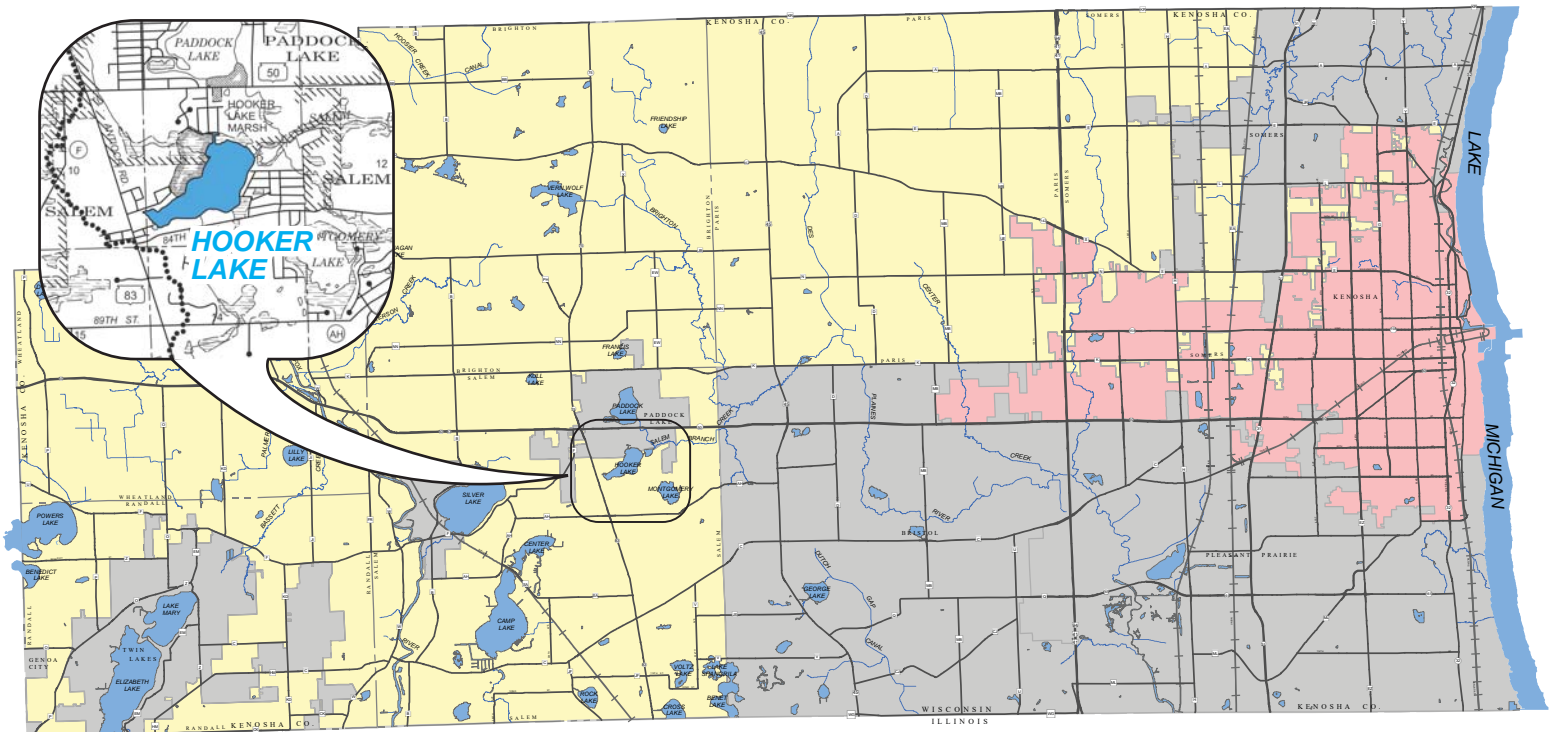


HOOKER LAKE USE REPORT UPDATE LR-5

Prepared by the
Southeastern Wisconsin Regional Planning Commission
for
Kenosha County, Wisconsin
October 2017



This Lake Use Report Update is a product of the Lake and Stream Resources Classification Project for Kenosha County Wisconsin: 2017. This report is available online at co.kenosha.wi.us.

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BACKGROUND

Kenosha County's lakes are vital natural resource assets adding significant value to the aesthetic and ecological value of the County and Region. The Lakes are enjoyed by large numbers of lakeshore residents and local citizens as well as those seeking water-based recreation living in nearby urban areas such as Milwaukee, Racine, Kenosha, and Chicago. Kenosha County has 34 named Lakes ranging in size from about two to about 640 acres.¹ Of the 20 that are considered "major lakes" (i.e., lakes with a surface area of 50 acres or more), 12 lie in unincorporated or recently incorporated portions of the County. Between 1968 and 1970, the Wisconsin Department of Natural Resources (WDNR) produced a series of individual Lake Use Reports for each of the 12 named major lakes within Kenosha County. Even though Hooker Lake is one of the 12 named major lakes, it was not included in the 1968 to 1970 reports. However, this report is being included as an update to the earlier reports to complete the set.

Hooker Lake was included in a 1961 report of the surface waters of Kenosha County developed by the (then) Wisconsin Conservation Department (later to become the WDNR).² In addition to the 1961 report, Hooker Lake was the subject of a lake protection plan developed in 2016 by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) for the Hooker Lake Management District (HLMD).^{3,4}

The HLMD maintains a website (hookerlake.com/). The website is used to post a wide variety of information Lake users may find interesting. In addition to the above report, Hooker Lake was also part of a 2017 lake and stream classification project developed for Kenosha County by Southeastern Regional Planning Commission (SEWRPC).⁵

INTRODUCTION

Hooker Lake is located in the Village of Salem Lakes, Kenosha County, Wisconsin; the north-most portion of the Lake lies in the Village of Paddock Lake in Kenosha County, Wisconsin. Despite its relatively modest size, the Lake's fishery, natural beauty, and location give it significant local economic and recreational value. In addition, its healthy and relatively diverse aquatic plant community and large contiguous marshlands provide noteworthy fish and wildlife habitat. The Lake provides significant value to local ecology.

PHYSICAL DESCRIPTION

Lake Characteristics

Based upon recent orthophotography, Hooker Lake has a surface area of 113 acres.⁶ As shown on Map 1, Hooker Lake has a loosely bent-oval shaped basin with a northeast-southwest orientation and a maximum depth of 28 feet. According to 1960 depth soundings published by the WDNR, Hooker Lake contains approximately 1,365 acre-feet of water. Seventeen percent of Hooker Lake is three feet deep

¹ Wisconsin Department of Natural Resources Publication No. PUB-FH-800 2005, Wisconsin Lakes, 2005.

² Wisconsin Conservation Department, Surface Water Resources of Kenosha County, Poff, Ronald J., and Threinen, C. W., 1961.

