SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION
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Staff Memorandum

SCOUT LAKE SURVEY, MILWAUKEE COUNTY, WISCONSIN

April 6, 2026

In an effort to build upon the Southeastern Wisconsin Regional Planning Commission (Commission or SEWRPC) Planning Report No. 42, A *Regional Natural Areas and Critical Species Habitat Protection and Management Plan for the Southeastern Wisconsin Region*, Commission staff secured grant funding from the Wisconsin Coastal Management Program (WCMP) to assist with natural area and aquatic site inventory, protection, and management plan development. The goals of the project include increasing the regional capacity to update existing biological inventories, completing inventories lacking surveys, and incorporating data into ecological restoration plans. Commission staff identified Milwaukee County lakes that had very little or no water quality or biotic information collected to conduct aquatic plant surveys, water quality monitoring, aquatic invasive species surveys, shoreline surveys, and/or sediment surveys. The data collected on the lakes surveyed are being summarized in brief reports that are made available to the public. The data and reporting are intended to help establish the ecological status of the waterbodies to assist in management strategies to protect and restore them so that they can continue to serve Milwaukee County and its residents. Four lakes (Jackson Park Pond, McGovern Park Pond, Scout Lake, and Mallard Lake) were surveyed in the summer of 2025.

LAKE BACKGROUND INFORMATION

Scout Lake (Lake) is a 5-acre lake located entirely in the Village of Greendale within Milwaukee County, Wisconsin.[1] Although the WDNR designates the Lake as a seepage lake, it is located along an unnamed intermittent stream that drains to Dale Creek and ultimately the Root River (see Figure 1).[2] The Lake is one of the County's few natural lakes, and is also one of its deepest. Some of the earliest mapping of the Lake is shown in Figure 2. Some of the earliest data on the Lake were recorded in the 1964 publication *Surface Water Resources of Milwaukee County*.[3] According to the report, Scout Lake attained a maximum depth of approximately 20 feet, with fertile and turbid waters, most likely due to excessive algal growth. Additional observations included that largemouth bass, bluegill, and pumpkinseed constituted the Lake's fishery, and muskrats and waterfowl were abundant. In the decades since the report was published, the area immediately surrounding the Lake has been kept relatively naturalized to provide access to greenspace in the Village (see Figure 3). A 1981 map by the WDNR indicates that the Lake had a maximum depth of 19.4 feet with a volume of approximately 50 acre-feet (see Map 1).[4]

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[1] *apps.dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=6100&page=facts.*

[2] *Seepage lakes are generally considered to primarily receive their water from either precipitation or groundwater and also lose their water to evaporation or groundwater.*

[3] *Wisconsin Conservation Department*, Surface Water Resources of Milwaukee County, *1964*.

[4] *Wisconsin Department of Natural Resources,* Scout Lake – Milwaukee County, Wisconsin DNR Lake Map*, July 1981*.

Figure 1
Images from Scout Lake

Overlooking Scout Lake	Eurasian Watermilfoil and Curly-Leaf Pondweed
	
The Southern Intermittent Outlet	Litter Accumulation near Fishing Pier
	

Source: SEWRPC

Today, Scout Lake is a part of the larger Scout Lake Park, owned and maintained by Milwaukee County Parks. The Lake is surrounded by a half-mile paved walking trail with multiple benches for nature views and maintains a permanent, handicap-accessible fishing pier on its eastern shore.[5] The Lake provides habitat for crayfish, fish, herptiles, odonates, and several species of waterfowl and shorebirds.[6] Data collected by Milwaukee County Parks staff and citizen scientists identified several rare species (see Table 1) as well as a Wisconsin State-Listed herptiles and odonates of special concern. Fish are stocked by the WDNR as a part of their urban fishing waters program and fishing is a popular use of the Lake.[7,8] The Scout Lake pavilion overlooks the Lake just south of the pier and is available as rental space through the Parks. In the summer, Scout Lake Park is often a location of the Milwaukee County traveling beer garden, a popular tourist attraction.[9]

[5] *www.visitmilwaukee.org/listing/scout-lake-park/14029.*

[6] *The website eBird indicates that American black ducks, pied-billed grebes, mallards, herons, geese, and Caspian terns are the most commonly observed waterfowl and sea birds at Scout Lake: ebird.org/hotspot/L2839399/iconic-birds.*

[7] *Since 2010, between 2,000 and 4,000 rainbow trout are stocked annually in Scout Lake through this program. See dnr.wisconsin.gov/topic/Fishing/anglereducation/urbanfishing for more information on the program. Milwaukee County also stocked the lake in the mid-2000s with several other species (bluegill, yellow perch, black crappie, and largemouth bass) to support children's fishing clinics.*

[8] *Multiple reviews of Scout Lake Park on Google Maps mention fishing, walking the trail, and viewing the wildlife.*

[9] *www.travelingbeergardens.com.*

Using the WDNR Watershed Explorer (WEx) tool, Commission staff delineated the lake's watershed and summarized the land use and pollutant loading information.[10] The lake has a 109-acre watershed that drains lands east of STH-36, which include wooded and residential areas, as well as the lot of the Department of Motor Vehicles (see Map 2). Commission staff utilized the Wisconsin in-lake Suite Modeling (WiLMS) component of WEx to model phosphorus loads to the Lake based on watershed land uses (see Table 2). As most phosphorus transported to lakes is bound to soil particles, these estimates could be considered a proxy for sediment loading sources as well. Medium density urban land use is predicted to be the predominant phosphorus loading source, contributing eight pounds (44.4 percent of the total phosphorus). As these urban lands are on the surrounding edges of the watershed, the internal woods and wetlands serve a vital role in reducing sedimentation and pollutant loading into the Lake via filtration and slowing of stormwater flow.

Figure 2
1891 Map of Scout Lake

Source: USGS

SURVEY FINDINGS

Commission staff surveyed the Lake on July 15, 2025. This work included an aquatic plant survey, water quality measurements, and identification of aquatic invasive species (AIS). Weather conditions were warm and sunny with mild wind. Most of the Lake was surrounded by vegetative buffers along the shoreline with the exception of a wide concrete slab going into the Lake in from of the pavilion, most likely used as a boat launch before the County prohibited boating in the waters.

Commission staff completed a point-intercept aquatic plant survey of the lake using a 100-point grid provided by Wisconsin Department of Natural Resources (WDNR) (see Figure 4). At each survey point the water depth, sediment type, and the qualitative abundance of each species observed as well as all aquatic plants combined, were recorded. Photos and specimens were collected for each observed aquatic plant species. Water quality measurements, including a Secchi disk reading and profiles of temperature, dissolved oxygen, dissolved oxygen saturation, pH, PSI, and mVORP were measured using a Hanna Instruments meter at the lake's deep hole site, shown in Figure 5.

Aquatic Plant Observations

Commission staff observed 11 aquatic plant species during the point-intercept survey: nine native species and two invasive species (see Table 3). The total littoral vegetation coverage, or the percentage of aquatic plant occurrence in depths that were shallower than the maximum depth of plants, was 76.7 percent. The maximum depth of colonization by plants was 20 feet, though coontail (*Ceratophyllum demersum)* was the only plant observed beyond 12 feet.[11] The average rake fullness was 2.43, indicating a fairly dense and abundant plant community (see Figure 6). The top five most common species observed were, in order of abundance within vegetated areas were: white water lily (*Nymphaea odorata*, 74.2 percent), coontail (69.7 percent), Eurasian watermilfoil (*Myriophyllum spicatum*, 16.7 percent), common waterweed (*Elodea canadensis*, 10.6 percent), and curly-leaf pondweed (*Potamogeton crispus*, 9.1 percent). White water lily densely covered much of the littoral area (see Figure 1). Community members discussed concern for the high abundance of the white water lilies with Commission staff the day of the survey. While there is high

[10] *dnr-wisconsin.shinyapps.io/WaterExplorer.*

[11] *Coontail can be free-floating in lakes and thus may not have been rooted at these deeper depths.*

Figure 3
Aerial Imagery of Scout Lake: 1937, 2000, and 2020

1937 Aerial

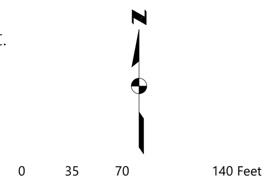
2000 Aerial

2020 Aerial

Source: U.S. Department of Agriculture and SEWRPC

Map 1
Scout Lake Bathymetry

Note: Contour intervals are 1.6 feet (converted from intervals of 0.5 meters). The maximum depth of the Lake is 18 feet.



