2020
Season Report

Itasca SWCD Aquatic Invasive Species Control & Monitoring

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Itasca SWCD - AIS

1/1/2021

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Preface

This publication represents the 13th seasonal report of the Aquatic Invasive Species Control Program in Itasca County. The Turtle Lake Association in Marcell, MN began The Purple Loosestrife Control Program in 2007 in cooperation with the U.S. Forest Service and the Itasca County Land Department. In 2015, the focus of the program expanded to the control and monitoring of all Aquatic Invasive Species as it joined forces with the Itasca SWCD and the Itasca County AIS Program.

We would like to give thanks to Itasca County, The MN DNR, The U.S. Forest Service, The University of Minnesota Extension, Itasca Waters, ICOLA, and all the seasonal staff which truly have been the backbone in making this program as successful as it has been year after year.

Thank You

Chris Evans
Itasca SWCD – AIS Division
January 2021

Itasca SWCD
AIS Control & Monitoring
-Lake and River Survey Protocol-

All lake and river surveys performed by our crews are geared towards the early detection and control of these invasive plants and animals: Eurasian Watermilfoil, Curly Leaf Pondweed, Purple Loosestrife, Flowering Rush, Starry Stonewort, Zebra Mussels, Quagga Mussels, Faucet Snails, Spiny Water Fleas, and Fish Hook Fleas.

Survey Methods

Varying methods are used to examine aquatic ecosystems for the presence invasive species, such as:

- Inspecting rocks, driftwood, and plant or substrate samples, as well as, using underwater cameras to visually search for and identify invasive plants and animals and collecting plankton samples for laboratory analysis.

- Traveling the perimeter of lakeshores or along the riverbanks in a canoe or on foot, zigzagging through the entire littoral zone searching for all above-mentioned invasive plants and animals. If invasive species are found, a sample is collected, and their populations are mapped using a GPS. Samples are given to the MN DNR for species confirmation.

Zebra Mussels / Quagga Mussels / Faucet Snails

These invertebrate species can be found clinging to solid surfaces such as rocks, driftwood, boats, docks & boat lifts, riprap, garbage, and even green vegetation.

Zebra Mussel Veliger settlement samplers are placed in high-risk areas in the spring and collected in the fall.

Plankton samples are collected using a 63-micron net and analyzed under a microscope for the presence of Zebra Mussel Veligers.

Eurasian Watermilfoil / Curly Leaf Pondweed / Starry Stonewort

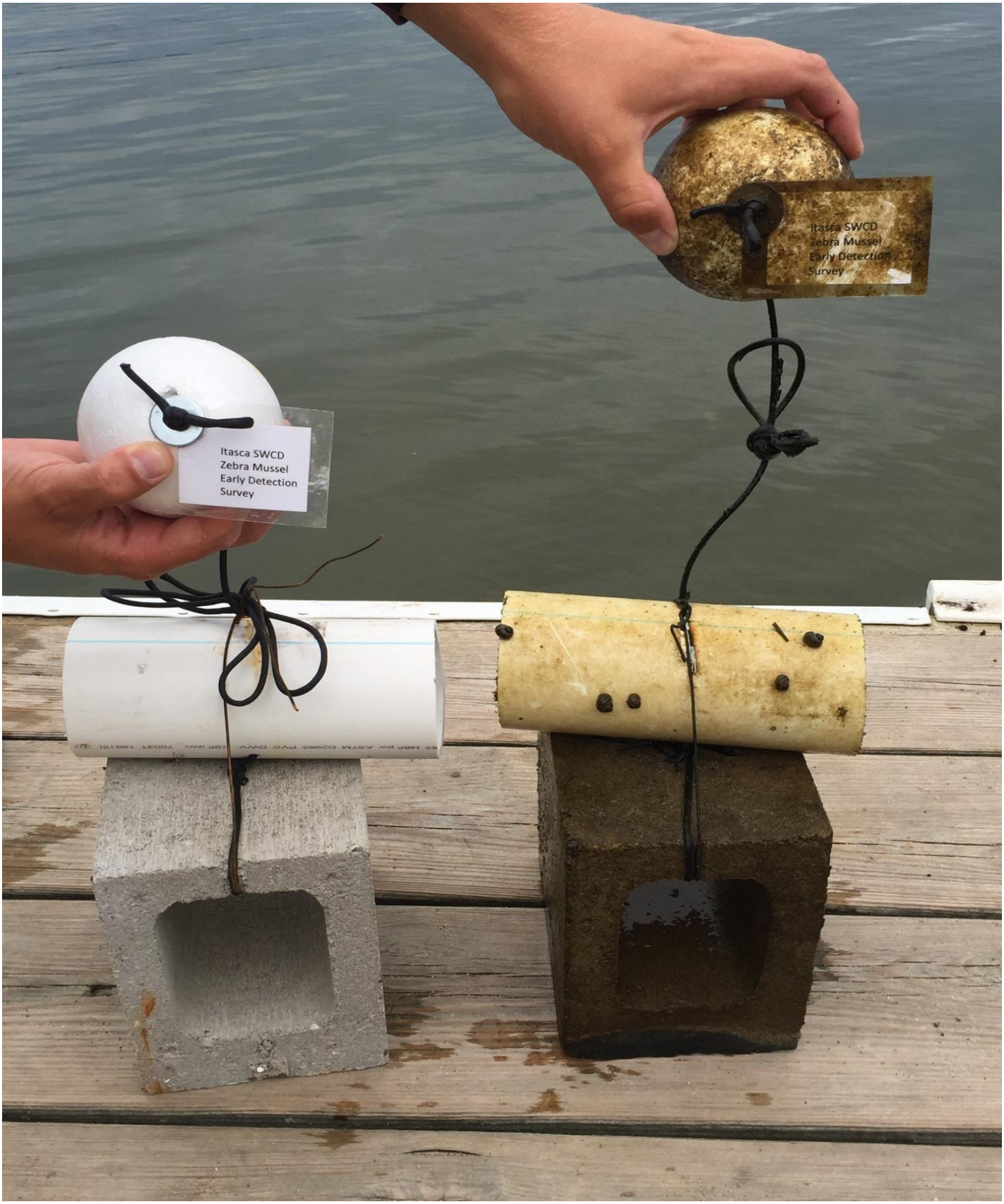
Inspect all suspicious looking populations of submerged vegetation by collecting samples with a double-sided weed rake or with underwater cameras. These invasive plants may grow as deep as 20 feet of water but are generally found in 15 feet or less.

Flowering Rush / Purple Loosestrife

These emergent species may be easy to identify during the entire growing season but are most easily spotted mid-July through September when they are displaying their showy pinkish-purple flowers. These plants are generally found in less than 5 feet of water.

Spiny Water Fleas / Fishhook Fleas

These aquatic microorganisms are most easily found by dragging high-test lead core line with a heavy weight at slow speeds along multiple transects in areas of deep water. Pull up the line occasionally looking for gelatinous masses of water fleas that have collected on the line. Collect any suspicious samples for further identification.



Zebra Mussel Veliger Settlement Sampler. (Right: 4 Months Submerged Under Dock at King's Landing; Pokegama Lake. Native Snails Attached.)

Zebra Mussel Veliger Settlement Samplers

67 Zebra Mussel Veliger settlement samplers were deployed in 2020 on these 54 Itasca County lakes for the early detection of Zebra Mussels, Quagga Mussels, and Faucet Snails. There were no Zebra Mussels found attached to the samplers in 2019.

Ball Club-31081200
Balsam - 31025900
Bass – 31057600
Biauswah - 31086200
Blackwater- 31056100
Bowstring-31081300
Buck -31006900
Burrows - 31041300
Caribou-31062000
Clubhouse- 31054000
Coon/Sandwick- 31052400
Cottonwood - 31059400
Deer - 31071900
Deer – 31033400
Dixon- 31092100
Dunbar- 31090400
Eagle - 31045400
Grave- 31062400
Hart- 31002000
Island- 31091300
Island - 31075400
Jay Gould-31056500
Jessie- 31078600
Johnson - 31058600
Larson - 31031700
Lawrence - 31023100
Little Bowstring-31075800
Little Jessie- 31078400
Little Splithand - 31034100
Little Turtle- 31077900
Maple – 31077300
Middle Pigeon - 31089200
Moose - 31072200
Moose – 31089800
Napoleon – 31029000
Pickerel - 31033900
Prairie - 31038400
Pokegama- 31053200
Round- 31089600
Round - 31026800
Ruby- 31042200
Rush Island- 31083200
Shallow- 31084000
Siseebakwet- 31055400
Spider- 31053800
Splithand- 31035300
Swan- 31006700
Trout- 31021600
Trout- 31041000
Turtle- 31072500
Twin – 31039100
Twin - 31002600
Wabana- 31039200
Whitefish- 31084300

Aquatic Invasive Species Surveys Conducted by the Itasca SWCD AIS Control & Monitoring Program

X = Year(s) Surveyed; No AIS Located RED = AIS Discovered

Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Alice	N/A					X	
Antler	31034900		X				
Arrowhead	31080500	X					
Ball Club	31081200		X			X	ZM
Ball Club River	N/A					X	ZM
Balsam	31025900	X					
Barwise/Cedar	31027800		X				
Bass - Near Cohasset	31057600	Purple Loosestrife Management Plan Since 2012					
Bass - Near Togo	31031600			X			
Bass - Near Spring Lake	31083300			X			
Batson	31070400		X				
Battle	31019700		X				
Bear	31015700		X				
Beatrice	31005800		X				
Beauty	31002800	X					
Beaver	31026100		X				
Bello-	31072600	X					
Biauswah	31086200			X	PL Management Since 2018		
Bigfork River	N/A				ZM	ZM, PL	ZM, PL
Big Island	31067100		X				
Big McCarthy	31012000		X				
Big Ole	31067000		X				
Big Rose	31076800			X			
Big Sucker	31012400		X				
Big Too Much	31079300		X				
Birch	31026300			X			
Birdseye	31083400		X				
Black Island	31041600		X				
Blackwater	31056100	CLP and Faucet Snails Since 2015; Zebra Mussels Since 2020					
Blandin Reservoir	31053300	Loosestrife Management Since 2015; Zebra Mussels since 2018					
Blind	31041800	Purple Loosestrife Management Since 2012					
Blind Pete	31028500		X				
Bluebill	31026500			X			
Bluewater	31039500	X			X	X	
Bosely	31040300		X				
Bower	31005200		Loosestrife Management since 2016				
Bowstring	31081300	PL Management since 2009; Zebra Mussels Discovered in 2020					

