



1414 West Hamilton Avenue
P.O. Box 8
Eau Claire, WI 54702-0008

October 31, 2018

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: 2018 Purple Loosestrife Monitoring Report
Holcombe Hydro (P-1982), Cornell Hydro (P-2639), Jim Falls Hydro (P-2491),
Wissota Hydro (P-2567), Chippewa Falls Hydro (P-2440) and Dells Hydro (P-
2670)**


Dear Secretary:

Enclosed is the 2018 Purple Loosestrife Monitoring Report for the above-referenced hydro projects. Pursuant to the 2001 Lower Chippewa River Settlement Agreement, Xcel Energy (licensee) is required to annually monitor for the presence of loosestrife at each impoundment and eradicate pioneering plants on company-owned shoreline.

The number of loosestrife sites and overall coverage from the previous year decreased at four of the six projects. A slight increase was documented at Jim Falls while Chippewa Falls continues to remain free of loosestrife.

Should you have any questions regarding this report, please contact Matthew Miller of this office at (715) 737-1353 or at matthew.j.miller@xcelenergy.com.

Sincerely,


for William Zawacki
Director, Hydro Plants

Enclosure

c: Nick Utrup - USFWS (via e-mail)
Cheryl Laatsch - WDNR (via e-mail)
Brian Guthman - Lake Holcombe Improvement Association (via e-mail)
Jeanette Kelly - Beaver Creek Reserve (via e-mail)
Project Files

PURPLE LOOSESTRIFE ASSESSMENT – 2018

**Dells Pond, Chippewa Falls Flowage, Lake Wissota, Old Abe Flowage,
Cornell Flowage, Holcombe Flowage, and Jim Falls Spillway Channel**

Prepared for:

**Xcel Energy
P.O. Box 8
Eau Claire, WI 54702**

Prepared by:



**Principal contact:
Christopher J. Turner
Ph.: 715/829-3737
Fax: 715/874-5389
Email: cturner@glec.com**

October 26, 2018

INTRODUCTION

Purple loosestrife (*Lythrum salicaria* L.) is an erect, herbaceous perennial of Eurasian origin that became established in the estuaries of northeastern North America by the early 1800's. Since then, this highly invasive species has spread throughout much of the United States, including most of Wisconsin's counties. As purple loosestrife expands its local distribution and becomes more widespread, it poses a serious threat to native emergent vegetation in shallow-water marshes and shorelines by displacing native food and cover plants in the waterways.

As part of the 2001 Lower Chippewa River Settlement Agreement, Xcel Energy agreed to monitor for the presence and spread of purple loosestrife at its six Lower Chippewa River hydroelectric projects. The surveys are to take place each year in the late summer when loosestrife blooms are easily detectable. Additionally, Xcel Energy committed to treating small clusters of pioneering plants which occur on company-owned property with an approved aquatic herbicide.

In 2010, Xcel Energy partnered with Beaver Creek Reserve to introduce European beetles (*Galerucella californiensis* and/or *Galerucella pusilla*) into the main spillway channel adjacent to the Jim Falls Hydro. Beetles were again introduced into the same area during the summer of 2011. The beetles are commonly referred to as "Cella" foliage beetles or purple loosestrife bio-control beetles and they feed specifically on purple loosestrife plants. Their use has shown to be successful at decreasing the overall population of purple loosestrife. The locations and density of loosestrife within the Jim Falls spillway channel are therefore being monitored to determine the success of the beetle introduction.

METHODS

Following the same approach as previous surveys, an inspection of the entire shoreline of Dells Pond, Chippewa Falls Flowage, Lake Wissota, Old Abe Flowage, Cornell Flowage and Holcombe Flowage was performed by boat. The surveys were conducted between August 25 and September 25, 2018. The surveyor motored slowly around the shoreline looking for purple loosestrife plants. When loosestrife was discovered, the location was

marked on a map and coordinates were entered into a handheld GPS unit. Loosestrife infestations were classified as either “present” or “abundant” and marked on the map with a specific color. “Present” was defined as a few plants that sparsely inhabited an area but did not comprise a large percentage of the overall vegetation in that area. “Abundant” indicated that denser loosestrife growth existed and that the loosestrife made up a significant portion of the shoreline’s overall vegetative cover.

By referencing the location of purple loosestrife plants with land ownership maps provided by Xcel Energy, the surveyor determined if the plants were on company-owned property. If the plants were on Xcel Energy property, and if it was only a minor infestation, the plants were sprayed with Rodeo[®] (an aquatic herbicide) from a backpack sprayer. From past work, it has been determined that herbicide application can be used as an effective treatment for small loosestrife populations, however, it is much less effective at controlling larger infestations. If major infestations were noted on Xcel Energy property, they were not to be treated, but documented for the possibility of a different eradication method in the future.

Using GPS coordinates and notations made by the surveyor, the locations of purple loosestrife infestation were noted on field maps and catalogued in a spreadsheet. The locations were then digitized onto GIS base maps (Wisconsin DNR 24K Hydrography version 6 and ESRI StreetMap USA). Locations of purple loosestrife are depicted on the maps using green for present and red for abundant. Due to the scale of the maps, locations covering less than 20 feet of shoreline are denoted by a dot while areas covering 20 feet of shoreline or greater are denoted by a line drawn to scale. Through the combined use of GPS, laser rangefinder, visual estimates, and GIS, the total length of shoreline infested by purple loosestrife was calculated for each flowage (Table 1). Appendix A includes survey maps for each flowage infested with loosestrife along with a corresponding catalog of each loosestrife location.

A survey of purple loosestrife was also conducted in the Jim Falls spillway channel adjacent to the downstream powerhouse. This area has been known to contain purple loosestrife in locally high densities which prompted the introduction of purple loosestrife bio-control beetles. A comprehensive mapping effort of the area began in 2010 to monitor the spread of loosestrife and the success of the beetle introduction. This portion of the fieldwork

was completed on foot using GPS and maps to identify the locations and densities of the loosestrife within the channel.

RESULTS AND DISCUSSION

The number of purple loosestrife locations and the total length of shoreline infested for each flowage over the last three years are summarized below in Table 1. A standardized approach used to calculate abundance and shoreline coverage allows for a direct comparison from year-to-year. This year’s survey revealed an increase in infestation on Old Abe Flowage and a decrease on all the other flowages. Collectively, the amount of loosestrife infestation on the five flowages has decreased approximately 21 percent since 2017. Table 2 includes a summary of the total number of loosestrife infestations and the total length of shoreline infested for all six hydro projects over the past three years. Chippewa Falls Flowage again remained free of loosestrife infestation.

Table 1. Summary of Purple Loosestrife Infestations (2016-2018).

	Number of purple loosestrife locations						Shoreline Affected (ft)					
	Present			Abundant			Present			Abundant		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Holcombe	170	189	152	1	1	1	812	1007	704	120	40	40
Cornell	29	25	20	0	0	0	80	76	72	0	0	0
Old Abe	26	30	42	0	0	0	100	118	176	0	0	0
Wissota	9	10	5	0	0	0	27	30	16	0	0	0
Chippewa Falls	0	0	0	0	0	0	0	0	0	0	0	0
Dells	3	2	1	0	0	0	8	6	2	0	0	0

Table 2. Total Purple Loosestrife Infestations (2016-2018).