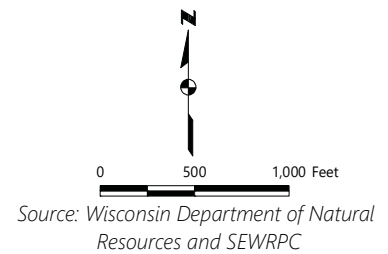
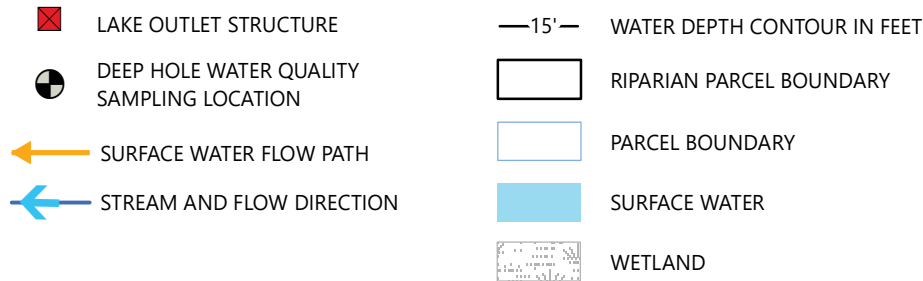
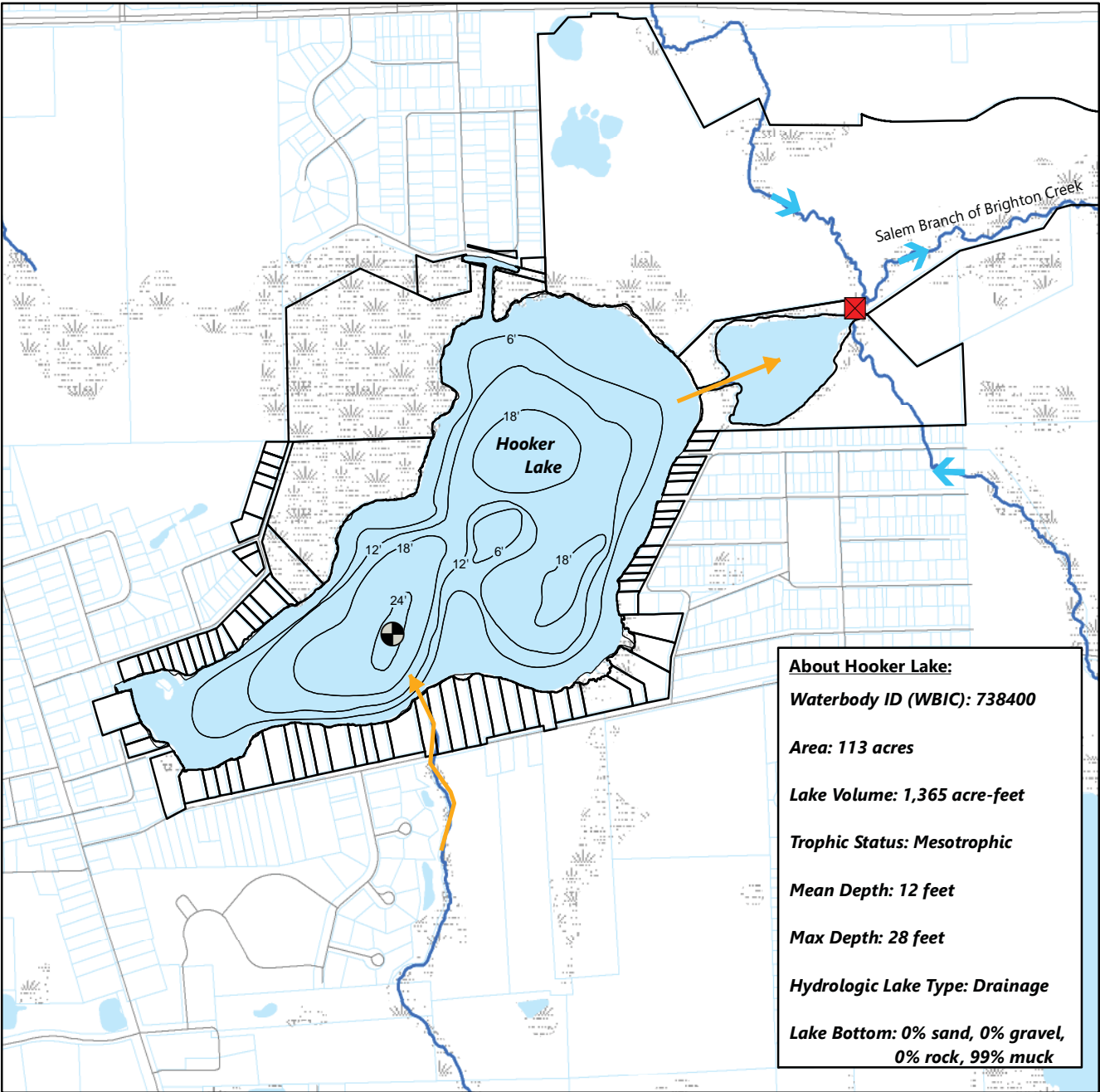
³ SEWRPC Community Assistance Planning Report No. 328, A Lake Protection Plan for Hooker Lake, Kenosha County, Wisconsin, 2016.

⁴ The HLMD is a Chapter 33, Wisconsin Statutes public inland lake protection and rehabilitation district that oversees management of Hooker Lake; the District's website is: hookerlake.com/ The WDNR also lists a volunteer lake organization, the "Salem Oaks Community Association", at Hooker Lake.

⁵ SEWRPC Memorandum Report No. 222, Lake and Stream Resources Classification Project for Kenosha County, Wisconsin: 2017.

⁶ Reported lake areas commonly fluctuate over time and between documents. The apparent size of a lake depends upon the lake's water level at time of measurement, the type and condition of shoreline vegetation, and the accuracy of available tools and techniques. For example, nearly all lakes are larger when water levels are higher. Conversely, lakes can appear smaller on aerial photographs when shorelines are covered by dense tree canopy. See Table 1 for more detail.

Map 1
Hooker Lake



or less, yielding an average depth of 12 feet.⁷ The Lake has normal water surface elevation of approximately 754 feet above National Geodetic Vertical Datum, 1929 adjustment.⁸ According to WDNR records, Hooker Lake's bottom sediments are composed almost entirely of muck. Additional information regarding Hooker Lake's hydrology and morphometry is summarized in Table 1.

Hydrology

Based upon its depth and the topography of surrounding lands, WDNR classifies Hooker Lake as a deep headwater lake. Deep headwater lakes are larger than 10 acres, are likely to thermally stratify during warm weather and have hydrologic characteristics of a drainage lake. Hooker Lake's primary source of water is precipitation and direct drainage from the surrounding land, but it does have several small unnamed, ephemeral tributaries and likely does receive some flow from groundwater. The WDNR uses these parameters to set water quality goals for the Lake.

Water drains from Hooker Lake through a small shallow lake into the Salem Branch of Brighton Creek and eventually into the Des Plaines River. The outflow of Hooker Lake has been controlled by a dam since at least 1929.⁹ At least 3 dams have controlled the Lake's water level over this period. The most upstream dam is located along the shoreline of the eastern-most area of Hooker Lake proper, and is generally referred to as "Hooker Lake Dam." At present, this dam is not known to be used and is largely submerged. Water levels within the Lake are now controlled by the "Bryzek Dam" located approximately 1,100 feet east-northeast of the Hooker Lake Dam, downstream of the shallow lake (Figure 1).

Watershed Characteristics and Land Use

Hooker Lake's 1,267-acre watershed lies primarily to the north and east of the Lake. A lake's watershed is the physical area from which surface-water runoff can drain to a lake. Hooker Lake has a modest-sized watershed for its size, with a watershed to lake area ratio of 11:2. Lakes with ratios above 10:1 tend to develop water-quality problems.¹⁰ Lakes with large watersheds are comparatively more vulnerable to human disturbance.

According to topographic maps, shoreline land slopes are low, with two small sections of moderate slopes on the north side of the Lake, west of the wetland, and along the northeast side of the Lake. Away from the shoreline of the Lake, the lands in the watershed are steepest north of the wetland on the northwest side of the Lake. The remaining lands within the watershed are comprised of low to moderate slopes.

Table 1
Hydrology and Morphometry of Hooker Lake

Parameter	Measurement
Size	
Surface Area of Lake	113 acres
Tributary Area ^a	1,269 acres
Lake Volume	1,365 acre-feet
Residence Time ^b	1.0-1.3 years
Shape	
Length	0.8 mile
Width	0.3 mile
Shoreline Length	2.5 miles
Shoreline Development Factor ^c	1.3
General Lake Orientation	SW-NE
Depth	
Maximum Depth	28 feet
Mean Depth	12.3 feet

^a Total tributary area represents land contributing runoff to lake, and specifically excludes the lake surface but may include localized internally drained basins.

^b Residence time is estimated as the time period required for a volume of water equivalent to the volume of the lake to enter the lake during years of normal precipitation.

^c Shoreline development factor is the ratio of the shoreline length to the circumference of a circular lake of the same area.

Source: U.S. Geological Survey, Wisconsin Department of Natural Resources, and SEWRPC

⁷ dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=738400

⁸ Information regarding the outlet dam is found on the WDNR's dam information database found at dnr.wi.gov/topic/dams/damSearch.html.

⁹ Wisconsin Department of Natural Resources, Detailed Information for Dam Hooker Lake, On-Line Dam Database, April 4, 2016.

¹⁰ Uttormark, Paul D. and Mark L. Hutchins, 1978, Input Output Models as Decision Criteria for Lake Restoration, University of Wisconsin-Madison, Wisconsin Water Resources Center, Technical Report No. 78-03, pg. 61.

Figure 1
Hooker Lake Outlet



Source: SEWRPC

Some land development has occurred around Hooker Lake since 1970 (see Figures 2 and 3). Map 2 and Table 2 show the 2010 land uses in the Hooker Lake watershed. Agricultural lands comprise over 40 percent of watershed land use. Wetlands and woodlands comprise another 11 and 10 percent of watershed land use, respectively. Urban uses account for just over 30 percent of the watershed with medium-density single-family residential areas accounting for the majority of residential land use. Residential land uses, particularly on the north and south sides of the Lake, visibly increased between 1970 and 2015 (See Figures 2 and 3). Projected 2035 land use (Table 2) indicates significant changes within the Hooker Lake watershed. Currently, projections indicate that almost all agricultural lands within the watershed will be converted to residential areas, resulting in a 60 percent decrease in rural lands and a 130 percent increase in urban lands.

