Upper Salt Creek
Watershed-based Plan

DuPage River Salt Creek Workgroup

March 31, 2023

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Acknowledgements

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Front cover photo: Arlington Heights Branch, at the Rolling Meadows Historical Museum, courtesy of Hey and Associates, Inc.

Back cover photo: Salt Creek, Busse Woods Forest Preserve, Elk Grove Village, courtesy of TCF

Executive Summary

The Upper Salt Creek watershed is comprised of Salt Creek, upstream of and including Busse Lake, and includes the West Branch, the Arlington Heights Branch, and many smaller tributaries. Situated in suburban Chicagoland, and once predominantly agricultural, this region has experienced urban sprawl and subsequent significant levels of modification and development. These changes have collectively negatively impacted water quality through nonpoint source pollution.

Regulation and management of point source pollution is typically more straightforward, as specific outfalls can be identified and monitored for levels of constituents that are within maximum threshold requirements. Non-point source pollution is much more challenging to manage, as there isn’t a clear singular, identifiable source for impairment. Rather, nonpoint sources are comprised of oils, and gas from roads and parking lots, and are exacerbated by a reduction in wetland and floodplain areas, and the removal of native deep-rooted vegetation.

This Watershed-based Plan is designed to create and guide a collaborative and collective strategy to improve water quality, manage stormwater, and support quality of life of those who live, work, and visit the watershed by targeting these nonpoint sources. Watershed planning groups throughout Chicagoland have been developing watershed plans with similar goals, culminating in a region with a robust network of planning areas (Figure 1) that support management of nonpoint source pollution reduction.

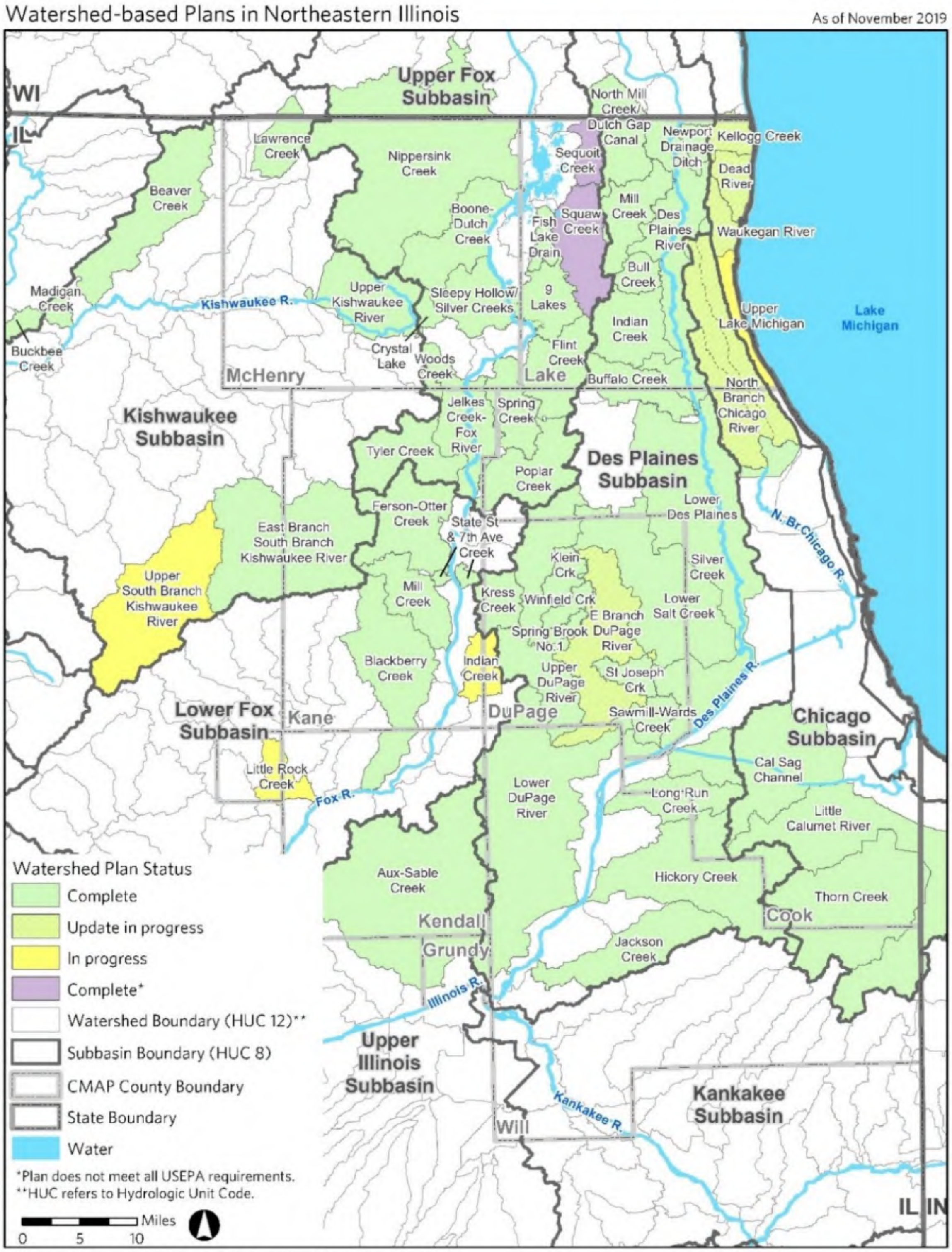
In an effort to further support nonpoint source management, and guided by U.S. Environmental Protection Agency (USEPA) watershed-based plan requirements, components of this plan were specifically written to support the eligibility of implementation projects for Clean Water Act Section 319(h) grant funding.

The development of this plan, and the resulting plan itself, are products of many watershed stakeholders and watershed planning efforts of the surrounding region. This process took place in the midst and aftermath of the COVID-19 Pandemic. Many stakeholder group meetings were held virtually, and immediate public health crises were at the forefront of many member organizations and representatives. Despite these challenges, these entities and people came together to contribute to this plan.

The organizations that have been partners of the stakeholder group, the Upper Salt Creek River Watershed Planning Steering Committee, have made a commitment to consider and implement to the extent possible, the prioritized recommendations that evolved out of the watershed planning process. Partners identified through the planning process will prioritize recommendations for collaborative grant seeking opportunities going forward.

As further development and redevelopment occurs, it is critical that stakeholders in the watershed take appropriate action to recognize, appreciate, restore, and protect our natural areas and resources. This Watershed Plan is an advisory document designed for that purpose; to be used by all who live in, work in, and visit the Upper Salt Creek watershed, including residents, private landowners, municipal and county officials and their staff, developers, special districts, and land stewardship organizations.

Figure 1. Watershed Plan Status in Chicagoland



Chicago Metropolitan Agency for Planning, November 2019

1. Introduction

The goal of watershed planning is to preserve, restore, and protect ecological health of an area, to best sustain and enrich the lives of stakeholders.

The livelihood of communities depends on the vibrance and richness of the natural world and their inhabitants, including ourselves. Ecological health of the places people live, work, and play impacts the wellness of the residents and their ability to continue building community for years to come.

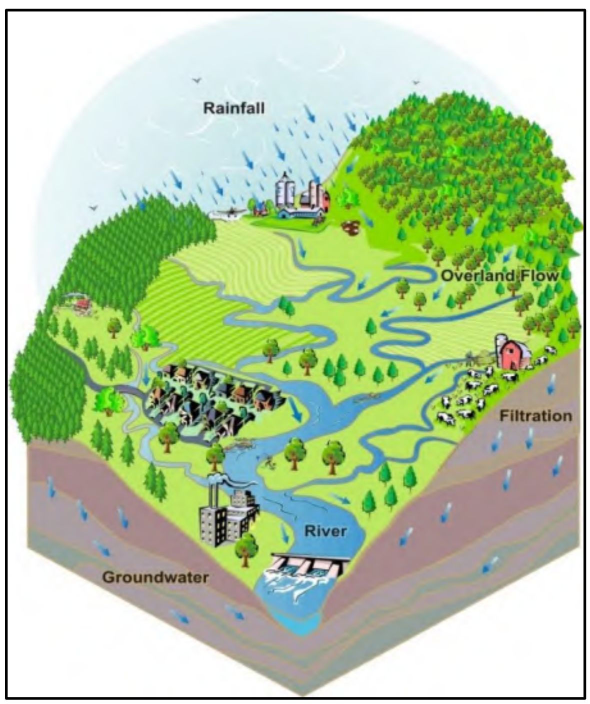
Human development has historically changed the landscape, from building roads and buildings, to straightening rivers and altering plant communities and habitat. Many of these watershed changes have negatively impacted our waterways, including their ability to manage floodwaters, support diverse plant and animal communities, and sustain sediment and nutrient cycles. Throughout the course of developing into the landscape, many natural areas and ecosystem functions have been preserved. Likewise, redevelopment of impacted areas has been focused on restoring a more undisturbed condition or transitioning to a more naturalized new design complex.

A watershed, defined by the United States Geological Survey as “an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel”, serves as the geographic area for thinking about, planning, and managing activities that affect many aspects of the landscape.

Watershed boundaries are primarily defined by natural topographic features. High points and ridges will form the edge or boundary of a watershed (Figure 2). Watershed boundaries can also change over time and be defined by man-made features like roads and canals.

Typically, stakeholders are identified as all the parties with an interest, in this case, in the watershed area. Residents, businesses, municipalities, counties, districts, and organizations are all stakeholders for the watershed area. It’s important to note that the stakeholder group also extends far outside the watershed, not only to users that visit the watershed, but to groups like downstream communities, users of aquifer resources, and adjacent communities.

Figure 2. Watershed boundary schematic, IEPA’s Watershed-based Planning presentation



Preserving ecosystems and their functions is important in the context of entire ecoregions and continents too, extending far outside our watershed and the reach of stakeholders. Diversity of plants, animals, and entire ecosystems make our communities more resilient to change. Therefore, preserving, restoring, and protecting natural areas and their functions at the smallest of scales compounds to preserve the cornerstones of diversity, richness, and resilience.

The Conservation Foundation (TCF) received a Clean Water Act grant from the IEPA to develop a watershed-based plan for the Upper Salt Creek watershed located in northern DuPage County and northwestern Cook County in northeastern Illinois. TCF partnered with the DuPage River Salt Creek Workgroup (DRSCW) to prepare this plan and work with local stakeholders to develop recommendations that upon implementation will help restore and protect the water quality of Salt Creek and its tributaries that ultimately drain to the Des Plaines River. This plan follows USEPA and IEPA watershed-based planning guidelines since it is made possible by Clean Water Act funding.

This watershed-based plan was built to closely resemble the Lower Salt Creek Watershed-based Plan, prepared by CMAP with partners DuPage County Stormwater Management (DCSM) and the DuPage River Salt Creek Workgroup (DRSCW). Since the Upper Salt Creek watershed flows directly into the Lower Salt Creek Watershed Figure 3 and the urbanized areas are similar in nature (covering both DuPage and Cook Counties, sharing prior plans, sharing monitoring network efforts, similar development timeframe and trends, etc.), consistency between these two plans is important.

In an effort to support continuity within the Salt Creek Watershed (Figure 3), this plan will address a similar problem statement and goals as those that were identified by stakeholders during the planning process for the Lower Salt Creek Watershed-based Plan:

Problem Statement: Surface waterbodies are impacted by a variety of nonpoint sources of pollution. Within the Upper Salt Creek watershed planning area, data indicates that Salt Creek and Busse Lake fail to meet certain water quality standards and thus do not attain all of their designated uses due to both known and unknown causes of pollution often related to land use. Many other streams and waterbodies in the watershed were not assessed or did not have enough data to support attainment status. Best management practices, programs, and policies must be identified and implemented by landowners and managers as resources allow to improve water quality and to restore designated use attainment. A plan will be completed that outlines protective actions to address nonpoint source pollution and guide remedial activities during the following ten years.

Goal: Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.

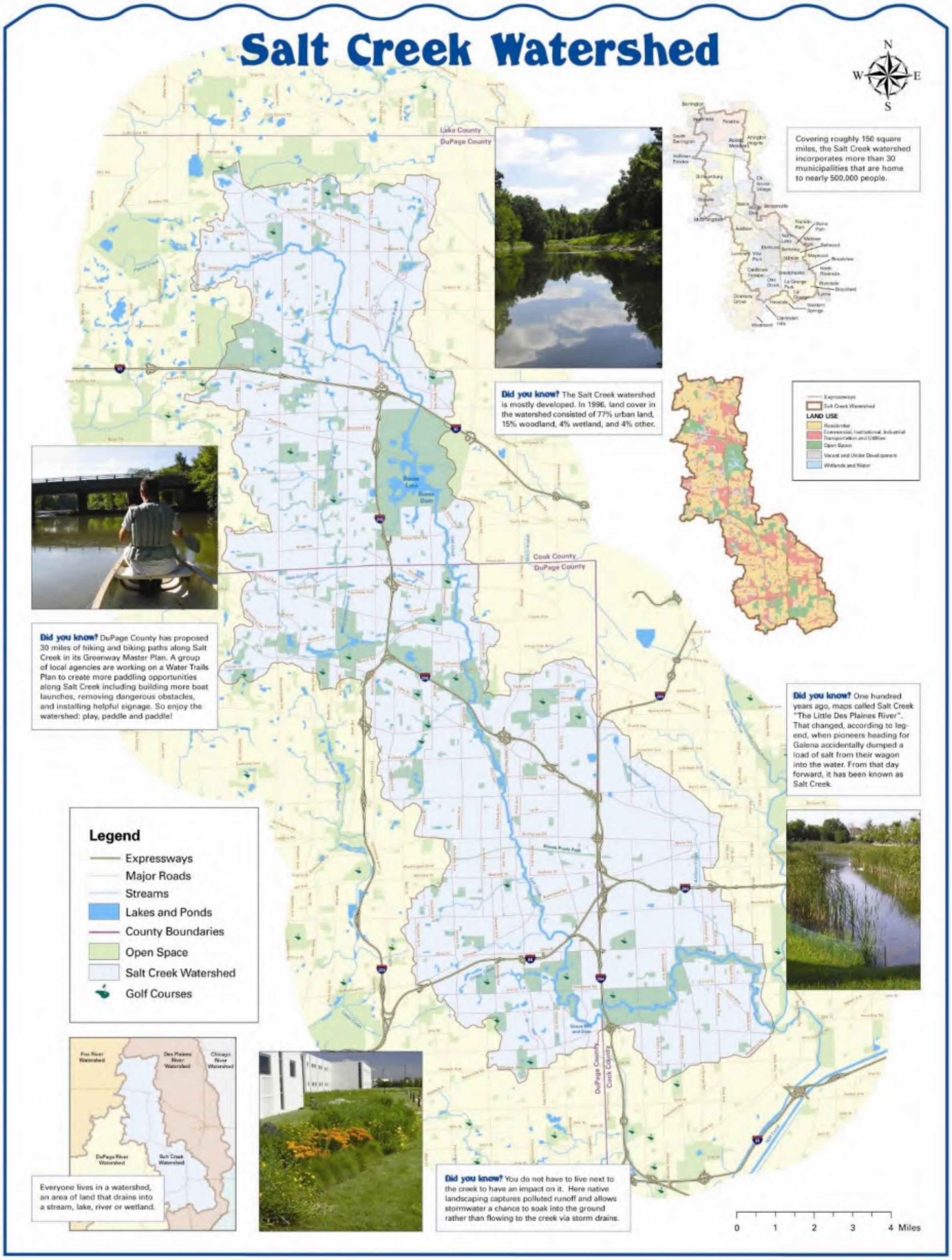
Goal: Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.

Goal: Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.

Goal: Continue to build, strengthen, and support local partnerships and expertise to protect streams, lakes, and wetlands via plan implementation.

Goal: Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.

Figure 3. Salt Creek Watershed Map, Salt Creek Network



2. Upper Salt Creek Watershed Planning Area

The Upper Salt Creek watershed planning area lies within the Des Plaines River Subbasin[1] intersecting the DuPage-Cook County border (Figure 4). For the extent of this plan, Upper Salt Creek originates in the headwaters of the Upper Salt Creek Mainstem, Arlington Heights Branch, and West Branch Salt Creek, includes Busse Lake, and terminated at the Busse Lake South Dam. The Upper Salt Creek planning area is comprised of one HUC 12 (071200040401) watershed (Figure 5). The 49.1 square mile planning area boundary was further refined and was subdivided into 4 subwatersheds or "study units" (Figure 6) to allow for a more nuanced understanding of local conditions and to improve consideration of best management practices in terms of where they will be helpful.

Table 1. Subwatershed study units in the Upper Salt Creek planning area

Subwatershed Study Unit	Area (sq mi)	Area (acres)
Upper Salt Creek Mainstem	19.2	12,298.5
Arlington Heights Branch	10.2	6,517.4
West Branch Salt Creek	11.8	7,521.7
Busse Lake	8.0	5,095.1
Total	*49.1*	*31,432.6*

[1] The Des Plaines Subbasin (HUC 07120004) is a part of the Upper Mississippi region (located within the Upper Illinois subregion). Major streams include the Des Plaines River, Salt Creek, and West Branch of the DuPage River.

Figure 4. Upper Salt Creek planning area within the Des Plaines River Basin

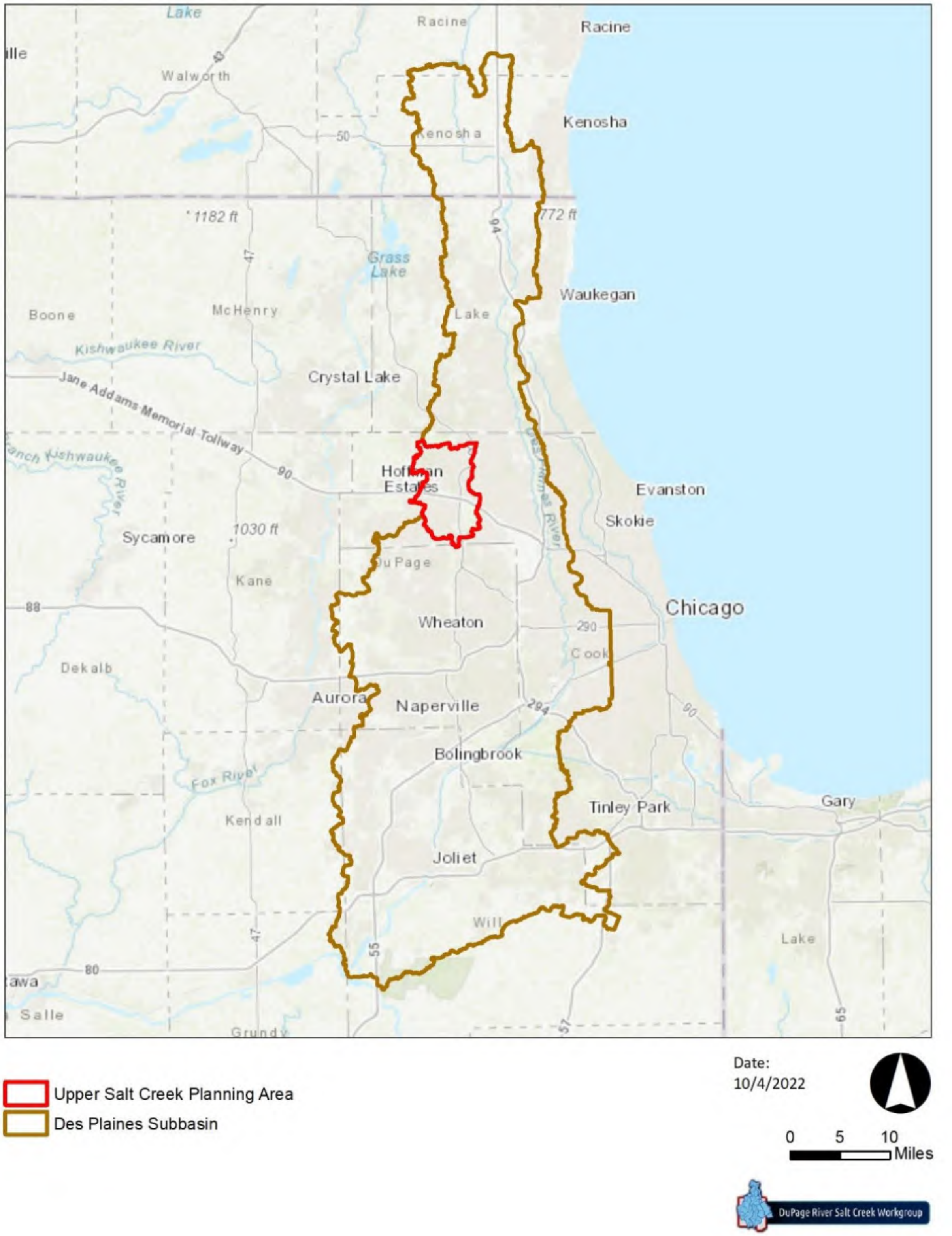


Figure 5. Upper Salt Creek planning area

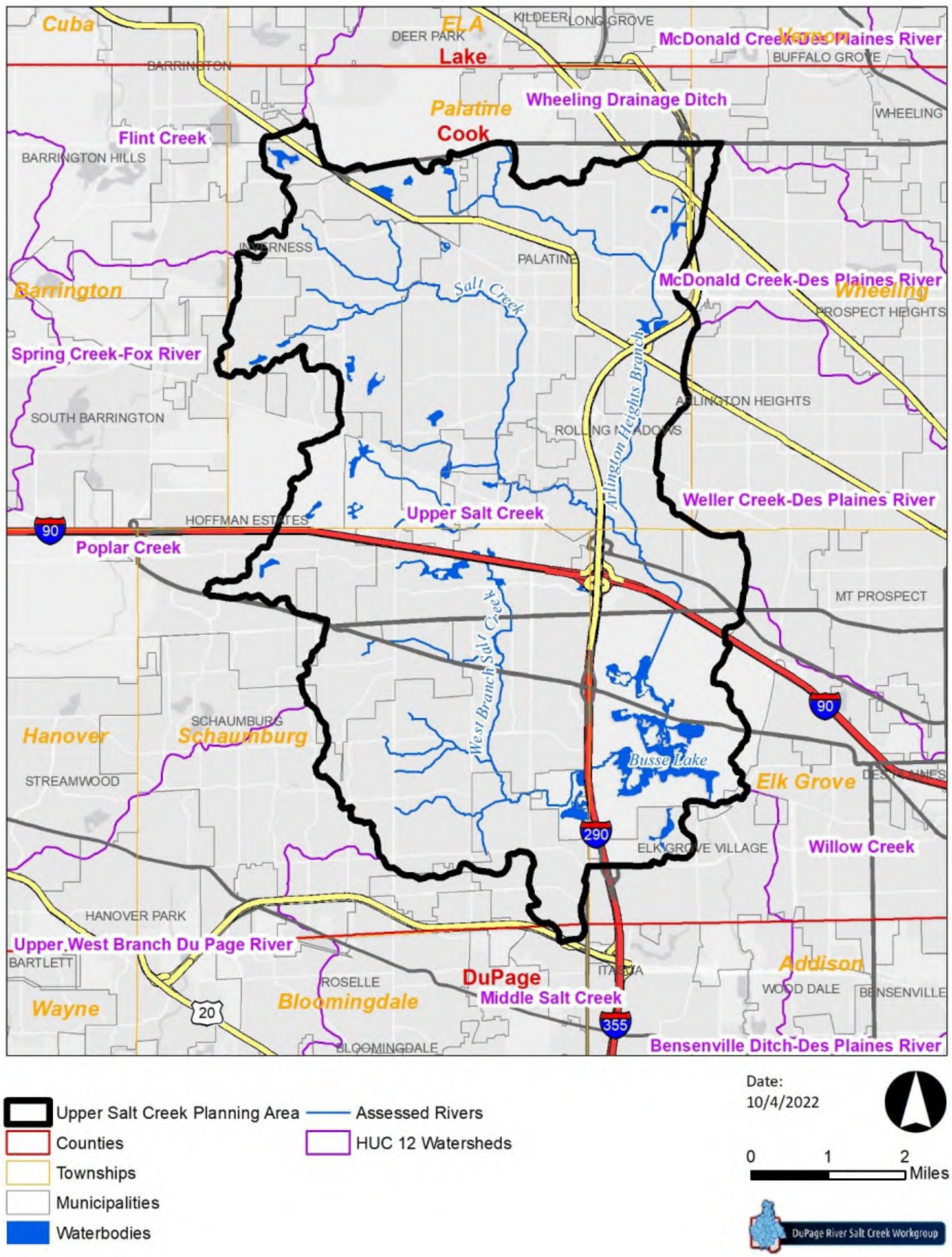
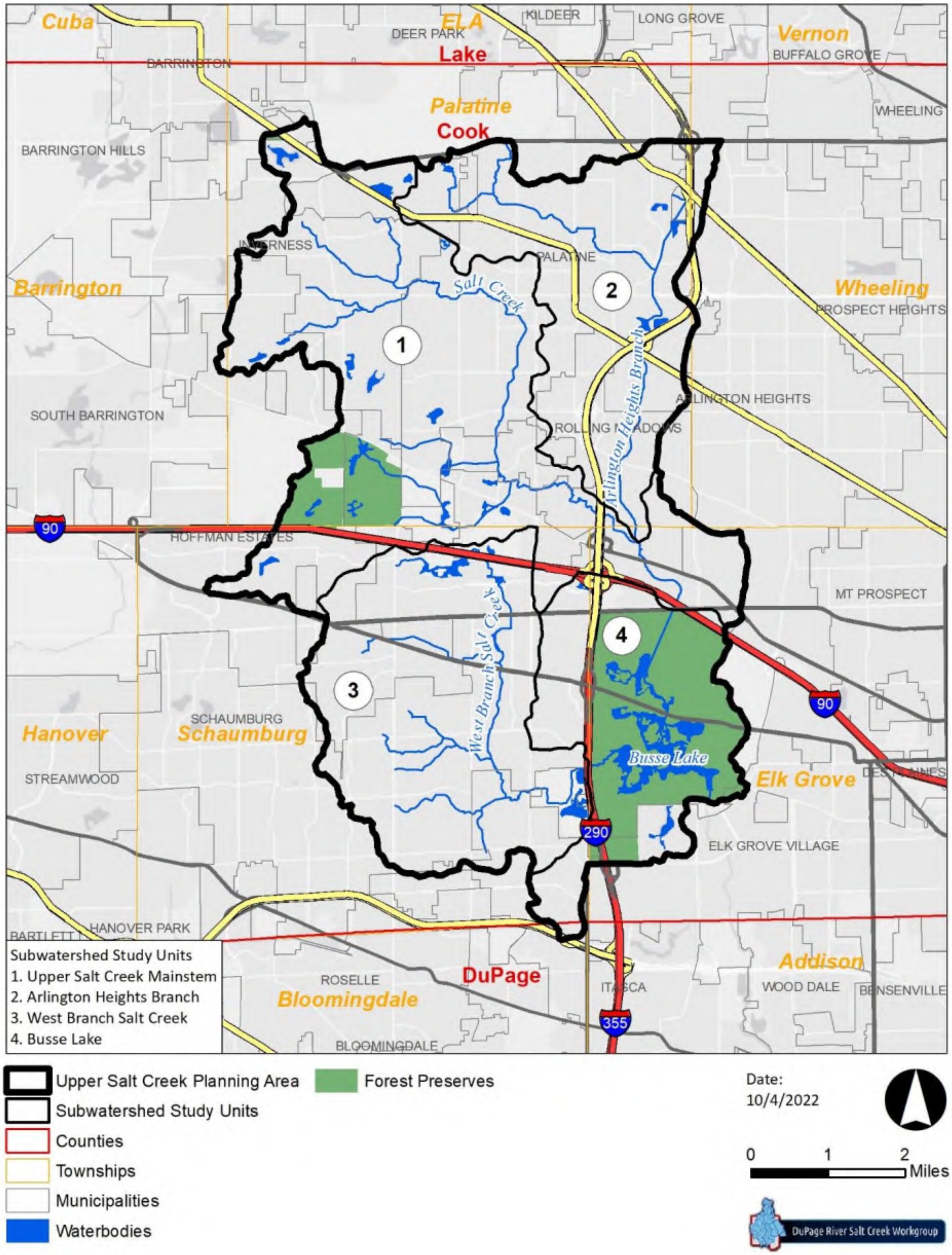


Figure 6. Upper Salt Creek subwatershed study units



2.1. Previous Watershed Planning and Implementation Activities

2.1.1. Watershed Plans

Detailed Watershed Plan for the Upper Salt Creek Watershed: Volume 1 (MWH for MWRD, 2009)

MWRD has authority for regional stormwater management within Cook County as granted by the Illinois General Assembly in Public Act 93-1049, which requires MWRD to develop watershed plans, including Upper Salt Creek. The primary goals of this plan were to 1) document stormwater problem areas, 2) evaluate existing watershed conditions using hydrologic and hydraulic (H&H) models, 3) produce flow, stage, frequency, and duration information about flood events along regional waterways, 4) Estimate damages associated with regional stormwater problems, and 5) evaluate potential solutions to regional stormwater problems. As part of this process, the Upper Salt Creek Watershed Planning Councils (WPCs) was formed to advise MWRD. This plan includes the development of stormwater improvement projects to address regional problem areas along open waterways. The report can be found at https://mwrd.org/sites/default/files/documents/1_Upper%20Salt%20Sections%201-6.pdf.

2.1.2. Flood Mitigation-based Plans

IDNR

Primarily of historical interest, these flood control reports are based on land use and design rainfall depths that have since changed significantly. These reports are available in the Illinois Department of Natural Resources (IDNR) Office of Water Resources library in Springfield, Illinois.

- Survey Report for Flood Control - Salt Creek (1955)
- Report on Plan for Flood Control and Drainage - Salt Creek (1958)
- Survey Report - Busse Woods Forest Preserve Reservoir (1963)
- Report for Flood Control and Drainage Development (1965)
- Supplemental Report - Report for Flood Control and Drainage Development (1967)
- Feasibility Report on Drainage Development - West Branch (1972)
- Upper Salt Creek Watershed Management Plan (1979)

USGS

The United States Geological Survey (USGS) has been investigating real-time flood control on Salt Creek, including Upper Salt Creek. Two papers have been produced summarizing the work.

- Modeling System for Near Real-time Flood Simulation for Salt Creek (1998)
- NEXRAD and Rainfall-Gauge Precipitation Inputs for Near Real-Time Flood Simulation of Salt Creek (2003)

USDA

The United Stated Department of Agriculture (USDA) documents are also of historical interest only. These reports are available in the IDNR Office of Water Resources library in Springfield.

- Preliminary Investigation Report - Salt Creek Watershed (1968)
- Watershed Work Plan (1971)

CMAP

CMAP has produced numerous reports over the years addressing flood control issues in Northeast Illinois. Two reports with applicability to Upper Salt Creek are summarized below.

Evaluation of Stormwater Detention Effectiveness in Northeastern Illinois (1989)

CMAP developed LANDS and Full Equations (FEQ) models of the Watershed to evaluate the effectiveness of detention in preventing increases in instream flow rates at the watershed scale. In the study, it was concluded that detention designed using the CMAP two-year and 100-year release rates would prevent increases for typical northeastern Illinois watersheds up to at least 30 square miles.

Investigation of Hydrologic Design Methods for Urban Development in Northeastern Illinois (1991)

As part of this study HSPF (successor to LANDS) was calibrated to the Upper Salt Creek (Algonquin Road gauge) and the Lower Salt Creek (Wolf Road gauge) watersheds. The calibrated model was then used to evaluate the various design storm methods used to size detention basins. In the report, it was concluded that the modified rational formula underestimates required detention volumes and that hydrograph methods such as TR-20 and ILLUDAS overpredict detention volumes under some circumstances and underpredict for others. A detention sizing chart was developed using the HSPF model and continuous rainfall-runoff simulations to provide an easy-to-use method for detention sizing. The chart (and variations for different release rates) has been included in DuPage and Lake County stormwater ordinances.

MWRD

Upper Salt Creek Watershed Floodwater Management Plan (1973)

The District, in association with NRCS, the North Cook County Soil and Water Conservation District (SWCD), the Forest Preserves of Cook County (FPCC), the State of Illinois, and the local municipalities and park districts, produced this report, which led to the construction of the Watershed reservoir system and the construction of the reservoirs.

DuPage County

DuPage County has prepared numerous reports on flood forecasting, model calibration, project evaluation, and methods of using continuous simulation and dynamic flood routing for establishing floodplain limits. Three reports that are specific to the Watershed are described below.

Hydrologic Calibration of HSPF Model for DuPage County (1994)

This study established countywide HSPF model parameters for use in DuPage County. The Salt Creek stream gauge at Algonquin Road, which is located within the Watershed, was one of five calibration points used for the countywide calibration.

Meteorologic Database Extension and Hydrologic Model Verification of HSPF Model for DuPage County (1994)

The countywide HSPF model was verified at seven streamflow gauges that were not used in the original 1994 calibration. The meteorologic database and runoff simulation were extended from water year 1988 through water year 1993.

Hydraulic Evaluation of HSPF Model for Upper Salt Creek Watershed (Conservation Design Forum, 2005)

The HSPF and FEQ models were verified for simulation through water year 1996. During this effort, it was found that the 1985 land cover data within Cook County required significant adjustment to achieve an acceptable model calibration at the Algonquin Road and Busse Woods streamflow gauges. Using impervious cover as a calibration parameter for the Cook County simulation, the impervious land cover significant updating.

Although not a mitigation-based plan, it should be noted that the Federal Emergency Management Agency (FEMA) has recently updated the Flood Insurance Study (FIS) for Cook County and Incorporated Areas. The effective date is September 10, 2021.

2.1.3. Water Quality-based Implementation Projects

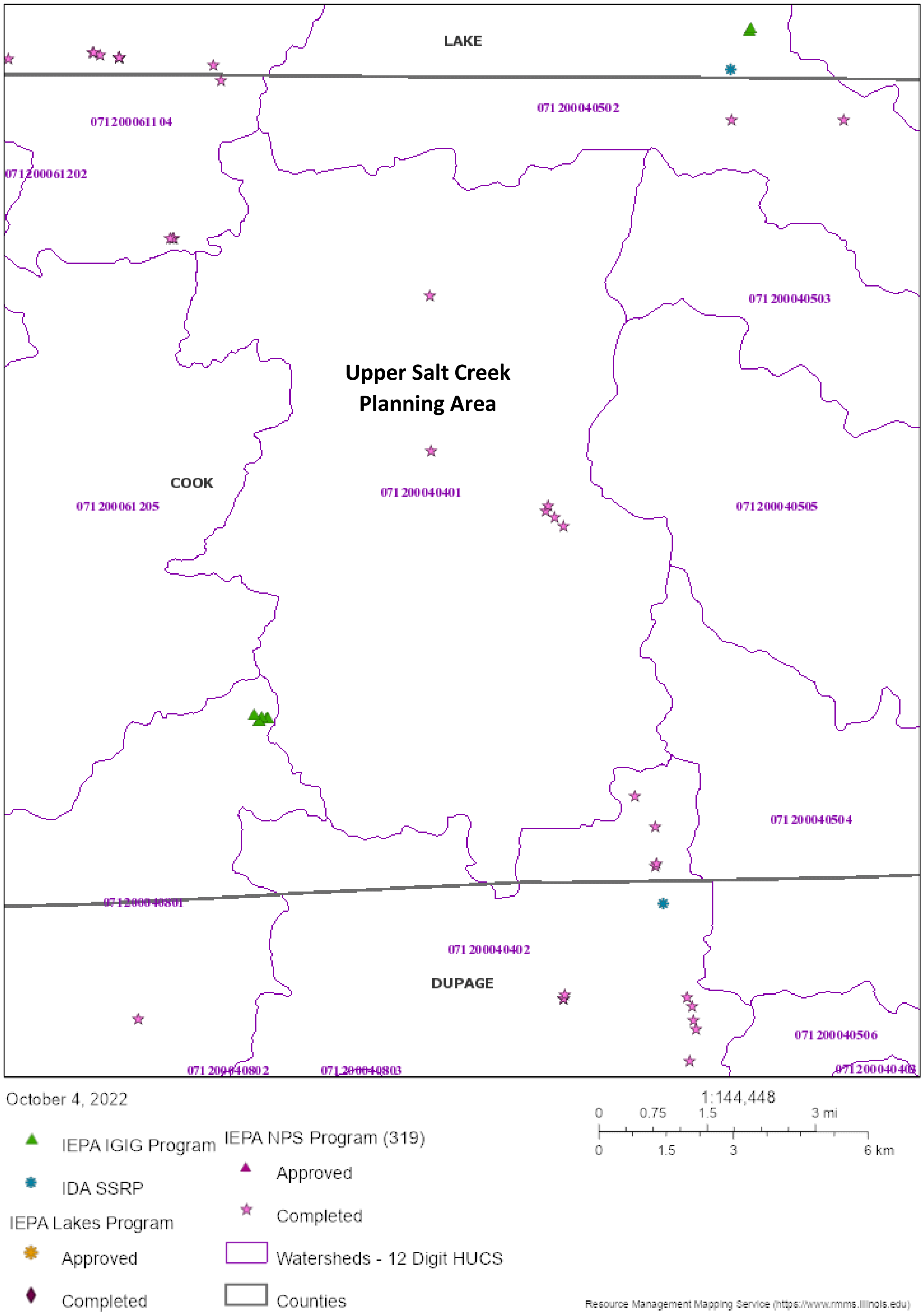
Projects aimed at protecting or improving water quality have been implemented in the planning area (Table 2, Figure 7). Several have been supported by federal or state grant programs including the federal Nonpoint Source Pollution Control "Section 319" Program administered through IEPA, the Illinois Clean Lakes Program, the Illinois Green Infrastructure Grant (IGIG) program, and the state's Streambank Stabilization and Restoration Program (SSRP) administered by the Illinois Department of Agriculture through county Soil and Water Conservation Districts. Although not included in Table 2, numerous other BMP projects have been supported by local grant funds such as MWRD's Stormwater Management Program. Five of the 316 projects were received by the City of Rolling Meadows, while the remaining project was received by the Village of Palatine.

Table 2. Water quality-based implementation projects by subwatershed[2]

Subwatershed Study Unit	319	Clean Lakes	IGIG	SSRP
Salt Creek Mainstem	6	0	0	0
Arlington Heights Branch	0	0	0	0
West Branch Salt Creek	0	0	0	0
Busse Lake	0	0	0	0
Total	*6*	*0*	*0*	*0*

[2] Counts for the 319, Clean Lakes, IGIG, and SSRP supported projects were derived from https://www.rmms.illinois.edu/ (accessed October 14, 2022). The "Other BMPs" were submitted to CMAP by watershed stakeholders through a web-based survey tool

Figure 7. Water quality-based implementation projects within the Upper Salt Creek planning area



2.1.4. Outreach and Education Publications

Salt Creek: A Resource Worth Preserving - Best Management Practices for Reducing Non-Point Source Pollution (NIPC, SCWN, and IEPA, 2004)

Developed by the Northeastern Illinois Planning Commission and SCWN with funding support from the IEPA, this manual provides local governments and other landowners with cost-effective techniques to help improve the quality of Salt Creek. The manual covers best management practices (BMPs) and outlines ideas for implementation of public green spaces, natural landscaping, buffers, swales and filter strips, rain barrels, cisterns, and rain gardens, reduced road salt impacts, bioengineered streambank stabilization, naturalized detention basins, infiltration practices, and green roofs. The manual can be accessed at https://static1.squarespace.com/static/5377ae2de4b0cb63d6fa7d44/t/537d6fc6e4b051f3bf87dce2/1400729542574/SaltCreekBMP.pdf.

Salt Creek: A Resource Worth Preserving - Guide for Funding Watershed Improvements and Projects (NIPC, SCWN, and IEPA, 2004)

In association with the BMP manual noted above, a companion booklet was produced to provide information on funding for water quality and watershed improvement projects. The guide is divided into three categories: Water Quality; Habitat and Wetlands; and Land Conservation, Recreation, and General Environment. The guide lists organizations to contact for funding as applicable to each of the three categories. However, the grant program and contact information is now outdated.

Salt Creek: A Resource Worth Preserving - Watershed Brochure and Map (NIPC, SCWN, and IEPA, 2004)

The third piece of SCWN's education and outreach strategy was a full-color informational brochure. On one side, it described the SCWN, the geography and history of the watershed, present challenges, and what citizens could do to help protect Salt Creek. On the other side, it included a map of the entire Salt Creek watershed showing waterbodies, open space, golf courses, roadways, and counties. Three inset maps provided locational context, land use, and municipalities within the watershed.

3. Watershed Resource Inventory

3.1. Local Governments and Districts

Serving predominantly Cook County, but also DuPage County (Table 3), portions of nine municipalities and six townships are located in the Upper Salt Creek planning area (Figure 8, Table 4, Table 5). Municipal jurisdictions cover approximately 84% (41.7 square miles) of the planning area, nearly half of which is comprised of the Village of Palatine and the Village of Schaumburg. Palatine Township, alone, makes up half (50.4%) of the township jurisdictional area.

Soil and Water Conservation District jurisdiction mirrors the division between Cook and DuPage counties, between North Cook County Soil and Water Conservation District and Kane-DuPage Soil and Water Conservation District, respectively.

There are 4 library districts that can play an important role in the education component of the plan, as well as 7 elementary school districts, 3 high school districts, one unit school district and two community college districts. There are 61 schools within or on the boundary of the planning area, of both public and private higher education universities, high schools, alternative schools, elementary schools, and district offices. There are two municipal sanitary districts, one wastewater treatment facility. Lastly, 11 municipal park districts, the Metropolitan Water Reclamation District of Greater Chicago, and the Forest Preserve District of Cook County own and manage land within the watershed planning area.

Table 3. Counties within the Upper Salt Creek planning area

Jurisdiction	Area (sq mi)	Area (acres)	Percent of Planning Area
Cook	49.5	31,648.4	99.9%
DuPage	0.1	42.0	0.1%
Total	*49.5*	*31,690.4*	*100.0%*

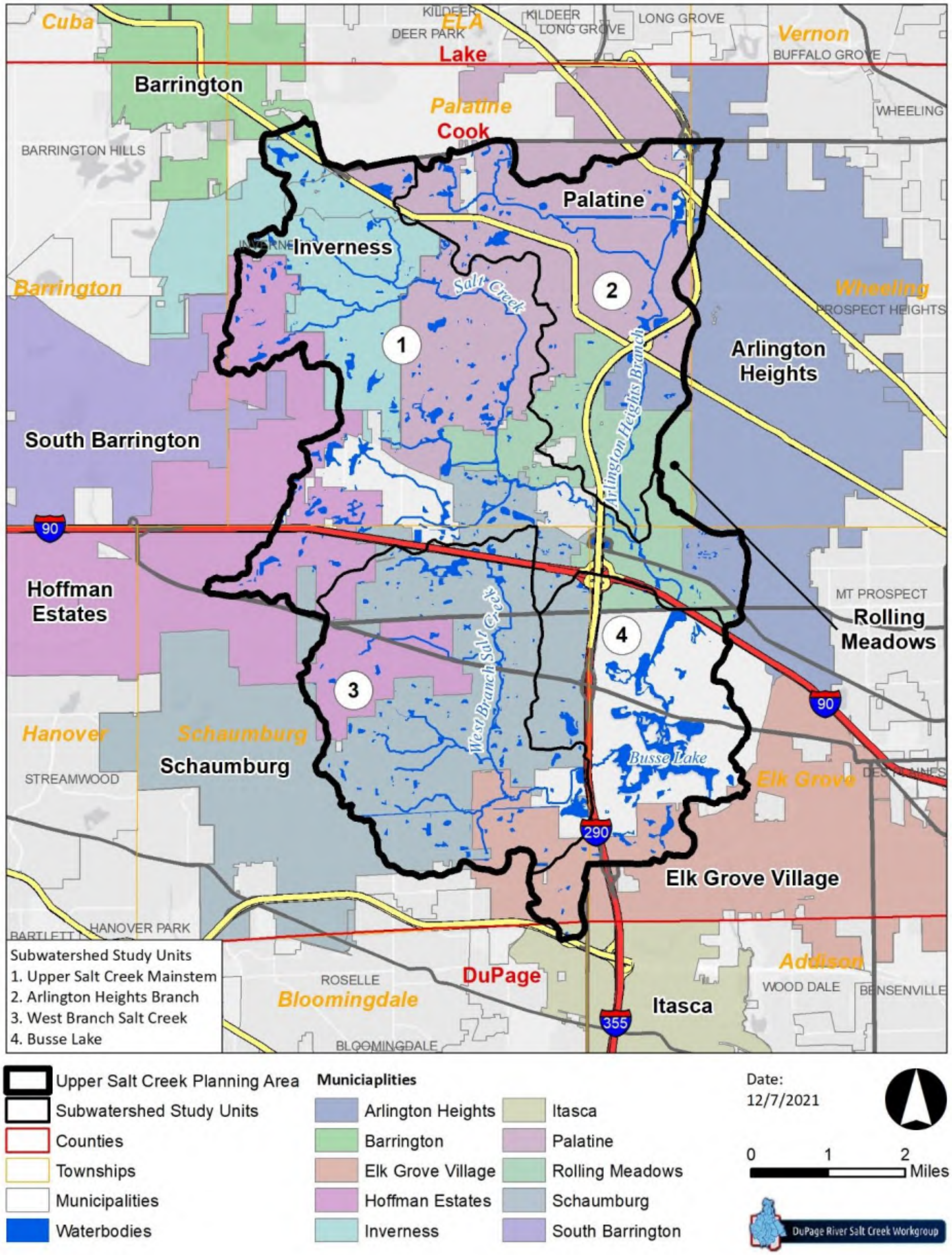
Table 4. Municipalities within the Upper Salt Creek planning area

Jurisdiction	Area (sq mi)	Area (acres)	Percent of Planning Area
Arlington Heights	1.6	1,016.8	3.2%
Barrington	0.1	82.6	0.3%
Elk Grove Village	2.4	1,536.5	4.8%
Hoffman Estates	5.6	3,559.8	11.2%
Inverness	3.9	2,521.3	8.0%
Itasca	0.1	41.7	0.1%
Palatine	11.8	7,567.1	23.9%
Rolling Meadows	4.9	3,124.1	9.9%
Schaumburg	11.3	7,253.0	22.9%
Unincorporated Areas	7.8	4,987.7	15.7%
Total	*49.5*	*31,690.4*	*100.0%*

Table 5. Townships within the Upper Salt Creek planning area

Jurisdiction	Area (sq mi)	Area (acres)	Percent of Planning Area
Barrington	0.04	26.7	0.1%
Bloomingdale	0.1	41.9	0.1%
Elk Grove	7.8	4,967.5	15.7%
Palatine	25.0	15,976.3	50.4%
Schaumburg	16.4	10,475.3	33.1%
Wheeling	0.3	202.7	0.6%
Total	*49.5*	*31,690.4*	*100.0%*

Figure 8. Municipalities and townships within the Upper Salt Creek planning area



3.2. Population and Demographics

Population (2020) in the planning area is estimated to be 169,774 people[3], a 2.55% increase from the 2010 population, 165,555[4]. This increase in population is in contradiction of the overall decrease in population by 0.14% for the state of Illinois. CMAP's On To 2050 Plan forecasts an 18% growth in population for Cook County[5]. Due to the large variation of demographic in Cook County, this projection cannot be very representative of the planning area.

Employment is another important demographic factor for watersheds because it affects land use, traffic patterns, and water use, to list a few. In the On To 2050 Plan, wage and salary employment is forecasted to increase by 16% for Cook County. Again, it is difficult to generalize this number to the planning area.

Figure 9 through Figure 12 visually present some representative data for the planning area with data akin from the U.S. Census.

Table 6. Select Upper Salt Creek planning area, county, and state demographic data

Characteristic	UPS	Cook Co.	DuPage Co.	Illinois
Median Age	42	35	38	37
Age 65 & over	11.5%	11.9%	11.6%	12.5%
< 5 years of age	5.1%	6.6%	6.2%	6.5%
< 18 years of age	19.8%	23.7%	24.8%	24.4%

[3] Population data for 2020 and census tracts provided by CMAP

[4] U.S. Census Bureau census block data for 2010. "Clipping" census blocks with the planning area boundary using ESRI ArcMap v10.1 geoprocessing tools will result in an overestimate of population.

