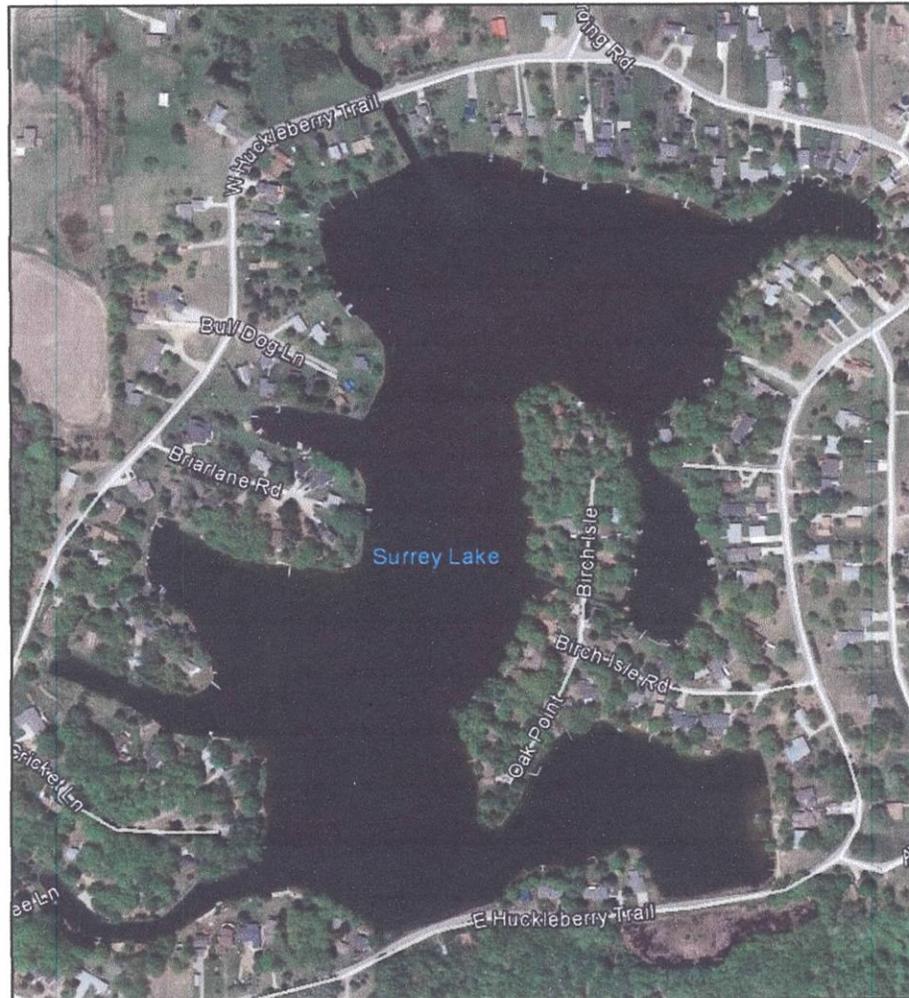




A new perspective on Lake and Pond management

Surrey Lake, Clare Co. 2017 Year End Report



Surrey Township, Clare Co.
T17N, R5W, Sec. 21-22
45 Surface Acres

2014 N. Saginaw Rd. Suite 160
Midland, MI 48640

Main Phone: 989-967-3600
Web: www.helpmylake.com

2017 Surrey Lake Year-End Report:

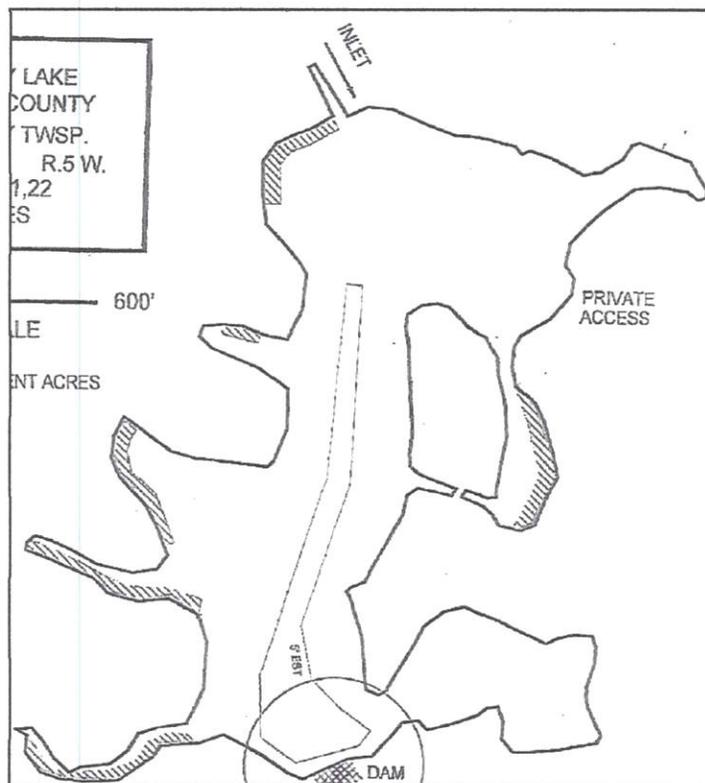
Background information:

Lake Size - 45 S/A

Max Depth – TBD

Mean Depth – TBD

Primary Uses: Surrey Lake is classified as an all sports lake, recreational boating and fishing are common. The lake is highly developed with single family residences.

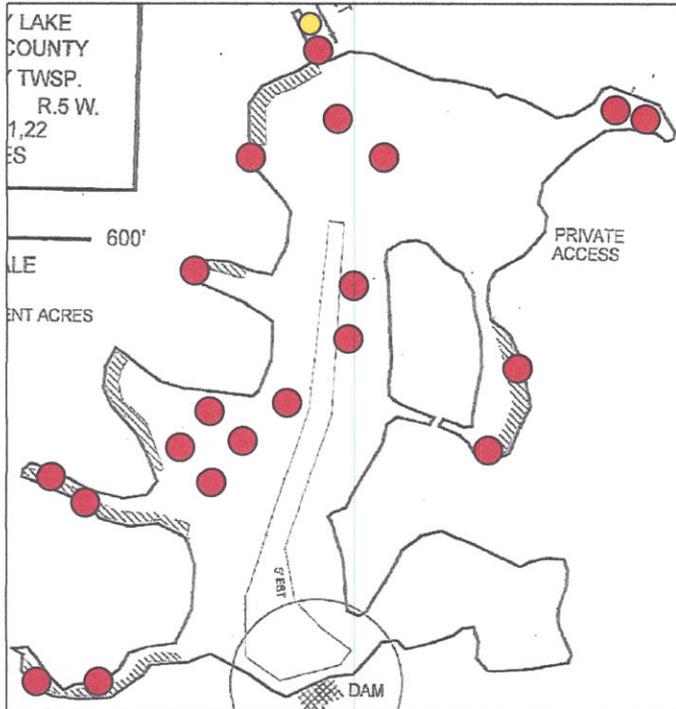


Bathymetric map of Surrey Lake

Lake Management: In the past, various chemical methods have been used to control Curly-Leaf Pondweed and Eurasian Milfoil, invasive species found in many lakes throughout the United States. The current focus of management is to maintain the minimum populations of Curly-Leaf Pondweed while promoting native species to create bio-diversity. We also continue to monitor the water quality of the lake.

2017 Surrey Lake Year-End Report:

2017 Invasive species Location map:

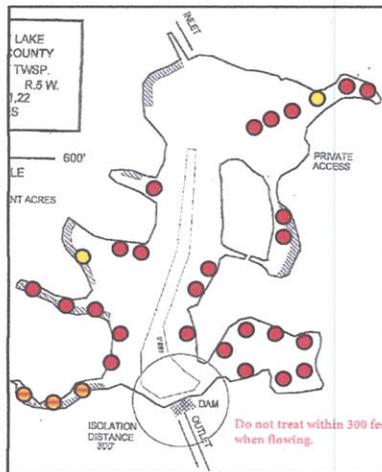


Invasive Species Locations:

- Starry Stonewort
- Eurasian Milfoil
- Curly-Leaf Pondweed
- Flowering Rush
- Phragmites

Details of invasive species on pages 5-6

Historic Invasive species Location maps:



2014

Invasive Species Locations:

- Starry Stonewort
- Eurasian Milfoil
- Curly-Leaf Pondweed
- Flowering Rush
- Phragmites

2017 Surrey Lake Year-End Report:

Basic Recommendations for 2018:

Surrey Lake currently contains known invasive species that are currently under management. With a combined effort between the lake manager and various homeowners, we have been able to identify and contain these problem species. Going forward the lake residents should consider the following:

- Continued monitoring and active management of invasive species.
- Education of homeowners / visitors to identify invasive species and how to prevent further infestation.
- Recommendations to lake owners on proper fertilizer usage / other nutrient abatement strategies.
- Monitoring of water quality issues.