WATER QUALITY

The WDNR re-evaluated Hooker Lake's water quality as part of the recent impairment listing cycle and found that the Lake's water quality clearly meets State thresholds for recreation as well as fish and aquatic life uses.¹¹

Historical water quality gives insight into changes that may be occurring within the Lake and its watershed. By comparing data and evaluating trends, causes for change may be identified and management actions can be taken to help protect the Lake. Historically, both the WDNR and U.S. Geological Survey (USGS) have collected water quality data for Hooker Lake. Currently, Hooker Lake residents participate in the University of Wisconsin - Extension (UWEX) Citizen Lake Monitoring Network (CLMN) under which citizen volunteers

¹¹ Wisconsin Department of Natural Resources, Hooker Lake, Kenosha County website, "conditions" dnr.wi.gov/water/waterDetail.aspx?key=10425.

Figure 2
1970 Aerial Photograph of Hooker Lake



Date of Photography: 1970

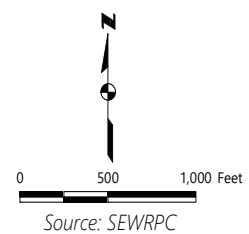
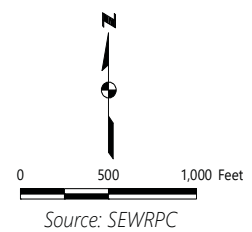


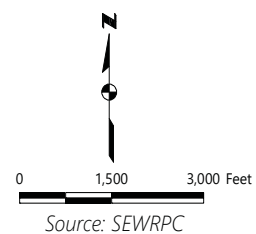
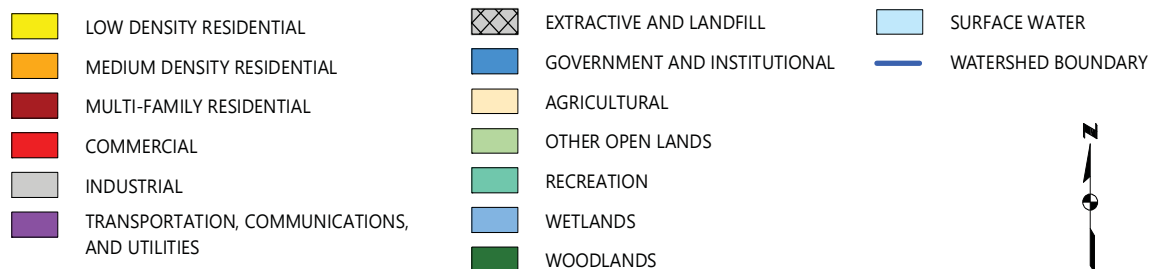
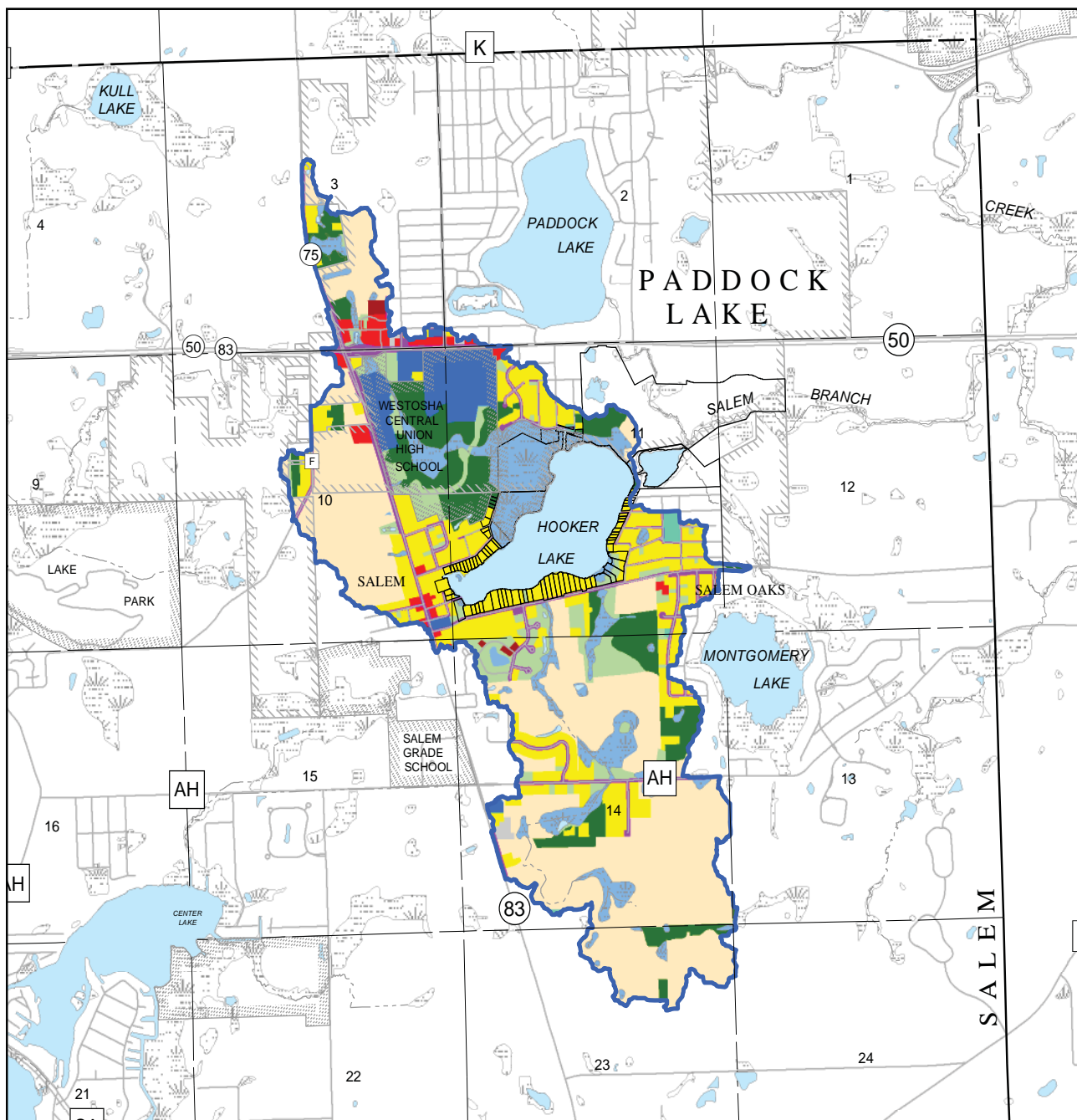
Figure 3
2015 Orthophotograph of Hooker Lake



Date of Photography: 2015



Map 2 2010 Land Use Within the Hooker Lake Watershed



Note: The Montgomery Lake subwatershed drains to the Back Bay/Outlet area downstream of Hooker Lake, so this subwatershed area was not incorporated as part of this project.

Table 2
Existing and Planned Land Use Within the Hooker Lake Watershed: 2010 and 2035

Land Use Categories ^a	2010		2035		Change: 2010-2035	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent
Urban						
Residential						
Single-Family, Suburban Density	--	--	--	--	--	--
Single-Family, Low Density	45	3.5	292	22.6	247	548.9
Single-Family, Medium Density	182	14.1	265	20.0	83	45.6
Single-Family, High Density	--	--	--	--	--	--
Multi-Family	4	0.3	27	2.1	23	575.0
Commercial	22	1.7	118	9.1	96	436.4
Industrial	4	0.3	4	0.3	0	0
Governmental and Institutional	61	4.7	81	6.3	20	32.8
Transportation, Communication, and Utilities	84	6.5	86	6.7	2	2.4
Recreational	5	0.4	60	4.6	55	1100.0
Subtotal	407	31.5	933	72.2	526	129.2
Rural						
Agricultural and Other Open Lands	579	44.8	52	4.0	-527	-91.0
Wetlands	145	11.2	149	11.5	4	2.8
Woodlands	137	10.6	133	10.3	-4	-2.9
Water ^b	25	1.9	26	2.0	1	4.0
Extractive	--	--	--	--	--	--
Landfill	--	--	--	--	--	--
Subtotal	886	68.5	360	27.8	-526	-59.4
Total	1,293	100.0	1,293	100.0	0	--

Note: This land use summary table includes internally drained areas. Internally drained areas do not contribute surface-water runoff to the Lake and are therefore not included in the Lake's watershed area listed in Table 1.

^a Parking included in associated use

^b Excludes Cross Lake

Source: SEWRPC

measure lake water quality parameters such as water clarity, phosphorus concentrations, and dissolved oxygen levels. CLMN is an extremely useful program to provide long-term water quality data. Water quality data is compiled and is available on the WDNR Lakes page.¹²

Water clarity is a commonly used and easily understood surrogate for perceived water quality. Many people equate "clear" water with "clean" water. While this is not always true, methods have been developed to allow lake water clarity to be compared and contrasted. Water clarity is measured with a Secchi disk (Figure 4). "Secchi depth" is the distance below the water surface that a Secchi disk can be seen under carefully prescribed conditions. Secchi depth has been occasionally measured in the Lake and the results over time are summarized graphically in Figure 5. On average, water clarity has been good to very good, with Secchi depth readings increasing significantly since 2010.