	2016	2017	2018
Total number of loosestrife points at Impoundments	238	257	221
Total feet of shoreline affected in Impoundments	1147	1277	1010

Holcombe Flowage again contained the most purple loosestrife among the six impoundments surveyed. There were 152 locations categorized as present and one location categorized as abundant (see Holcombe Flowage Map 1). This represents a decrease in both the number of infestations and the amount of shoreline affected from the previous year's

survey. While a few new plants were found during the survey, the majority of the infested areas have been documented in previous years. New infestations are generally associated with areas where the native vegetation has been disturbed. This disturbance can come from urbanization (clearing for home sites, swimming areas or fishing areas), road improvements, or erosion. It is also common to have plants grow only during select years. This may be the case on Holcombe Flowage, with new plants growing this year, while previously observed plants did not.

The majority of plants on Holcombe Flowage were again found in the area on and near Pine Island and along Highway 27. A comparison to the 2016 and 2017 surveys show much similarity with the overall loosestrife populations in this area (see Holcombe Map 2). Several small infestations were again found just to the east of the Highway 27 Bridge. This area had a similar degree of infestation last year. The only area of abundant plant growth this year was also classified as abundant in several previous surveys (the length of which remained stable at 40 feet). No purple loosestrife was found on the Pine Lake or Cranberry Lake areas of Lake Holcombe.

Several plant clumps were found scattered along the north and south shoreline of the main flowage (see Holcombe Maps 3 and 4) with many of these plants having been documented in the past. The large islands near the south shoreline of the main flowage also contain several plants. Overall, the plant density in the main basin remained fairly consistent with last year's survey.

The upstream reach of the flowage (see Holcombe Maps 5 and 6) also contains a number of purple loosestrife plants that have been noted in past surveys. The overall plant density in these areas was slightly less than what was documented in 2017. A few plants were noted in the eastern part of the flowage (see Holcombe Map 7), each of which have been seen in some of the previous years' surveys.

In total, approximately 744 feet of shoreline was found to contain purple loosestrife on Lake Holcombe compared to 1,047 feet in 2017 and 932 feet in 2016. As stated above, all infestations but one were classified as present.

Cornell Flowage includes 20 infestations classified as present and none as abundant (see map of Cornell Flowage). Many of the infested sites have been noted in surveys from the last several years. An area classified as abundant in previous surveys (2014 and earlier),

located in a low lying area on an island just upstream from the State Highway 64 Bridge, is classified as present as it has been since 2015. Both the overall number of loosestrife locations and the amount of shoreline affected decreased slightly from 2017.

Forty-two areas of loosestrife infestation were found on Old Abe Flowage (see map of Old Abe Flowage) all of which were classified as present. This is somewhat higher than the plant abundance from last year. Most of the locations consisted of single plants or a few plant clumps, many of which have been documented in past surveys. The total amount of shoreline infested by purple loosestrife this year was approximately 176 feet. This compares to 118 feet in 2017.

The number of purple loosestrife sites found on Lake Wissota decreased from ten in 2017 to five in 2018. These locations are all minor infestations with small plant clumps at each location (see map of Lake Wissota). Total shoreline infested on Lake Wissota decreased from 30 feet in 2017 to 16 feet in 2018. Very little variability has been documented over the last three years.

A single loosestrife location was documented on Dells Pond in 2018 (compared to two locations in 2017). This single plant location amounted to just two feet of shoreline.

The minimum flow channel at Jim Falls Hydro remains infested with a relatively high concentration of purple loosestrife plants. A significant decrease in the number of plants was noted in 2012 followed by a rebound in 2013 and 2014 before another decline in 2015. The number of plants subsequently increased in 2016 (Table 3). In 2017, the amount of loosestrife again was seen to decrease while the 2018 survey revealed almost no change from the previous year. Loosestrife was found scattered throughout the channel, with the lower third being moderately infested (see maps of Jim Falls Spillway Channel). The area of greatest concentration occurs just upstream from the County Highway Y Bridge (see Jim Falls Spillway map 2). The coverage of loosestrife in this area has decreased from approximately 5,431 square feet in 2017 to 3,600 square feet in 2018 (Table 4). The loosestrife is scattered throughout the area and therefore is not classified as abundant. A steady decline in the overall density of the plants in this area has also been noted over the last several years. The number of loosestrife sites in both the upper and lower portions of the spillway channel decreased slightly from last year while the amount of shoreline affected increased slightly. Collectively, these locations accounted for 262 feet of infested shoreline versus 222 feet in 2017. Most of

these locations were comprised of small plant clumps infesting between one and ten feet of shoreline, with a few more significant areas of infestation.

Eight years have passed since the introduction of the bio-control beetles into the minimum flow channel. While it is difficult to make a determination as to their success, the fact that the density of loosestrife in the lower area of the spillway channel is continuing to decrease, and the fact that loosestrife infestation in the remaining portion of the channel appears to be stabilizing is encouraging.

Table 3. Purple Loosestrife Infestations in the Jim Falls Spillway Channel (2016 – 2018).

	2016	2017	2018
Total number of loosestrife points at Jim Falls Spillway	69	45	43
Sq feet of Jim Falls Spillway infestation near Hwy Y	6,695	5,431	3,600
Total other shoreline affected at Jim Falls Spillway	313	222	262

Table 4. 2018 Summary of Purple Loosestrife Infestations in Jim Falls Spillway Channel

