2016 Yearend AIS Review

Comfort Lake – Forest Lake Watershed District

Lake Management Districts:

Bone Lake District

-Moody Lake

-Bone Lake

Little Comfort Lake District

-Little Comfort Lake

Forest Lake District

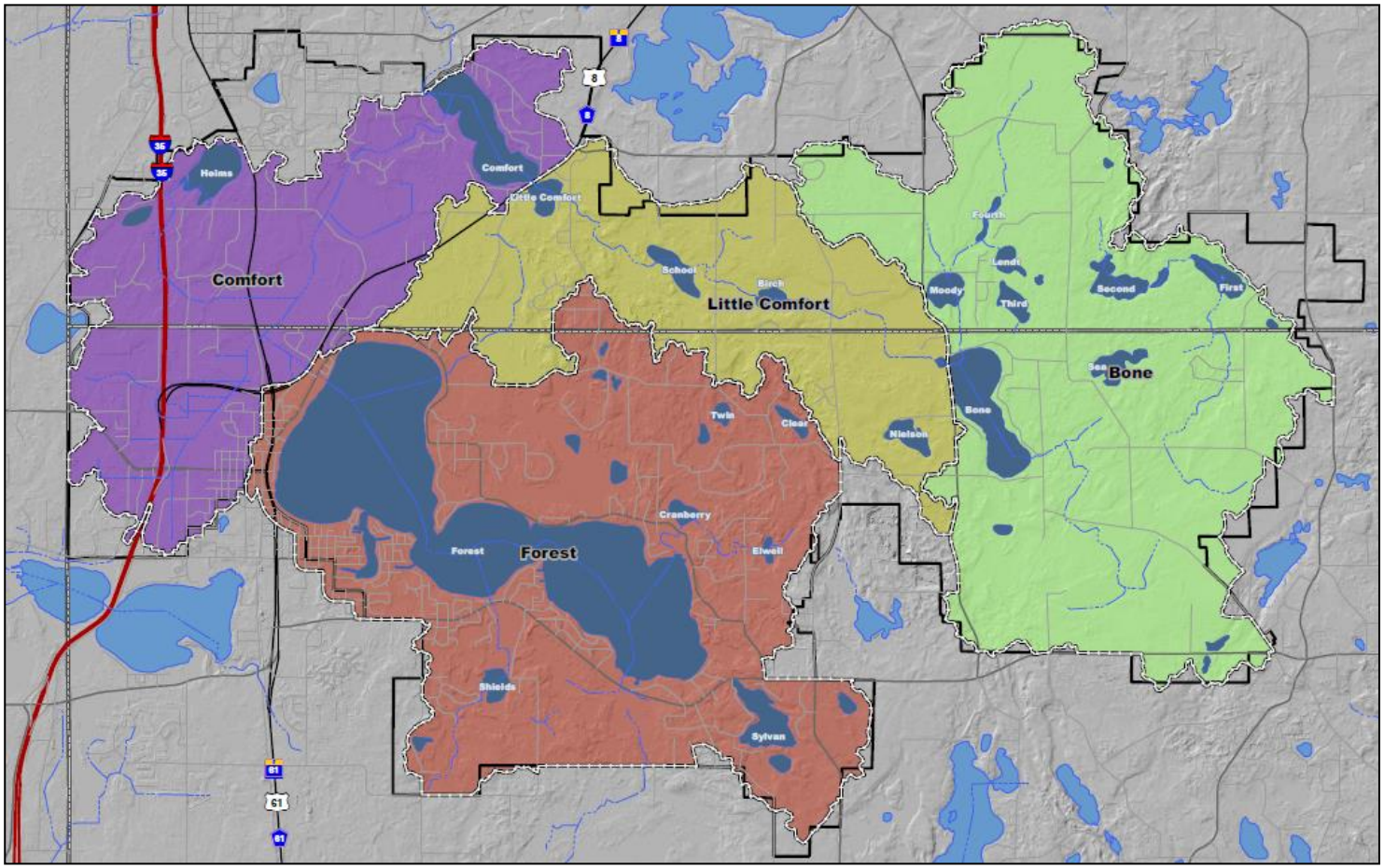
-Shields Lake

-Sylvan Lake

-Forest Lake

Comfort Lake District

-Comfort Lake



Comfort Lake – Forest Lake Watershed District

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District-Wide

2016 Year-End Report

Grants and Contributions

- Obtained a total of $49,699 in grants for AIS-related projects/programs.
- Forest Lake Lake Association and City of Forest Lake will provide an estimated combined total of $56,365 for AIS-related projects/programs on Forest Lake.
- Chisago County will contribute an estimated $4,425 to fund additional watercraft inspection hours on Comfort Lake.
- (Note that contributions have not yet been received as watercraft inspection hours were finalized on 10/16/16)

Watercraft Inspections

- Coordinated with Chisago County to manage 4 full-time level 1 inspectors and 3 full-time level 2 inspectors operating a decontamination unit (level 2 inspectors spent part of their time in Chisago County and part of their time at launches on Forest Lake).
- Inspectors rotated amongst 5 public boat launches within the District.
    - Forest Lake 1 – Lakeside Park public access (904.5 inspection hours total)
    - Forest Lake 2 – Willow Point public access (684 inspection hours total)
    - Forest Lake 3 – Hagberg public access (780.5 inspection hours total)
    - Bone Lake – public access (266 inspection hours total)
    - Comfort Lake – public access (442.5 inspection hours total)
- Inspectors achieved a total of 2,347.5 inspection hours within CLFLWD. In addition, the Minnesota Department of Natural Resources stationed inspectors at the Forest Lake 1 access for 730 hours at no cost to the CLFLWD. In total 3,077.5 inspection hours were performed within the CLFLWD in 2016.