Lake trophic state index (TSI) is calculated using physical and chemical indicators of lake nutrient enrichment. Lakes with low numeric scores (i.e., less than 40) generally have clear water of excellent quality and are termed oligotrophic. Lakes with TSI values between 50 and 60 are termed eutrophic and have limited water

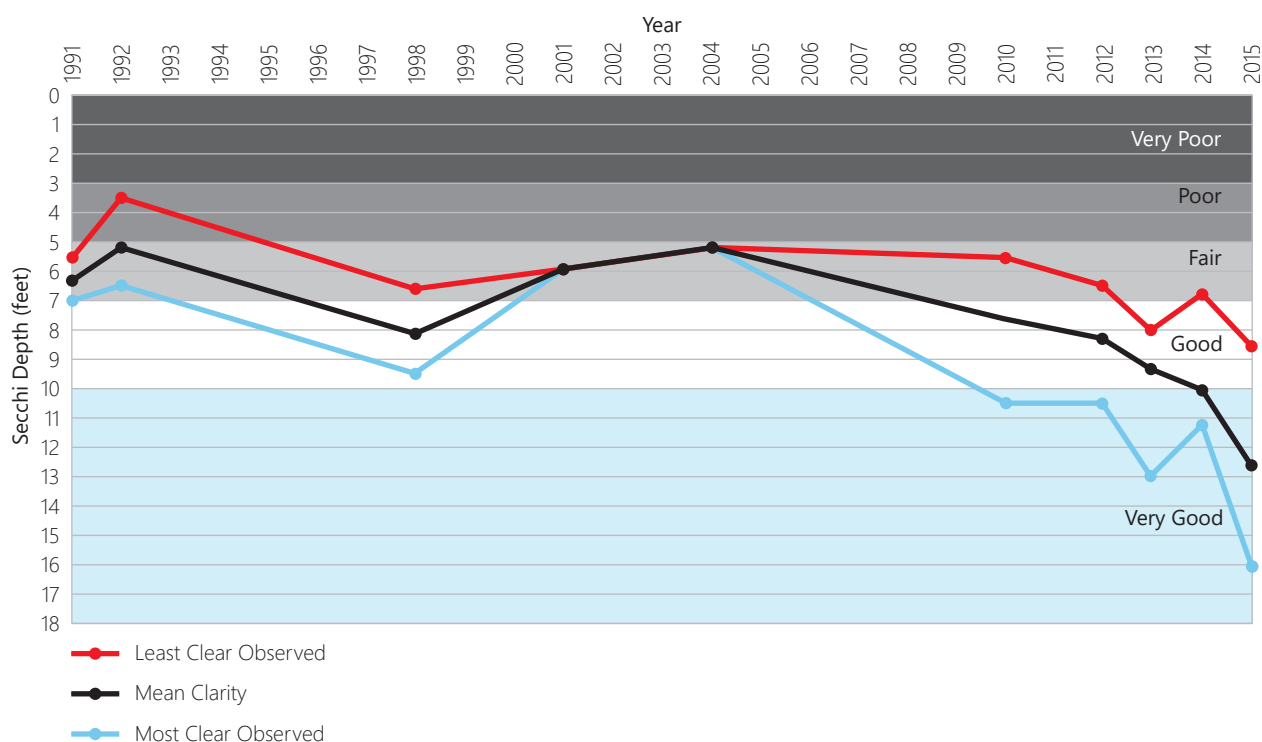
Figure 4
Measuring Water Clarity with a Secchi Disk



Source: www.burnsville.org and SEWRPC

¹² Water quality data and other information about Hooker Lake can be found at the WDNR Lakes page: dnr.wi.gov/lakes/LakePages/LakeDetail.aspx?wbic=738400.

Figure 5
Summer (June through August) Secchi Depth Ranges for Hooker Lake



clarity, fewer algal species, overly-abundant aquatic plant growth, and deep areas that are commonly devoid of oxygen during summer. Mesotrophic lakes (TSI values between 40 and 50) have conditions intermediate between oligotrophic and eutrophic lakes, while hypereutrophic lakes (TSI values above 70) commonly can experience algal blooms, poor water clarity, and, in extreme cases, summer fish kills. Hypereutrophic conditions rarely occur in nature and are generally associated with human activity.

Hooker Lake's TSI values are plotted over time in Figure 6. As can be seen from this graphic, data collected between 1991 and 2018 show an average Trophic State Index of 50, which indicates that the Lake is mesotrophic.¹³ Mesotrophic lakes typically support an abundance of aquatic plant growth, although generally not to nuisance levels, and support productive fisheries. Many Southeastern Wisconsin lakes are classified as mesotrophic.

NATURAL RESOURCES

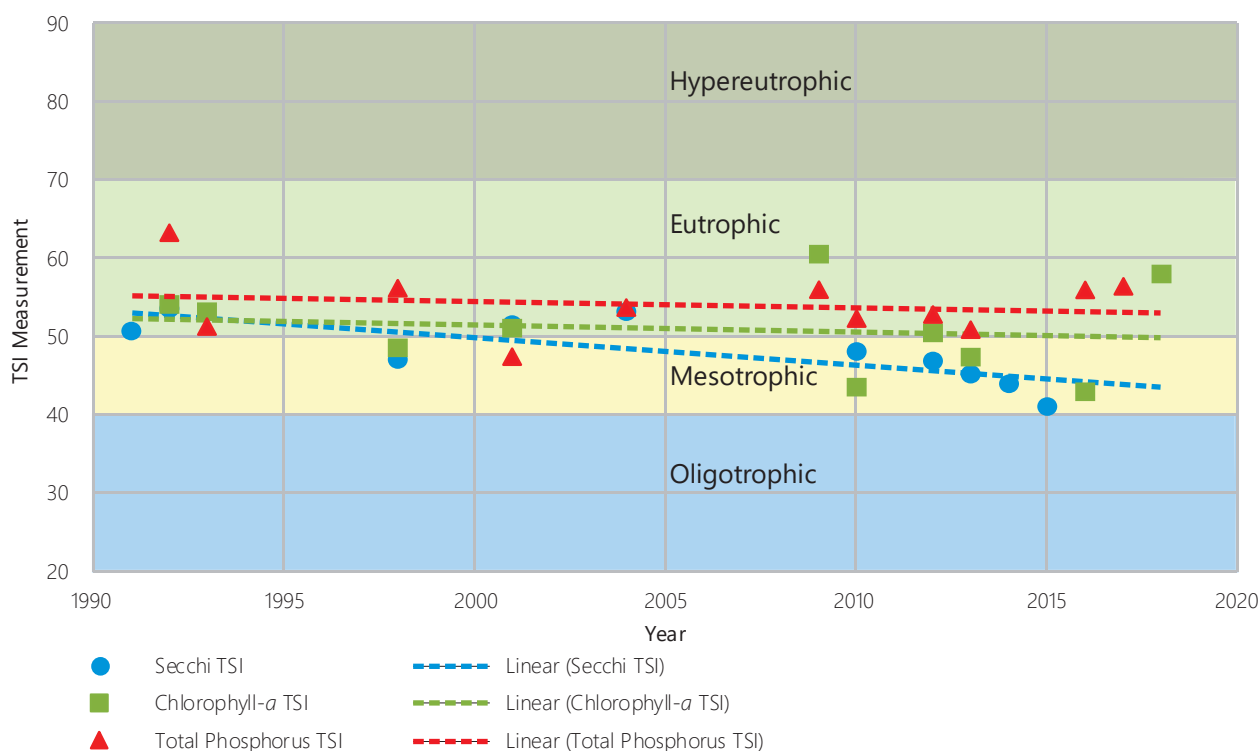
Aquatic Plants

Hooker Lake's aquatic plant community was examined during 1992, 2008, 2014, and 2016. Table 3 lists the frequency of occurrence of plant species noted in the 2008, 2014, and 2016 surveys.

The 1992 survey indicated that Eurasian water milfoil (*Myriophyllum spicatum*; EWM) and curly-leaf pondweed (*Potamogeton crispus*) were already present in Hooker Lake. Overall, fifteen native aquatic plant species were found in 1992. The most abundant plant species found during the 2008 survey was muskgrass

¹³ The Trophic State Index (TSI) is calculated using secchi depth, chlorophyll-a, and phosphorus concentration data. The index assumes that secchi depth, a measure of water clarity, is dependent on levels of algae growth, which, in turn, are dependent on levels of nutrients such as phosphorus. High nutrient levels fuel high algae growth, which reduces water clarity. The Trophic State Index, therefore, gives a measurement of the condition of a lake. Low TSI values of less than 40 indicate water clarity levels of over 12 feet, which indicates lower levels of nutrients and less biological activity. TSI values over 70 represent water clarity values of less than 1.5 feet, indicating higher nutrient concentrations and higher plant and algae growth.