[5]https://www.cmap.illinois.gov/documents/10180/905585/FINAL+Socioeconomic+Forecast+Appendix.pdf/928da7b0-84cf-8b78-0f73-daed68d96167

Figure 9. Population density in the Upper Salt Creek planning area, 2020

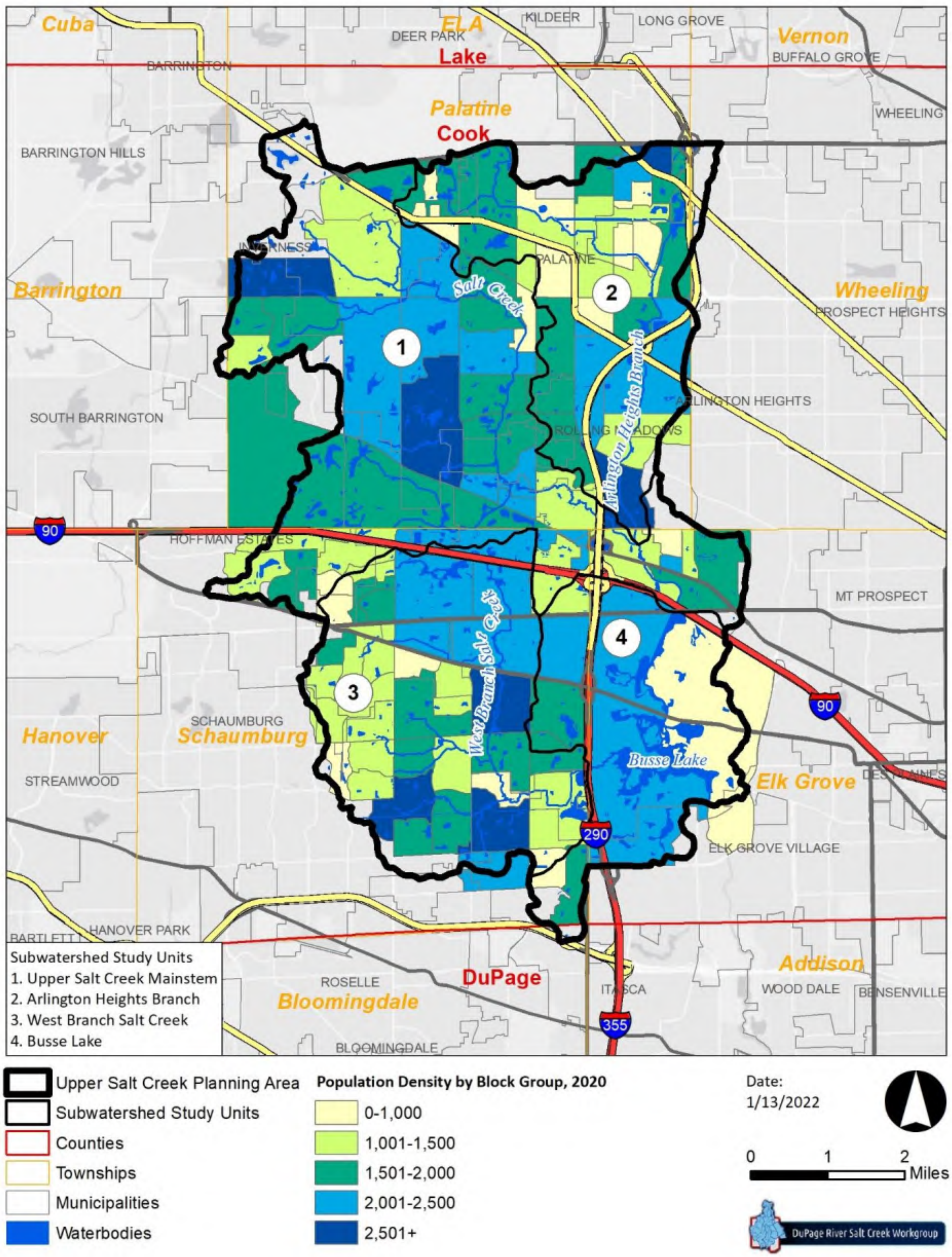


Figure 10. Median age in the Upper Salt Creek planning area, 2010

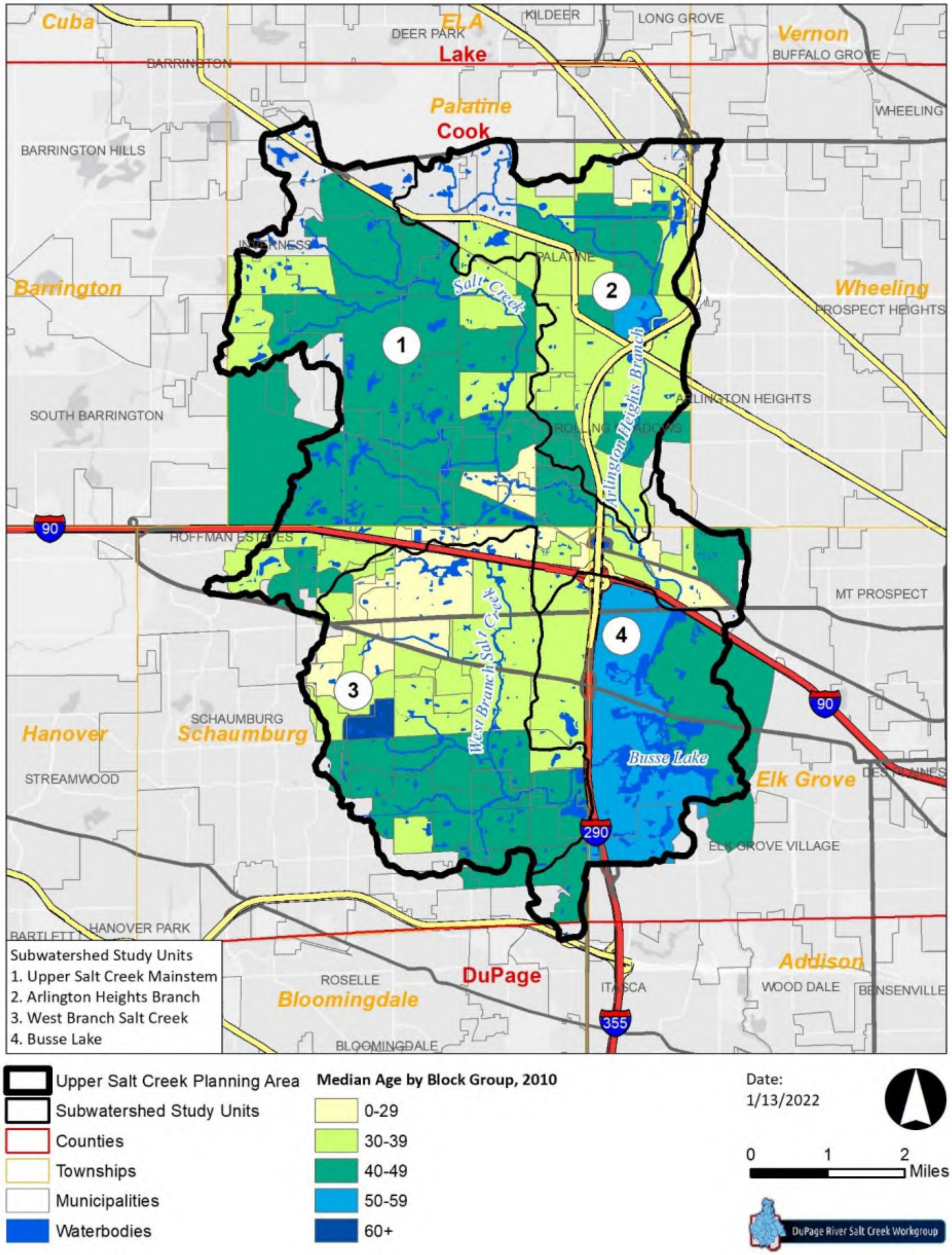


Figure 11. Median income in the Upper Salt Creek planning area, 2019

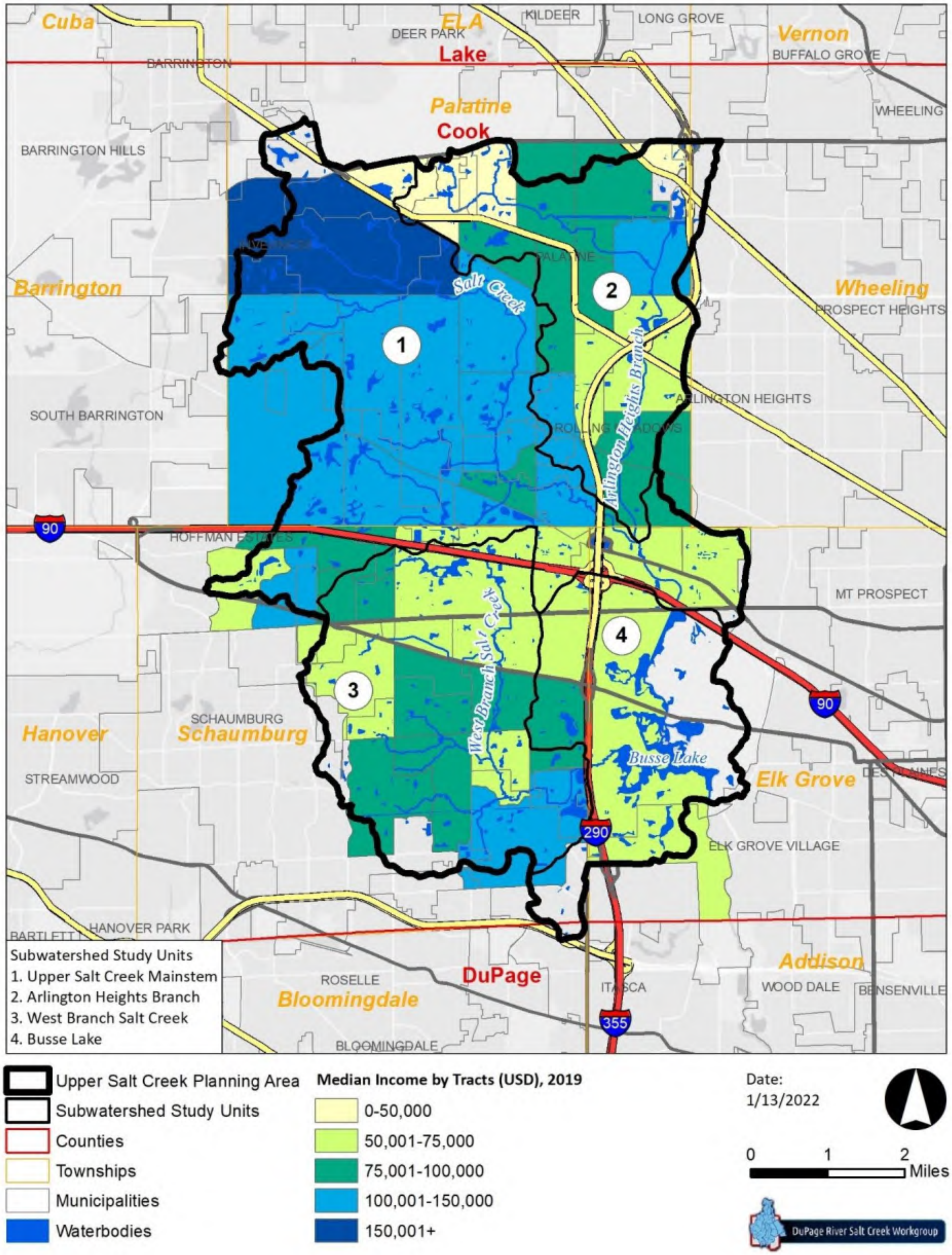
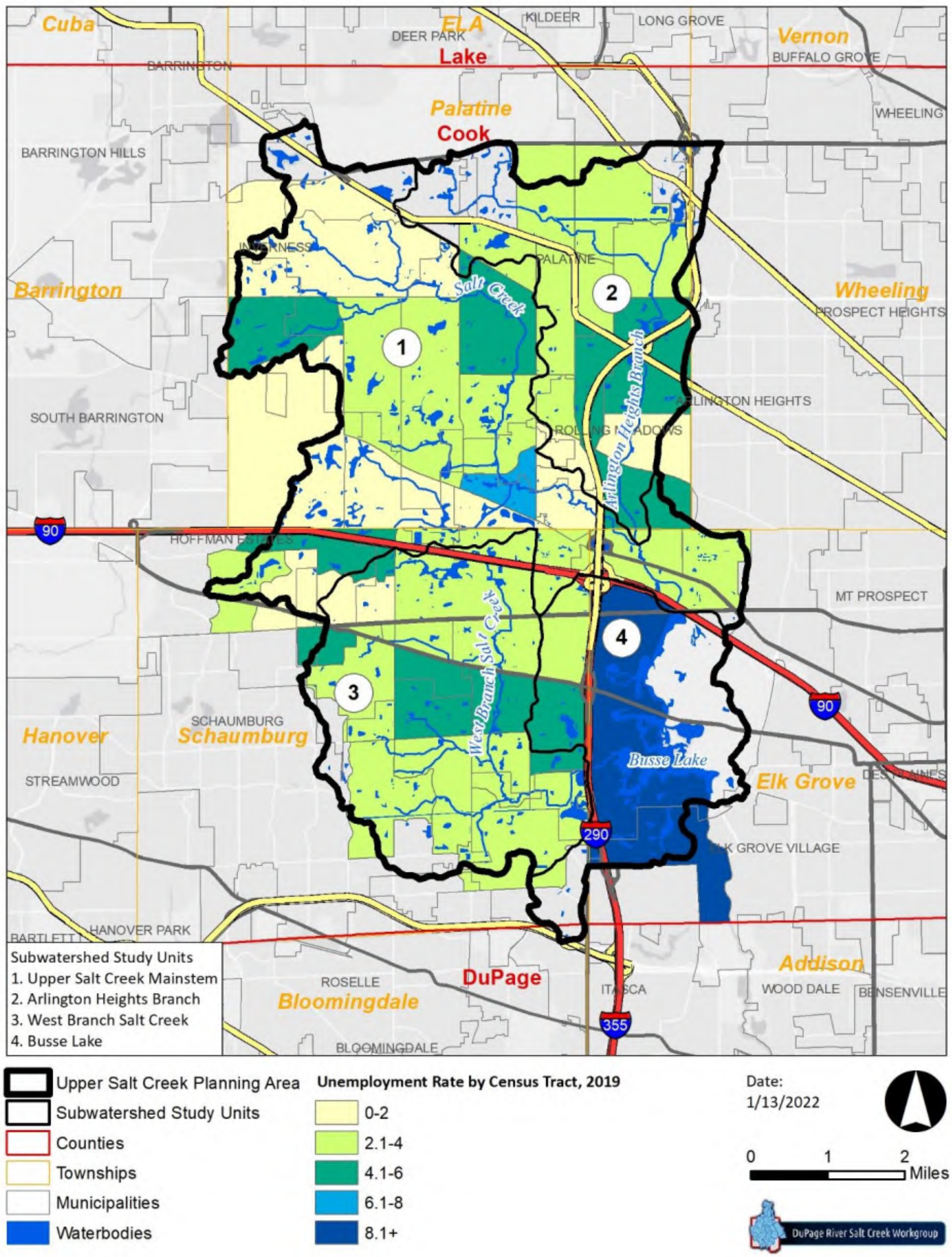


Figure 12. Unemployment in the Upper Salt Creek planning area, 2019



3.3. Physical and Natural Features

3.3.1. Climate and Precipitation

Located in northern Illinois, the Upper Salt Creek planning area experiences a continental climate. This means that it is quite common for summers to be hot and humid, while winters are colder with frequent below freezing temperatures. This occurs because Illinois is often affected by the polar jet-stream, which acts as an atmospheric highway; mass movements of cold polar air from the north move southward as southern, warm tropical air masses move northbound. The collision of both polar and tropical air masses leads to a continental climate where frequent fluctuations in temperature, humidity, wind direction, and cloudiness are possible within the short and long term. In terms of the prevailing winds, from November to May, they are west-northwest, and from June through October, they are south-southwest.

Data collected from O'Hare International Airport in Chicago, Illinois by the National Oceanic and Atmospheric Administration was used because it provided the most accurate and up-to-date representation of weather patterns and climate for Upper Salt Creek planning area. The data showed that the average annual temperature for the watershed is 49.9˚F. The warmest months occur in the Summer (June- August), with an average temperature of 71.8˚F. On the other hand, the coldest months (December-February) have an average temperature of 33.6˚F. Throughout the year, the average annual precipitation falls at 36.89 inches, and, consistent with the continental climate description(s), there are no dedicated wet or dry seasons[6].

In March of 2020, the Illinois State Water Survey updated Bulletin 70 and Circular 172/173 with a newer, more consolidated document entitled Bulletin 75. Bulletin 75 incorporates an additional 34-years of rainfall monitoring data and time-distribution characteristics to update the statistical analyses and subsequent precipitation depths for standard recurrence intervals. The 100-year, 240-hour storm intensities in northeastern Illinois increased by 13%. Future Illinois stormwater and water resources infrastructure should be designed and constructed to handle the new estimates of potential rainfall. As of January 2020, many construction standards and regulatory agencies, including the Illinois Department of Natural Resources Office of Water Resources and District 1 of the Illinois Department of Transportation, require the use of Bulletin 75 data for all new projects[7]. While not all counties across the state have adopted the use of Bulletin 75 at the time of this report, Cook County's regulatory authority, the Metropolitan Water Reclamation District of Greater Chicago, has updated their regulatory standards to reflect Bulletin 75.

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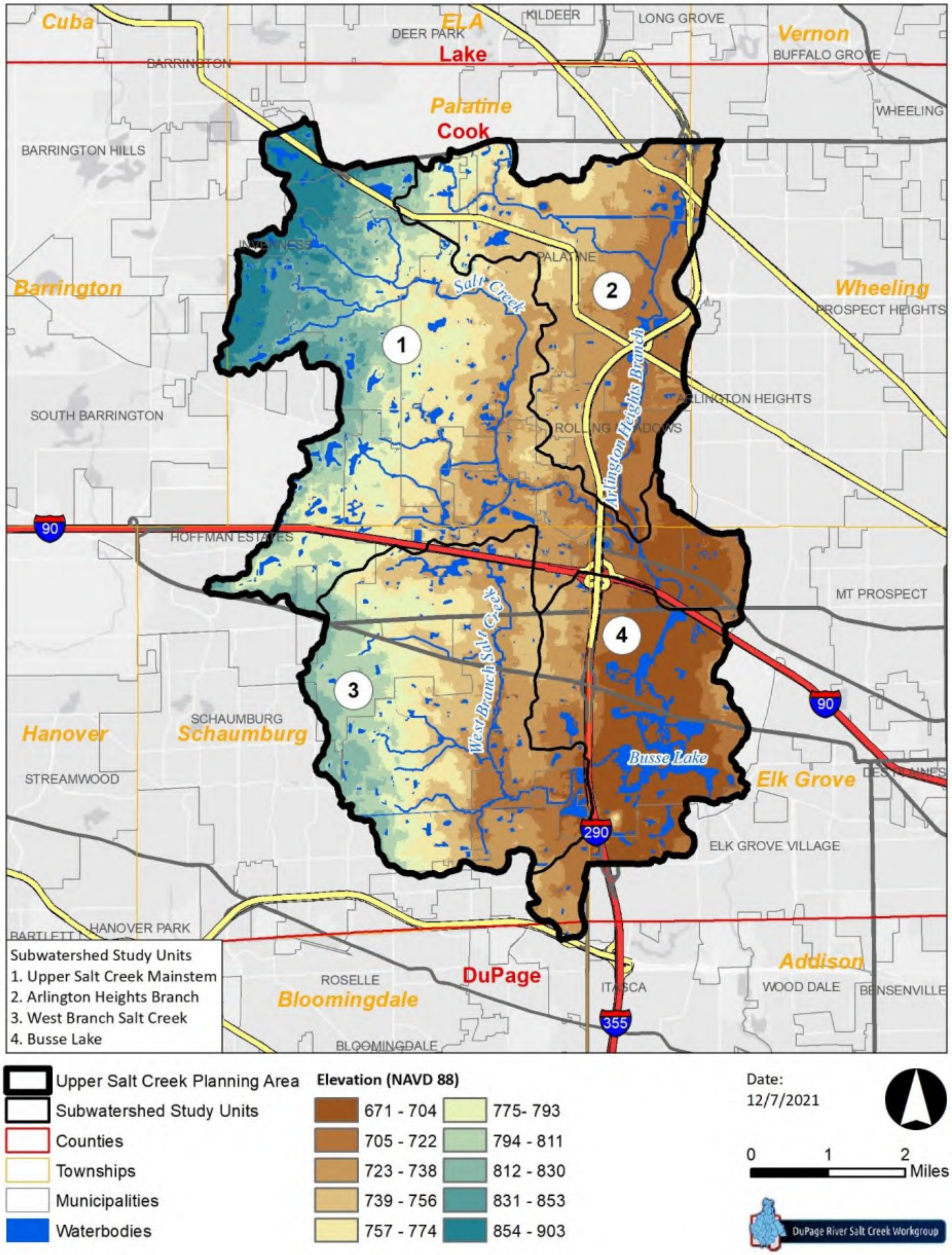
[6] U.S. Department of Commerce, National Oceanic & Atmospheric Administration, 1981-2010 Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, Station: Chicago O'Hare International Airport, IL US, by National Climatic Data Center, Asheville, North Carolina, 2013. Requested and received on 11/02/2021

[7] Markus, Momcilo; Wang, Kexuan Ariel; Kerschner, Brian M.; Singh, Shailendra, 2020. Precipitation Frequency Study for Illinois. Illinois State Water Survey Bulletin 75, Champaign, IL., http://hdl.handle.net/2142/106653 (Accessed on November 2, 2021)

3.3.2. Topography

Elevation within the planning area ranges from a high of 903 feet (USGS Datum NAVD 88) to a low of 671 feet (USGS Datum NAVD 88), for total relief of 232 feet. The highest elevations are generally in the northwest and the lowest elevations to the southeast (Figure 13).

Figure 13. Elevation in the Upper Salt Creek planning area



3.3.3. Ecoregion Geography

According to the USEPA, ecoregions are areas where the overall ecosystems are generally similar in the type, quantity, and quality of environmental resources they provide. Derived from Omernik (1987), with help from other various organizations, including the USEPA, state resource management agencies, and neighboring North American countries, ecoregions denote areas with a similar mosaic of biotic, abiotic, terrestrial, and aquatic ecosystem components[8]. Ecoregions also consider other phenomena including physiography, climate, soils, hydrology, vegetation, wildlife, and overall land use, including human alteration and occupation of land. Utilizing and understanding ecoregion maps is considerably important when trying to develop ecosystem management strategies.

Ecoregions are comprised of four separate levels, with Level I denoting the largest, most broad regions ending at Level IV, which identifies many small, more precise categories. The levels and respective ecoregion numbers for each level are as follows:

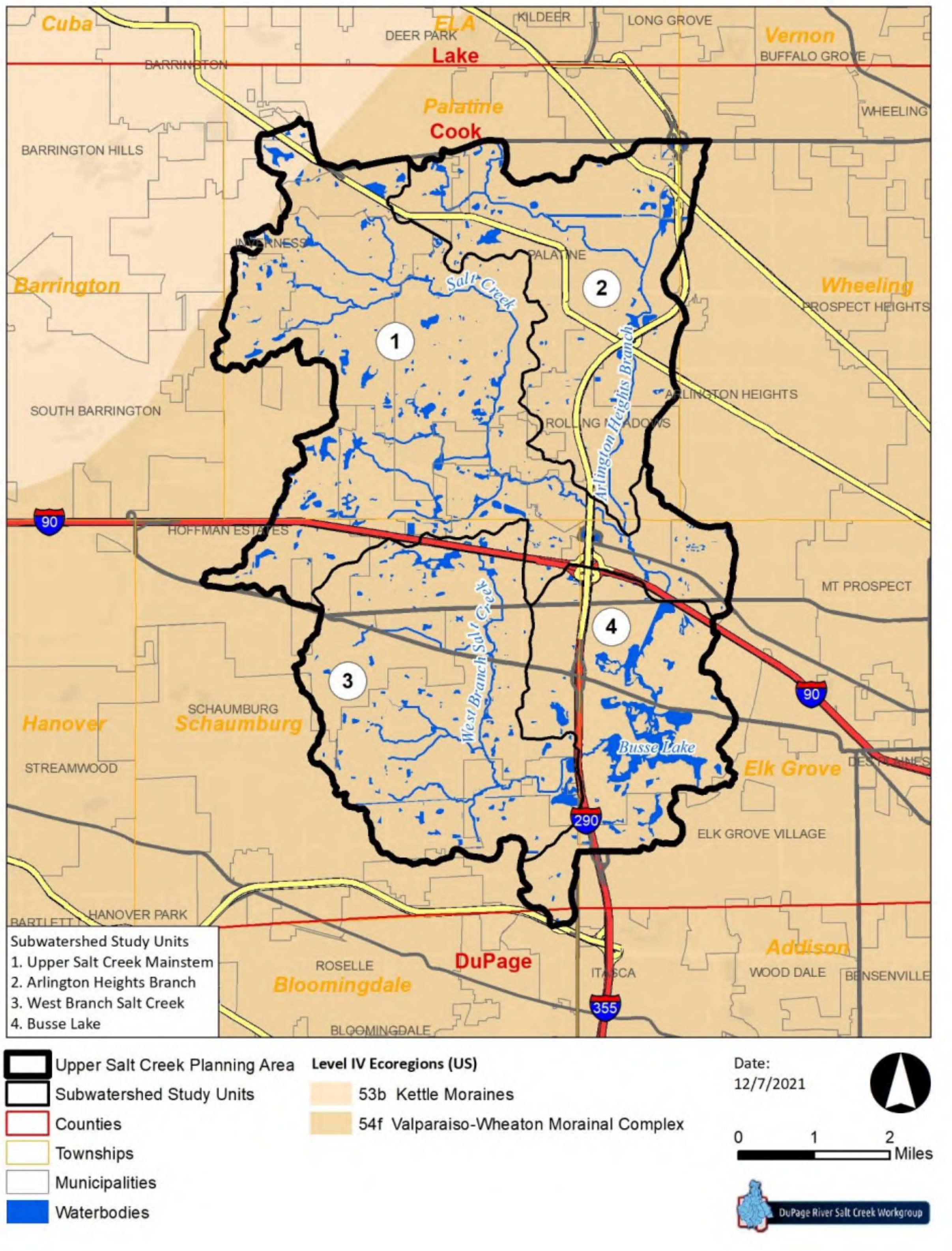
- Level I - 12 ecoregions in the continental U.S.
- Level II - 25 ecoregions in the continental U.S.
- Level III -105 ecoregions in the continental U.S.
- Level IV - 967 ecoregions in the conterminous U.S.

The Upper Salt Creek planning area, in its entirety, is located within the Eastern Temperate Forests (Level I), Central USA Plains (Level II), Central Corn Belt Plaines (Level III) and is categorized further by the Valparaiso-Wheaton Morainal Complex and partially by Kettle Moraine (Level IV)[9]. The Valparaiso-Wheaton Morainal Complex landscape was formed by glaciation periods. Some of its most notable features are rolling till plains, moraines, outwash plains and disconnected drainage systems comprised of kettle holes, ravines, small lakes, and marshes. Kettle Moraine's geology is comprised of Wisconsin-age glacial till, outwash gravels, and thin loess that is less than 20 inches thick. The drainage network is not integrated well because the physiography is comprised of hummocky to hilly areas with steeply sloped moraines, outwash plains, closed depression, and many wetlands and natural lakes. Since these two ecoregions have varying physiography, the ecosystem management strategies are likely to be different across the two areas.

[8] "Ecoregions." *US Environmental Protection Agency*, Environmental Protection Agency, https://www.epa.gov/eco-research/ecoregions

[9] "Level III and IV Ecoregions by State," US Environmental Protection Agency, last accessed November 10, 2021, https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-state

Figure 14. Ecoregions in the Upper Salt Creek planning area



3.3.4. Surficial Geology

In the context of this study, surficial geology concerns landforms and the underlying unconsolidated sediments that were deposited within the Upper Salt Creek planning area during the late Wisconsin glaciation approximately 21,000 to 13,600 years ago.[10] Understanding the composition of these surficial sediments helps to inform the land use planning and land management practice decision making process concerning future development and infrastructure. Figure 15 depicts sediment deposits of which the composition is predominantly diamicton deposited as till and ice-marginal sediment. Waterlain river sediment and wind-blown beach sand comprise the surficial sediments along the major drainageways. These sediments are parts of a series of moraines within northeastern Illinois.[11]

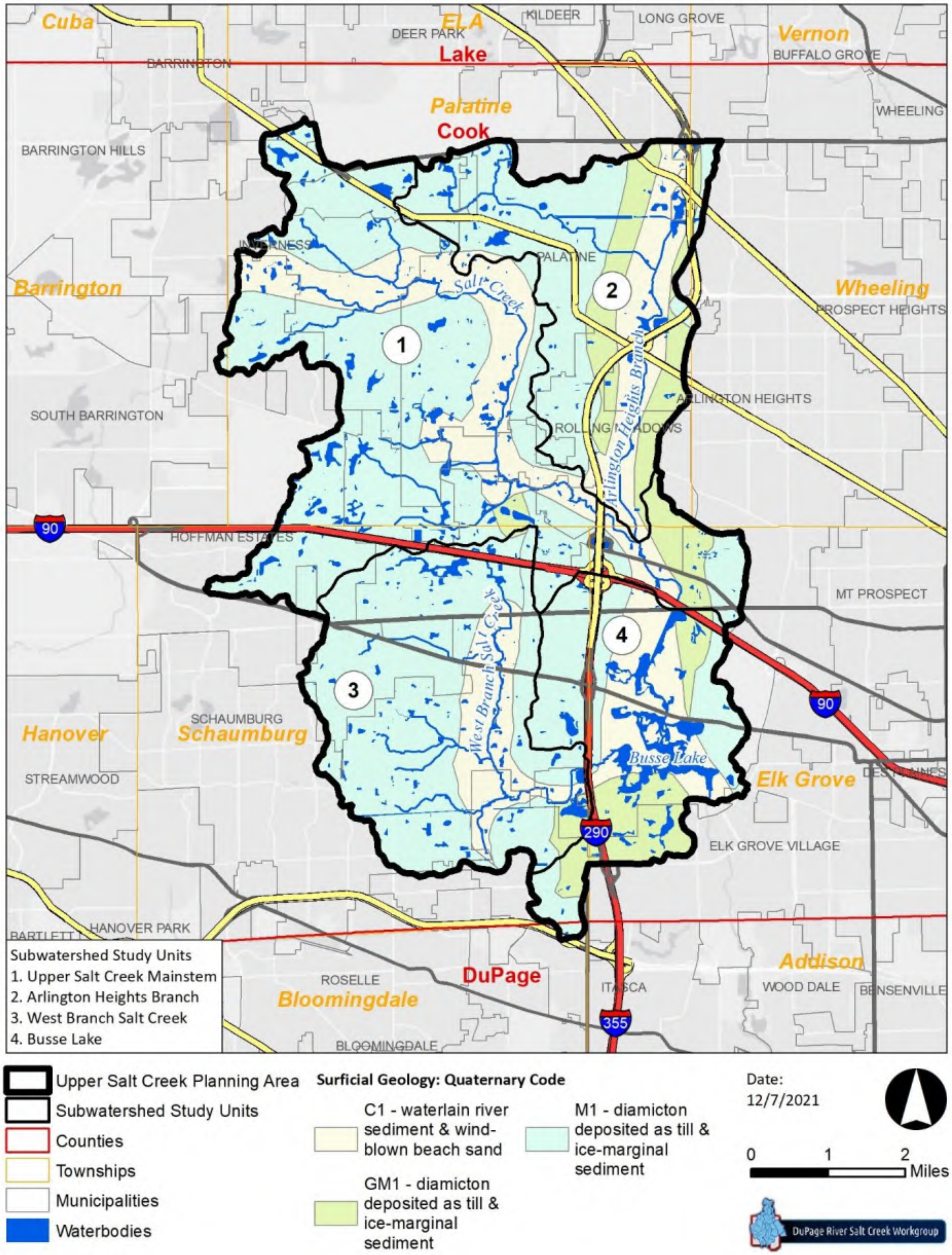
Drift thickness to bedrock of these drift sediments range between 50 and 300-feet within the watershed. Bedrock in this area is composed of Silurian sedimentary rock. Overall, the aquifers within northeastern Illinois are shallow compared areas to the southern and western areas and the near surface material of many of these areas are poorly drained. These factors and compositions of the waterlain river sediment matrix suggest aquifer recharge predominantly occurs at the surface-groundwater interface, along major stream and river zones. These areas located near and along the Salt-Creek and its tributaries contain well-drained alluvial coarse sediment, sand, and gravel which are comparatively more susceptible to groundwater contamination.

The largely urbanized planning area contains significant channelization and limits the amount of natural recharge from rainfall infiltration into ground-water reservoirs. These characteristics could warrant protective or regulatory measures to ensure the maintenance of appropriate aquifer quality and prevention of surface contamination of relatively shallow aquifers to protect well-sourced water users.

[10] https://igws.indiana.edu/Surficial

[11] https://files.isgs.illinois.edu/sites/default/files/maps/statewide/ofs2000-07.pdf

Figure 15. Surficial geology in the Upper Salt Creek planning area



3.3.5. Soils

Soil characteristics can vary drastically depending on the specific environment in which the soil profile developed. Having such influence on the biotic communities and human development, they must be considered whenever assessing a site. For example, certain soils may be exposed to oversaturation for extended periods of time, producing hydric soils and their associated characteristics, and driving integration of drain tiles on agricultural practices and other regional development. While tiles can remove moisture from soil, the removal or even damage of a tile can revert a landscape back to a more hydrologic state.

Soil saturation isn't the only influential property; infiltration capability also largely influences development. Knowing a specific soil unit's infiltration rating can allow for proper use and placement of infiltration BMPs, along with knowledge necessary to deciding on locations for future wetland creation/ restoration projects, along with the location placement of detention basins.

The last major soil characteristic covered in this report is erodibility, informed by a soil unit's composition and geographical slope. Knowing this is especially important in developing and maintaining soil erosion and sediment control practices to limit sediment release into waterways.

Hydrologic soil groups, hydric soils, soil drainage classes, and highly erodible soils will be detailed and discussed in the sections to follow. These various features of soil are emphasized in this plan, as they tend to largely influence water quality and can be impacted by land use practices. The soils data presented herein was obtained from the United States Department of Agriculture – Natural Resources Conservation Service's (NRCS) Web Soil Survey.

3.3.5.1. Hydrologic Soil Group

The Natural Resources Conservation Service (NRCS) has classified the United States' soils into specific classifications based upon their permeability and surface runoff potential. These classifications are known as Hydrologic Soil Groups (HSGs) and are based upon a soil unit's transmission and infiltration rates. These rates are used to determine runoff curve numbers, an estimation of potential runoff for specific soils with varying land covers. These numbers allow for approximation of the amount of direct runoff that may occur from a rainfall event within a particular area. This is important because it informs design of and improvements to stormwater infrastructure.

HSGs are classified into four primary categories: A, B, C, and D; along with three subclasses: A/D, B/D, and C/D.

- **Group A** is comprised of the most permeable soil types and have the lowest runoff potential. These soils consist of mainly deep, well drained to excessively drained sands or gravelly sands. Group A soils have a high rate of water transmission.
- **Group B** soils have a moderate infiltration rate and are moderately deep, moderately well drained, or well drained with fine texture to moderately course texture (silt and sand). Group B soils have a moderate rate of water transmission.
- **Group C** soils have slow infiltration rates because of a fine texture soil layer comprised of silt and clay that impedes the downward migration of water. Group C soils have a slow rate of water transmission.

- **Group D** soils have the slowest infiltration rates and a high runoff potential. These soils are typically clay and exhibit very slow rates of water transmission.
- Dual hydrologic groups (**A/D, B/D, and C/D**) are classified differently. The first letter represents the HSG for the artificially drained (typically by subsurface drain tile) soils in the area. The second letter represents the HSG for the undrained, natural conditions. Only soils that are rated D in the natural conditions are assigned to dual classes.

Table 7. Hydrologic Soil Groups and their corresponding attributes in the Upper Salt Creek planning area

HSG	Soil Texture	Drainage Description	Runoff Potential	Infiltration Rate	Transmission Rate
A	Sand, loamy sand, or sandy loam	Well to excessively well drained	Low	High	High
A/D	Sand or silt loam to clay	Well drained to poorly drained	High to Low	High to Very Low	High to Very Low
B	Silt loam or loam	Moderately well to well drained	Moderate	Moderate	Moderate
B/D	Silt loam, silty clay loam, clay	Moderately well to poorly drained	Moderate to Low	Moderate to Low	Moderate to Very Low
C	Sandy clay loam	Somewhat poorly drained	High	Low	Low
C/D	Sandy clay loam, silty clay loam, clay	Somewhat poorly drained to poorly drained	High	Low to Very Low	Low to Very Low
D	Clay loam, silty clay loam, sandy clay loam, silty clay, clay	Poorly drained	High	Very Low	Very Low

Figure 16. Hydrologic Soil Groups in the Upper Salt Creek planning area

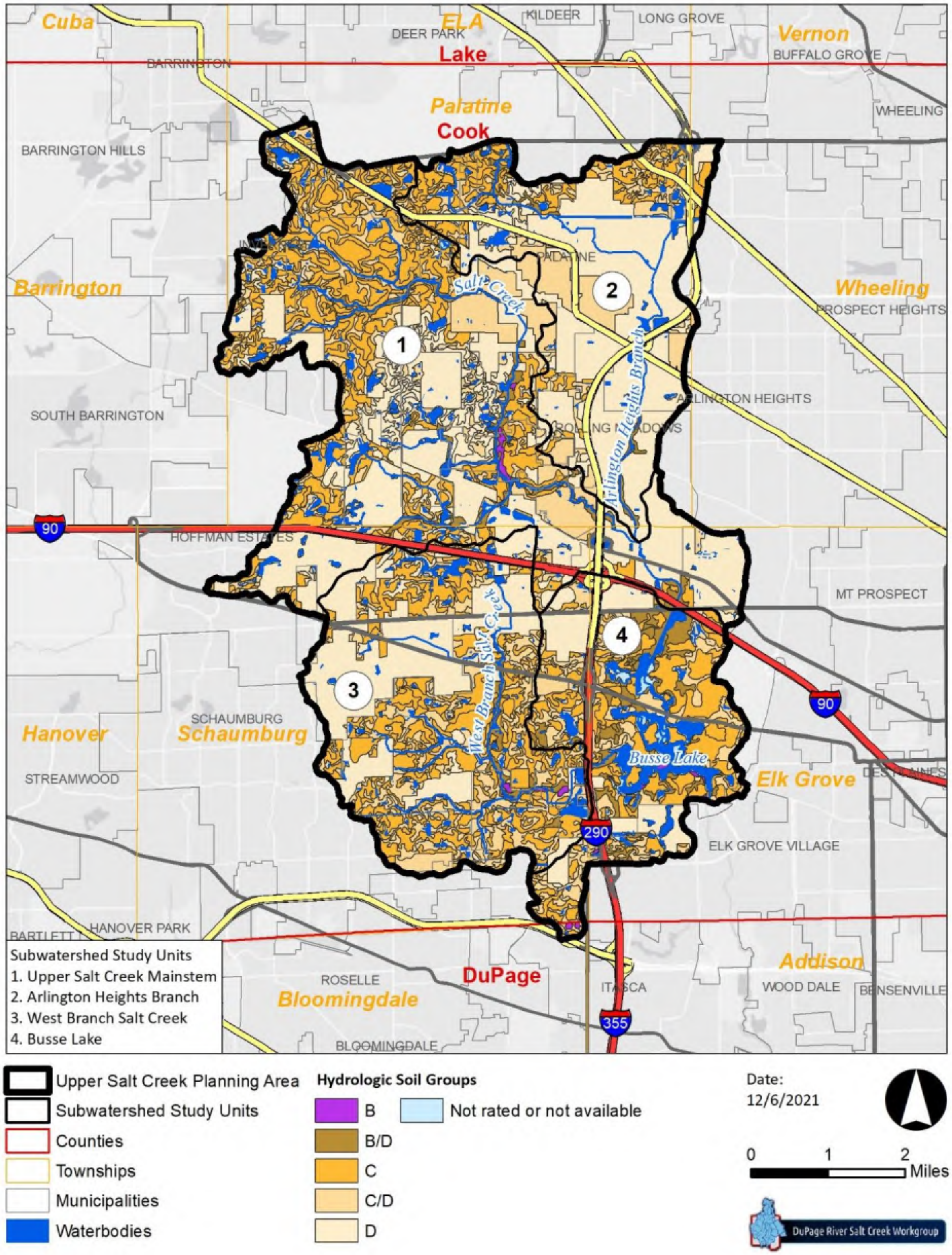


Table 8. Hydrologic Soil Groups including total acreage and percent coverage

HSG	Area (acres)	Percent of Watershed
A	0.0	0.0%
A/D	0.0	0.0%
B	73.7	0.2%
B/D	1,400.0	4.4%
C	9,006.2	28.4%
C/D	7,424.6	23.4%
D	12,751.0	40.2%
Unclassified	1,034.9	3.2%

Figure 17 provides a visible depiction of the location and distribution of each HSG within the Upper Salt Creek planning area while Table 8 summarizes both the total acreage and percent coverage of each HSG. To summarize, there were no classified Group A and A/D HSGs within the watershed, while Group D comprised 40.2% of the area. This group of soils are considered poorly drained with high runoff potential. Groups C and C/D comprised the second and third most acreage at 28.4% and 23.4% coverage, respectively. The other 7.9% coverage is comprised of Group B, B/D, and unclassified soils. Overall, the Upper Salt Creek planning area is comprised predominantly of soils that tend to be considered poorly drained, producing higher runoff potentials when compared to other well/moderately well drained soil groups.

3.3.5.2. Hydric Soils

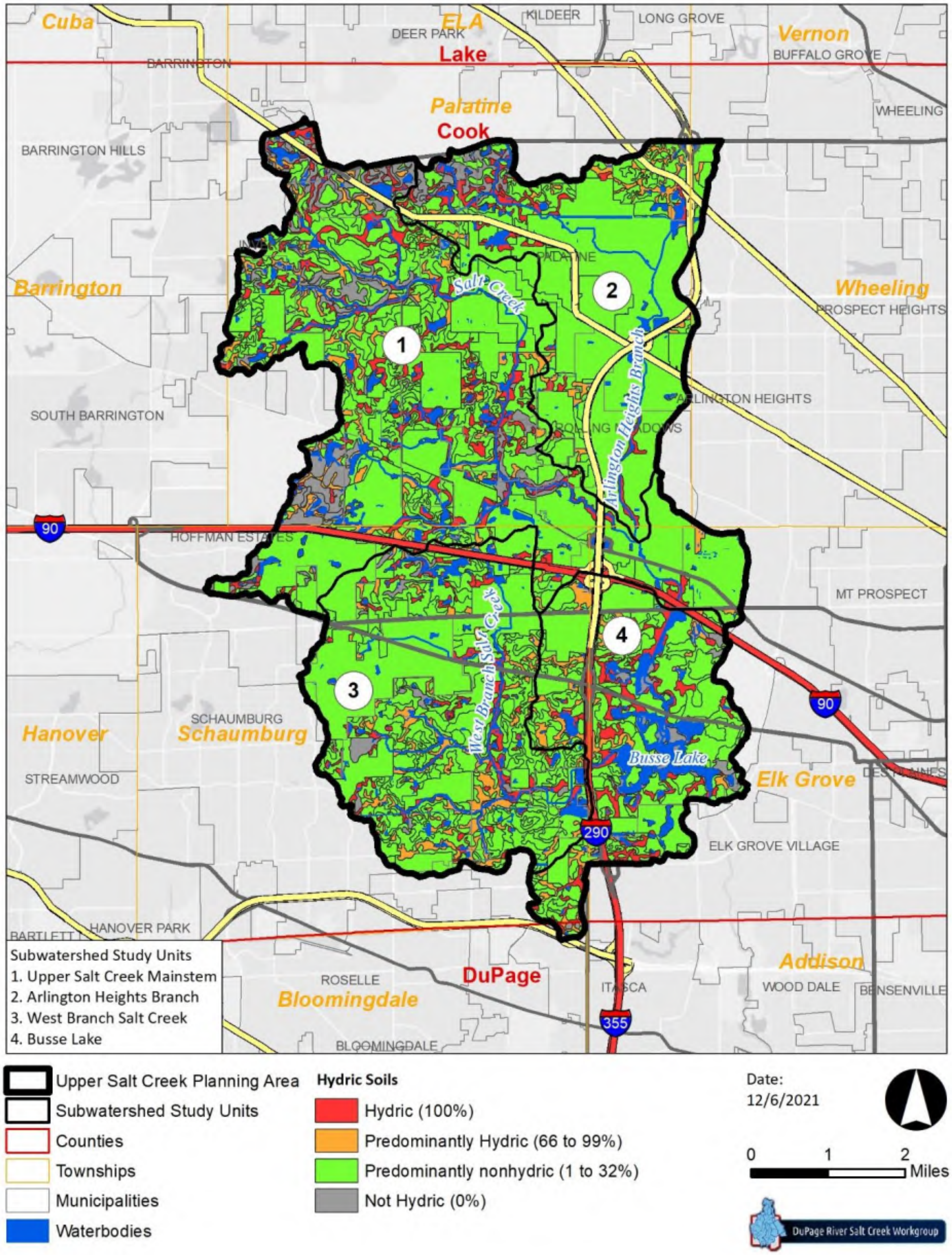
The National Technical Committee for Hydric Soils (NTCHS) defines hydric soils as soils that are formed under conditions of saturation, flooding, or ponding and retain moisture long enough during the growing season to develop anaerobic conditions in the soil layers closest to the surface. Hydric soils are an important tool because they are used as one of the main criteria used for identifying the historic existence of wetlands and depressional areas. Knowing where hydric soils are located has many land planning applications, including weighing developability and identifying areas suitable for wetland restoration efforts. Knowing the location, size, and distribution of hydric soil patterns can help stakeholders determine project location and design.

It should be noted that drain tiles are often found in hydric soils, but because said tiles are draining water away from the location, historic may no longer be present. While not always practical, decommissioning drain tiles and allowing for the natural flow of water to resume can be effective strategies in wetland restoration. Resuming pre-tile wetland hydrology is typically not the only step to restoration, with excavation, planting, and management being other important components. Table 9 identifies the percent coverage of hydric soils in the watershed and Figure 17 displays the location and distributions.

Table 9. Hydric soils in the Upper Salt Creek planning area

Hydric Soil Class	Area (acres)	Percent of Planning Area
Nonhydric (0%)	2,760.1	8.7%
Predominantly nonhydric (1 to 32%)	23,824.5	75.2%
Partially hydric (33 to 65%)	0.0	0.0%
Predominantly hydric (66 to 99%)	2,191.4	6.9%
Hydric (100%)	2,895.6	9.1%
Total	*31,671.6*	*100.0%*

Figure 17. Hydric soils in the Upper Salt Creek planning area



3.3.5.3. Soil Drainage Class

Soils are classified into multiple drainage classes depending upon their natural drainage conditions in reference to the duration and frequency of wet periods. The classes, from most dry to most wet, are as follows: Excessively Drained, Somewhat Excessively Drained, Well Drained, Moderately Well Drained, Somewhat Poorly Drained, Poorly Drained, and Very Poorly Drained. Table 10 and Figure 18. Soil drainage classes in the Upper Salt Creek planning area show the extent of the soils and their respective drainage classes.

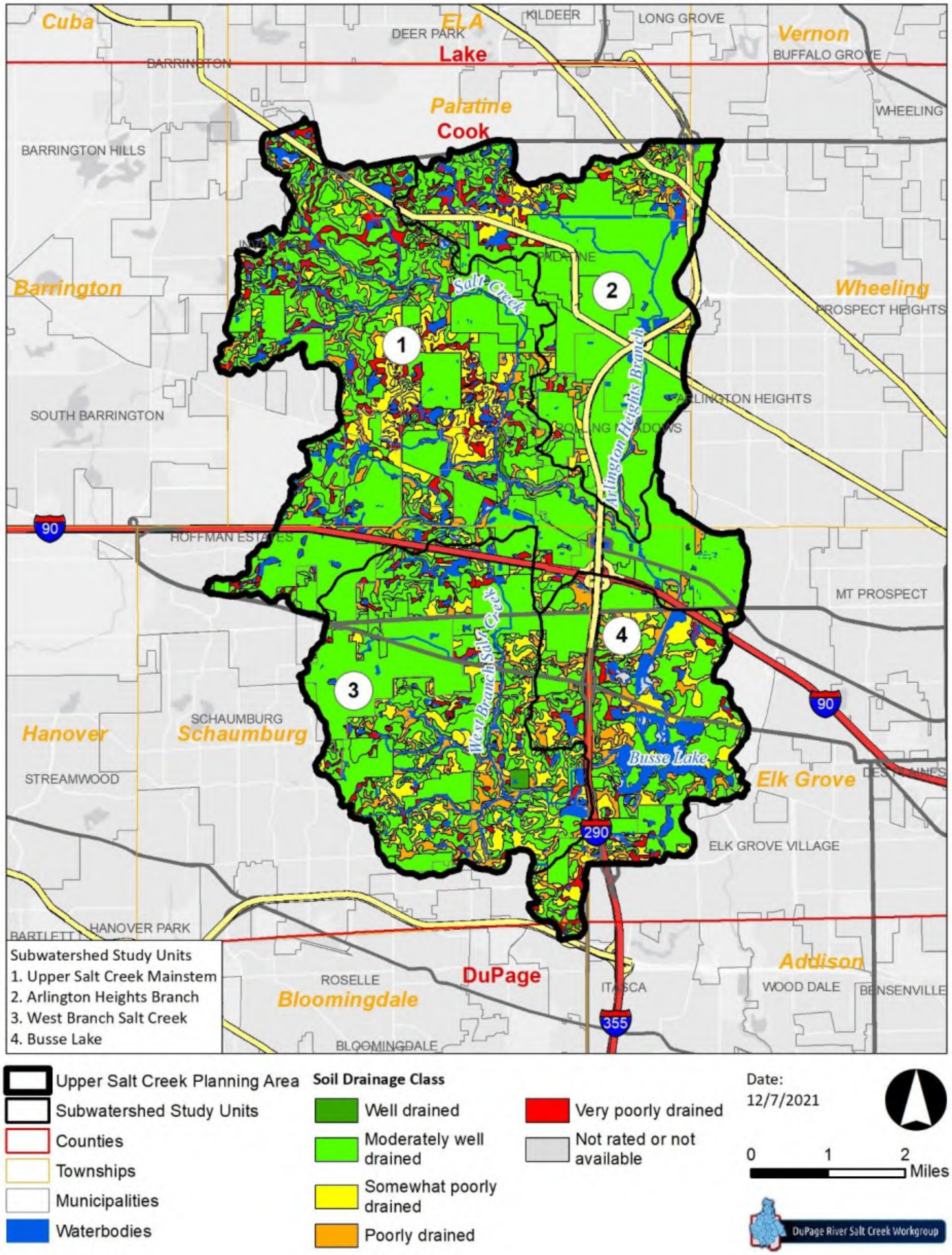
While knowing a soils drainage class is commonly utilized for agricultural applications, in regions that are more developed like the Upper Salt Creek planning area, class can inform stormwater design and impact water quality. For example, in areas where the soil is Well Drained and Moderately Well Drained (69.9% of the planning area), stormwater infiltration BMPs are more likely to be effective than in areas where soil is Very Poorly Drained and Poorly Drained (16.1% of the planning area).

In the planning area, there are no soil units classified as Somewhat Excessively Drained. Also note that 3.3% of the area has unclassified soils.

Table 10. Soil drainage classes in the Upper Salt Creek planning area

Soil Drainage Class	Area (acres)	Percent of Planning Area
Somewhat excessively drained	0.0	0.0%
Well drained	119.9	0.4%
Moderately well drained	22,015.2	69.5%
Somewhat poorly drained	3,415.0	10.8%
Poorly drained	3,122.6	9.9%
Very poorly drained	1,964.4	6.2%
Unclassified	1,034.9	3.3%
Total	*31,672.6*	*100.0%*

Figure 18. Soil drainage classes in the Upper Salt Creek planning area



3.3.5.4. Highly Erodible Soils

Soil erosion and subsequent sedimentation is a natural process that can cause significant impact to water quality. Over time, sediment deposits originating from erosion can blanket cobble, sand, food sources, nutrients, and other resources needed by biota and humans. Phosphorus particles, and other nutrients, sorb to soil particles and can also lead to impairment. Erosion and sedimentation can also lead to reduced use expectancies and/or more frequent maintenance needs in ponds, reservoirs, and lakes; and can increase the cost and need for filtration systems.

Defined by the USDA NRCS, a highly erodible soil unit is one that has reached its maximum potential for erosion that is equal to or even exceeds eight times the tolerable soil erosion rate (T)[12]. The following formula calculates the Erodibility Index (EI) for Sheet and Rill Erosion:

$$EI = RKLS/T$$

where

$$EI = erodibiliy\ index$$

$$R = rainfall\ factor$$

$$K = erodibiliy\ value$$

$$LS = slope\ factor$$

and is used to determine the maximum potential erosion rate. When the equation presented above results in a value for EI greater than 8, the soil is considered highly erodible[13]. In the state of Illinois, all soil map units that have slopes that are "C" or greater (8+% slope) are considered highly erodible[14]. It should be noted that the maximum erosion potential was calculated without consideration of stream bank restoration or other conservation management practices. These practices can decrease erosion rates and therefore the data presented may overrepresent erodibility. Additionally, localized conditions may result in increased erosion risk for soils of lower Erodibility Index.

Figure 19 shows the pattern of highly erodible soils across the watershed, spanning 9,006.2 acres (28.4% coverage within Upper Salt Creek planning area). It should be noted that erosion control practices should be utilized for any human disturbance of an area because soils can erode at severe rates when stockpiling and excavation occurs without necessary controls.