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Bray	31014700		Purple Loosestrife Management Since 2016				
Brown	31042500		X				
Buck	31006900		X				
Buckman	31027200			X			
Burns	31065400		X				
Burnt Shanty	31042400	X					
Burrows	31041300		X		X	X	X
Busties	31053000		X				
Button Box	31017500		X				
Cad	31065500		X				
Cameron	31054400		X				
Canisteo Pit	31128200		X				
Caribou	31062000	X			X	X	
Carlson	31036600		X				
Carpenter	31064100			X			
Cavanaugh	31057201	X					
Charlie	31041900		X				
Chase	31074900		X				
Clear	31084500		X				
Clearwater	31040200		X				
Clubhouse	31054000	Purple Loosestrife Management Since 2009					
Connors	31071000					PL Discovered 2019	
Coon / Sandwick	31052400	Eurasian Water Milfoil since Early 2000's					
Cottonwood	31059400	X					
Cowhorn	31035600		X				
Cresent	31029400		X				
Crooked	31019300	Purple Loosestrife Management Since 2012					
Crystal / Ice	31037200	PL Management since 2008; Discoverd E. Milfoil Early 2000's					
Cutaway	31042900			X			
Cutfoot Sioux	31085700	PL Management Since 2012; Zebra Mussels Discovered in 2015					
Day	31063700	X					
Dead Horse	31062200		X				
Decker	31093400		X			X	
Deer - Near Togo	31033400		X		X	X	X
Deer - Near Grand Rapids	31071900	PL Mngmnt Since 2012; Curly Leaf Pondweed Mngmnt Since 2017					
Deer River	N/A	Purple Loosestrife Management Since 2014					
Dinner Pail	31055100		X				

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Dixon	31092100	X					
Dock	31064900		X				
Dollar	31013900		X		X	X	
Dora	31088200		X	Zebra Mussels Discovered in 2017			
Duck	31031400			X			
Dunbar	31090400	Purple Loosestrife Management Since 2015					
Eagle	31045400	Purple Loosestrife Management Since 2013					
East	31046000		X				
East Smith	31061600		PL Management 2016-2018			X	X
Elbow - Near Craigville	31032800		X				
Elbow -Near Jessie Lake	31078300			X			
Erskine	31031100			X			
Farley	31090200			X			
Fawn	31060900			X			
Five Island	31028300			X	X	X	
Forest - Grand Rapids	31037400	Purple Loosestrife Management Since 2012					
Forest - Near Marcell	31066300	X					
Fox	31046300			X			
Gale	31051300			X			
Gauze	31028800			X			
Ghost	31066200			X			
Grass	31072700		X				
Grave	31062400	X			X	X	X
Greeley	31086300		X				
Guile	31056900	X					
Gunderson	31078200		X				
Gunn	31048000		X				
Gunny Sack	31026700		X				
Hale	31037300	PL Management Since 2012; Milfoil Discovered Early 2000's					
Hatch	31077100		X				
Hay	31040700	X					
Hart	31002000	Flowering Rush Discovered in the Early 2000's					
Hartley	31015400	Purple Loosestrife Management Since 2012					
Highland	31048100		X				
Holland	31080400	X					
Holman	31022700	PL Management Since 2012; Flowering Rush Discovered 2000's					
Island - Near Taconite	31021700		X				

Aquatic Invasive Species Surveys Conducted by the Itasca SWCD AIS Control & Monitoring Program

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Island - Near Deer River	31075400		X		X		
Island - Near Northome	31091300	X		X		X	X
Island - Near Canisteo	31040600	X					
Jack the Horse	31065700		X				
Jay Gould	31056500	X		X	X	X	ZM
Jessie	31078600	X			X	X	X
Johnson - Near Marcell	31068700		X				
Johnson -Near GR	31058600		X	PL Management since 2017			
Johnson -Near Side Lake	31005900			X			
Kelly	31029900		X				
King	31025800	X					
Klingenpiel	31019400		X				
Kremer	31064500		X				
Lake of the Isles	31050600			X			
Lammon Aid	31009600	X					
Larson	31031700		X			X	
Lawrence	31023100		X				
Leighton	31073900	Purple Loosestrife Management Since 2012					
Lily	31037500	Purple Loosestrife Management Since 2012					
Little Ball Club	31082200		X				
Little Bass - Cohasset	31057500	X					
Little Bass - Near Togo	31054100		X				
Little Bear	31015600		X				
Little Bowstring	31075800		X			X	X
Little Cottonwood	31059500			X			
Little Cowhorn	31019800		X				
Little Deer	31075100	X					
Little Drum	31074100		Purple Loosestrife Management Since 2016				
Little Island	31002200		X		X	X	
Little Jay Gould	31056600	Curly Leaf Discovered Early 2000's; Zebra Mussels Discovered 2020					
Little Jessie	31078400		X			X	X
Little Long	31061300	Purple Loosestrife Management Since 2012					
Little McKewen	31068300		X				
Little Moose - Near GR	31061000	X				X	
Little Moose - Near Togo	31016200			X			
Little Ole	31067600		X				
Little Pokegama	N/A				X	X	

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Little Ranier	31066000				X		
Little Rice	31071600		X				
Little Sand - Calumet	31009300	X					
Little Sand - Squaw Lake	31085300	Zebra Mussels Discovered in 2012					
Little Siseebakwet	31073300		X				
Little Smith	31067900		X				
Little Splithand	31034100	X			X		X
Little Trout	31039400				X	X	X
Little Turtle	31077900	Purple Loosestrife Management Since 2007					
Little Wabana	31039900		X				
Little Whitefish	31083600			X			
Little White Oak	31074000		Purple Loosestrife Management Since 2016				
Little Winnibigoshish	31085000		X	Zebra Mussels Discovered in 2017			
Long - Cohasset	31057000	Purple Loosestrife Management Since 2010					
Long - Near Suomi	31060500		X		X		
Long - Near Spring Lake	31078100		X				
Long - Goodland	31000100	X					
Long - Bigfork	31029600		X			X	
Loon - Cohasset	31057100	Purple Loosestrife Management Since 2010					
Loon - Zemple	31057900	X					
Lost	31028900			X			
Lost Moose	31043200			X	X	X	
Lower Balsam	31024700		Purple Loosestrife Management Since 2016				
Lower Lawrence	31023800	Purple Loosestrife Management Since 2009					
Lower Panasa	31011200	X					
Lower Pigeon	31089300			X			
Maple	31077300	Purple Loosestrife Management Since 2008					
Maple	31055200		X				
McAvity	31058500		X				
McGuire	31013200		X				
McKewen	31068200		X				
McKinney	31037000	Purple Loosestrife Management Since 2012					
Middle Hansen	31039600		X				
Middle Pigeon	31089200		X				
Mike's	31096600	Purple Loosestrife Management Since 2009					
Minisogama	31093000			X			
Mink	31045500		X				

Aquatic Invasive Species Surveys Conducted by the Itasca SWCD AIS Control & Monitoring Program

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Mirror	31016000		X				
Mississippi River	N/A	PL Management since 2012; Zebra Mussels Discovered in 2017					
Moose - Deer River	31072200	Purple Loosestrife Mngmnt Since 2010; Curly Leaf Mngmnt Since 2016					
Moose - Northome	31089800		X				
Moose - Nashwauk	31019200		X				
Morph	31092900			X			
Mosomo	31086100			X			
Napoleon	31029000	Purple Loosestrife Management Since 2013					
New	31070000	X					
Nickel	31047000		X				
Noma	31083700		X				
North Star	31065300	X		Zebra Mussels Discovered in 2017			
Nose	31041700		X				
O'Brien	31003200		Purple Loosestrife Management Since 2016				
O'Leary	31070000	X					
O'Reilly	31021900		X				
Orange	31058700		X				
Owen	31025200		X				
Oxhide	31010600		X				
Pancake	31016000	X					
Pear	31067500			X			X
Peterson	31079100			X			
Pickerel	31033900			X	X	X	
Pickle	31029100			X			
Pigeon River Flowage	31089400			X			
Pine	31047800		X				
Pokegama	31053200	PL Since 2012; CLP Since 2016; Zebra Mussels Discovered in 2020					
Portage	31082400	Purple Loosestrife Management Since 2009					
Prairie	31038400	Mapping Curly Leaf Pondweed Since 2015					
Prairie River 65 to Wolf L	N/A				X		
Pughole	31060200	X					
Raddison	31028400		X				
Ranier	31066400				X		
Reed	31074000	X					
Rice	31087600	Zebra Mussels Discovered in 2013					
Rice	31071700		X				
Roosevelt	31124700			X			

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Round - Squaw Lake	31089600	X				X	PL
Round - Near Balsam	31026800		X				
Ruby	31042200	X			X	X	X
Rush Island	31083200	PL	X	X	X	PL	X
Sand - Squaw Lake	31082600	PL Management since 2009; Zebra Mussels Discovered in 2012					
Sand - Near Wabana	31043800	Purple Loosestrife Management Since 2010					
Sand - Near Warba	31082000		X				
Scooty	31015000		X				
Section 11	31006000			X			
Shallow	31084000		X				
Shallow Pond	31091000			X			
Shamrock	31021800		X				
Sioux	31090700			X			
Siseebakwet	31055400	X			X	X	X
Smith -Near Grand Rapids	31054700	X			X		
Smith - Near Marcell	31065000	Purple Loosestrife Management Since 2007					
Snaptail	31025500	Purple Loosestrife Management Since 2012					
Snowball	31010800		X				
Someman	31027600		X				
South Sturgeon	31000300			Purple Loosestrife Management since 2017			
South Sugar	31055500	Purple Loosestrife Management Since 2013					
Spider	31053800	Flowering Rush Management Since 2015					
Splithand	31035300	X			X	X	X
Spring	31078900		X				
Spruce	31084900			X			
Stingy	31051000	X					
Sucker	31031200			X			
Swan	31006700	PL Management Since 2010, CLP Mangement Since 2018					
Tank/Helen	31023000	X					
Thistledew	31015800		X				
Tioga Pit	31094600	X					
Trestle	31080300	X					
Trout - Near Coleraine	31021600	FR, PL	PL	X	X	PL	X
Trout - Near Wabana	31041000	Purple Loosestrife Since 2009					
Turtle	31072500	Purple Loosestrife Management Since 2007					
Tuttle	31072500		X				
Twin - Near Marble	31039100	PL, FR, EWM Discovered in Early 2000's					

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Lake Name	Lake ID #	2015	2016	2017	2018	2019	2020
Twin - Near Pengilly	31002600	Purple Loosestrife Management Since 2014					
Wabana	31039200	X			X	X	X
Wagner	31091200			X			
Wasson	31028100		Purple Loosestrife Management Since 2016				
West Smith	31068000		X				
Whitefish	31084300	X				X	
Wilderness	31090100			X			
Willow	31077500		X				
Wilson	31032000		X				
Winnibigoshish	31014700	PL	PL, ZM	PL,ZM,SSW	PL,ZM,SSW	PL,ZM,SSW	PL,ZM,SSW
Wirt	31084800			X			
Wolf	31015200		X				
Woodtick	31035700	X					

History of
AIS Infestations Found in Itasca County
and
Implementation of Management Plans

By Lake Name In Alphabetical Order

All lakes are surveyed as described in the *Lake Survey Protocol* for: Eurasian Water Milfoil (EWM), Curly Leaf Pondweed (CLP), Purple Loosestrife (PL), Flowering Rush (FR), Starry Stonewort (SSW), Zebra Mussels (ZM), Quagga Mussels (QM), Faucet Snails (FS), Spiny Water Fleas (SWF), and Fish Hook Fleas (FHF).

Ball Club – 31081200 - ZM
In the late fall of 2019, our crew noticed that the Ball Club River was flowing rapidly into Ball Club Lake from the Mississippi River. We then thoroughly investigated the littoral zone on the south shore of the lake from the public access to the mouth of the river in search of Zebra Mussels. None were found.

We discovered adult Zebra Mussels in Ball Club Lake attached to our Veliger Settlement Sampler on June 29th, 2020. The sampler had been submerged near the South access for just over 1 month. The next day our crew walked a 2 mile stretch of littoral zone on the south side (the same stretch surveyed in 2019) and found an abundant population of 3-4 year old Zebra mussels the entire way.