Figure 6
Summer (June through August) Annual Average Trophic State Indices (TSI) for Hooker Lake



Note: June-August data of each year was averaged to produce the resultant values.

Source: Wisconsin Department of Natural Resources and SEWRPC

(*Chara* spp.) followed by coontail (*Ceratophyllum demersum*) and EWM. A total of thirteen submerged native aquatic plant species were observed and documented in 2008. The 2014 survey found eight submerged native species with the highest species richness occurring around the edges of the Lake. The most abundant species found during the 2014 survey was coontail, followed by muskgrass. In 2016, eight submerged native species were found with coontail being the most abundant again. Native species are especially important because they provide a variety of benefits, including food for wildfowl and fish, and shelter for fingerling fish such as trout, bluegill, and bass. All of the plants found were species commonly observed in lakes within the Region.

A diverse array of native aquatic plant species is generally indicative of a healthy aquatic plant community. The substantial decline in the number of native submerged plant species between 2008 and 2014 was a potential cause for concern. Moreover, of the twelve high-value species identified under Chapter NR 107, "Aquatic Plant Management," of the *Wisconsin Administrative Code* as plants that contribute important ecosystem services to lakes, five were found in Hooker Lake in 2008: wild celery (*Vallisneria americana*), Illinois pondweed (*Potamogeton illinoensis*), clasping-leaf pondweed (*Potamogeton richardsonii*), white-stem pondweed (*Potamogeton praelongus*), and sago pondweed (*Stuckenia pectinata*); of these five, only wild celery and sago pondweed were found during the 2014 and 2016 survey.

Aquatic Invasive Species

The terms "nonnative" and "invasive" are often confused and incorrectly assumed to be synonymous. Nonnative (sometimes also referred to as "exotic") is an overarching term describing living organisms introduced to new areas beyond their native range with intentional or unintentional human help. Nonnative species may not necessarily harm ecological function or human use values in their new environments. Invasive species are the subset of nonnative species that damage the ecological health of their new environments and/or are commonly considered nuisances to human use values. In summary, invasive species are non-native but not all non-native species are invasive.

Table 3
Hooker Lake Aquatic Plant Surveys: 2008, 2014, and 2016

Aquatic Plant Species	2008	2014	2016
<i>Ceratophyllum demersum</i> (coontail)	23.1	61.4	83.0
<i>Chara</i> spp. (muskgrass)	46.2	31.5	6.4
<i>Elodea canadensis</i> (waterweed)	6.2	11.8	7.1
<i>Heteranthera dubia</i> (water stargrass)	15.4	11.0	25.5
<i>Myriophyllum verticillatum</i> (whorled water milfoil)	13.9	--	--
<i>Myriophyllum spicatum</i> (Eurasian water milfoil)	21.5	19.7	6.4
<i>Najas flexilis</i> (bushy pondweed)	--	2.4	--
<i>Najas marina</i> (spiny, or brittle, naiad)	7.7	--	5.7
<i>Potamogeton crispus</i> (curly-leaf pondweed)	1.5	--	--
<i>Potamogeton illinoensis</i> (Illinois pondweed)	1.5	--	--
<i>Potamogeton praelongus</i> (white-stem pondweed)	1.5	--	--
<i>Potamogeton pusillus</i> (small pondweed)	--	--	1.4
<i>Potamogeton richardsonii</i> (clasping-leaf pondweed)	4.6	--	--
<i>Potamogeton zosteriformis</i> (flat-stem pondweed)	15.4	--	--
<i>Stuckenia pectinata</i> (Sago pondweed)	4.6	2.4	2.1
<i>Utricularia vulgaris</i> (common bladderwort)	1.5	--	--
<i>Vallisneria americana</i> (water celery)	6.2	3.1	8.5

Note: All above data is for **Frequency of Occurrence**. The frequency of occurrence of a species is derived from a combination of the number of occurrences of a species and the number of sampling sites that had some kind of vegetation present; it provides an indication of the dominance of a species within a community.

Nonnative species above are listed in red print; all other species are native.

NR 107 Wisconsin Administrative Code high-value species are printed in green print.

Source: Wisconsin Department of Natural Resources, Aron and Associates, Inc., and SEWRPC

Eurasian Water Milfoil (*Myriophyllum spicatum*) and Eurasian/Northern Water Milfoil Hybrids

EWM, one of eight milfoil species found in Wisconsin, is the only milfoil species known to be exotic/nonnative (see Figure 7). This plant can grow profusely in nutrient-rich lakes impeding boating and recreational use. Because of this management concern, EWM is actively managed by mechanical and chemical means in many Southeastern Wisconsin lakes. In recent years, EWM/native northern milfoil hybrids have been observed in some Wisconsin lakes. These hybrids pose a difficult management problem: not only do hybrids grow quickly like EWM, but hybrids appear to be more tolerant to aquatic herbicides such as 2, 4-D and Endothall that are commonly used to manage EWM.¹⁴ Both EWM and EWM/native milfoil hybrids have been identified in Hooker Lake.

Curly-leaf Pondweed (*Potamogeton crispus*)

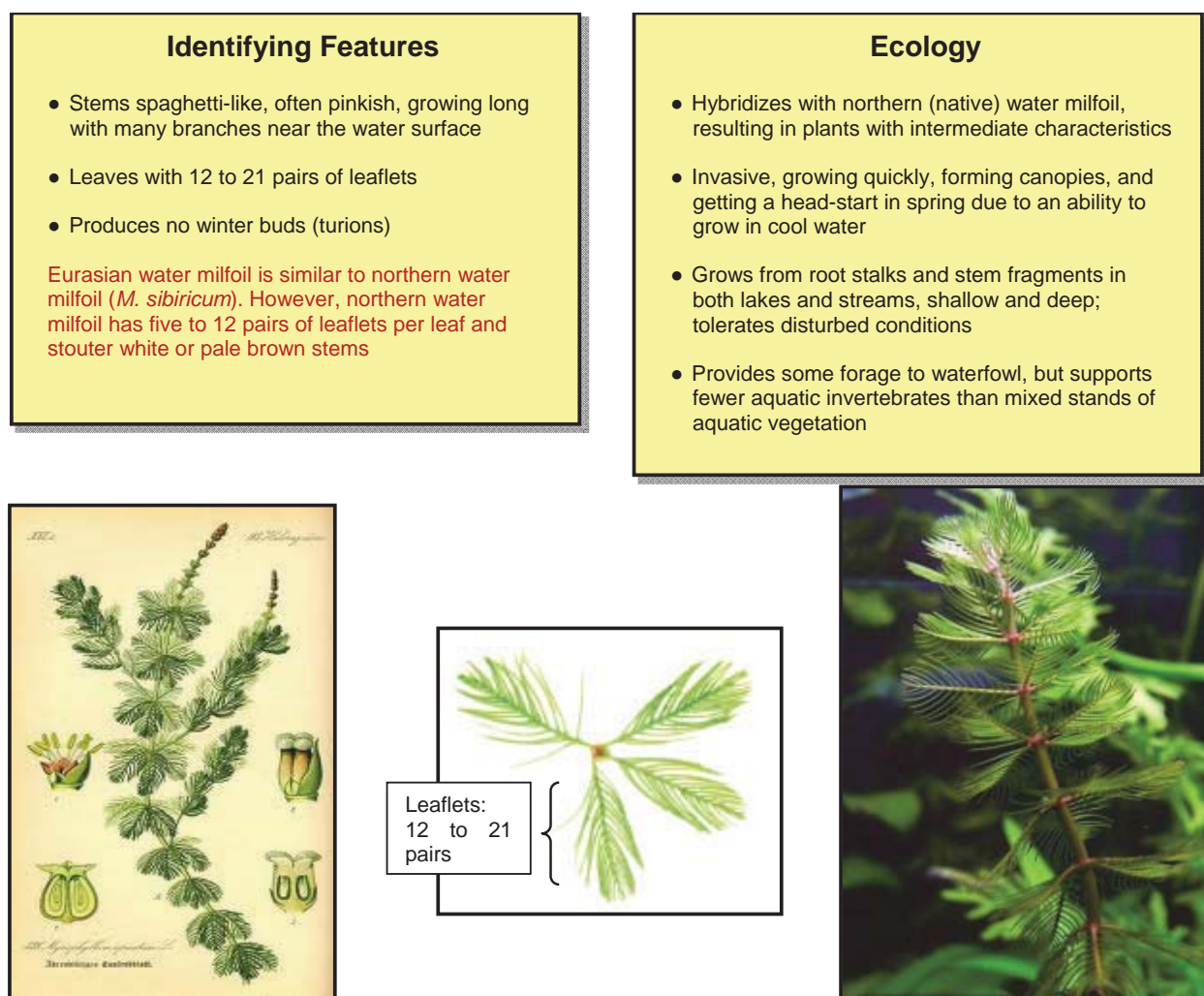
Curly-leaf pondweed (see Figure 8) is a plant that thrives in cool water and exhibits an early-season growth cycle that helps give it a competitive advantage over native plants. However, curly-leaf pondweed begins to die off during the summer when lake water temperatures start to peak. Therefore, it is not normally considered a nuisance during summer months. Curly-leaf pondweed was found in moderate quantities during the 2008 survey and was not observed during the 2014 or 2016 surveys.