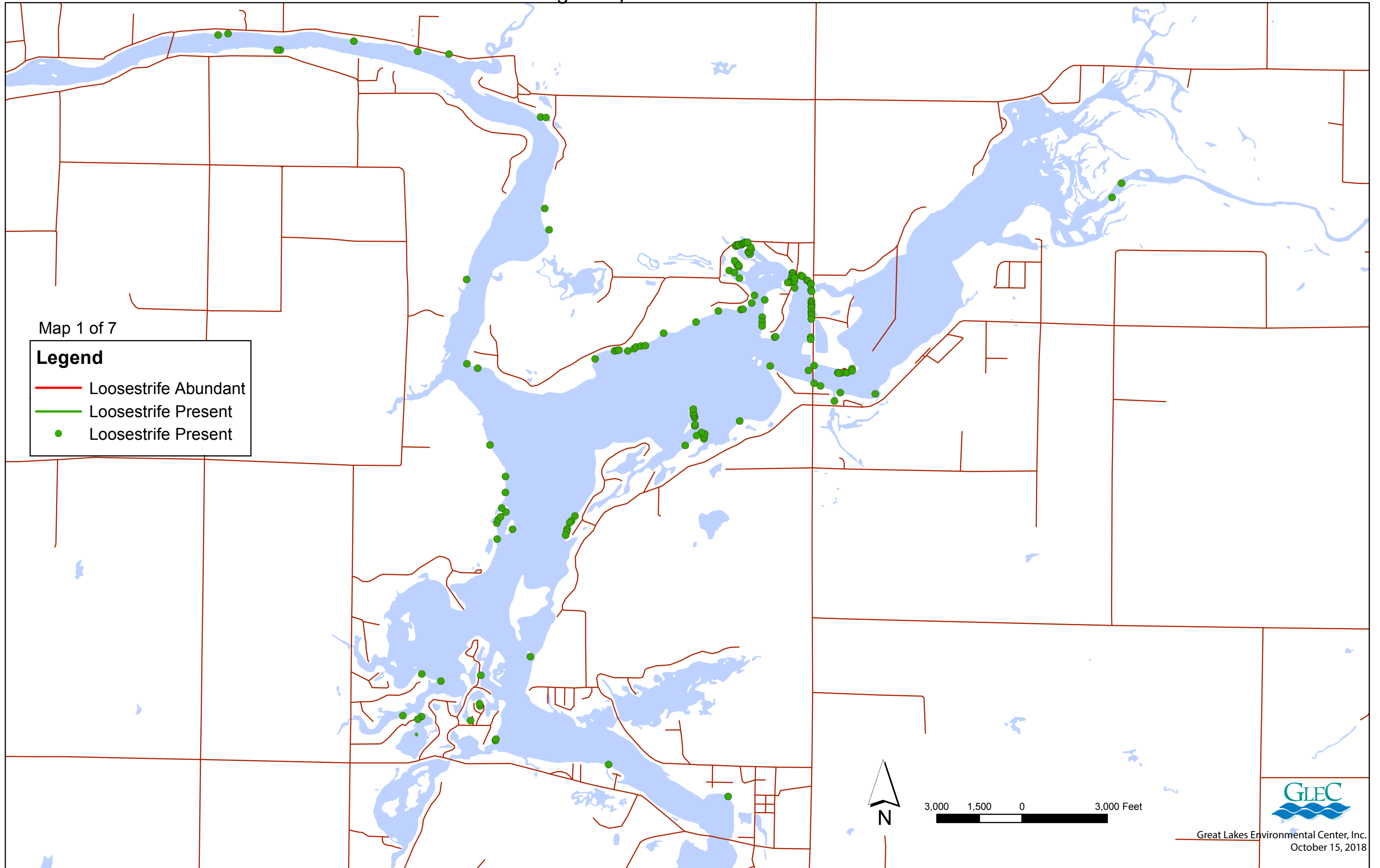
Location #	Degree of Infestation	Single / Multiple	Coverage (ft)	Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
JF1	Present	Multiple	3600 sq ft	JF36	Present	Multiple	10 ft
JF2	Present	Multiple	3 ft	JF37	Present	Single	6 ft
JF3	Present	Single	1 ft	JF38	Present	Single	3 ft
JF4	Present	Multiple	12 ft	JF39	Present	Multiple	11 ft
JF5	Present	Multiple	10 ft	JF40	Present	Multiple	6 ft
JF6	Present	Multiple	10 ft	JF41	Present	Multiple	3 ft
JF7	Present	Single	3 ft	JF42	Present	Multiple	3 ft
JF8	Present	Multiple	20 ft	JF43	Present	Multiple	8 ft
JF9	Present	Multiple	24 ft				
JF10	Present	Multiple	7 ft				
JF11	Present	Single	2 ft				
JF12	Present	Multiple	7 ft				
JF13	Present	Multiple	8 ft				
JF14	Present	Single	3 ft				
JF15	Present	Single	3 ft				
JF16	Present	Single	5 ft				
JF17	Present	Single	3 ft				
JF18	Present	Single	2 ft				
JF19	Present	Single	2 ft				
JF20	Present	Single	4 ft				
JF21	Present	Multiple	7 ft				
JF22	Present	Single	3 ft				
JF23	Present	Multiple	9 ft				
JF24	Present	Multiple	10 ft				
JF25	Present	Single	4 ft				
JF26	Present	Single	2 ft				
JF27	Present	Single	3 ft				
JF28	Present	Multiple	4 ft				
JF29	Present	Multiple	3 ft				
JF30	Present	Single	4 ft				
JF31	Present	Multiple	10 ft				
JF32	Present	Single	5 ft				
JF33	Present	Multiple	6 ft				
JF34	Present	Multiple	7 ft				
JF35	Present	Multiple	6 ft				

Appendix A

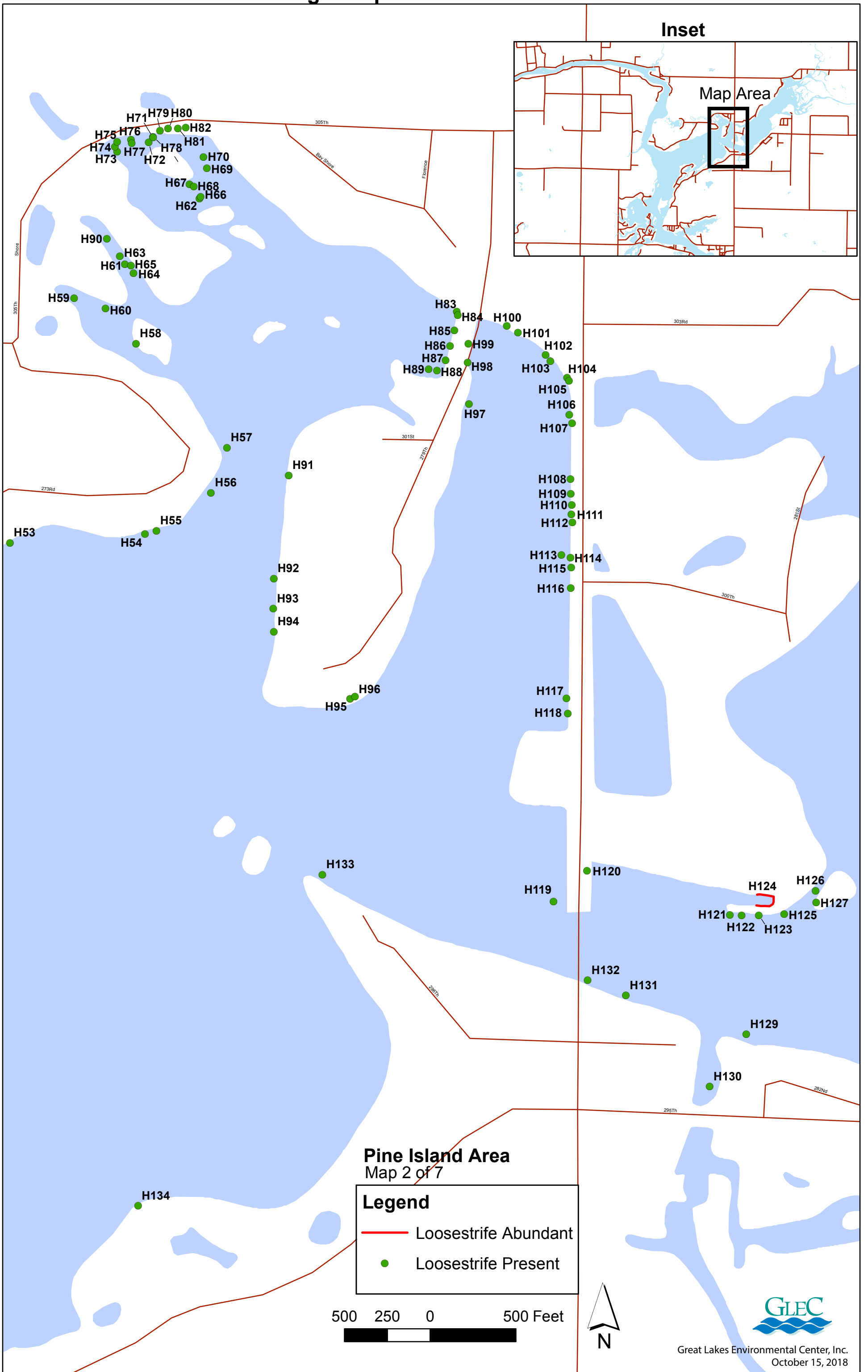
Survey Maps and Catalog of Purple Loosestrife Locations at Surveyed Flowages

