Goodwin, AIS Committee Chair				na	

Area(s) Proposed for Control:	Treatment Length	Treatment Width	Estimated Acreage	Average Depth	Calculated Volume
1.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = 7.6 ac	X 7.1 ft =	53.96 ac-ft
2.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
3.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
4.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
5.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
6.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
7.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
8.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
9.	ft X _____	ft ÷ _____	43,560 ft <sup>2</sup> = _____ ac	X _____ ft =	_____ ac-ft
Estimated Acreage Grand Total			7.6 ac	Calculated Volume Grand Total	53.96 ac-ft

If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth in Section II, complete and attach Form 3200-004A, Large-Scale Treatment Worksheet. Private pond treatments are exempted from this requirement.

Is this area within or adjacent to a sensitive area designated by the Department of Natural Resources? <input checked="" type="radio"/> Yes <input type="radio"/> No	DNR Use: NHI Review? <input checked="" type="radio"/> Yes <input type="radio"/> No Describe:
--	--

# Chemical Aquatic Plant Control Application and Permit WPDES Pesticide Pollutant Permit Application

Form 3200-004 (R 02/17)

Page 2 of 4

### Section III - Fees

1. [s. NR 107.11\(1\)](#), Wis. Adm. Code, lists the conditions under which the permit fee is limited to the \$20 minimum charge.
2. [s. NR 107.11\(4\)](#), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3. [s. NR 107.04\(2\)](#), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.
4. Fee calculations:

If proposed treatment is over 0.25 acre, calculate acreage fee:  
(round up to nearest whole acre, to maximum of 50 acres.)

\_\_\_\_\_ 8 \_\_\_\_\_ acres X \$25 per acre = \$ \_\_\_\_\_ 200 \_\_\_\_\_

If proposed treatment is ≤ 0.25 acre, acreage fee is \$0.

Enter Acreage Fee (from above) . . . . . \$ \_\_\_\_\_ 200.00

Basic Permit Fee (non-refundable) . . . . . \$ \_\_\_\_\_ 20.00

Total Fee Enclosed . . . . . \$ \_\_\_\_\_ 220.00

**Site Map:** Attach a sketch or a printed map of lake indicating area and dimensions of each individual area where plant control is desired and flow of surface water outside treatment area. Also show location of property owners riparian to and adjacent to the treatment area. Attach a separate list of owners and corresponding treatment dimensions coded to the lake map, if necessary.

### Section IV - Reasons for Aquatic Plant Control

Is this permit being requested in accordance with an approved Aquatic Plant Management Plan?

Yes  No

Treatment Type:

Lake  Pond  Wetland  Marina  Other

Goal of Aquatic Plant Control:

1.  Maintain navigational channel
2.  Maintain boat landing and carry in access
3.  Improve fish habitat
4.  Maintain swimming area
5.  Control of invasive exotics
6.  Other: Rhodamine Dye study to determine potential impacts of chemical treatment near inlet

Nuisance Caused By:

- Algae
- Emergent water plants (majority of leaves and stems growing above water surface, e.g. cattails, bulrushes)
- Floating water plants (majority of leaves floating on water surface, e.g., waterlilies, duckweed)
- Submerged water plants (leaves and stems below water surface, flowering parts may be exposed, e.g., milfoil, coontail)
- Other: \_\_\_\_\_

List Target Plants

NA

**Note: Different plants require different chemicals for effective treatment. Do not purchase chemical before identifying plants.**

### Section V - Chemical Control

Alternatives to Chemical Control:

Feasible?

If No, Why Not?

- |                                   |                                      |                                     |       |
|-----------------------------------|--------------------------------------|-------------------------------------|-------|
| 1. Mechanical harvesting          | <input type="radio"/> Yes            | <input checked="" type="radio"/> No |       |
| 2. Manual removal                 | <input type="radio"/> Yes            | <input checked="" type="radio"/> No | _____ |
| 3. Sediment screens/covers        | <input type="radio"/> Yes            | <input checked="" type="radio"/> No | _____ |
| 4. Dredging                       | <input type="radio"/> Yes            | <input checked="" type="radio"/> No | _____ |
| 5. Lake drawdown                  | <input type="radio"/> Yes            | <input checked="" type="radio"/> No | _____ |
| 6. Nutrient controls in watershed | <input checked="" type="radio"/> Yes | <input type="radio"/> No            | _____ |
| 7. Other: _____                   | <input type="radio"/> Yes            | <input type="radio"/> No            | _____ |

**Note: If proposed treatment involves multiple properties, consider feasibility of EACH alternative for EACH property owner.**

If you checked yes to any of the alternatives listed above, please explain your decision to use chemical controls:

The dye study is proposed to be done at the main inlet at the northern end of Balsam Lake to determine the feasibility of chemical control in that area and potential impacts treatment in that area could have around the entire lake.