Zebra Mussel (*Dreissena polymorpha*)

The WDNR also verified the presence of the invasive animal species zebra mussel (*Dreissena polymorpha*, Figure 9). Hooker Lake residents reported the presence of Zebra mussels since at least 2010. Zebra mussels have known negative impacts on native benthic organism populations that can disrupt aquatic food chains. The mussels also can cause a significant increase in water clarity that can fuel nuisance algae and aquatic plant growth. Water clarity did begin increasing in 2010, therefore zebra mussels do appear to be significantly affecting water clarity in Hooker Lake.

¹⁴ T. Groves, P. Hausler, and P. Tynning, Water Resources Group, Progressive AE, Hybrid Milfoil: Management Implications and Challenges, *The Michigan Riparian*, Winter 2015.

Figure 7
Eurasian Water Milfoil (*Myriophyllum spicatum*)



Source: WDNR and Skawinski, P. M. (2014). *Aquatic Plants of the Upper Midwest: A Photographic Field Guide to Our Underwater Forests, 2nd Edition*, Wausau, Wisconsin, USA: Self-Published

Purple loosestrife (*Lythrum salicaria*)

Purple loosestrife (see Figure 10) spreads profusely, outcompeting native plant species and reducing the quality of fish and wildlife habitat, while adding little ecological benefit. This species is a declared a noxious weed in the State of Wisconsin and is subject to an ongoing eradication program. Purple loosestrife is present in wetlands fringing Hooker Lake. The Lake's extensive marshland area makes large areas particularly susceptible to purple loosestrife infestation.

Fisheries and Wildlife

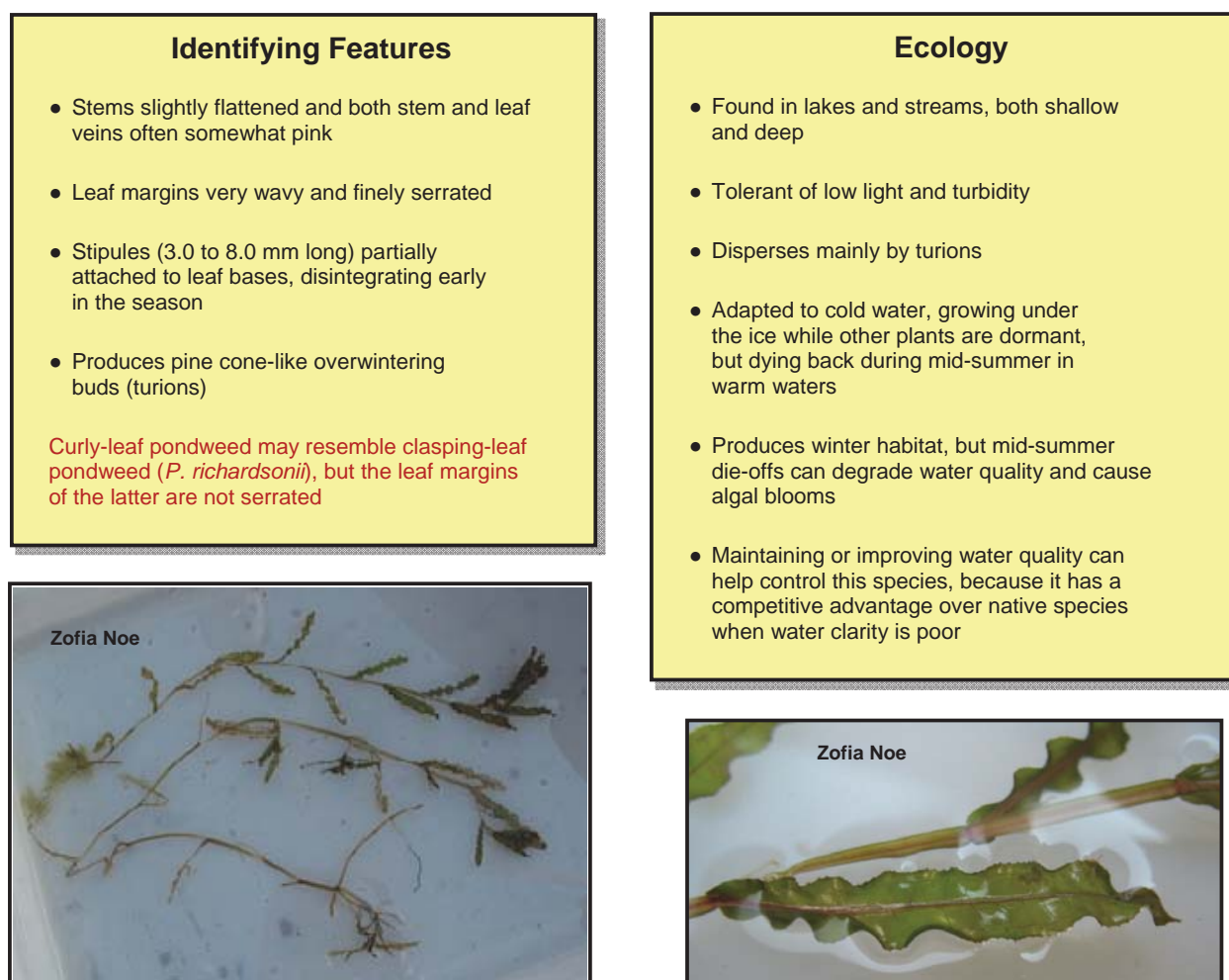
The WDNR's lake page lists the Lake's largemouth bass (*Micropterus salmoides*) population as "abundant," and northern pike (*Esox lucius*) and panfish as "common."¹⁵

The WDNR conducted an electrofishing survey on Hooker Lake in 2008.¹⁶ Hooker Lake was considered to have a high quality fishery, supporting both panfish and predator populations. The survey determined that the fish community within Hooker Lake was comprised of northern pike, largemouth bass, common carp

¹⁵ dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=738400.

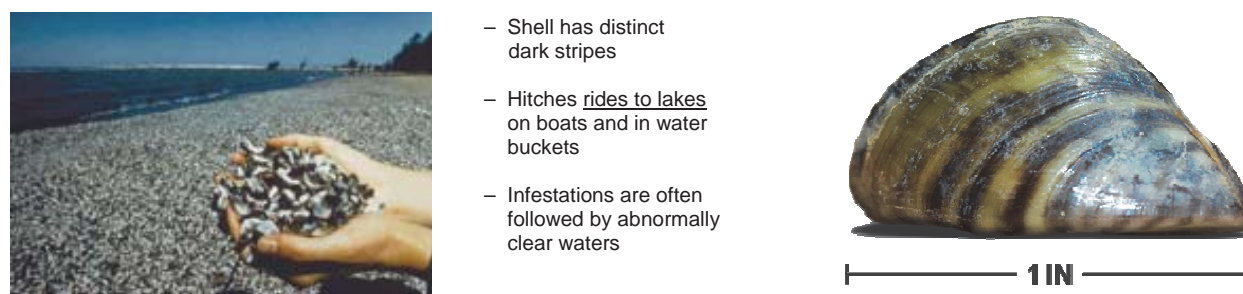
¹⁶ Aron & Associates, Inc., Hooker Lake Aquatic Plant Management Plan, opt cit.

Figure 8
Curly-Leaf Pondweed (*Potamogeton crispus*)



Source: WDNR, SEWRPC, and Skawinski, P. M. (2014). *Aquatic Plants of the Upper Midwest: A Photographic Field Guide to Our Underwater Forests*, 2nd Edition, Wausau, Wisconsin, USA: Self-Published

Figure 9
Zebra Mussels (*Dreissena polymorpha*)



Source: Wisconsin Department of Natural Resources, Vic Ramey, University of Florida, Minnesota Sea Grant, Ohio Sea Grant, Texasinvasives.org, and SEWRPC

(*Cyprinus carpio*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), smallmouth bass (*Micropterus dolomieu*), yellow bullhead (*Ictalurus natalis*), warmouth (*Lepomis gulosus*), and bowfin (*Amia calva*). Walleye (*Sander vitreus*) was found in small numbers during a 2017 WDNR survey. In addition, Hooker Lake contains one fish species of “special concern”: the lake chubsucker, *Erimyzon sucetta* (see Figure 11).