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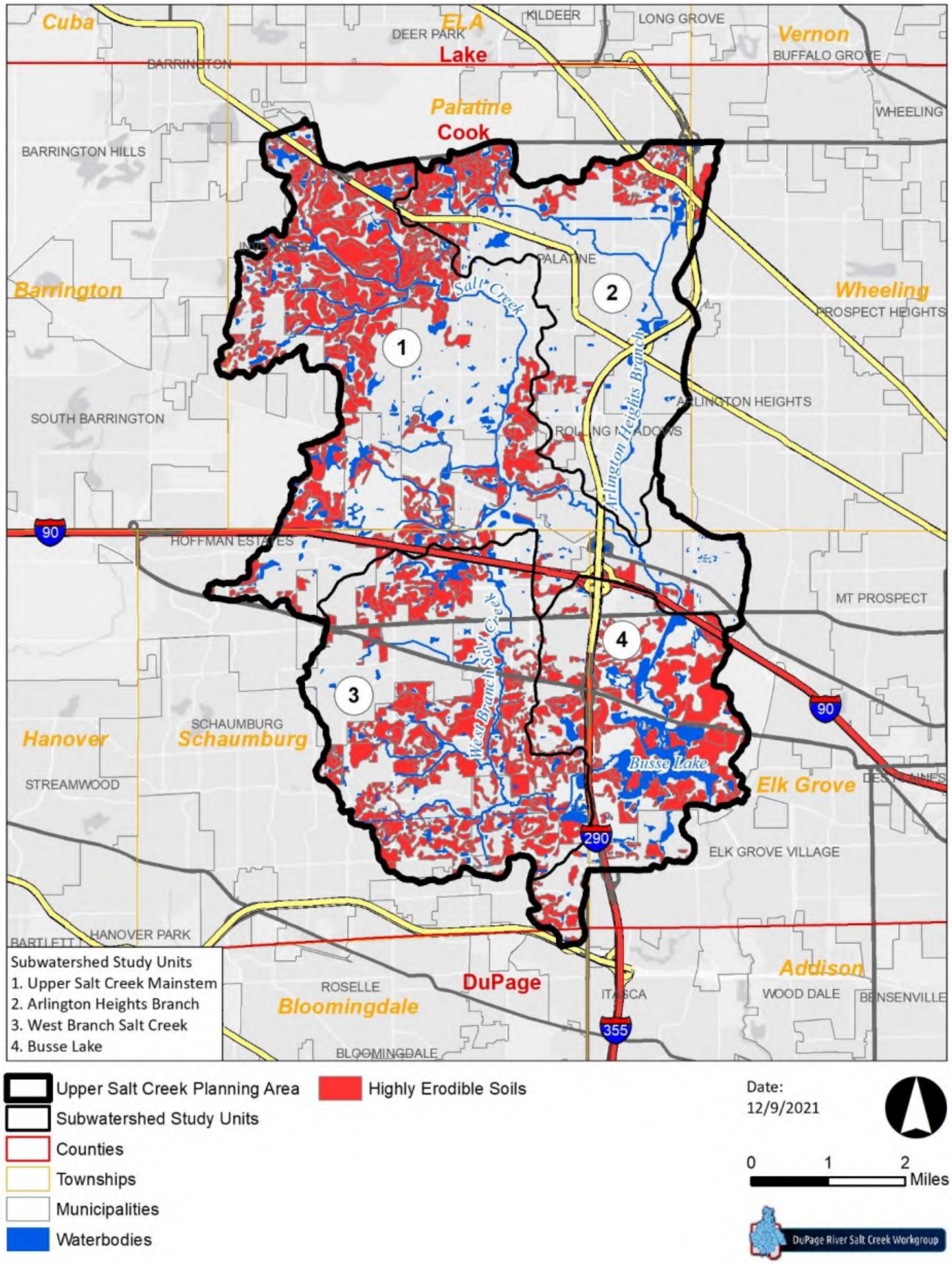
[12] The soil loss tolerance rate (T) is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given soil. Erosion is considered to be greater than T if either the water (sheet & rill) erosion or the wind erosion rate exceeds the soil loss tolerance rate. The NRCS uses the Universal Soil Loss Equation (USLE) to determine a soil's erosion rate by analyzing rainfall effects, characteristics of the soil, slope length and steepness, and cropping and management practices.

[13] "RI Soil Survey - Highly erodible soil map units," USDA Natural Resources Conservation Service, Rhode Island, last accessed October 17th, 2017, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016637

[14] Bob Oja, McHenry-Lake County SWCD, personal communication, Nov. 24, 2014.

Figure 19. Highly erodible soils in the Upper Salt Creek planning area



3.3.6. Floodplains

A floodplain is defined as "any land area susceptible to being inundated by floodwaters from any source."[15] The 100-year floodplain or "base flood" encompasses an area of land that has a 1-in-100 chance of being flooded or exceeded within any given year; the 500-year floodplain has a 1-in-500 chance of being flooded or exceeded within any given year. Floodways are defined by the National Flood Insurance Program as "the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." Floodways are a subset of the 100-year floodplain and carry the deeper, faster moving water during a flood event.

Prior to modern floodplain and stormwater management regulations, development in the Upper Salt Creek planning area and throughout the Chicagoland region occurred in flood prone areas, such as floodplains, wetlands, and other low-lying areas. Before these flood prone areas were developed, they provided natural flood control in the watershed. While flooding is a natural process, the development of these lands places homes, businesses, and people at greater risk for flooding impact, and reduces the land's natural flood control capacity, thus pushing the water to areas that may not have flooded previously. In effect, flooding can result in property damage, streambank erosion, and degraded water quality. Thus, it is important that floodplains and their relationship to land use be considered in local plans and development codes.

Within the Upper Salt Creek planning area, approximately 2.4 percent (751.8-acres) of the planning area is identified as floodway, 6.0 percent (1,887.6-acres) is mapped 100-year floodplain, and an additional 1.9 percent (615.2-acres) is mapped 500-year floodplain.

Flood-prone areas inundated by the base flood or 100-year frequency flood event. The base flood is the flooding event in which has a one percent (1%) probability of being equaled or exceeded in any given year. Flood prone areas can be regarded as regulatory floodplains if it is 1) a riverine area inundated by the base flood where there is at least 640 acres of tributary drainage area or 2) a non-riverine area with a storage volume of equal to or greater than 0.75 acre-foot when inundated by the base flood or 3) indicated as a Special Flood Hazard Area on the FEMA Flood Insurance Rate Map or Letter of Map Revision. Many of these areas, particularly confined depressional areas, may experience significant and regular flooding but may not be reflected in the FEMA data analyzed as part of this report.

Table 11. Flood hazard zones in Upper Salt Creek planning area

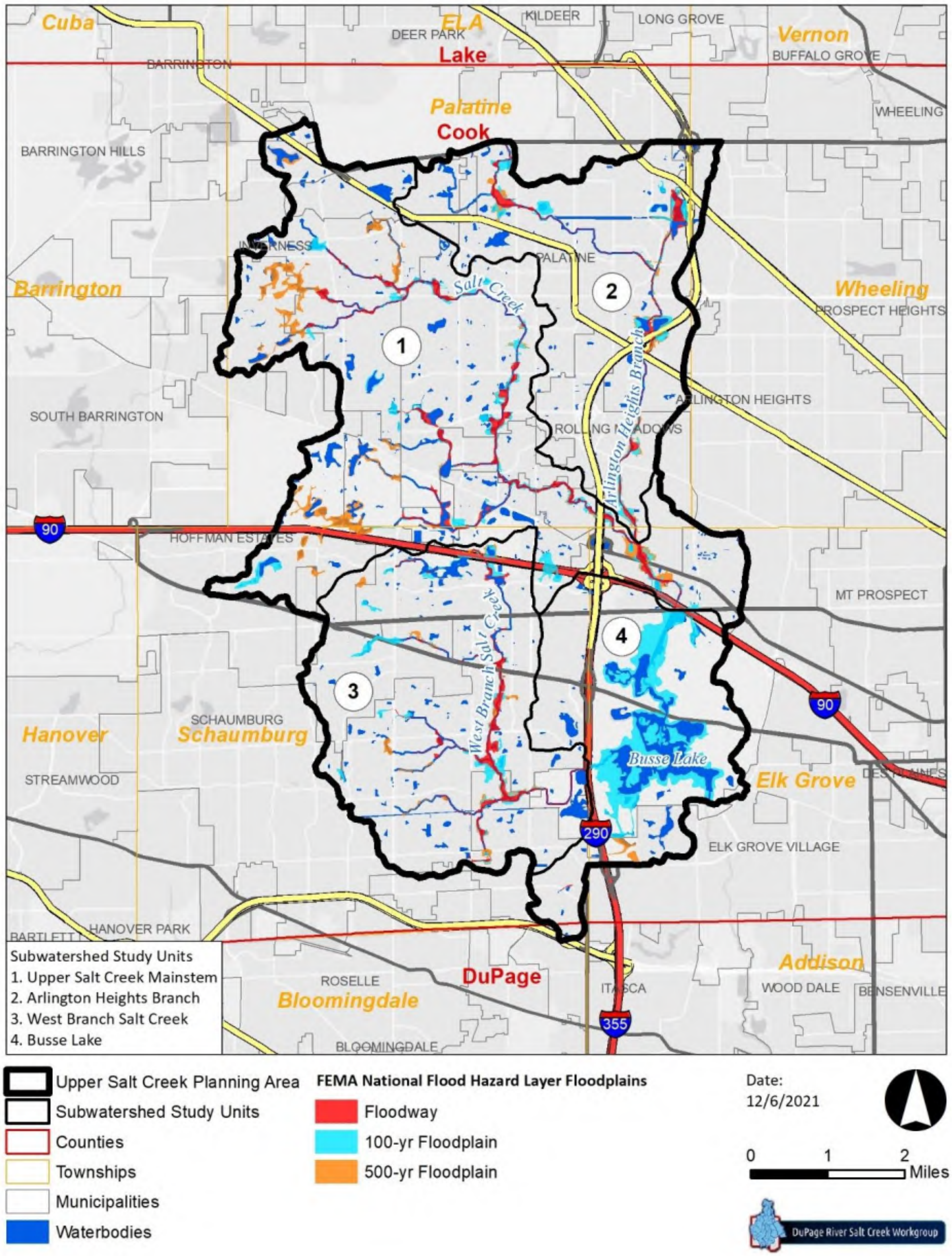
Flood Hazard Zone	Area (acres)	Percent of Planning Area
Floodway	751.8	2.4%
100-Year Floodplain	1,887.6	6.0%
500-Year Floodplain	615.2	1.9%
Total	*3,254.6*	*10.3%*

[15] Federal Emergent Management Agency (FEMA), Floodplain Management Requirements, National Flood Insurance Program Terminology Index, FEMA, 2021, National Flood Insurance Program Terminology Index | FEMA.gov (accessed November 8, 2021)

Table 12. Flood hazard zones by subwatershed study unit

Subwatershed Study Unit	Floodway (acres)	100-yr Floodplain (acres)	500-yr Floodplain (acres)	Total Area (acres)
Salt Creek Mainstem	360.2	356.9	457.5	1174.6
Arlington Heights Branch	180.5	169.0	55.0	404.5
West Branch Salt Creek	209.2	193.3	76.6	479.1
Busse Lake	1.9	1,168.3	26.1	1,196.3
Total	*751.8*	*1,887.6*	*615.2*	*3,254.6*

Figure 20. Flood hazard zones in Upper Salt Creek planning area



3.3.7. Wetlands

Wetland ecosystems provide ecological, social, and even economic benefits to communities in many ways, including by removing nutrients from polluted runoff, recharging aquifers, and providing stormwater storage to reduce flooding. On the regional scale, wetlands are used as an integral part of promoting green infrastructure and provide vast and impactful ecosystem services. Despite the value of these resources, wetland ecosystems are on the continual decline in the continental United States[16]; approximately 90% of wetlands are estimated to have been lost in Illinois[17]. It should be noted that some states, including Illinois, have made it a goal to restore natural wetlands in hopes of reaping the benefits mentioned above[18].

The National Wetlands Inventory records approximately 2,067.2 acres (approximately 6.5% of the land area) of wetlands within Upper Salt Creek planning area (Figure 21). There are five classifications of wetland that are present in the planning area: freshwater emergent wetland, freshwater forested/shrub wetland, freshwater ponds, lakes, and riverine. Of these five, freshwater emergent wetlands comprise the largest land area within the watershed: 888.8-acres or 2.8% of the planning area. Freshwater ponds and lakes are the second most abundant, at 532.1 and 381.7-acres respectively.

As the most abundant wetland type in the area, freshwater emergent wetlands are commonly found alongside freshwater ponds and lakes. Examples of freshwater emergent wetlands include fens, wet meadows, marshes, and sloughs. The vegetative communities found in these areas tend to be tall, herbaceous, and hydrophytic emergent plants. Of these plants, perennial species are usually the most common, accounting for approximately 30% of the wetland plant species. While the appearance of emergent wetlands is seemingly unchanging throughout all seasons, it is common in the Midwest that said wetlands may periodically revert to open water due to both seasonal and longer-term climactic fluctuations[19]. These climate impacts will continue to become a much more common and impactful as climate change continues to be an ever more present issue[20].

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[16] "National Wetlands Inventory," U.S. Fish and Wildlife Service, Ecological Services, last accessed November 10, 2021, http://www.fws.gov/wetlands/Status-And-Trends-2009/index.html

[17] https://www2.illinois.gov/dnr/education/Documents/OnlineIntroIllinoisNatRes(9).pdf

[18] "Protect and Restore IL Wetlands," U.S. Department of Agriculture, Natural Resources Conservation Service, Illinois, last accesses November 11, 2021, Protect and Restore IL Wetlands | NRCS Illinois (usda.gov)

[19] Federal Geographic Data Committee, Wetlands Subcommittee, *Classification of Wetlands and Deepwater Habitats of the United States*, by Lewis M. Cowardin et al. 1979. FGDC–STD-004-2013, Virginia: FDGC, 2013, https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-UnitedStates-2013.pdf (accessed November 11, 2021).

[20] Climate Impacts in the Midwest, United States Environmental Protection Agency, City of Chicago, Climate Change Impacts, last accessed November 11, 2021, https://climatechange.chicago.gov/climate-impacts/climate-impacts-midwest

Table 13. Wetlands by Type in the Upper Salt Creek planning area

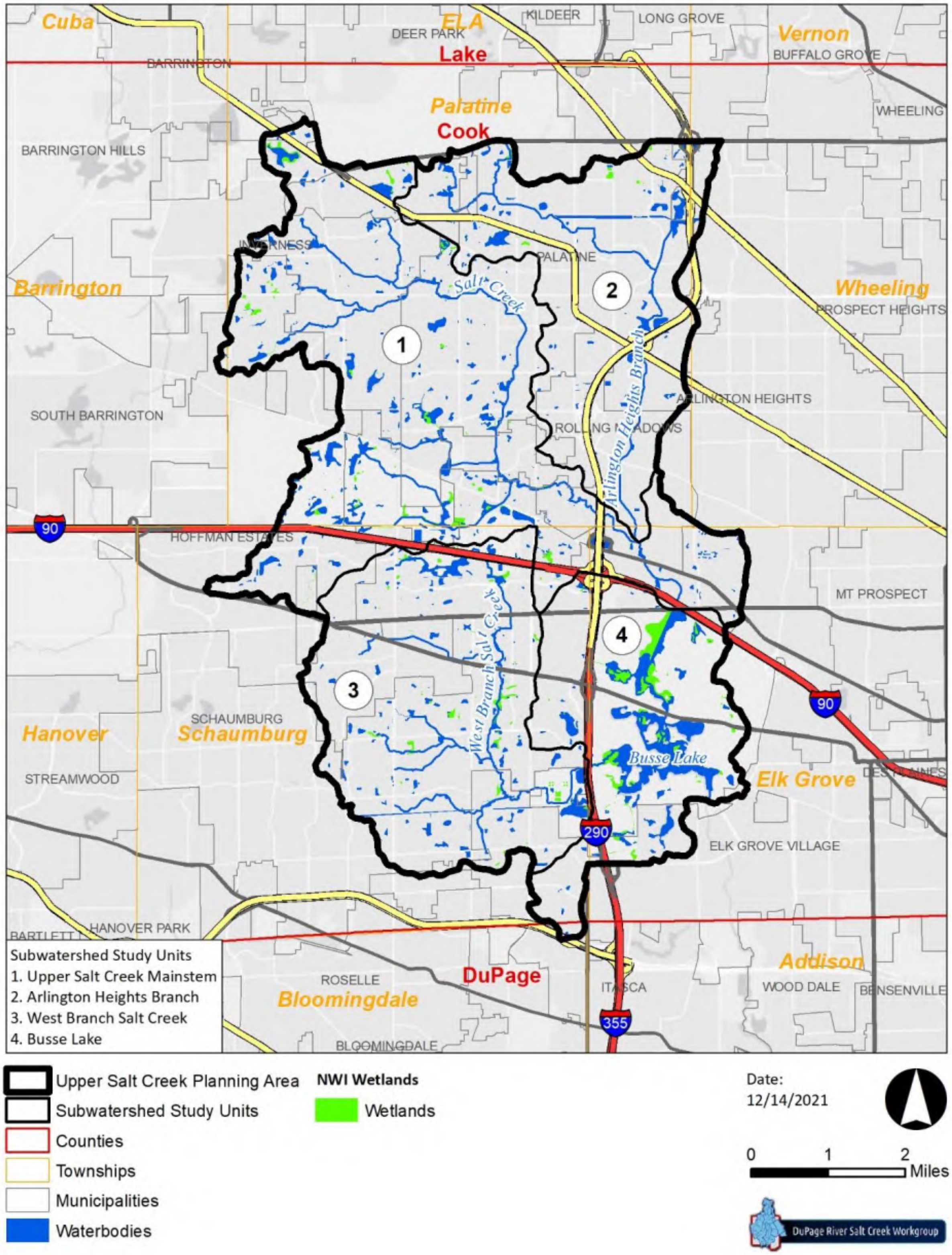
Wetland Type	Area (acres)	Percent of Planning Area
Freshwater Emergent Wetland	888.8	2.8%
Freshwater Forested/Shrub Wetland	140.6	0.4%
Freshwater Pond	532.1	1.7%
Lake	381.7	1.2%
Riverine	124.0	0.4%
Total	*2,067.2*	*6.5%*

When compared to pre-settlement vegetation and understanding temporal development trends in the region, wetland communities have been on a drastic decline. Not all wetlands are protected within publicly held open space, forest preserves, and other natural areas, making these specific ecosystems great opportunities for additional protection such as acquisition or easements by county, state, or even federal organizations. Privately owned wetlands such as those found on golf courses also present opportunities for restoration and protection.

Table 14. Wetlands by Subwatershed Study Unit in the Upper Salt Creek planning area

Subwatershed Study Unit	Wetland Area (acres)	Percent of Area
Upper Salt Creek Mainstem	746.6	14.7%
Arlington Heights Branch	218.3	3.4%
West Branch Salt Creek	345.5	4.6%
Busse Lake	821.5	6.7%
Total	*2,131.9*	*6.8%*

Figure 21. Wetlands in the Upper Salt Creek planning area



3.3.8. Threatened and Endangered Species

In addition to improving water quality, protecting and restoring floodplains, wetlands, and natural landcover can benefit biotic communities. Many aquatic species are inventoried as part of the bioassessment monitoring described in Section 3.5.7.2. DRSCW Stream Studies, but the watershed may be home to other land-dwelling bioindicator species. Migratory species may reflect for habitat regions in general, while nonmigratory species can indicate more localized impacts.

Although not a comprehensive review of potential species, the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC)[21] tool was used to query threatened and endangered species potentially present in the planning area. Although no critical habit areas within the planning area were identified, these species and resources are still important planning considerations. Summary notes on the species list retrieval are included in the sections below. Note that the most prominent threat to these species is habitat loss, which is particularly relevant since the planning area is largely developed.

Table 15. Threatened and Endangered Species potentially present within the Upper Salt Creek planning area

Common Name	Scientific Name	Status
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened
Piping Plover	*Charadrius melodus*	Endangered
Red Knot	*Calidris canutus rufa*	Threatened
Eastern Massasauga	*Sistrurus catenatus*	Threatened
Hine's Emerald Dragonfly	*Somatochlora hineana*	Endangered
Monarch Butterfly	*Danaus plexippus*	Potential Candidate
Rusty Patched Bumble Bee	*Bombus affinis*	Endangered
Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Threatened
Leafy Prairie-clover	*Dalea foliosa*	Endangered
Prairie Bush-clover	*Lespedeza leptostachya*	Threatened

Northern Long-eared Bat

A fungal disease, white-nose syndrome is the most prominent threat to the Northern Long-eared Bat, and as the disease continues to spread, the species will continue to decline. Notable summer roosting habitat can be found underneath bark, in cavities, and in services of both dead and live trees, while dusk insect feeding grounds include forested hillsides and ridges, both present, but likely historically more abundant prior to present-day. Small stream corridors with well-developed riparian woods and upland forests are described to be suitable habitat for the bats, in addition to caves and mines for hibernacula, although these latter two are less likely to be present in the area[22].

[21] "IPAC: Information for Planning and Consultation." *IPaC: Explore Location Resources*, https://ecos.fws.gov/ipac/location/ZE26BDD44RE3BLRAVLUCX7GVBE/resources

[22] Service, U.S. Fish and Wildlife. "Illinois County Distribution." *Official Web Page of the U S Fish and Wildlife Service*, https://www.fws.gov/midwest/endangered/lists/illinois-cty.html.

Piping Plover

This species has been listed as endangered since 1985. The largest threat to the Piping Plover is habitat degradation, primarily due to development of and use impact to habitat. Piping plover presence in the watershed is unlikely, as primary habitat areas, including coastal beaches, sandflats, and sparsely vegetated beaches or dunes, cobble pans, or sand spits are not present. When this species is found in the greater Chicagoland region, it is generally along the Great Lakes shorelines [23].

Red Knot

Although primary habitat is not present in the watershed, this migratory species relies on intermediate habitat in the region to provide refuge along migratory pathways. During their time passing through this area, threats to this species include development, predominantly in shoreline areas, and human disturbance[24].

Eastern Massasauga

Habitat loss and fragmentation, and, to a lesser extent, Snake fungal disease are the primary threats to this species. Wet prairies, marshes, and riparian floodplain, in addition to their associated adjacent uplands, are primary habitat areas. This species hibernates in large logs, tree roots, and small burrows. Regular fire regimes and the deterrence of non-native plant species are important factors in preserving suitable habitat areas, although care should be taken in timing prescribed burns or mowing activities to avoid seasonal emergence from hibernation[25].

Hine's Emerald Dragonfly

This species is listed as endangered with significant threat of extinction. Habitat degradation and loss are the main reasons for this species listing[26]. Habitat includes spring fed wetlands, wet meadows, and marshes, in which the dragonfly will inhabit for the duration of an individual's lifetime.

Monarch Butterfly

While not currently listed, this species is currently under consideration. As a migratory species, monarch rely on regional habitat to provide refuge and host breeding in open fields and meadows where milkweed species are present during the spring and summer months. Climate change, habitat loss, and pesticides are major threats to this species[27].

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[23] U.S. Fish and Wildlife Service. "USFWS: Piping Plover Great Lakes Population." *Official Web Page of the U S Fish and Wildlife Service*, https://www.fws.gov/midwest/endangered/pipingplover/index.html.

[24] U.S. Fish and Wildlife Service. "Migration Miracle: The Long-Distance Flier, Rufa Red Knot." *Official Web Page of the U S Fish and Wildlife Service*, rekn_infograph_final_5.jpg (1906×1952) (fws.gov)

[25] U.S. Fish and Wildlife Service. "Eastern Massasauga (Sisrurus catenatus)" *Official Web Page of the U S Fish and Wildlife Service*, Species Profile for Eastern Massasauga (=rattlesnake)(Sistrurus catenatus) (fws.gov)

[26] U.S. Fish and Wildlife Service. "Hine's Emerald Dragonfly (Somatochlora Hineana)." *Official Web Page of the U S Fish and Wildlife Service*, https://www.fws.gov/midwest/endangered/insects/hed/hins_fct.html.

[27] U.S. Fish and Wildlife Service. "Monarch Butterfly (Danaus plexippus)." *Official Web Page of the U S Fish and Wildlife Service*, Species Profile for monarch butterfly(Danaus plexippus) (fws.gov)

Rusty Patched Bumble Bee

This species is currently endangered and is approaching extinction. Disease, pesticides, climate change, and habitat loss are contributing factors to population decline[28]. Colony survival is dependent on a continuous supply of flowering plants near nest sites from spring until fall, and lack of disturbance over winter.

Eastern Prairie Fringed Orchid

Habitat loss and degradation, predominantly conversion of prairie to cropland, but also including competition with non-native plants, wetland loss, intensive hay mowing, fire suppression, and overgrazing, also threatens these species[29]. Collection has also been notes as a threat, as orchids are rare, and beloved for their beauty. Hawkmoths are depended upon for pollination of these orchids, which are negatively impacted by insecticides. In terms of suitable habitat, mesic to wet prairies and meadows are preferred habitat, but old fields and roadside ditches are also known to support populations. Bogs, fens, and sedge meadows are also suitable sites for this species.

Leafy Prairie-clover

This species is endangered and is at threat to become extinct. This species is currently endangered primarily due to habitat loss[30]. Prairie remnants on thin soil over limestone along the Des Plaines River corridor are suitable habitat. Development of these areas in addition to grazing and near elimination of fire regimes have further impacted habitat availability.

Prairie Bush-clover

Attributed to inundation by dams, herbicide application, collection, disturbance, browsing, non-native plant establishment, and severe drought, habitat loss is the primary threat to this species[31]. This species is well suited for tallgrass prairie and dry to mesic prairies with gravelly soil.

3.4. Land Use and Land Cover

3.4.1. Current Land Use

Land Use spatial data for the planning area was sourced through CMAP. The most current version of this data at the time of this report is the 2015 Land Use Inventory Classification Scheme, which is based on parcel data. This classification system contains 57 unique land uses that fall under five major classifications: Urbanized, Agriculture, Open Space, Vacant or Under Construction, and Water[32].

Within this planning area, land uses have been organized into 11 categories which fall under the five major classifications (Table 16). Residential (40.6%) and Open Space (18.9%) comprise the majority of the area.

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[28] Service, U.S. Fish and Wildlife. "Rusty Patched Bumble Bee." *Official Web Page of the U S Fish and Wildlife Service*, https://www.fws.gov/midwest/endangered/insects/rpbb/FAQsFinalListing.html.

[29] "Prairie Fringed Orchids - FWS." *U.S. Fish & Wildlife Service*, https://www.fws.gov/midwest/Endangered/plants/pdf/prairiefringedorchids.pdf.

[30] Service, U.S. Fish and Wildlife. "Leafy Prairie-Clover (Dalea Foliosa)." *Official Web Page of the U S Fish and Wildlife Service*, https://www.fws.gov/midwest/endangered/plants/leafypra.html.

[31] U.S. Forest Service. "Prairie Bush-Clover: Threatened, Endangered, and Proposed (TEP) Plant Profile." *U.S. Department of Agriculture* , https://www.fs.fed.us/wildflowers/Rare_Plants/profiles/TEP/dalea_foliosa/index.shtml.

[32] Chicago Metropolitan Agency for Planning, September 2020, *2015 Parcel-Based Land Use Inventory Categories*, accessed November 11, 2021

Other significant types of land use categories are Unclassifiable/Other (16.1%), which includes isolated parcels with no identifiable use, and commercial (10.4%). All remaining categories, Institutional, Industrial, Transportation/Communication/Utilities/Waste (TCUW), Agriculture, Vacant, Under Construction, and Water, individually comprise no greater than 5% of land use.

Since this land use data is derived from attributing County Assessor data to parcel data, there are some associated limitations. Among others, relevant limitations include:

- Parcel and rights-of-way are generally simplified to the dominant land use category. In some cases, smaller, land uses within a parcel are not reflected due to the simplification process by which this data was created.
- This data was created in 2015 and published in 2020. Land use is dynamic, while this data portrays a "snapshot in time" depiction. This concept is particularly relevant in context of Vacant and Under Construction parcels, as project timelines and construction schedules will typically be surpassed by the time since the data was originally captured.

The degree of development that has been undertaken in this watershed suggests that it is unlikely for forecasted land use to change substantially.

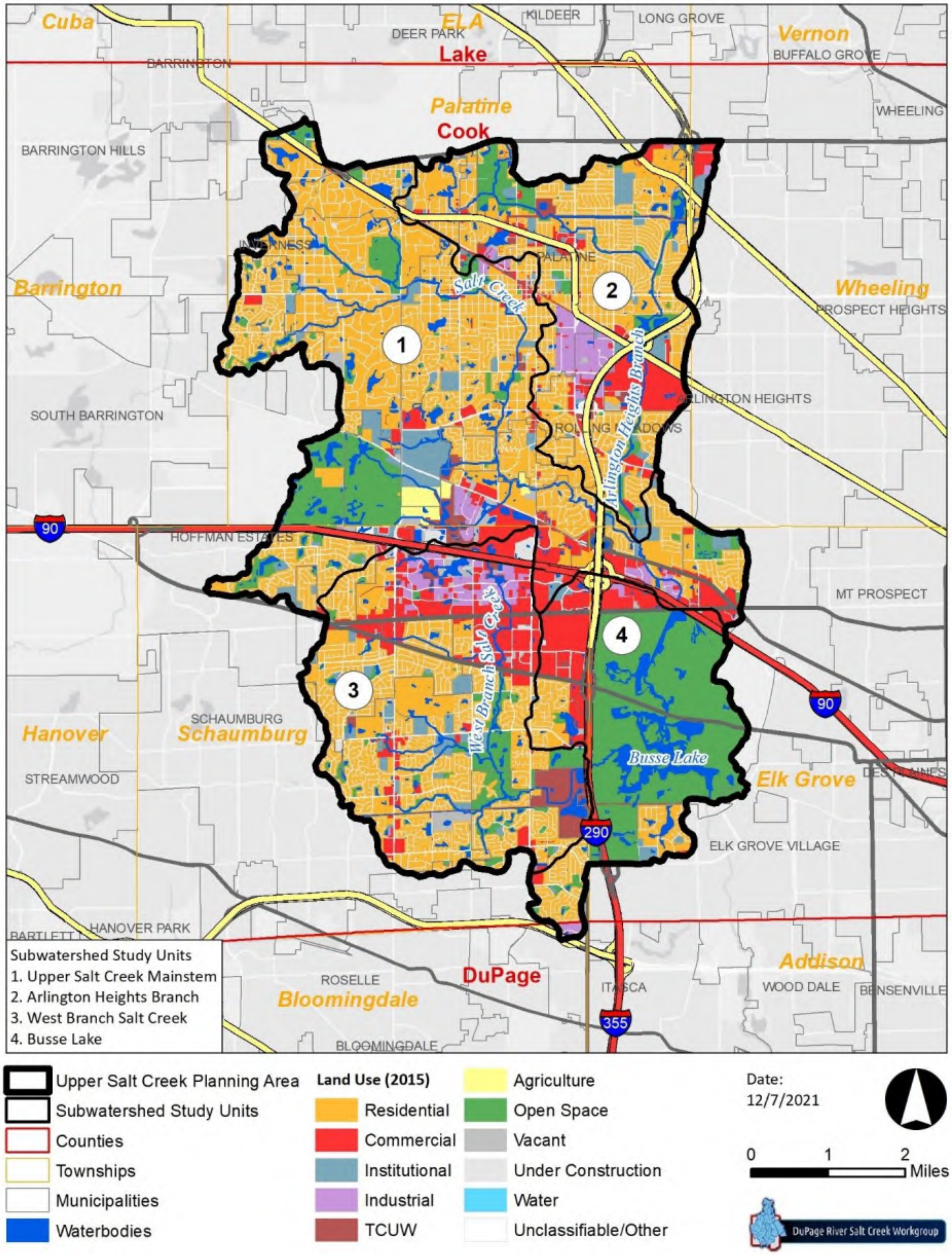
Table 16. Land use categories and extent within the Upper Salt Creek planning area

Land Use Category	Area (acres)	Area (sq mi)	Percent of Planning Area
Residential	12,877.8	20.1	40.6%
Commercial	3,294.0	5.1	10.4%
Institutional	1,513.9	2.4	4.8%
Industrial	855.6	1.3	2.7%
TCUW	1,185.3	1.9	3.7%
Agriculture	169.2	0.3	0.5%
Open Space	5,989.4	9.4	18.9%
Vacant	603.7	0.9	1.9%
Under Construction	103.7	0.2	0.3%
Water	8.4	0.01	0.0003%
Unclassifiable/Other	5,089.5	8.0	16.1%
Total	*31,690.4*	*49.5*	*100.0*

Table 17. Land use (acres) by subwatershed planning unit within the Upper Salt Creek planning area

Land Use Category	Upper Salt Creek Mainstem	Arlington Heights Branch	West Branch Salt Creek	Busse Lake
Residential	6,140.2	2,916.4	3,182.7	638.6
Commercial	818.6	790.0	1,074.8	610.5
Institutional	726.9	428.2	296.2	62.5
Industrial	184.2	337.4	284.0	50.1
TCUW	306.3	258.6	508.7	111.7
Agriculture	169.2	0.0	0.0	0.0
Open Space	1,668.1	550.2	675.5	3,095.6
Vacant	326.9	93.3	171.0	12.4
Under Construction	38.5	0.8	62.0	2.4
Water	3.3	4.5	0.0	0.5
Unclassifiable/ Other	2,016.6	1,191.1	1,328.9	552.9
Total	*12,398.9*	*6,570.4*	*7,583.9*	*5,137.3*

Figure 22. Land use in the Upper Salt Creek planning area



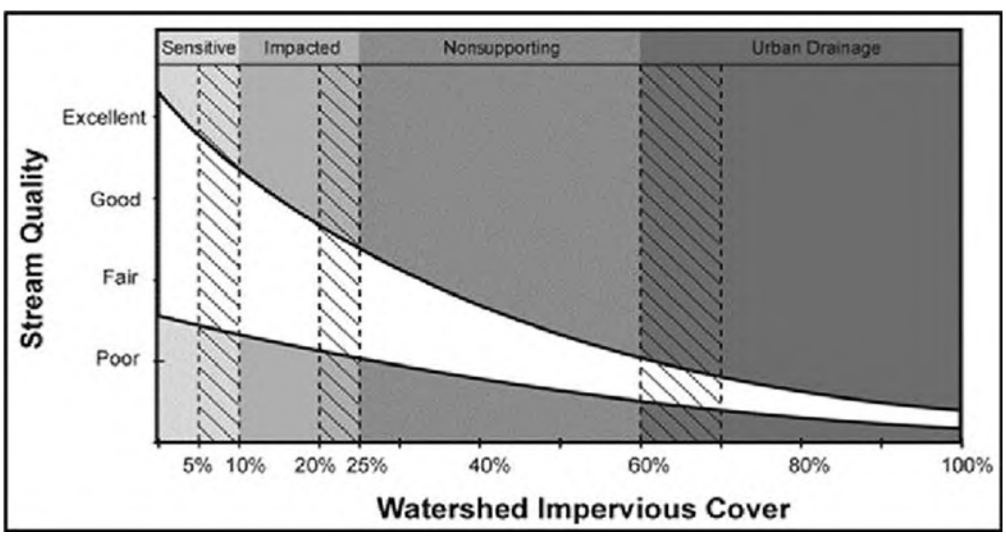
3.4.2. Impervious Surface

Paved areas or those covered with a nonporous material (e.g., concrete, asphalt, roofs, etc.) that prevent the infiltration of rainfall, runoff, and snowmelt are called impervious surfaces. Although sometimes seemingly small areas, cumulatively, they create additional runoff, changing local hydrology and generating nonpoint source pollution. Largely correlated to and inferred from land use, the impacts specifically from impervious areas are impactful and will be presented in addition to the land use assessment.

To visualize and contextualize the overall imperviousness in the Upper Salt Creek planning area, the National Land Cover Database 2019 (NLCD 2019)[33] was utilized. The NLCD 2019 is the most recent Landsat-derived, 30-meter resolution land cover database for the nation. Figure 24 displays the extent and distribution of impervious surfaces within the planning area. Analysis reveals that nearly 86.1% of the entire planning area is covered by surfaces that have some degree of imperviousness, 11.1% of which are 80% impervious or greater.

For the purpose of this plan, impervious surfaces should best be understood in the context of their impact on stream quality. This is because impervious cover is still widely used as a base metric for estimating stream health when looking at a watershed-wide scale.[34] Figure 23 shows the relationship between overall stream health and the degree of impervious surfaces using the Impervious Cover Model (ICM). Please note that the stream health categories discussed in this section are not regulatory and are specifically associated with the ICM. The reformulated ICM includes notable changes to the original conceptual model. Most notably, the impervious cover and stream quality relationship is expressed as a "cone" to represent 1) generally continuous but variable gradient of stream degradation and 2) variability in the response of stream indicators to urbanization.

Figure 23. ICM stream health categories relative to the extent of impervious surfaces



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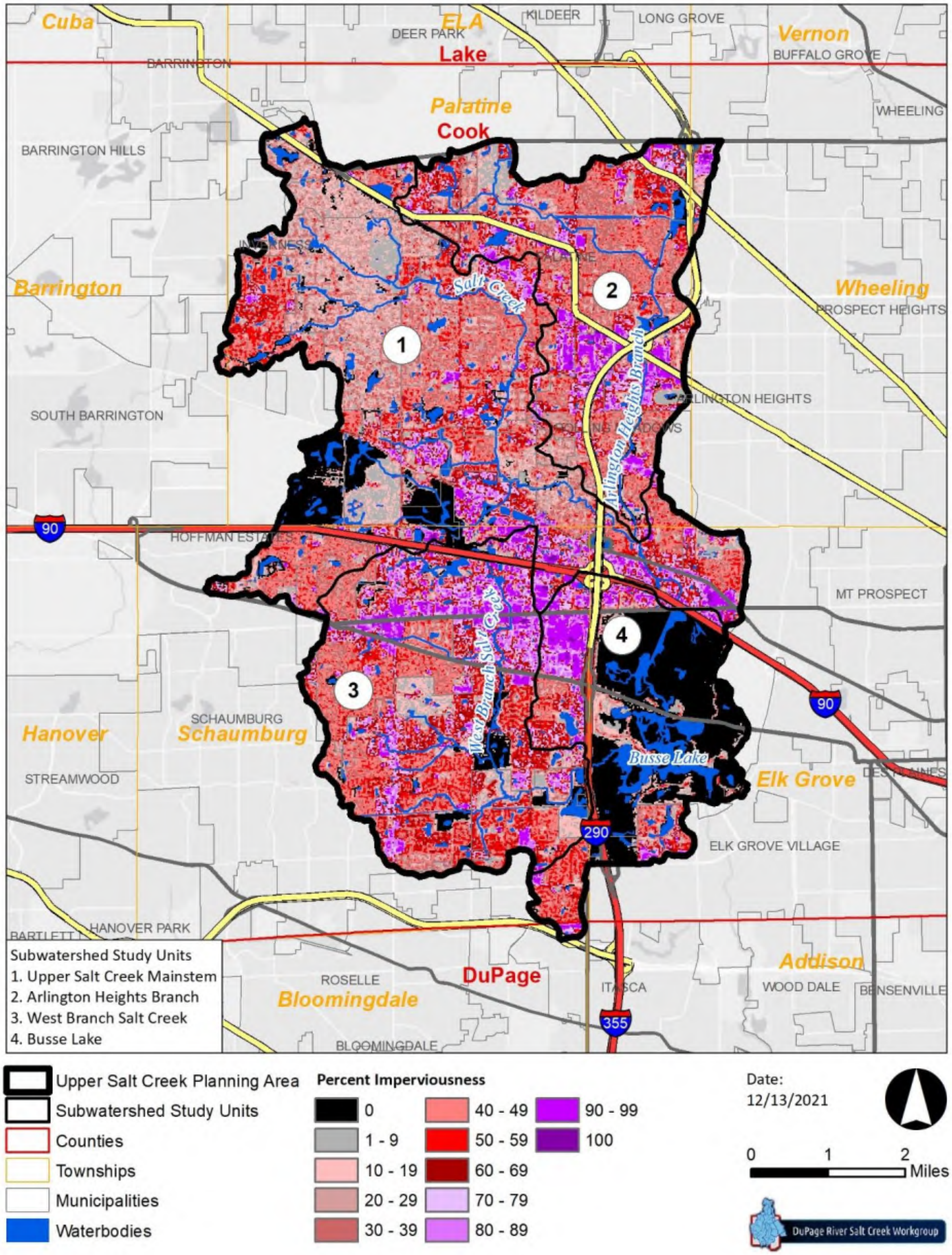
[33] "National Land Cover Database," Multi-Resolution Land Characteristics Consortium (MRLC), last accessed December 10, 2021, http://www.mrlc.gov/

[34] T.R. Scheuler, "Is Impervious Cover Still Important? Review of Recent Research," *Journal of Hydrologic Engineering* 14, no. 4 (2009), 309-315.

Figure 24. Impervious surface (0-100%) in the Upper Salt Creek planning area



For a more descriptive view into the relationship between impervious surfaces and ICM stream quality, it is best to examine the information on a smaller geographical scale, such as that of the subwatershed planning units. Covering less spatial extent focusses the analysis primarily on lakes and streams nearby and how they may be affected. Table 18 shows a breakdown of the individual subwatershed planning units, their respective imperviousness, percentages of imperviousness, and the varying ICM stream health categories. Calculated percentages of impervious surfaces classify each subwatershed planning unit into the non-supporting ICM category. Whilst not a direct indicator of stream quality and health, impervious cover and urbanization of the planning area may be somewhat limiting.

Table 18. Impervious surface extent and ICM stream health by Upper Salt Creek subwatershed planning unit

Subwatershed Planning Unit	Impervious Surface Area (ac)	Percent Impervious Surface	ICM Stream Health Category
Upper Salt Creek Mainstem	4,421.2	36%	Non-Supporting
Arlington Heights Branch	3,123.2	48%	Non-Supporting
West Branch Salt Creek	3,740.6	49%	Non-Supporting
Busse Lake	1,369.3	27%	Non-Supporting
Total	*12,683.8*	*40%*	Non-Supporting

3.4.3. Open Space Reserve

Open space reserves are areas of land and/or water that are protected or conserved so that no development, current or future, will take place. This helps to protect natural areas for years to come. Within the Upper Salt Creek planning area, open space reserves encompass more than 9,500-acres (Table 19). As shown in Figure 25, forest preserves, managed by the Cook County Forest Preserves (FPCC) comprise the majority of open space reserve land at just over 4,000-acres. Although not necessarily reserves, golf courses managed by the IDNR were included within this assessment because some are located within forest preserves.

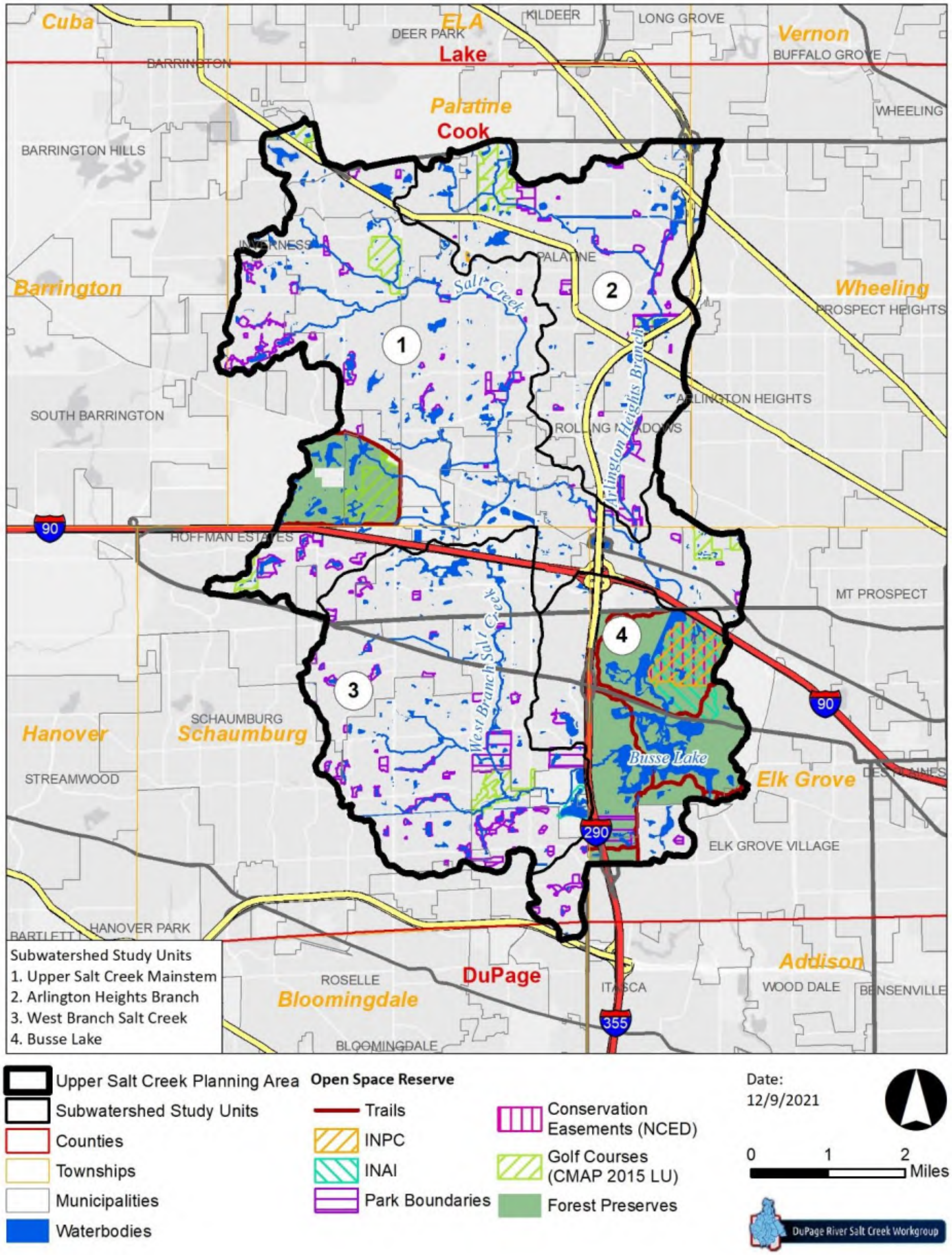
The open space reserve holdings were compiled from a variety of sources, including the Cook County Forest Preserves, the Illinois Department of Natural Resources, the Illinois Natural Areas Inventory, the National Conservation Easement Database, and the Cook County Government.

Table 19. Open space reserve holdings in the Upper Salt Creek planning area

Open Space Reserve	Area (acres)	Percent of Planning Area
INAI natural areas	1,824.6	5.8%
Parks	1,338.9	4.2%
Forest Preserves	4,002.6	12.6%
Golf Courses	994.9	3.1%
Conservation easements	1,538.2	4.9%
**Total*	9,699.2	18.7%

**The total area and percent values included above are not sums of the values associated with different open space reserve types, as some of these areas overlap. Instead, they calculate the total land area comprised by these reserve types.*

Figure 25. Open space reserves in the Upper Salt Creek planning area



3.4.4. Presettlement Land Cover

During the Public Land Survey System (PLSS) effort from 1804-1884, field notes were kept by surveyors to record the landscape. These historical records were used by the Illinois Natural History survey to create the data referenced as part of this section and describes the landscape during the initial stages of Euro-American settlements in the early 1800s[35].

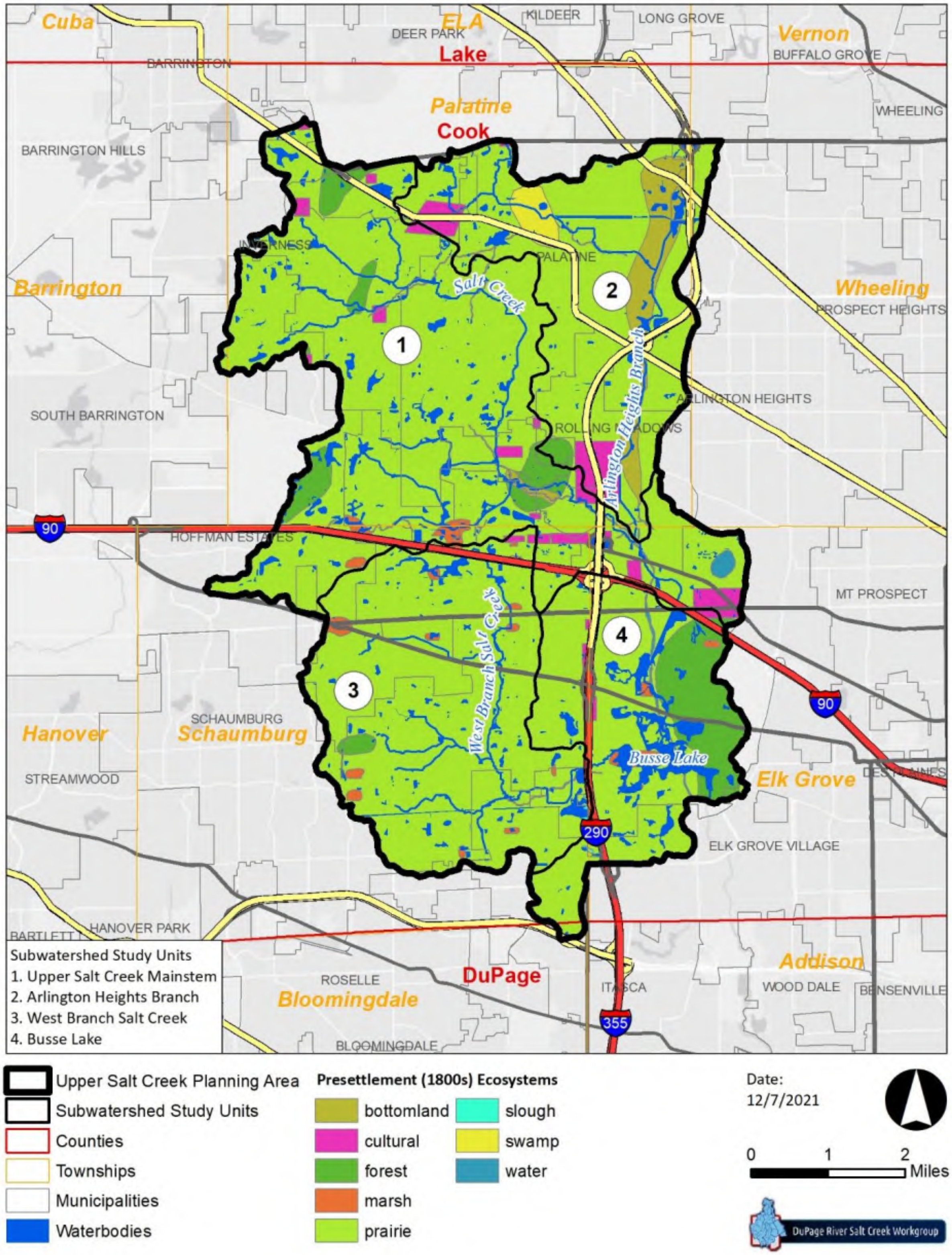
Historically, the Upper Salt Creek planning area consisted primarily of prairie. While not as prominent, forest and wetlands (categorized as slough, marsh, and swamp) were also prominent on the landscape. General large-scale comparison to present day land use (3.4.1. *Current Land Use*) can provide valuable insight to how the area has changed in the last approximately 200 years.