Boat Launch Upgrades

- Placed compost bins, AIS pavement stencils, garbage cans, and recycling cans at the public accesses on Forest, Bone, and Comfort Lakes.
- Informational kiosks are being developed for installation at public boat accesses throughout the District. A Washington County AIS Prevention grant was received in 2016 to fund installation on the three accesses on Forest Lake. Installation at Bone Lake and Comfort Lake is planned for 2017. The kiosks will contain two pamphlet holders: one for specific information pertaining to the lake on which the kiosk is located and another with information about AIS in general and a boat inspection checklist.
- Discussions continue regarding installing an innovative watercraft cleaning station the Lakeside Park public accesses on Forest Lake. The unit is called a CD^3 station, which stands for Clean, Drain, Dry and Dispose. The District continues to give input on the station design and support grant applications to fund construction and installation. Though grants are being sought, funding from the District budget may be required in order to get the project off the ground. Currently, the estimated cost for implementing the station at Lakeside Park is $18,000.

Awards

- The District's AIS Prevention and Management program is a nominated finalist for the MN Association of Watershed Districts (MAWD) 2016 program of the year award. There are two other finalists including Nine Mile Creek WD's Summer Education Series and Sauk River WD's Water Fest and River Rallies. Winners will be announced in early December at the MAWD Annual Meeting and Conference.

Moody Lake

2016 Yearend Report

Rough Fish Management

- Continued operation of aeration system in winter months to increase dissolved oxygen and reduce winterkills
- Applied for aeration permit from the Department of Natural Resources for 2016-2017 winter.
- Preparing to publish public notice warning about thin ice during aeration operation and explanation of aeration system purpose.

----------**Other Lakeshed Projects**----------

Moody Lake Wetland Restoration Project

- District Board passed resolution 16-06-01 in June 2016 ordering the project.
- Obtained and reviewed soil boring data to determine depth of nutrient-rich soil in wetlands and excavation areas.
- Updated plans to include treatment swale prior to discharge into the wetlands.
- Continued coordinating with landowner regarding easements/permissions.
- Project is predicted to result in a phosphorus reduction of 445 lbs/year to Moody Lake.

10/19/2016

Moody Lake Management

		Sub Totals				Annual											
		Budget	Grants	BWS	Contractor	Balance											
Moody Lake 2016 Activities		$ 7,967	$ -	$ -	$ (100)	**$ 7,867**	Timeline										
							April	May	June	July	August	September	October	November	December	January	February
Aeration System	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense											
	Permitting					$ -					WD						
	Setup	$ 7,967			*$ (100)*	$ (100)									WD/EOR[1]		
	Inspections					$ -									WD/EOR		
	Total	$ 7,967	$ -	$ -	$ (100)	$ (100)											
2016 Work Plan and Budgeting							WD/EOR										

*Aeration system budget dollars represent fraction of 3010 - Operations and Maintenance budget

[1] *Cost estimate to replace/repair thin ice signs*

2015 Work	Status
CLP Delineation & Assessment	Received
Point-intercept survey	Received
Lake bottom sonar map	Received
Mini-fyke netting report	Received
Carp and fish pop surveys	Received

2016 Work	Status
Aeration system permit	Application submitted to DNR
Aeration system pubic notice	Drafted, to be sent out closer to ice over

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L)	60	40	40	127
Avg. summer secchi depth (m)	1.0	1.4	1.4	0.8
Avg. summer secchi depth (ft)	3.3	4.6	4.6	2.6
Water quality rating grade	C	C	C	D-

Bone Lake

2016 Yearend Report

Curly-leaf Pondweed

- Four delineation surveys were performed this year: April 15th, May 16th, June 2nd, and June 14th.
- The District did not treat curly-leaf pondweed in 2016 due to the delineations showing low growth densities in spring when CLP is typically treated. For the second year in a row, CLP has sprouted late in Bone Lake compared to other lakes in the area. Originally, this growth pattern was thought to be an anomaly. However, it is now suspected that CLP should be delineated and treated later than in other lakes. This late delineation/late treatment approach will likely need special permission from the DNR, as curly-leaf pondweed treatment is typically not permitted after the lake surface water reaches 55 degrees F. Staff has begun discussions with the DNR invasive species specialist on this topic. He indicated that the low water clarity may be delaying plant growth considerably, and that the DNR is open to considering a special permit for late treatment.
- Assessment was performed on June 2 and June 14. Significant CLP growth occurred from May 16 to June 2. In most lakes, CLP distribution and abundance is set in May, but in Bone Lake, CLP expands in late May. In 2017, CLP delineations will be conducted in early June to characterize potential treatment conditions.
- Reports
    - Blue Water Science: Delineation and Assessment Report (Expected in early 2017)