It is very likely that the influx of water coming from the Mississippi River had flushed this adult ZM population into Ball Club Lake between the fall of 2019 and spring of 2020.
The population is too widespread to consider treatment.

We will visit Ball Club lake again in 2021 to search for any new introductions of AIS and to document any changes in the Zebra Mussel population.

Bass Lake - 31057600 - PL
We have been implementing a Purple Loosestrife management project on Bass Lake since 2012 which consists of annual herbicide applications to all Purple Loosestrife found via back-pack sprayer. The PL population is mostly located within the SW bay of the lake and has gone from roughly 150 mature plants in 2012 to 10 small flowering plants with scattered seedlings near them.

Bass Lake will be revisited in 2021 to survey for all Aquatic Invasive Species and to continue control efforts on the Purple Loosestrife population.

Biauswah Lake – 31086200 – PL
1 Purple Loosestrife plant was discovered on Biauswah Lake late in the 2018 season. We began implementing a chemical control project out there in 2019 when we found 2 individual plants along the West shore of the lake.

This season, there was no PL found at the 2019 locations although we found 1 mature flowering plant near the south end of the lake. Herbicide was applied to that 1 plant.

Biauswah will be surveyed again in 2021 to maintain control of the PL population.

Blackwater Lake – 31056100 - *ZM, CLP, FS
This year, Zebra Mussels were found in Blackwater, Jay Gould, Little Jay Gould, and Pokegama Lakes. There was known population spreading toward these lakes through the Mississippi River but adult ZM's had still not been located in these bodies of water until this year.

Our AIS crew has been mapping the Curly Leaf Pondweed in Blackwater Lake since 2015. The CLP population does not seem to change much from year to year; it can be found in dense patches throughout the bay near the public access and in areas of low flow following the Mississippi River channel.

Faucet snails can be found in most sediment samples throughout the lake.

Our crew will revisit Blackwater Lake in 2021 to monitor the spread of the Zebra Mussel population, note any changes in the CLP population, and to survey for any new AIS introductions.

Blandin Reservoir – 31053300 – *ZM, PL, CLP
When we retrieved our Zebra Mussel Veliger Settlement Sampler from under the Sylvan Bay Access Dock in 2018, there were 2 juvenile Zebra Mussels attached. A more intensive search revealed a sparse ZM population throughout the bays along the South shore and only a couple adult ZM's along the North shore. We then tracked this Zebra Mussel population downstream through the Mississippi River and the last Zebra Mussel we could find was located roughly 8.5 miles from Blandin Reservoir, just downstream of the County Rd 91 bridge near Blackberry, MN.

In 2019, the Zebra Mussel population had dramatically increased in the Sylvan Bay portion of Blandin Reservoir. The fishing pier now has a solid blanket of Zebra Mussels on every portion that is submerged; most docks in the bay show a similar population. The increase in density of ZM's may suggest that they have not been present in the lake for more than a couple seasons.

Our AIS crews have been monitoring the Curly Leaf Pondweed population on Blandin Reservoir since 2015 and have been implementing a Purple Loosestrife management plan there since 2016.

There is dense Curly Leaf Pondweed population that fluctuates slightly from year to year, but we have seen no dramatic increases in area or density compared to our first survey in 2015.

Our Purple Loosestrife management plan integrates both biological and chemical control methods We have released 9,103 Galerucella Beetles on Blandin Reservoir for the biocontrol of PL since 2016.

Control efforts for Purple Loosestrife will continue in 2021and we will conduct a survey for any new AIS infestation.

Blind - 31041800 – PL
Our Purple Loosestrife management plan on Blind Lake has been in implementation since 2012. At the time of our first survey, there were over 100 mature PL plants along the North shore near the U.S. Forest Service campsite.

We released 2,290 Galerucella beetles throughout the invasive plant population in 2013-2014. The PL population has now decreased to around 10 seedlings emerging from the residual seed bank; mostly found to the East of the dispersed campsite.

The Galerucella beetle population seems to be reproducing very well on Blind Lake and most PL plants showed debilitating insect damage.

Our crew will revisit Blind Lake in 2021 to survey for all AIS and to add beetles to the biocontrol population if needed.

Bower – 31005200 - PL
A population of Purple Loosestrife was located by our crew on the North shore of Bower Lake in 2016; there were 4 large patches consisting of around 40 plants total. Herbicide was applied to all PL found on Bower in 2016 to prevent seed dispersal.

The herbicide treatments from 2016 through 2019 made an obvious decrease in PL density. This season we located 3 flowering plants and 5 seedlings in the same location. All PL plants found were treated with herbicide. Bower Lake will be revisited in 2021 to survey for all Aquatic Invasive Species and to implement PL control efforts if needed.

Bowstring – 31081300 - *ZM, PL, FS
Zebra Mussels were discovered in Bowstring Lake this year and at the time their population was mostly located along the NW and the NE shorelines. When we collected our ZM veliger samplers in the early fall, we noticed juvenile mussels had now spread throughout the entire lake and there population was increasing rapidly.

Our crews, in cooperation with the MN DNR, have been implementing a Purple Loosestrife control plan on Bowstring Lake which integrates both biological and chemical control methods.

The PL population on Bowstring is very dense in areas and the species can be found throughout most of the shoreline.

Since 2009 we have dispersed 106,854 Galerucella Beetles throughout the entire shoreline of Bowstring Lake as well as along the South Access road and within the vast wetland complex in the SW corner of the lake which has now become one of our main beetle collection sites. Annually, any Loosestrife found outside of the biocontrol areas with no evidence of a beetle population receives an herbicide application to reduce seed dispersal.

We will return in 2021 to survey for any new AIS introductions, document any changes in the ZM population, add Galerucella beetles to the bio-control population, and apply herbicide to any PL plants that lie outside of the bio-control areas.

Bray – 31014700 – PL
We have been implementing a Purple Loosestrife management plan on Bray lake since 2016 which, due to the sparse population of plants, consists strictly of chemical control.

In the first year there were 11 mature PL plants found, mostly near the culvert on the south end of the lake. The herbicide applications from 2016 through 2019 have resulted in a decline in PL. There were 3 small

flowering plants found near the culvert this season as well as one seedling found across the road where the stream flows out toward Crooked Lake.

We will return to Bray Lake in 2021 to survey for all Aquatic Invasive Species and to further work towards the eradication of Purple Loosestrife

Clubhouse – 31054000 - PL
There has been a Purple Loosestrife management plan in place on Clubhouse and Mike's Lakes since 2009 when we discovered roughly 100 mature plants between the two lakes. Since the PL population was very accessible, we decided to implement chemical control methods.

The annual herbicide applications have resulted in there being only 7 flowering Purple Loosestrife plants on Clubhouse and 5 seedlings found on Mike's Lake. There was 1 new location found in the creek between the two lakes. There was one new PL seedling found near the Public Access in 2018 that had never been there before; there has not been PL in that location since.

We conducted 3 surveys on clubhouse this season (2020) to ensure adequate control of the invasive population. We will return in 2021 to survey for all aquatic invasive species, evaluate the results of our Purple Loosestrife control efforts, and to make additional herbicide applications if necessary.

Connors – 31071000 - PL
During a "shoreline alterations" visit in 2019, Wetland Specialist Waylon Glienke discovered a mature stand of Purple Loosestrife along the northeast shore of Connors Lake. Due to late timing of the season and inaccessibility of the lake we decided to wait until the 2020 season to evaluate the infestation and create a management plan.

As 2020 came to be, covid-19 restrictions caused us to have a smaller crew size and we did not get a chance to survey Connors Lake.

We will attempt to visit Connors Lake in 2021 to perform control efforts on the Purple Loosestrife population and to survey for the presence of any other Aquatic Invasive Species.

Coon/ Sandwick – 31052400 - EWM
The chemical control efforts contracted out by the DNR in 2017 and 2018 have made a decrease in the Eurasian Watermilfoil in the North end of Coon Lake where it has been abundant for around a decade. EWM can still be found in abundance in the littoral zone of the Southern half of Coon Lake. Since our first AIS survey in 2015, the Milfoil has crept through the channel into Sandwick Lake where smaller patches have now been newly established along the West Shore.

Our crew will return to Coon & Sandwick Lakes in 2021 to survey for all Aquatic Invasive Species and to continue to monitor any changes in the Eurasian Watermilfoil population.

Crooked – 31019300 - PL
There has been a Purple Loosestrife management plan on Crooked Lake since 2012 which has exclusively involved herbicide application.

At the time of discovery, there were roughly 30 mature PL plants found to the East and West of the public access.

In 2018 & 2019 there were multiple new PL sites found along the Northern residential shoreline of Crooked Lake.

This season There were 11 PL locations found on Crooked, mostly on the north shore although there were 2 individual plants that have spread to new locations. Herbicide applications were made to all PL plants found. We will revisit Crooked Lake in 2021 to survey for all Aquatic Invasive Species and to make an herbicide application to any Purple Loosestrife found.

Crystal/Ice – 31037200 - EWM, PL
Our AIS crew has been monitoring the Eurasian Milfoil population on Crystal Lake since 2015 and implementing biological and chemical control measures for Purple Loosestrife since 2009.

The EWM is found throughout 90% of the littoral zone in 6-12 feet of water. In 2019 the MN DNR contracted out an herbicide application for the milfoil on Crystal Lake and there were obvious results in the week following the treatment.

Our PL management plan on Crystal is centered around biological control. We have added 3,071 Galerucella Beetles to the existing population that has been present since the early 2000's. We implement annual chemical control measures to the PL in areas where the biocontrol is insufficient.

We will return in 2021 to survey for all aquatic invasive species, evaluate the progress of our biocontrol population, implement chemical control measures where needed, and to monitor any changes in the Eurasian Watermilfoil population as result of the herbicide treatments.

Cut Foot Sioux – 31085700 - PL, FS, ZM
Our AIS crew has been implementing a Purple Loosestrife management plan on Cutfoot Sioux since 2012. At the time of discovery, there were 12 mature PL plants and hundreds of seedlings just East of the Hwy 46 Bridge on the South side of the channel.

Since this was the only patch of Purple Loosestrife found on the entire waterbody, we decided that chemical control was our best option. Due to eight seasons of herbicide applications, the PL population has decreased dramatically and there were only about 20 foot-tall plants found within a 250 sq ft area.

In 2015, Zebra Mussels were known to be in low numbers in Lake Winnibigoshish, but they had not yet been discovered in Cut Foot Sioux Lake. In 2017, the ZM population had noticeably spread into Cutfoot from Winnie and we had found them attached to every veliger settlement sampler that we placed in the lake.

In 2017, a sparse population of Starry Stonewort was discovered along the Western shore of Winnibigoshish. Since then, it has aggressively spread throughout much of Winni and can be found in abundance on the 12-15 foot drop off on the West, South, and East shores. Despite the rapid spread, our crews have not yet located SSW in Cutfoot Sioux or downstream of the Winni Dam.

Our Crews will revisit Cutfoot Sioux in 2021 to survey for all AIS, monitor any spread of Starry Stonewort and to perform control efforts on the Purple Loosestrife population.