Source: WDNR and SEWRPC

Table 1
Aquatic Wildlife Observed at Scout Lake

Species Type	Species Name	Status	Year Observed
Crayfish	White River Crayfish *(Procambarus acutus)*		2014
Fish	Brown Bullhead (Ameiurus nebulosus)		2024
	Green Sunfish *(Lepomis cyanellus)*		2024
Herptiles	American Toad (Anaxyrus americanus)		2023
	Northern Green Frog *(Lithobates clamitans)*		2025
	Common Snapping Turtle *(Chelydra serpentina)*		2023
	Western Painted Turtle *(Chrysemys picta)*		2025
	Red-Eared Slider *(Trachemys scripta elegans)*	Nonnative	2022
	Yellow-bellied Pond Slider *(Trachemys scripta scripta)*	Nonnative	2020
Odonates	Common Green Darner *(Anax junius)*		2023
	Comet Darner *(Anax longipes)*	Rare in Milwaukee County	2021
	Great Spreadwing *(Archilestes grandis)*		2020
	Ebony Jewelwing *(Calopteryx maculata)*		2020
	Halloween Pennant *(Celithemis eponina)*		2023
	Racket-tailed Emerald *(Dorocordulia libera)*	Rare in Milwaukee County	2023
	Marsh Bluet *(Enallagma erbium)*		2021
	Skimming Bluet *(Enallagma geminatum)*		2024
	Slender Bluet *(Enallagma traviatum westfalli)*	Rare in Milwaukee County	2021
	Common Baskettail *(Epitheca cynosure)*	Rare in Milwaukee County	2024
	Prince Baskettail *(Epitheca princeps)*		2021
	Eastern Pondhawk *(Erythemis simplicicollis)*		2023
	Fragile Forktail *(Ischnura posita)*		2024
	Eastern Forktail *(Ischnura verticalis)*		2024
	Slender Spreadwing *(Lestes rectangularis)*		2020
	Frosted Whiteface *(Leucorrhinia frigida)*	Rare in Milwaukee County	2021
	Dot-tailed Whiteface *(Leucorrhinia intacta)*		2024
	Twelve-spotted Skimmer *(Libellula pulchella)*		2021
	Cyrano Darner *(Nasiaeschna pentacantha)*	Rare in Milwaukee County	2021
	Sedge Sprite (*Nehalennia irene)*		2023
	Four-spotted Skimmer *(Libellula quadrimaculata)*		2023
	Blue Dasher *(Pachydiplax longipennis)*		2023
	Eastern Amberwing *(Perithemis tenera)*		2023
	Common Whitetail *(Plathemis lydia)*		2021
	Autumn Meadowhawk *(Sympetrum vicinum)*		2021
	Black Saddlebags *(Tramea lacerate)*		2023
	Red Saddlebags *(Tramea onusta)*		2021

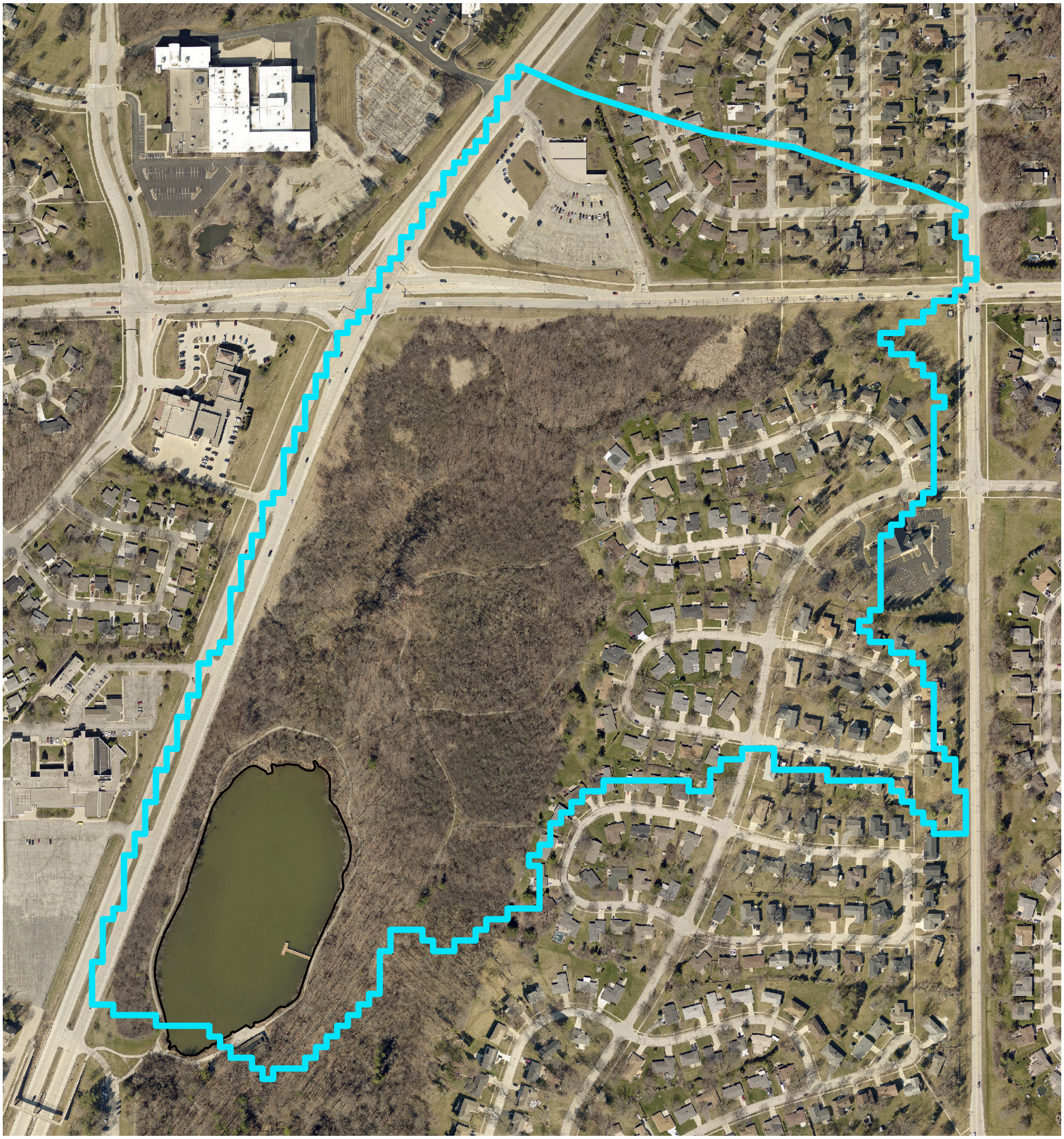
Source: Data courtesy of Milwaukee County Parks (MCP) Staff. Data taken from MCP staff surveys, WI Odonate Survey website, Odonata Central, and iNaturalist.

density of the water lilies, these native plants provide benefits for the aquatic life in the Lake, as described on Table 3. Furthermore, the water depth around the fishing pier is too deep for lily growth, thus not inhibiting recreational access for lake users. Many of the aquatic plant species in the Lake are associated with eutrophic (nutrient-rich) conditions, discussed later in the memorandum. A balance of fisheries habitat, aquatic plants, and incoming nutrients combine to maintain a healthy lake community.

Two invasive aquatic plant species were observed during the Scout Lake survey, both of which had been previously reported to the WDNR: Eurasian watermilfoil and curly-leaf pondweed.[12] These species were observed throughout Lake, most often intermixed with other species (see Figure 1). The 2005 Milwaukee

[12] *Both species were previously known to occur in Scout Lake, with Eurasian watermilfoil reported in 1997 and curly-leaf pondweed reported in 2013 based on WDNR records: apps.dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=6100&page=invasive.*

Map 2
WDNR-Delineated Scout Lake Watershed



Note: Watershed was delineated using the WDNR Water Explorer tool and may not be fully accurate to actual boundaries.