2018

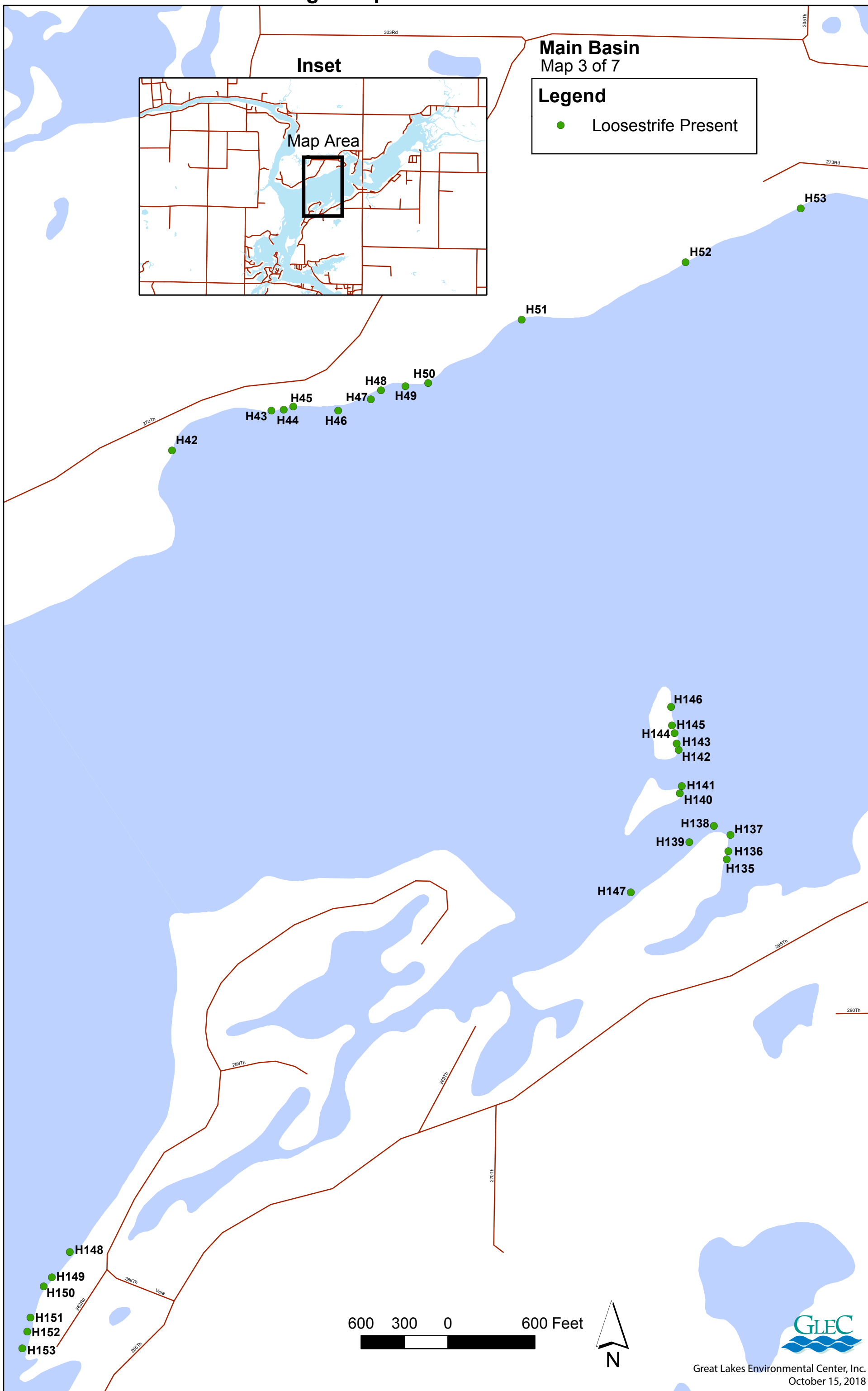
Holcombe Flowage Purple Loosestrife Assessment - 2018



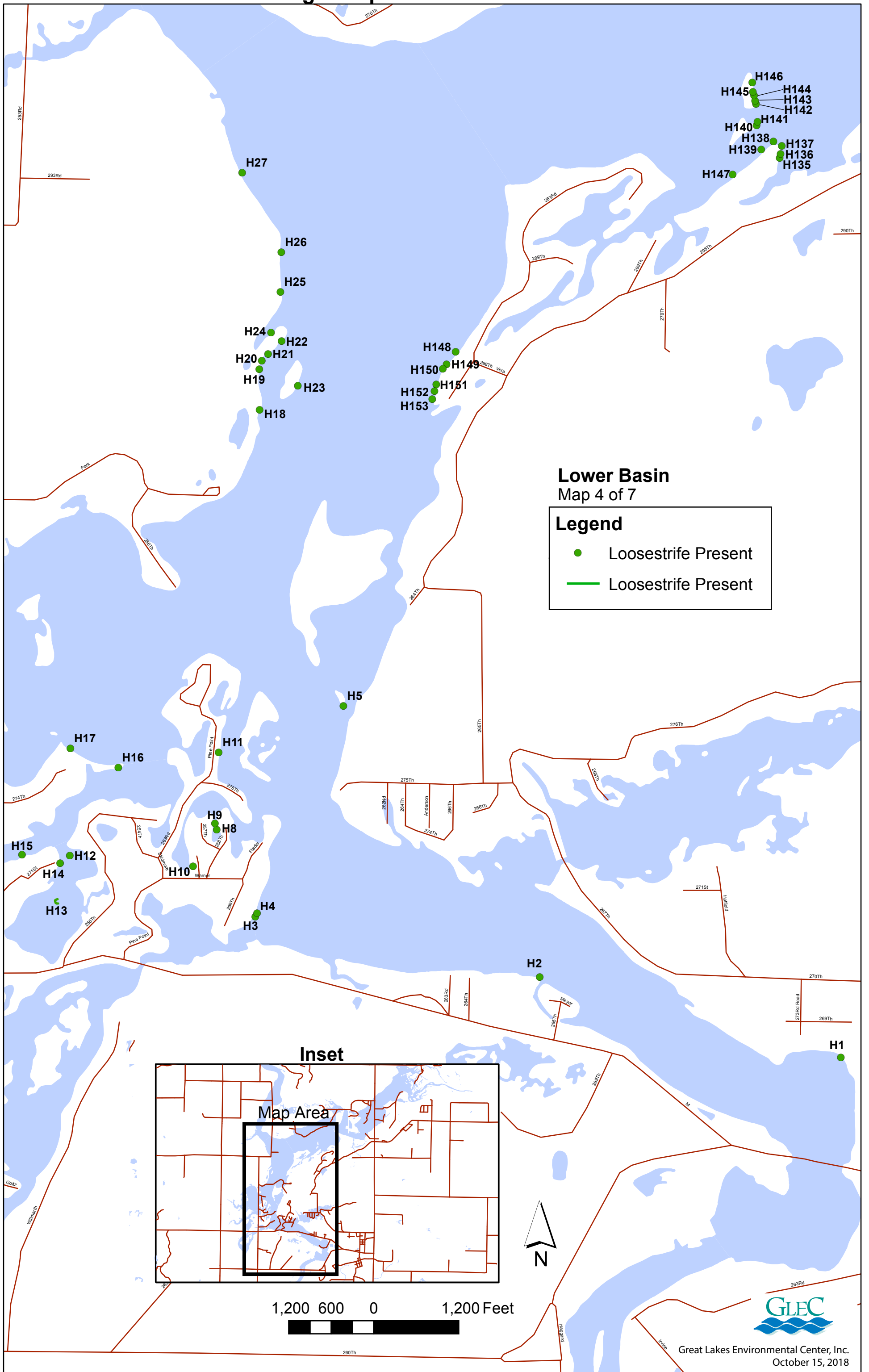
Holcombe Flowage Purple Loosestrife Assessment - 2018