Deer - 31071900 – PL, CLP
Our crew first surveyed Deer Lake and began integrating both chemical and biological control methods for Purple Loosestrife in 2012. At that time, Loosestrife was densely growing on over 80% of the South

Shore, 30% of the North Shore, and was abundant on the WMA islands near the East Shore. We have revisited Deer Lake every year since, adding beetles to the densest areas of Loosestrife and applying herbicide to all PL plants found outside of the biocontrol areas. From 2012-2019, we have released 38,700 Galerucella beetles throughout the shores of Deer Lake.

There are areas of the North shore of Deer Lake where our herbicide applications have resulted in a dramatic decline in the Purple Loosestrife population. There are other areas of the lake where the Loosestrife seems to be spreading rapidly due to poor reproduction of our bio-control species.

We plan to continue adding to the Galerucella beetle population in the densest areas of PL. If the insect population doesn't reproduce to the point of plant control, we will likely become more aggressive with our chemical control efforts.

In 2017, we hand-pulled three small patches of Curly Leaf Pondweed near the Public access dock. Our crews have searched the Public Access bay with underwater cameras for Curly Leaf and all other submerged invasive species in 2018 and 2019 and found none. This season, we discovered 2 large patches of CLP on opposite ends of Deer Lake totaling an infested area of approximately 5100 sq ft.
All CLP plants found were hand-pulled by our crew and members of the Deer Lake Association in a 3 day event.
We plan to revisit Deer Lake again in 2021 to conduct a full-lake survey for all AIS, to implement biological and chemical control on the PL population and to continue the control efforts on the CLP.

Deer River – PL
Our crews have been implementing a Purple Loosestrife management plan on the Deer River since 2014 which involves both biological and chemical control methods.

Our management plan covers, roughly, the first 2 miles of river West of County Road 142. The Purple Loosestrife is found in dense patches throughout many of the river bends and is found sparsely along the straightaways.

We have released 5000 Galerucella Beetles in the densest patches of PL and have made annual herbicide applications to the individual plants outside of the bio-control areas since 2014.

We have noticed a dramatic decline in the Purple Loosestrife population throughout the areas where herbicide has been applied; The biocontrol areas show less of a result but there is good evidence of beetle reproduction and is expected to provide better control in future seasons.
We plan to maintain the current PL management plan on the Deer River in future seasons as well as survey this stretch of river for the presence of any new AIS infestations.

Dora – 31088200 - ZM
Dora Lake is the Headwaters for the Bigfork River. In 2016, a full lake survey was conducted for all Aquatic Invasive Species in Dora Lake and despite Dora being downstream of a known Zebra Mussel Infestation (Sand Lake Chain), no Zebra Mussels were present in 2016.

In 2017, the Zebra Mussel population was found to be spreading from the Sand Lake Chain downstream and into Dora Lake where we found ZM's attached to the boulders underneath the County Road 29 Bridge. The ZM's were quite small, suggesting that they are the young of the year that had been carried through the current of the Bowstring River coming from Rice Lake. From Dora Lake we tracked the Zebra Mussel

population spreading into the Bigfork River and eventually found our last mussel approximately 9.5 Miles downstream of Dora.

Although the ZM population has greatly increased in density in Dora Lake, we still do not find an abundant population in the Bigfork River in 2020. It is likely that we may see their numbers greatly increase and begin spread more aggressively through the river.

Our crews plan to revisit Dora Lake in 2021 to survey for all AIS and to monitor any changes in the Zebra Mussel population downstream.

Dunbar - 31090400 – PL
Itasca SWCD has had a Purple Loosestrife management plan in place on Dunbar lake since 2015 which integrates both biological and chemical control methods. There are 3 separate areas of the lake that have a sparse, yet consistent, Purple Loosestrife population.

The 2 locations along the West shore are very reachable by canoe and on foot with a back-pack sprayer so we plan to make annual herbicide applications for the control of those sites.

The Purple Loosestrife along the east shore is bit denser and more widespread throughout some boggy shoreline. There is a biocontrol population established at this site. We plan to add Galerucella Beetles to the densest areas annually as well as apply herbicide to all PL plants that appear to be unaffected by the bio-control species.
We will conduct another survey of Dunbar Lake in 2021 for all aquatic invasive species and to monitor the results of our Purple Loosestrife control efforts.

Eagle – 31045400 – PL
Our AIS Crew has been implementing a Purple Loosestrife management plan on Eagle Lake since 2013 which integrates both biological and chemical control methods.

The goal of our current management plan is to attempt to isolate the Purple Loosestrife to the southern-most bay of the lake. At the time of discovery, there was a sparsely scattered population throughout 80% of the entire lakeshore and 2 areas in the south bay that had a very dense population throughout some boggy type wetlands.

Since 2013, we have introduced 16,584 Galerucella beetles throughout the 2 densest PL areas and their reproduction has been very successful. We have made annual herbicide applications to all Purple Loosestrife that was found outside of the two bio-control areas and have seen a dramatic reduction in the total area infested with Purple loosestrife.

Our goal is to keep adding Galerucella Beetles to the bio-control areas until the insect population reaches the point of providing 100% plant control, meanwhile maintaining chemical control on any PL seedlings that emerge from the residual seed bank outside of the bio-control areas.

We will revisit Eagle Lake in 2021 to survey the lake for all AIS and to implement Purple Loosestrife control measures as needed.

East Smith – 31061600 - PL
Historically, there has not been Purple Loosestrife on East Smith Lake although neighboring Smith Lake, to the north, has had a widespread PL population for well over a decade.

In 2016-18, Purple Loosestrife was located in 3 small patches along the North shore of East Smith and herbicide was applied to all PL found.

There was no PL found on East Smith in the 2019 and 2020 seasons. We will conduct another survey of East Smith Lake in 2021 to search for all Aquatic Invasive Species and to monitor our PL control efforts.

Forest - 31037400 - PL
Our crews have been implementing a Purple Loosestrife management plan on Forest Lake since 2012 which integrates both biological and chemical control strategies.
Annually, it is our goal to add Galerucella Beetles to the existing biocontrol population which has spread well throughout the lakeshore. Since 2012 we have added 6,615 beetles between the beach in SE corner of the lake and the boggy wetland area in the NW corner.

We typically return mid-summer to evaluate the biocontrol population and to make herbicide applications to any PL plants that appear to be unaffected by the biocontrol species.

We will revisit Forest lake in 2021 to survey for the presence of new AIS infestations and to further implement biological and chemical control efforts on the Purple Loosestrife population.

Hale – 31037300 - EWM, PL
In 2012, our crew first surveyed and mapped the Purple Loosestrife population on Hale Lake. At that time, there was a continuous population of PL around most of the shoreline. We designated the densest PL location on the West end of the lake as the central location of our bio-control efforts in future seasons.

Since 2012 we have released 13,958 Galerucella Beetles mostly along the shoreline in the western half of the lake. Over the years we have noticed their population spread around much of the shoreline.

To assist the bio-control species, we make annual herbicide applications to all PL plants that show no sign of the insect population.

We have been mapping the changes in the Eurasian Watermilfoil population in Hale Lake since 2015. At that time, there were small scattered patches along the South and East shores. Since then we have witnessed the EWM population dramatically increase in density in the Western half of the lake and the bays on the East end.

Hale was chemically treated for Eurasian Milfoil this season (2019). 1 week after treatment, the EWM in the treatment areas showed obvious signs that the chemical was effective. There was not a chemical treatment on the milfoil in 2020.

We will revisit Hale Lake in 2021 to implement biological and chemical control efforts on the PL population, map the extent of the EWM, and to survey the entire lake for any new AIS infestations.

Hart – 31002000 - FR
Our AIS crew has been mapping the changes in the Flowering Rush population on Hart Lake since 2015. At the time of our first survey, Flowering Rush was found in approximately 40 separate patches throughout the littoral zone along the South and West shores.

From 2015 to 2018, the density of the Flowering Rush gradually increased throughout the infested sites and there are now 10 or more new FR sites near the North Public Access and along the North Shore compared to our original survey.
There is now approximately 4500 linear feet of shoreline on Hart Lake infested with flowering rush which extends through the littoral zone.

Due to covid-19, are crew size was smaller this season and we did get a chance to map the spread of FR on Hart Lake. We will attempt to visit the lake in 2021 to get an accurate map o the current status of the infestation.

Hartley – 31015400 - PL
Our program has been implementing a Purple Loosestrife management plan near the Hartley Lake public access since 2012.

At the time of our first survey there were 5 mature plants found in the "Native Planting" to the south of the fish ladder project. We had made an herbicide application to all PL found and it did not return until 2016 when three seedlings emerged from the residual seed bank.

Herbicide was applied to PL seedlings at this site in 2016, 2017, 2019, and 2020.
We will visit this site in 2021 to continue out Purple Loosestrife control efforts.

Holman – 31022700 - FR, PL
Our crew has been mapping the Flowering Rush population since 2015 and implementing a Purple Loosestrife management plan on Holman Lake since 2012 which integrates both biological and chemical control methods.

At the time of our first survey PL was densely scattered among approximately 50% of the entire shoreline, being the densest in the North and South extremities of the lake as well as on the island directly west of the Public Access.

There was an existing Galerucella Beetle colony and about half of the plants showed insect damage to some degree. Herbicide was applied, from 2012 to through 2020, to all plants that were flowering to assist the biocontrol in seed reduction.

Our crew has released 9,275 Galerucella beetles throughout the Loosetrife infestation of Holman Lake since 2013. The reproduction of the bio-control species has been minimal over recent years but had greatly improved during the 2017 season; every PL plant found had insect damage to some extent with many plants being reduced to an unrecognizable brown stalk.

At the time of our first Flowering Rush survey in 2015 there were only 3 separate locations found within the lake. The FR population has steadily increased over the past 3 seasons and Flowering Rush has now become established throughout many areas of the lake.

Our AIS crew will revisit Holman Lake in 2021 to survey for new introductions of AIS and to maintain control of the PL population.

Jay Gould – 31056500 – CLP, *ZM
Zebra Mussels have now been found to be spreading from the Mississippi River into Jay Gould Lake as well as the connected waters downstream. Our Veliger settlement sampler had 1 Zebra Mussel attached when we retrieved it this fall. We expect the population to spread rapidly over the next couple of seasons.

Our Crew has been mapping the Curly Leaf Pondweed in Jay Gould Lake since 2015. Each year we find a stable population of CLP in the channel coming from Blackwater Lake as well as in the channel going to Little Jay Gould Lake. The CLP density at these sites vary from year to year.

Little Jay Gould has a dense population of CLP in the SW section of the lake heading through the flowage to Pokegama Lake; this is the apparent source of the CLP in Pokegama.

Our crew will revisit the Jay Gould Lakes in 2020 to monitor the spread of Zebra Mussels and CLP and to search for all other Aquatic Invasive Species.

Johnson – 31058600 – PL
Our crew began implementing a Purple Loosestrife management plan on Johnson Lake in 2017 throughout a dense infestation along the residential area in the SW corner of the lake.

There are now scattered seedlings popping up along the East shore likely from seed dispersal that happened before the infestation was discovered.

We will visit Johnson Lake in 2021 to evaluate the results of our chemical control efforts, to implement more control if needed, and to survey the entire lake for new introductions of AIS.

Leighton – 31073900 – PL
Our AIS crew has been implementing a Purple Loosestrife management plan on Leighton Lake since 2012 which incorporates both biological and chemical control methods.