Watershed Boundary

0 120 240 480 Feet

Source: WDNR and SEWRPC

Table 2
WiLMS Nonpoint Phosphorus Loading Output for the Scout Lake Watershed

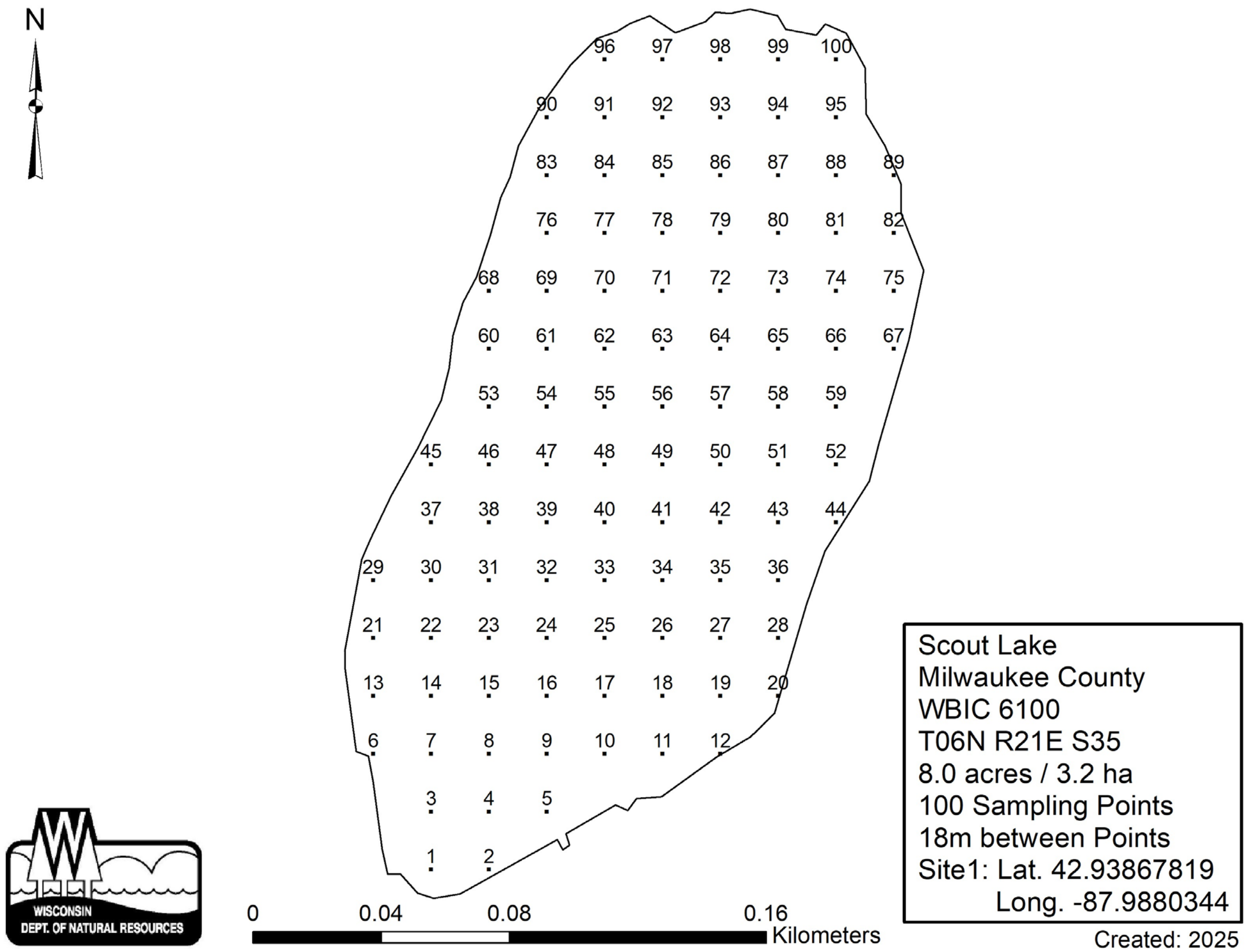
Land Use Class	Area of Land Use Class (acres)	Percent of Watershed	Low Phosphorus Export (kg/ha)	Likely Phosphorus Export (kg/ha)	High Phosphorus Export (kg/ha)	Annual Phosphorus Load (lbs) (Lower est. – Higher est.)
Rural Residential	45	41	0.1	0.1	0.3	4 (2 – 10)
Wetlands	34	31	0.1	0.1	0.1	3[b]
Medium Density Urban (1/4 Ac)	17	16	0.3	0.5	0.8	8 (5 – 12)
Lake Surface	6	6	0.1	0.3	1.0	2 (1 – 6)
Forest	6	5	0.1	0.1	0.2	0 (0 – 1)
High Density Urban (1/8 Ac)	1	1	1.0	1.5	2.0	2 (1 – 2)
Total	109	100	1.7	2.6	4.4	18 (12 – 34)

Note: Information obtained from the WiLMS Nonpoint Phosphorus Loading tool found at: dnr-wisconsin.shinyapps.io/WaterExplorer.

[a] *The lower and higher estimated loads are the same and thus have no range.*

Source: WDNR and SEWRPC

Figure 4
Point-Intercept Grid of Scout Lake



Source: WDNR

County Pond & Lagoon Management Plan indicates that both mechanical and chemical control have been used to manage populations of these species on the Lake, with between 25 and 50 percent of Lake designated as high priority for control.[13] Chemical control methods have been used as recently as 2022 for aquatic plant management in the Lake to decrease abundance of invasive species as well as maintaining fishing access.[14] Additionally, Commission staff observed a goldfish in the Lake, most likely dumped from an aquarium. Goldfish are a restricted species in Wisconsin, meaning they are prohibited from being introduced into local waters without a permit.

Water Quality

Scout Lake has previously been sampled for an array of water quality metrics, particularly in the 1980s into the early 2000s. This dataset provides insight into the historical water quality, ranges, and fluctuations throughout the seasons. Scout Lake was consistently surveyed by citizen lake monitoring efforts from 1994 through 2006, which collected data such as total phosphorus, chlorophyll-*a*, Secchi depths, dissolved oxygen, and temperature. This dataset was summarized in the *Community Assistance Planning Report No. 316, A Restoration*

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[13] *Milwaukee County Environmental Services,* Milwaukee County Pond & Lagoon Management Plan*, June 2005. county.milwaukee.gov/files/county/administrative-services/Environmental-Services/MILWAUKEECOUNTYPONDANDLAGOONMGMTPLAN.pdf.*

[14] *permits.dnr.wi.gov/water/SitePages/DocSetViewArchive.aspx?DocSet=AP-IP-SE-2022-41-X03-06T21-32-36&Loc=apm1&Lib=Archive.*