Eurasian Watermilfoil

- Obtained a signature waiver from the DNR so that individual landowner signatures were not required this year. Public notice was given via email to the Bone Lake Association and posting on the District's website and Facebook page.
- Delineation was performed on 7/15/16, identifying 0.69 acres to be treated.
- Treated 0.69 acres with herbicide on 8/3/16. Though moderate to heavy growth was observed at more than 0.69 acres, herbicide treatment was not possible due to close proximity to waterlilies.
- Assessment was performed on 9/14/16. Moderate to heavy growth was observed on the south and north ends of the lake. A EWM pattern is being established. EWM is widely distributed in water depths out to 5 feet deep which is typically out to the end of the dock or just beyond. Moderate to heavy growth occurs primarily in the north and south ends of the lake. These are the areas that could qualify for treatment.
- Reports
    - Blue Water Science: Delineation and Assessment Report (Expected in early 2017)

Rough Fish Management

- Carp Harvest
    - St. Mary's University performed telemetry on February 14th and May 10th to determine carp locations and estimate efficacy of harvest.
    - Winter harvest was cancelled because telemetry showed that carp were not congregated in one location, making a harvest impractical.
    - In the spring, flow trap netting was initiated with assistance from EOR and Blue Water Science. This involved utilizing inlet fish barrier to hold back water and create artificial flow scenario to attract carp during spawning time period.
    - Spring harvest was cancelled due to low number of observed carp near the inlet during the flow trap netting time period.
    - Several lakeshore homeowners have described how carp numbers seem much lower in the past two years than in previous years. This may be an indication that the District's inlet and outlet barriers are

successfully hindering the year-to-year recruitment of carp.
    - Based on early season surveys and observations fall baiting and netting did not occur. However, carp monitoring should continue in 2017. Questions still remain about the overall carp abundance.
- Carp Spawning Investigation
    - Blue Water Science performed a carp spawning investigation in nearby Sea Lake September 20th-22nd. The purpose of the survey was to determine if the two lakes are hydrologically connected and if Sea Lake could serve as a spawning refuge for carp. Preliminary results suggest that the lakes are not hydrologically connected and that carp are not spawning in Sea Lake.
- Fish Barriers
    - Maintained and managed stop logs in the two fish barriers located at the inlet and outlet of the lake
    - Created an online spreadsheet that is regularly updated with stop log statuses
- Reports
    - Blue Water Science: Flow trap netting summary (Expected in early 2017)
    - Blue Water Science: Carp Spawning Investigation Report (Expected in early 2017)

Zebra Mussels

- CLFLWD staff and one volunteer monitored 2 sampler plates for early detection. No zebra mussels detected in 2016.

Watercraft Inspections

- Inspectors performed 266 inspection hours on Bone Lake.
- Reports
    - Chisago County: 2016 AIS Prevention Report (Expected in early 2017)
    - CLFLWD: Watercraft Inspections Summary (Expected in November 2016)

----------Other Lakeshed Projects----------

Bone Lake Partially Drained Wetland Restorations Project

- Used information from 2015 Bone Lake Diagnostic Study and 2014 Drained Wetland Inventory to identify 6 wetland restoration projects that would reduce phosphorus loads to Bone Lake by 50 lbs/year. This project is a more cost-effective alternative to the previously proposed infiltration basin project that was submitted for a Clean Water Fund grant and denied in 2016.
- Submitted a FY17 Clean Water Fund grant application for $88,000 (with a $22,000 match).

Bone Lake Agricultural Best Management Practices

- 2015 Bone Lake Diagnostic Study identified several agricultural BMPs with high cost-effectiveness including conservation tillage, conservation cover, and contour buffer strips. Will seek federal grant assistance to implement practices.
- Plan to conduct sign-ups and design in 2017, and construction in early 2018

10/19/2016

Bone Lake Management

		Sub Totals				Annual
		Budget	Grants	BWS	Contractor	Balance
Bone Lake 2016 Activities		$ 21,500	$ 1,200	$ (15,400)	$ (6,323)	**$ 977**
Curly-Leaf Pondweed	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Delin-Report			*$ (2,100)*		$ (2,100)
	Permitting	$ 2,500				$ -
	Management					$ -
	Total	$ 2,500	$ -	$ (2,100)	$ -	$ (2,100)
Eurasian Watermilfoil	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Delin-Report			*$ (2,000)*		$ (2,000)
	Permitting	$ 2,500				$ -
	Management		$ 1,200		$ (338)	$ (338)
	Total	$ 2,500	$ 1,200	$ (2,000)	$ (338)	$ (2,338)
Rough Fish Management	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Telemetry				$ (626)	$ (626)
	Flow Trapping	$ 10,000		*$ (4,000)*		$ (4,000)
	Spawning Survey			*$ (7,300)*		
	Harvest					$ -
	Total	$ 10,000	$ -	$ (11,300)	$ (626)	$ (11,926)
Zebra Mussels	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Samplers	$ 500			$ (39)	$ (39)
	Total	$ 500		$ -	$ (39)	$ (39)
Boat Launches	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense
	Inspection Hours	$ 6,000			$ (5,320)	$ (5,320)
	Total	$ 6,000	$ -	$ -	$ (5,320)	$ (5,320)
2016 Work Plan and Budgeting						