At the time of our first survey there were over 200 mature Purple Loosestrife plants found within an approximate 80-yard stretch near the Public Access. Herbicide was applied to all PL plants in 2012 to knock back the population and reduce the seed output.

Our 2013 survey showed that the herbicide treatment had reduced the population to approximately 100 PL plants.

From 2013 to 2015, we had decided to designate Leighton Lake as a biocontrol site and released 7,500 Galerucella beetles throughout the 80-yard stretch. No herbicide applications were made during this 3-year period.

In 2016, we found no evidence of an existing Galerucella Beetle population and there were still 100+ plants present at the site. At this point we decided to abandon all bio-control efforts and focus on chemically controlling the Purple Loosestrife.

The annual herbicide applications from 2016 to 2019 have now reduced the PL population to 11 seedlings emerging from the residual seed bank. We visited this site twice this season to ensure adequate control of the invasive population.

We will revisit this site on Leighton Lake in 2021 to follow-up with our chemical control efforts and to survey the entire lake for any new AIS introductions.

Lily – 31037500 - PL
We have been implementing a Purple Loosestrife management plan on Lily Lake since 2015. During our first survey of Lily, we found about 100 Purple Loosestrife plants throughout the cattails and tall grass along the west shore. There was minimal evidence of an existing Galerucella Beetle population; we applied herbicide to all PL that seemed untouched by the biocontrol population.

Although we find evidence of their residency, the bio-control species does not seem to be reproducing to the level of PL plant control. The Loosestrife population has become more and more widespread each season.

This year there were about 15 separate sites on Lily Lake that had dense clumps of PL; mostly along the East and West shores. Herbicide was applied to all PL found to get a handle on the increasing invasive population. Due to the lack of reproduction at this site, we will likely abandon all bio-control efforts and focus on chemical control in future seasons.

Due to Covid-19, our crew size was smaller this season and we did not get a chance to do work on Lily Lake. We will visit Lily in 2021 to continue our control efforts on the Purple Loosestrife.

Little Drum – 31074100 - PL
The Itasca AIS crew has been implementing a Purple Loosestrife management plan on Little Drum Lake since 2016 which integrates both biological and chemical control efforts.

At the time of our first survey in 2016, two separate dense patches of Purple Loosestrife were discovered on floating bog portions of the shoreline on opposite sides of the lake (east and west). Herbicide was applied to the PL plants that were accessible from the water to reduce the seed dispersal throughout the lake. These areas were then designated as biological control sites for future seasons.

In 2017, we released 448 Galerucella Beetles throughout the 2 Purple Loosestrife sites on Little Drum Lake. When we returned in 2018 to survey for all Aquatic Invasive Species and to monitor the Loosestrife control efforts, the water level was so low we could not even get a canoe in the lake.

In 2019 our survey revealed a much more widespread PL population than previous years. We released 900 Galerucella Beetles among the 2 biocontrol areas and made herbicide applications to plants at 10 other sites throughout the lake.

We did not get a chance to visit Little Drum Lake in 2020 due to Covid-19 and crew size restrictions. We will visit Little Drum in 2021 to continue our PL control efforts and to survey for the presence of all AIS.

Little Jay Gould – 31056600 - *ZM, CLP
See the description of Little Jay Gould Lake under the section for *Jay Gould*

Little Long – 31061300 - PL
Our crew has been implementing a Purple Loosestrife management plan on Little Long Lake since 2012 which integrates both biological and chemical control.

Our first survey in 2012 revealed a steady population of Purple Loosestrife in the south half of the lake which is very dense among the boggy type bays. We applied herbicide in 2012 to all accessible PL plants to prevent seed dispersal throughout the lake.

Since 2013 we have released 20,320 Galerucella Beetles among the densest populations of PL and they appear to be reproducing very well and have provided great plant control in most areas. Each season, herbicide is applied to all PL plants found outside of the biocontrol sites which has made a major reduction in the PL population throughout the lake.

We will return to Little Long Lake in 2021 to conduct a survey for all Aquatic Invasive Species and continue our control efforts on the Purple Loosestrife population.

Little Sand – 31085300 - ZM
There is a known Zebra Mussel infestation that has spread downstream from Sand Lake into Little Sand, Rice, Dora, and into the Bigfork River. Our future efforts will be focused on monitoring the spread of this Zebra Mussel population through the Bigfork River and toward the Rainy River. More details on the spread of this Zebra Mussel population are described under *Dora Lake*.

Little Turtle – 31077900 - PL
Our invasive species program has been implementing a Purple Loosestrife management plan on Little Turtle Lake since 2007 which integrates both biological and chemical control methods.
At the time of our first survey, PL was confined to the SW corner of the lake throughout the emergent vegetation, as well as, in the wetland across Hwy 286. Herbicide was applied to all PL plants found from 2007-2013 to work toward the depletion of the residual seed bank.

Since 2014 there have been 16,186 Galerucella Beetles released throughout the infested areas. Herbicide has been applied annually to the Loosestrife on the extreme ends of the infestation to confine it to the designated biological control area.

The Galerucella Beetle population is now reproducing very well in the SW corner of Little Turtle Lake with a majority of the Purple Loosestrife plants showing strong evidence of the insect colony. Herbicide was applied to any PL plants found to have no insect damage.

We will revisit Little Turtle Lake in 2021 to continue our Purple Loosestrife control efforts and to survey the lake for new introductions of aquatic invasive species.

Little White Oak – 31074000 - PL
In 2016, we discovered 8 mature Purple Loosestrife plants scattered through the tall grass and emergent vegetation near the public access of Little White Oak Lake. Herbicide was applied to all PL found.

There had been no PL found at this site since the original survey in 2016, yet this season (2020) there were another 50+ plants discovered throughout the cattails following the channel from the boat ramp out to the open water. Herbicide was applied to all PL plants found.

We will revisit Little White Oak in 2020 to survey for all Aquatic Invasive Species and to conduct control efforts on any Purple Loosestrife found sprouting from the residual seed bank if needed.

Little Winnibigoshish – 31085000 - ZM

In 2017, while deploying our ZM sampler at the Little Winnie Resort, we found a soda can in the water with 2 small Zebra Mussels on it. We went directly to the Winnie Dam and found that ZM's were densely populated on the rocks below the dam. In the following days, we assisted Rich Rezanka of the MN DNR in a full-lake survey of Little Winnie. There were adult ZM located throughout Little Winnie Lake and were found to have spread approximately 17.5 miles downstream through the Mississippi River past the confluence of the Leech River.

In 2018 and 2019 we located Zebra Mussels on the rip rap under the bridge on Hwy 6 South. The river seems to be void of Zebra Mussels beyond this point until the Blandin Reservoir where they are currently found in dense populations in the areas of low flow. We have found this population spreading as far as the Blackberry Bridge on County Road 91.

Although Starry Stonewort has an established population in Winnibigoshish, we have not yet found it spreading downstream into the river system. Over 120 vegetation samples were taken this summer (2020) between the Winnie Dam and Little Winnie. No SSW was found.

We will revisit Little Winnibigoshish and the river below the dam in 2021 to monitor any changes in the ZM population and to survey for the introduction of any new AIS. More detail on the spreading Zebra Mussel colony can be found under *Mississippi River, Blackwater, Blandin Reservoir, Jay Gould, Little Jay Gould, Pokegama.*

Long – 31057000 - PL

Our AIS crew has been implementing a Purple Loosestrife management plan on Long Lake since 2010 which integrates both biological and chemical control methods. Historically, Purple Loosestrife has only been present in the east bay. This Season there was 1 PL plant located in the West portion of the lake roughly 300 yards West of the channel coming from the access bay.

Since 2012, we have released 12,270 Galerucella Beetles throughout the entire infested area, but the reproduction of the insect species is minimal and has not reached the point of controlling the Loosestrife. Each season, herbicide has been applied to all PL plants that lacked evidence of the biocontrol species to reduce seed production and dispersal.

Long Lake will be revisited in 2021 to survey for all Aquatic Invasive Species, and to implement control measures on the PL population where needed.

Loon – 31057100 - PL

Our crew has been implementing a Purple Loosestrife management plan on Loon Lake since 2010. Our original survey revealed approximately 25 Purple Loosestrife plants to the west of the Public Access. The PL seed was obviously coming through the culvert from Long lake.

Annual herbicide applications have eliminated the resident population of PL on Loon Lake but seed continues to come through the culvert from the South and new seedlings appear each year. This year there were 3 sprouts found near the culvert.

We will continue to visit Loon Lake annually to make herbicide applications to any Purple Loosestrife found emerging from the residual seed bank and to survey the entire lake for any new introductions of Aquatic Invasive Species.

Lower Balsam – 31024700 - PL
Our AIS crew has been implementing a Purple Loosestrife management plan on Lower Balsam Lake since 2016 which integrates both biological and chemical control methods.

Purple Loosestrife was discovered on Little Balsam Lake in 2016, found in scattered dense patches periodically throughout the lakeshore. Herbicide was applied to all PL found in 2016 and the density of these patches came back in 2017 about 25% of what they were before the treatment.

From 2017 to present, we have released a total of 7,856 Galerucella Beetles throughout the PL along the East shore where it is most abundant. The Galerucella Beetle population appears to be reproducing very well and there is obvious insect damage to most of the PL along the east shore.
Any PL found with no insect damage is treated with herbicide annually to assist the biocontrol species in the reduction of seed output.

We will visit Lower Balsam Lake in 2021 to survey for all Aquatic Invasive Species and to monitor the populations of both the Purple Loosestrife and the Galerucella Beetles.

Lower Lawrence – 31023800 - PL
Our crews have been implementing a Purple Loosestrife management plan on Lower Lawrence Lake since 2009 which focuses solely on chemical control due to the low plant density and accessibility of the PL population.

Our annual herbicide applications had reduced the PL population at this site form the original 10 mature plants in 2009 to 1 flowering plant in 2019.

This year (2020) there were 3 PL seedlings coming from the residual seed bank and 1 new site consisting of 1 plant found on the south shore.
We will visit Lower Lawrence Lake in 2021 to survey for any new introductions of Aquatic Invasive Species and to continue our PL control efforts.

Maple - 31077300 - PL
Our AIS crew has been implementing a Purple Loosestrife management plan on Maple Lake since 2008 which, due to the low plant density and ease of access to the plants, focuses on chemical control.

We have reduced the PL population from the original 25 mature plants in 2008 to 1-2 seedlings each year that emerge from the residual seed bank. This season we did find 1 mature plant growing roughly 350 yards north of the original PL site near Maple Creek.

We will return to Maple Lake in 2021 to implement control measures on any PL found and to survey for new introductions of AIS.

McKinney - 31037000 - EWM, PL
Our AIS crew has been implementing a Purple Loosestrife management plan on McKinney Lake since 2012 which integrates both biological and chemical control methods. We have also been mapping the Eurasian Watermilfoil since 2015.

There is a continuous dense stand of Purple Loosestrife that can be found throughout most of the shoreline being the densest in the NW corner of the Lake and throughout the cattails along Hwy 38.

Since 2013, we have released 13,679 Galerucella Beetles throughout the entire shoreline of McKinney. Annual Herbicide applications have been made to all PL plants found that lack evidence of the biocontrol species to reduce seed production and dispersal.

Eurasian Watermilfoil can be found in a continuous ring around the lake in 6-12 feet of water.
The DNR, in cooperation with the Itasca AIS program, performed chemical treatments in 2019 and 2020 for the EWM which showed obvious results. The Milfoil was reduced from and infested area of approximately 15 acres in 2019 to around 10 acres in 2020.