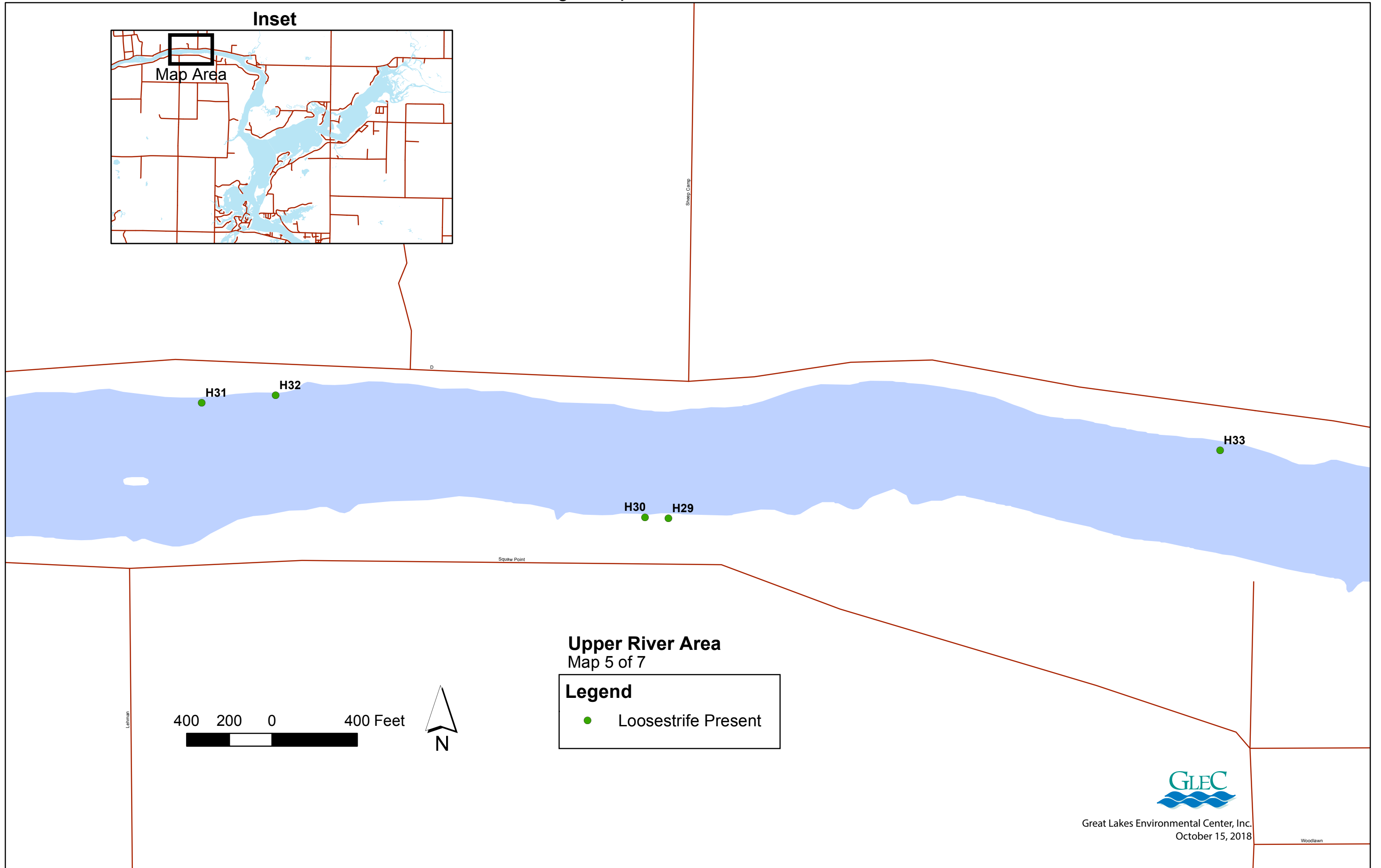
Holcombe Flowage Purple Loosestrife Assessment - 2018



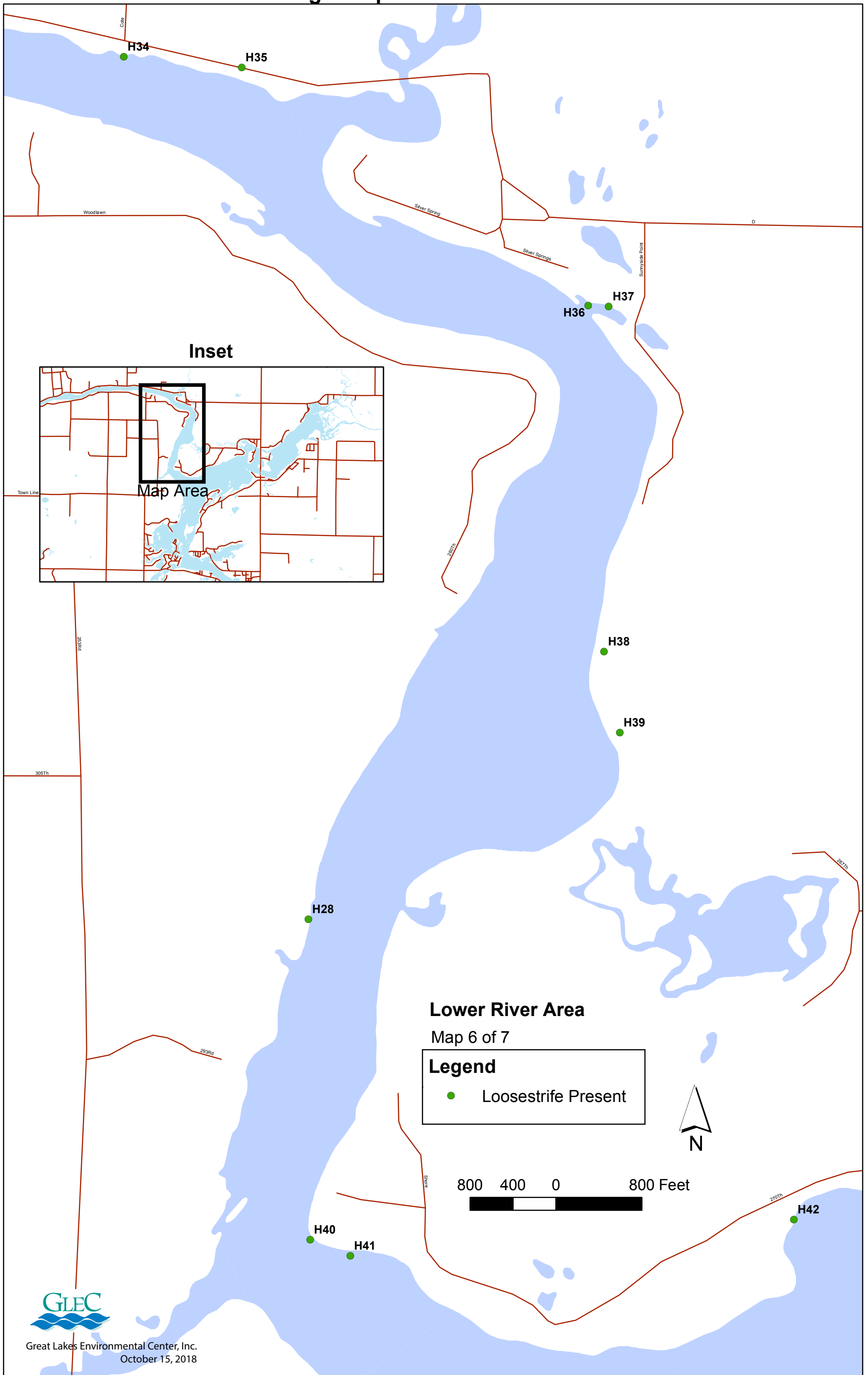
Holcombe Flowage Purple Loosestrife Assessment - 2018