Table 20. Presettlement Land Cover in the Upper Salt Creek planning area, 1800s

Land Use Category	Area (acres)	Area (sq mi)	Percent of Planning Area
Bottomland	886.8	0.4	2.8%
Cultural	942.4	1.5	3.0%
Forest	1,938.5	3.0	6.1%
Marsh	405.9	0.6	1.3%
Prairie	27,050.5	42.3	85.4%
Slough	31.2	0.05	0.1%
Swamp	218.7	0.3	0.7%
Water	198.2	0.3	0.6%
Total	*31,672.2*	*48.5*	*100.0*

[35] "Land Cover of Illinois in the Early 1800's," Illinois Natural History Survey (INHS), Prairie Research Institute, last accessed on November 30, 2021, https://www.inhs.illinois.edu/resources/gis/glo/

Figure 26. Presettlement Land Cover in the Upper Salt Creek planning area, 1800s



3.5. Water Resource Conditions

3.5.1. Watershed Drainage System

In the Upper Salt Creek planning area, a HUC level 12 watershed, the water is generally conveyed from the northwest to southeast. Throughout the system, there are many features that provide water storage and support drainage, including stormwater detention basins, flood control facilities, wetlands, and ponds. The 49.5-square mile area was subdivided into 4 subbasins or “study units” to create smaller management units, quantify resource distribution, and define overall drainage and water quality. The names of the four study units are as follows: 1) Upper Salt Creek Mainstem, 2) Arlington Heights Branch, 3) West Branch Salt Creek, and 4) Busse Lake. See section 3.5.2.2 for a further explanation of the overall stream network for the Upper Salt Creek planning area.

3.5.2. Physical Stream Conditions

3.5.2.1. Introduction and Methods

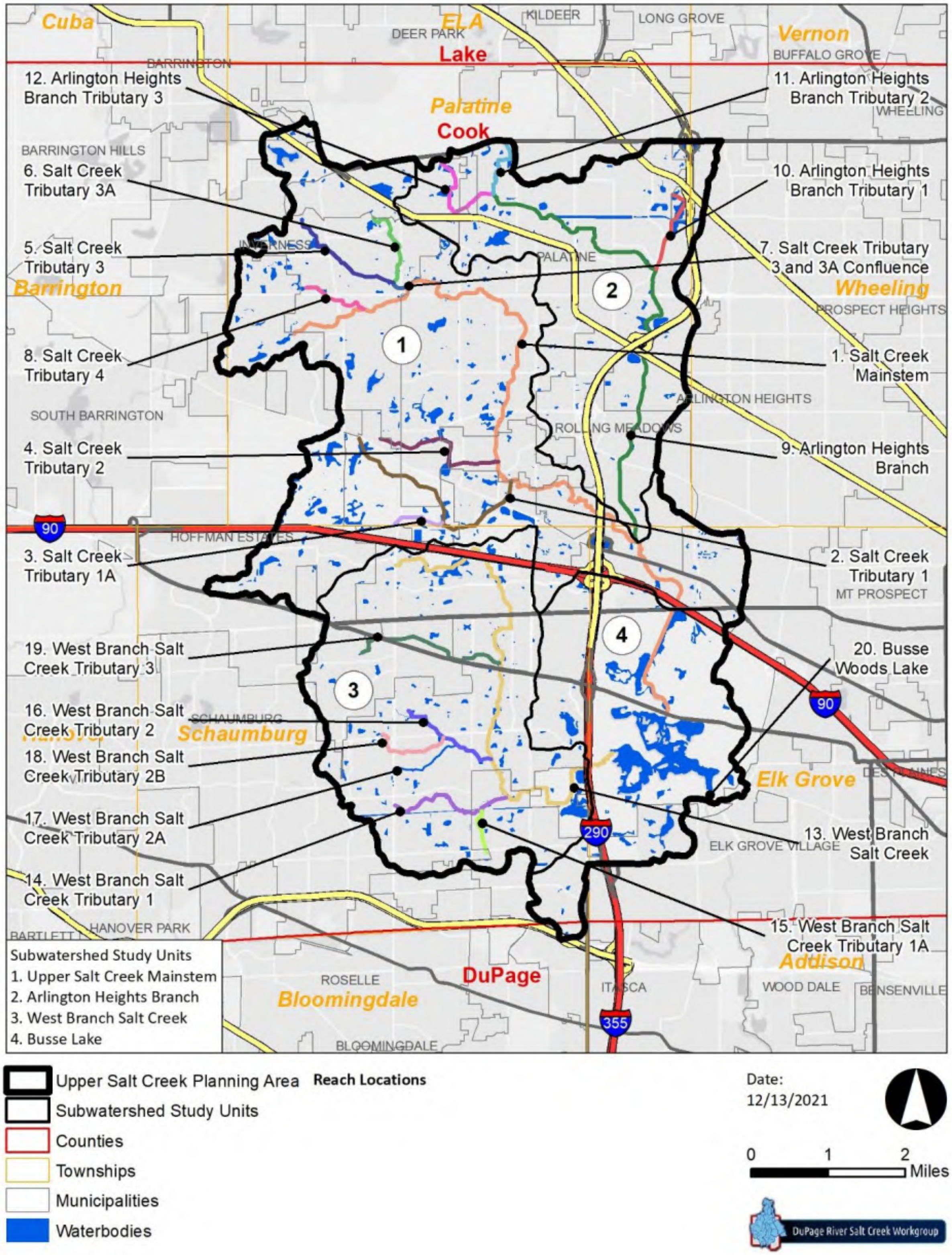
During the summer and fall of 2021, the DRSCW and Hey inventoried water resource features within the Upper Salt Creek planning area. The inventory collected data specific to lakes, detention and retention basins, and streams and rivers within the planning area. This section will focus on the streams and river portion of that inventory.

Reaches, smaller defined segments of the waterways, were defined by subdividing the Upper Salt Creek stream network, originally derived from the National Hydrography Dataset (NHD), by major stream or river confluences. Twenty (20) reaches were defined and have been identified by unique names as included below. This list below attempts to include all known alternate names. These reaches total approximately 42.4 miles in length.

1. Salt Creek Mainstem (also known as Salt Creek Upper Reach)
2. Salt Creek Tributary 1 (also known as Unnamed Tributary to Salt Creek Tributary D)
3. Salt Creek Tributary 1A (also known as Salt Creek Tributary D)
4. Salt Creek Tributary 2 (also known as Salt Creek Tributary C from Harper Lake at Harper College downstream)
5. Salt Creek Tributary 3 (also known as Salt Creek Tributary A)
6. Salt Creek Tributary 3A
7. Salt Creek Tributary 3 and 3A Confluence
8. Salt Creek Tributary 4 (also known as Salt Creek Tributary B)
9. Arlington Heights Branch (also known as Baldwin Creek from the confluence of Arlington Heights Tributary 2 and Arlington Heights Tributary 3 to the confluence with Arlington Heights Tributary 1)
10. Arlington Heights Branch Tributary 1 (also known as Anderson Drive Tributary)
11. Arlington Heights Branch Tributary 2
12. Arlington Heights Branch Tributary 3
13. West Branch Salt Creek
14. West Branch Salt Creek Tributary 1 (also known as Lancer Creek and Salt Creek West Branch Tributary 6)
15. West Branch Salt Creek Tributary 1A (also known as Salt Creek West Branch Tributary 7)

16. West Branch Salt Creek Tributary 2 (also known as Yeargin Creek, also known as Salt Creek West Branch Tributary 3)
17. West Branch Salt Creek Tributary 2A (also known as Salt Creek West Branch Tributary 5)
18. West Branch Salt Creek Tributary 2B (also known as Salt Creek West Branch Tributary 4)
19. West Branch Salt Creek Tributary 3 (also known as Salt Creek West Branch Tributary A)
20. Busse Woods Lake (this section is comprised of National Hydrography Dataset (NHD) lines within Busse Lake)

Figure 27. Reaches in the Upper Salt Creek planning area



Not all extents of these reaches were accessible for the field reconnaissance portion of this inventory, as many sections of these reaches extend through private property.

The following data were collected during the stream/river portion of the inventory:

- Channelization
- Bank Erosion
- Riparian Width
- Debris Jams

Field reconnaissance was undertaken during summer and fall of 2021, as described above, to collect channelization, bank erosion, riparian width, and debris jam data along the accessible extents of the stream network. To standardize the inventory, the 2021 field work utilized Qualitative habitat evaluation index (QHEI) methods and evaluation criteria for all assessed parameters. This field work, along with the analysis of high-resolution aerial imagery, was used to complete the stream inventory effort.

In summary, 42.1 miles were assessed in the drainage network. A summary by reach or reach group is included as Table 21 below.

Table 21. Total versus assessed stream miles in the Upper Salt Creek planning area

Reach/Reaches	Total Stream/River Miles*	Total Stream/River Miles Assessed	Percent Accessed
Salt Creek	11.6	11.6	99.9%
Salt Creek Tributaries	7.5	7.2	96%
Arlington Heights Branch	6.3	6.3	99.9%
Arlington Heights Branch Tributaries	3.5	3.5	99.9%
West Branch Salt Creek	6.3	6.3	99.9%
West Branch Salt Creek Tributaries	7.3	7.3	99.9%
Totals	*42.4*	*42.1*	*99%*

**Does not include lengths through on-line features, such as flood control reservoirs, lakes, or detention basins.*

3.5.2.2. Stream Network Description

Upper Salt Creek is comprised of three main drainages: the Mainstem, the Arlington Heights Branch, and the West Branch. The Arlington Heights Branch joins the Mainstem and feeds Busse Lake from the north, while the West Branch directly feeds Busse Lake from the west. Each subsection below describes the general drainages associated with each reach identified in Section 3.5.2.1. *Introduction and Methods*.

Salt Creek Mainstem

Salt Creek headwaters at Westbury Park, near Frank C Whiteley School. After traveling northeast through dense canopy cover in residential neighborhoods and under S Ela Rd, the mainstem joins Tributary 4 near Firth Road. After winding through more backyards and crossing Roselle and Palatine Roads, the Tributary

3 and 3A Confluence discharges to this reach. Continuing east and following Palatine Road, the Mainstem passes by Riemer Reservoir Park and receives any flow from the Margreth Riemer Reservoir. The channel passes Stuart R Paddock School, Kirk School, the Palatine Fire Department facilities on Illinois Avenue, Cardinal Park, on its path south to meet Tributary 2 near the intersection of Old Plum Grove Road and Hartung Road. About a half mile further, and Tributary 1 joins the mainstem.

Now traveling southeast, the channel crossed IL-53 and meets the Arlington Branch near Rolling Meadows High School. Now, carrying much larger flows, the channel proceeds under Interstate 90 and enters the Ned Brown Preserve, and eventually Busse Woods Reservoir/Busse Lake.

Salt Creek Tributary 1

Tributary 1 begins at W Algonquin Road, near S Ela Road. Once it begins, it flows southeast into a large freshwater emergent wetland. Once it leaves the wetland, it continues southeast, passing through the northern portion of Highland Woods Golf Course and under Roselle Road, entering a piped section through Saint Michael’s Cemetery. Downstream of the Cemetery, this reach enters a lake (Unnamed Lake 10) and joins Tributary 1a. Past the lake, the reach moves northeast and eventually meets another lake (Unnamed Lake 9). From this point, the tributary moves north and crosses under S Old Plum Grove Road and W Algonquin Road. After a short segment through a neighborhood of apartments, Salt Creek Tributary 1 confluences with the Salt Creeks mainstem.

Salt Creek Tributary 1A

Spanning only 0.94-miles, Tributary 1a flows almost entirely east, parallel to I-90. The headwaters of this small tributary are at the most southeastern portion of Highland Woods Golf Course, underneath W Central Road. Water is conveyed under Roselle Road and moves through a small portion of predominantly forest before it joins Tributary 1 in Unnamed Lake 10.

Salt Creek Tributary 2

Tributary 2 begins as a piped section southeast of Euclid Avenue and Roselle Road. The tributary flows under Roselle Road and through the Harper College Campus, then enters Plum Grove Reservoir Park. As it leaves Plum Grove Reservoir, Tributary 2 continues under S Quentin Road before entering a neighborhood northeast of Hartung Road and S Quentin Road. Just downstream, the reach parallels Hartung Road and meets the mainstem.

Salt Creek Tributary 3

Originating west of Stratford Lane and Roberts Road from an unnamed pond, Tributary 3 begins its largely southeastern journey. After passing through a secondary unnamed pond within the same subdivision, this reach eventually enters Maggie Rogers Park. Moving downstream, the reach passes under Ela Road on its way to the Inverness Park District’s North Park. After bisecting another subdivision, the channel moves through Inverness Golf Club, where it joins Tributary 3a.

Salt Creek Tributary 3A

Beginning southeast of Dunbar Road and N Inverway Road, Tributary 3A begins to convey flow southeast. After passing under W Baldwin Road, just west of the Inverness Police Department, it enters Inverness Golf Club from the north. Once inside the grounds, the tributary parallels Roselle Road and then turns south. It is at the southern portion of this golf course where it converges with Tributary 3.

Salt Creek Tributary 3 and 3A Confluence

Downstream of the confluence of Tributary 3 and Tributary 3A in Inverness Golf Club, this drainage exits the golf course through its southeastern extent, passing under Roselle Road before connecting with the mainstem.

Salt Creek Tributary 4

In its entirety, Tributary 4 primarily moves southeast. It begins in the eastern portion of Juniper Park before it crosses underneath W Palatine Road. Further downstream, the reach meets S Ela Road and passes through the subdivision on the southeastern corner of S Ela Road and Palatine Road. In this subdivision, the tributary meets Salt Creek. Tributary 4 is the most upstream tributary and is the first of the tributaries to join the mainstem.

Arlington Heights Branch

The Arlington Heights Branch begins at the confluence of Tributary 2 and 3, near Palatine Park District's Robert "Dutch" Schultz Recreation Area and Palatine Hills Golf Course. Passing Walter R. Sundling Junior High School and the Tom T. Hamilton Reservoir, the channel crosses Hicks Rd and joins Tributary 1 near Palatine Park District's Maple Park. Turning south and continuing under Palatine Road, the Arlington Heights Branch enters Lake Irene at Twin Lakes Golf Course and Recreation Area. Continuing south under Illinois Route 53 and Route 14, the reach passes through Arlington Park, Kimball Hill Park, and South Salt Park before discharging to the Salt Creek Mainstem near Rolling Meadows High School.

Arlington Heights Tributary 1

Originating in Wilke Marsh, Tributary 1 flows predominantly south towards alongside Illinois Route 53. After passing through wetlands, the reach enters Lake Louise. South of the lake, the channel moves through Lindberg Park, crossing under East Anderson Drive, joins the Arlington Heights Branch near Maple Park.

Arlington Heights Tributary 2

Headwaters of Tributary 2 begin in Deer Grove East Forest Preserve. Draining under W Dundee Road through Palatine Hills Golf Course until meeting Tributary 3 and forming the Arlington Heights Branch.

Arlington Heights Tributary 3

Southwest of the intersection of Dundee and Quentin Roads, Tributary 3 begins in a residential neighborhood along Lakeview Drive. Moving south, the reach moves through other residential properties before crossing Quentin Rd just north of Route 14 and turning northeast. Near the southern extent of Palatine Hills Golf Course, Tributary 3 meets Tributary 2, forming the Arlington Heights Branch.

West Branch Salt Creek

The West Branch begins near the business campus southeast of the intersection of Interstate 90 and Roselle Road. The channel widens into a wetland complex, crossed Interstate 90 and doubles back through another office park and industrial corridor, through the Woodfield Campus and into Woodfield Lake. Just south of Woodfield Road, Tributary 3 joins the West Branch. Moving further south, through Park St. Claire and Spring Valley Nature Center and Heritage Farm, Tributary 2 joins the system in Fox Run Golf Links. Now moving east, the channel passes by MWRD's Egan facility, and enters Busse Lake in the southwest portion of the Ned Brown Preserve.

West Branch Salt Creek Tributary 1

Originating near the intersection of Roselle Road and Weathersfield Way, Tributary 1 bisects Lancer Creek Park, crosses Plum Grove Road, and joins Tributary 1A in the southwest corner of Fox Run Golf Links. Further into the facility, the reach joins the West Branch.

West Branch Salt Creek Tributary 1A

Windemere Park and surrounding areas feed this short reach, moving north under Wise Road, through Colony Park, and meeting Tributary 1 in the southwest corner of Fox Run Golf Links.

West Branch Salt Creek Tributary 2

Starting in Schaumburg Golf Course and traveling southeast, flowing through a piped section through a townhome community, Tributary 2 quickly joins Tributary 2B at the Village of Schaumburg Municipal Center. Less than a quarter mile downstream, Tributary 2A meets the reach at the Sculpture Park. Continuing southeast and crossing Plum Grove Road, Tributary 2 joins the West Branch at Spring Valley Nature Center and Heritage Farm.

West Branch Salt Creek Tributary 2A

Tributary 2A begins near the Hadi School of Excellence along Roselle Road. Flowing east via a section of pipe, and then northeast along Beech Drive, the cannel opens again in Abrahamsen Park. As flows leaves the park, it is once again conveyed via a pipe, under Summit Drive, and emerges at the Village of Schaumburg Municipal Center. Just downstream, at the Sculpture Park, this reach terminates at the confluence with Tributary 2.

West Branch Salt Creek Tributary 2B

Tributary 2B begins at Olde Schaumburg Centre Park. Crossing Schaumburg Road, flow is conveyed through a piped section outletting at Schaumburg Town Square. Upon leaving this pond, flow enters another piped section to move under Roselle Road and daylights near Scully Court. Continuing east, Tributary 2B converges with Tributary 2 at the Village of Schaumburg Municipal Center.

West Branch Salt Creek Tributary 3

Tributary 3 begins at a nonnamed pond north of Bode Road and west of Grand Canyon Parkway. Moving northeast, it passes through a pond at Community Park, under Higgins Road, and under Roselle Road. Entering a residential area, and altering direction to move more southeast, the channel runs through a business park and eventually joins the West Branch just north of Park St. Claire.

Busse Woods

While not a stream or river in present day, when the South Dam at Ned Brown Preserve was installed, the downstream most extents of the Mainstem and West Branch were inundated to create Busse Woods Reservoir (Figure 28). As the downstream receiving waterbody for the planning area, Busse Woods Reservoir, also known as Busse Lake, is largely impacted by the water quality of the upstream waterbodies. Although Busse Lake is the downstream most water feature studied as part of this effort, further downstream lays the Lower Salt Creek Watershed, eventually converging with the Des Plaines River.

Figure 28. Historical Aerial Image (1938) pre-South Dam at the Ned Brown Preserve

3.5.2.3. Channelization

Channelization is the practice of dredging and straightening stream channels, generally in an attempt to increase flow rates, increase capacities, re-route drainage, and create more developable area, sometimes at the detriment to other land areas downstream. Traditionally, channelization was done to quickly move as much water as possible away from an area for agricultural drainage purposes and to and prevent flooding. Wetlands in the area were often drained using channelization to use the high-quality soils for farmland. In a channelized stream, many of the natural stream features no longer exist, through the elimination of the meandering bends and the over-widening of the channel bottom.

Channelized streams are unnatural systems and create many water-related problems within a watershed. The health of streams and rivers deteriorates from elimination of suitable instream habitat and wildlife by limiting the number of natural instream features such as pool-riffle sequences in the channel. Additionally, channelization reduces the overall length of the stream and increases the gradient of the channel. In both streams and constructed channels, channelization increased the speed at which runoff flows through the stream system. Because it is the nature of concentrated, flowing water to create meandering channels as a means to distribute and dissipate stream energy, channelized streams may be susceptible to bank instability and erosion as the stream attempts to achieve more stable morphological form.

The physical stream condition survey prepared as part of the watershed-based planning process documents channelization in the Upper Salt Creek planning area. The degree of channelization was assessed using the following classifications:

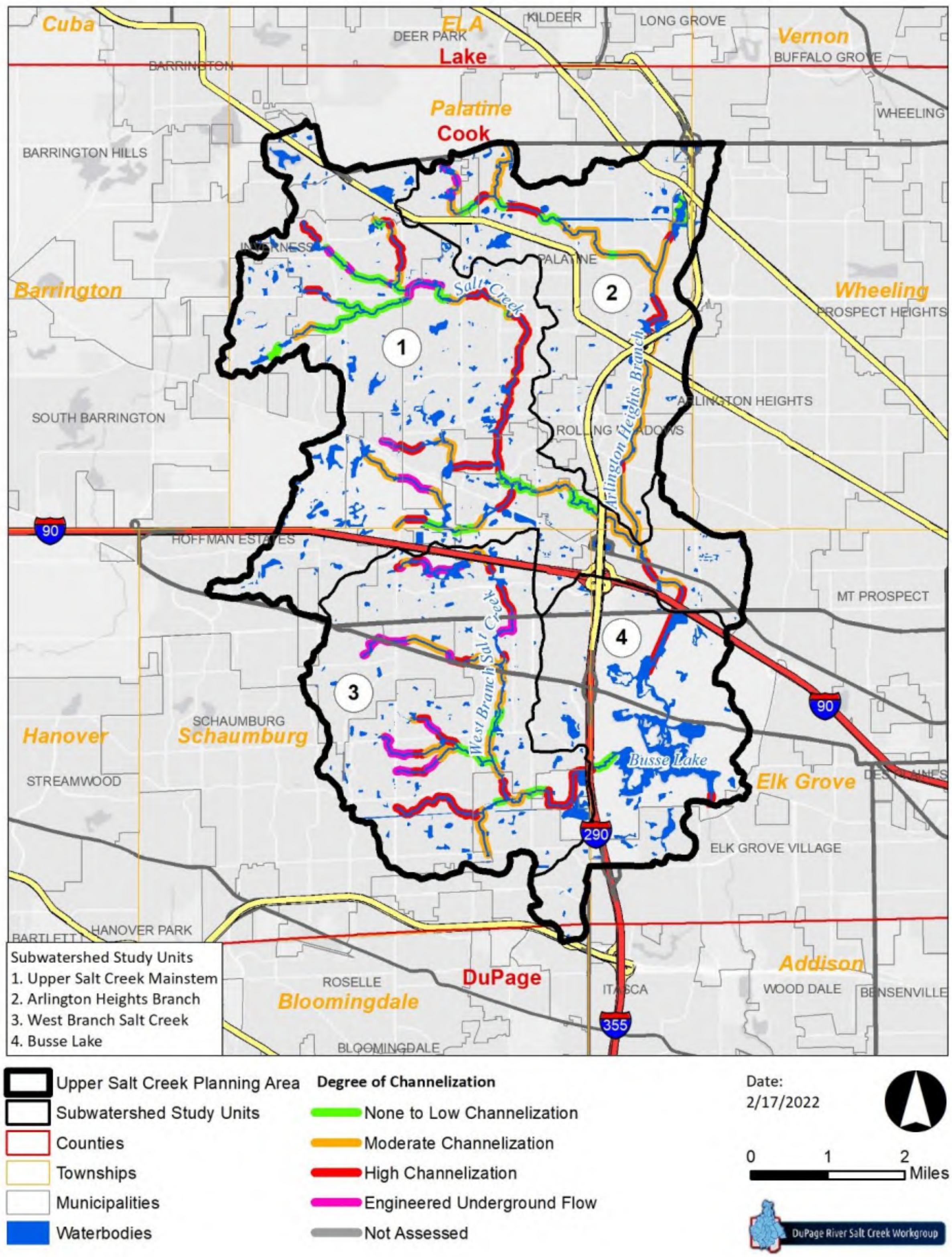
- **None to Low Channelization** refers to streams that have had little to no human modification to flow path, channel, bottom, etc.
- **Moderate Channelization** refers to streams that have evident human modification but still maintain some natural morphologic function.
- **High Channelization** refers to streams that have been completely modified and have no resemblance to a natural condition.
- **Engineered Underground Flow** refers to streams that have been redirected into storm systems underground.

The Upper Salt Creek planning area falls within an urban stream corridor; thus, channelization is expected. Moderate to high channelization is seen in 76.1% of assessed stream feet and low channelization is present in the remaining 23.9%. Table 22 provides a summary of the degree of channelization for the assessed reaches of the Upper Salt Creek planning area.

Table 22. Degree of channelization for assessed stream reaches in the Upper Salt Creek planning area

Degree of Channelization		None to Low	Moderate	High	Unassessed	Engineered Underground Flow
Salt Creek	Reaches	29.0	30.0	15.0	0.0	1.0
	Feet	19697.8	21670.8	16600.5	0.0	3049.0
	% of Feet	32.3%	35.5%	27.2%	0.0%	5.0%
West Branch Salt Creek Tributaries	Reaches	6.0	17.0	11.0	0.0	11.0
	Feet	3702.5	12006.8	12807.7	0.0	9983.0
	% of Feet	9.6%	31.2%	33.3%	0.0%	25.9%
West Branch Salt Creek	Reaches	6.0	10.0	11.0	0.0	4.0
	Feet	6494.0	9344.0	11409.0	0.0	6149.0
	% of Feet	19.4%	28.0%	34.2%	0.0%	18.4%
Salt Creek Tributaries	Reaches	18.0	16.0	13.0	2.0	5.0
	Feet	11959.0	9364.0	12143.0	1627.0	4740.0
	% of Feet	30.0%	23.5%	30.5%	4.1%	11.9%
Arlington Heights Branch	Reaches	14.0	23.0	7.0	0.0	1.0
	Feet	5975.0	22034.8	4714.3	0.0	341.0
	% of Feet	18.1%	66.6%	14.3%	0.0%	1.0%
Arlington Heights Tributaries	Reaches	4.0	11.0	2.0	0.0	3.0
	Feet	4525.5	11348.5	1277.0	0.0	1100.0
	% of Feet	24.8%	62.2%	7.0%	0.0%	6.0%
Totals	*Reaches*	*77.0*	*107.0*	*59.0*	*2.0*	*25.0*
	Feet	*52353.8*	*85768.8*	*58951.5*	*1627.0*	*25362.0*
	% of Feet	*23.4%*	*38.3%*	*26.3%*	*0.7%*	*11.3%*

Figure 29. Degree of channelization for assessed stream reaches in the Upper Salt Creek planning area



3.5.2.4. Streambank Erosion

Streambank erosion is a function of the amount of water flowing along the bank, soil type, steepness of the bank, and vegetative cover or armoring on the bank. Streambank erosion is a natural process and contributes to the sinuous, meandering planform often associated with undisturbed alluvial stream channels. In relatively natural systems, there is typically an overall balance of sediment transported withing a reach or river cross section. However, in watersheds with significant development or channelization, streambank erosion rates are increased by changes in watershed hydrology or channel geomorphology, leading to several problems. Erosion can cause physical water quality problems such as increased or excessive turbidity in the water. Erosion can also lead to sedimentation, which is the deposition of sediment within the stream channel. Sedimentation reduces the volume that can be conveyed and covers existing streambed materials such as gravel, which are important habitat for macroinvertebrates and fish. Additionally, erosion can lead to water quality problems because nutrients, particularly phosphorus, are often bound to sediment particles and introduced to the aquatic environment by erosion. Excessive erosion can also be problematic for property owners and land managers because it can lead to downcutting and/or widening of the stream channel, thus leading to loss of land, property, or structures.

Streambank erosion was documented along the Upper Salt Creek during the physical stream condition survey for the watershed-based planning process. The degree of erosion was assessed using the following classifications:

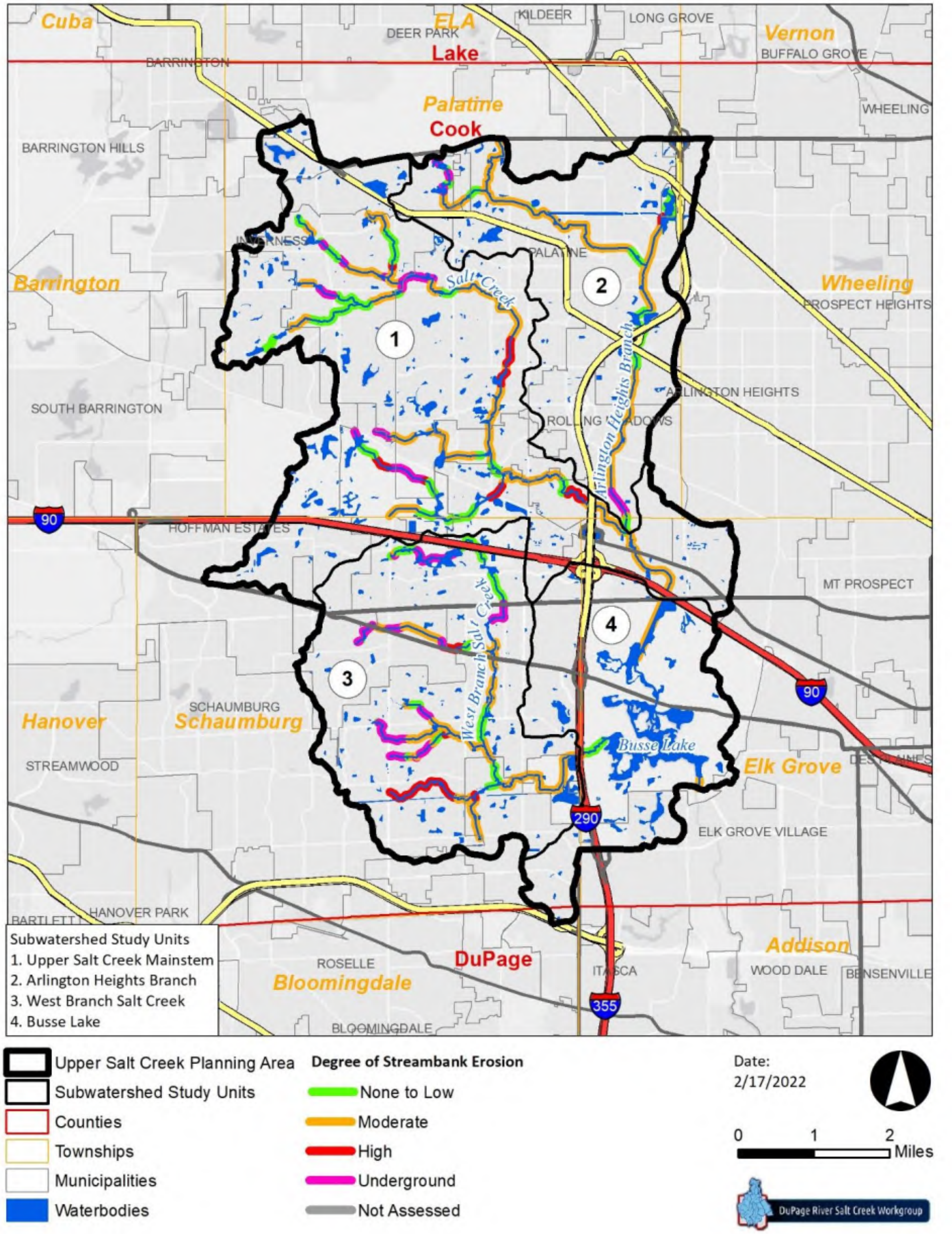
- **None to Low Erosion:** streambanks are stable, but slightly changed along the transect line; less than 25% of streambank is receiving any stress, or eroding
- **Moderate Erosion:** streambanks are receiving moderate alteration along transect line; at least 50% of streambank is in natural stable condition; not more than 50% is eroding
- **High Erosion:** streambanks have received major alterations along transect lines; less than 50% of streambank is in stable condition; over 50% of streambank is eroding

Streambank erosion is a clear issue in the Upper Salt Creek planning area as determined by the assessed stream reaches. Of the assessed streams, 55.5% had moderate erosion issues with only 25.7% of streams showing little to no erosion. Table 23 shows the summarization of field data collected during the summer of 2021. Note that not all lengths of the streams and rivers were assessed as part of the field visit component, as many were not publicly accessible. Of the assessed areas, lower degrees of streambank erosion may be over represented due to land use practices in publicly accessible areas.

Table 23. Degree of streambank erosion for assessed stream reaches in the Upper Salt Creek planning area

Degree of Streambank Erosion		None to Low Bank Erosion	Moderate Bank Erosion	High Bank Erosion	Underground	Unassessed
Salt Creek	Reaches	18	47	3	1	0
	Feet	11,759.0	41,498.0	4,712.0	3,049.0	0
	% of Stream	19.3%	68.0%	7.7%	5.0%	0%
West Branch Salt Creek Tributaries	Reaches	20	24	8	10	0
	Feet	5,804.6	16,285.8	7,586.7	8,823.0	0
	% of Stream	15.1%	42.3%	19.7%	22.9%	0%
West Branch Salt Creek	Reaches	14	16	1	4	0
	Feet	11,843.9	15,240.9	162.3	6,149.0	0
	% of Stream	35.5%	45.6%	0.5%	18.4%	0
Salt Creek Tributaries	Reaches	20	23	4	5	2
	Feet	15,384.0	15,855.0	2,227.0	4,740.0	1,627.0
	% of Stream	38.6%	39.8%	5.6%	11.9%	4.1%
Arlington Heights Branch	Reaches	9	29	0	2	0
	Feet	7,193.3	23,461.8	0.0	2,410.0	0
	% of Stream	21.8%	71.0%	0.0%	7.3%	0
Arlington Heights Tributaries	Reaches	7	10	1	3	0
	Feet	5,113.5	11,109.5	928.0	1,100.0	0
	% of Stream	28.0%	60.9%	5.1%	6.0%	0
Total	*Reaches*	*88*	*149*	*17*	*25*	*2*
	Feet	*57,098.2*	*123,450.9*	*15,615.9*	*26,271.0*	*1,627.0*
	% of Streams	*25.5%*	*55.1%*	*7.0%*	*11.7%*	*0.7%*

Figure 30. Degree of streambank erosion for assessed stream reaches in the Upper Salt Creek planning area



3.5.2.5. Streambed Erosion

The amount of downcutting a riverine system has experienced can be described as streambed erosion. Increased velocities, increased discharges, and changes to the natural hydrograph are primary drivers of this type of hydrologic impact. Similar to bank erosion, influences to bed erosion are a product of cumulative sources, including bed substrate, decreased storage and increased runoff from the upper watershed, decreased in emergent vegetation, channelization, and location and distribution of outfalls.

Also similar to bank erosion, sediment migration can cause excessive turbidity, sedimentation in downstream reaches and in on-line basin features, can feed the development of bank erosion, and cause undermining of outfalls and other structural features throughout the channel.

In relatively natural channel systems in this region, we typically see narrower, shallower channels in the headwaters, growing to widened, and slightly deeper main channels as tributaries converge in the primary drainage system.

In some cases, streambed erosion can be challenging to quantify without known historical streambed profile information. In other cases, deposition may have occurred in lieu of or in addition to bed erosion, proving cumulative impact or quantification challenging. Based on historical and geomorphic perspective, the field assessment of bed erosion was largely qualitative in nature. Relative depth to width, obvious signs of channelization, and channel substrate were the primary factors used in determining varying levels of bed erosion throughout the planning area. Streambed erosion was documented along the Upper Salt Creek during the physical stream condition survey for the watershed-based planning process. The degree of erosion was assessed using the following classifications:

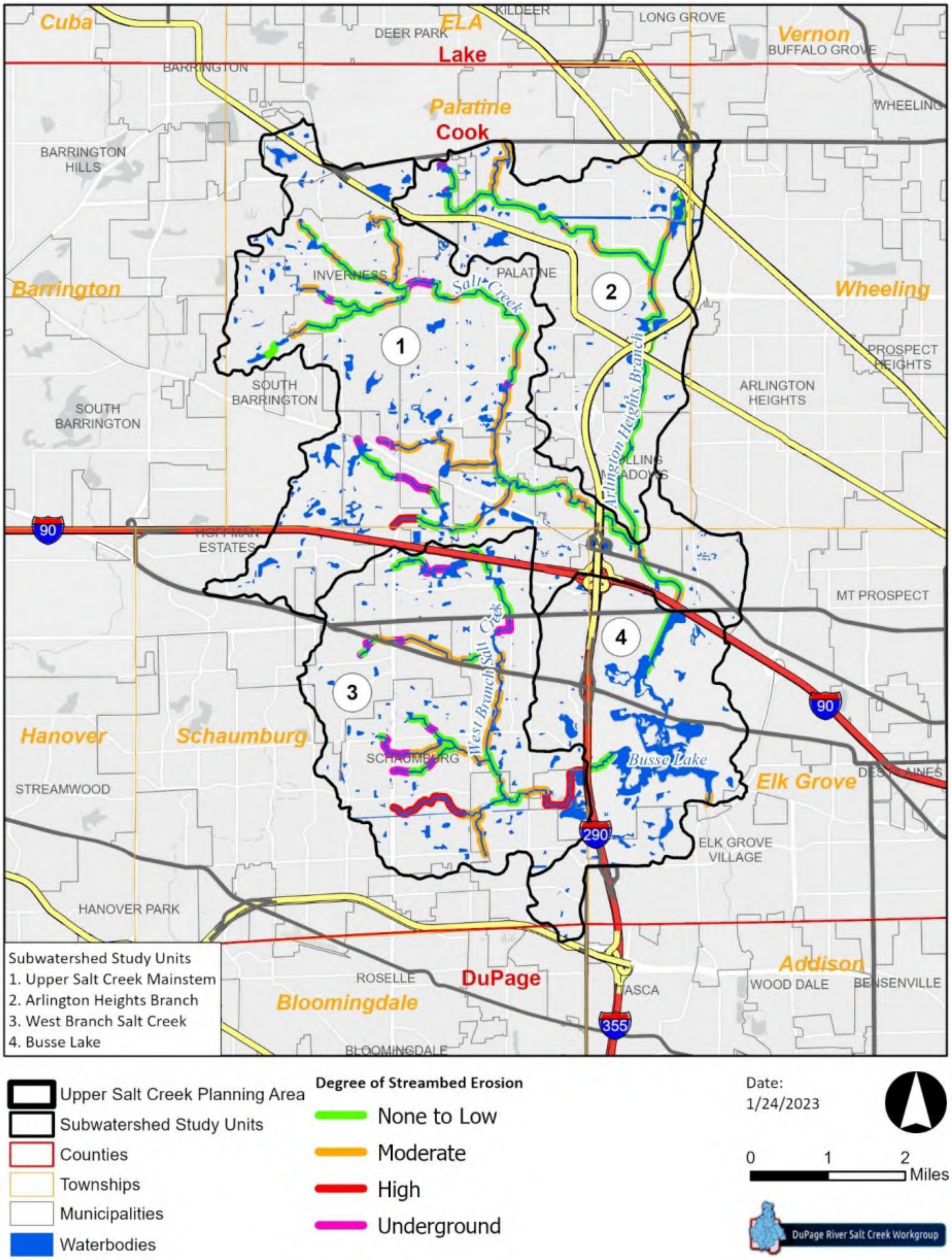
- **None to Low Erosion:** streambed appears stable with expected bed substrate composition, but may seem slightly more incised compared to what would be expected in a reference reach unaltered condition
- **Moderate Erosion:** streambed appears moderately stable with combined sand/gravel and clayey substrate, depth ratio appears to exceed what would be expected in a reference reach unaltered condition
- **High Erosion:** streambed appears actively eroding, substrate shows low sand/gravel composition, depth ratio clearly exceeds what would be expected in a reference reach unaltered condition

Streambed erosion across the Upper Salt Creek planning area is still an issue of concern, even as it is more challenging to quantify and may not be as severe as streambank erosion. Of the assessed reaches, 35.0% had moderate bed erosion issues and 46.4% of reaches showed little to no erosion. Table 24 shows the summarization of field data collected during the summer of 2021. Note that not all lengths of the streams and rivers were assessed as part of the field visit component, as many were not publicly accessible.

Table 24. Degree of streambed erosion for assessed stream reaches in the Upper Salt Creek planning area

Degree of Streambed Erosion		None to Low Bank Erosion	Moderate Bank Erosion	High Bank Erosion	Underground	Unassessed
Salt Creek	Reaches	42	17	0	2	0
	Feet	35,245.0	21,408.0	0.0	4,034.0	0
	% of Stream	58.1%	35.3%	0%	6.6%	0%
West Branch Salt Creek Tributaries	Reaches	11	15	2	10	0
	Feet	5,345.0	17,956.0	6,376.0	8,823.0	0
	% of Stream	13.9%	46.6%	16.6%	22.9%	0%
West Branch Salt Creek	Reaches	13	12	1	4	0
	Feet	12,575.0	8,782.0	5,890.0	6,149.0	0
	% of Stream	37.7%	26.3%	17.6%	18.4%	0%
Salt Creek Tributaries	Reaches	18	21	3	8	0
	Feet	13663.0	17912.0	2160.0	6429.0	0
	% of Stream	34.0%	44.6%	5.4%	16.0%	0%
Arlington Heights Branch	Reaches	29	5	1	1	0
	Feet	26781.0	5537.0	406.0	341.0	0
	% of Stream	81.0%	16.7%	1.2%	1.0%	0%
Arlington Heights Tributaries	Reaches	11	4	0	3	0
	Feet	10389.0	6762.0	0	1100.0	0
	% of Stream	56.9%	37.1%	0%	6.0%	0%
Total	*Reaches*	*124*	*74*	*7*	*28*	*0*
	Feet	*103998.0*	*78357.0*	*14832.0*	*26876.0*	*0*
	% of Streams	*46.4%*	*35.0%*	*6.6%*	*12.0%*	*0%*

Figure 31. Degree of streambed erosion for assessed stream reaches in the Upper Salt Creek planning area



3.5.2.6. Riparian Buffers

Riparian buffers are areas adjacent to streams, rivers, wetland, or any body of water. While these areas can be comprised of many different land uses and land covers, they are predominantly comprised of grasses, grass-like forbs, shrubs, and trees. Vegetated riparian buffers can provide a plethora of benefits, not only for the water systems, but for soils, living organisms, and communities. While not limited to those listed, some of the most pronounced benefits include increasing soil stability, making streambanks more resistant to erosion, providing biota habitat and movement greenspace corridors, providing shade in the stream for the system, and filtering runoff and other pollutants. In general, the wider the vegetated riparian buffer, the better said buffer is at removing pollutants and improving water quality.

For the Upper Salt Creek planning area, the vegetated riparian buffers were visually assessed during the desktop inventory using high-resolution aerial photography and validated during a series of site visits where access was feasible. During the assessment, the riparian buffers categorized based upon their overall quality. It should be noted that single reaches were identified and then classified into categories depending on the percentage of the reach that was best defined by each category.

The following categories were used in this assessment:

- **No riparian buffer or poor** quality riparian buffers referred to areas where vegetative corridors were narrow or not present, communities comprised of non-native plants, landscaping, or turf grass, active bank erosion was observed, floodplain was generally disconnected (inferred from topography), active bed erosion and downcutting was observed, gabions, sheet pile, or other artificial wall structures comprised bank reaches, and concrete-lined channels
- **Fair** riparian buffer quality was generally indicated by some combination of poor and good factors. These areas include wide buffers comprised of non-natives, narrow buffers comprised of natives, short reaches of wall sections bisecting naturalized banks, and varying levels of erosion and deposition.
- **Good** riparian buffer quality was identified as a wide adjacent vegetated area composed of diverse, native, predominantly herbaceous vegetation, low or no observable erosion, evidence of floodplain connection, and minimal artificial bank structures
- Reaches in which **underground conveyance infrastructure** exists or the system moves through **wetland complexes** were categorized separately. Please note that an assessment of wetlands is provided in section 3.3.7. *Wetlands*.

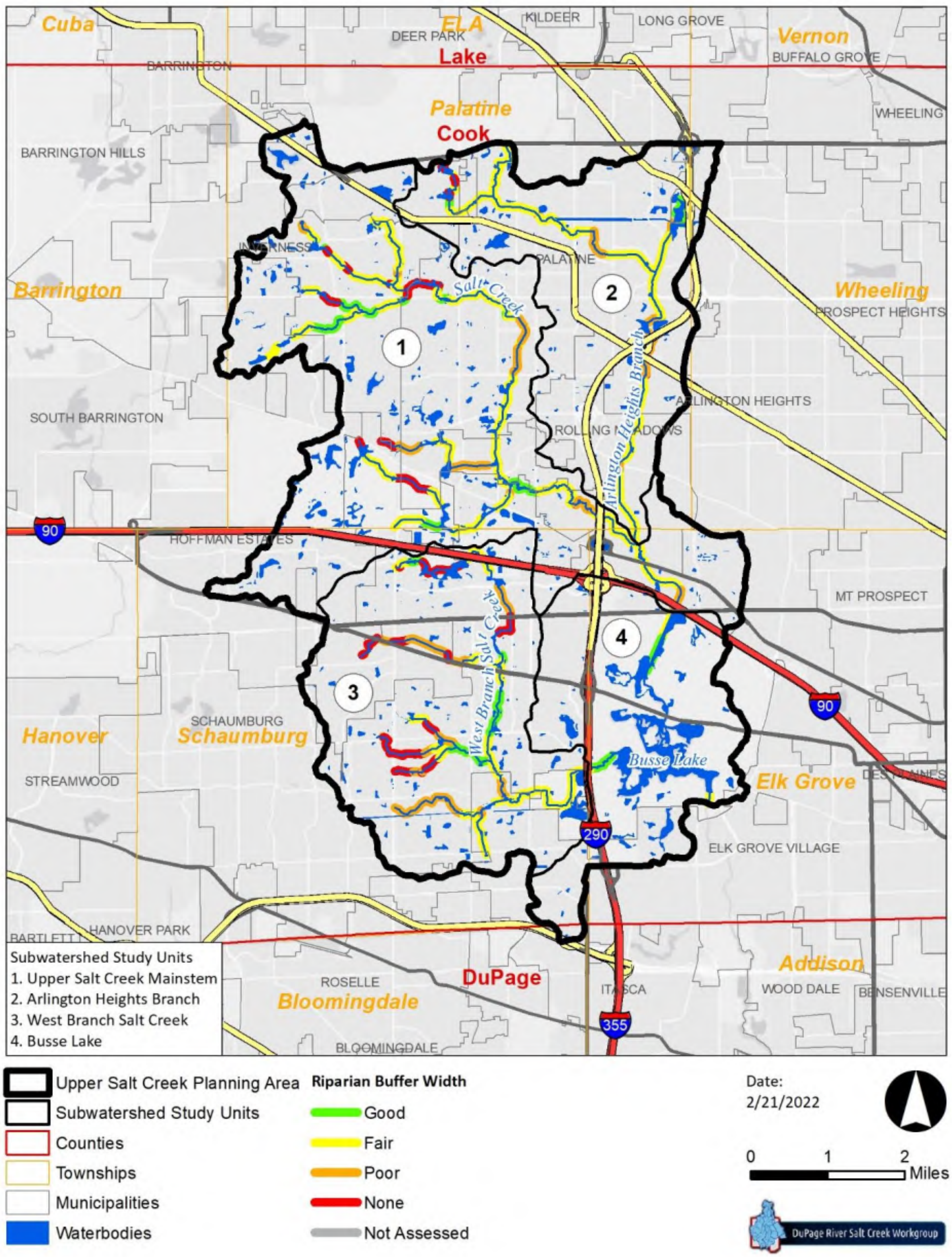
Presence of invertebrates was considered in this assessment, although their absence in certain field assessments was likely impacted by seasonality towards the latter extents of the field season.

Most of the assessed buffers within the planning area are either considered to be fair or poor in quality, 54.9% and 22.4% respectively. Only 11.6% of the buffers are thought to be in good quality. Table 25 provides a summary of the riparian buffers throughout the Upper Salt Creek planning area, while Figure 31 illustrates each recording buffer and gives a visualization of its dominant recorded quality.

Table 25. Riparian buffer quality assessed along stream reaches within the Upper Salt Creek planning area

Condition of Riparian Buffer		Good	Fair	Poor	Underground	Unassessed
Salt Creek	Reaches	14	51	11	1	0
	Feet	8,899.5	40,840.5	8,229.0	3,049.0	0
	% of Stream	14.6%	66.9%	13.5%	5.0%	0%
West Branch Salt Creek Tributaries	Reaches	4	15	15	11	0
	Feet	3618.66	8746.06	16649.8	9482	0
	% of Stream	9.4%	22.7%	43.2%	24.6%	0%
West Branch Salt Creek	Reaches	7	18	8	4	0
	Feet	6,169.8	17,204.3	3,873.0	6,149.0	0
	% of Stream	18.5%	51.5%	11.6%	18.4%	0
Salt Creek Tributaries	Reaches	4	32	10	5	2
	Feet	3,810.0	23,246.0	6,410.0	4,740.0	1,627.0
	% of Stream	9.6%	58.4%	16.1%	11.9%	4.1%
Arlington Heights Branch	Reaches	0	27	18	1	0
	Feet	0.0	20,436.5	12,287.5	341.0	0
	% of Stream	0.0%	61.8%	37.2%	1.0%	0
Arlington Heights Tributaries	Reaches	2	12	6	3	0
	Feet	3,269.5	11,604.5	2,277.0	1,100.0	0
	% of Stream	17.9%	63.6%	12.5%	6.0%	0
Total	*Reaches*	*31*	*155*	*68*	*25*	*2*
	Feet	*25767.41*	*122077.81*	*49726.3*	*24861*	*1627*
	% of Streams	*11.5%*	*54.5%*	*22.2%*	*11.1%*	*0.7%*

Figure 31. Riparian buffer quality assessed along stream reaches within the Upper Salt Creek planning area



3.5.2.7. Debris Jams

Almost all streams, rivers, and tributaries transport some number of debris downstream, including leaves, branches, and even trash. The transportation of debris is a naturally occurring process that is quite beneficial to stream health and diversity. Large woody material that is partially exposed from the water provides basking and perching sites for birds and reptiles, and provides complex surfaces for algae to grow on. Aquatic macroinvertebrates and fish species also use these systems for food and shelter[36]. Hydraulic disruptions in the water column due to this debris can impact bed formation, sediment distribution, and create dynamic erosional and depositional cycles.

Too much debris or debris that is too large for the system may become problematic. Conveyance limitations, flooding, and prolonged stagnant erosion and depositional cycles can impact bank stability and damage riparian properties and structures. Generally, smaller natural debris in the system is beneficial, but larger jams may require monitoring or removal if they threaten to impact conveyance substantially in developed areas.

Debris jam data was collected during the Summer of 2021 by field staff during the stream inventories. It should be noted that specific locations of observed debris jams were not documented, instead were only stated as relative abundance within a given assessed reach. In total, 23 separate debris jams were identified across the planning area. The reaches containing debris jams are shown in Figure 32. Ongoing issues with riparian tree mortality related to disease and pests, such as the Emerald Ash Borer, can exacerbate the potential for problematic debris jams.