Figure 10
Purple Loosestrife (*Lythrum salicaria*)

Identifying Features

- Terrestrial or semi-aquatic, emergent forb
- Stems often angled with four, five, or more sides, and growing one to two m tall
- Flowers deep pink or purple, six-parted, 12 to 25 mm wide, and in groups
- Leaves lance-like, four to 11 cm long and either opposite or in whorls of three

Purple loosestrife, if small, is similar to winged loosestrife (*Lythrum alatum*), but winged loosestrife differs in having leaves generally smaller (<5.0 cm long), leaves mostly alternate (only lower leaves opposite), and flowers mostly held singly in the leaf axils rather than in pairs or groups

Ecology/Control

- Found in shallows, along shores, and in wet to moist meadows and prairies
- Invasive and continues to escape from ornamental plantings
- Galerucella beetles have been successfully used to control purple loosestrife. Plants may also be dug or pulled when small, but they subsequently should be placed in a landfill or burned. Several herbicides are effective, but application near water may require permits and aquatic-use formulas



Source: The Nature Conservancy and SEWRPC

The WDNR has been rotationally stocking northern pike and walleye fairly consistently since 1972. The associated wetlands and undeveloped shorelines within Hooker Lake could provide major northern pike and largemouth bass spawning ground.

The wetlands and aquatic plant beds of Hooker Lake provide excellent habitat for waterfowl, muskrats, pheasants, and various marsh and migratory birds. The Lake's shallow depth and dense aquatic plant growth make it ideal for waterfowl. Herons, sandhill cranes, blue-winged teal, and bitterns have been reported as commonly present. The non-migratory species of Canada goose so prevalent throughout southeastern Wisconsin is abundant.

Environmentally Significant Areas

The Hooker Lake watershed contains numerous environmentally significant areas. These areas generally represent the best remaining natural resource areas in the Lake's watershed. Many important interdependent relationships occur between living organisms and their environment in such areas. Destruction or deterioration of any one element of a natural environment may unravel the value and stability of the overall resource. Therefore, it is important to protect such areas.

As shown on Map 3, primary environmental corridor areas occupy nearly 516 acres of land and water area (including the Lake itself) in the Lake's direct watershed, much of it in close proximity to the Lake. Preserving these areas is critically important to maintaining the ecological integrity of the Lake. The wetland on the north shore of Hooker Lake ("Hooker Lake Marsh") and the shoreline and littoral zone along the southwest corner the Lake constitute the 13 acres designated as WDNR Sensitive Areas.

Aesthetic Features

Hooker Lake provides a generally peaceful and natural lake setting. Much of the lakeshore is wooded which helps to conceal the homes and developed appearances of the properties that encircle the Lake. The wetland on the north side, in particular, provides a natural scenic view.

LAKE USE

Recreational Use

During summer and winter 2014 and 2015, SEWRPC staff conducted recreational surveys to examine public lake use. The surveys showed that pontoon boats and power or ski boats were the most commonly owned boats on the Lake. Rowboats, canoes, paddle boards, and kayaks were also fairly common. The surveys also revealed that fishing and water skiing/tubing were the most popular on-water activities during the summer (Figure 12); the most popular winter activity observed was ice fishing (Figure 13). Snowmobiling is also a popular local winter pastime.

Public Access

There are three public boat ramps on Hooker Lake. Therefore, the WDNR deems the Lake to have adequate public recreational boating access pursuant to standards set forth in Chapter NR 1 of the Wisconsin Administrative Code. Currently, public boat launches are located off of 78th Street on the north side (Village of Paddock Lake Boat Launch), 80th Place on the northeast side, and 83rd street on the west side (See Map 4). Slow-no-wake zones are in effect within 200 feet of the shoreline at all times and are in effect for the entire lake from sunset to 10 am.

Cottages and Homesites

There are 80 residential lots around the shoreline of Hooker Lake. Lot sizes average 2.4 acres and range from a minimum of less than 0.01 acres to a maximum of 98 acres. The population and number of households in the Hooker Lake watershed is projected to increase significantly by 2035 (Table 4).

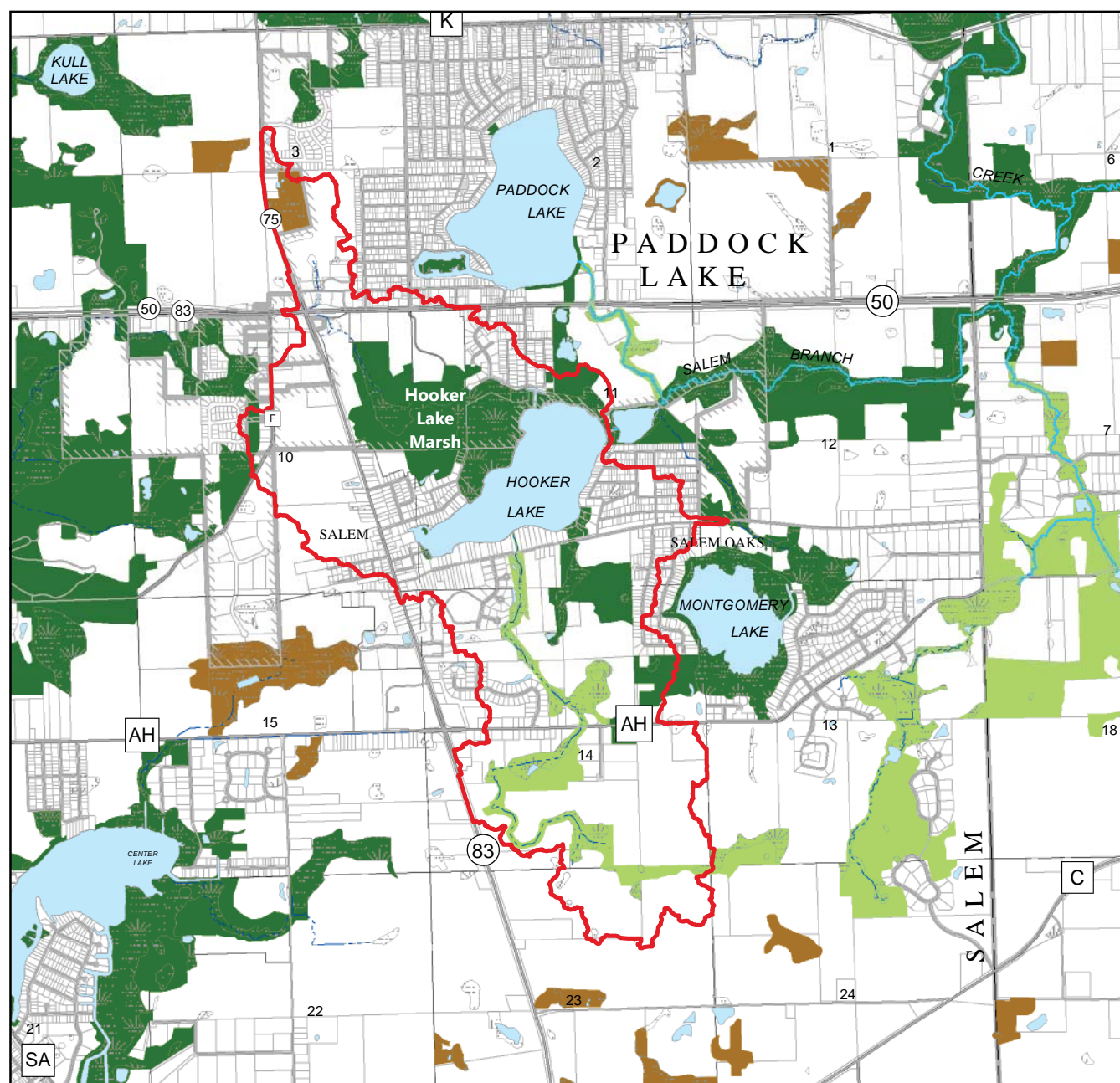
Figure 11
Special Concern Species Found in Hooker Lake



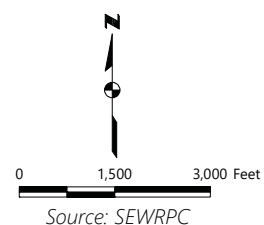
Lake Chubsucker
(*Erimyzon sucetta*)

Source: SEWRPC

Map 3 Environmentally Significant Areas Within the Hooker Lake Watershed: 2015



- | | |
|---------------------|-----------------------------------|
| SURFACE WATER | PRIMARY ENVIRONMENTAL CORRIDORS |
| WATERSHED BOUNDARY | SECONDARY ENVIRONMENTAL CORRIDORS |
| PERENNIAL STREAM | ISOLATED NATURAL RESOURCE AREA |
| INTERMITTENT STREAM | WETLANDS |



Note: The Montgomery Lake subwatershed drains to the Back Bay/Outlet area downstream of Hooker Lake, so this subwatershed area was not incorporated as part of this project.