Chemical Aquatic Plant Control Application and Permit  
WPDES Pesticide Pollutant Permit Application

Form 3200-004 (R 02/17)

Page 3 of 4

Section V – Chemical Control (continued)

Full Trade Name of Proposed Chemical(s)

Rhodamine WT 20%

Method of Application: Sub-surface injection

Will surface water outflow and/or overflow be controlled to prevent chemical loss?  Yes  No

Have the proposed chemicals been permitted in a prior year on the proposed site?  All  Some  None

What were the results of the treatment?

N/A

For private ponds and wetlands please ignore next question

Is treatment area greater than 5% of surface area?  Yes  No

If yes, calculate whole lake concentration (in ppm). Refer to DNR Lake pages [dnr.wi.gov/Lakes](http://dnr.wi.gov/Lakes) to answer the following:

Does the lake stratify?  Yes  No

If yes, calculate whole lake concentration using volume above thermocline.  
If no, calculate whole lake concentration using total lake volume.

Whole Lake Concentration: \_\_\_\_\_ ppm

Note: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural Resources at the following link: [dnr.wi.gov/Lakes/plants/factsheets/](http://dnr.wi.gov/Lakes/plants/factsheets/).

Section VI – Applicant Responsibilities and Certification

- The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.
- The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s. NR 107.07, Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement?  Yes  No
- The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.
- The applicant has provided a copy of the current application to any affected property owners' association, inland lake district and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland lake district.
- Conditions related to invasive species movement. The applicant and operator agree to the following methods required under s. NR 109.05(2), Wis. Adm. Code for controlling, transporting and disposing of aquatic plants and animals, and moving water:
  - Aquatic plants and animals shall be removed and water drained from all equipment as required by s. 30.07, Wis. Stats., and ss. NR 19.055 and 40.07, Wis. Adm. Code.
  - Operator shall comply with the most recent Department-approved 'Boat, Gear, and Equipment Decontamination and Disinfection Protocol', Manual Code # 9183.1, available at <http://dnr.wi.gov/topic/invasives/disinfection.html>

Check if you are signing as Agent for Applicant.

I hereby certify that the above information is true and correct and that copies of this application have been provided to the appropriate parties named in Section II and that the conditions of the permit and pesticide use will be adhered to.

  
Signature of Applicant

4-1-18  
Date Signed

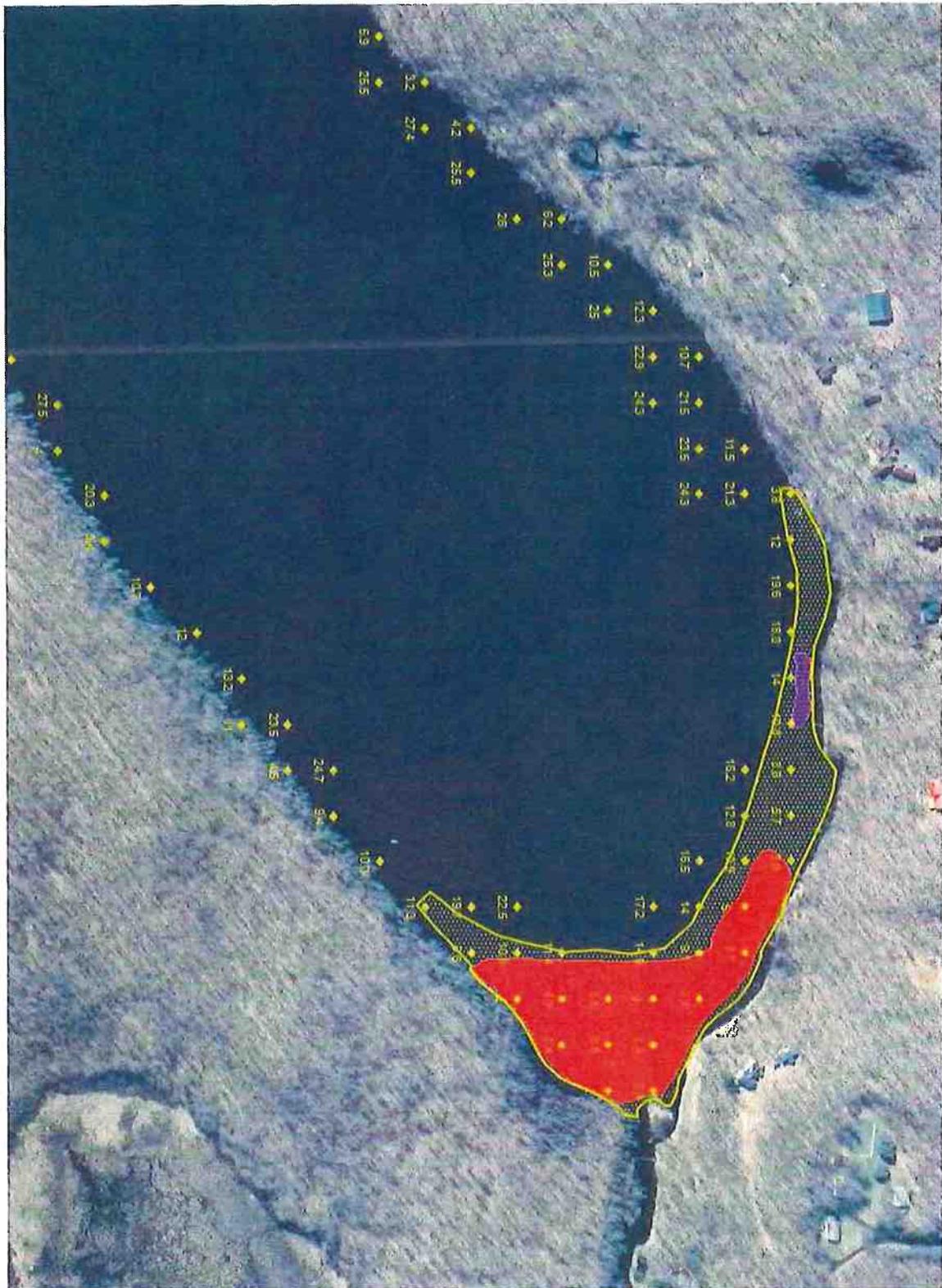
All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at time of treatment. During treatment all provisions of Chapter NR 107, specifically ss. NR 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.