In accordance with the Cook County Stormwater Management Plan, MWRD maintains a Small Streams Maintenance Program (SSMP) to help relieve flooding in urban areas. The program is centered around removing debris jams caused by woody materials, bank erosion, and non-native plants. Figure 33 below was created to show a bigger picture of the debris jams happening within the watershed[37]. Reaches observed in the field and debris jam data from MWRD were used to create a better understanding of the issue. Small stream issues can be reported to SSMP on their Citizen Incident Reporting page or by calling (847) 568-8225.

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[36] Danielle Rhea Extension Educator Expertise Private water supplies Water testing and treatment Nutrient Management Planning Agricultural Water Issues Pond management Stormwater Management More by Danielle Rhea News Extension Water Team Welcomes New Water. "Benefits of Large Woody Debris in Streams." *Penn State Extension*, 25 Oct. 2021, https://extension.psu.edu/benefits-of-large-woody-debris-in-streams.

[37] Debris Jam data provided by Mark Castillo at MWRD

Figure 32. Debris jam presence in the Upper Salt Creek planning area

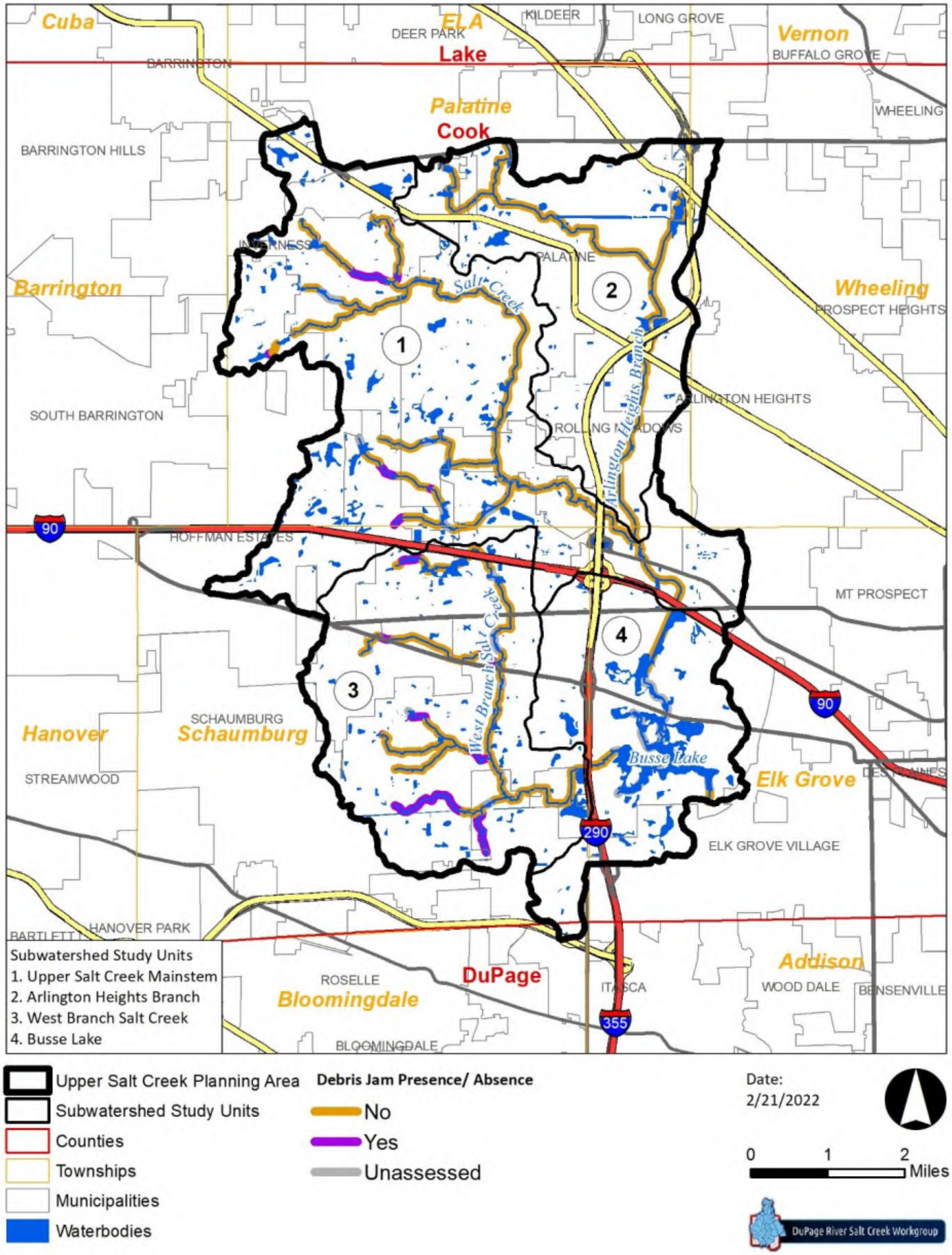
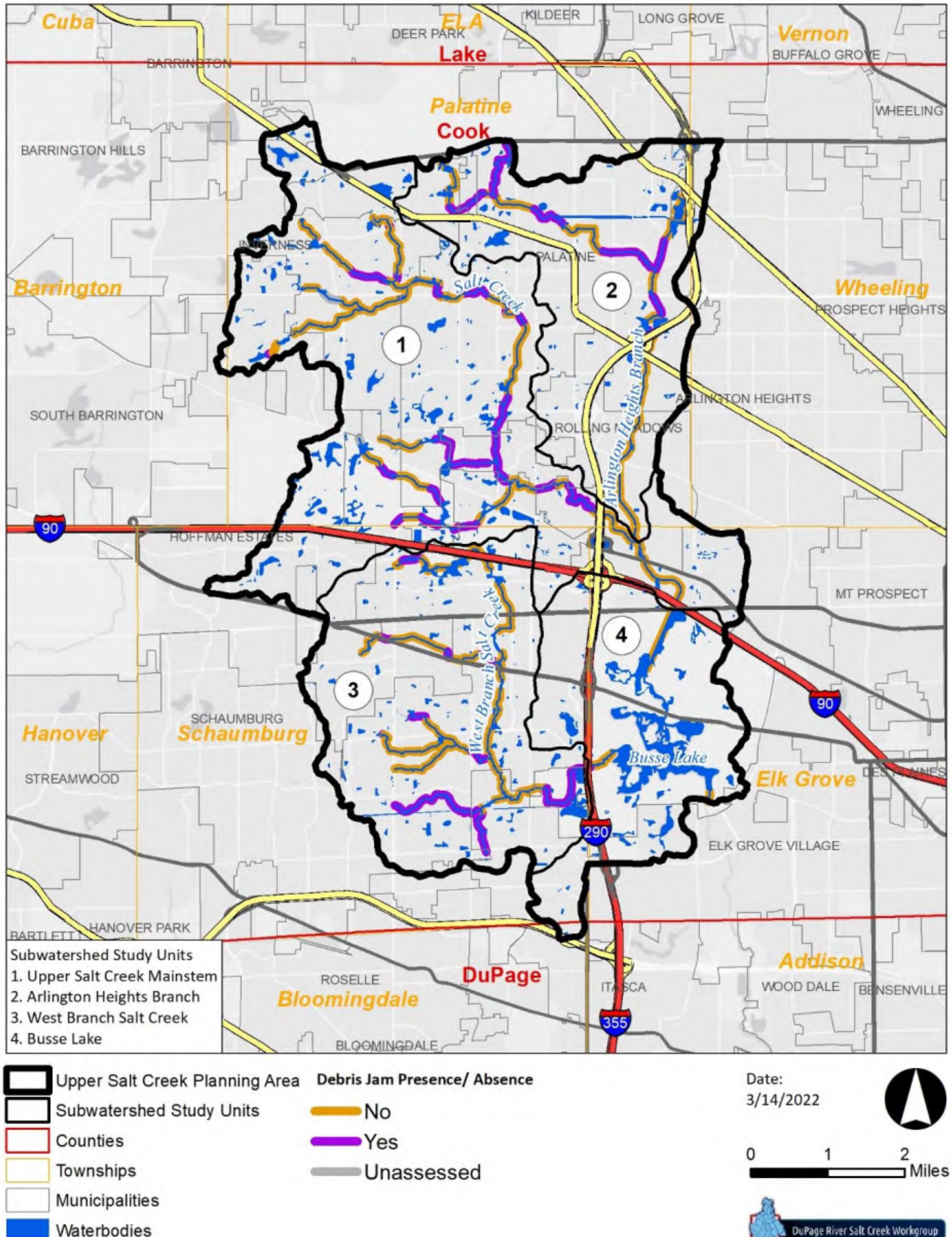


Figure 33: Debris Jams cleared by MWRD in the Upper Salt Creek planning area (2021)



3.5.2.8. Dams

The presence of dams is an important consideration when examining a water system. They can provide many benefits to our communities, such as flood control, however, many additional impacts exist, including those to nutrient cycling, water chemistry and quality, movement of in-stream biota, and the greater ecosystem. The streams and rivers are home to many biotic communities that use habitat connectedness and rely on substrate composition for their lifecycles, including feeding, breeding, and transportation. The addition of dams can greatly disrupt the lives of these species by fragmenting habitat, changing bottom compositions, amongst many other changes to flow regime and water chemistry. Sediment deposition and distribution can be greatly impacted by the addition of these impounding structures, affecting habitat for many fish species and other aquatic organisms[38]. The principal dams in the Upper Salt Creek planning area are described below[39] (ordered north to south), and their locations are shown in Figure 39.

Twin Lakes Reservoir Dam (NID ID 50054)
Located at the southern end of the Twin Lakes Golf Course and Recreation Area, this earthen dam impounds the Arlington Heights Branch. Lake Irene and Doughnut Lake are upstream and outlet through the dam owned and maintained by MWRD. Constructed in 1987, the dam is 14 feet high and impounds 775 acre-feet. The hazard potential rating is high. See section 3.5.5. *Flood Control Reservoirs and Facilities* for more information on this facility.

Figure 34. Twin Lakes Reservoir Dam

Plum Grove Reservoir Dam (NID ID IL50021)
Located at Harper College on the Plum Grove Reservoir Park, this earthen dam impounds Salt Creek Tributary C at the eastern and southern end of the reservoir. The dam is owned and maintained by MWRD. Constructed in 1984, the structure is 23 feet high and impounds 985 acre-feet. The hazard potential rating is high. See section 3.5.5. *Flood Control Reservoirs and Facilities* for more information on this facility.

Figure 35. Plum Grove Reservoir Dam

[38] Positive and Negative Impacts of Dams on the Environment. International Congress on River Basin Management. https://cvc.ca/wp-content/uploads/2011/02/60.pdf. Accessed November 15, 2021
[39] Many of the data included below was provided the U.S. Army Corps of Engineering's National Inventory of Dams. https://nid.sec.usace.army.mil/ords/f?p=105:1::::::. Accessed November 16, 2021.

St. Michael Reservoir Dam (NID ID IL50045)
Located south of St. Michael's Cemetery, this earthen dam impounds Salt Creek Tributary D, also known as the St. Michael's Tributary, at the eastern and southern extent of the reservoir. The dam is owned and maintained by MWRD. Constructed in 1985, the structure is 26 feet high and impounds 1,584 acre-feet. The hazard potential rating is high. See section 3.5.5. *Flood Control Reservoirs and Facilities* for more information on this facility.

Figure 36. St. Michael Reservoir Dam

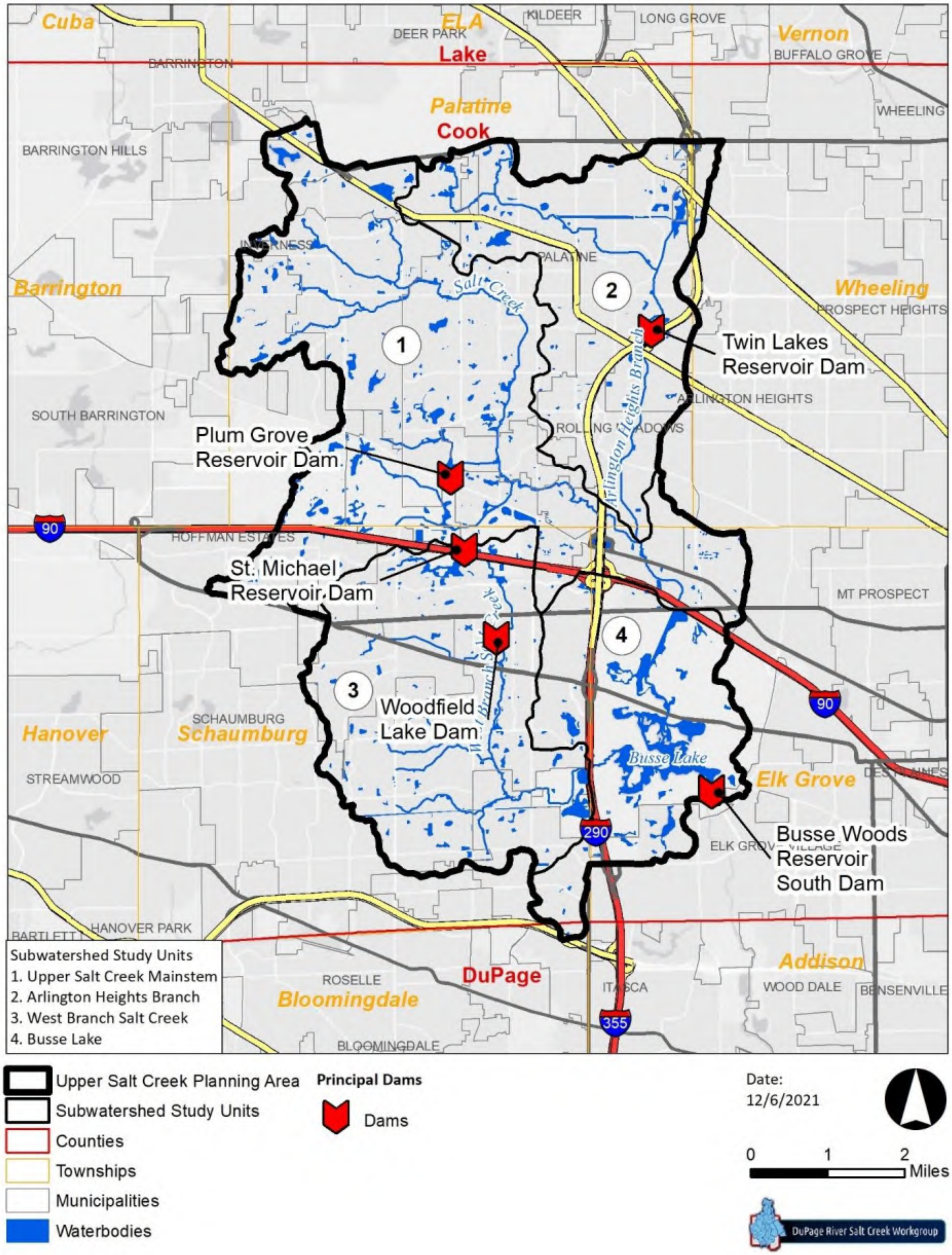
Figure 37. Woodfield Lake Dam

Woodfield Lake Dam (NID ID IL50311)
Impounding the West Branch of Salt Creek, this structure creates Woodfield Lake in Schaumburg. Woodfield Lake outlets at its southern extend through the dam. The earthen dam is owned and maintained by the Woodfield Lake Campus Association. Constructed in 1977, the dam is 8 feet high and impounds 61 acre-feet. The hazard potential rating is low. See section 3.5.5. *Flood Control Reservoirs and Facilities* for more information on this facility.

Busse Woods Reservoir South Dam (NID ID IL01231)
Located at the southern end of Busse Woods, this earthen structure was built in 1977 to impound Salt Creek. Upstream drainages include Salt Creek's West Branch, Arlington Branch, and Mainstem and the dam separates the Upper Salt Creek watershed from the Lower Salt Creek watershed. The 23-foot-high earthen dam impounds 17,621 acre-feet and is owned and maintained by IDNR. Recently, the dam was modified to primarily address flooding in Elk Grove Village and better control water level fluctuations by replacing the fixed weir with movable hinge gate weirs The hazard potential rating is high. There are two other dams in the Busse Woods Reservoir system: one separating the North Pool from the Main Pool and one separating the South Pool from the Main pool See section 3.5.5. *Flood Control Reservoirs and Facilities* for more information on this facility.

Figure 38. Busse Woods Reservoir South Dam

Figure 39. Principal dams in the Upper Salt Creek planning area



3.5.3. Lakes Inventory

As described in Section 3.5.2.1. *Introduction and Methods*, DRSCW and Hey inventoried water resource features within the Upper Salt Creek planning area during the summer and fall of 2021. The inventory collected data specific to lakes, detention and retention basins, and streams and rivers within the planning area. This section will focus on the lakes portion of that inventory. Table 26 and Figure 40 show the lakes in the Upper Salt Creek planning area, including the reservoirs that were inventoried as part of this effort.

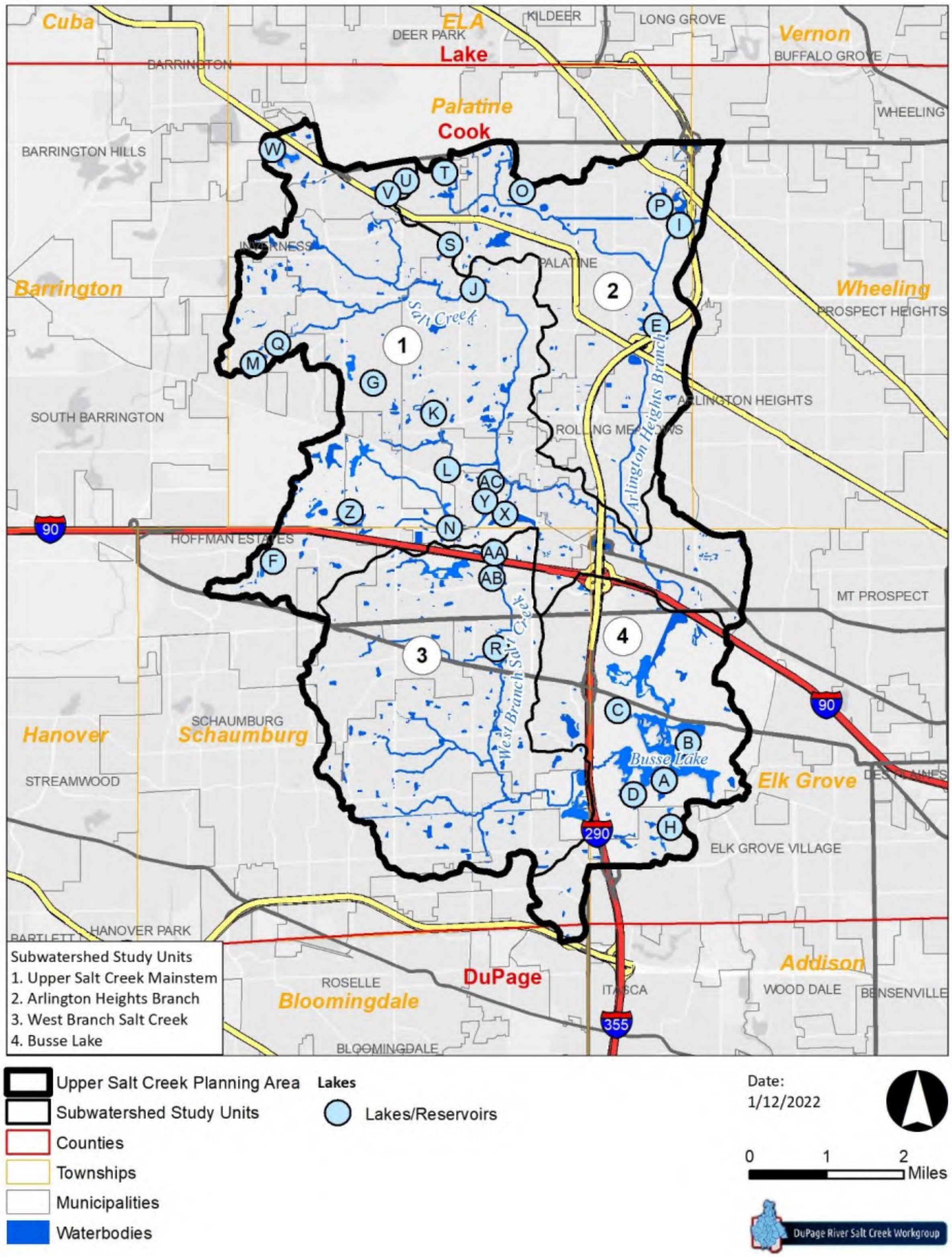
Lakes not surveyed as part of this inventory, in part due to access restrictions, include:

- Virginia Lake
- Unnamed Lake 7, at the SW corner of Algonquin Road and Progress Parkway

Table 26. Lakes in the Upper Salt Creek planning area

Map Key	Lake Name	Municipality
A	Busse Lake	Unincorporated
B	Busse Lake - Main Pool	Unincorporated
C	Busse Lake - North Pool	Unincorporated
D	Busse Lake - South Pool	Unincorporated
E	Twin Lakes Reservoir: Lake Irene (west), Doughnut Lake (east)	Palatine
F	Fabbrinii Park Lake	Hoffman Estates
G	Lake Inverness (Pheasant)	Inverness
H	Lake Cosman	Elk Grove Village
I	Lake Louise	Palatine
J	Margreth Riemer Reservoir	Palatine
K	Peregrine Lake	Palatine
L	Plum Grove Reservoir	Rolling Meadows
M	South Ridge Lake	Inverness
N	St. Michael Reservoir	Unincorporated
O	Tom T. Hamilton Reservoir	Palatine
P	Virginia Lake	Palatine
Q	Westbury Park Lake	Hoffman Estates
R	Woodfield Lake	Schaumburg
S	Unnamed Lake 1	Palatine
T	Unnamed Lake 2	Palatine
U	Unnamed Lake 3	Palatine
V	Unnamed Lake 4	Palatine
W	Unnamed Lake 5	Inverness
X	Unnamed Lake 6	Schaumburg
Y	Unnamed Lake 7	Schaumburg
Z	Unnamed Lake 8	Unincorporated
AA	Unnamed Lake 9	Schaumburg
AB	Unnamed Lake 10	Schaumburg
AC	Unnamed Lake 11	Schaumburg

Figure 40. Lakes in the Upper Salt Creek planning area



3.5.3.1 Shoreline Erosion

Similar to streambank erosion, shoreline erosion is a function of water surface fluctuations, wind and wave action, soil type, steepness of the bank, and vegetative cover or armoring. Erosion can cause impacts to water quality, including increased or excessive turbidity and nutrients, and lead to sedimentation. Excessive erosion can also be problematic for property owners and land managers because it can lead to migration of the shoreline, thus leading to loss of land, property, or structures.

Shoreline erosion was documented in lakes in the Upper Salt Creek planning area during the field reconnaissance. The degree of erosion was assessed using the following classifications:

- **None to Low Erosion:** shorelines are stable, but slightly changed along the transect line; less than 25% of streambank is receiving any stress, or eroding
- **Moderate Erosion:** shorelines are receiving moderate alteration along transect line; at least 50% of shoreline is in natural stable condition; not more than 50% is eroding
- **High Erosion:** shorelines have received major alterations along transect lines; less than 50% of shoreline is in stable condition; over 50% of shoreline is eroding

Compared to streambank erosion, shoreline erosion is less prominent in the waters assessed as part of this inventory in the Upper Salt Creek planning area. Of the assessed shorelines, 21.1% had moderate erosion issues with 78.9% of streams showing little to no erosion. Table 27 shows the summarization of field data collected during the summer of 2021. Note that not all lengths of the shorelines were assessed as part of the field visit component, as some were not publicly accessible. Of the assessed areas, lower degrees of streambank erosion may be over represented due to land use practices in publicly accessible areas.

Table 27. Degree of shoreline erosion for assessed stream reaches in the Upper Salt Creek planning area

Degree of Shoreline Erosion			None to Low	Moderate	High
A	Busse Lake	Feet	15,035.5	5,165.6	0.0
		% of Shoreline	74%	26%	0%
B	Busse Lake - Main Pool	Feet	767.3	255.8	0.0
		% of Shoreline	75%	25%	0%
C	Busse Lake - North Pool	Feet	2,477.5	2,477.5	0.0
		% of Shoreline	50%	50%	0%
D	Busse Lake - South Pool	Feet	9,317.0	0.0	0.0
		% of Shoreline	100%	0%	0%
E	Doughnut Lake (Twin Lakes Reservoir East)	Feet	3,158.0	0.0	0.0
		% of Shoreline	100%	0%	0%
E	Lake Irene (Twin Lakes Reservoir West)	Feet	1,743.5	1,743.5	0.0
		% of Shoreline	50%	50%	0%
F	Fabbrinii Park Lake	Feet	4,477.0	0.0	0.0
		% of Shoreline	100%	0%	0%
G	Inverness Lake	Feet	1,438.5	1,438.5	0.0
		% of Shoreline	50%	50%	0%
H	Lake Cosman	Feet	9,450.0	0.0	0.0
		% of Shoreline	100%	0%	0%
I	Lake Louise	Feet	2,003.5	2,003.5	0.0
		% of Shoreline	50%	50%	0%
J	Margreth Riemer Reservoir	Feet	2,051.0	0.0	0.0
		% of Shoreline	100%	0%	0%
K	Peregrine Lake	Feet	3,515.0	0.0	0.0
		% of Shoreline	100%	0%	0%
L	Plum Grove Reservoir	Feet	3,050.0	350.0	0.0
		% of Shoreline	90%	10%	0%
M	South Ridge Lake	Feet	3,085.0	0.0	0.0
		% of Shoreline	100%	0%	0%
N	St. Michael Reservoir	Feet	2,000.0	0.0	0.0
		% of Shoreline	100%	0%	0%
O	Tom T. Hamilton Reservoir	Feet	2,190.0	110.0	0.0
		% of Shoreline	95%	5%	0%
Q	Westbury Park Lake	Feet	3,171.0	0.0	0.0
		% of Shoreline	100%	0%	0%
R	Woodfield Lake	Feet	1,161.0	0.0	0.0
		% of Shoreline	100%	0%	0%
S	Unnamed Lake 1	Feet	1,178.0	1,178.0	0.0
	Inverness and Palatine, near Colfax Street and Quentin Road	% of Shoreline	50%	50%	0%
T	Unnamed Lake 2	Feet	2,019.0	0.0	0.0
	Palatine, near Dundee and Quentin Roads	% of Shoreline	100%	0%	0%

Degree of Shoreline Erosion			None to Low	Moderate	High
U	Unnamed Lake 3 Palatine, near Winnetka Street and North Grove Avenue	Feet	2,248.0	0.0	0.0
		% of Shoreline	100%	0%	0%
V	Unnamed Lake 4 Palatine, near Northwest Highway and Palos Avenue	Feet	3,500.0	0.0	0.0
		% of Shoreline	100%	0%	0%
W	Unnamed Lake 5 Inverness, near Baker's Lake Nature Preserve	Feet	3,564.0	3,564.0	0.0
		% of Shoreline	50%	50%	0%
X	Unnamed Lake 6 Schaumburg, SE corner of Algonquin Road and Progress Parkway	Feet	2,112.0	0.0	0.0
		% of Shoreline	100%	0%	0%
Z	Unnamed Lake 8 At Highland Woods Golf Course	Feet	3,165.0	3,165.0	0.0
		% of Shoreline	50%	50%	0%
AA	Unnamed Lake 9 Schaumburg, near Motorola Solutions	Feet	3,000.0	0.0	0.0
		% of Shoreline	100%	0%	0%
AB	Unnamed Lake 10 Schaumburg, near Tower Rd and State Parkway	Feet	5,600.0	0.0	0.0
		% of Shoreline	100%	0%	0%
AC	Unnamed Lake 11 Hidden Pond Condo Complex	Feet	2,550.0	450.0	1.0
		% of Shoreline	85%	15%	0%
	Total	*Feet*	*99,027*	*21,901*	*1*
		% of Shoreline	*81.9%*	*18.1%*	*0.0%*

3.5.3.2 Shoreline Buffers

Similar to riparian buffers, shoreline buffers are areas adjacent lakes. Further description of composition and impacts of buffers can be found in Section 3.5.2.6. *Riparian Buffers*.

In general, the wider the vegetated riparian buffer, the better said buffer is at removing pollutants and improving water quality.

Shoreline buffers were categorized based upon their overall quality, and are represented using the following categories:

- **No shoreline buffer or poor** quality shoreline buffers referred to areas where vegetative corridors were narrow or not present, communities comprised of non-native plants, landscaping, or turf grass, active shoreline erosion was observed, and gabions, sheet pile, or other artificial wall structures were present
- **Fair** shoreline buffer quality was generally indicated by some combination of poor and good factors. These areas include wide buffers comprised of non-natives, narrow buffers comprised of natives, short reaches of wall sections bisecting naturalized banks, and varying levels of erosion.
- **Good** shoreline buffer quality was identified as a wide adjacent vegetated area composed of diverse, native, predominantly herbaceous vegetation, low or no observable erosion, and minimal artificial bank structures

Most of the buffers within the planning area are either considered to be fair or poor in quality, 43.6% and 31.9% respectively. Only 17.3% of the buffers are thought to be in good quality. Table 28 provides a summary of the riparian buffers throughout the Upper Salt Creek planning area.

Table 28. Riparian buffer quality assessed along shorelines within the Upper Salt Creek planning area

Condition of Riparian Buffer			No/ Poor	Fair	Good
A	Busse Lake	Feet	8,422.7	8,448.9	3,329.4
		% of Shoreline	42%	42%	16%
B	Busse Lake - Main Pool	Feet	767.3	255.8	0.0
		% of Shoreline	75%	25%	0%
C	Busse Lake - North Pool	Feet	0.0	2,477.5	2,477.5
		% of Shoreline	0%	50%	50%
D	Busse Lake - South Pool	Feet	4,812.0	3,533.8	971.3
		% of Shoreline	52%	38%	10%
E	Doughnut Lake (Twin Lakes Reservoir East)	Feet	0.0	0.0	3,158.0
		% of Shoreline	0%	0%	100%
E	Lake Irene (Twin Lakes Reservoir West)	Feet	0.0	0.0	3,487.0
		% of Shoreline	0%	0%	100%
F	Fabbrinii Park Lake	Feet	0.0	2,238.5	2,238.5
		% of Shoreline	0%	50%	50%
G	Inverness Lake	Feet	0.0	2,877.0	0.0
		% of Shoreline	0%	100%	0%
H	Lake Cosman	Feet	9,450.0	0.0	0.0
		% of Shoreline	100%	0%	0%
I	Lake Louise	Feet	0.0	2,003.5	2,003.5
		% of Shoreline	0%	50%	50%
J	Margreth Riemer Reservoir	Feet	0.0	2,051.0	0.0
		% of Shoreline	0%	100%	0%
K	Peregrine Lake	Feet	0.0	1,757.5	1,757.5
		% of Shoreline	0%	50%	50%
L	Plum Grove Reservoir	Feet	0.0	350.0	3,050.0
		% of Shoreline	0%	10%	90%
M	South Ridge Lake	Feet	0.0	3,085.0	0.0
		% of Shoreline	0%	100%	0%
N	St. Michael Reservoir	Feet	1,500.0	500.0	0.0
		% of Shoreline	75%	25%	0%
O	Tom T. Hamilton Reservoir	Feet	1.0	1.0	2,300.0
		% of Shoreline	0%	0%	100%
Q	Westbury Park Lake	Feet	0.0	3,171.0	0.0
		% of Shoreline	0%	100%	0%
R	Woodfield Lake	Feet	0.0	0.0	1,161.0
		% of Shoreline	0%	0%	100%
S	Unnamed Lake 1	Feet	0.0	589.0	1,767.0

Condition of Riparian Buffer			No/ Poor	Fair	Good
	Inverness and Palatine, near Colfax Street and Quentin Road	% of Shoreline	0%	25%	75%
T	Unnamed Lake 2	Feet	0.0	2,019.0	0.0
	Palatine, near Dundee and Quentin Roads	% of Shoreline	0%	100%	0%
U	Unnamed Lake 3	Feet	1,686.0	562.0	0.0
	Palatine, near Winnetka Street and North Grove Avenue	% of Shoreline	75%	25%	0%
V	Unnamed Lake 4	Feet	350.0	2,800.0	350.0
	Palatine, near Northwest Highway and Palos Avenue	% of Shoreline	10%	80%	10%
W	Unnamed Lake 5	Feet	0.0	0.0	7,128.0
	Inverness, near Baker's Lake Nature Preserve	% of Shoreline	0%	0%	100%
X	Unnamed Lake 6	Feet	0.0	2,112.0	0.0
	Schaumburg, SE corner of Algonquin Road and Progress Parkway	% of Shoreline	0%	100%	0%
Z	Unnamed Lake 8	Feet	0.0	0.0	6,330.0
	At Highland Woods Golf Course	% of Shoreline	0%	0%	100%
AA	Unnamed Lake 9	Feet	0.0	0.0	3,000.0
	Schaumburg, near Motorola Solutions	% of Shoreline	0%	0%	100%
AB	Unnamed Lake 10	Feet	0.0	5,600.0	0.0
	Schaumburg, near Tower Rd and State Parkway	% of Shoreline	0%	100%	0%
AC	Unnamed Lake 11	Feet	3,000.0	0.0	0.0
	Hidden Pond Condo Complex	% of Shoreline	100%	0%	0%
	Total	*Feet*	*29,989*	*46,432*	*44,509*
		% of Shoreline	*24.8%*	*38.4%*	*36.8%*

3.5.4. Stormwater Detention Basins

As described in Section 3.5.2.1. *Introduction and Methods*, DRSCW and Hey inventoried water resource features within the Upper Salt Creek planning area during the summer and fall of 2021. The inventory collected data specific to lakes, detention and retention basins, and streams and rivers within the planning area. This section will focus on the detention and retention basin portion of that inventory.

Natural stormwater storage can be provided by historic wetlands, ponds, lakes, and topographic depressional areas. Stormwater detention is typically provided by designed ponds, lakes, and other depressional areas and are built in conjunction with newer developments or redevelopments. Of these areas, some basins are normally dry (i.e., dry bottom or infiltration basins) and others retain water year-round (i.e., wet bottom). Some areas providing natural stormwater storage have been adapted and modified to serve as stormwater detention facilities.

Stormwater is routed to these facilities from surrounding contributing areas via ditches, culverts, and other traditional grey infrastructure. Some may not have direct piped stormwater inputs but receive overland flow from other waterbodies. While holding water, these basins can infiltrate and evaporate in addition to their primary goal of providing a means to reduce peak runoff volume and rates. Natural outlets, designed overflows, connection to facilities downstream, and mechanical means (lift station) are all methods in which stormwater exits these facilities.

To create a comprehensive inventory of detention basins throughout the Upper Salt Creek planning area, basins were identified within the study area using spatial data and aerial imagery. Following basin identification, identified sites were visited and data was recorded using an ESRI ArcGIS Collector Application interactive map. Some sites were deemed inaccessible and were desktop-assessed using spatial data and aerial imagery. The following aspects of each detention basin were assessed:

- Type of basin (wet, wet with extended dry detention, dry turf, dry naturalized, constructed wetland)
- On-stream (yes/no, stream name)
- Connected to Other Basins (yes/no, upstream/downstream)
- Side Slope Cover types (turf grass, native plants, non-native plants, rip rap, seawall)
- Side Slope Angle (horizontal: vertical)
- Buffer Width (native plants)
- Water’s Edge Cover types (not applicable, turf grass, native/wetland plants, non-native plants, riprap)
- Basin Bottom Cover types (unknown, turf grass, native/wetland plants, submersed aquatic vegetation, non-native plants, concrete-lined channel)
- Shoreline Erosion (not applicable, minimal, slight, moderate, high)
- Safety Shelf presence (yes/no/unknown) and Wetland Vegetation presence (yes/no)
- Sediment Forebay presence (yes/no/unknown)
- Stilling Basin presence at Inlets and Outlets (yes/no/unknown)
- Short Circuiting (yes/no)
- Overall Water Quality Benefits Assessment (good, fair, minimal)
- Management needs

- Retrofit opportunities within the basin and immediate contributing area

The types of basins found in the Upper Salt Creek planning area include dry naturalized, dry turf, wet, wet with extended dry, constructed wetland, and volunteer wetland. Above and beyond rate reduction, when well designed and in good condition, these basins play an important water quality role by retaining stormwater runoff and filtering and settling pollutants before slowly releasing volume. They also prevent many areas from being inundated during a flood event, containing the number of pollutants carried downstream. Limiting flooding instances, providing habitat for native pollinators, and, when designed as such, can enhance recreational opportunities, further benefiting communities.

The number, location, type, and relative water quality benefit of detention basins were determined for this effort[40]. The planning area has approximately 536 stormwater detention facilities (Table 29, Table 29, Figure 30). Unless something unique or unusual was obvious, the assessment of overall water quality benefit - good, fair, minimal - is largely a function of detention basin type. Retrofit opportunities and management needs were also noted and included as Appendix B.

Table 29. Summary of stormwater detention basins in the Upper Salt Creek planning area, by municipality

Municipality	No. of Basins ID'd	Detention Basin Type						Water Quality Benefit			Inaccessible/ Unassessed
		Wet	Dry-Turf	Dry-Nat	Wet-Ext. Dry	Constr. Wetland	Vol. Wetland	Good	Fair	Minimal	
Arlington Heights	18	12	2	3	1	0	0	2	7	9	0
Barrington	3	3	0	0	0	0	0	0	3	0	0
Elk Grove Village	29	14	4	3	0	1	7	11	5	13	0
Hoffman Estates	52	23	5	4	6	7	7	22	14	16	0
Inverness	49	30	1	5	3	2	5	7	18	21	3
Itasca	1	1	0	0	0	0	0	0	1	0	0
Palatine	132	69	12	21	3	15	11	24	43	64	1
Rolling Meadows	27	20	4	3	0	0	0	3	4	20	0
Schaumburg	178	104	10	17	2	31	14	33	69	76	0
Unincorporated	16	9	2	1	3	0	0	6	5	4	1
Total	*505*	*285*	*40*	*57*	*18*	*56*	*44*	*108*	*169*	*223*	*5*
		56%	*8%*	*11%*	*4%*	*11%*	*9%*	*21%*	*33%*	*44%*	*1%*

[40] Six types of detention basins are noted: 1) dry bottom – turf, 2) dry bottom –naturalized, 3) wet bottom, 4) wet bottom with an extended dry area, 5) constructed wetland, and 6) “volunteer” wetland.

Table 30. Summary of stormwater detention basins in the Upper Salt Creek planning area, by subwatershed study unit

Subwatershed Study Units	No. of Basins ID'd	Detention Basin Type						Water Quality Benefit			Inaccessible/ Unassessed
		Wet	Dry-Turf	Dry-Nat	Wet-Ext. Dry	Constr. Wetland	Vol. Wetland	Good	Fair	Minimal	
Salt Creek Mainstem	226	123	12	28	13	21	26	59	78	86	3
Arlington Heights Branch	88	50	13	15	1	5	3	8	28	51	1
West Branch Salt Creek	149	87	14	7	5	27	9	24	52	73	0
Busse Lake	42	24	1	6	1	3	6	17	11	13	1
Total	*505*	*284*	*40*	*56*	*20*	*56*	*44*	*108*	*169*	*223*	*5*
		56%	*8%*	*11%*	*4%*	*11%*	*9%*	*21%*	*33%*	*44%*	*1%*

Generally, basins providing “good” water quality benefit were identified as either a) wet detention with a vegetated wetland shelf, having natively vegetated side slopes, and supporting submersed aquatic vegetation, b) constructed wetlands, or c) dry detention with native vegetation covering the basin bottom and side slopes (Figure 41). Basins providing “fair” water quality benefits were generally identified as either a) wet detention with a vegetated wetland shelf, having turf grass side slopes, supporting submersed aquatic vegetation, or b) dry detention with natively vegetated waterways or bioswales, or a natively vegetated outlet area (Figure 42). Basins providing “minimal” water quality benefits were typically identified as either a) wet detention with turfgrass side slopes, having little or no vegetated wetland shelf, and potentially short-circuiting flows, or b) dry detention with turfgrass bottom, including concrete-lined channels, and/or potentially short-circuiting flows (Figure 43).


Figure 41. Examples of detention basins with “good” water quality benefit


Figure 42. Examples of detention basins with “fair” water quality benefit


Figure 43. Examples of detention basins with “minimal” water quality benefit

Figure 44. Stormwater detention basins by type in the Upper Salt Creek planning area

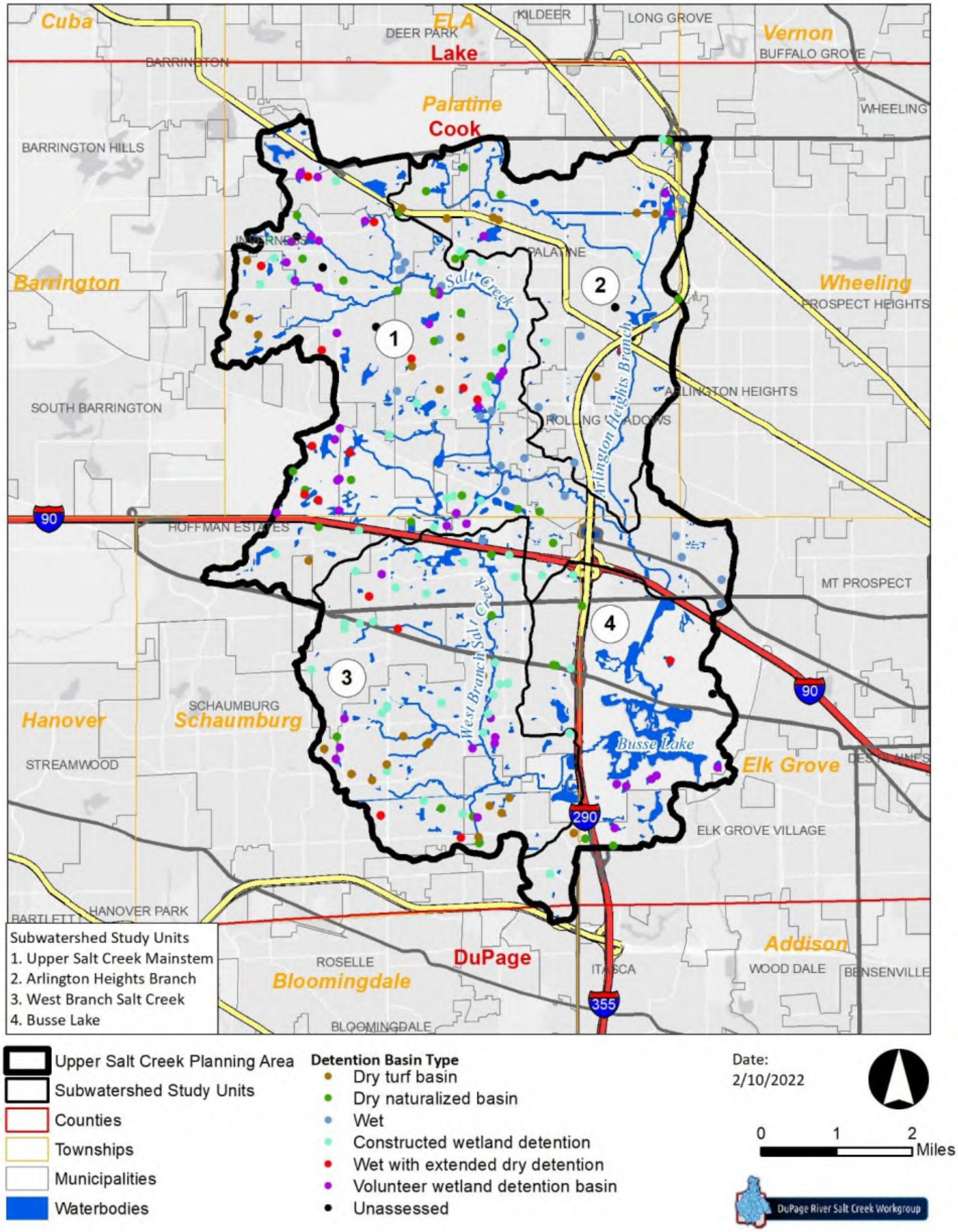
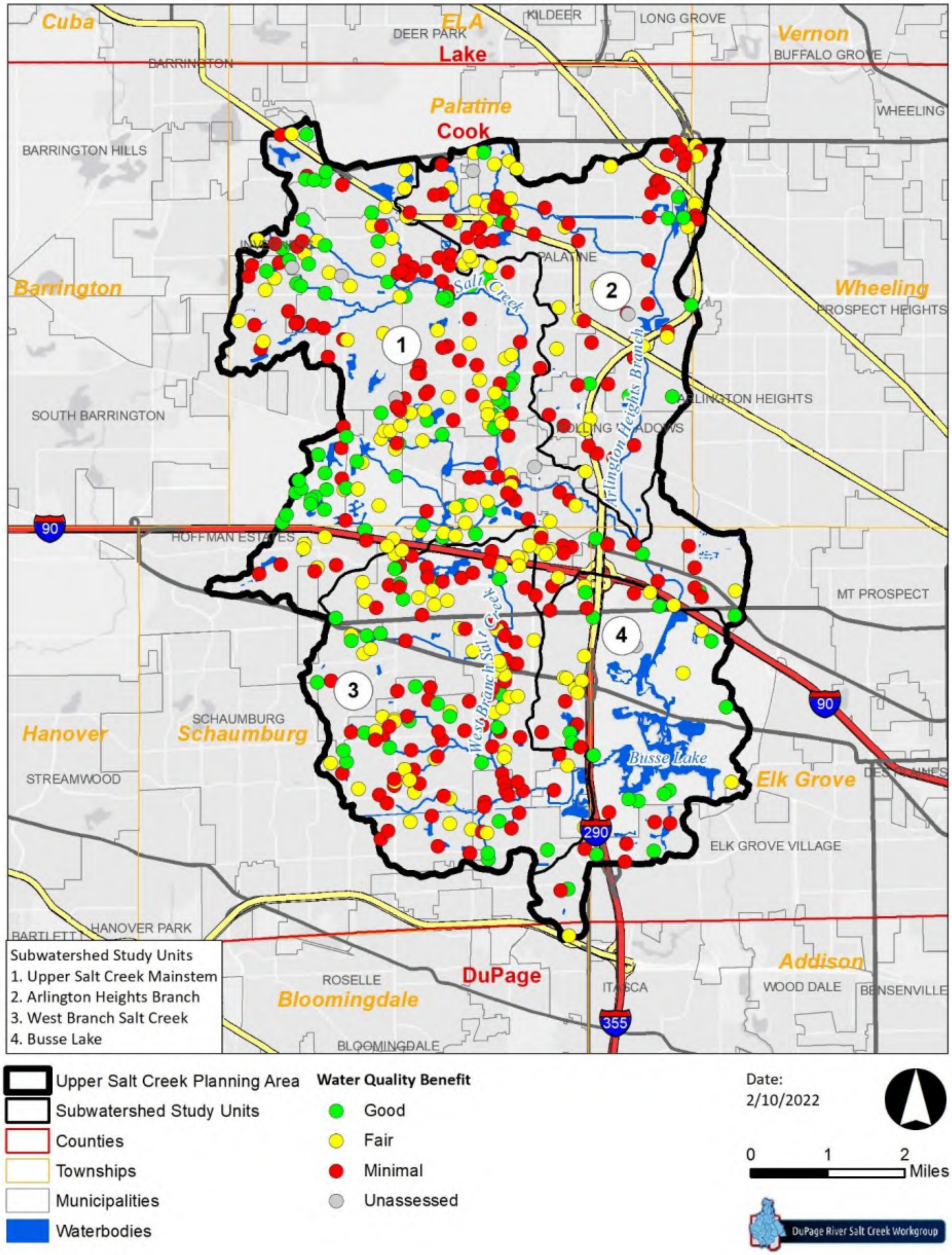


Figure 45. Stormwater detention basins by water quality benefit in the Upper Salt Creek



3.5.5. Flood Control Reservoirs and Facilities

MWRD sponsored construction of Twin Lakes Reservoir, Plum Grove Reservoir, St. Michael Reservoir, Busse Woods Reservoir, Margreth Riemer Reservoir, and Tom T. Hamilton Reservoir between 1974 and 1986, which collectively provide approximately 4,000 acre-feet of flood storage. These projects were constructed based on a plan (Watershed Work Plan, USDA, May 1973) prepared for the NRCS and sponsored by MWRD. All the facilities included in this section are either owned by or operated in partnership with MWRD. Reservoir descriptions provided herein were adapted from the Detailed Watershed Plan of the Upper Salt Creek Watershed: Volume 1, November 2009.

Twin Lakes Reservoir

The Twin Lakes Reservoir was completed in 1986. It is located along the Arlington Heights Branch in the Village of Palatine and has a tributary area of 2,330 acres. The reservoir is formed by an embankment along Illinois Route 53. The reservoir is divided into two cells, Lake Irene and Doughnut Lake, connected by twin 24-inch diameter pipes. High flows can also pass over a concrete weir that also serves as a parking lot for the recreational facilities. Flow enters the west cell of the reservoir through a culvert and weir in series and exits the same cell through a 10-foot by 12-foot box culvert under the expressway. An orifice and weir control structure limits flows through the box culvert. The emergency spillway is located on the far southwest edge of the west pond. See Section 3.5.2.7. for more information on the dam associated with this facility.

Plum Grove Reservoir

Plum Grove Reservoir was completed in 1984. It is located along Tributary C of the Mainstem in the Village of Palatine and the City of Rolling Meadows and has a tributary area of about 1,240 acres. The reservoir is formed by an earthen dam approximately 25 feet high and approximately 2,700 feet long. Discharge from the reservoir is controlled by a hooded riser spillway of standard Soil Conservation Service (SCS) design. The spillway discharges to a 42-inch diameter culvert pipe through the embankment. Energy dissipation at the downstream end of the culvert is provided by a standard United States Bureau of Reclamation (USBR) Type VI structure. Emergency overflows are accommodated in an earthen spillway in the left abutment of the dam. See Section 3.5.2.7. for more information on the dam associated with this facility.

St. Michael Reservoir

St. Michael Reservoir was completed in 1986. It is located along Tributary D of the Mainstem in the Village of Schaumburg and the City of Rolling Meadows and has a tributary area of about 2,420 acres. The reservoir is formed by an earthen dam approximately 25 feet high and approximately 4,800 feet long. The service spillway arrangement is nearly identical to that at the Plum Grove Reservoir discussed above. The emergency spillway is located on the right abutment of the dam. See Section 3.5.2.7. for more information on the dam associated with this facility.

Busse Woods Reservoir

Busse Woods Reservoir was constructed in the mid-1970s at the confluence of the Mainstem and the West Branch at the Cook County Forest Preserve's Ned Brown Preserve. The reservoir creates Busse Lake, impounded by an earthen dam approximately 20 feet high and about 1,000 feet long. The dam was constructed as a joint project between IDNR, FPCC and the SCS, now known as NRCS. The dam was modified in 2016, consisting of the installation of two hinged gates, which allow for water level control.

During normal operating conditions, the gates sit at the same elevation as the prior fixed weir dam and result in a 590-acre normal pool.[41] See Section 3.5.2.7. for more information on the dam associated with this facility.