Timeline

April	May	June	July	August	September	October	November	December	January	February
BWS (4/15/16)							**BWS**			
WD										
No treatment										
	BWS (5/16, 6/2, 6/14, 7/15)						**BWS**			
WD										
		LMI (8/3/16)								
		SMU (2/14, 5/10)								
		BWS (Spring 2016)								
					BWS					
		No harvest								
WD										
	WD/Chisago Co.									
WD/EOR										

**Blue Water Science costs not yet finalized.*

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L	40	40	30	40
Avg. summer secchi depth (m)	1.2	1.2	2.1	1.3
Avg. summer secchi depth (ft)	4.0	4.0	7.0	4.2
Water quality rating grade	C	C	B	C

2015 Work	**Status**
CLP Delineation & Assessment	Received
EWM Delineation & Assessment	Received
Lake bottom sonar map	Received
Mini-fyke netting report	Received
Carp and fish pop. Surveys	Received

2016 Work	**Status**
CLP Delin & Assessment	Delineation on 4/15/16; map received
EWM Delin & Assessment	Final delineation on 7/15/16
Carp spawning habitat survey	Complete
Carp flow trap netting	Attempted in spring 2016; no harvest
Carp Telemetry	Completed in spring 2016

2016 EWM Treatment Cost Estimates

Based on 3.5 acres of EWM

Liquid Herbicide (Triclopyr)		Liquid Herbicide (2,4-D)		Granular Herbicide (Triclopyr)		Granular Herbicide (2,4-D)		Mechanical Pulling/Harvest	
PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	Dive Guys LLC	Wtrfrnt Restor. LLC
$2,191	$1,663	$1,190	$1,435	$5,030	$3,409	$2,884		$45,738	$5,510

Little Comfort Lake

2016 Yearend Report

Curly-leaf Pondweed

- Delineation performed on 4/15/16, observing CLP at only one site. Blue Water Science indicated that growth was scarce and recommended no treatment. These findings are consistent with what was observed in 2015 and what was expected for 2016. Based on this, staff recommends that the District not contract to have CLP surveys performed on Little Comfort Lake in 2017.
- Reports
    - Blue Water Science: Delineation and Assessment Report (Expected in early 2017)

Rough Fish

- Blue Water Science performed a fish survey and collected lake-bottom sediment samples September 14th-16th, with assistance from District staff. Preliminary results indicate that the Little Comfort Lake fish community is dominated by bluegill and that common carp are not abundant.
- Reports
    - Fish Survey and Sediment Sample Report (Expected in early 2017)

Zebra Mussels

- One volunteer monitored a zebra mussel sampler on private dock for early detection. No zebra mussels detected in 2016.

----------Other Lakeshed Projects----------

Tributary Streams Biological Monitoring

- Water quality samples were collected throughout 2016 with coordination between Emmons and Olivier Resources (EOR) and Washington Conservation District (WCD).
- Load analyses and summary will be conducted this fall/winter.

10/19/2016

Little Comfort Lake Management

		Sub Totals				Annual
		Budget	Grants	BWS	Contractor	Balance
Little Comfort Lake 2016 Activities		$ 6,500	$ -	$ (6,200)	$ (39)	**$ 261**
Curly-Leaf Pondweed	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Delin-Report	$ 1,000		*$ (1,300)*		$ (1,300)
	Total	$ 1,000	$ -	$ (1,300)	$ -	$ (1,300)
Rough Fish Management	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Fish Survey	$ 5,000		*$ (3,400)*		$ (3,400)
	Sediments			*$ (1,500)*		$ (1,500)
	Total	$ 5,000	$ -	$ (4,900)	$ -	$ (4,900)
Zebra Mussels	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense
	Samplers	$ 500			$ (39)	$ (39)
	Total	$ 500	$ -	$ -	$ (39)	$ (39)
2016 Work Plan and Budgeting						

Timeline										
April	May	June	July	August	September	October	November	December	January	February
BWS (4/15/16)							**BWS**			
					BWS					
					BWS					
WD										
WD/EOR										

**Blue Water Science costs not yet finalized*

2015 Work	**Status**
CLP & Algae Delineation	Received
Filamentous Algae Memo	Received
Filamentous Algae Flyer	Received
Shoreline survey	Received
Point-intercept survey	Received

2016 Work	**Status**
CLP Delin & Assessment	Delineation on 4/15/16; map received
Fish Survey	Completed Sept 14-16
Sediment sampling	Completed Sept 14-16

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L)	40	40	30	51
Avg. summer secchi depth (m)	1.5	1.5	2.1	1.6
Avg. summer secchi depth (ft)	5.0	5.0	7.0	5.3
Water quality rating grade	C	C	B	C-

Shields Lake

2016 Year-End Report

Fish Barrier

- Continued operation and maintenance of electric fish barrier located on tributary between Shields Lake and Forest Lake.
- Assessed update requirements compared to retrofitting to a passive system similar to those on Bone Lake, and concluded that a retrofit would be the more cost-effective long-term solution.
- Submitted a Conservation Partners Legacy grant application for $30,600 (with a match of $8,000) to fund the retrofit. Received positive feedback from DNR staff regarding the project shortly thereafter.

Zebra Mussels

- CLFLWD staff monitored a sampler plate on the public dock for early detection. No zebra mussels detected in 2016.