**2018 Balsam Lake Rhodamine Dye Study for CLP Management LEAPS 3-26-2018**

Dye Requirements Balsam Lake (LEAPS 3-26-2018)						
Treatment Site	Treatment Area (Acres)	Mean Depth (ft)	Treatment Volume (acre-feet)	Dye Requirement (liters)	Dye Requirement (gallons)	Dye Requirements (lbs)
Northern Inlet	7.60	7.13	54.19	2.71	0.72	6.93
Total	7.60		54.19	2.71	0.72	
Rhodamine Dye WT 20% concentration						
Specific Gravity of Rhodamine Dye = 1.16						
1 gallon of water (Specific gravity = 1.0) weighs 8.343 lbs						
Specific gravity of rhodamine dye (1.16) multiplied by 8.343 lbs = 9.68 lbs						
1 gallon of rhodamine dye weighs 9.68 lbs						
0.72 gallons of rhodamine dye weigh 6.93 lbs.						
7.0 x \$35/lb = \$245.00						

Target Concentration= 10 ppb



**Balsam Lake Property Owners Adjacent to the Dye Study Area**

**DAVID A HAGEN TRUST**

957 PINE VIEW CT  
SAINT PAUL MN 55119-5637

**JANET A GUSTAFSON**

7480 CLOMAN WAY E  
INVER GROVE HEIGHTS MN 55076-4308

**STEVEN J LUNIEWSKI**

1419 4TH ST NE  
MINNEAPOLIS MN 55413-1206

**DAVID L BREKKEN**

PO BOX 368  
BIRCHWOOD WI 54817-0368

**RONALD E FARLEY**

650 FOXMOOR LN  
EAU CLAIRE WI 54701-7492

**PAUL J ELLINGSON**

64477 E WIND RIDGE CIR  
SADDLEBROOKE AZ 85739-1211

**WILLIAM C RIEMAN JR**

PO BOX 367  
BIRCHWOOD WI 54817-0367

**ANN C GLEICHERT TRUST**

W 681 COUNTY HWY D  
BIRCHWOOD WI 54817-9134

**SUSAN J ROHLIK**

2952 29TH AVE  
BIRCHWOOD WI 54817-9207

**JERRY D GARGULAK**

R6081 ARROWHEAD TRL  
RINGLE WI 54471-9555

**PATRICK M BLACKALLER**

W 545 COUNTY HWY D  
BIRCHWOOD WI 54817-9134

**JASON A JOHNSON**

W 601 COUNTY HWY D  
BIRCHWOOD WI 54817-9134

**WILLIAM J PETERSEN TRUST**

W 401 COUNTY HWY D  
BIRCHWOOD WI 54817-7347



# Appendix E – 2018 WDNR Chemical Application Treatment Record

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## Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R 11/16)

**Notice:** Completion of this form is a condition of the permit and provides records required by WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

- Submit this form:**
- (1) immediately if any unusual circumstances occurred during treatment
  - (2) as soon after treatment as possible, no later than 30 days
  - (3) by October 1 if no treatment occurred

Completion of this form along with the permit satisfies the requirements of WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22).