We plan to revisit McKinney Lake in 2021 to survey for all AIS, implement biological and chemical control efforts on the PL population, and to evaluate the results of the EWM control project.

Mike's (Clubhouse Chain) - 31096600 - PL
The Itasca AIS crew has been implementing a Purple Loosestrife management plan on the Clubhouse Chain of Lakes since 2009 which focuses on chemical control because of the low density and accessibility of the Purple loosestrife.

At the time of our first survey, there were approximately 30 PL plants among a 40-yard stretch on the South shore of Mike's Lake. We have applied herbicide to all PL plants found on Mike's lake every season since 2009 to work towards the depletion of the residual seed bank.

There were 5 PL plants found this season (2020) along the South shore of Mike's Lake and for the 1 time ever, there was 1 PL plant discovered in the creek coming from Clubhouse lake.

Mike's Lake will be visited in 2021 to implement control measures on the PL population and to survey the entire chain of lakes for new introductions of AIS.

Mississippi River – ZM, PL, CLP
In the 2017 season, our crew tracked the spread of Zebra Mussels for 17.5 miles from the Winnie Dam, through Little Winnie Lake, and downstream through the Mississippi River to the confluence of the Leech River. We did not find any ZM's downstream of the Leech River confluence at that point although it is likely they had made it further.

In 2018, we located Zebra Mussels another 20 miles downstream to the bridge at Hwy 6 South. The 2 Mussels we found there were very small, just millimeters in length, which likely means they were the young of the year. We did locate a seemingly separate Zebra Mussel colony in the Blandin Reservoir and downstream through the lower portion of the Mississippi River. Although the mussels found here were full size adults, there were no Zebra Mussels located upstream between the Pokegama Dam and the Hwy 6 Bridge (14 miles of river).

This season (2020) Zebra Mussels have now been discovered in the connected waters between Hwy 6 and Pokegama Dam: Blackwater, Jay Gould, Little Jay Gould, and Pokegama.

Curly Leaf Pondweed and Purple Loosestrife are also present in the stretch of the Mississippi river between Blackwater Lake and The Prairie River confluence. Both species have populations that fluctuate from year to year depending on water levels.

Our crew has released 31,889 Galerucella Beetles between the River Road bridge and the Prairie River confluence for the biological control of Purple Loosestrife between the years of 2012 and 2017. Herbicide is applied annually to all PL that showed a lack of the biocontrol population.

Starry Stonewort is currently known to be invading Winnibigoshish Lake but has not yet been discovered in the Mississippi River or the connected waters downstream. Over 120 vegetation samples were taken this season (2020) between the Winnie Dam and Little Winnie.

Our crew will survey multiple stretches of the Mississippi River again in 2021 to implement control measures on the PL population, monitor the spread of Zebra Mussels and Curly Leaf Pondweed, and to detect any new introductions of AIS including Starry Stonewort.

Moose – 31072200 - PL, CLP
Our crew has been implementing a Purple Loosestrife management plan on Moose lake since 2010 which integrates biological and chemical control. We have been managing the Curly Leaf Pondweed on Moose Lake since 2016 via mechanical control (hand-pulling).

In 2016, we located an approximate 40 square foot patch of Curly Leaf Pondweed along the cattails, just West of the South public access. After 3 short sessions of hand-pulling, we had removed all the CLP. There has been no Curly Leaf found in Moose Lake from 2017 to present. We will continue to revisit this site annually to remove any CLP if it happens to come back.

Presently, the Purple Loosestrife population is isolated to the biocontrol areas on the NW shore in front of the Moose Lake Resort and within the creek that flows between Moose Lake and Deer lake.

There were 3,806 Galerucella Beetles added to the existing biocontrol population this season (2020). Herbicide is applied annually to all Purple Loosestrife found on Moose Lake that lacks evidence of the biocontrol population. This season we conducted two surveys of Moose lake to ensure adequate control of the invasive plant population.

We will visit Moose Lake in 2021 to implement control measures on the PL and CLP and to survey for new introductions of AIS.

Napoleon - 31029000 - PL
Our crew has been implementing a Purple Loosestrife management plan on Napoleon lake since 2013 which integrates biological and chemical control methods.

In 2013, we had found dense patches of PL throughout most of the shoreline. Herbicide was applied to all PL found in 2013 and 2014 to knock back the dense vegetation and to reduce the seed output and dispersal.

In 2015, we began introducing Galerucella Beetles to three areas of Napoleon Lake where the PL was the densest; we have released 3,086 Galerucella Beetles throughout Napoleon lake since 2015. Herbicide has been applied annually to all PL found outside of these biocontrol areas.

This year, Purple Loosestrife was only found in the 3 biocontrol areas except 1 plant which was found on the East shore, South of the main biocontrol area. Herbicide was applied to any PL plants that lacked evidence of the biocontrol species.

We will visit Napoleon Lake in 2021 to add Galerucella Beetles to the biocontrol population, apply herbicide to all PL found outside of the biocontrol areas, and to survey for new introductions AIS.

Northstar – 31065300 - ZM
In 2017, a landowner had discovered a Zebra Mussel population while removing their dock / boat lift from the lake.

In 2018, the Zebra Mussel colony was found to be abundant along the East shore of the main lake but less frequent among the rest of the lake. There are many areas of Northstar where the sediment is clay; we did not find any Zebra Mussels in these areas.

Northstar Lake was not surveyed by our crew in 2020.
We plan to visit Northstar Lake in 2021 to document any changes occurring in the Zebra Mussel population, as well as, to survey for the presence of any other Aquatic Invasive Species.

O'Brien – 31003200 – PL
Our Crew has been implementing a Purple Loosestrife management plan on O'brien Lake since 2016 when we discovered 17 separate PL locations throughout the lake.

Our annual herbicide applications have reduced the density of Purple Loosestrife in most locations and many of the original locations are now void of Purple Loosestrife.

There is 1 dense Purple Loosestrife location in the SE portion of the lake where we plan to release a biocontrol species in 2021 due to the inaccessibility and density of the PL.

We will survey O'Brien Lake again in 2021 to implement PL control measures and to search for new introductions of Aquatic Invasive Species.

Pokegama - 31053200 - *ZM, PL, CLP
Adult Zebra Mussels were discovered on a resident's dock / boat lift in early June of 2020. Although ZM's were expected to be infiltrating the lake from the West end coming from the Mississippi River flowage, these first adults were found on the extreme East end of the lake suggesting they may have been established from an independent source.

Since the discovery of the Zebra Mussels, juveniles are now able to be found throughout the lake.

The Itasca AIS program has been implementing a Purple Loosestrife management plan on Pokegama Lake since 2012 which integrates biological and chemical control methods.

We released 6,800 Galerucella Beetles in a stand of dense PL on the West shore of Sherry's Arm in 2013; the biological control species has reproduced very well and have reduced the density of the PL population dramatically at that site.

There have been many other PL sites discovered around Pokegama Lake that are very low in plant density and quite accessible which we have applied herbicide to annually. The invasive plant has been eliminated form many of those sites yet there are new PL discoveries each season.

CLP is present along the shallow flat area of Tioga bay and into the channel connected to Little Jay Gould Lake where Curly Leaf Pondweed is abundant. In 2017, we discovered a couple new patches of CLP just inside the harbor leading to the Pickled Loon Saloon.

We will visit Pokegama lake in 2021 to implement control measures on the Purple Loosestrife population, monitor any changes in the Zebra Mussel and Curly Leaf Pondweed populations, and to survey the entire lake for new introductions of AIS.

Portage – 31082400 – PL
Our crew has been integrating biological and chemical control methods on the Purple Loosestrife population of Portage Lake since 2009. When discovered, the Purple Loosestrife population was present throughout 80% of the entire shoreline with the most-dense population found along the western residential shoreline. There have been 46,319 Galerucella Beetles released on the shores of Portage since 2009 and the success of their reproduction varies from year to year.

This season (2020) the bio-control population seemed to be doing very well along the west and south shores. Our crew applied herbicide to all PL found that showed no damage from the insects.

Due to the direct connection to Sand Lake, Portage Lake is now also infested with a Zebra Mussel population. The mussels are not extremely overpopulated, and it was tough to find any throughout the littoral zone during our surveys in 2018-2020.

Our crew will visit Portage Lake in 2021 to survey for all Aquatic Invasive Species, monitor any changes in the Zebra Mussel population, and to implement control measures on the Purple Loosestrife population.

Prairie - 31038400 – CLP
Our crew has mapping the changes in the Curly Leaf Pondweed population on Prairie Lake since 2015. The population has become more widespread, increasing from 3 original sites to around 15 sites throughout the lake. The CLP in most sites appear to have increased in area each year.
The largest patch of CLP in the south bay of the lake near the dam is now well over 20 acres.

We will return to Prairie Lake in 2021 to search for new introductions of AIS and to map any changes in the existing Curly Leaf Pondweed population.

Prairie River – PL
In 2016, there was 1 Purple Loosestrife plant found growing under the Hwy 169 Bridge; herbicide was applied to that one plant. Since then, there has been no Purple Loosestrife found at that location or anywhere else on the Prairie River. We will survey the Prairie River in 2021 to search for new introductions of any Aquatic Invasive Species.

Rice – 31087600 - ZM
See description for *Sand Lake Chain*

Round Lake -31089600 – PL
Round Lake has been surveyed four times since 2015 and there have been no AIS discoveries until this season when our crew located an approximate 150-yard stretch of the SE shoreline with a consistent Purple Loosestrife population. Herbicide was applied to al PL plants found.

Round Lake will be visited in 2021 to implement control measures on the Purple Loosestrife population and to survey the entire lake for new introduction s of Aquatic Invasive Species.

Rush Island – 31083200 - PL
Our AIS crew discovered 1 mature flowering Purple Loosestrife plant just East of the Rush Island public access in 2015. Herbicide was applied to this one plant and PL has not been found since.

We will survey Rush Island again in 2021 to search for any new introduction of AIS and to apply herbicide to any PL, if found.

Sand Lake Chain - 31082600 - ZM, PL
Our AIS crew has been implementing a Purple Loosestrife management plan on Sand Lake since 2009 which integrates both biological and chemical control methods.

The PL has historically been found scattered among the southern bays in sparse patches but growing quite densely in the SW bay near the Bowstring River.
This season (2020) It was also found growing consistently in the NE corner near the Ghost Bay Resort.

There have been over 107,000 Galerucella Beetles released throughout the SW bay of Sand Lake, the Bowstring River, and Bowstring Lake since 2007; the success of the bio-control population varies from year to year. Herbicide has been applied annually to all Purple Loosestrife found in areas that lie outside of the bio-control areas.

Although Zebra Mussels are still abundant in Sand Lake, their population has seemed to decrease in certain areas. The thick sheets of ice that form in the winter reach the bottom of the lake out to about 3-4 feet of water. This freezes the ZM's solid and gives the appearance of a declining population. The mussels in deeper water are unaffected by the ice and are still flourishing.

As discovered in 2017, The Zebra Mussel population from Sand Lake has spread North through the Bowstring River into Dora Lake and the Bigfork River.
For More information on the spread of this Zebra Mussel colony, see the description for *Dora Lake*.