Figure 5
Water Quality Profiles for Scout Lake

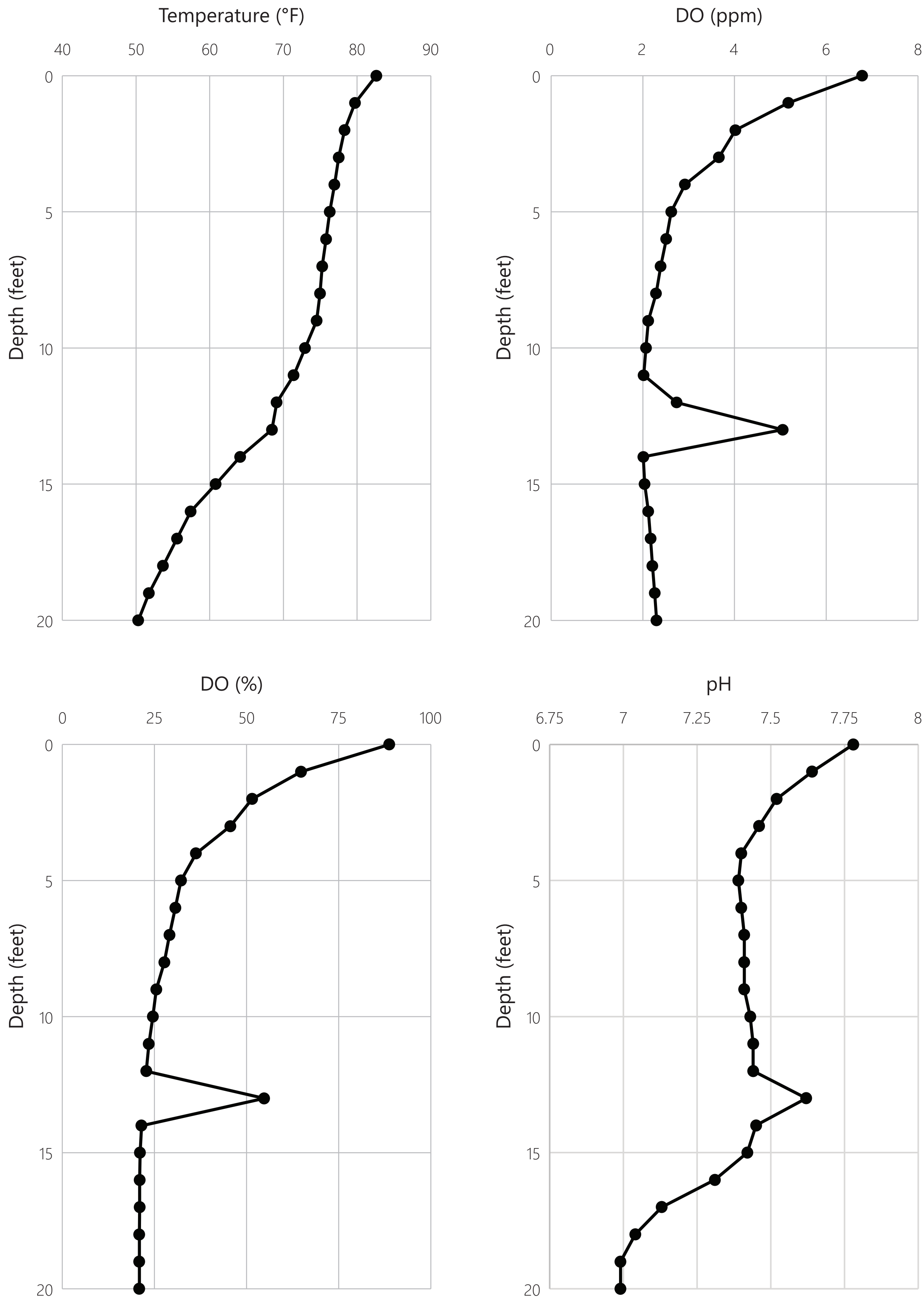
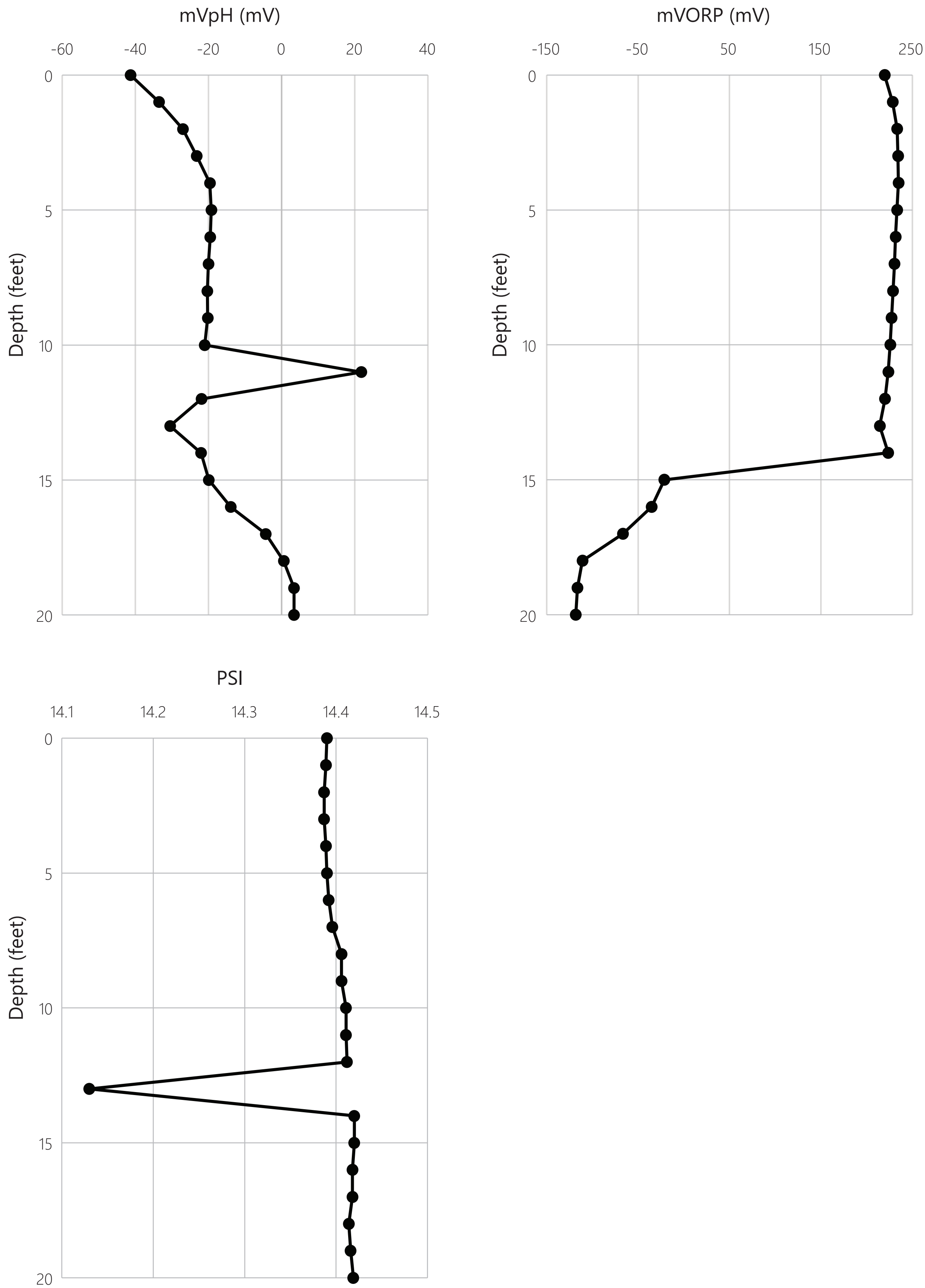


Figure 5 (Continued)



Source: SEWRPC

Table 3
Ecological Significance of Aquatic Plant Species in Scout Lake: 2025

Species Name	Ecological Significance
Ceratophyllum demersum (coontail)	Provides good shelter for young fish and supports insects valuable as food for fish and ducklings.
Elodea canadensis (waterweed)	Provides shelter and support for insects which are valuable as fish food.
Heteranthera dubia (water stargrass)	Provides food and shelter for fish, locally important food for waterfowl.
Lemna sp. (duckweeds)	Provides food for waterfowl. Rapidly absorbs nutrients from water column.
Myriophyllum spicatum (Eurasian watermilfoil)	Invasive species that can cause navigation issues. Provides habitat for fish.
Nymphaea odorata (white water lily)	Seeds consumed by waterfowl while rhizoids consumed by mammals. Provides shade and habitat for fish.
Persicaria amphibia (water smartweed)	Food for waterfowl, shade and habitat for fish and invertebrates.
Potamogeton crispus (curly-leaf pondweed)	Provides habitat for aquatic life in winter and spring; midsummer die-off creates sudden habitat loss and releases nutrients into the water column. Invasive.
Sagittaria latifolia (large arrowhead)	Provides food for waterfowl, muskrat, beaver, and deer.
Sparganium sp. (bur-reed)	Provides food for waterfowl and muskrats; invertebrate habitat.
Stuckenia pectinata (sago pondweed)	Most important pondweed for ducks as food source. Provides food and shelter for young fish.

Note: Information obtained from A Manual of Aquatic Plants by Norman C. Fassett, University of Wisconsin Pressure; Guide to Wisconsin Aquatic Plants, Wisconsin Department of Natural Resources; Through the Looking Glass: A Field Guide to Aquatic Plants, Wisconsin Lakes Partnership, University of Wisconsin – Extension; and U.S. Forest Service; Encyclopedia Brittanica.

Source: SEWRPC

Plan for the Root River Watershed, and is shown in part in Figure 7.[15] Commission staff have endeavored to summarize previous efforts and report on the Lake's water quality using the available data from the WDNR.

Temperature and Dissolved Oxygen

Seasonal air temperature fluctuation and varying amounts of sunshine influence lake temperatures, causing waters to mix and stratify seasonally. In spring and fall, most lakes are well mixed and therefore are the same temperature from the water surface to the lake bottom. In summer, surface water warms and becomes more buoyant than underlying cooler water. Commission staff measured water temperatures through a depth profile of the lake, taken at the deep hole site from the surface down to 20 feet (see Figure 5). Water temperatures ranged from 10.2 to 28.1°C (50.3 to 82.6°F), within the range of previously recorded temperatures for the Lake in the month of July (44.5°F recorded in 2005 to 84°F recorded in 2001). Scout Lake exhibited stratification, meaning that the Lake most likely experiences little to no mixing of waters throughout the summer. As the Lake is fed by groundwater and precipitation, the cooler waters in the deep-hole of the Lake may contribute to stratification, though the eutrophication process may be decreasing stratification intensity. The surface water temperature surpassed sublethal criteria for warmwater fish species, though depths of a foot down to 12 feet of depth were within healthy temperature ranges for fish species found in Southeastern Wisconsin.[16] High temperatures surpassing sublethal criteria can increase fish stress and decrease the vitality and longevity of stocked species.