----------Other Lakeshed Projects----------

Shields Lake Stormwater Harvest, Irrigation Reuse System, and Alum Treatment Project

- Identified through 2015-2016 diagnostic monitoring. Project is estimated to reduce phosphorus loads enough to achieve the District's water quality goal for Shields Lake. It would subsequently reduce loads for Forest Lake's middle basin by up to 205 lbs/year.
- Submitted a FY17 Clean Water Fund grant application for $824,000 (with a $206,000 match).
- Reports
    - EOR: Shields Lake Modeling and Preliminary Results memo
    - EOR: Shields Lake Diagnostic Monitoring Memo

10/19/2016

Shields Lake Management

Shields Lake 2016 Activities		Sub Totals Budget	Grants	BWS	Contractor	Annual Balance	Timeline
		$ 8,467	$ -	$ -	$ (39)	**$ 8,427**	

							April	May	June	July	August	September	October	November	December	January	February
Fish Barrier	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense											
	Maintenance	$ 7,967				$ -	**WD/EOR**										
	Inspections					$ -	**WD/EOR**										
	Grant Application										**WD**						
	Total	$ 7,967	$ -	$ -	$ -	$ -											
Zebra Mussels	Work Task	2016 Budget	Grants	BWS	Contractor	Total Expense											
	Samplers	$ 500			$ (39)	$ (39)	**WD**										
	Total	$ 500	$ -	$ -	$ (39)	$ (39)											
2016 Work Plan and Budgeting							**WD/EOR**										

*Fish barrier budget dollars represent fraction of 3010 - Operations and Maintenance budget

Water Quality Goals	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L	100	60	60	241
Avg. summer secchi depth (m)	1.3	1.3	1.3	1.0
Avg. summer secchi depth (ft)	4.3	4.2	4.2	3.1
Water quality rating grade	D	C	C	F+

2015 Work	**Status**
Modeling & Preliminary Results	Received
Point-intercept survey	Received
Carp and Fish Survey	Received

2016 Work	**Status**
DNR CPL grant application	Submitted
Fish barrier upgrades/maint.	Planning in progress

Sylvan Lake

2016 Year-End Report

Purple Loosestrife

- The District initiated biological control in 2016 with the release of purple loosestrife-eating beetles and weevils. District staff, EOR, and volunteers collected over 1,000 beetles and weevils on June 14th at a DNR-suggested site near White Bear Lake. Lakeshore homeowners volunteered to release the insects on patches of loosestrife later that day.
- Staff performed a follow-up survey on 8/25/16 and observed insect damage on PLS plants inside of release areas. Large-scale control typically wouldn't occur until a couple of years after the initial release, but the observed insect damage is an encouraging sign that insects are thriving and reproducing.

Zebra Mussels

- One volunteer monitored a sampler plate on private dock for early detection. No zebra mussels detected in 2016.

10/19/2016

Sylvan Lake Management

		Sub Totals				Annual
		Budget	Grants	EOR	Contractor	Balance
Sylvan Lake 2016 Activities		$ 6,500	$ -	$ (592)	$ (39)	**$ 5,869**

							Timeline										
Purple Loosestrife	Work Task	2016 Budget	Grants	EOR	Contractor	Total Expense	April	May	June	July	August	September	October	November	December	January	February
	Permitting	$ 6,000				$ -	**N/A**										
	Management			$ (592)		$ (592)		**WD/EOR (6/14/16)**									
	Assessment					$ -				**WD/EOR**							
	Summary					$ -						**WD**					
	Total	$ 6,000	$ -	$ (592)	$ -	$ (592)											
Zebra Mussels	Work Task	2016 Budget	Grants	EOR	Contractor	Total Expense											
	Samplers	$ 500		$ -	$ (39)	$ (39)	**WD**										
	Total	$ 500	$ -	$ -	$ (39)	$ (39)											
AIS Detection Survey	Work Task	2016 Budget	Grants	EOR	Contractor	Total Expense											
	Survey								**WD (6/24/16)**								
	Total																
2016 Work Plan and Budgeting							**WD/EOR**										

2015 Work	**Status**
Purple Loosestrife Survey Results	Received
Point-intercept survey	Received

2016 Work	**Status**
Purple Loosestrife biocontrol assessment	Performed on 8/25/16
AIS detection survey report	Included in July 28th meeting packet

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L)	20	20	20	16
Avg. summer secchi depth (m)	3.0	3.0	3.0	4.6
Avg. summer secchi depth (ft)	9.9	9.9	9.9	15.1
Water quality rating grade	A	A	A	A

Forest Lake

2016 Year-End Report

Curly-leaf Pondweed

- Delineation was performed on 4/12/16.
- Treated 113 acres with herbicide on 5/2/16. This was an increase from 88 acres in 2015.
- Assessment was performed on 6/10/16. Curlyleaf control was below expectations. Several areas had poor control. Based on records submitted by the applicator, average depths were too low and areas were under-dosed with Aquathol, likely producing poor control. This will be corrected for 2017.
- Reports
    - Blue Water Science: Delineation and Assessment report (Expected in early 2017)

Eurasian Watermilfoil

- Delineation was performed on 6/10/16.
- One herbicide treatment of 13.9 acres was applied on 7/18/16. In July 2015, two consecutive herbicide treatments at 30.3 acres each were applied as an attempt at eradication. Regrowth was observed in 2016.
- Assessment was performed on 9/15/16. Light to moderate growth was observed on along the west shoreline of the west basin (1st Lake). No EWM was observed in 2nd or 3rd lake.
- Reports
    - Blue Water Science: Delineation and Assessment report (Expected in early 2017)