### General Permit Information

Permit Number NO-2018-66-0735	Waterbody Name (including ponds, e.g., Smith Pond) Red Cedar Lake		
County Barron	Permit Holder Name (Customer Name) RCLA Tom Goodwin		
Permit Holder Address 2960 28 7/16 St	City Birchwood	State WI	ZIP Code 54871

### Treatment Information

Treatment Date (mm/dd/yyyy) 06/07/2018	Starting Time (24 hr) 08:00	Ending Time (24 hr) 9:00	Water Temp 69	<input type="radio"/> C <input checked="" type="radio"/> F	Ambient Air Temp 72	<input type="radio"/> C <input checked="" type="radio"/> F
Wind Speed (mph) 2-3	Wind Direction N	Expected Duration of Chemical Residuals 24 hrs but we'll see				

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	If Yes, Supervisor Name Tom Goodwin
-----------------------------	--	--

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)  
 Site

Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107?

**Applicator shall provide each customer with a free copy of each pesticide label used (if requested)**

### Applicator Information

Individual or Business Name Dale Dressel		Telephone (xxx) 123-1234 (715) 495-5252	
Street Address 1061 240th street	City Dresser	State WI	ZIP Code 54009
Individuals Making Pesticide Application:	Last Name Dressel	First Dale	Certification # 061742
	Last Name	First	Certification #
	Last Name	First	Certification #
	Last Name	First	Certification #
Name of Person Completing Form Dale Dressel	Signature	Date Signed 06/07/2018	DNR Use Only Date Received

# Aquatic Plant Management Herbicide Treatment Record

### Treatment Site and Chemical Information - 1

Site No.	Property Name	Address / Fire No.	Treated Acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
	North Inlet		7.6	7.60	<input type="checkbox"/> Y		
Herbicide Name		EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)		
Rhodamine Dye (not herb)			6.93	pounds			
<b>Total Amount Applied</b>			6.93				

### Treatment Site and Chemical Information - 2

Site No.	Property Name	Address / Fire No.	Treated Acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
					<input type="checkbox"/> Y		
Herbicide Name		EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)		
<b>Total Amount Applied</b>							

### Treatment Site and Chemical Information - 3

Site No.	Property Name	Address / Fire No.	Treated Acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
					<input type="checkbox"/> Y		
Herbicide Name		EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)		
<b>Total Amount Applied</b>							

Add a Treatment Site >>

### If treating >5% of the lake surface area, what is the whole lake concentration (mg/l = ppm) per herbicide applied?

Herbicide Name	Herbicide Name	EPA Reg. No.	Total Amount	Units	Whole Lake Concentration Rate (mg/l = ppm)
<b>Total Amount Applied For All Sites</b>			6.93		

### Aquatics at Treatment Site: TS = Target Species SP = Species Present

TS	SP	Site(s)	TS	SP	Site(s)	TS	SP	Site(s)
<input type="radio"/>	<input type="radio"/>	Cattail	<input type="radio"/>	<input type="radio"/>	Flat-Stem Pondweed	<input type="radio"/>	<input type="radio"/>	Richardson Pondweed
<input type="radio"/>	<input type="radio"/>	Chara	<input type="radio"/>	<input type="radio"/>	Floating-Leaf Pondweed	<input type="radio"/>	<input type="radio"/>	Robbins Pondweed
<input type="radio"/>	<input checked="" type="radio"/>	Coontail	<input type="radio"/>	<input type="radio"/>	Illinois Pondweed	<input type="radio"/>	<input type="radio"/>	Sago Pondweed
<input type="radio"/>	<input checked="" type="radio"/>	Curly-Leaf Pondweed	<input type="radio"/>	<input type="radio"/>	Large-Leaf Pondweed	<input type="radio"/>	<input type="radio"/>	Starry Stonewort
<input type="radio"/>	<input type="radio"/>	Duckweed	<input type="radio"/>	<input type="radio"/>	Northern Milfoil	<input type="radio"/>	<input type="radio"/>	Watershield
<input type="radio"/>	<input checked="" type="radio"/>	Elodea	<input type="radio"/>	<input type="radio"/>	Phragmites	<input type="radio"/>	<input checked="" type="radio"/>	White Water Lily
<input type="radio"/>	<input type="radio"/>	Eurasian/hybrid Milfoil	<input type="radio"/>	<input type="radio"/>	Planktonic Algae	<input type="radio"/>	<input type="radio"/>	White-Stem Pondweed
<input type="radio"/>	<input checked="" type="radio"/>	Filamentous Algae	<input type="radio"/>	<input type="radio"/>	Purple Loosestrife	<input type="radio"/>	<input type="radio"/>	Wild Celery
<input type="radio"/>	<input type="radio"/>	[Enter species name]	<input type="radio"/>	<input type="radio"/>	[Enter species name]	<input type="radio"/>	<input type="radio"/>	[Enter species name]