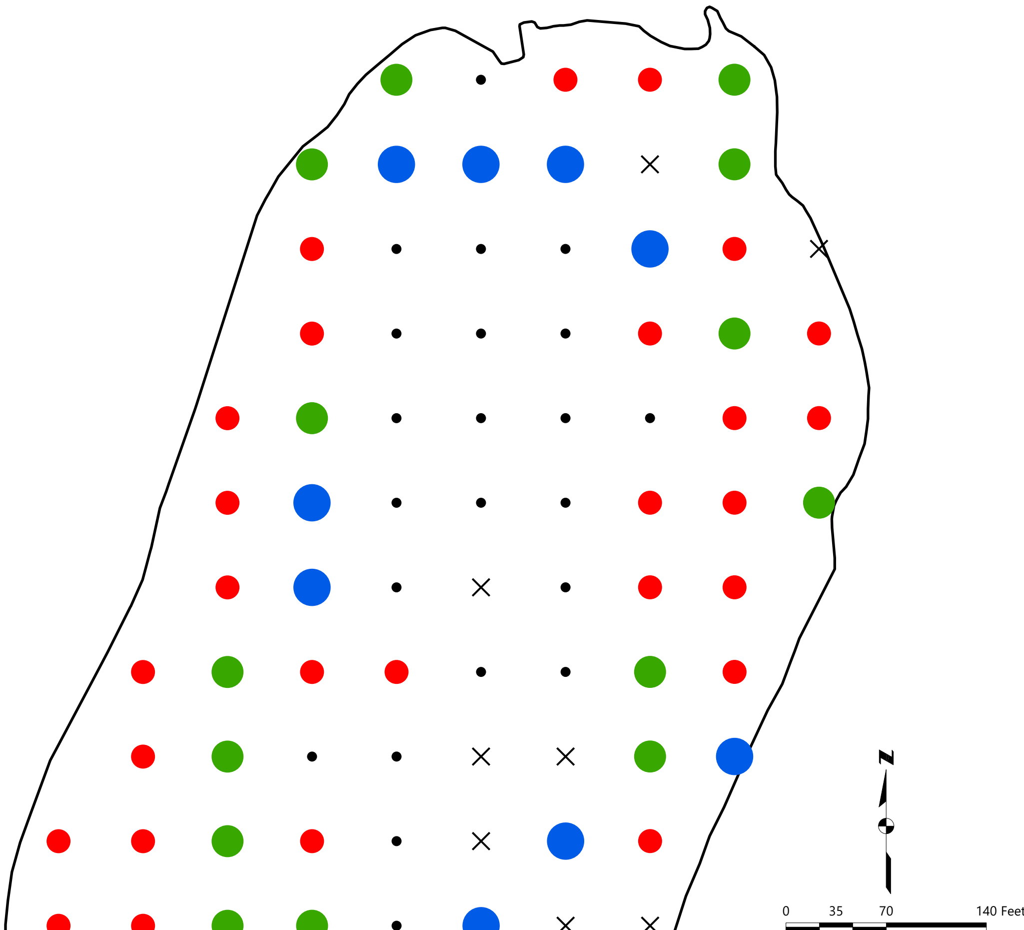
Dissolved oxygen (DO) levels are one of the most critical factors affecting the living organisms of a lake ecosystem. DO is generally higher at the surface of a lake where there is an interchange between the water and atmosphere, stirring by wind action (which aids in atmospheric oxygen diffusion into the surface waters at the air-water interface), and oxygen production by plant and algae photosynthesis. Metabolic processes, such as bacterial decomposition and respiration by aquatic organisms, consume oxygen and decrease DO concentrations. Dissolved oxygen was reported both as a concentration in ppm (parts per million) as well as percent saturation.[17] The concentration is the amount of oxygen in a volume of water while percent saturation is the relative amount of oxygen the water could hold at a given temperature and air pressure. When water is holding as much oxygen as can be absorbed, it is 100 percent saturated. Oxygen saturation values above 100 percent, called supersaturation, occur when the water contains a higher concentration of dissolved

[15] *SEWRPC Community Assistance Planning Report No. 316,* A Restoration Plan for the Root River Watershed*, 2014*.

[16] *docs.legis.wisconsin.gov/code/admin_code/nr/100/102.pdf#page=18*.

[17] *Conversion of units from ppm to mg/L (milligrams per Liter) is a direct conversion of 1:1*.

Figure 6
Total Rake Fullness in Scout Lake: Summer 2025



Source: WDNR and SEWRPC

RAKE FULLNESS RATING

1 2 3

● NO PLANTS ON RAKE

× NOT SAMPLED

Note: Survey was conducted on Scout Lake on July 15th, 2025.

Figure 7
Historic Water Quality Statistics for Scout Lake from the 2014 Root River Watershed Restoration Plan

Table 31

SUMMARY STATISTICS FOR WATER QUALITY CONSTITUENTS IN SCOUT LAKE: 1980-2005

Constituent	Spring (March-May)	Summer (June-August)	Autumn (September-November)	Winter (December-February)
Chlorophyll-a (µg/l)				
Samples	5	43	15	- -
Minimum	0.98	<0.01	1.50	- -
Maximum	9.42	61.00	31.60	- -
Mean	3.96	7.09	8.94	- -
Median	2.00	4.65	6.98	- -
Standard Deviation	3.65	9.56	7.66	- -
Chloride (mg/l)				
Samples	1	- -	3	- -
Minimum	255.0	- -	0.0	- -
Maximum	255.0	- -	6.0	- -
Mean	255.0	- -	3.7	- -
Median	255.0	- -	5.0	- -
Standard Deviation	- -	- -	3.2	- -
Dissolved Oxygen (mg/l)				
Samples	30	86	26	4
Minimum	0.60	0.00	0.00	6.65
Maximum	12.80	12.90	11.10	11.30
Mean	7.38	4.47	6.07	8.83
Median	7.85	4.00	6.40	8.70
Standard Deviation	4.02	3.59	3.18	0.22
pH (stu)				
Samples	4	9	5	- -
Minimum	7.10	6.70	7.30	- -
Maximum	8.80	9.70	8.70	- -
Mean	7.95	8.49	8.01	- -
Median	7.95	8.60	7.90	- -
Standard Deviation	0.98	0.87	0.57	- -
Specific Conductance (µS/cm)				
Samples	2	9	5	- -
Minimum	1,200	278	870	- -
Maximum	1,200	1,347	1,680	- -
Mean	1,200	919	1,188	- -
Median	1,200	902	937	- -
Standard Deviation	0	311	379	- -
Temperature (degrees Celsius)				
Samples	34	108	35	4
Minimum	3.9	5.6	5.6	1.0
Maximum	22.0	28.9	18.5	3.8
Mean	10.0	17.1	12.3	2.3
Median	9.2	17.7	12.2	2.3
Standard Deviation	4.7	6.9	2.9	0.6
Total Phosphorus (mg/l)				
Samples	19	59	22	5
Minimum	0.020	0.010	0.020	0.020
Maximum	0.182	0.722	2.490	6.310
Mean	0.062	0.118	0.215	1.320
Median	0.042	0.036	0.040	0.055
Standard Deviation	0.050	0.175	0.550	2.790

Figure 7 (Continued)

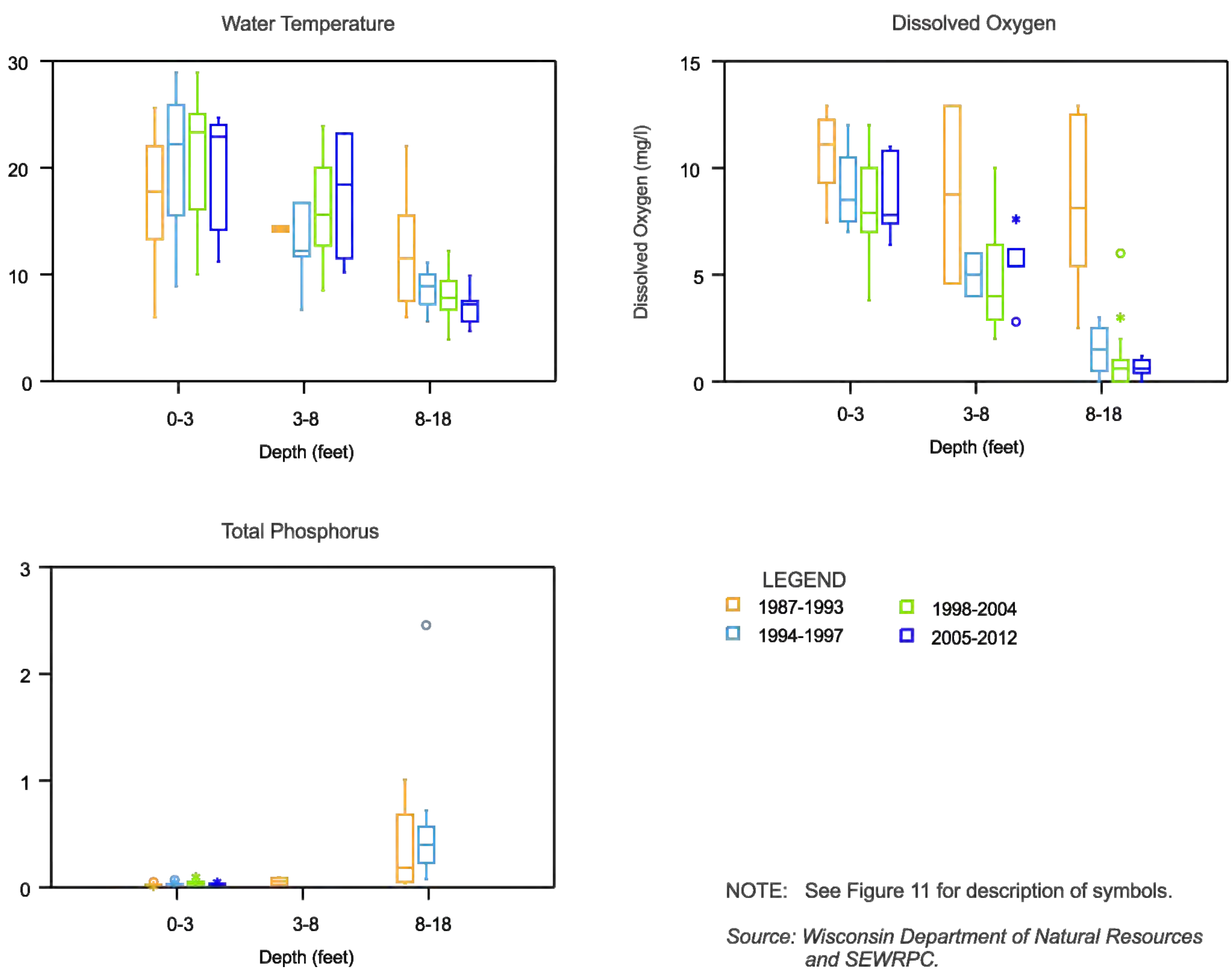
Table 31 (continued)