Flowering Rush

- Completed two rounds of large-patch herbicide treatment and two rounds of spot herbicide spraying through PLM Lake and Land Management.
    - First large patch herbicide treatment occurred on 8/3/16; total area was 36 acres.
    - Second large patch herbicide treatment occurred on 8/31/16; on the same 36 acres.
- Assessment was performed on 9/21/2016. Control was excellent. Flowering rush was found at mostly light densities at 81 sites covering an estimated 9,200 square feet. Pre-herbicide coverage was estimated at 83,000 square feet. This is a reduction of 89%. Also only 3 new sites were observed in 2016. A similar herbicide strategy combined with seed removal methods is recommended for 2017.
- Evaluated the efficacy of hand cutting as a management tool in an experimental patch near the 2nd Lake public access. Concluded that hand cutting must occur many times in a season in order to get control.
- Conducted seed viability experiment, which confirmed anecdotal information that the local variety of flowering rush produces viable seeds.
- Developed education and outreach materials including: newspaper articles, mailers, watercraft inspector handouts, emails, and social media ads.
- Reports
    - Blue Water Science: Delineation and assessment report (Expected in early 2017)
    - CLFLWD: Flowering rush management summary (Expected in November 2016).

Forest Lake

2016 Year-End Report

Zebra Mussels

- Eleven zebra mussel sampling plates were deployed around Forest Lake and were checked monthly, either by District staff or volunteers. Theft and destruction of the plates located at the public accesses was a problem, so in the future plates will only be deployed at private residences.

Watercraft Inspections

- District inspectors performed 1,639 inspection hours on Forest Lake, while the DNR contributed inspectors for an additional 730 hours at no cost to the CLFLWD.
- Reports
    - Chisago County: 2016 AIS Prevention Report (Expected in early 2017)
    - CLFLWD: Watercraft Inspections Summary (Expected in November 2016)

----------**Other Lakeshed Projects**----------

Forest Lake Wetland Treatment Basin Implementation (3rd Lake Pond)

- The District Board ordered the project on June 2, 2016.
- Design drawings and permitting are currently underway.
- Project bidding will occur this fall and construction is slated for this winter.
- Project is predicted to result in a phosphorus reduction of 56 lbs/year to Forest Lake.

Forest Lake Diagnostic Study

- Water quality samples were taken throughout 2016 at various sites. Anticipated end date of study is June 2017.

Forest Lake North Shore Subwatershed Assessment

- The assessment and final report were completed in January 2016. The final report can be found on the District's website at www.clflwd.org/data.php under Forest Lake.

Hilo Lane Stormwater Retrofit Project

- Preliminary construction activities were completed in spring 2016 including tree trimming/removal, channel stabilization and rock weir installation. Remainder of construction to be completed in fall/winter 2016 including pond excavation and pipe installation. Project is predicted to result in a phosphorus reduction of 12 lbs/year to Forest Lake.

Forest Lake Enhanced Street Sweeping Plan

- Proposed street sweeping plan to optimize phosphorus removal by identifying road-specific street

sweeping timing and frequency, quantifying load reductions, itemizing costs, and recommending funding options. District will work with the City of Forest Lake to create and implement the plan. Submitted a FY17 Accelerated Implementation grant application for $36,000 (with a $9,000 match).

Priority Subcatchment Implementation Planning

- Proposed targeted monitoring to identify shovel-ready projects in three priority subcatchments within the Forest Lake subwatershed. Submitted a FY17 Accelerated Implementation grant application for $132,000 (with a $36,000 match).

Forest Lake South Best Management Practices (BMPs)

- Proposed implementation of three BMPs in the Forest Lake direct drainage area predicted to result in a phosphorus reduction of 6.3 lbs/year to Forest Lake. Submitted a FY17 Clean Water Fund grant application for $105,949 (with a $26,487 match).

10/19/2016

Forest Lake Management

		Sub Totals				Annual	Timeline											
		Budget	Grants/Cont.	BWS	Contractor	Balance												
Forest Lake 2016 Activities		$ 168,500	$ 100,414	$ (12,100)	$ (72,889)	**$ 183,925**	April	May	June	July	August	September	October	November	December	January	February
Curly-Leaf Pondweed	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Delin-Report			*$ (2,600)*		$ (2,600)	**BWS (4/12/16)**								**BWS**			
	Permitting	$ 50,000				$ -	**WD**											
	Management		$ 30,489		$ (37,521)	$ (37,521)		**LMI (5/2/16)**										
	Total	$ 50,000	$ 30,489	$ (2,600)	$ (37,521)	$ (40,121)												
Flowering Rush	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Delin-Report			*$ (6,200)*		$ (6,200)				**BWS (7/14/16)**			**BWS**					
	Permit/Outreach	$ 50,000			$ 997	$ 997	**WD**											
	Management		$ 20,910		$ 10,714	$ 10,714				**PLM (8/3/16 & 8/10/16)**								
	Total	$ 50,000	$ 20,910	$ (6,200)	$ 11,711	$ 5,511												
Eurasian Watermilfoil	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Delin-Report			*$ (3,300)*		$ (3,300)			**BWS/DNR (6/10/16)**						**BWS**			
	Permitting	$ 50,000				$ -	**WD**											
	Management		$ 10,000		$ (10,369)	$ (10,369)				**LMI (7/18/16)**								
	Total	$ 50,000	$ 10,000	$ (3,300)	$ (10,369)	$ (13,669)												
Rough Fish Management	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Fish Survey - Cranberry Lake					$ -						**BWS**						
	Total	$ -	$ -	$ -	$ -	$ -												
Zebra Mussels	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Samplers	$ 500			$ (39)	$ (39)	**WD**											
	Total	$ 500	$ -	$ -	$ (39)	$ (39)												
Boat Launches	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense												
	Inspection Hours	$ 18,000	$ 37,465		$ (35,120)	$ (35,120)		**WD/Chisago Co.**										
	Improvements		$ 1,550		*$ (1,550)*	$ (1,550)		**WD**										
	Total	$ 18,000	$ 39,015	$ -	$ (36,670)	$ (36,670)												
2016 Work Plan and Budgeting							**WD/EOR**											