Holcombe Flowage Purple Loosestrife Assessment - 2018



Holcombe Flowage Purple Loosestrife Assessment - 2018



Holcombe Flowage Purple Loosestrife Assessment - 2018

Main Creek/ Jump River Area

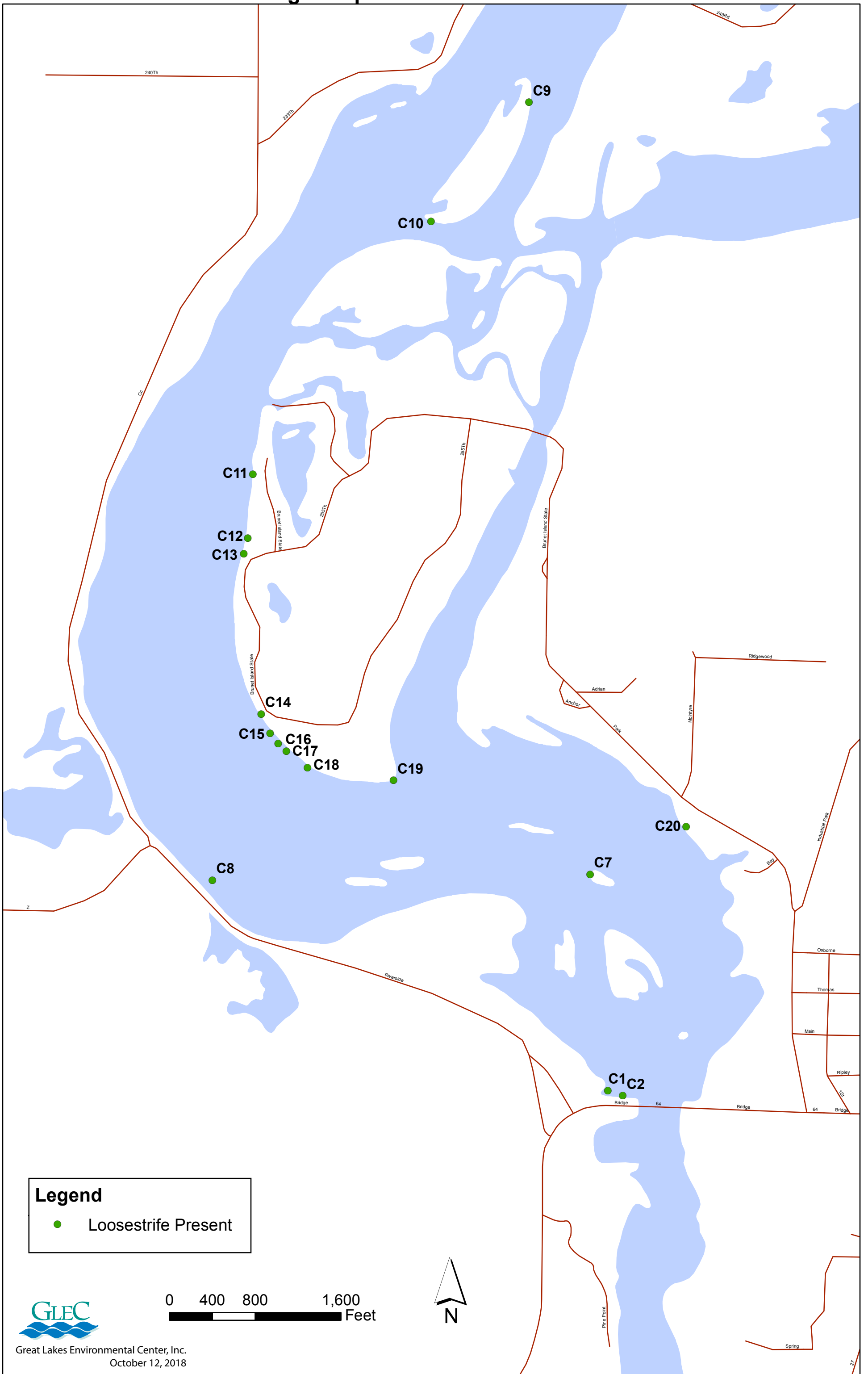
Map 7 of 7

Legend

- Loosestrife Present



Cornell Flowage Purple Loosestrife Assessment - 2018



Legend

● Loosestrife Present

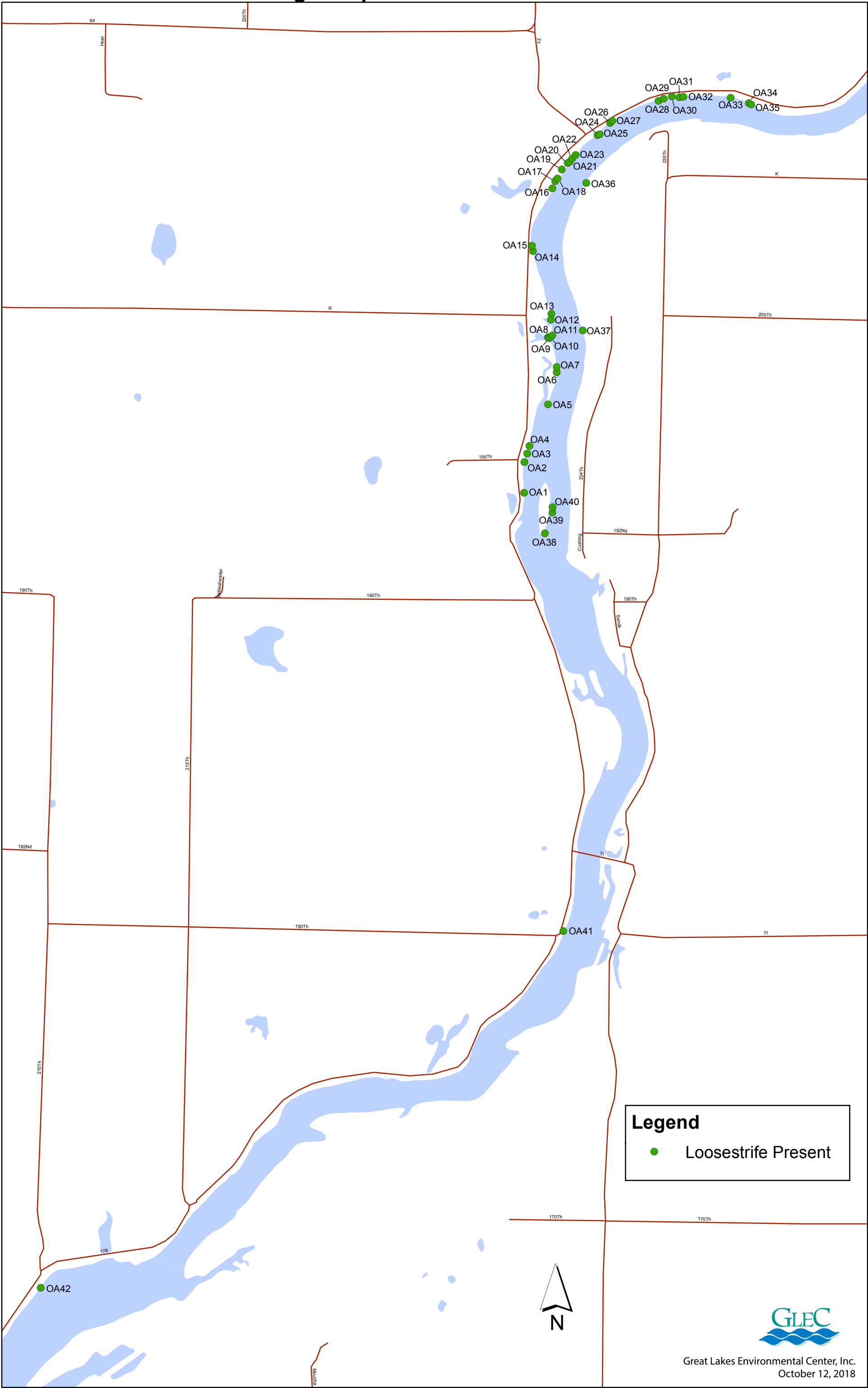


Great Lakes Environmental Center, Inc.
October 12, 2018