Constituent	Spring (March-May)	Summer (June-August)	Autumn (September-November)	Winter (December-February)
Secchi Depth (feet)				
Samples	11	43	14	- -
Minimum	1.50	2.00	2.50	- -
Maximum	7.55	13.10	10.00	- -
Mean	4.12	5.89	5.75	- -
Median	4.00	6.00	5.90	- -
Standard Deviation	1.75	3.12	2.31	- -

Source: Wisconsin Department of Natural Resources, Milwaukee County, and SEWRPC.

Figure 49

DISSOLVED OXYGEN, WATER TEMPERATURE, AND TOTAL PHOSPHORUS IN SCOUT LAKE: 1987-2012



NOTE: See Figure 11 for description of symbols.

Source: Wisconsin Department of Natural Resources and SEWRPC.

oxygen than is normally soluble at ambient conditions of temperature and pressure. Supersaturation can occur when photosynthesis is releasing oxygen faster than can be used and can be indicative of algae blooms or eutrophic conditions.

A minimum DO concentration of 5 mg/L is considered necessary for survival of most species of fish. Commission staff measured dissolved oxygen concentrations ranging from 2.3 to 6.8 mg/L (see Figure 5), generally decreasing with depth. Percent saturation of DO showed similar data patterns, ranging from 20.9 to 88.7 percent throughout the water column. Only the first foot of the water column had concentrations equal to or greater than 5 mg/L, which is the minimum concentration that supports survival of most warmwater fish species.[18] Lower depths of the lake were nearly anoxic and would not be supportive of fish or other aquatic life. The anoxic levels recorded are likely a result of the respiration of sediments at bottom of the lake consuming (reducing) the dissolved oxygen concentrations. There was a spike in oxygen concentration at 13 feet of depth, just surpassing the 5 mg/L minimum, perhaps due to aquatic plant photosynthesis. The reported dissolved oxygen levels, when paired with the high surface water temperatures indicate suboptimal conditions for supporting many fish species. This survey was conducted during mid-summer, which is typically among the most stressful periods from fish due to warm waters and low dissolved oxygen concentrations.

Comparing the 2025 data against previous measurements, the bottom depths of Scout Lake have consistently been low in oxygen with decades of measurements recording less than 2 mg/L below 15 feet of depth. However, the oxygen levels in the upper depths of the Lake have decreased since the 1980s/early 2000s, where dissolved oxygen levels in the first 10 feet of the water column were recorded in a ranges of 5 to 9.6 mg/L. The overall decrease in dissolved oxygen, specifically in the upper waters, suggests that viable fish habitat is decreasing over time. As fishing is an important recreational activity to the Lake, maintaining dissolved oxygen levels through aquatic plant management, regular monitoring of water quality conditions, and reducing nutrient loads to the Lake (see discussion below) can aid in creating a thriving environment for fish. Other methods to alleviate dissolved oxygen conditions, such as operating an aerator or circulator, could also be considered to alleviate conditions during particularly stressful mid-summer periods.

Nutrients and Trophic Status

Nutrients are elements and compounds needed for plant and algal growth. They are often found in a variety of chemical forms, both inorganic and organic, which may vary in their availability to plants and algae. Typically, growth and biomass of plants and algae in a waterbody are limited by the availability of the nutrient present in the lowest amount relative to the organisms' needs. Lake biological productivity is referred to in terms of "trophic status." Water clarity, total phosphorus, and chlorophyll-*a* are three important determinants of a lake's trophic status.

Water clarity, or transparency, provides an indication of overall water quality—the greater the clarity, the better the water quality. In most Southeastern Wisconsin lakes, water clarity is influenced by the abundance of algae and suspended sediment. Water clarity generally varies throughout the year as algal populations increase and decrease in response to changes in lake temperature, sunlight, and nutrient availability. Large rainfall events can also influence water clarity, with sediment-induced clarity declines caused by heavy runoff. Clarity is measured using a Secchi disk, a black-and-white, eight-inch-diameter disk. This disk is lowered into the water until it is no longer visible, at which point the depth is recorded, and then it is raised until visible again, when depth is recorded again. The average of these depths is called the "Secchi depth." Commission staff measured a Secchi depth of 4.5 feet at the deep hole site, which is indicative of average water clarity. This value was within range of past reported Secchi readings, ranging from 1.5 feet (very poor clarity) to a maximum of 13.1 feet (high clarity) in 1992.[19]

Other parameters indicating trophic status can include phosphorus and chlorophyll-*a*. Phosphorus is a key nutrient for aquatic plants and algae and its availability often limits their growth and abundance. Chlorophyll-*a* is a photosynthetic pigment whose abundance is used to indicate algal biomass within a lake. Although chlorophyll-*a* and phosphorus were not collected in the 2025 survey, the historically collected

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[18] *Some fish species, such as carp, can tolerate DO concentrations as low as 3 mg/L while coldwater fish species, such as trout, can require DO concentrations greater than 6 mg/L for healthy conditions.*

[19] *apps.dnr.wi.gov/lakes/waterquality/Station.aspx?id=413687.*

data is briefly discussed in this memorandum as Scout Lake is currently listed as an impaired waterbody due to phosphorus. The Lake was listed in 2014 due to exceedance of phosphorus levels by the Wisconsin Department of Natural Resources.[20] The most recent total phosphorus measurements were taken in 2005, with a maximum concentration of 0.049 mg/L recorded in July of that year. As little management has occurred besides general aquatic treatment via intermittent herbicides, these data from the early 2000s can provide insight into possible present-day conditions. This snapshot concentration exceeded the 0.04 mg/L numeric criterion that would indicate impairment due to nutrient enrichment based on WDNR standards for unstratified lakes.[21,22] Referencing historic measurements, Scout Lake's phosphorus levels have ranged from 0.01 up to 6.3 mg/L (see Figure 7). In 2005, the maximum chlorophyll-*a* concentration was 18 µg/L; under the 27 µg/L criterion that would suggest impairment of lakes and reservoirs.[23] When converted to a trophic state index, these measurements indicate that the Pond is most likely eutrophic, meaning that it is excessively rich in nutrients.

Though Scout Lake is impaired for phosphorus, the Lake is amongst the highest quality Milwaukee County Park Ponds and is a valuable urban greenspace for the area and beyond. The 2005 Milwaukee County Pond & Lagoon Management Plan assessed several Milwaukee County Park ponds for water quality in 2003 and 2004.[24] Notably, Scout Lake had the lowest concentrations of total suspended solids, total phosphorus, and chlorophyll-*a*. These attributes can be contributed to the Lake's depth, natural origin, small watershed, and surrounding vegetation. Soil compaction was the only noted erosion issue at the time of the survey.[25] As a valuable inland lake, noting where specifically water quality issues lie can ensure targeted management to maintain the space for future generations to come. In Scout Lake specifically, phosphorus and low dissolved oxygen levels were the most pressing water quality issues, particularly located in the lower depths of the Lake. Potential remedies could include applying an alum treatment, enhancing native shoreline vegetation, physical removal of aquatic plant mass, or considering an aerator. Particularly, native shoreline plantings can decrease soil erosion, increase pollinator visitation, and discourage direct access of waterfowl into and out of the Lake to deter nuisance populations.[26]

Other Parameters

Commission staff additionally recorded pH and mVORP values as detected in the suite of the Hanna Instruments meter (see Figure 5). The pH scale measures the acidity of water, a logarithmic measure of the hydrogen ion concentration on a scale of 0 to 14. Pure water has a pH of 7, neutral on the pH scale. In Wisconsin lakes, pH can range anywhere from 4.5 in some acid-bog lakes to 8.4 in hard water, marl lakes.[27] Many chemical and biological processes are affected by pH, as are the solubility and availability of many substances. Different organisms can tolerate different ranges of pH, with most preferring ranges between about 6.5 and 8.0. Although moderately acidic water (slightly below a pH of 7) does not usually harm fish, as pH drops to 6.5 or lower, some species can be adversely affected, especially during spawning. In addition, many metals are more soluble in water with low pH than they are in water with high pH and can be released from lake sediment if present under low pH conditions.