We will visit the Sand Lake Chain in 2021 to implement control measures on the Purple Loosestrife population, monitor any changes in the Zebra Mussel colony, and to search for new introductions of AIS.

Sand – 31043800 – PL
Our crew has been implementing a Purple Loosestrife management plan on Sand Lake since 2010 which focuses solely on chemical control. At the time of our first survey there were over 100 mature PL plants within a 150-yard stretch along the South shore, West of the landing. There was also one plant found in the NW corner of the lake.

There has been a steady decline in the density of PL on Sand Lake due to the annual herbicide applications and this season there were only a total of 3 small plants located within the historically infested area.

We will return to sand Lake in 2021 to maintain control of the Purple Loosestrife population and to survey the entire lake for new introductions of Aquatic Invasive Species.

Smith – 31065000 - CLP, PL
The Itasca AIS crew has been implementing a Purple Loosestrife management plan on Smith Lake since 2007 which integrates both biological and chemical control methods.

At the time of our original 2007 survey, PL was found to be abundant along a majority of the shoreline, being densest in the boggy portions of the lake. Historically, Galerucella Beetles have been released in areas where PL is the densest and herbicide has been applied to all PL plants found outside of the biocontrol sites

The biocontrol insects do not reproduce very well in the areas where they have been released and were not slowing down the spread of the Purple Loosestrife so we began applying herbicide to all PL in 2012. Since 2012 we have seen a major decline in the PL around the lake although there is still an abundant seed bank in the boggy sections on the south shore.

There were 10 locations on Smith Lake in 2020 with a sparse population of Purple Loosestrife, most locations having just 1 plant.

In 2016, we located a small patch of Curly Leaf Pondweed just out from the landing, but it is too deep for our crew to hand-pull.

We will visit Smith Lake in 2021 to implement control measures on the Purple Loosestrife population, monitor any changes in the Curly Leaf Pondweed population, and to search for any new introduction of Aquatic Invasive Species.

Snaptail - 31025500 – PL
The Itasca AIS crew has been implementing a Purple Loosestrife management plan on Snaptail Lake since 2012 which integrates both biological and chemical control methods.

The Purple Loosestrife is very abundant among approximately 80% of the shoreline of Snaptail Lake. Since 2012, we have released 23,934 Galerucella Beetles throughout the densest PL stands on the lake and applied herbicide to all PL that was found outside of the biocontrol areas.

The population of Galerucella Beetles has increased significantly over the last 3 seasons and has reached the point of causing extreme damage to the Purple Loosestrife along the western and northern shores. Although there is significant beetle damage along the eastern and southern shores as well, there are still PL plants in those areas that show minimal beetle damage. Herbicide is applied annually to all PL that shows minimal evidence of the biocontrol population.

Snaptail Lake will be visited in 2021 to implement control measures on the Purple Loosestrife population and to search for any new introductions of Aquatic Invasive Species.

South Sturgeon/Little Sturgeon – PL **31000300/69129000**
Our AIS crew has been implementing a Purple Loosestrife management plan on the Sturgeon Chain of Lakes since 2017 when there was 1 PL plant located on the south side of the channel, east of the County Road 473 Bridge. This 1 PL plant looked as if it was imported with the soil used for the construction of the new bridge.

There was no Purple Loosestrife found in 2018-2020 at this site or anywhere else in the entire chain of lakes.

We will visit the Sturgeon Chain of Lakes in 2021 to implement control efforts on any Purple Loosestrife found and to search for any new introductions of Aquatic Invasive Species.

South Sugar – 31055500 – PL
The Itasca AIS crew has been implementing a Purple Loosestrife management plan on South Sugar Lake since 2013 which focuses solely on chemical control.

At the time of discovery there were about 15 mature PL plants within a 30-yard stretch along a residential portion of the North Shore.

There have consistently been fewer PL plants sprouting from the seed bank each season due to our annual herbicide applications. There were just 2 plants found this season, for the second season in a row, emerging from the residual seed bank. The reduction in Purple Loosestrife at this site has resulted in the emergence of multiple Showy Lady Slippers that had been displaced by the invasive plant population.

Our crew visited South Sugar lake twice this season to implement control measures on the Purple Loosestrife population and ensure adequate control. We will return in 2021 to search the lake for any new introductions of Aquatic Invasive Species and control the PL if needed.

Spider - 31053800 – FR
Our AIS Control & Monitoring crew has been implementing a Flowering Rush control project on Spider Lake since 2015 which consists solely of hand-pulling the plants.

At the time of discovery, there were 2 patches of Flowering Rush near the public access totaling about 140 sq. ft. in size.

Each season the density and infested area of the Flowering Rush patch has dramatically been reduced due to our control efforts.

This season (2020) there were 12 FR plants located just east of the boat ramp and a new FR location was discovered about 20 feet to the West of the ramp. All Flowering Rush found was uprooted and removed from the lake.

We will return to Spider Lake in 2021 to implement control measures on the Flowering Rush population and to survey the entire lake for any new introductions of Aquatic Invasive Species.

Swan – 31006700 - CLP, PL
Our AIS Control & Monitoring crew has been implementing a Purple Loosestrife management plan on Swan Lake since 2010 which consists solely of chemical control methods.

There are two areas of Swan Lake that have consistently had a sparse PL population. There have also been a couple random single plants located throughout the lake over the past 10 seasons.

Herbicide has been applied to all PL plants found during our annual lake surveys and there has been a major reduction in the number of plants that emerge from the seed bank each year.

We began surveying for all Aquatic Invasive Species and mapping the Curly Leaf Pondweed on Swan Lake in 2015, and since then we have witnessed the Curly Leaf Pondweed population fluctuate in density

throughout the Western portion of the lake. There are still large dense patches reaching the surface in much of the West Bay in 2020 but the population has decreased dramatically since last year's survey.

The CLP was not found in the East basin of the lake this season (2020) but it has been know to be spreading to the east over the last couple seasons.

We will visit Swan Lake in 2021 to maintain control of the Purple Loosestrife population, map any changes in the Curly Leaf Pondweed population, and survey the entire lake for new introductions of Aquatic Invasive Species.

Trout - 31021600 - PL, FR
Our crew has been implementing management plans on Trout Lake for Purple Loosestrife since 2013 and Flowering Rush since 2015.

The PL has historically been located in the drainage ditch, east of the North Public Access and the Flowering Rush site is located just out from the boat ramp at the same access.

There was no Purple Loosestrife or flowering Rush found in Trout Lake from 2016 to 2018 due to our control efforts. There was 1 small Purple Loosestrife plant found about 200 yards east of the north boat ramp in 2019 which we applied herbicide to. There was again no PL in 2020.

Since Trout Lake has not had Flowering Rush since its removal in 2015, it may soon be able to be removed from the MN DNR's infested waters list.

We will visit Trout Lake in 2021 to ensure the eradication of Flowering Rush and Purple Loosestrife and to conduct another survey for all Aquatic Invasive Species.

Trout – 31041000 - PL
Our AIS Control & Monitoring Crew has been implementing a Purple Loosestrife management plan on Trout Lake, and the entire Wabana Lake chain since 2009 which consists solely of chemical control.

At the time of discovery, there was a continuous stand of Purple Loosestrife on the North end of the lake spanning from the Public Access to the creek in the NE corner. There was also 1 small patch of PL located on the West Shore.

Due to 10 seasons of herbicide applications, the Purple Loosestrife population has been dramatically reduced each season and this year (2020) there were only 3 PL plants located on the North shore.

Our crew will visit Trout Lake and the entire Wabana Lake Chain in 2021 to implement control measures on the PL population, if needed, and to search for any new introductions of Aquatic Invasive Species.

Turtle – 31072500 - PL
Our AIS Control & Monitoring crew has been implementing a Purple Loosestrife management plan on Turtle Lake since 2007 which integrates both biological and chemical control methods.

At the time of our first survey, Purple Loosestrife was found to be very abundant throughout the Western arm of the lake; the East half of the lake only had one PL location.

Since 2007 there have been 83,128 Galerucella Beetles released among 4 bio-control areas on Turtle Lake; those sites are the areas where Purple Loosestrife is still densely populated. Herbicide has been applied annually to all Purple Loosestrife located outside of the biocontrol areas. A majority of the chemical control sites now have no PL present.

Our crews conducted 2 full-lake AIS surveys on Turtle Lake this season (2020) in search of all AIS but specifically for Zebra Mussels and Starry Stonewort. No new infestations were found. We will visit Turtle again in 2021 to implement control efforts on the Purple Loosestrife population and survey the entire lake for any new introductions of Aquatic Invasive Species.

Twin - 31002600 – PL
The Itasca AIS Control & Monitoring crew has been implementing a Purple Loosestrife management plan on Twin Lake in Pengilly, MN since 2014 which integrates both biological and chemical control methods.

At the time of our first survey of Twin Lake, Purple Loosestrife was found to be abundant throughout the shoreline of the East basin and there was a 40-yard stretch of shore in the center basin of the lake that had a sparse PL population.

In 2019 there were two new Purple Loosestrife sites discovered near Hart Lake road in the western most basin.

Since 2015, there has been 5,594 Galerucella Beetles released throughout the East basin of the lake where the Purple Loosestrife is the densest. Some biocontrol areas appear to be very conducive to the reproduction of the biocontrol insect; other areas show no evidence of the insect species.

Herbicide has been applied annually to all Purple Loosestrife located on Twin Lake that showed no sign of the biocontrol species to prevent seed production and dispersal.

Our crew will visit Twin Lake again in 2021 to implement control measures on the PL population and to survey the entire lake for any new introductions of Aquatic Invasive Species.

Twin – 31039100 - FR, EWM, PL
Our AIS Control & Monitoring crew has been mapping the Purple Loosestrife on Twin Lakes since 2012 and mapping the Flowering Rush and Eurasian Milfoil since 2015.

The stand of Purple Loosestrife on the North shore has supported great beetle reproduction year after year and this site has supplied a large portion of the biocontrol insects that we have dispersed throughout Itasca County. In 2019 & 2020 the beetle population seems to be lower than past years but that is likely due to the number of beetles we have collected in the past 7 seasons as well as the slightly higher water level.

At the time of our first survey, FR was found in scattered dense patches in North Twin Lake and there were 2 small patches located in South Twin.

Since 2015, we have witnessed the Flowering Rush density increase dramatically to the point where there is now a continuous population of it around most of the lake in about 5 feet of water or less. Despite chemical control efforts that had been contracted by the MN DNR, the Flowering Rush is well on its way to dominating the littoral zone of Twin Lakes. We may attempt to collaborate with the DNR to create a more intensive FR management plan in the future to lessen the ecological impact of the invasive plant.

Eurasian Watermilfoil is scattered, mostly along the eastern shore, in low density populations and has not changed much since our initial 2015 survey. There are two large patches of the native species Northern Watermilfoil that have been increasing in area every season. When the native plants explode in population like this, it usually means there is an excess of nutrients entering the lake in that area.

We will return in 2021 to monitor the Galerucella Beetle population and collect some if the population will support it. We will also map any spread of the Eurasian Watermilfoil and Flowering Rush, as well as search for any new introductions of Aquatic Invasive Species while we conduct our survey.

Wasson – 31028100 – PL
Our AIS Control & Monitoring crew has been implementing a Purple Loosestrife management plan on Wasson Lake since 2016 which focuses solely on the use of chemical control methods.
Our annual herbicide applications had reduced the PL population at this site from 6 Large flowering PL bushes to just 1 plant in 2019.