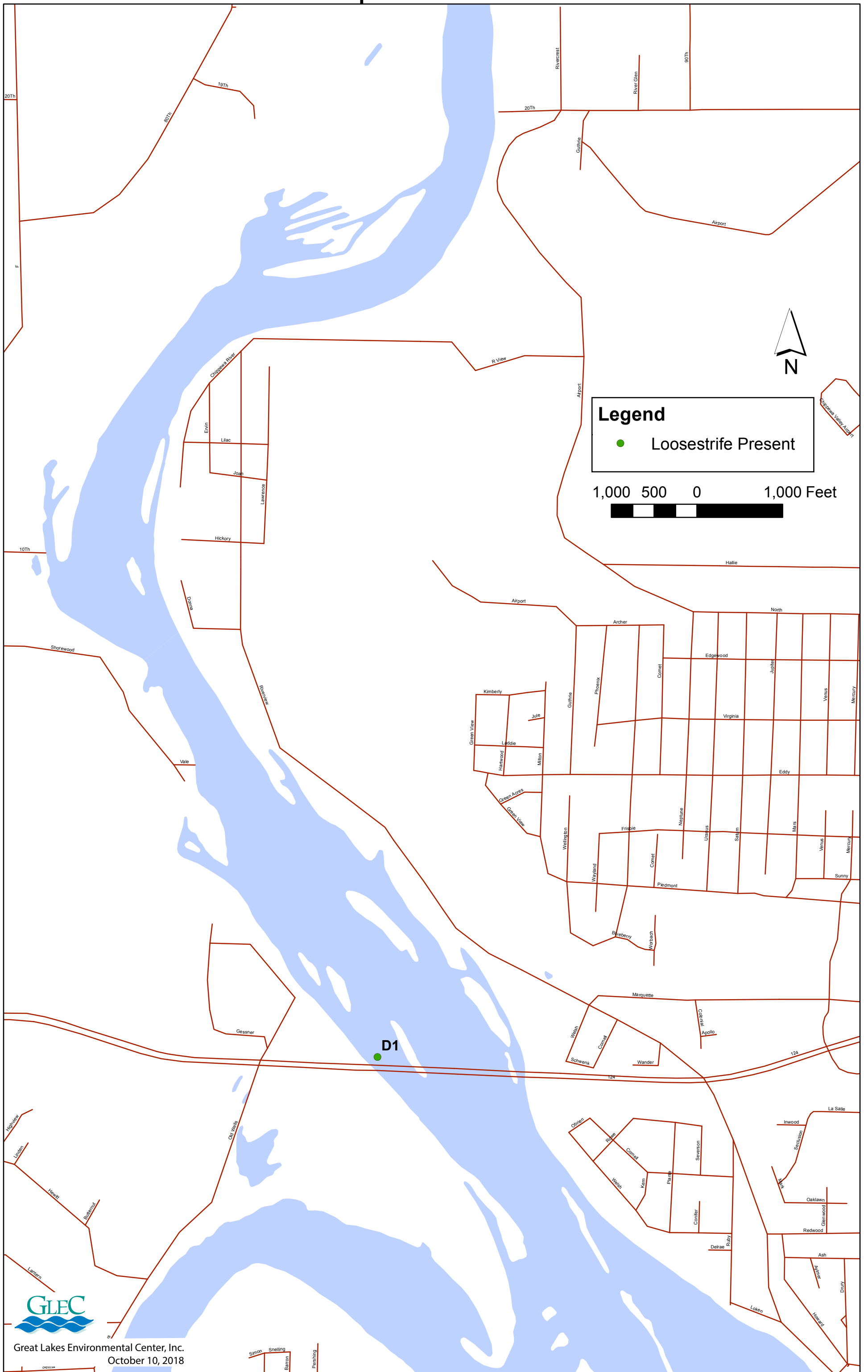
0 400 800 1,600
Feet



Old Abe Flowage Purple Loosestrife Assessment - 2018



Dells Pond Purple Loosestrife Assessment - 2018



Jim Falls Spillway Channel Purple Loosestrife Assessment – 2018 (Map 1 of 4)



Jim Falls Spillway Channel Purple Loosestrife Assessment – 2018 (Map 2 of 4)



Jim Falls Spillway Channel Purple Loosestrife Assessment – 2018 (Map 3 of 4)



Jim Falls Spillway Channel Purple Loosestrife Assessment – 2018 (Map 4 of 4)