With an average pH of 7.4, Scout Lake is a slightly basic waterbody.[28] The pH of the Pond ranged from 7.0 to 7.8 and was more alkaline near the surface (see Figure 5). These measurements are slightly more acidic when compared to the earliest known data taken during the same time of year in 1981 as the 2025 data.

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[20] *dnr.wisconsin.gov/topic/SurfaceWater/Impairments.html.*

[21] *dnr.wisconsin.gov/topic/SurfaceWater/Impairments.html.*

[22] *Total phosphorus levels have ranged from 0.01- 0.15 mg/L since 1980.*

[23] *Chlorophyll-a concentrations have ranged from 0-61 µg/L since 1981.*

[24] *Milwaukee County Environmental Service, 2005,* op. cit.

[25] Ibid.

[26] *Smith, et al.,* Managing Canada Geese in Urban Environments, *1999.*

[27] *Wisconsin Department of Natural Resources, Byron Shaw, Christine Mechenich, and Lowell Klessig*, Understanding Lake Data: *www.uwsp.edu/cnrap/UWEXLakes/Documents/ecology/shoreland/background/understanding%20lake%20data.pdf.*

[28] *Lillie, R.A. and Mason, J.W*, Limnological characteristics of Wisconsin lakes: Wisconsin Department of Natural Resources Tech. Bulletin No. 138*, 1983.*

The 1981 findings (pH between 7.6 and 8.2) indicate slight acidification of the Lake over time. A waterbody's pH can be affected by acids released by decomposition of organic material, underlying soil and bedrock type, and photosynthesis of aquatic plants, phytoplankton, and algae. Additionally, external factors such as pollutants contained in discharges from point sources and stormwater runoff as well as precipitation ("acid rain") can also affect the waterbody's pH.

Additionally, mVORP measurements refer to the oxidation-reduction potential (ORP), measured in millivolts (mV), which reports the electron transfer capacity by measuring oxidizing or reducing agents. The unique combination of dissolved solutes in the water (i.e. chlorine, decaying matter, hydrogen, oxygen) swing the redox value to be positive or negative. A high ORP typically signifies oxidizing conditions in a lake ecosystem, which sustains aerobic bacteria to enhance decomposition, while low ORP can indicate reducing conditions that sustain anaerobic bacteria and may limit decomposition. The mVORP values of Scout Lake were positive from the surface waters down to 14 feet, maintaining a range between 214 – 245 mV. There was a stark drop at 15 feet where values swung down to negative 21 mV and then continued to decrease (see Figure 5). These positive results within 14 feet of the water column indicate that decomposition can occur efficiently under aerobic, oxidizing conditions, though the deeper areas down into the sediment may be unable to perform decomposition efficiently.

Sediment

As part of the natural aging process, all lake basins gradually fill with sediment. This sediment is primarily derived from the following processes.

- Sediment carried to a lake by actively flowing water: Erosion over broad expanses of upland areas is typically the primary source of such sediment to most lakes. This sediment is generally funneled to lakes through tributary streams. In some cases, general overland flow around the lake and shoreline erosion can also be significant contributors to a lake's overall sediment load. Much of the sediment carried to lake basins by moving water is comprised of inorganic gravel, sand, silt, and clay. Lakes with large watersheds, significant land and/or shoreline disturbance can lead to the accumulation of large amounts of sediment to be deposited into the lake bottom each year. Coarser-grained sediments (i.e., silt, sand, and gravel) commonly accumulate near the point where moving water enters a lake. In contrast, portions of lakes well offshore, or otherwise distant from moving water, accumulate clay-size sediment. The actual amount of sediment entering lake basins is highly dependent on lake- and watershed-specific factors and is therefore highly variable.

- Sediment originating in a lake comprised of dead plants and animals: All aquatic plants, algae, diatoms, fish, and other aquatic life eventually die and settle to the lake bottom. When the supply of such material exceeds the ability for material to be decomposed and removed from the lake bottom, organic deposits form. These deposits are commonly termed muck or peat. Muck is deposited throughout lake basins while peat is general confined to riparian wetlands. The amount of these materials deposited within lakes is highly variable and is highly dependent upon the level of lake nutrient enrichment.

Scout Lake was reported to attain a maximum depth of 20 feet in 1964, the same maximum depth that was recorded by Commission staff in 2025. The lack of change suggests that the Lake has not substantially filled in during the intervening years from sedimentation.[29] A 1981 WDNR map indicates that the Lake bottom was predominantly organic, mucky sediment over clay or sand; these conditions were consistent with the sediment observations by Commission staff during the 2025 aquatic plant survey.[30] Scout Lake's sediment was tested for contaminants such as phosphorus, the pesticide DDT (dichloro-diphenyl-trichloroethane), and metal contaminants in 2003 as a part of Milwaukee County's Phase II of the Park and Lagoon Management Plan.[31] The sediment cores were not found to exceed any quality guidelines that would affect benthic macroinvertebrates or groundwater.[32]

[29] *Wisconsin Conservation Department*, Surface Water Resources of Milwaukee County*, 1964*.

[30] *WDNR, 1981,* op. cit.

[31] *Milwaukee County Environmental Service, 2005,* op. cit.

[32] *See Table 1 on page 17 on the* WDNR Consensus-Based Sediment Quality Guidelines; Recommendations for Use & Application*, December 2003. (widnr.widen.net/s/fkwscvxq26/rr088).*

Taking a broader view of the Lake and its watershed, the Lake is surrounded by steep slopes, classified here as greater than or equal to nine percent gradient (see Map 3). Steep slopes can cause erosion that intensifies nutrient runoff and sedimentation into the Lake. Over time this process has formed a gulley north of Scout Lake, draining from a culvert off State Highway 36 before cutting into the Park (see Figure 8). The carried sediment from the gulley pushes through a culvert under the paved lake trail before emptying into Scout Lake. Significant amounts of sediment have filled approximately 0.13 acres in the Lake over time.[33] While there is no stormwater pipe at the head of the gulley, the major intersection of State Highway 36 and Grange Avenue forms the northern and eastern boundaries of the Park and funnels runoff southeast towards the gulley (see Map 3). Milwaukee County Park staff have noted this gulley and surrounding erosion to be an ongoing problem that has continued to become worse. As a State Highway, STH 36 is owned by Wisconsin DOT and falls under the TS4 Permit for stormwater management in accordance with chapter 283, Wis. Stats. and chs. NR 151 and NR 216, Wis. Adm. Code.[34] As per their most recent permit, "the DOT is only responsible for controlling pollutants in stormwater discharges that originate within DOT property…".[35] Piles of stone have been placed at the head of the gulley in 2024 within the DOT parcel, most likely as an erosion control measure to address the headcutting. As the gulley flows through two parcels, measures to address the gulley should be collaborative as well as practical. These measures can include removal or reduction in the water source of the gulley through roadside BMP's and can be coordinated with contact with the WDOT for further information. Other measures can include refilling the gulley with spaced dikes to slow that can limit the amount of sedimentation occurring. Further removal of invasive buckthorn and subsequent planting of native species will aid in soil stabilization along the slopes. As buckthorn is allelopathic, thus inhibiting the growth of other species, primary removal of buckthorn is recommended before seeding native plantings. Additional implementation and/or enhancement of vegetative riparian buffers immediately around the Lake would also be beneficial in slowing the lake sedimentation process and enhancing the Lake's water quality.

SUMMARY

- Scout Lake is of great value to Park users and supports outdoor recreation, access to greenspace, and community gathering space. The Lake also provides habitat for aquatic reptiles, amphibians, and birds as well as the opportunity for users to view and connect with this wildlife.

- The Lake is one of few natural inland lakes in Milwaukee County and among the deepest inland lakes in the County. The Lake's depth, natural origin, small watershed, and surrounding vegetation make it amongst the highest quality Lakes owned and maintained by Milwaukee County Parks.

- Scout Lake was listed as impaired for phosphorus in 2014 by the WDNR. Phosphorus reduction methods such as erosion reduction by shoreline and surrounding slope stabilization may help in reducing incoming sediment and associated nutrients. The Lake is eutrophic, and possible physical removal of invasives like EWM and CLP may aid in removal of the associated nutrients in the plants themselves.