This season (2020) there were 6 PL seedlings located among the original site along the West shore of the Northern most bay. Herbicide was applied to all PL found.

Our crew will visit Wasson Lake in 2021 to maintain control of the Purple Loosestrife population and to search for any new introductions of Aquatic Invasive Species.

Winnibigoshish - 31014700 - *(North shore from Plughat Landing to West Winnie Landing)* *ZM*, FS, PL, SSW
Our crew began mapping the populations of Zebra Mussels, Starry Stonewort, Faucet Snails and Purple Loosestrife in Lake Winnibigoshish in 2016.

We have been applying herbicide to the Purple Loosestrife population near the mouth of Raven Creek since 2016 when we located 8 mature flowering plants. Each season since the discovery of the site, we have found approximately the same number of individual Purple Loosestrife locations with a few seedlings sprouting from the residual seed bank at each location. This is the only spot on Lake Winnibigoshish, to date, that we have found Purple Loosestrife.

Between 2016-2019, our crew has witnessed the Starry Stonewort population explode from being only sparsely found near the West Winnie Public Access to the point now where it blankets the bottom of the lake in much of the shallow areas along the South, West and East shores. SSW is also found in a dense monoculture covering the 10-15 ft drop off along much of the shoreline.

Over this same period (2016-2019), we have witnessed the Zebra Mussel population dominate the lake. Zebra Mussels can be found attached to pretty much every hard surface throughout Winnibigoshish and have spread through Cutfoot Sioux, Little Winnibigoshish, and the Mississippi River.

Faucet Snails have been present in Winnibigoshish for well over a decade. We take note when we find them in samples, but they truly are not a species of concern for our Control & Monitoring crew.

Our crews will visit Winnibigoshish Lake again in 2021 to maintain control of the Purple Loosestrife population, map any changes in the Starry Stonewort population, and search for any introductions of new Aquatic Invasive Species to the lake.

Biological Control of Purple Loosestrife

Purple Loosestrife Defoliating Beetles (*Galerucella spp.*) were collected from Bowstring Lake, North Twin Lake (Marble, MN) and Kelly Creek (Kelly Lake, MN) in the 2020 season.

The collected beetles were released throughout known dense stands of Purple Loosestrife in these locations in 2020:

- 660 Beetles released on Dunbar Lake Along the East and West Shores
- 2129 Beetles released throughout the Portage Lake (Sand Lake Chain)
- 1347 Beetles released throughout Lower Balsam Lake
- 2119 Beetles released throughout Snaptail Lake
- 2051 Beetles released throughout Hale Lake (near GR Highschool)
- 1109 Beetles released in the NW corner of Forest Lake (GR)
- 4120 Beetles released throughout the SW corner of Little Turtle Lake
- 11473 Beetles released on Turtle Lake throughout Moose Bay and Maple Creek
- 8298 Beetles released among the Southern bays of Deer Lake
- 3806 Beetles released on the North shore of Moose Lake
- 200 Beetles released throughout Ice/Crystal Lake
- 3000 Beetles released throughout Lily Lake (Airport)
- 3100 Beetles released in the NW Corner of McKinney Lake
- 2300 Beetles released throughout Little Long Lake
- 2500 Beetles released among the East bay of Long lake (Cohasset)
- 6700 Beetles released near the Wabigama Duck Camp on Bowstring Lake
- 1886 Beetles were released along the roadside near Orty's Meats in Deer River

Total of 56,798 Galerucella Beetles Collected and Relocated in 2020

Complete 2007-2020 Beetle Release Table on next page.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Site Total
Turtle Lake	4,800	16,100	12,800	1,700	5,600	3,700	0	2,885	4,481	6,004	4,500	5,079	4,006	11,473	83,128
4th St GR Beaver Pond	0	0	0	0	0	0	0	0	0	3,600	1,900	0			5,500
Blandin Reservoir	0	0	0	0	0	0	0	0	0	0	3,603	0			3,603
Blind Lake	0	0	0	0	0	0	1,500	790	0	0	0	0			2,290
Bovey - ATV Trail	0	0	0	0	0	0	0	0	0	6,261	8,369	2,871			17,501
Bowstring Lake/River	5,500	9,500	6,100	7,500	4,600	25,400	9,200	14,319	13,155	1,650	3,230	0		6700	106,854
Creek/ Deer River	0	0	0	0	0	0	800	200	0	0	0	0			1,000
Crystal/Ice Lake	0	0	0	0	0	0	0	0	455		1,500	0	916	200	3,071
Cty RD135 Cass Cty	0	0	0	0	0	0	0	3,685	0	0	0	0			3,685
Deer Lake	0	0	0	0	0	2,300	7,700	2,000	500	10,028	3,698	3,041	1,135	8298	38,700
Donated to DNR	0	0	0	0	0	5,500	5,750	6,000	0	3,365	2016	0			22,631
Donated to Leech Tribe	0	0	0	0	0	0	0	0	0	0	2,442	0			2,442
Dunbar														660	660
Donovan Pond	0	0	0	0	0	0	0	0	0	5,900	0	0			5,900
Eagle Lake	0	0	0	0	0	0	0	5,095	0	4,316	6,000	1,173			16,584
Forest Lake	0	0	0	0	0	0	1,300	1,100	0	200	2,035	500	371	1109	6,615
Hale Lake	0	0	0	0	0	0	900	9,007	0	0	0	2,000		2051	13,958
Holman Lake	0	0	0	0	0	0	5,600	0	0		3,675	0			9,275
Hwy 65/Nashwauk	0	0	0	0	0	0	0	0	0	0	1,000	0			1,000
Hwy 65/Swan River	0	0	0	0	0	0	0	0	2,900	6,928	11,614	7,067			28,509
Kelly Creek RD	0	0	0	0	0	0	0	200	0	0	0	0			200
L&M Wetland	0	0	0	0	0	0	0	0	0	2,278	2,015	0			4,293
Leighton Lake	0	0	0	0	0	0	2,000	5,500	0	0	0	0			7,500
Lily Lake (Airport)														3000	3,000
Little Drum Lake	0	0	0	0	0	0	0	0	0	0	448	0	900		1,348
Little Long Lake	0	0	0	0	0	0	2,300	4,525	7,600	2,845	750	0		2300	20,320
Little Turtle Lake	0	0	0	0	0	0	0	2,563	2,500	1,650	2,250	0	3,103	4120	16,186
Long Lake	0	0	0	0	0	500	4,700	1,500	400	0	0	0	2,670	2500	12,270
Lower Balsam Lake	0	0	0	0	0	0	0	0	0	0	3,882	1,924	703	1347	7,856
McKinney Lake	0	0	0	0	0	0	1,100	1,325	630	2,616	0	4,908		3100	13,679
Mississippi River	0	0	0	0	0	11,200	14,000	0	0	0	6,689	0			31,889
Moose Lake														3806	3,806
Napoleon Lake	0	0	0	0	0	0	0	0	0	1,260	0	2,532			3,792
Orty's Meats	0	0	0	0	0	0	0	0	0	0	6,794	0	3,149	1886	11,829
Pelican Lake(Buffalo, MN)	0	0	0	0	0	0	1,100	0	0	0	0	0			1,100
Plum Creek	0	0	0	0	0	0	0	0	8,373	0	2,250	552	212		11,387
Pokegama	0	0	0	0	0	0	6,800	0	0	0	0	0			6,800
Portage	0	0	7,300	3,000	9,900	6,600	0	0	0	786	10,731	3,031	2,842	2129	46,319
Sand Lake / Bowstring River													1,040		1,040
Schafer Creek	0	0	0	0	0	0	0	0	0	0	4,000	0			4,000
Serpent	0	0	0	0	0	0	0	2,000	0	0	0	0			2,000
Snaptail	0	0	0	0	0	3,200	2,400	750	6,302	5,258		2,840	1,065	2119	23,934
SugarLakeGolfCourse	0	0	0	0	0	0	0	750	0		2,000	0	618		3,368
The Deer River	0	0	0	0	0	0	0	0	0	0	5,000	0			5,000
Twin Lakes(Pengilly)	0	0	0	0	0	0	0	0	3,783	0	1,811	0			5,594
YMCA Wetland	0	0	0	0	0	0	0	0	0	0	1,500	0			1,500
Yearly Total	10,300	25,600	26,200	12,200	20,100	58,400	67,150	64,194	51,079	64,945	105,702	37,518	22,730	56,798	622,916

-Purple Loosestrife Eradication-

The following list of lakes have had Purple Loosestrife infestations in past seasons. Due to the control efforts of our AIS Control & Monitoring Crew, Purple Loosestrife has been eradicated from these lakes:

Batson – 31070400
Little Ranier – 31066000
Hatch – 31077100
Rush Island – 31083200
Trout - 31021600

We will continue to visit these sites periodically to ensure the depletion of the residual seed bank.

-Purple Loosestrife Roadside Management-

Purple Loosestrife is an Aquatic Invasive Species that often spreads into aquatic systems from adjacent roadways. This invasive plant is by far the most widespread Aquatic Invasive Species in the United States, as well as, in Itasca County, MN.

Since 2007, our crew has taken the initiative to locate, document, and implement control efforts on all Purple Loosestrife found as a preventative tactic against its seed dispersal into the pristine waters and wetlands of Itasca County.

There are now approximately 50 roadside wetland sites throughout Itasca County where our crew is currently managing infestations of Purple Loosestrife on an annual basis. There are numerous sites where PL has been discovered and eradicated over the last 13 years, yet new sites are discovered annually.

For further information on the locations of Purple Loosestrife in Itasca County, MN, contact Chris Evans in the Aquatic Invasive Species Division of our office at (218) 328-4107 or chris.evans@itascaswcd.org.

-AIS Location Maps-

If you would like to request an AIS map of a specific body of water, contact Chris Evans in the Aquatic Invasive Species Division of our office at (218) 328-4107 or chris.evans@itascaswcd.org.

-AIS Photos- 2020-

The following collection of photographs were taken by the 2020 Itasca SWCD Aquatic Invasive Species Control & Monitoring Crew.

Pictured Below: The first Zebra Mussels found in Ball Club Lake; 3-4 yr old adults.

Pictured Above: Curly Leaf Pondweed discovered near the access of Deer Lake.

Pictured Below: Two Control & Monitoring crew members uprooting Curly Leaf Pondweed by hand; Deer Lake.
(Left: Brooks Bachmann, Right: Ryan Dunnell)

Pictured Right:
Control & Monitoring crew removing Curly Leaf from the NE corner of Deer Lake.
(Left: Joe Rohm, Right: Colton Utecht)

Pictured Below:
Two Rubbermaid tubs full of Curly Leaf Pondweed ready to be disposed of on dry land.

Pictured Left:
The first Zebra Mussel documented on Bowstring Lake found along the East shore on a tire exhumed from the bottom of the lake.

Pictured Right:

The first Zebra Mussel found on Bowstring Lake held for a size comparison.

Pictured Left:
Brooks Bachmann examining woody debris in search of Zebra Mussels on Bowstring Lake.

Pictured Right:
One Zebra Mussel found on the log in the above picture.

Pictured Above:
Purple Loosestrife on Bowstring Lake that has been devastated by the biocontrol agent Galerucella calmariensis. Note how all other native vegetation is green and unaffected by the defoliating beetle.