**XCEL PURPLE LOOSESTRIFE LOCATIONS
2018
HOLCOMBE FLOWAGE**

Location #	Degree of Infestation	Single / Multiple	Coverage (ft)	Location #	Degree of Infestation	Single / Multiple	Coverage (ft)	Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
H1	Present	Single	2	H52	Present	Single	1	H103	Present	Multiple	3
H2	Present	Multiple	3	H53	Present	Single	1	H104	Present	Multiple	8
H3	Present	Single	1	H54	Present	Single	1	H105	Present	Single	2
H4	Present	Multiple	3	H55	Present	Single	3	H106	Present	Multiple	5
H5	Present	Multiple	7	H56	Present	Single	3	H107	Present	Single	2
H6	Present	Multiple	22	H57	Present	Single	2	H108	Present	Multiple	7
H7	Present	Single	1	H58	Present	Multiple	8	H109	Present	Multiple	3
H8	Present	Multiple	4	H59	Present	Multiple	8	H110	Present	Single	3
H9	Present	Single	1	H60	Present	Single	2	H111	Present	Multiple	10
H10	Present	Single	3	H61	Present	Multiple	5	H112	Present	Multiple	6
H11	Present	Single	3	H62	Present	Multiple	7	H113	Present	Multiple	8
H12	Present	Multiple	10	H63	Present	Multiple	18	H114	Present	Multiple	10
H13	Present	Multiple	28	H64	Present	Multiple	15	H115	Present	Multiple	5
H14	Present	Single	3	H65	Present	Single	4	H116	Present	Single	1
H15	Present	Single	3	H66	Present	Multiple	9	H117	Present	Single	6
H16	Present	Multiple	14	H67	Present	Multiple	12	H118	Present	Multiple	16
H17	Present	Single	4	H68	Present	Multiple	8	H119	Present	Single	2
H18	Present	Multiple	6	H69	Present	Multiple	8	H120	Present	Single	5
H19	Present	Single	2	H70	Present	Multiple	7	H121	Present	Single	4
H20	Present	Single	3	H71	Present	Single	3	H122	Present	Multiple	4
H21	Present	Single	4	H72	Present	Multiple	5	H123	Present	Single	1
H22	Present	Multiple	12	H73	Present	Multiple	9	H124	Abundant	Multiple	40
H23	Present	Single	2	H74	Present	Multiple	14	H125	Present	Multiple	2
H24	Present	Single	1	H75	Present	Multiple	8	H126	Present	Single	4
H25	Present	Single	2	H76	Present	Single	5	H127	Present	Single	2
H26	Present	Multiple	6	H77	Present	Single	2	H128	Present	Single	3
H27	Present	Single	3	H78	Present	Multiple	12	H129	Present	Single	2
H28	Present	Single	2	H79	Present	Single	2	H130	Present	Multiple	5
H29	Present	Single	2	H80	Present	Single	6	H131	Present	Single	1
H30	Present	Multiple	12	H81	Present	Multiple	5	H132	Present	Multiple	3
H31	Present	Multiple	6	H82	Present	Multiple	6	H133	Present	Single	1
H32	Present	Single	3	H83	Present	Single	2	H134	Present	Single	1
H33	Present	Single	1	H84	Present	Single	2	H135	Present	Single	5
H34	Present	Single	1	H85	Present	Single	1	H136	Present	Single	2
H35	Present	Multiple	6	H86	Present	Single	3	H137	Present	Single	1
H36	Present	Single	1	H87	Present	Single	2	H138	Present	Multiple	2
H37	Present	Single	2	H88	Present	Multiple	10	H139	Present	Single	3
H38	Present	Single	3	H89	Present	Multiple	6	H140	Present	Single	2
H39	Present	Single	3	H90	Present	Multiple	6	H141	Present	Multiple	4
H40	Present	Single	1	H91	Present	Multiple	4	H142	Present	Single	1
H41	Present	Single	4	H92	Present	Single	3	H143	Present	Single	2
H42	Present	Single	1	H93	Present	Single	2	H144	Present	Multiple	4
H43	Present	Multiple	5	H94	Present	Single	1	H145	Present	Multiple	8
H44	Present	Multiple	4	H95	Present	Single	2	H146	Present	Multiple	6
H45	Present	Single	1	H96	Present	Single	3	H147	Present	Single	2
H46	Present	Multiple	5	H97	Present	Multiple	5	H148	Present	Multiple	6
H47	Present	Single	1	H98	Present	Multiple	12	H149	Present	Multiple	5
H48	Present	Multiple	3	H99	Present	Single	2	H150	Present	Single	2
H49	Present	Single	2	H100	Present	Multiple	4	H151	Present	Single	2
H50	Present	Single	1	H101	Present	Multiple	5	H152	Present	Multiple	8
H51	Present	Single	2	H102	Present	Multiple	3	H153	Present	Single	2

**XCEL PURPLE LOOSESTRIFE LOCATIONS
2018
CORNELL FLOWAGE**

Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
C1	Present	Single	6
C2	Present	Single	2
C3	Present	Multiple	16
C4	Present	Single	3
C5	Present	Single	2
C6	Present	Multiple	4
C7	Present	Single	1
C8	Present	Single	3
C9	Present	Single	2
C10	Present	Single	1
C11	Present	Single	2
C12	Present	Single	1
C13	Present	Multiple	5
C14	Present	Single	3
C15	Present	Single	2
C16	Present	Multiple	7
C17	Present	Single	1
C18	Present	Single	1
C19	Present	Single	6
C20	Present	Multiple	4

**XCEL PURPLE LOOSESTRIFE LOCATIONS
2018
OLD ABE FLOWAGE**

Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
OA1	Present	Single	2
OA2	Present	Single	2
OA3	Present	Single	3
OA4	Present	Multiple	5
OA5	Present	Single	2
OA6	Present	Single	3
OA7	Present	Single	2
OA8	Present	Multiple	6
OA9	Present	Single	2
OA10	Present	Multiple	4
OA11	Present	Multiple	8
OA12	Present	Single	4
OA13	Present	Multiple	4
OA14	Present	Single	3
OA15	Present	Single	1
OA16	Present	Multiple	7
OA17	Present	Multiple	12
OA18	Present	Multiple	10
OA19	Present	Multiple	8
OA20	Present	Single	2
OA21	Present	Multiple	3
OA22	Present	Single	1
OA23	Present	Multiple	5
OA24	Present	Single	1
OA25	Present	Multiple	5
OA26	Present	Multiple	15
OA27	Present	Multiple	6
OA28	Present	Single	2
OA29	Present	Multiple	7
OA30	Present	Multiple	10
OA31	Present	Single	1
OA32	Present	Single	1
OA33	Present	Single	2
OA34	Present	Multiple	3
OA35	Present	Single	2
OA36	Present	Single	2
OA37	Present	Single	2
OA38	Present	Single	2
OA39	Present	Single	3
OA40	Present	Multiple	7
OA41	Present	Single	3
OA42	Present	Single	3

**XCEL PURPLE LOOSESTRIFE LOCATIONS
2018
LAKE WISSOTA**

Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
W1	Present	Single	2
W2	Present	Single	2
W3	Present	Single	1
W4	Present	Multiple	6
W5	Present	Multiple	5

**XCEL PURPLE LOOSESTRIFE LOCATIONS
2018
DELLS POND**

Location #	Degree of Infestation	Single / Multiple	Coverage (ft)
D1	Present	Single	2