- A gulley draining from STH 36 has been noted as a significant source of sediment loading into Scout Lake and has only gotten worse over time. Addressing the gulley to prevent further degradation can be achieved through collaborative efforts with the WDOT to improve stormwater runoff into the Park and long-term implementation of gulley management methods.

- Project fundraising and volunteer hours for restoration projects could be provided by Milwaukee Parks Foundation, The Park People, or other non-profit organizations. Aquatic rakes could be provided for hand-pulling aquatic invasive species.

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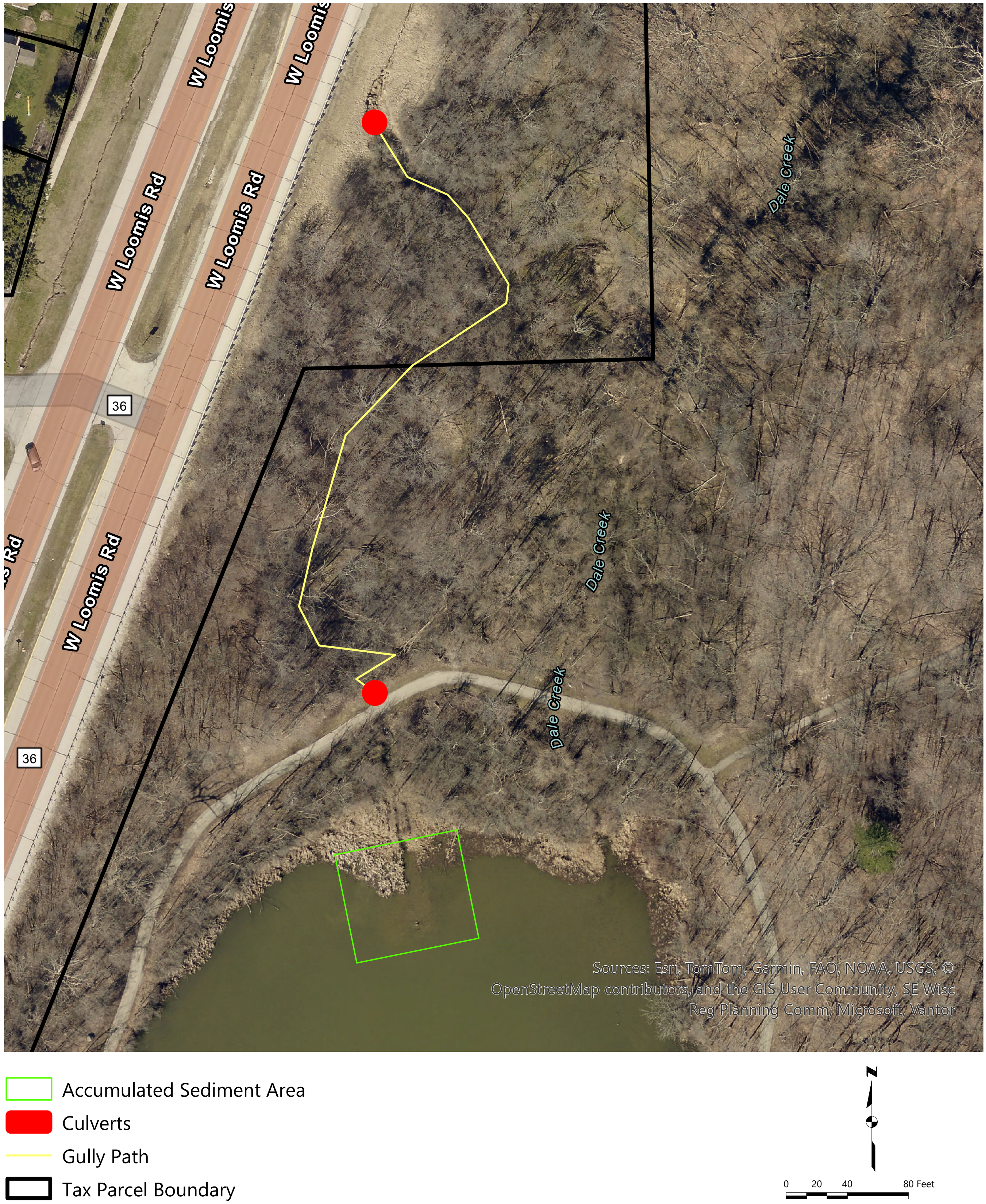
[33] *As quantified by Milwaukee County Parks staff.*

[34] *More information about the WDOT stormwater management can be found on their website, including past and current TS4 permits, see: wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/environment/stormwtr-mgmnt.aspx.*

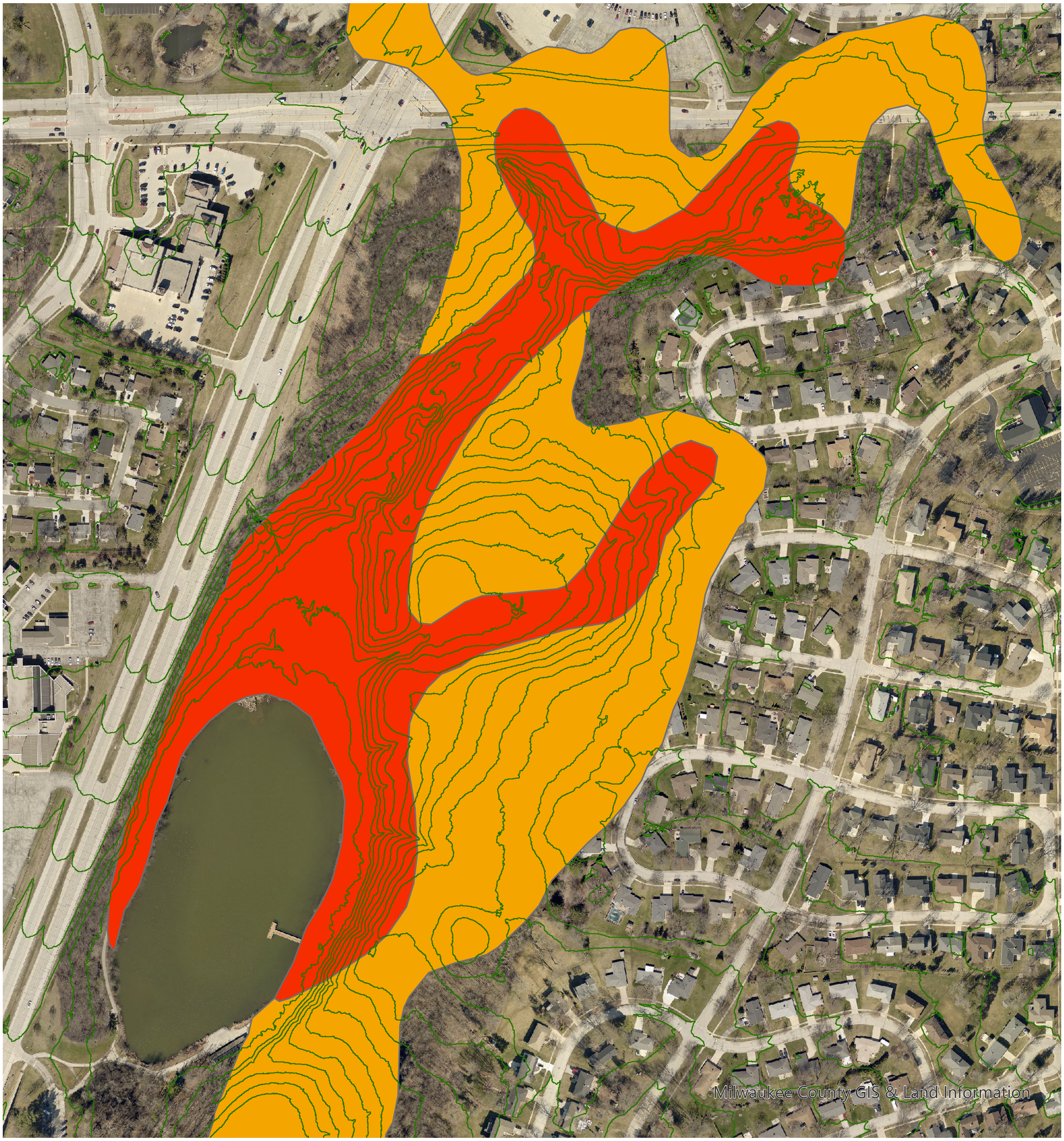
[35] *State of Wisconsin Department of Natural Resources,* General Permit to Discharge Under the Wisconsin Pollutant Discharge Elimination System WPDES Permit No. WI-S066800-2, *December 2023.*

Figure 8
Gully Into Scout Lake



Source: Milwaukee County Parks and SEWRPC

Map 3
Steep Slopes Surrounding Scout Lake



Slope Gradient (percent)

9

16

Topographic Contour

N

0 95 190 380 Feet

Source: Milwaukee County and SEWRPC