Margreth Riemer Reservoir

The Margreth Riemer Reservoir was completed in 1984. It is located along the Mainstem in the Village of Palatine and has a tributary area of 3,400 acres. The basin is divided into two pools, the main west pool and a smaller east pool connected by a 48-inch diameter equalizer pipe. The bypass control structure has been modified from the original design to force water into the reservoir more frequently than originally designed.

Figure 46. Margreth Riemer Reservoir Bypass Control Structure

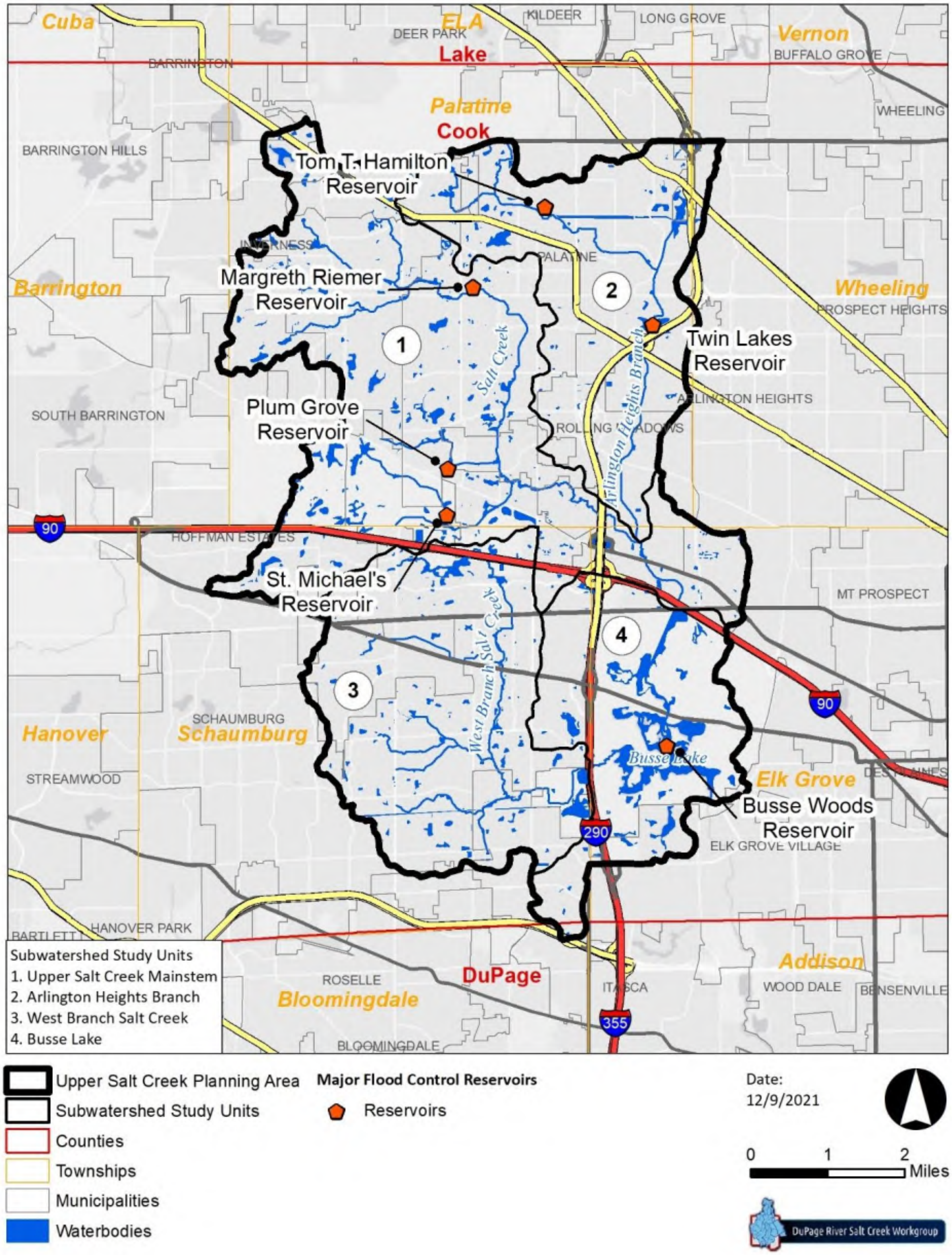
Figure 47. Tom T. Hamilton Reservoir Bypass Control Structure

Tom T. Hamilton Reservoir

The Tom T. Hamilton Reservoir was completed in 1981. It is located on the Arlington Heights Branch in the Village of Palatine and has a tributary area of about 3,600 acres. The reservoir is located adjacent to the stream channel. A bypass control structure, similar to that at Margreth Riemer Reservoir, restricts the downstream flow; the remaining flow passes over a weir into the reservoir. After a storm event the reservoir is pumped down. The bypass control structure has been modified from the original design to force water into the reservoir more frequently than originally designed.

[41] Busse Dam Modification Project – 2017. [Busse Dam Modification Project – 2017 Update — Salt Creek Watershed Network]

Figure 48. Major flood control reservoirs and facilities in the Upper Salt Creek planning area



3.5.6. Groundwater Studies

The early days of Chicagoland development were greatly aided by the quality and abundance of groundwater in the region as a ready source for potable water. The groundwater resources of the region consist of four aquifer systems: 1) sand and gravel deposits of the glacial drift: 2) shallow dolomite formations, mainly of Silurian age: 3) Cambrian-Ordovician Aquifer, of which the Ironton-Galesville and Glenwood-St. Peter Sandstones are the most productive formations: and 4) the Mt. Simon Aquifer, consisting of the sandstone of the Mt. Simon and lower Eau Claire Formations of Cambrian age[42]. Figure 49 shows the layout of the NE Illinois aquifers. The combined aquifers and Lake Michigan provided an abundance of water for rapid civil and industrial expansion in the region. However, the unmonitored usage of groundwater led to massive overuse and rapid depletion of aquifers. This led to a great shift to dependence of Lake Michigan for water instead of groundwater.

The shift to Lake Michigan water has resulted in a low demand for groundwater studies in the region. The Upper Salt Creek planning area has not had a study done in several decades with only a small percentage of the municipalities still dependent on groundwater. The gradual shift to Lake Michigan drinking water is shown in Figure 50 below.

[42] Preliminary Report on Ground-Water Resources of the Chicago Region, Illinois. https://www.isws.illinois.edu/pubdoc/coop/iswscoop-1.pdf. Accessed November 15, 2021

Figure 49. NE Illinois aquifers

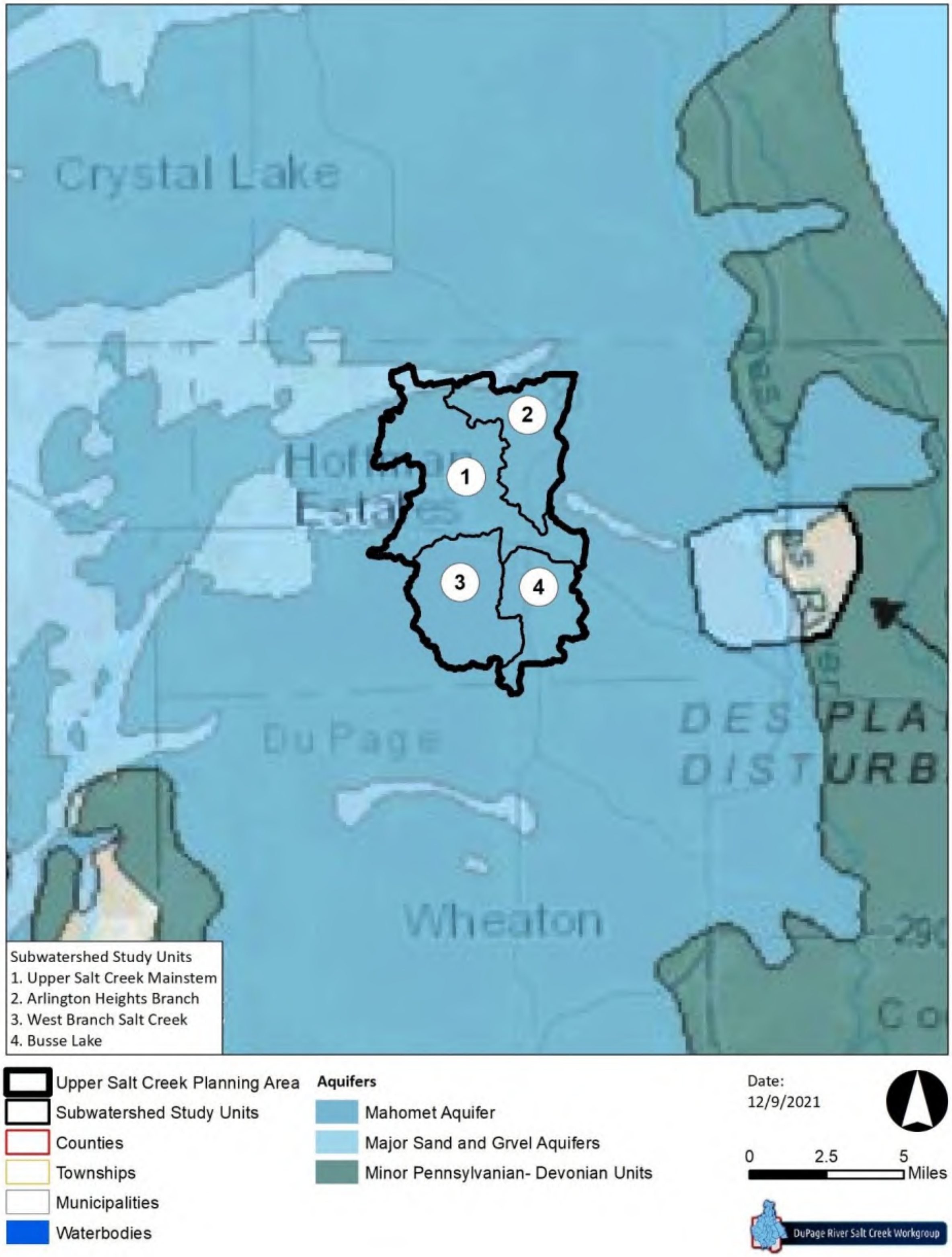
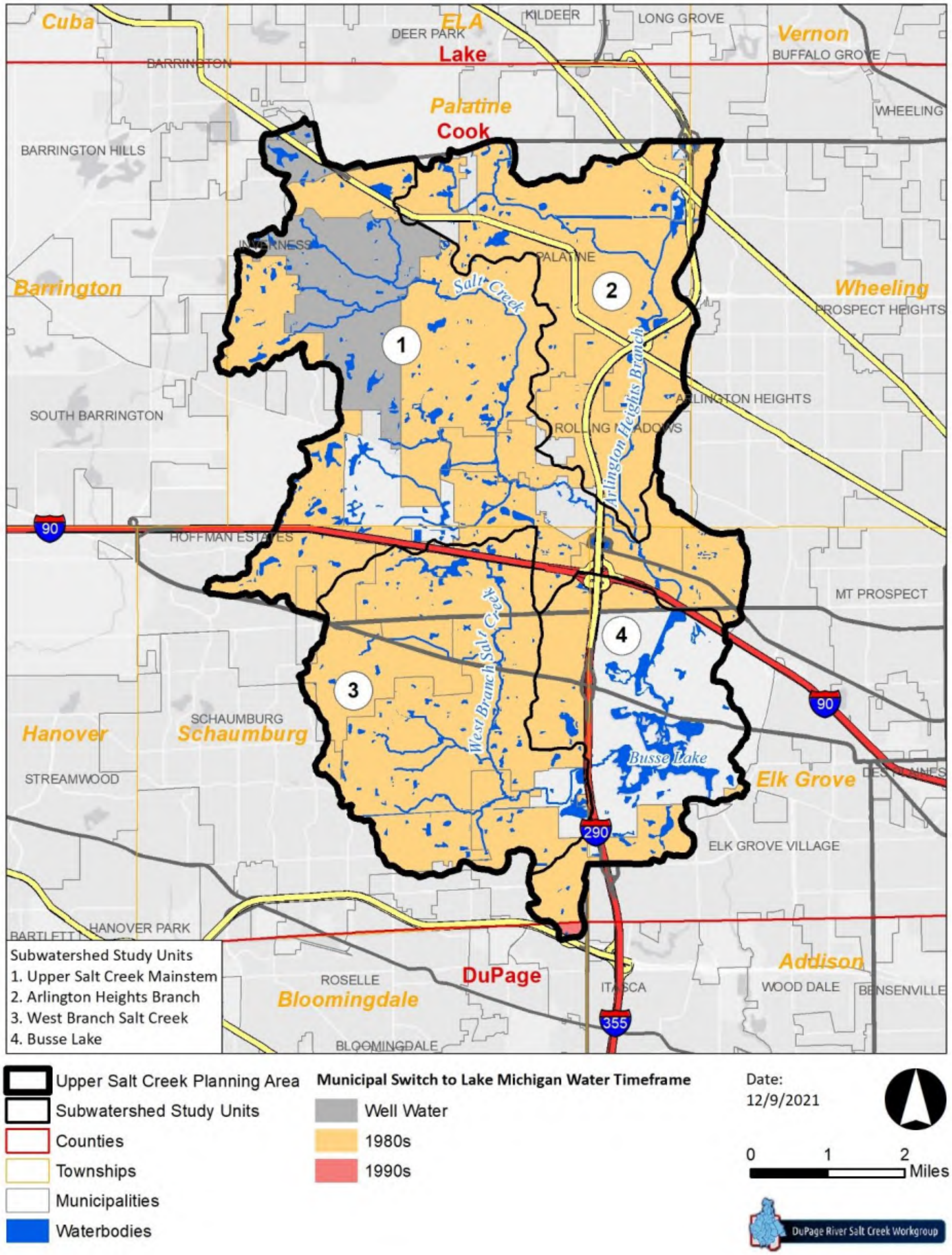


Figure 50. Shift to Lake Michigan drinking water in the Upper Salt Creek planning area



3.5.6.1. Sensitive Aquifer Recharge Areas

For those areas that still rely on wells, groundwater is a very important resource. Through fast development and high demand, the aquifers of Chicagoland have had significant drawdown. Precipitation is the main recharge source for groundwater when it falls to the ground and soaks down to the aquifers but can take many years to move through the subsurface geology. Wells can be built anywhere to access and use this water, but there are only certain areas with the right conditions for water to recharge the aquifers. These areas are considered sensitive aquifer recharge areas (SARAs) Development on or near these areas can be hazardous to the groundwater. Placing a parking lot on top of a SARA will prevent water from draining down through the soil and instead it may be redirected through stormwater conveyance systems. The conditions that help water reach the aquifer are the same conditions conducive for contaminants to reach the aquifer so industrial runoff near a SARA can harm the water supply for the community[43].

SARAs have so far been identified in McHenry and Kane counties and are still a valid consideration for development in the surrounding counties.

3.5.7. Surface Water Quality

3.5.7.1. Designated Uses, Assessment, and Impairment Status

The Illinois Integrated Water Quality Report (Integrated Report) and Section 303(d) List, better known as the 303(d) List, comprise a significant source of information for assessing stream health and identifying sources of impairment for watershed planning initiatives statewide. These documents are released every two years by the IEPA; the most recent Integrated Report was issued in June 2022 and is referenced as the 2020/2022 Report. The purpose of the Integrated Report is to provide water quality data for both surface and ground waters and to fulfill Section 303(d) of the federal Clean Water Act and the Water Quality Planning and Management regulation at 40 CFR Part 130 for the State of Illinois.[44]

This watershed plan focuses on surface water data within the Upper Salt Creek planning area. The Integrated Report seeks to assess the extent to which waterbodies support a set of recognized designated uses. Each designated use has a related standard for which the designated use for that stream or lake is protected. IEPA has seven possible designated uses; however, only four of those uses apply within the Upper Salt Creek planning area. These are Aquatic Life, Fish Consumption, Primary Contact, and Aesthetic Quality. A waterbody is considered not fully supporting a designated use if it does not meet the related standard. These standards are derived from information including biological data, water chemistry, instream habitat, and toxicity data.

Waters found to be not fully supporting any of the seven designated uses as an outcome of an assessment are said to be impaired and placed on the 303(d) List. Removing waterbodies from the 303(d) List is a main objective of watershed planning projects like the Upper Salt Creek Watershed-Based Plan.

Numerous waterbodies in the Upper Salt Creek planning area have been assessed for water quality impairments (Figure 51 - Figure 54). The following tables (Table 31 -Table 36) summarize the designated

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[43] Sensitive Aquifer Recharge Areas Map Descriptor: McHenry County, IL. Sensitive Aquifer Recharge Areas Map Descriptor: McHenry County, Illinois. Accessed November 15, 2021

[44] https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx

uses, assessment status, impairment status, and causes and sources of impairment for waterbodies within the Upper Salt Creek planning area as identified in the 2020/2022 Integrated Report.

Table 31. Specific assessment information for streams in the Upper Salt Creek planning area, 2020/2022

Assessment Unit ID	Name	Length (miles)	Category	Aquatic Life	Aesthetic Quality	Fish Consumption	Primary Contact
IL_GLC	Arlington Heights Branch	6.83	3	Not Assessed	Not Assessed	Not Assessed	Not Assessed
IL_GL	Salt Creek	11.23	5	Algae, Chloride, Dissolved Oxygen, Flow Regime Modification, Total Phosphorus	Not Assessed	Mercury, PCBs	Fecal Coliform

Table 32. Specific assessment information for lakes in the Upper Salt Creek planning area, 2020/2022

Assessment Unit ID	Name	Area (acres)	Category	Aquatic Life	Aesthetic Quality	Fish Consumption	Primary Contact
IL_UGZ	Doughnut / Timber Lake North	12.09	2	Fully Supporting	Fully Supporting	Not Assessed	Not Assessed
IL_RGZX	Busse Woods	458.18	5	Fully Supporting	Total Phosphorus, Total Suspended Solids	Mercury, PCBs	Fecal Coliform

Table 33. Use support information for streams in the Upper Salt Creek planning area, 2020/2022

Designated Use	Stream Miles Fully Supporting	Stream Miles Not Supporting	Stream Miles Not Assessed
Aquatic Life	-	11.23	6.83
Fish Consumption	-	11.23	6.83
Primary Contact	-	11.23	6.83
Aesthetic Quality	-	-	18.06

Table 34. Use supported information for lakes in the Upper Salt Creek planning area, 2020/2022

Designated Use	Lake Acres Fully Supporting	Lake Acres Not Supporting	Lake Acres Not Assessed
Aquatic Life	470.27	-	-
Fish Consumption	-	458.18	12.09
Primary Contact	-	458.18	12.09
Aesthetic Quality	12.09	458.18	-

Table 35. Causes of impairments for streams in the Upper Salt Creek planning area, 2020/2022

Cause Of Impairment	Stream Miles Impaired	% of Total Stream Miles Assessed (18.06)
Algae	11.23	62%
Chloride	11.23	62%
Dissolved Oxygen	11.23	62%
Flow Regime Modification	11.23	62%
Total Phosphorus	11.23	62%
Mercury	11.23	62%
PCBs	11.23	62%
Fecal Coliform	11.23	62%

Table 36. Causes of impairment for lakes in the Upper Salt Creek planning area, 2020/2022

Cause Of Impairment	Lake Acres Impaired	% of Total Lake Acres Assessed (470.27)
Total Phosphorus	458.18	97%
Total Suspended Solids	458.18	97%
Mercury	458.18	97%
PCBs	458.18	97%
Fecal Coliform	458.18	97%

Figure 51. IEPA waterbody Aquatic Life impairment status in the Upper Salt Creek planning area

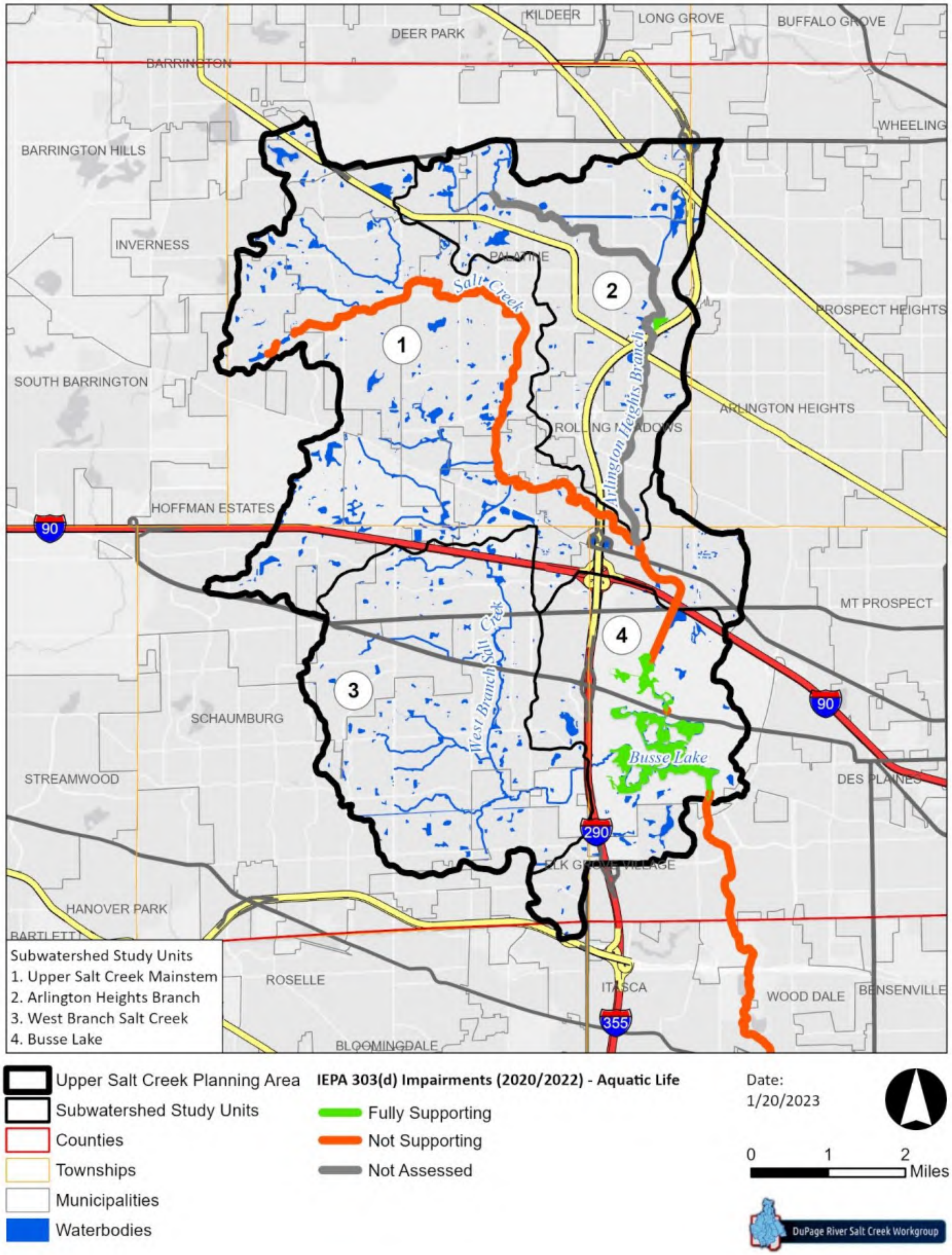


Figure 52. IEPA waterbody Fish Consumption impairment status in the Upper Salt Creek planning area

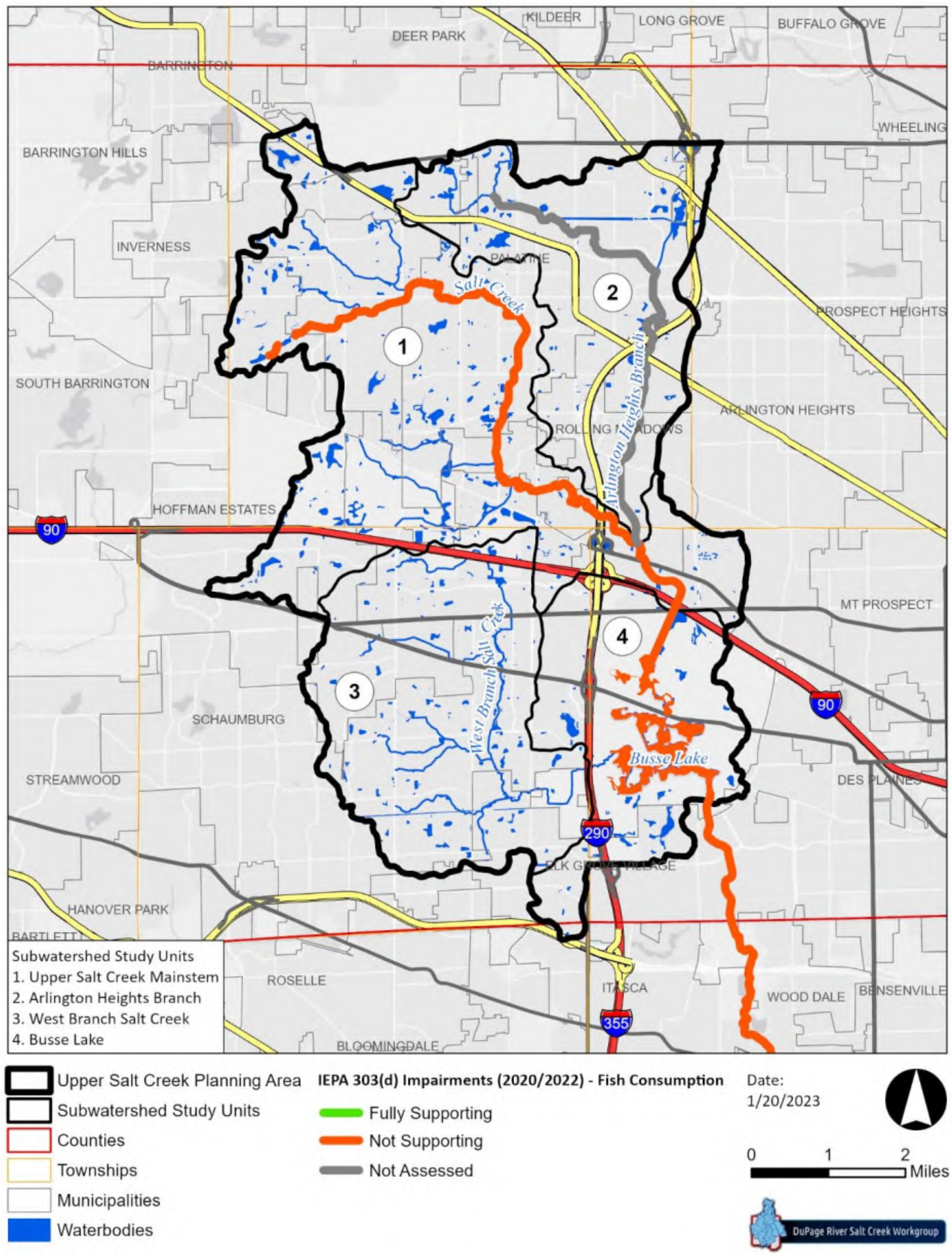


Figure 53. IEPA waterbody Primary Contact impairment status in the Upper Salt Creek planning area

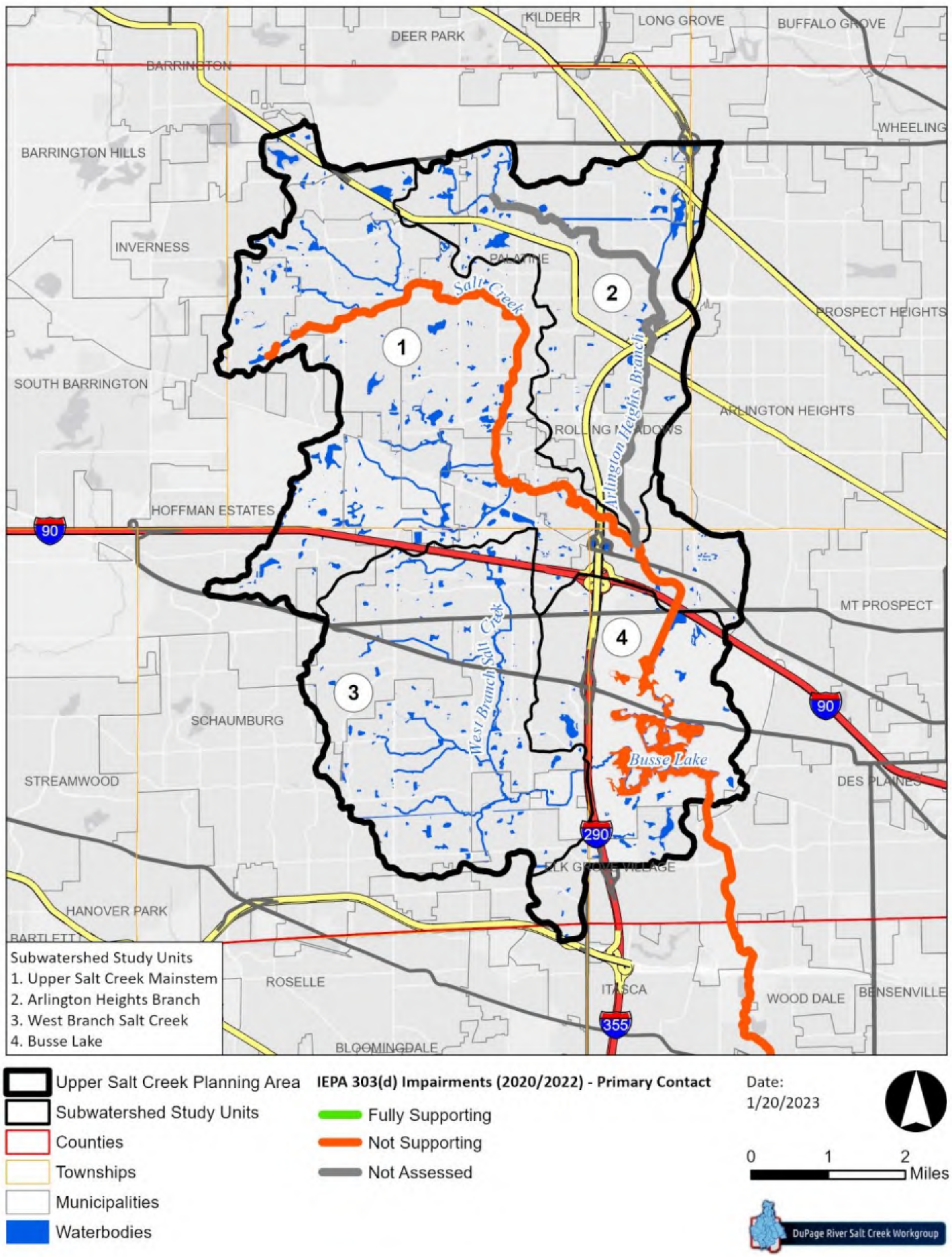
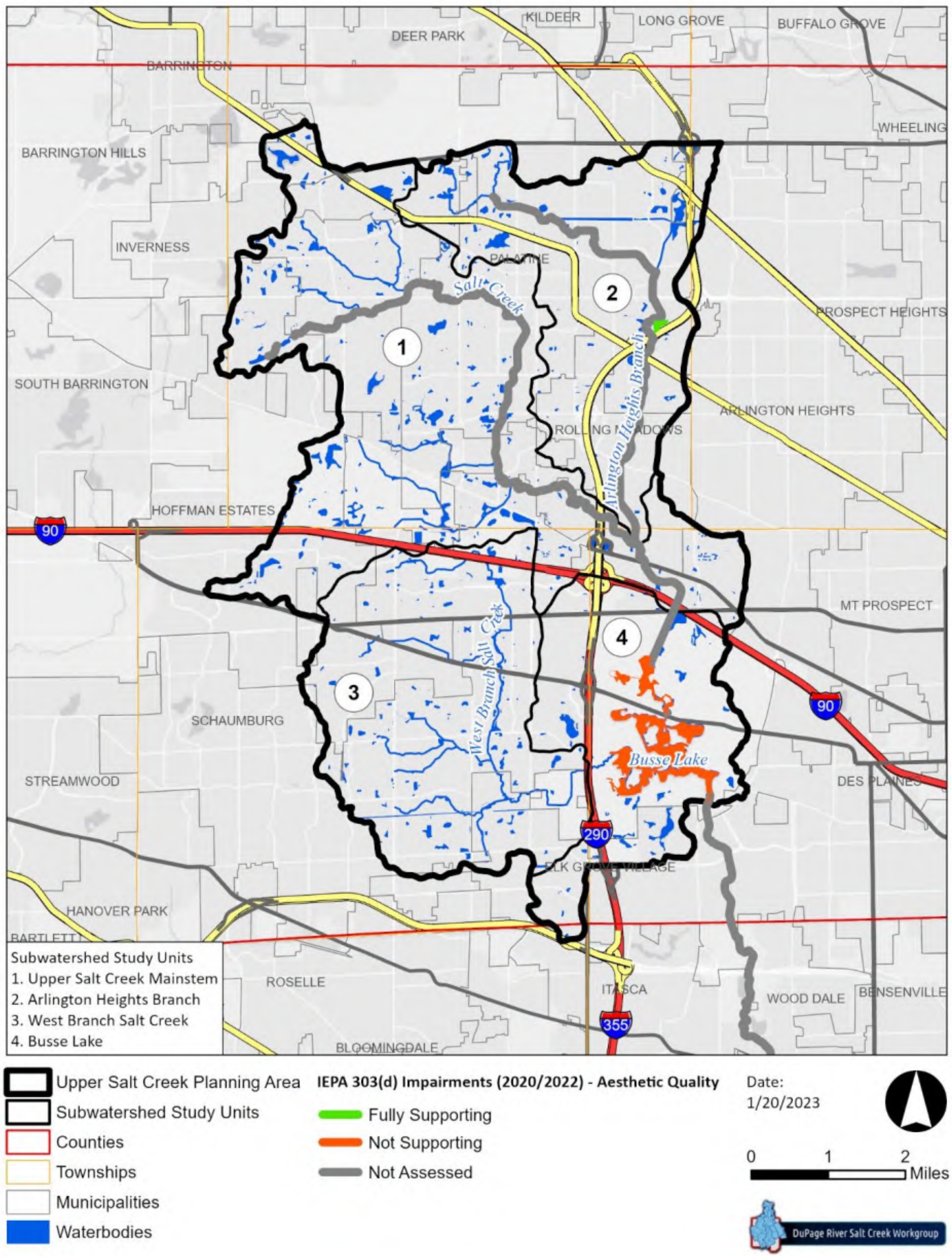


Figure 54. IEPA waterbody Aesthetic Quality impairment status in the Upper Salt Creek planning area



3.5.7.2. DRSCW Stream Studies

The objectives of the DRSCW's monitoring in the watersheds are multi-faceted and include the following:

- Characterize water quality conditions and trends throughout the watershed;
- Support the development of segment specific water quality standards and in-stream targets, and projects;
- Provide technical information to help guide implementation efforts; and
- Document the effectiveness of water quality management strategies

Since 2006, the DRSCW has conducted numerous surveys in the Upper Salt Creek watershed as part of their bioassessments program. Additionally, the DRSCW has conducted continuous DO monitoring, and sediment oxygen demand (SOD) monitoring in the Lower Salt Creek watershed (downstream of Busse Woods Dam). Developing and implementing a monitoring program that produces credible data for decision making purposes involves various activities including establishing and documenting quality assurance procedures; training or hiring certified staff; purchasing and maintaining sampling equipment; collecting and managing samples; conducting quality assurance/quality control; and managing, analyzing, and reporting data. To date, the DRSCW has prepared and IEPA has approved Quality Assurance Project Plans for the continuous DO monitoring program and the bioassessment sampling program. Table 37 details the sampling conducted by the DRSCW. Note that DRSCW monitoring includes sites outside the Upper Salt Creek watershed boundary downstream of the Busse Woods dam.

Table 37. DRSCW Sampling Efforts

Parameter(s) Surveyed	Dates Collected	Description	Report, Analysis & Data
Water Column Chemistry	2006, 2010, 2013, 2016, 2021	Demand, nutrients, organics & metals collected at approximately 57 sites	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
Modeled DO	2009	Calibrated and validated QUAL 2K DO model developed for Salt Creek. Prioritization analysis carried out by stakeholder group	Stream DO Improvement Feasibility Study for Salt Creek. (Focused on Salt Creek downstream of Busse Woods Dam) http://drscw.org/wp/dissolved-oxygen/
DO (continuous)	2006-2022 (June-August)	DO, pH conductivity and water temperature collected hourly	Excel spreadsheet and Bioassessment Reports. (Focused on Salt Creek downstream of Busse Woods Dam)
Conductivity (proxy for Chloride)	2008-2022 (Dec.-March)	DO, pH conductivity and water temperature collected hourly	Conductivity and Chloride Monitoring Summary 2007/2008. Annual updates. Trends analysis 2007-2014. (Focused on

Parameter(s) Surveyed	Dates Collected	Description	Report, Analysis & Data
			Salt Creek downstream of Busse Woods Dam)
Sediment Chemistry	2006, 2010, 2013, 2016, 2021	Organics and metals collected at approximately 23 sites	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
Fish Survey	2006, 2010, 2013, 2016, 2021	Fish shocking survey on the mainstem and tributaries at approximately 57 sites	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
Macroinvertebrate Survey	2006, 2010, 2013, 2016, 2021	Macroinvertebrate sampling on the mainstem and tributaries at approximately 57 sites	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
Physical Habitat Evaluation	2006, 2010, 2013, 2016, 2021	QHEI on the mainstem and tributaries at approximately 57 sites	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
SOD Survey (DO Feasibility Study)		Sediment oxygen demand sampling measured at 20 locations	Stream DO Improvement Feasibility Study for Salt Creek. (Focused on Salt Creek downstream of Busse Woods Dam) http://drscw.org/wp/dissolved-oxygen/
Point Source Evaluation	2005-2021	Evaluation of flow and effluent quality for 10 Publicly Owned wastewater treatment plants (WWTPs)	Biological and Water Quality Study of the East and West Branch DuPage Rivers and Salt Creek Watersheds (Bioassessment report) (2006, 2010, 2013, 2016, 2021*). http://drscw.org/wp/bioassessment/
Chlorides	2007 (with bi-annual updates)	Review of public roads loading and source reduction measures. Annual questionnaire to public agencies with winter road	Chloride Usage Education and Reduction Program Study. http://drscw.org/wp/chlorides-and-winter-management/

Parameter(s) Surveyed	Dates Collected	Description	Report, Analysis & Data
		management responsibilities to track progress of BMP uptake	
Aquatic Life Stressor Analysis and Segment Prioritization	2012 (update 2018)	Causal analysis of proximate stressors to aquatic life and application of prioritization algorithm for mainstem and tributaries	Priority rankings based on estimated restorability for stream segments in the DuPage River and Salt Creek Watersheds. http://drscw.org/wp/project-identification-and-prioritization-system/
Canoe Survey of Channel Form	2006	Geo-referenced images of Salt Creek	Geo-database file. (Focused on Salt Creek downstream of Busse Woods Dam)
Aerial Survey of Channel Form	2007 USGA aerial flyover videos	30 min flyover DVDs with geo-references readout	Geo-references DVD of Salt Creek. (Focused on Salt Creek downstream of Busse Woods Dam)

*2021 reports are under development

Dissolved Oxygen Monitoring (focused on Salt Creek downstream of Busse Woods Dam)
The DRSCW launched the continuous dissolved oxygen (DO) monitoring network in 2006. Prior to that, DO was monitored continuously at four sites on Lower Salt Creek under the authority of MWRD. In 2006, the DRSCW established five DO monitoring stations on Lower Salt Creek for a total of nine (9) monitoring locations. As of 2022, five (5) continuous monitoring locations are maintained along Lower Salt Creek: one (1) by MRWD and four (4) by the DRSCW.

Each of the continuous DO monitoring sites are equipped with a HydroLab DS 5X or a Eureuka Manta 35+ and collect continuous DO and hourly data on pH, conductivity and water temperature from April through to October (the seasonal period recognized as containing the lowest annual levels of stream DO). Additional information and the results of the DO monitoring project can be found at:
http://drscw.org/wp/dissolved-oxygen/.

Conductivity Monitoring (focused on Salt Creek downstream of Busse Woods Dam)
Ambient monitoring of conductivity is carried out at two (2) sites in the Salt Creek watershed, both situated in the Lower Salt Creek watershed. These sites are positioned upstream and downstream in their watersheds to capture concentration data within the watershed. The upstream Salt Creek conductivity site (Busse Woods) is at the upstream most point of the Lower Salt Creek watershed. The site isn't placed further upstream as there are no treatment plants above this site and the original purpose of the site was to monitor for wastewater effluent impacts. Long term data collection allows the DRSCW to monitor changes in chloride concentrations over time. For the sites located within the DRSCW watersheds, conductivity concentrations are used to calculate chloride concentrations based on a linear relationship

from direct chloride sampling established by the DRSCW in 2007 and 2019. Additional information and the results of the conductivity monitoring can be found in the DRSCW's annual reports at: https://drscw.org/activities/project-identification-and-prioritization-system/

Bioassessment

Overview and Sampling Plan

A biological and water quality survey, or "biosurvey", is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. The DRSCW bioassessment is the latter. The DRSCW bioassessment program began in 2007 with sampling in the West Branch DuPage River, East Branch DuPage River, and Salt Creek watersheds. From 2009-2016, each watershed was sampled on a 3-year rotation beginning with the West Branch DuPage River watershed in 2006. Beginning in 2017, each watershed will be sampled in a 4-year rotation. The bioassessment program functions under a quality assurance plan[45] agreed on with the IEPA. The Salt Creek bioassessment was sampled in 2007, 2010, 2013, 2016, and 2021 and will next be sampled in 2024.

The DRSCW bioassessment program utilizes standardized biological, chemical, and physical monitoring and assessment techniques employed to meet three major objectives:

1. Determine the extent to which biological assemblages are impaired (using IEPA guidelines);
2. Determine the categorical stressors and sources that are associated with those impairments; and,
3. Add to the broader databases for the DuPage River and Salt Creek watersheds to track and understand changes through time in response to abatement actions or other influences.

The data collected as part of the bioassessment is processed, evaluated, and synthesized as a biological and water quality assessment of aquatic life use status. The assessments are directly comparable to previously conducted bioassessments such that trends in status can be examined and causes and sources of impairment can be confirmed, amended, or removed. A final report containing a summary of major findings and recommendations for future monitoring, follow-up investigations, and any immediate actions that are needed to resolve readily diagnosed impairments is prepared following each bioassessment. The bioassessment reports are posted on the DRSCW website, as previously referenced. It is not the role of the bioassessments to identify specific remedial actions on a site specific or watershed basis. However, the baseline data provided by the bioassessments contributes to the Integrated Priority System[46] that was developed to help determine and prioritize remedial projects.

Sampling sites for the bioassessment were determined systematically using a geometric design supplemented by the bracketing of features likely to exude an influence over stream resource quality, such as combined sewer overflows (CSOs), dams and wastewater outfalls. The geometric site selection process starts at the downstream terminus or "pour point" of the watershed (Level 1 site), then continues by deriving each subsequent "panel" at descending intervals of one-half the drainage area (D.A.) of the preceding level. Thus, the drainage area of each successive level decreases geometrically. This results in in seven drainage area levels in each of the three watersheds, starting at the largest (150-square miles)

[45] http://drscw.org/wp/bioassessment/

[46] http://drscw.org/wp/project-identification-and-prioritization-system/

and continuing through successive panels of 75-, 38-, 19-, 9-, 5- and 2-square miles. Targeted sites are then added to fill gaps left by the geometric design and assure complete spatial coverage in order to capture all significant pollution gradients including reaches that are impacted by WWTPs, major stormwater sources, CSOs, and dams. The number of sampling sites by method/protocol in the Salt Creek watershed are listed in Table 38.

Table 38. Number of sampling sites in the Salt Creek watershed

Method/Protocol	Upper Salt Creek Watershed (2021)	Lower Salt Creek Watershed (2021)	Reference Sites (2021)	Total Sites
Biological sampling	15	50*	3	68
Fish	15	50*	3	68
Macroinvertebrates	15	50*	3	68
QHEI	15	50*	3	68
Water Column Chemical/ Physical Sampling	15	42	3	60
*Nutrients***	15	42	3	60
Water Quality Metals	15	19	3	37
Water Quality Organics	2	15	2	19
Sediment Sampling	3	24	2	29

*Includes eight (8) sites that were being monitored as part of pre-project monitoring at Fullersburg Woods and post-project monitoring at the Preserve at Oak Meadows.

**Also included indicators or organic enrichment and ionic strength, total suspended solids (TSS), DO, pH and temperature. Also, in 2021, chlorophyll A was included as a nutrient parameter.

Representativeness – Reference Sites

Data is collected from selected regional reference sites in northeastern Illinois preferably to include existing IEPA and IDNR reference sites, potentially being supplemented with other sites that meet the IEPA criteria for reference conditions. One purpose of this data will be to index the biological methods used in this study that are different from IEPA and/or IDNR to the reference condition and biological index calibration as defined by IEPA. In addition, the current IEPA reference network does not yet include smaller headwater streams, hence reference data is needed to accomplish an assessment of that data. Presently thirteen (13) reference sites have been established with three (3) reference sites sampled in 2021.

The bioassessment sampling includes four (4) sampling methods/protocols: biological sampling, QHEI, water column chemical/physical parameter sampling and sediment chemistry. The biological sampling includes two assemblages: fish and macroinvertebrates.

A list of the sites sampled as part of the 2021 Salt Creek bioassessment is included in Table 39 and includes the site name, site location, and the type and frequency of each sampling method. Sites in the Upper Salt Creek watershed are SC01-SC15 and SC44-SC45.

The fish and macroinvertebrate results are presented as Index of Biotic Integrity (IBI) scores. IBI is an evaluation of a waterbody's biological community in a manner that allows the identification, classification and ranking of water pollution and other stressors. IBIs allow the statistical association of various anthropogenic influences on a water body with the observed biological activity in said water body and in turn the evaluation of management interventions in a process of adaptive management. Chemical testing of water samples produces only a snapshot of chemical concentrations while an IBI allows an evaluation of the net impact of chemical, physical and flow variables on a biological community structure. Dr. James Karr formulated the IBI concept in 1981.

Based on sampling conducted within the Salt Creek watershed by the Midwest Biodiversity Institute for the DRSCW in accordance with Illinois EPA criterion, biological assemblages sampled are rated poor to fair. No fish Index of Biological Integrity (fIBI) values met the “good” IEPA criterion, and “good” macroinvertebrate IBIs (mIBI) were limited to two sites located within the lower Salt Creek mainstem, two mainstem sites within the Preserve at Oak Meadows restoration site, and one site on West Branch Salt Creek #5 (located within the Upper Salt Creek watershed). Because of the low biological performance, none of the sites sampled within the watershed fully supported Illinois EPA aquatic life use goals. Table 40 and Figure 55 includes the status of aquatic life use support for all sites sampled in the Salt Creek watershed along with fIBI, mIBI, and QHEI values and identified potential causes of impairment.

Table 39. 2021 Bioassessment Sampling Sites and Frequency of Sampling.