Figure 12
Typical Summer Activities on Hooker Lake



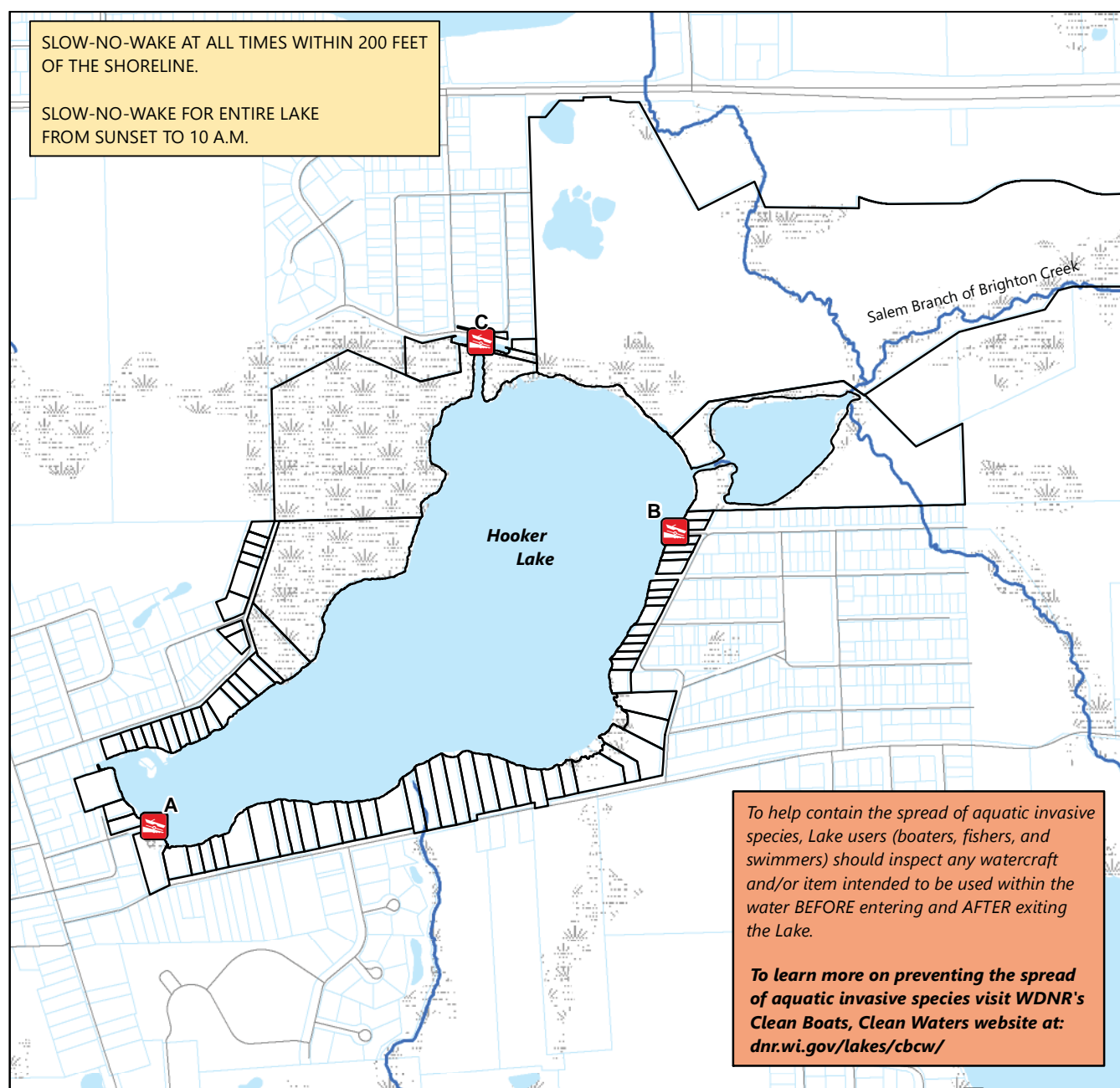
Source: SEWRPC

Figure 13
Typical Winter Activities on Hooker Lake

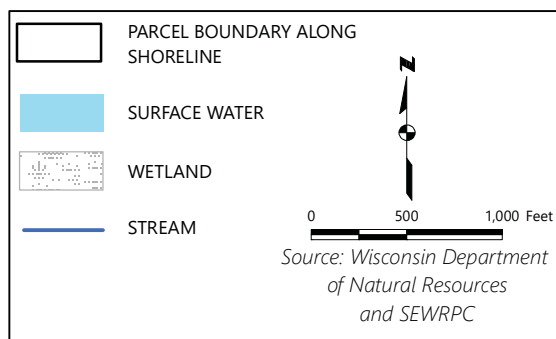


Source: SEWRPC

Map 4 Recreational Uses on Hooker Lake: 2015



Map ID	Description	Facilities							
		Boat Ramp	Fee	Car-trailer Parking	Car Parking	Pier	Swim Beach	Picnic Area	Shelter
A	Town Fire Lane (Unnamed Boat Launch)	Yes-Gravel	No	No	No	No	No	No	No
B	Town Fire Lane (Unnamed Boat Launch)	Yes-Gravel	No	No	No	No	No	No	No
C	Village of Paddock Lake Boat Launch	Yes-Paved	Yes	Yes	Yes	Yes	No	No	No



Note: For additional lake information or boating regulations go to: dnr.wi.gov/lakes/lakepages/Results.aspx

EXISTING PROTECTIVE MEASURES

Sewage Disposal

At present, residential lands in the Hooker Lake watershed are served or planned to be served or are planned to be served by public sanitary sewer systems. Some homes along the southern periphery of the watershed are still served by onsite septic systems. Such systems need to be conscientiously maintained and inspected to ensure operation compliant with county and or local ordinances.

Shoreline Protection and Erosion Control

The shoreline of Hooker Lake is comprised of stretches of protected shoreline (either man-made or natural), as well as some areas of unprotected shoreline, such as where riparian owners mow lawn to the water's edge (see Map 5). About 51 percent of the shoreline is vegetated without manmade shoreline protective structures such as riprap or bulkhead. Shoreline protection consisted of buffer (approximately seven percent of the shoreline), bulkhead (approximately ten percent of the shoreline), and riprap (approximately twenty percent of the shoreline). No major areas of shoreline erosion were recorded during a survey conducted by SEWRPC in August 2014.¹⁷

Land Use Regulations

Comprehensive zoning ordinances are one of the most important tools available to local units of government for directing the proper use of lands within their area of jurisdiction. Hooker Lake and its watershed are subject to ordinances and regulations developed jointly by the Village of Salem Lakes and Village of Paddock Lake, Kenosha County. Table 5 shows the general and special-purpose zoning ordinances for the civil divisions that are part of the Hooker Lake watershed.

Water Use Regulations

Hooker Lake is subject to a Water Use Ordinance promulgated jointly by the Village of Salem Lakes (Chapter 20 of the Village Code of Ordinances) and the Village of Paddock Lake, Kenosha County (Chapter 16 of the Village Code of Ordinances). These ordinances are consistent with Chapter 30 of the Wisconsin Statutes and applies to persons, boats, watercraft, and objects upon, in, and under the waters of Hooker Lake within the jurisdiction of the Villages and limits the times during which boats may operate on Hooker Lake.

Table 4
Population and Households Within
the Hooker Lake Watershed: 1960-2035

Year	Population	Households
1960	495	170
1970	861	257
1980	1,306	408
1990	1,293	452
2000	1,590	551
2010	1,731	643
Planned 2035	2,899	1,091

Note: Planned 2035 data based on 2000 census data and does not reflect change which may have occurred between 2000 and 2015.

Source: U.S. Bureau of Census and SEWRPC

Table 5
Land Use Regulations Within the Hooker Lake Watershed in Kenosha County by Civil Division: 2016

Type of Ordinance	Community		
	Kenosha County	Village of Salem Lakes	Village of Paddock Lake
General Zoning	Adopted	Regulated under County ordinance	Adopted
Floodplain Zoning	Adopted	Regulated under County ordinance	Adopted
Shoreland Zoning	Adopted	Regulated under County ordinance	Adopted ^a
Subdivision Control	Adopted ^b	Adopted ^b	Adopted
Construction Site Erosion Control and Stormwater Management	Adopted ^b	Adopted ^b	Adopted

^a The Village of Paddock Lake has adopted a Shoreland-Wetland Overlay Zoning District to comply with the requirements of Chapter NR 117 of the Wisconsin Administrative Code. The Village has also adopted a Shoreland Overlay Zoning District that applies within 100 feet of the ordinary high water mark of navigable waters, which regulates building setbacks and removal of vegetative cover. These latter regulations are more restrictive than the State-mandated shoreland zoning regulations for cities and villages in NR 117.

^b Both the Kenosha County and Village of Salem Lakes subdivision ordinances and erosion control and stormwater management ordinances apply within the Village of Salem Lakes. In the event of conflicting regulations, the more restrictive regulation applies.

Source: SEWRPC

¹⁷ SEWRPC Memorandum Report No. 222, op.cit.

Map 5
Shoreline Survey of Hooker Lake: 2014