**Blue Water Science and boat launch improvements costs not yet finalized*

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L	40	40	30	35
Avg. summer secchi depth (m)	1.5	1.5	2.1	1.7
Avg. summer secchi depth (ft)	5.0	5.0	7.0	5.5
Water quality rating grade	C	C	B	C+

2015 Work	**Status**
EWM Initial Investigation & Map	Received
EWM Final Investigation & Map	Received
FR delineation & assessment	Received
EWM assessment report	Received
EWM & CLP assessment report	Received
ZM distribution/pop report	Received

2016 Work	**Status**
CLP Delin & Assessment	Delineation on 4/12/16; map received
EWM Delin & Assessment	Delineation on 6/10/16; map received
FR Delin & Assessment	Delineation on 7/14/16-7/15/16; map received
ZM Population Distribution	Will evaluate after samplers are collected
Cranberry Lake Fish Survey	Completed Sept 2016

2016 EWM Treatment Cost Estimates (based on 30 acres)							
Liquid Herbicide (Triclopyr)		Liquid Herbicide (2,4-D)		Granular Herbicide (Triclopyr)		Granular Herbicide (2,4-D)	
PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.
$21,750	$13,350	$11,730	$10,650	$50,100		$28,650	

Comfort Lake

2016 Year-End Report

Curly-leaf Pondweed

- Delineation was performed on 4/15/16. No treatment was performed due to low levels of growth observed during the delineation.
- Assessment was performed on 5/6/16.
- Reports
    - Blue Water Science: Delineation and Assessment report (Expected in early 2017)

Eurasian Watermilfoil

- Delineation was performed on 5/6/16, identifying 7.5 acres for treatment.
- Treated 7.5 acres with herbicide on 5/11/16.
- Assessment was performed on 9/15/16. EWM has increased in distribution compared to 2015 with light to moderate growth observed around the lake in water depths out to about 3 feet. Heavy growth was observed near the inlet at the northwest portion of the lake.
- Reports
    - Blue Water Science: Delineation and Assessment report (Expected in early 2017)

Zebra Mussels

- CLFLWD staff and one volunteer monitored 2 sampler plates for early detection. No zebra mussels detected in 2016.

Watercraft Inspections

- Inspectors performed 550 inspection hours on Comfort Lake
- Reports
    - Chisago County: 2016 AIS Prevention Report (Expected in early 2017)
    - CLFLWD: Watercraft Inspections Summary (Expected in November 2016)

----------Other Lakeshed Projects----------

Sunrise River Water Quality Improvement Project (Bixby Park)

- Project construction began in January and was completed in March 2016. Since then, the area has been seeded and vegetation has grown in. Ongoing water level management using stop logs in the two weirs will begin in spring 2017. This project is predicted to result in a phosphorus reduction of 206 lbs/year to Comfort Lake.

Tributary Streams Biological Monitoring

- Water quality samples were collected throughout 2016 with coordination between Emmons and Olivier Resources (EOR) and Washington Conservation District (WCD).
- Load analyses and summary will be conducted this fall/winter.

10/19/2016

Comfort Lake Management

		Sub Totals				Annual
		Budget	Grants/Cont.	BWS	Contractor	Balance
Comfort Lake 2016 Activities		$ 10,500	$ 4,925	$ (3,700)	$ (11,687)	**$ 38**

							Timeline										
							April	May	June	July	August	September	October	November	December	January	February
Curly-Leaf Pondweed	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense											
	Delin-Report			*$ (1,400)*		$ (1,400)	**BWS (4/15/16)**							**BWS**			
	Permitting	$ 2,000				$ -	**WD**										
	Management					$ -	**No treatment**										
	Total	$ 2,000	$ -	$ (1,400)	$ -	$ (1,400)											
Eurasian Watermilfoil	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense											
	Delin-Assess			*$ (2,300)*		$ (2,300)		**BWS (5/6, 5/22)**						**BWS**			
	Permitting	$ 2,000				$ -	**WD**										
	Management		$ 500		$ (2,798)	$ (2,798)		**LMI (5/11/16)**									
	Total	$ 2,000	$ 500	$ (2,300)	$ (2,798)	$ (5,098)											
Zebra Mussels	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense											
	Samplers	$ 500			$ (39)	$ (39)	**WD**										
	Total	$ 500	$ -	$ -	$ (39)	$ (39)											
Boat Launches	Work Task	2016 Budget	Grants/Cont.	BWS	Contractor	Total Expense											
	Inspection Hours	$ 6,000	$ 4,425		$ (8,850)	$ (8,850)		**WD/Chisago Co.**									
	Total	$ 6,000	$ 4,425	$ -	$ (8,850)	$ (8,850)											
2016 Work Plan and Budgeting							**WD/EOR**										