Site ID	RIVER	Latitude	Longitude	Frequency of Sampling during the 2021 Bioassessment							
				Biological Sampling	QHEI	Demand/ Nutrient	Metals	Water Organics	Sediment	Sulfate	Oil and Grease
SC01	Tributary to Salt Creek	42.143664	-88.078158	1	1	2					
SC02	Tributary to Salt Creek	42.113270	-88.082431	1	1	2					
SC03	Salt Creek	42.108005	-88.083462	1	1	2					
SC04	Salt Creek	42.110637	-88.062385	1	1	4					
SC05	Tributary to Salt Creek	42.125180	-88.039411	1	1	2					
SC06	Tributary to Salt Creek	42.116387	-88.012306	1	1	2					
SC07	Salt Creek	42.077084	-88.053031	1	1	4	4				
SC08	Tributary to Salt Creek	42.067958	-88.019216	1	1	4					
SC11	Tributary to Salt Creek	42.028369	-88.055516	1	1	4					
SC12	Tributary to Salt Creek	42.025566	-88.063601	1	1	2					
SC13	Tributary to Salt Creek	42.015691	-88.054162	1	1	2					
SC14	Tributary to Salt Creek	42.017338	-88.045095	1	1	4	4				
SC15	Salt Creek	42.051095	-88.008992	1	1	6	4		1	1	1
SC16	Spring Brook	41.971781	-87.998034	1	1	6	4		1	1	1
SC17	Spring Brook	41.967116	-88.046834	1	1	4					
SC18	Spring Brook	41.958246	-88.065080	1	1	4					
SC19	Meacham Creek	41.995347	-88.051359	1	1						
SC20	Tributary to Meacham Creek	41.988298	-88.054429	1	1	2					
SC21	Spring Brook	41.973240	-88.079282	1	1	2	2	1	1		
SC22	Westwood Creek	41.939820	-87.992964	1	1	4		1	1		
SC23	Salt Creek	41.936938	-87.984234	1	1	9	6	1	1		
SC24	Addison Creek	41.946217	-87.926124	1	1	2					
SC25	Tributary to Addison Creek	41.937825	-87.939885	1	1	2					
SC26	Addison Creek	41.928711	-87.910687	1	1	4					
SC27	Addison Creek	41.898963	-87.883344	1	1	4	4				
SC28	Addison Creek	41.861162	-87.867743	1	1	6	4		1	1	1
SC29	Salt Creek	41.818297	-87.833708	1	1	12	6	1	1	1	1
SC30	Ginger Creek	41.837873	-87.970817	1	1	2					
SC31	Ginger Creek	41.839376	-87.953247	1	1	4					
SC32	Oakbrook Creek	41.853770	-87.948831	1	1	2					

Site ID	RIVER	Latitude	Longitude	Frequency of Sampling during the 2021 Bioassessment							
				Biological Sampling	QHEI	Demand/ Nutrient	Metals	Water Organics	Sediment	Sulfate	Oil and Grease
SC33	Sugar Creek	41.872959	-87.959728	1	1	4					
SC34	Salt Creek	41.951765	-87.986441	1	1	9	6	1	1		
SC35	Salt Creek	41.944091	-87.981079	1	1	9	6	1	1		
SC35A	Salt Creek	41.942500	-87.982100	1	1						
SC35B	Salt Creek	41.941120	-87.983000	1	1						
SC36	Oak Brook	41.850896	-87.958463	1	1	2					
SC37	Salt Creek	41.885162	-87.959927	1	1	9	3	1	1		
SC38	Salt Creek	41.890375	-87.964024	1	1	9	6	1	1		
SC39	Salt Creek	41.919985	-87.972745	1	1	9	6	1	1		
SC40	Salt Creek	41.962745	-87.984390	1	1	9	6	1	1		
SC41	Salt Creek	41.970302	-87.988175	1	1	9	6	1	1		
SC42	Salt Creek	41.991326	-87.994485	1	1	6	4		1		
SC43	Salt Creek	42.011973	-88.000920	1	1	6	4	1	1	1	1
SC44	Salt Creek	42.016020	-88.000508	1	1	6	4	1	1		
SC45	Tributary to Salt Creek	42.084211	-88.019856	1	1	4	4	1	1		
SC46	Spring Brook	41.966727	-88.077424	1	1	2	2	1	1		
SC47	Spring Brook	41.963342	-88.031508	1	1	6	4	1	1		
SC48	Addison Creek	41.872732	-87.868775	1	1	6	4		1		
SC49	Salt Creek	41.825756	-87.900036	1	1	9	6	1	1	1	1
SC50	Salt Creek	42.021262	-88.004911	1	1	6	4		1		
SC51	Salt Creek	41.875767	-87.957990	1	1	9	6		1	1	1
SC52	Salt Creek	41.820328	-87.926117	1	1	9	6		1		
SC53	Salt Creek	41.825544	-87.931557	1	1	9	6		1		
SC53A	Salt Creek	41.821120	-87.928600	1	1						
SC54	Salt Creek	41.845607	-87.851945	1	1	12	6		1		
SC55	Salt Creek	41.847630	-87.936374	1	1	6	6				
SC56	Salt Creek	41.832606	-87.941979	1	1	6	6				
SC56A	Salt Creek	41.830600	-87.940435	1	1						
SC56B	Salt Creek	41.830287	-87.931866	1	1						
SC56C	Salt Creek	41.828490	-87.930590	1	1						
SC57	Salt Creek	41.873713	-87.955260	1	1	9	6				
SC59	Salt Creek	41.826080	-87.914590	1	1	12	6				

Site ID	RIVER	Latitude	Longitude	Frequency of Sampling during the 2021 Bioassessment							
				Biological Sampling	QHEI	Demand/ Nutrient	Metals	Water Organics	Sediment	Sulfate	Oil and Grease
SC60	Salt Creek	41.825950	-87.886170	1	1	12	6				
SCBR	Salt Creek					6					

Table 40. Status of aquatic life use support for stream segments in the Salt Creek watershed, 2021

Site ID	River Mile Fish/Macros	Latitude	Longitude	Drainage Area (sq mi)	fIBI	mIBI	QHEI	Aq Life Status
Salt Creek								
SC04	39.50/39.50	42.1106	-88.0601	5.75	16.0	27.60	47.0	Non - Poor
SC07	36.00/36.00	42.0762	-88.0531	10.77	17.0	32.10	71.5	Non - Poor
SC15	32.00/32.00	42.0489	-88.0108	28.60	16.0	19.00	48.5	Non - Poor
SC50	30.60/30.60	42.0201	-88.0080	47.86	17.0	23.50	63.5	Non - Poor
SC44	29.30/29.30	42.0162	-88.0006	48.23	18.0	17.90	63.8	Non - Poor
SC43	29.00/29.00	42.0098	-88.0009	48.39	16.5	27.60	66.5	Non - Poor
SC42	27.00/27.00	41.9903	-87.9942	50.41	16.0	26.80	70.8	Non - Poor
SC41	25.00/25.00	41.9691	-87.9862	50.41	19.5	35.70	62.3	Non - Poor
SC40	24.50/24.50	41.9611	-87.9832	73.70	18.0	32.57	52.5	Non - Poor
SC34	23.50/23.50	41.9502	-87.8951	74.50	15.5	42.36	77.0	Non - Poor
SC35	23.00/23.00	41.9459	-87.9822	74.80	18.0	30.22	77.5	Non - Poor
SC35B	22.80/22.80	41.9430	-87.9818	81.76	13.5	40.22	72.0	Non - Poor
SC35A	22.70/22.70	41.9415	-87.9843	75.10	14.5	42.44	72.8	Non - Poor
SC23	22.50/22.50	41.9373	-87.9846	81.70	16.5	34.23	46.0	Non - Poor
SC39	20.50/20.50	41.9179	-87.9728	84.20	15.0	30.70	64.3	Non - Poor
SC38	18.00/18.00	41.8939	-87.9642	87.73	12.5	33.20	74.8	Non - Poor
SC37	17.50/17.50	41.8836	-87.9604	91.30	12.0	32.80	73.5	Non - Poor
SC51	17.00/17.00	41.8780	-87.9566	91.90	8.5	27.10	78.0	Non - Poor
SC57	16.50/16.50	41.8724	-87.9546	92.10	11.0	31.60	63.8	Non - Poor
SC55	13.50/13.50	41.8454	-87.9366	103.00	10.5	24.00	40.0	Non - Poor
SC56	12.50/12.50	41.8342	-87.9420	109.70	14.0	30.10	56.0	Non - Poor
SC56A	12.20/12.20	41.8315	-87.9412	109.80	16.0	36.71	62.0	Non - Poor
SC56B	11.70/11.70	41.8305	-87.9345	113.60	12.0	-	50.0	Non - Poor
SC56C	11.30/11.30	41.8276	-87.9310	113.70	13.0	28.09	50.3	Non - Poor

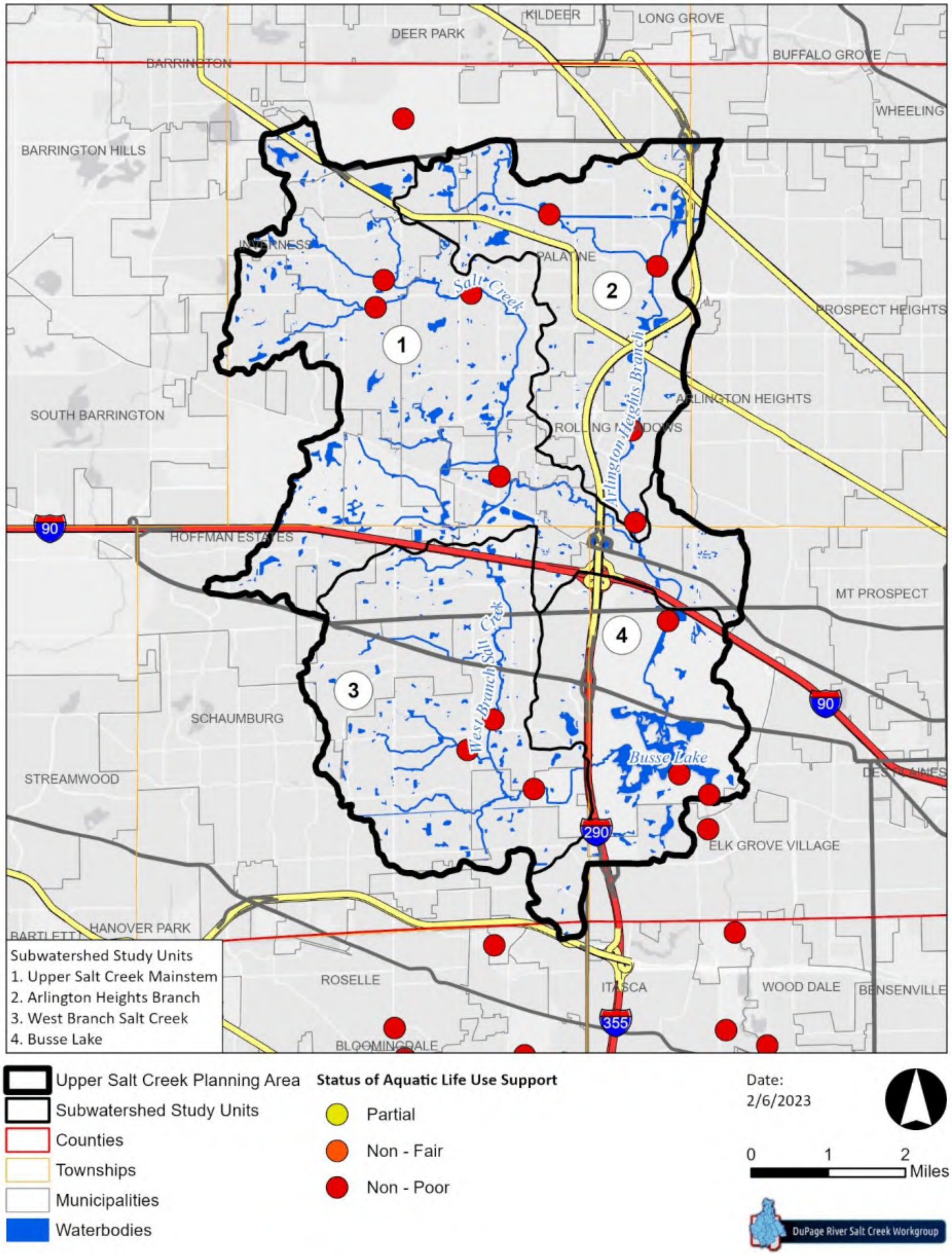
Site ID	River Mile Fish/Macros	Latitude	Longitude	Drainage Area (sq mi)	fIBI	mIBI	QHEI	Aq Life Status
SC53	11.00/11.00	41.8234	-87.9323	114.00	16.0	28.71	46.0	Non - Poor
SC53A	10.80/10.80	41.8212	-87.9293	114.00	13.0	19.74	43.5	Non - Poor
SC52	10.50/10.50	41.8198	-87.9243	114.00	28.0	45.04	82.8	Partial
SC59	9.10/9.10	41.8262	-87.9116	116.00	29.5	42.10	86.0	Non - Fair
SC49	8.00/8.00	41.8258	-87.8971	116.00	29.5	31.50	76.8	Non - Fair
SC60	7.20/7.20	41.8270	-87.8844	117.60	25.0	24.90	77.0	Non - Fair
SC54	3.00/3.00	41.8437	-87.8505	144.00	26.0	25.20	74.5	Non - Fair
SC29	0.50/0.50	41.8192	-87.8373	150.00	28.0	22.90	75.5	Non - Fair
Arlington Heights Branch Salt Creek								
SC06	4.00/4.00	42.1156	-88.0132	2.11	15.0	24.10	40.5	Non - Poor
SC45	1.50/1.50	42.0848	-88.0196	9.00	18.0	23.20	62.0	Non - Poor
SC08	0.25/0.25	42.0675	-88.0190	10.17	18.0	29.30	57.5	Non - Poor
Baldwin Creek								
SC05	2.00/2.00	42.1254	-88.0403	2.15	1.0	26.30	60.0	Non - Poor
Unnamed Tributary (#1) to Arlington Heights Br Salt Cr @ RM 4.14								
SC01	2.00/2.00	42.1435	-88.0771	1.52	17.0	28.50	66.5	Non - Poor
Unnamed Tributary (#2) to Salt Creek @ RM 43.1								
SC02	0.00/0.25	42.1131	-88.0822	0.86	Dry	19.10	Dry	Non - Poor
Unnamed Tributary (#3) to Salt Creek @ RM 42.9								
SC03	0.50/0.50	42.1080	-88.0843	2.25	14.0	27.00	66.5	Non - Poor
West Branch Salt Creek (#5)								
SC11	5.00/5.00	42.0305	-88.0549	5.80	15.0	32.50	64.5	Non - Poor
SC14	2.50/2.50	42.0174	-88.0447	10.50	15.0	45.20	78.0	Non - Poor
Yeargin Creek								
SC12	0.25/0.25	42.0248	-88.0614	1.70	17.0	39.40	70.5	Non - Poor
Ginger Creek								
SC30	1.50/1.50	41.8381	-87.9700	3.40	13.0	16.10	63.0	Non - Poor
Sugar Creek								
SC33	0.25/0.25	41.8731	-87.9588	4.20	13.0	19.50	47.0	Non - Poor
Addison Creek								
SC24	10.50/10.50	41.9470	-87.9264	2.00	9.0	12.50	37.0	Non - Poor
SC26	8.00/8.00	41.9287	-87.9115	6.30	3.0	13.00	61.0	Non - Poor
SC27	5.00/5.00	41.8988	-87.8848	10.50	3.0	33.10	57.5	Non - Poor
SC48	2.50/2.50	41.8727	-87.8688	17.00	9.0	4.90	42.8	Non - Poor

Site ID	River Mile Fish/Macros	Latitude	Longitude	Drainage Area (sq mi)	fIBI	mIBI	QHEI	Aq Life Status
SC28	1.50/1.50	41.8616	-87.8689	20.80	12.0	4.70	43.0	Non - Poor
Unnamed Tributary to Addison Creek @ RM 10.35								
SC25	0.50/0.50	41.9373	-87.9400	1.00	12.0	12.80	53.5	Non - Poor
Spring Creek								
SC21	6.50/6.50	41.9726	-88.0800	2.10	16.0	18.50	71.5	Non - Poor
SC46	6.00/6.00	41.9669	-88.0775	2.60	14.0	27.70	73.5	Non - Poor
SC18	4.50/4.50	41.9582	-88.0653	6.35	13.0	24.50	72.0	Non - Poor
SC47	2.50/2.50	41.9634	-88.0305	13.70	17.0	20.30	69.0	Non - Poor
SC16	0.25/0.25	42.9720	-87.9965	16.80	13.0	18.20	44.0	Non - Poor
Oakbrook Creek								
SC36	0.50/0.50	41.8508	-87.9587	0.80	18.0	17.60	56.0	Non - Poor
SC32	0.25/0.25	41.8537	-87.9495	1.20	29.0	10.10	61.0	Non - Poor
Unnamed Tributary to Meacham Creek @ RM 1.9								
SC20	0.25/0.25	41.9881	-88.0548	2.00	14.0	15.20	46.5	Non - Poor
Westwood Creek								
SC22	0.50/0.50	41.9399	-87.9921	4.00	16.0	25.00	56.0	Non - Poor
Meacham Creek								
SC17	0.40/0.40	41.9674	-88.0473	17.83	7.0	10.30	32.0	Non - Poor

Table 41. Status of aquatic life use support key

Parameter		fIBI	mIBI	QHEI	Aq Life Status
Condition Category Thresholds	Excellent	≥50	>73	≥84.5	FULL
	Good	>41-49	41.8-72.9	75.9-84.0	FULL
	Fair	30-<41	30-41.7	50.1-75.0	PARTIAL
	Poor	>15-29	>15-29	25-50	NON-Fair
	Very Poor	≤15	≤15	<25	NON-Poor
Source	**IPS**	**IEPA/IPS**	**IEPA/IPS**	**IPS**	**IPS**
FULL - Both indices in the good range					
PARTIAL - One index in good range and fIBI ≥ 20 or mIBI ≥ 20.9					
Non - Fair - Both indices in fair range (fIBI > 20 or mIBI > 20.9)					
Non - Poor - Any index poor (fIBI < 20 or mIBI < 20.9)					

Figure 55. Status of aquatic life use support for stream segments in the Salt Creek watershed, 2021



Fish

Methodology

Methods for the collection of fish at wadeable sites was performed using a tow-barge or longline pulsed D.C. electrofishing apparatus (MBI 2006b). A Wisconsin DNR battery powered backpack electrofishing unit was used as an alternative to the long line in the smallest streams (Ohio EPA 1989). A three-person crew carried out the sampling protocol for each type of wading equipment sampling in an upstream direction. Sampling effort was indexed to linear distance and ranged from 150-200 meters in length. Non-wadeable sites were sampled with a raft-mounted pulsed D.C. electrofishing device in a downstream direction (MBI 2007). Sampling effort was indexed to lineal distance over 0.5 km. Sampling was conducted during a June 15-October 15 seasonal index period.

Samples from each site were processed by enumerating and recording weights by species and by life stage (y-o-y, juvenile, and adult). All captured fish were immediately placed in a live well, bucket, or live net for processing. Water was replaced and/or aerated regularly to maintain adequate D.O. levels in the water and to minimize mortality. Fish not retained for voucher or other purposes were released back into the water after they had been identified to species, examined for external anomalies, and weighed either individually or in batches. While the majority of captured fish were identified to species in the field, any uncertainty about the field identification required their preservation for later laboratory identification. Identification was made to the species level at a minimum and to the sub-specific level if necessary. Vouchers were deposited and verified at The Ohio State University Museum of Biodiversity (OSUMB) in Columbus, OH.

2021 Results

Fish assemblages in Salt Creek were in poor to fair condition throughout the mainstem. The longitudinal pattern of fIBI scores along the length of the mainstem in 2007, 2010, 2013, 2016, and 2021 is depicted in

Figure 56. Table 42 and Table 43include the key to dams and WWTP discharges denoted on the IBI, QHEI, and water chemistry figures for Salt Creek. The Upper Salt Creek watershed is the portion of Salt Creek located upstream of Busse Woods dam (Dam A). Scores in tributaries throughout the watershed in 2021 were in the poor to fair range. Figure 57 depicts the resource quality (i.e., poor, fair, or good) as indicated by the fIBI scores (Table 40) at the DRSCW monitoring sites sampled in the Upper Salt Creek watershed in 2021.

Fish assemblages in the Salt Creek watershed are limited by stormwater pollutants, episodically low DO concentrations, and poor and fragmented habitat. Episodically low DO concentrations are driven by organic enrichment. The source of the organic enrichment is both direct, from CSOs and stormwater runoff, as well as indirect from algae cooked-up in stormwater ponds and behind low head dams. Low DO concentrations, apart from being directly lethal or stressful, also result in denitrification of nitrate to nitrite. Nitrite is highly toxic to aquatic organisms.

Table 42. Key to dams on the dam included on the Salt Creek IBI, QHEI, and water chemistry figures

Figure Reference	Name of Dam
A	Busse Woods Dam
B	Oak Meadows Dam (removed in 2016)
C	Graham Center Dam
D	Old Oak Brook Dam
E	Fullersburg Woods (Graue Mill) Dam
F	Possum Hollow Woods Dam

Table 43. Key to POTW dischargers on the Salt Creek IBI, QHEI, and water chemistry figures

Figure Reference	WWTP Discharge
1	MWRD Egan WRP
2	Itasca STP
3	Wood Dale North STP
4	Wood Dale South STP
5	Addison North STP
6	Addison South - Larocca STP
7	Salt Creek Sanitary District
8	Elmhurst WWTP

Figure 56. Fish IBI scores in Salt Creek, 1983, 2007, 2010, 2013, 2014, 2016, and 2021 in relation to municipal POTW dischargers and dams

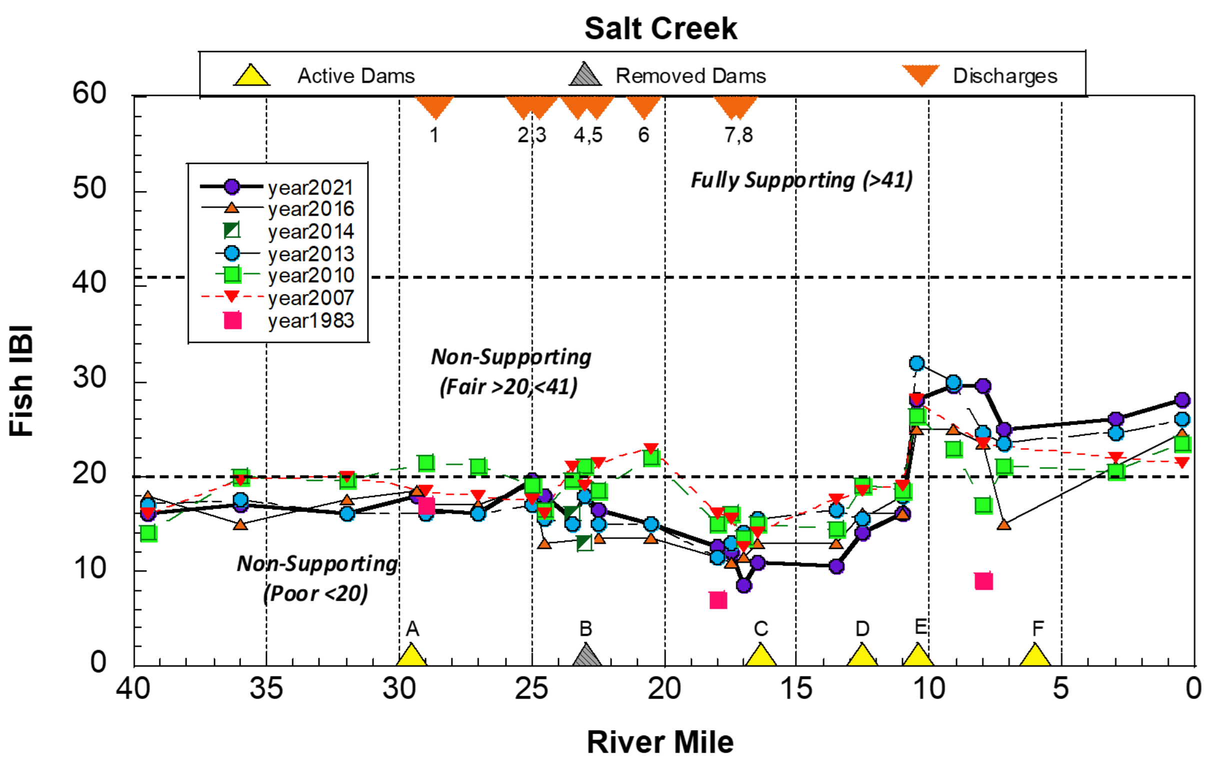
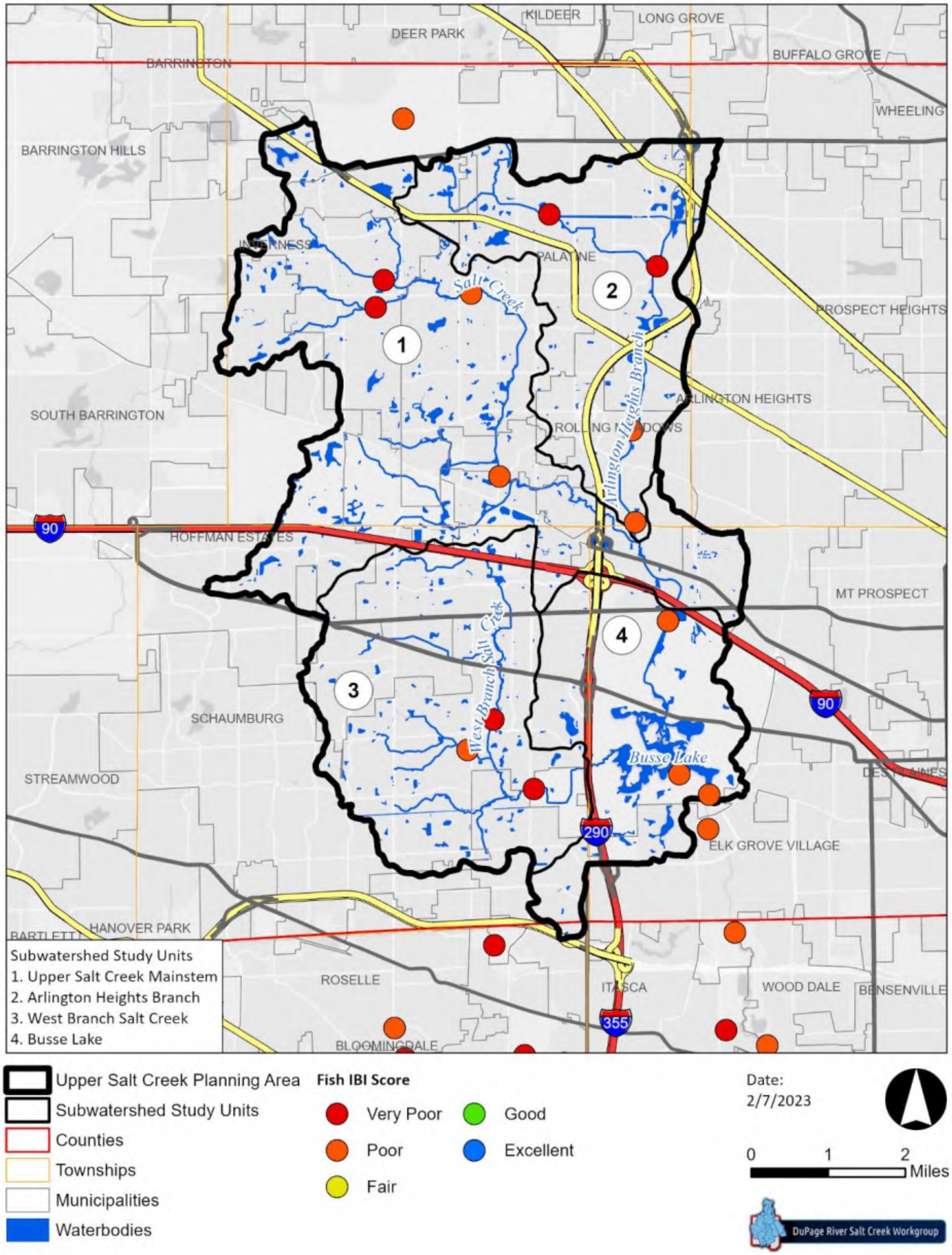


Figure 57. Resource quality as indicated by fish IBI scores at DRSCW monitoring sites in the Upper Salt Creek watershed, 2021



Macroinvertebrates

Methodology

The macroinvertebrate assemblage is sampled using the IEPA multi-habitat method (IEPA 2005). Laboratory procedures followed the IEPA (2005) methodology for processing multi-habitat samples by producing a 300-organism subsample with a scan and pre-pick of large and/or rare taxa from a gridded tray. Taxonomic resolution is performed to the lowest practicable resolution for the common macroinvertebrate assemblage groups such as mayflies, stoneflies, caddisflies, midges, and crustaceans, which goes beyond the genus level requirement of IEPA (2005). However, calculation of the macroinvertebrate IBI (mIBI) followed IEPA methods in using genera as the lowest level of taxonomy for mIBI calculation and scoring.

2021 Results

Macroinvertebrate communities sampled from the mainstem of Salt Creek revealed no clear longitudinal pattern (Figure 58) and mainly fall in the fair to poor ranges. There are four sites on the mainstem of Lower Salt Creek with mIBI scores in the good range: two (2) sites located immediately downstream of the Fullersburg Woods dam and two (2) sites within the Preserve at Oak Meadows restoration site. With the exception of one (1) site located on West Branch Salt Creek #5 (located within the Upper Salt Creek watershed) where a mIBI of 45.20 (good), scores in tributaries throughout the watershed in 2021 were in the poor to fair range. Figure 59 depicts the resource quality (i.e., poor, fair, or good) as indicated by the mIBI scores (Table 40) at the DRSCW monitoring sites sampled in the Upper Salt Creek watershed in 2022.

Figure 58. Macroinvertebrate IBI scores in Salt Creek, 2007, 2010, 2013, 2016, and 2021 in relation to municipal POTW dischargers and dams

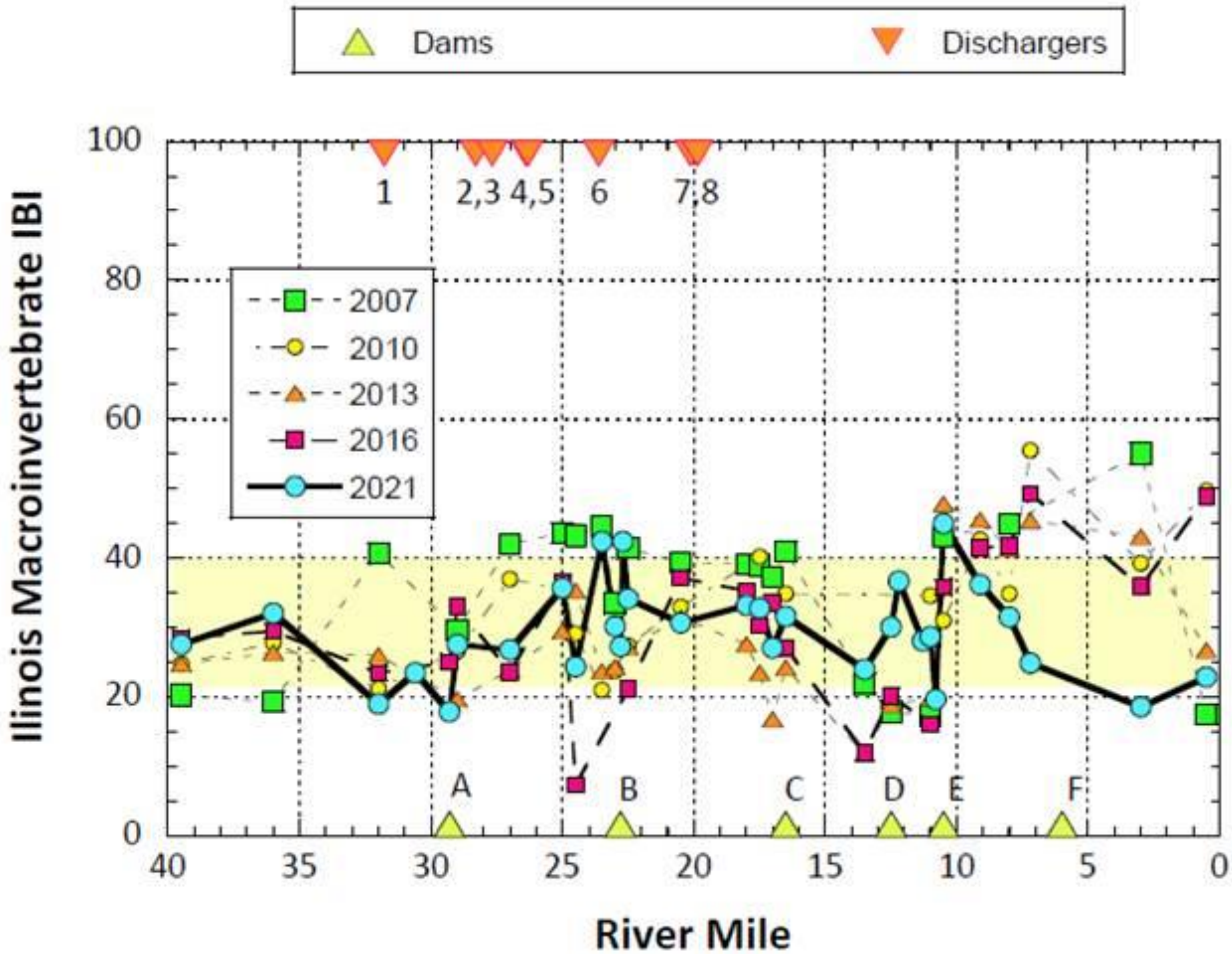
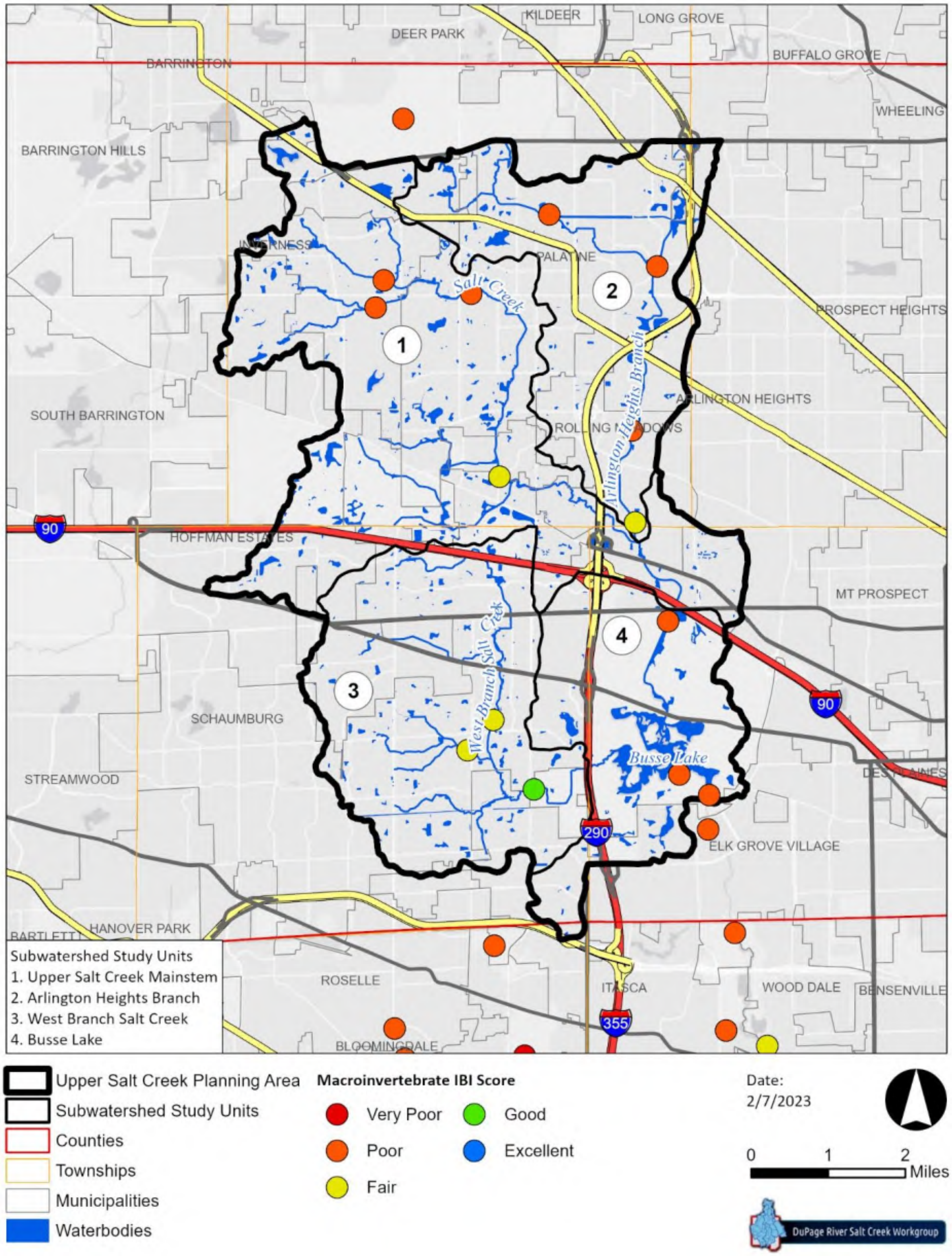


Figure 59. Resource quality as indicated by macroinvertebrate IBI scores at DRSCW monitoring sites in the Upper Salt Creek watershed, 2021



Habitat

Methodology

Physical habitat was evaluated using the QHEI developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995; Ohio EPA 2006b) and as modified by MBI for specific attributes. Attributes of habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient used to determine the QHEI score which generally ranges from 20 to less than 100. QHEI scores and physical habitat attribute were recorded in conjunction with fish collections.

2021 Results

The physical habitat of a stream is a primary determinant of biological quality. Streams in the glaciated Midwest, left in their natural state, typically possess riffle-pool-run sequences, high sinuosity, and well-developed channels with deep pools, heterogeneous substrates and cover in the form of woody debris, glacial tills, and aquatic macrophytes. The QHEI categorically scores the basic components of stream habitat into ranks according to the degree to which those components are found in a natural state, or conversely, in an altered or modified state.

QHEI is a composite score of substrate, instream vegetation, channel morphology, riparian zone and bank erosion, glide and riffle/run quality, and gradient. Based on QHEI scores, mainstem habitat quality fell mostly in the fair range, but varied by location (Figure 60 and Figure 61).

Figure 60. QHEI scores for Salt Creek in 2007, 2010, 2013, 2014, 2016, and 2021 in relation to municipal WWTP discharges and dams

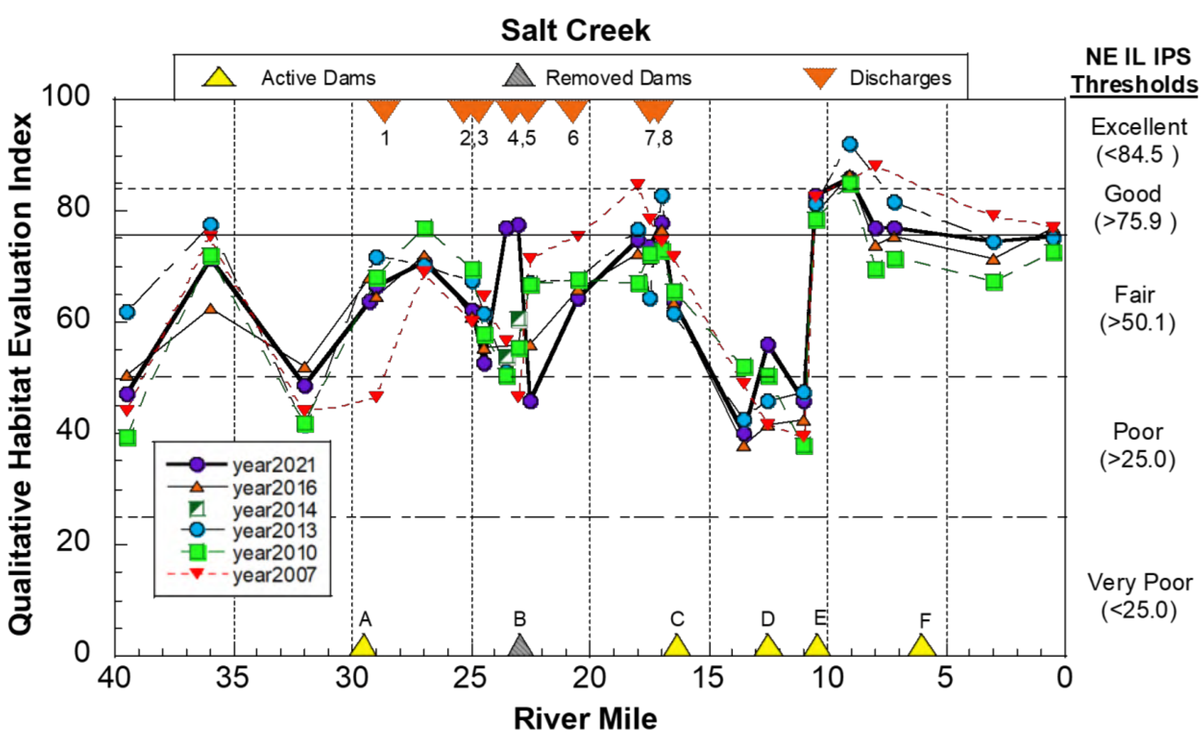
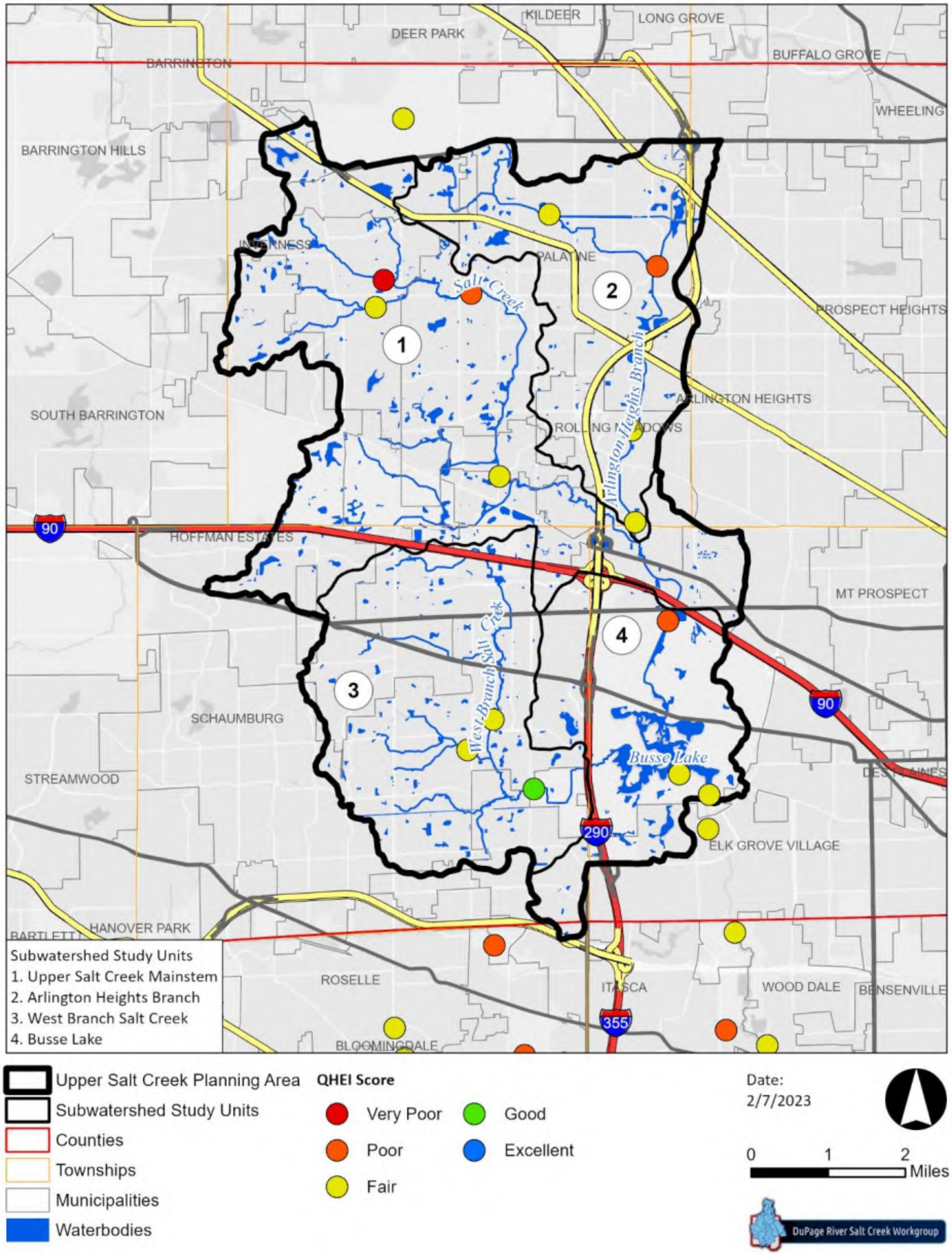


Figure 61. Resource quality as indicated by QHEI scores at DRSCW monitoring sites in the Upper Salt Creek watershed, 2021



Water Quality And Sediment Chemistry

Methodology

Water column and sediment samples are collected as part of the DRSCW bioassessment programs. Total number of collected water chemistry samples in the Salt Creek watershed is include in Table 39. The number of samples collected at each site is largely a function of the site's drainage area with the frequency of sampling increasing as drainage size increases. Organics sampling is a single sample done at a subset of sites. Sediment sampling is done at a subset of sites using the same procedures as IEPA. Table 40 details the 2021 Salt Creek Bioassessment sites and the frequency of sample at each site. Figure 62 shows the location of the sites within Upper Salt Creek watershed where water chemistry was collected. Figure 63 shows the location of the Upper Salt Creek watershed bioassessment sediment sampling sites.

The parameters sampled for are included below and can be grouped into demand parameters, nutrients, demand, metals and organics. All sampling occurs between May and October of the sample year with the exception of sediment that occurs October to December. The Standard Operating Procedure for water quality sampling can be found at http://drscw.org/wp/bioassessment/.

Water Quality Parameters

Demand Parameters	*Nutrients*	*Metals*	*Organics - Water*
5 Day BOD	Ammonia	Cadmium	PCBS
Chloride	Nitrogen/Nitrate	Calcium	Volatile Organics
Conductivity	Nitrogen – Total	Copper	Pesticides
DO	Kjeldahl	Iron	Semi volatile Organics
pH	Phosphorus, Total	Lead	
Temperature	Chlorophyll A	Magnesium	
Total Dissolved Solids		Zinc	
TSS			

Sediment Parameters

Sediment Metals		*Sediment Organics*
Arsenic	Lead	Organochlorine Pesticides
Barium	Manganese	PCBS
Cadmium	Nickel	Percent Moisture
Chromium	Potassium	Semi volatile Organics
Copper	Silver	Volatile Organic Compounds
Iron	Zinc	

Figure 62. Water chemistry sites sampled by the DRSCW in the Upper Salt Creek watershed

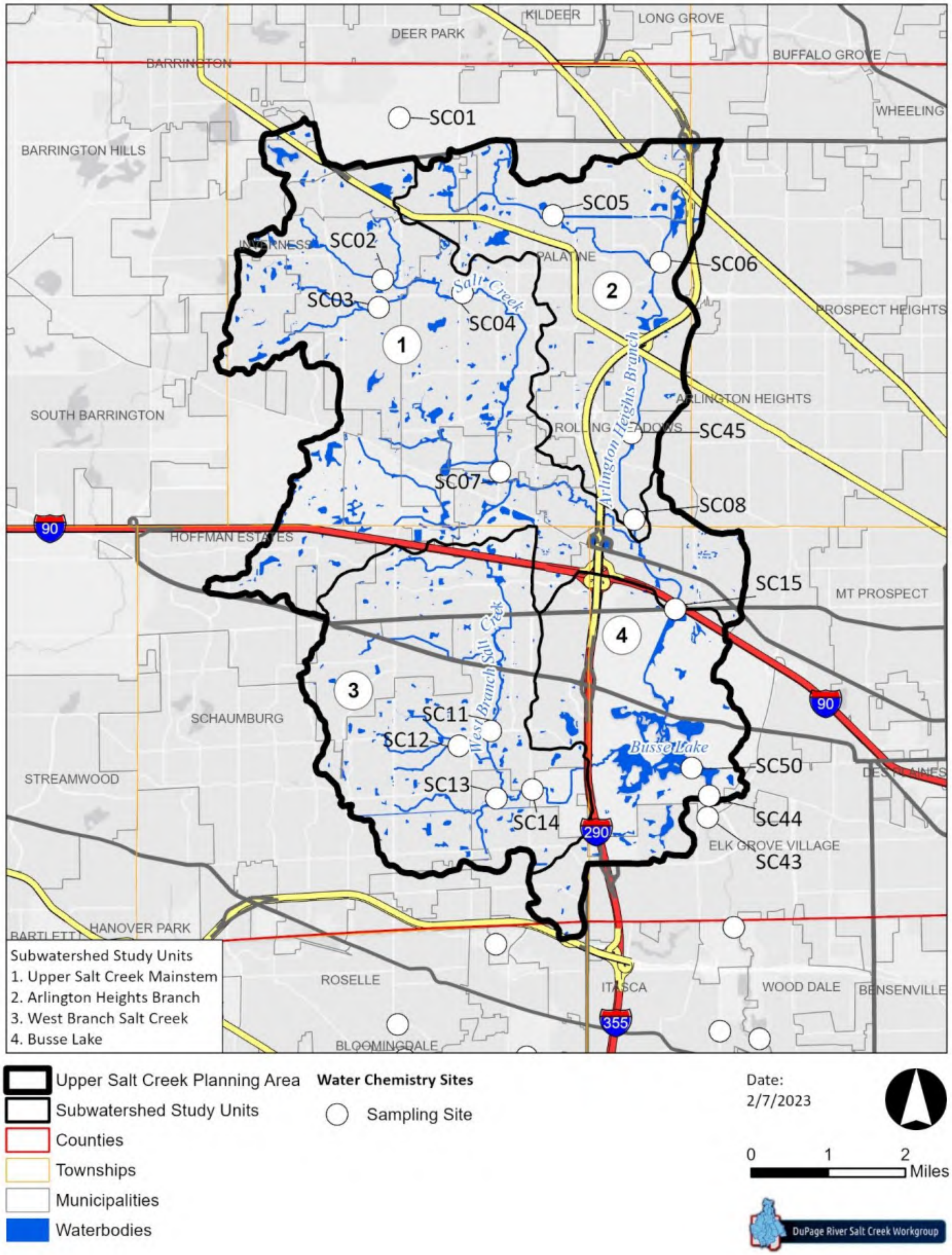
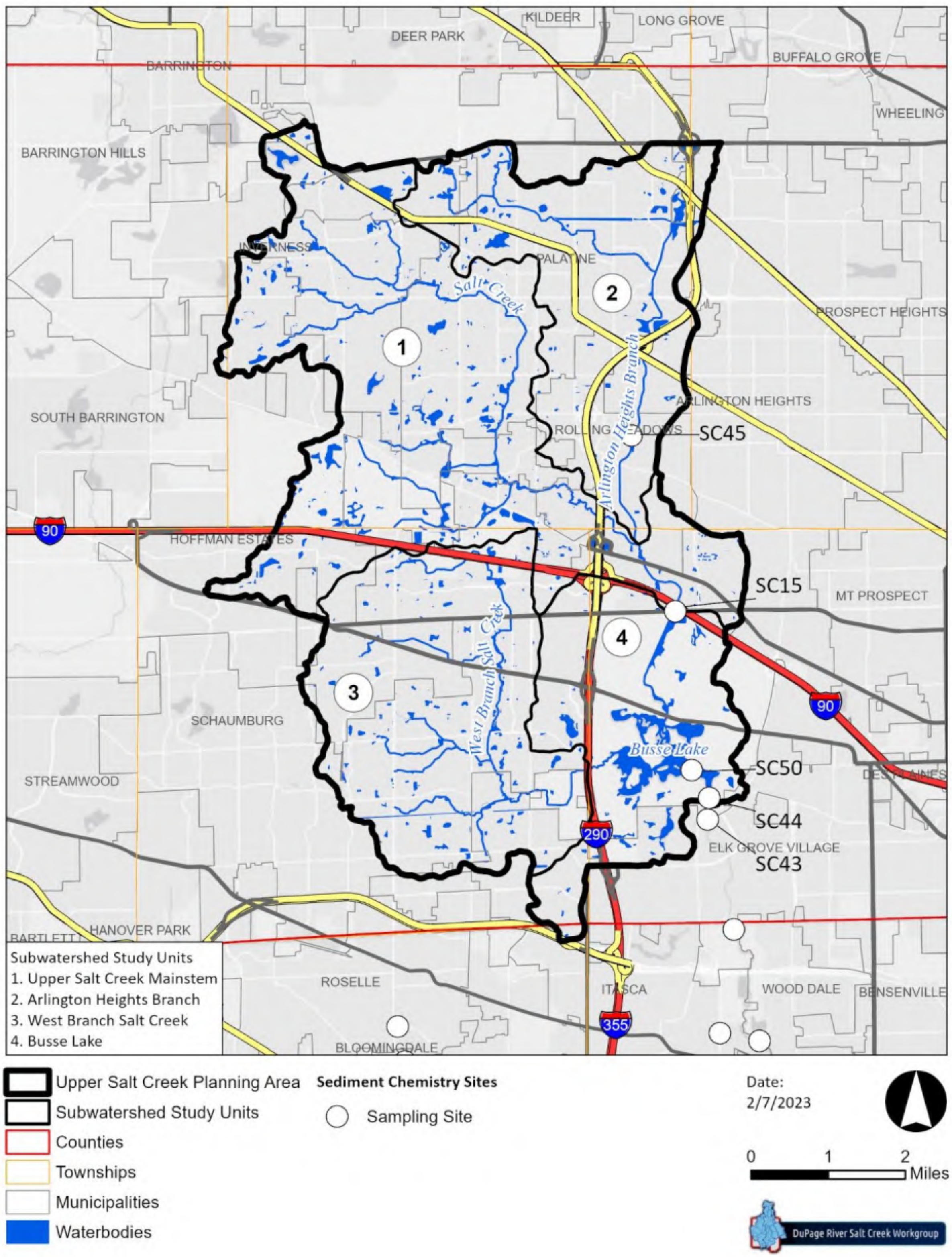


Figure 63. Sediment chemistry sites sampled by the DRSCW in the Upper Salt Creek watershed

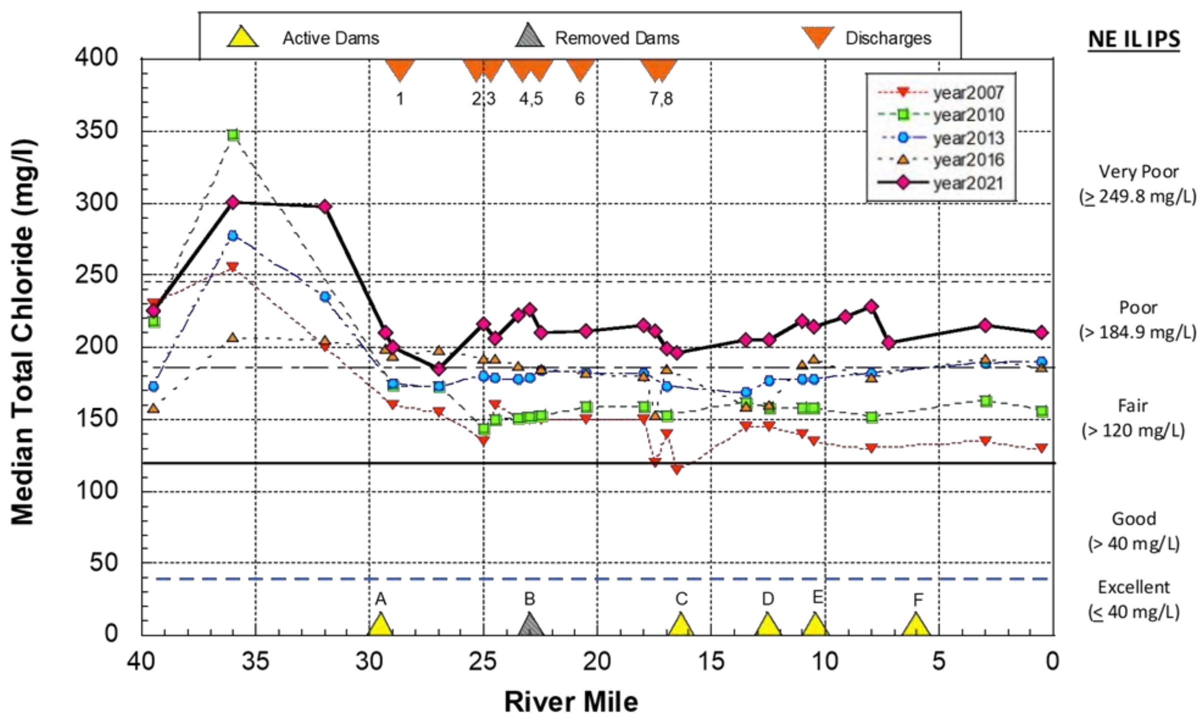


2021 Results

Nutrients and Demand Parameters

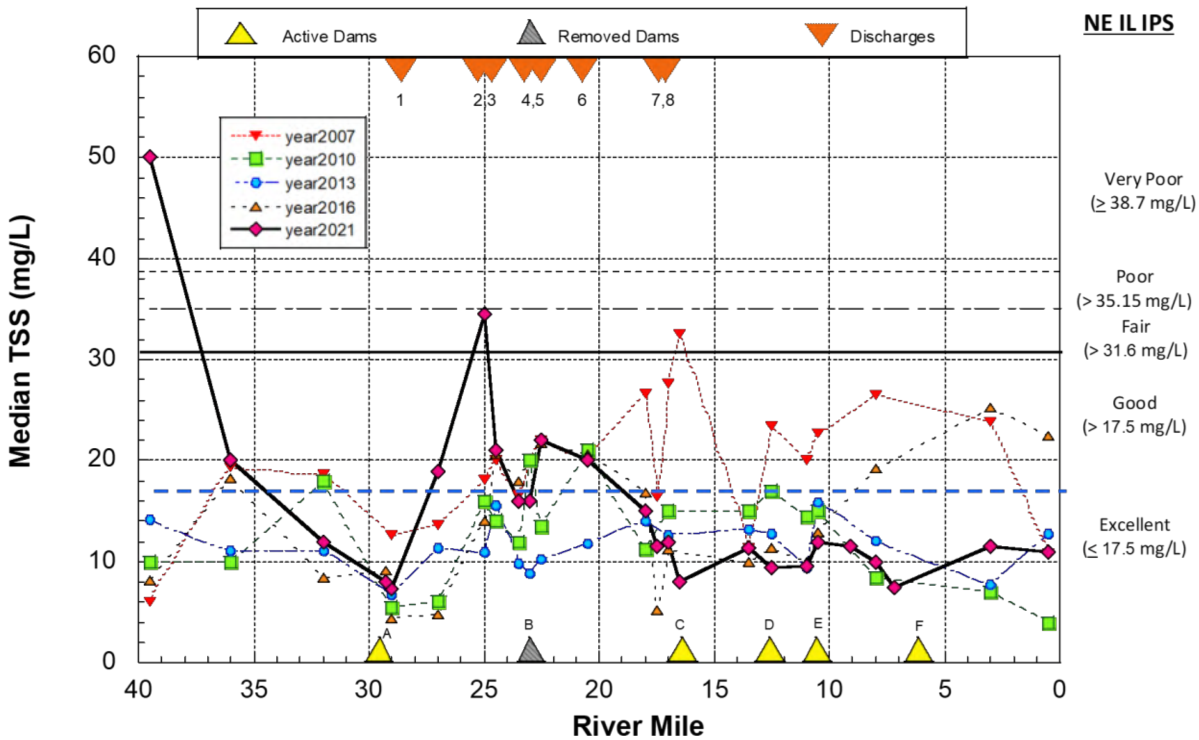
Salt Creek drains a highly urbanized landscape with a high population density. Pollutants associated with urbanized landscapes, especially heavy metals, hydrocarbons, and road de-icing compounds, enter the stream system via stormwater flows. Because heavy metals and hydrocarbons are typically attached to sediment particles, those pollutants accumulate in the bottom sediments. However, de-icing compounds, being soluble, persist mainly in the water column. The water quality "footprint" resulting from de-icing compounds is most obvious in the small tributaries and especially in the Upper Salt Creek watershed (Figure 64). Summer concentrations of chlorides measured in the Upper Salt Creek watershed were elevated to the point that if one were to attempt drinking the water, the taste would be "salty." Chloride concentrations that elevated are anomalous for freshwater systems and are beyond the tolerance of most macroinvertebrates.