Please find in the following pages some identification information of invasive plants. We also have information at our website www.helpmylake.com

If you have any questions or would like to inquire about other services we provide please contact us anytime at 989-967-3600.

Michigan Lakefront Solutions is a Michigan owned business that specializes in aquatic weed and algae control in lakes, ponds, canals and marinas in central and northern Michigan.

We have 40 years of combined experience in the Lake and Pond Management industry. With backgrounds in both large and small operations, we can combine the best of both worlds. We aim to deliver a diverse array of services, yet maintaining a focus on the one on one connection with our customers and the waterbody they value. As part of our dedication to maintain healthy aquatic environments we offer the following services:

- Water testing to ensure a proper balance of nutrients
- Aeration systems to maintain oxygen levels and improve fish health
- Fountains for an aesthetically pleasing addition to any pond
- Lake management plans to give a detailed view of your lake
- Bactria / enzymes for excess muck and nutrient reduction

Michigan Lakefront Solutions is a member and active in the following organizations:

- Midwest Aquatic Plant Managers Association
- Michigan Lakes and Streams Association
- Aquatic Plant Management Society
- Aquatic Eco Restoration Foundation



2014 N. Saginaw Rd. Ste. 160
Midland, MI 48640

Main Phone: 989-967-3600
Web: www.helpmylake.com

Invasive Species Reference

Eurasian Watermilfoil is an exotic, aggressive growing plant in Michigan lakes and ponds. Its origin has been traced to the Hudson Bay area during the 1940's.

Because it is not native to Michigan waters, there are no natural controls to prevent growth. Milfoil can reproduce by seed or by fragmentation. A small piece or fragment of the plant can form roots and develop into a new plant. In fact, a single wisp can multiply into dense mats that can restrict boating, fishing and swimming.



Eurasian Watermilfoil



Curly Leaf Pondweed

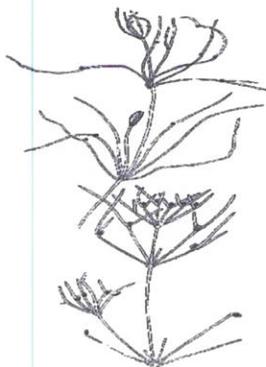
Curly-leaf pondweed was introduced into North America sometime in the late 1800's, and has now spread throughout many parts of the U.S. and Canada. This species usually emerges early each spring, flowers and sets seed in the late spring and early summer, then collapses sometime in July. In some cases re-growth communities can be found through August.

These plants are capable of surviving under the ice during the winter. Curly leaf can be a severe nuisance during the early part of the peak recreational use season. Early control of this species is recommended to reduce oxygen stress within the water body.





An invasive form of algae. It is a submersed bottom growing plant with long uneven branches that look angular at each joint. The branches feel smooth and look like green gelatin. May have one star-shaped, cream colored bulb at the base of each cluster of branches. Similar in appearance to Chara but much more aggressive in its growth pattern.



Starry Stonewort

Flowering rush is a rhizomatous, perennial monocot. It has narrow, linear leaves that arise from a stout rhizome. The leaves may be emergent, floating, or submersed. The emergent leaves are fleshy and triangular. The submersed and floating leaves are long and ribbon-like resembling those of wild celery (Eel Grass). The flower stalk rises above the leaves with a terminal cluster of many flowers. The flowers have 3 petals and 3 sepals. The flowers are most often pink but can be white.

Flowering rush most frequently grows as an emergent in shallow water along the shorelines of lakes, ponds, rivers and shallow marshes. The submersed growth form is found in deeper waters. Flowering rush will grow in a variety of sediments and water depths. Flowering occurs in late June to mid August and fruit is set by late summer.



Flowering Rush



Phragmites (Common reed) is a tall, coarse perennial with stout rhizomes. The stems are stout up to 4 m tall and 5-15 mm thick. The leaves are flat, stiff, 1-6 cm broad and to 6 dm long, serrate, tapering to long tips.

Plants grow in marshes, shores, often in tidal waters, along streams, lakes and estuaries. The invasive *Phragmites* is more likely to be found in disturbed sites such as roadsides, construction areas, agricultural fields, or along developed shorelines. Colonies of the introduced species tend to be denser than those of the native subspecies. Plants can form extensive colonies from rhizomes. Spread is by wind or waterborne seeds or vegetatively through rhizomes or rhizome fragments.

Phragmites