**Blue Water Science costs not yet finalized.*

Water Quality Goals				
	2020 goal	2030 goal	2040 goal	10-year avg.
Avg. summer phosphorus (µg/L)	40	40	30	33
Avg. summer secchi depth (m)	1.5	1.5	2.1	1.6
Avg. summer secchi depth (ft)	5.0	5.0	7.0	5.3
Water quality rating grade	C	C	B	C+

2015 Work	**Status**
CLP Delineation Map	Received
CLP Assessment Map	Received
EWM Delineation Map	Received
EWM & CLP Assessment Report	Received

2016 Work	**Status**
CLP Delin & Assessment	Delineation on 4/15/16; map received
EWM Delin & Assessment	Delineations on 5/6 & 5/22; maps received
EWM Treatment	7.5 acres on 5/11/16

2016 EWM Treatment Cost Estimates									
Based on 4.65 acres of EWM									
Liquid Herbicide (Triclopyr)		Liquid Herbicide (2,4-D)		Granular Herbicide (Triclopyr)		Granular Herbicide (2,4-D)		Mechanical Pulling/Harvest	
PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	PLM Lake and Land Mgmt	Lake Mgmt Inc.	Dive Guys LLC	Wtrfrnt Restor. LLC
$2,451	$2,209	$1,818	$1,907	$5,599	$4,529	$3,227		$60,766	$4,430

10/19/2016

Budget Summary

Lake	2016 Budget	Grants/Cont.	BWS	Contractor	EOR	Balance
Moody	$ 7,966.67	$ -	$ -	$ (100.00)		$ 7,866.67
Bone	$ 21,500.00	$ 1,200.00	$ (15,400.00)	$ (6,323.43)		$ 976.57
Little Comfort	$ 6,500.00	$ -	$ (6,200.00)	$ (39.33)		$ 260.67
Shields	$ 8,466.67	$ -	$ -	$ (39.33)		$ 8,427.33
Sylvan	$ 6,500.00	$ -	$ (591.86)	$ (39.33)		$ 5,868.81
Forest	$ 168,500.00	$ 100,414.00	$ (12,100.00)	$ (72,888.73)		$ 183,925.27
Comfort	$ 10,500.00	$ 4,925.00	$ (3,700.00)	$ (11,686.83)		$ 38.17
Total	$ 229,933.33	$ 106,539.00	$ (37,991.86)	$ (91,117.00)	$ (8,647.35)	**$ 198,716.12**

Engineering AIS Program Management Costs		
Date	Invoice #	Total
2/10/2016	00376-0135-13	$ (2,573.15)
3/14/2016	00376-0135-14	$ (1,326.25)
4/14/2016	00376-0135-15	$ (1,898.70)
5/10/2016	00376-0135-16	$ (722.00)
6/8/2016	00376-0135-17	$ (1,443.25)
7/12/2016	00376-0135-18	$ (152.00)
8/10/2016	00376-0135-19	$ (380.00)
10/12/2016	00376-0135-20	$ (152.00)
	Total	$ (8,647.35)

2016 AIS Report Inventory

Lake	Contractor	Report/Deliverable Description	Submittal Status
Bone	Blue Water Science	Curlyleaf pondweed delineation	Received
Bone	Blue Water Science	Curlyleaf pondweed assessment	Expected late 2016
Bone	Blue Water Science	Eurasian watermilfoil delineation	Received
Bone	Blue Water Science	Eurasian watermilfoil assessment	Expected late 2016
Bone	Blue Water Science	Carp flow trap netting summary	Expected early 2017
Bone	Blue Water Science	Carp spawning investigation report	Expected early 2017
Little Comfort	Blue Water Science	Curlyleaf pondweed delineation	Received
Little Comfort	Blue Water Science	Curlyleaf pondweed assessment	Expected early 2017
Little Comfort	Blue Water Science	Fish survey and lake sediment sample report	Expected early 2017
Forest	Blue Water Science	Curlyleaf pondweed delineation	Received
Forest	Blue Water Science	Curlyleaf pondweed assessment	Expected early 2017
Forest	Blue Water Science	Flowering rush delineation	Received
Forest	Blue Water Science	Flowering rush assessment	Expected late 2016
Forest	Blue Water Science	Eurasian watermilfoil delineation	Received
Forest	Blue Water Science	Eurasian watermilfoil assessment	Expected late 2016
Comfort	Blue Water Science	Curlyleaf pondweed delineation	Received
Comfort	Blue Water Science	Curlyleaf pondweed assessment	Expected early 2017
Comfort	Blue Water Science	Eurasian watermilfoil delineation	Received
Comfort	Blue Water Science	Eurasian watermilfoil assessment	Expected late 2016