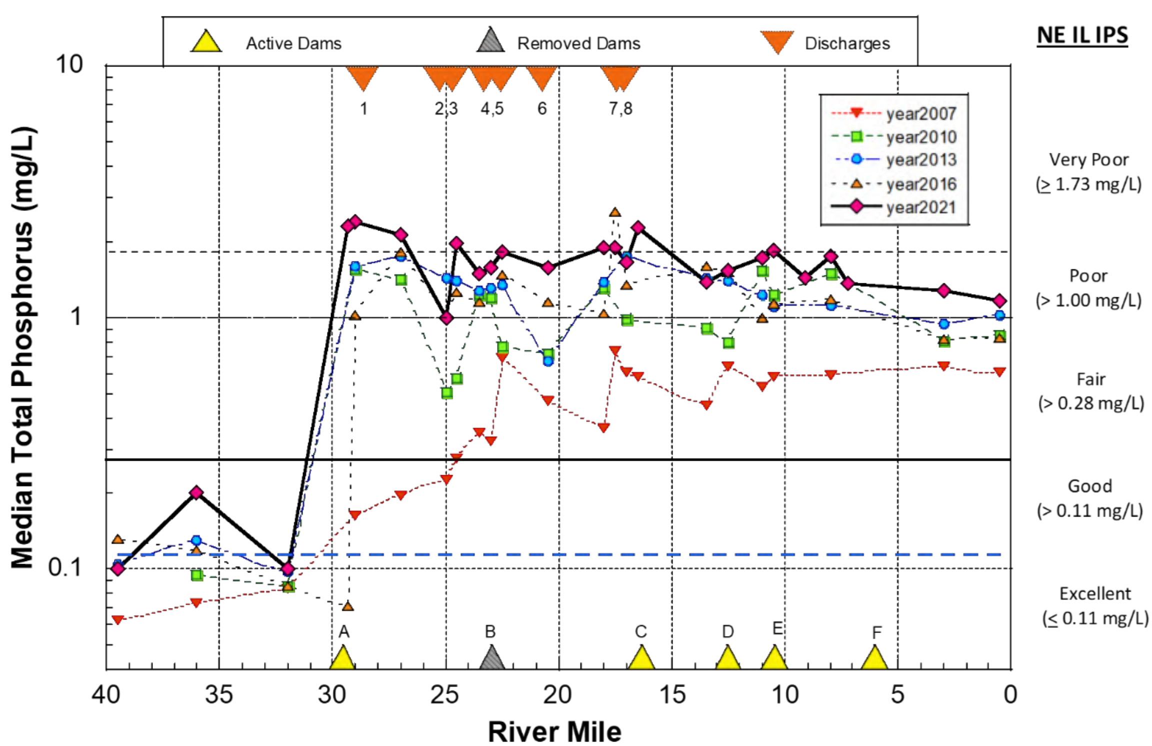
Figure 64. Median concentrations chloride from Salt Creek samples in 2007, 2010, 2013, 2016, and 2021 in relation to municipal WWTP discharges (top X-axis) and dams (bottom X-axis)



Concentrations of suspended solids were elevated at times, a likely function of the urbanized character of the watershed, algae discharged from stormwater retention ponds, and possibly the dispersive effect of monovalent ions on clayey silts (Table 65 - top panel).

Figure 65. Median concentrations of total suspended solids (top panel) and total phosphors (lower panel) from Salt Creek samples in 2007, 2010, 2013, 2016, and 2021 in relation to municipal WWTP discharges (top X-axis) and dams (bottom X-axis)

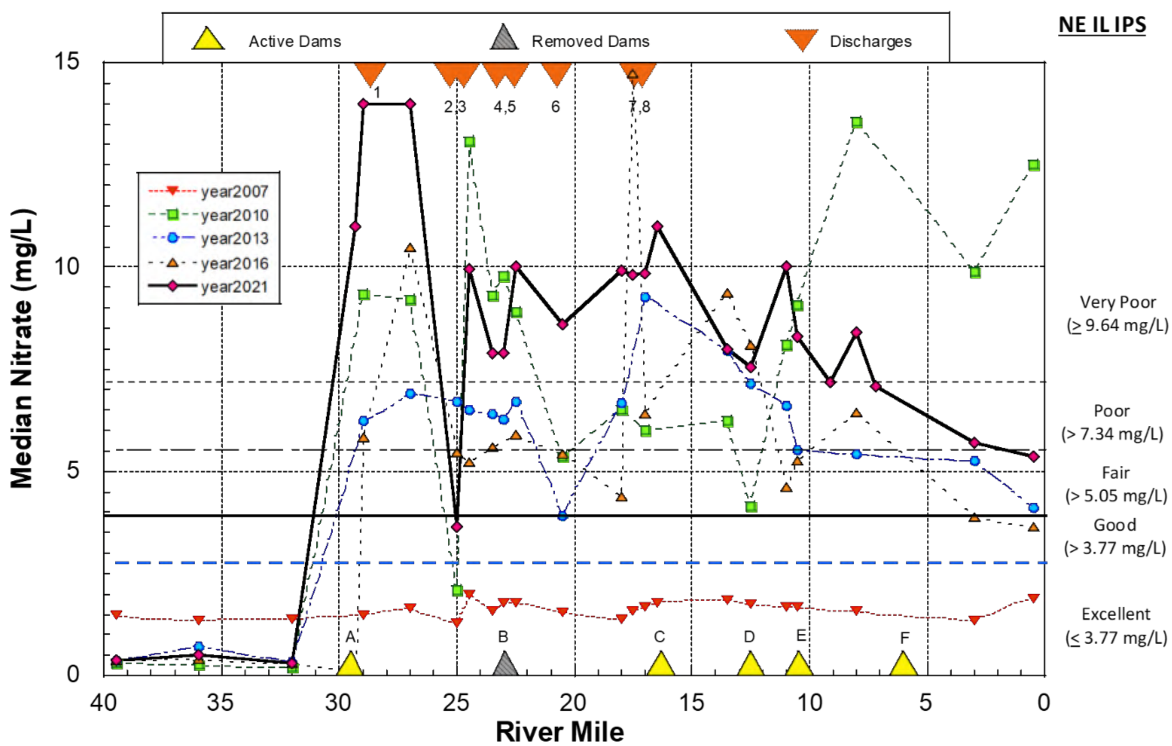




Given the high population density in the watershed, treated municipal effluent comprises a significant fraction of the total flow in Salt Creek and strongly influences water quality in the Lower Salt Creek watershed, especially with respect to phosphorus and nitrogen. Phosphorus concentrations in the Upper Salt Creek watershed were typical of developed urban landscapes but were not necessarily excessive. However, starting at the first major treatment plant, concentrations became highly elevated, with little or no assimilation occurring along the run-of-river (Figure 65 - lower panel).

Combined nitrate and nitrite nitrogen concentrations followed an essentially identical pattern, going from background concentrations (e.g., < 1 mg/L) in the Upper Salt Creek watershed to highly elevated (e.g., > 3 mg/L) in the lower portion of the watershed (Figure 66 - top panel). Total Kjeldahl nitrogen (TKN) also increased downstream from where the treatment discharges began (Figure 66 - lower panel). TKN can signal organic enrichment; however, as a by-product of treated domestic sewage, it can also represent refractory organic nitrogen. Ammonia- nitrogen concentrations were influenced by the WWTPs (Figure 67).

Figure 66. Median concentrations of nitrate (top panel) and TKN (lower panel) from Salt Creek samples in 2007, 2010, 2013, 2016, and 2021 in relation to municipal WWTP discharges (top X-axis) and dams (bottom X-axis)



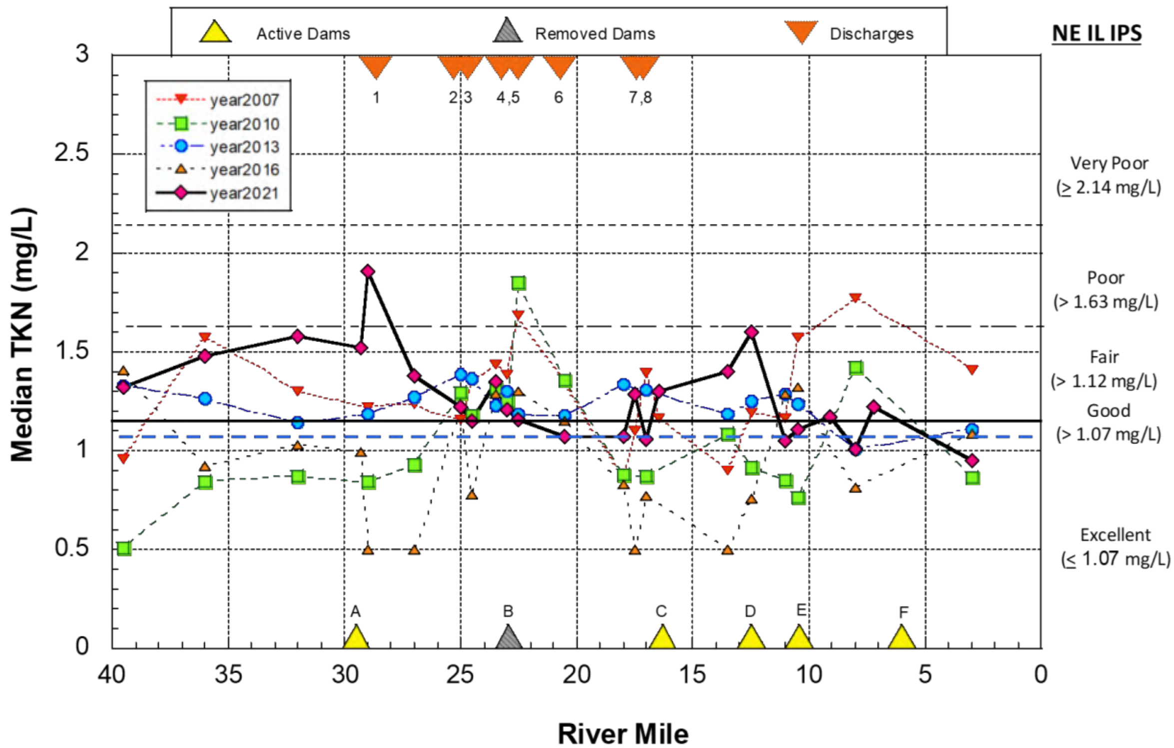
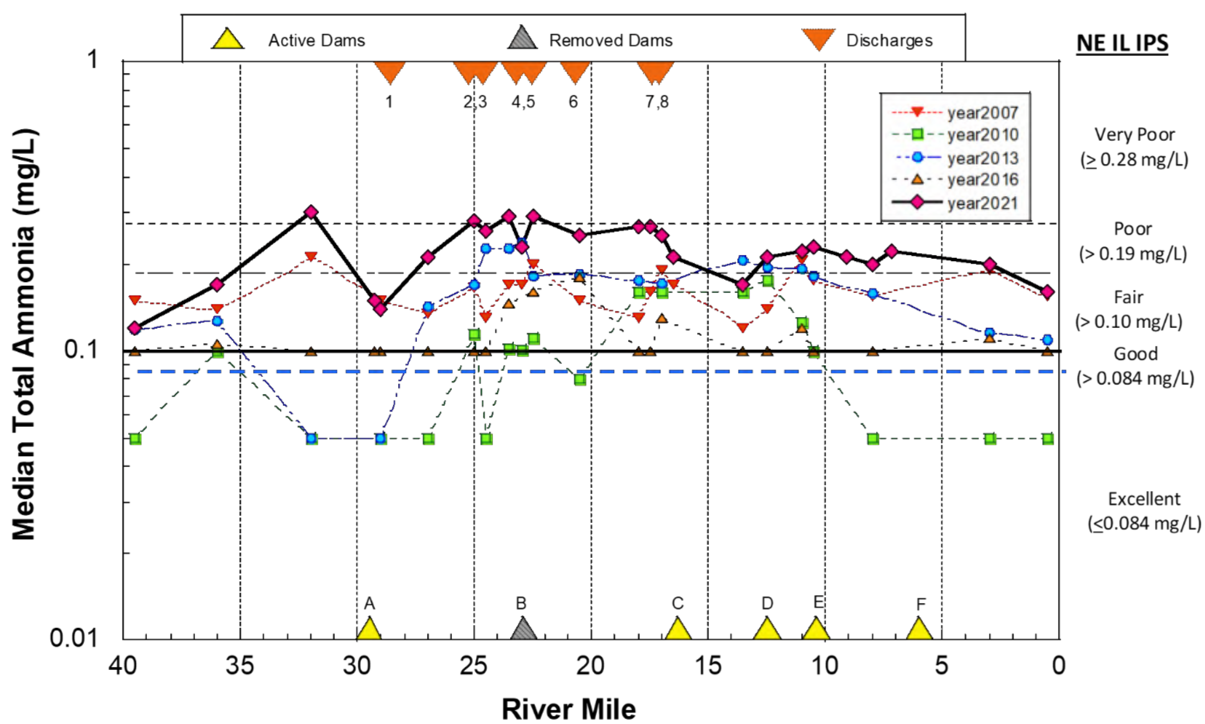


Figure 67. Median concentrations total ammonia from Salt Creek samples in 2007, 2010, 2013, 2016, and 2021 in relation to municipal WWTP discharges (top X-axis) and dams (bottom X-axis)



3.5.7.3. Volunteer Lake Monitoring Program

The Volunteer Lake Monitoring Program (VLMP) was established by IEPA in 1981 to collect data on thousands of lakes and ponds in the state. The volunteers focused on secchi transparency (water clarity), aquatic macrophyte, algal blooms, nitrogen and phosphorus, chlorophyll a, and DO. The collected data could then be used by IEPA staff to make decisions for the waterbody: whether that meant continuing to monitor or increasing investigations for remediation. The VLMP supports volunteerism, community engagement, and natural resources protection.

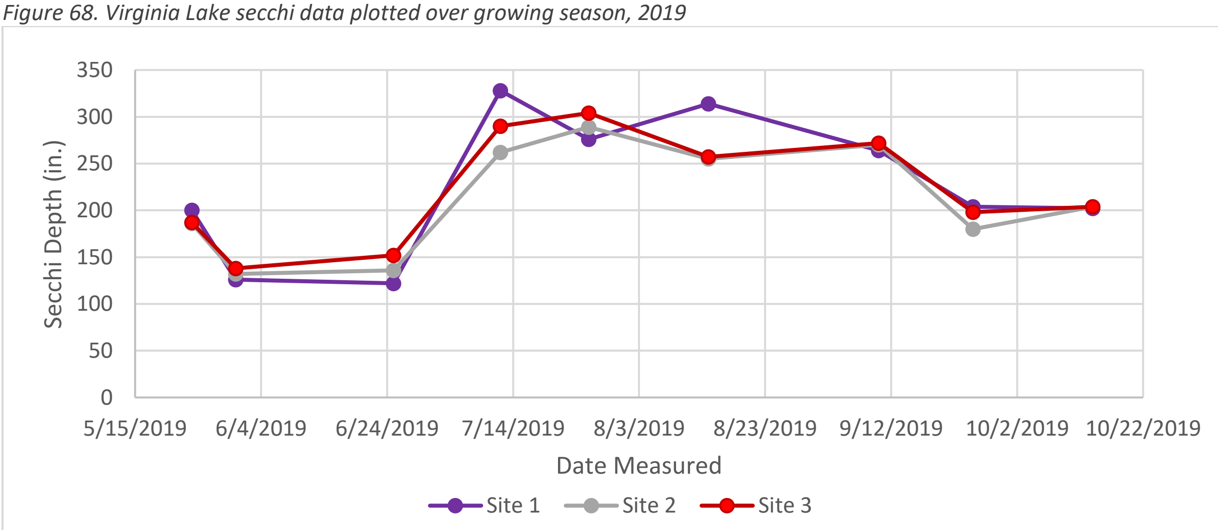
In 2019, the VLMP was suspended and will remain so until IEPA determines if it can be reinstated.[47] However, access to the database has been maintained. The Upper Salt Creek planning area contains three lakes that were monitored as part of the VLMP. The VLMP database provides Secchi disk data summarized in Table 44 below. Secchi depth is valuable information that measures water clarity.

Table 44. Secchi disk data summarization from VLMP database

Monitored Lake	Monitoring Years	Secchi Depth (in)				Avg Depth of All Sites (ft)
		Site 1 Avg	All Sites Avg	Max	Min	
Busse Lake (RGZX)	2003, 2006, 2008	26.6	19.9	96	6	7.3
Virginia Lake (SGB)	2014 - 2021	250	245	384	122	50.3
Harper Lake (WGQ)	2003, 2004, 2006	33.3	28.9	84	2	7.2

Measurements taken by VLMP volunteers took place between May and October to correspond with the growing season for aquatic plants and peak agricultural months. Figure 68 shows how the secchi depth varies according to the season. Many factors affect the water clarity in lakes and these factors are often seasonal. For example, heavier rains in the spring, longer dry periods in the summer, and crop harvesting in the fall can all affect nearby waters.

Figure 68. Virginia Lake secchi data plotted over growing season, 2019



47 https://epa.illinois.gov/topics/water-quality/monitoring/vlmp/database.html

3.5.7.4. Ambient Lake Monitoring Program

IEPA's Ambient Lake Monitoring Program (ALMP) was established in 1977 to assess trends in select publicly owned lakes. IEPA monitors approximately 50 of the state's 3,000 inland lakes[48] annually through the ALMP. In 2008, IEPA modified the sampling schedule to increase the sampling cycle to mimic the Intensive Basin Survey stream monitoring 5-year schedule. Busse Lake is the only lake in the planning area for which data has been collected within the last 10 years.

Table 45 below shows the characteristics that were monitored. Data was collected four or five times per collection season: once in the spring, two to three times in the summer, and once in the fall. Collecting the data throughout the growing season allows sampling results to be correlated to natural (i.e., rainy seasons) and human phenomena (i.e., agricultural schedules) that may occur seasonally or temporally. Building and keeping long-term data also allows for the identification and tracking of long-term trends.

Table 45. Average annual water quality characteristics for Busse Lake, Site 1, 2013 & 2018

Characteristic Name	2013	2018	Units
Alkalinity, total	141	152	mg/L
Ammonia-nitrogen	0.13	0.19	mg/L
Chloride	238	134	mg/L
Chlorophyll a, corrected for pheophytin	31.3	31.4	ug/L
Chlorophyll a, uncorrected for pheophytin	34.4	35.6	ug/L
Chlorophyll b	1.3	1.3	ug/L
Chlorophyll c	1.99	3.14	ug/L
Depth, bottom	10.0	9.8	ft
Depth, Secchi disk depth	27	27	in
Dissolved oxygen (DO)	7.44	6.09	mg/L
Dissolved oxygen saturation	83.1	69.2	%
Inorganic nitrogen (nitrate and nitrite)	-	0.161	mg/L
Kjeldahl nitrogen	0.846	0.989	mg/L
pH	8.0	7.8	
Pheophytin a	3.21	4.99	ug/L
Phosphorus	0.0427	0.0518	mg/L
Specific conductance	1093	802	umho/cm
Temperature, sample	2	4	deg C
Temperature, water	19.97	20.96	deg C
Total suspended solids	17	12	mg/L
Turbidity	17.2	-	NTU
Volatile suspended solids	8	5	mg/L

[48] Lakes are defined for IEPA purposes as 6-acres and greater in surface area.

Table 46. Secchi depth (in) by sampling site in Busse Lake

Site	2013					2018				
	May	Jun	Jul	Aug	Oct	May	Jun	Jul	Aug	Oct
1	22	48	25	22	18	23	36	24	-	25
2	23	-	25	23	28	22	21	20	-	27
3	19	13	24	24	31	16	5	18	-	22
4	22	22	13	24	22	30	42	24	-	30

Table 47. Turbidity (NTU) by sampling site in Busse Lake in 2013

Site	May	Jun	Jul	Aug	Oct
1	15.3	4.5	21.5	20.6	24.0
2	17.2	7.2	11.0	19.5	16.0
3	20.5	22.1	14.0	14.7	14.0
4	17.2	9.7	18.0	17.5	15.0

3.5.7.5. Forest Preserves of Cook County Monitoring

As part of multiple projects, FPCC has collected various data for Busse Lake. The most recent data provided includes water chemistry results from 2018 and 2021.

Table 48 - Table 50 summarizes water quality collected and provided by the FPCC as part of fisheries section surveys. Please note that the North Pool data was collected in 2021, while the South Pool and Main Pool were collected in 2018. The South Pool data was averaged across three sampling positions: deep hole, dam, and creek, while the Main Pool data was averaged across four sampling locations: main dam, north pool dam, south pool dam, and north of Higgins, pedestrian bridge.

Table 48. Water, chemical, and physical parameters collected from Busse North Pool in 2018

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	24.6	11.8	99	108	37.5	10	1.5	0.39	0.39	9.0
0.5	24.6	11.6	-	-	-	-	-	-	-	-
1	24.4	10.9	106	54	37.5	10	3	0.18	0.29	8.9
1.5	23.9	8.5	-	-	-	-	-	-	-	-
2	23.2	6.5	109	60	75	20	1.3	0.58	0.29	8.8
2.5	22.8	2.9	-	-	-	-	-	-	-	-
3	22.6	1.2	107	52	37.5	10	1.1	0.91	0.45	8.6
3.5	22.3	0.8	-	-	-	-	-	-	-	-
4	22.3	0.7	110	62	75	20	1.4	0.37	0.41	8.2

Table 49.Water, chemical, and physical parameters collected from Busse South Pool in 2018

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	23.4	6.45	112	91	100	30	1.9	0.12	0.36	8.5
0.5	23.3	6.13	-	-	-	-	-	-	-	-
1	23.2	5.79	110	93	103	30	2.1	0.09	0.3	8.6
1.5	23.0	4.91	-	-	-	-	-	-	-	-
2	22.3	3.14	113	96	120	35	1.2	0.09	0.31	8.5
2.5	21.3	2.34	113	95	100	30	1.5	0.14	0.36	7.7
3	20.3	5.13	108	93	100	30	2.5	0.57	0.31	8.4
3.5	19.7	5.51	-	-	-	-	-	-	-	-
4	19.1	5.63	107	94	120	35	1.9	0.19	0.52	7.7
4.5	18.8	0.51	-	-	-	-	-	-	-	-
5	18.2	0.38	107	98	150	45	1.5	0.58	0.81	7.7

Table 50. Water, chemical, and physical parameters collected from Busse Main Pool in 2018

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	25.1	8.44	149	118	73	23	2.3	0.30	0.45	8.7
0.5	24.7	7.95	-	-	-	-	-	-	-	-
1	24.1	6.94	133	88	90	28	2.1	0.34	0.46	9.0
1.5	23.1	4.48	160	138	80	25	2.1	0.14	0.62	8.3
2	22.1	1.55	137	94	100	30	2.7	0.25	0.55	8.7
2.5	20.8	0.37	-	-	-	-	-	-	-	-
3	20.5	0.25	137	92	150	48	2.3	0.38	0.56	8.5

Table 51 - Table 53 summarizes water quality collected and provided by the FPCC as part of another fisheries survey. Please note that these water samples were taken at shallow regions of the lake near the North end of the Main pool (south of Higgins Road) and therefore may not be the best indicator of overall water quality. This data series shows water chemistry seasonal fluctuations from spring, through fall. The data included was averaged between two sample locations, the north dam and Higgins Rd channel.

Table 51. Water, chemical, and physical parameters collected from Busse Main Pool in Spring 2021

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	17.5	-	117	682	110	35	2.4	0.21	0.61	7.6
0.5	-	-	-	-	-	-	-	-	-	-
1	17.5	-	112	726	100	30	1.6	0.29	0.56	7.6
1.5	-	-	-	-	-	-	-	-	-	-
2	17.0	-	113	699	110	32.5	1.8	0.42	0.52	7.7

Table 52. Water, chemical, and physical parameters collected from Busse Main Pool in Summer 2021

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	26.8	10.4	155	253	100	30	2.5	0.22	0.35	8.0
0.5	26.6	10.3	-	-	-	-	-	-	-	-
1	26.3	5.9	126	252	125	38	2.5	0.31	0.49	8.1
1.5	25.3	1.6	126	253	88	28	3.5	0.24	0.51	8.0

Table 53. Water, chemical, and physical parameters collected from Busse Main Pool in Fall 2021

Depth (m)	H_2O Temp (°C)	D.O. (mg/L)	Total Alk. (mg/L)	Cl^- (mg/L)	Color (APC)	Turb. (FTU)	NO_3 (mg/L)	PO_4 (mg/L)	NH_4 (mg/L)	pH
Surface	10.8	11.9	121	182	59	18	1.6	0.84	0.70	8.0
0.5	10.8	11.7	-	-	-	-	-	-	-	-
1	10.8	11.6	124	187	90	28	1.4	0.30	0.42	8.0

3.6. Land Management Practices

3.6.1. Comprehensive and Other Local Plans

There are 10 municipalities spanning two counties within the Upper Salt Creek planning area. Most of the municipalities have adopted a comprehensive plan to guide development, transportation, and conservation. The plans address natural resource and water resource concerns to varying degrees. Many plans would benefit from a more comprehensive consideration of natural resource elements, and several are dated and do not reflect current standards and practices. The following section discusses the elements of each comprehensive plan that potentially impact water quality and watershed health. Other local plans with water quality or natural resource components are also summarized below.[49]

Arlington Heights

The Village of Arlington Heights adopted its current Comprehensive Plan in 2015.[50] The Plan has outlined nine focal areas, including general planning, land use, housing and population, economic development, recreation and open space, municipal services, energy efficiency and conservation, thoroughfare and transportation, and downtown master plan.

One of the general planning goals is to preserve and enhance nature and the existing environment. This goal could have great benefits to the watershed by increasing the amount of native vegetation buffers that help filter and capture pollutants before they reach surface water. The Village is currently working on the Corridor Beautification Plan for Rand Road which aims to add vegetation along a busy uptown street.

[49] The organizational structure and qualitative analysis of these Comprehensive Plan reviews is adapted from the Lower Salt Creek Watershed-Based Plan (2017).

[50] Village of Arlington Heights Comprehensive Plan. Accessed November 17, 2021. https://vah.com/common/pages/DisplayFile.aspx?itemId=9788132

Thoroughfare and transportation goals highlight a desire to improve public transit and increase accessibility for bike traffic. These goals may lead to less pollution being added to watershed via street runoff.

Arlington Heights Park District
Adopted in 1982, and last revised in 2021, the Arlington Heights Park District Comprehensive Plan[51] primarily includes financial, recreational, community, and staffing. The plan includes stewardship goals that include promoting environmental and conservation education and protecting and managing natural resources. More specific and robust stewardship goals address reducing carbon footprints and herbicide use, expanding the use of organic fertilizers, planting and managing trees and native species communities, non-native species removal, and developing a strategic site plan for Lake Arlington.

Barrington
The Village of Barrington adopted its current Comprehensive Plan in 2021.[52] The Plan provides structure and accountability for the council. The Plan has outlined five main areas of focus including: natural resources, character, services, infrastructure, and public education, involvement, and empowerment.

There was a water study done in 2006 by Burns & McDonnel that determined additional wells should be added to accommodate for daily water demands. The opportunity for Lake Michigan water supply was also explored but was determined to not be feasible or cost effective.

To protect the Village's natural resources, many goals have been created. Most goals fall under the categories of education, outreach, and involvement of the community to allow everyone to be on a united front.

Elk Grove Village
The Elk Grove Village Comprehensive Plan was adopted in 2021.[53] The Plan consists of bulleted objectives to improve: water supply, sanitary and drainage facilities, highways and streets, railroad crossings, landscaping to prevent hazardous conditions, and location design to align with public best interests.

The Village is currently implementing their Monarch Butterfly Initiative to plant 11 gardens with native plants help fight the decline of pollinators, specifically the monarch butterfly. The project became the summer of 2021 and is ongoing.

Elk Grove Park District
The Elk Grove Park District Comprehensive Master Plan[54], last updated in 2021, prioritizes maintaining and enhancing existing parks and facilities and improving services to the community. In addition to the construction of many improvements projects, the plan recommends development of additional facility

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[51] Arlington Heights Park District Comprehensive Plan. Accessed October 10, 2022. https://www.ahpd.org/assets/1/6/2014-2023_Comprehensive_Plan.pdf
[52] Village of Barrington Comprehensive Plane. Accessed November 19, 2021. https://cms2files.revize.com/barringtonil/Departments/Development%20Services/Comprehensive%20Plan%202021/2021%20Comprehensive%20Plan.pdf
[53] Elk Grove Village, IL Code of Ordinances. Accessed November 19, 2021. https://codelibrary.amlegal.com/codes/elkgrovevillageil/latest/elkgrovevillage_il/0-0-0-6098
[54] Elk Grove Park District Comprehensive Master Plan. Accessed October 10, 2022. https://issuu.com/elkgroveparkdistrict/docs/master-plan

plans and highlights drainage evaluations and stormwater maintenance at park facilities. Acknowledgement of and a focus on coordinating with local stormwater management and watershed plans is integrated into recurring plan objectives.

Hoffman Estates

The Village of Hoffman Estates adopted their Comprehensive Plan in August 2007.[55] The Plan was established to guide future growth over the following two decades. The Village has 11 key initiatives outlining the plan: maintain strong and healthy neighborhoods, maintain a high quality of life, enhance and update the retail environment, ensure quality housing is accessible, provide transit alternatives, provide additional civic space, preserve Village history, encourage new mixed-use development, support community resource centers, maintain a strong office market, and ensure environmental sustainability.

The Village has outlined goals within their transportation sector to emphasize the importance of quality public transit to not only benefit the population but also the environment. Efficient, clean public transit is the goal which results in cleaner roads and less pollution finding its way into the air and water.

Hoffman Estates Park District

The Comprehensive Master Plan[56], including the Strategic Plan[57] guide the District from 2020 through 2024. Following a Needs Assessment Survey, the Comprehensive Plan, the plan was developed to focusing on patrons, facilities, financial responsibility, the park experience, and the environment. The Strategic Plan component includes priorities to maintain shorelines and ponds to decrease pollutants and improve water quality. Further pertinent goals and objectives include rainwater cistern implementation, expanded tree inventories, shifting mowing practices at detention facilities, naturalizing low-lying areas, and an emphasis on sustainable, low maintenance landscapes.

Inverness

The Village of Inverness adopted their Comprehensive Plan in 1981.[58] The Plan outlines four areas of focus to improve the city and guide future development: subdivision regulations, flood and stormwater management regulations, health and sanitation regulations, and the official map of the Village and area immediately surrounding.

Itasca

The Village of Itasca adopted their Comprehensive Plan in 2015.[59] The Plan dedicates four chapters to subcategories within the village: land use, transportation, community facilities, and parks and open space.

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[55] Village of Hoffman Estates Comprehensive Plan. Accessed November 19,2021.
https://www.hoffmanestates.org/home/showpublisheddocument/23914/637411188616870000

[56] Hoffman Estates Park District Comprehensive Master Plan. Accessed October 10, 2022.
https://www.heparks.org/wp-content/uploads/2019/10/HEParks-CMP-2019.pdf

[57] Hoffman Estates Park District Strategic Plan. Accessed October 10, 2022.
https://www.heparks.org/wp-content/uploads/2022/03/Strategic-Plan-2020-2024.pdf

[58] Inverness, IL Code of Ordinances. Accessed November 19, 2021.
https://codelibrary.amlegal.com/codes/invernessil/latest/inverness_il/0-0-0-4702#JD_6-1-1

[59] Village of Itasca Comprehensive Plan. Accessed November 19, 2021.
http://itasca.com/DocumentCenter/View/6478/Comprehensive-Plan-Adopted-7-7-15?bidId=

Each chapter describes the importance of each category and the goals and policies set to reach improvement goals.

Starting November 2021, in an ongoing effort to improve the stormwater drainage throughout the community, the Village will be installing storm sewers in the area between North Street and Orchard Street and between Maple Ave. and Linden Street. There will be two main storm sewers that will be installed. One main line will run along Elm Street from North Street to Orchard Street. The second main line will run along Center Street from Maple Avenue to Walnut Street, continuing south on Walnut Street and east along Orchard Street. This project will also include replacement of 80+ year old watermain along the streets that are to be reconstructed. Improving storm water systems will help protect natural areas from flooding and erosion.

Palatine

The Village of Palatine adopted their Comprehensive Plan in December 2011.[60] The Plan includes five chapters dedicated to the following subcategories: land use and community identity, transportation, economic development, community resources, and environmental stewardship. Each chapter lays out goals, policies, and strategies to improve the village.

In the environmental stewardship chapter, a nonspecific goal is outlined that is a great benefit to the watershed. The Village aims to improve the city with trees and landscaping whenever possible. Native plants and trees are excellent buffers to pollution entering the watershed. They also maintain stormwater ordinances adopted by MWRD to protect the community from flooding.

Palatine Park District

The Palatine Park District Comprehensive Plan[61] was developed in 2015 to assess current conditions, identify needs, and establish actionable goals. An assessment of the natural resources was part of the inventory process, including identification of watershed community, floodplain, and wetland resources. A prioritization strategy objective of particular pertinence to this plan is to improve natural areas and creek frontage by establishing a natural areas management plan.

Rolling Meadows

The City of Rolling Meadows adopted their Comprehensive Plan in April 2019.[62] The plan details three section with goals for improvement: community engagement, transportation, and environment and infrastructure.

The City has an objective to preserve and enhance Salt Creek as an amenity for all. They currently do not have any projects dedicated to this but maintain their stormwater systems to help manage the water draining to it.

[60] Village of Palatine Comprehensive Plan. Accessed November 22, 2021. https://www.palatine.il.us/DocumentCenter/View/1303/Final-Comprehensive-Plan-PDF

[61] Palatine Park District Comprehensive Plan. Accessed October 10, 2022. https://www.palatineparks.org/rccms/comprehensiveplan/

[62] City of Rolling Meadows Comprehensive Plan. Accessed November 22, 2021. https://www.cityrm.org/DocumentCenter/View/2871/RollingMeadows_ComprehensivePlan_2018

Rolling Meadows Park District

The 2019 Rolling Meadows Park District Comprehensive Master Plan[63] includes a section describing Natural Resource Areas and highlights one holding as such. Natural areas components were also assessed at the properties, including plant diversity, as included in the landscaping assessment. Site improvement recommendations include modified mowing practices, introduction of native species, and naturalizing areas in riparian areas. Sustainability components, including water usage, tree cover, stormwater detention and infiltration, impervious surfaces, and habitat are recommended.

Roselle Park District

The 2018-2021 Strategic Plan for the Roselle Park District[64] primarily focuses on organizational planning. Sustainability, in the form of environmental stewardship is recognized as one of the District's 6 key values.

Schaumburg

The Village of Schaumburg adopted their Comprehensive Plan in March 2018.[65] The Plan includes a vision for what the Village should be working towards, and it is structured by goals in five areas of focus: employment and commercial areas, housing and residential areas, community facilities, multi-mobility, and recreation and tourism.

The Plan places a high priority on improving green spaces and bicycle infrastructure. The Village wants to connect native spaces via sidewalk and bicycle lanes whenever possible to allow for greater access and less dependence on vehicular travel.

Schaumburg Park District

The Comprehensive Master Plan for the Schaumburg Park District[66] primarily focuses on programming and facilities. Low-maintenance facilities are identified and are largely comprised on low- and no- mow naturalized areas, including parks and detention facilities. Many sites include natural areas improvement recommendations, including non-native species management and installation of native species, and also highlights the impacts of climate change on hydrology and ecology.

Cook County[67]

In January 2020, Cook County released Planning for Progress: Cook County's Consolidated Plan and Comprehensive Economic Development Strategy, 2020-2024.[68] The Plan is the County's strategic plan to

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[63] Rolling Meadows Park District Comprehensive Master Plan. Accessed October 10, 2022. https://rmparks.org/upload/2020MasterPlanFN.pdf

[64] Roselle Park District Strategic Plan. Accessed October 10, 2022. https://assets.website-files.com/5d7017028fe3982d9fa1ebf5/5dbc8cbe8c248cb8dded7a02_RPD_StrategicReport_20182021_final.pdf

[65] Village of Schaumburg Comprehensive Plan. Accessed November 22, 2021. https://www.villageofschaumburg.com/home/showpublisheddocument/208/637173072419500000

[66] Schaumburg Park District Comprehensive Master Plan. Accessed October 10, 2022. https://issuu.com/schaumburgparkdistrict/docs/final_cmp_2017___bkmarks___hyperlin

[67] With overlapping counties, the remaining paragraphs have been duplicated from the Lower Salt Creek Watershed-Based Plan and updated where appropriate.

[68] Planning for Progress: Cook County's Consolidated Plan and Comprehensive Economic Development Strategy. Accessed March 2022. http://www.cmap.illinois.gov/documents/10180/113208/FY150058+PLANNING+FOR+PROGRESS+PLAN+013015.p-df/db94bec0-4cab-42ca-ab91-3600d80ab7a7

marshal existing funds, gather resources, and facilitate partnerships to meet future housing, community, and economic development needs. The Plan largely focuses on infrastructure, business, housing development, transportation, and services.

Furthermore, the County adopted a Hazard Mitigation Plan[69] in 2014 and updated in 2019, which addresses flooding. According to the Plan, a hazard flooding event is likely to occur within 25 years, impacting people, property, and the economy. The Plan contains a detailed list of mitigation measures that fall into four categories: manipulating the hazard, reducing exposure, reducing vulnerability, and increasing response capability. Manipulating the hazard includes implementing structural flood controls (e.g., levees) and low-impact development. Reducing exposure involves locating critical facilities outside the hazard area and maintaining or acquiring open space. Reducing vulnerability involves improvements in infrastructure. Lastly, increasing response capability includes producing better hazard maps, developing a public information strategy, and enforcing the National Flood Insurance Program.

Metropolitan Water Reclamation District of Greater Chicago

MWRD first adopted in 2007 and amended in 2014 a countywide Stormwater Management Plan[70] which provides the framework for a consolidated county stormwater management program and presents the management plan. Watershed Planning Councils (WPCs) were established for each of the major watersheds in the county, including Upper Salt Creek, as addressed in this watershed-based plan. The WPCs provided input to the Detailed Watershed Plans (DWPs) that were developed for each major watershed and to the countywide Watershed Management Ordinance (described elsewhere in this plan). The DWPs identify numerous stormwater improvement projects intended to address regional problem areas along waterways (included in sections addressing BMPs elsewhere in this plan).

Forest Preserves of Cook County

FPCC has a Natural and Cultural Resources Master Plan,[71] adopted in 2014, which details the elements, threats, and future goals for preserving the County's designated forest preserves. The FPCC aims to maintain and restore the health of the County's waterways by working with various organizations (e.g., MWRD, Openlands, and Friends of the Chicago River) and creating opportunities for volunteer cleanups. In addition, the FPCC supports the Green Infrastructure Vision of a healthy, connected network of natural areas, which provide clean air, clean water, flood control, and recreation. Furthermore, the Plan recognizes the need to address water quality issues from stormwater runoff to protect habitats. Stormwater runoff is one of the primary issues facing the Forest Preserves of Cook County and it is a major source of water pollution. Dam removal and erosion control measures are recognized as two methods to improve water quality. Preserving open, natural areas will also help to improve water quality by absorbing excess flood water.

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[69] Cook County Hazard Mitigation Plan. Accessed November 22, 2021. https://www.cookcountyemergencymanagement.org/hazard-mitigation-plan

[70] Cook County Stormwater Management Plan. Accessed December 2021. https://mwrd.org/stormwater-management

[71] Cook County Forest Preserves Natural and Cultural Resources Master Plan. Accessed November 2021. https://fpdcc.com/about/plans-projects/natural-and-cultural-resources-master-plan/

DuPage County

DuPage County adopted a Land Use Plan in 1990.[72] Its focus is on development, and it contains various draft plan maps for clusters, along with data tables with details of each site within these clusters. The Plan does contain a land use map depicting open space and it also contains a policy calling for the protection of environmentally sensitive areas (including floodplains and wetlands), but it does not contain a separate parks and open space or natural resources section.

DuPage County's Stormwater Management Plan, 120 adopted in 1989, sets minimum countywide standards for floodplain and stormwater management. The Plan has six guiding principles, including:

1. Reduce the existing potential for stormwater damage to public health, safety, life and property.
2. Control future increases in stormwater damage within DuPage County and in areas of adjacent counties affected by DuPage County drainage.
3. Protect and enhance the quality, quantity and availability of surface and groundwater resources.
4. Preserve and enhance existing aquatic and riparian environments and encourage restoration of degraded areas.
5. Control sediment and erosion in and from drainage ways, developments, and construction sites.
6. Promote equitable, acceptable, and legal measures for stormwater management.

In addition, the County adopted a Stormwater and Flood Plain Ordinance in 2013 and updated May 2019.[73] Ordinance information can be found in Sections 3.6.2 and 3.7.2.1.

In 2001, the County developed the Salt Creek Greenway Master Plan.[74] The Salt Creek Greenway Trail is a regional pedestrian/bicycle trail nearly 25 miles long that runs parallel to the Creek. It passes through the communities of Elk Grove Village, Itasca, Wood Dale, Villa Park, Oakbrook Terrace, Oak Brook, La Grange Park, Westchester, North Riverside, Brookfield, Riverside, Lyons, and Hinsdale. It also passes through portions of unincorporated Addison and York Townships. The Greenway was intended to improve connectivity between municipalities as well as protect the lands surrounding Salt Creek from development.

Furthermore, in 2006, DuPage County adopted an Environmental Policy to provide guidelines for improving environmental quality. The Policy provides recommendations for air quality, land management and uses, water quality, and energy use. The County's Environmental Commission is tasked with periodically reviewing the County's sustainability efforts andidentifying new areas for consideration.

DuPage County Forest Preserve District

The DuPage County Forest Preserve District has a Master Plan(2019),[75] that details several park improvements. The Plan identifies priorities over the next five years to: protect and restore natural resources; provide and improve nature experiences and outdoor recreation; maintain and improve trails;

[72] DuPage County Land Use Plan. Accessed November 2021. https://www.dupageco.org/EDP/Regional_Planning/56642/
[73] DuPage County Countywide Stormwater & Floodplain Ordinance. Accessed November 2021. https://www.dupageco.org/EDP/Stormwater_Management/Docs/60593/
[74] https://www.dupageco.org/EDP/Bikeways_and_Trails/29856/
[75] Forest Preserve District of DuPage County 2019 Master Plan. Accessed November 2021. https://www.dupageforest.org/hubfs/About/Documents/Mission-Vision/2019-12-17-Master-Plan-final.pdf

and invest in existing mission-aligned facilities. The District also has a Strategic Plan (2014),[76] but it focuses on the organization and operations of the District rather than natural resource elements and preservation.

Greenest Region Compact (GRC)

The Greenest Region Compact (GRC1), launched in 2007 by the Metropolitan Mayors Caucus, introduced coordinated municipal sustainability efforts to the region. The Greenest Region Compact 2 (GRC2) and associated resource document, the GRC Framework, were launched in 2016 as an update to the original Compact. Together the Compact and Framework serve as a comprehensive sustainability guide to coordinate community efforts across the region.[77] The goals pertain to climate, economic development, energy, land, leadership, mobility, municipal operations, sustainable communities, waste and recycling, and water. The detailed Framework provides possible objectives and strategies from which a municipality can create a plan tailored to its needs. Several communities within the Upper Salt Creek planning area have taken the additional step of formally adopting the GRC1 and/or GRC2 through resolution (Table 54).

Table 54. Municipalities within the Upper Salt Creek planning area that have adopted the Greenest Region Compact

GRC1 Adopters	GRC2 Adopters	
Itasca	Arlington Heights	Palatine
	Barrington	Rolling Meadows
	Hoffman Estates	Schaumburg

3.6.2. Local Ordinances

Communities and counties can establish regulations through their ordinances and codes to support their developmental vision for the community. In addition to zoning ordinances, which can guide building development, jurisdictions can also develop language to guide wetland protection, floodplain impacts, stormwater management, and transportation infrastructure. These tools not only aid in working towards a vision but can simultaneously protect our natural resources.

In the sections below, local ordinances will be examined from the frame of stormwater management, drainage, soil erosion and sediment control, floodplain impacts, and wetland and buffer protections. These assessments will also include pertinent excerpts that address natural areas, design, landscaping, and other conservation measures.

Lake County

Located in both Lake and Cook Counties, the Village of Barrington has adopted the Lake County Watershed Development Ordinance (WDO)[78]. Barrington is a certified community, which means the Village is responsible for administering and enforcing the WDO throughout its jurisdiction.

According to the Lake County Stormwater Management Commission, “the goal of the Lake County WDO is to ensure that new development does not increase existing stormwater problems or create new ones.

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[76] Forest Preserve District of DuPage County Strategic Plan 2014. Accessed November 2021. https://cdn2.hubspot.net/hubfs/2920355/About/Documents/Mission-Vision/Strategic-Plan-2014.pdf

[77] http://mayorscaucus.org/initiatives/environment/rec/

[78] https://www.lakecountyil.gov/DocumentCenter/View/3445/Lake-County-Watershed-Development-Ordinance-October-13-2020-PDF?bidId=

The WDO establishes minimum countywide standards for stormwater management, including floodplains, detention, soil erosion/sediment control, water quality treatment, and wetlands."

Cook County

For unincorporated Cook County areas, the Cook County Building and Zoning Department administers the Cook County Code of Ordinances[79]. Sections particularly relevant to water resources protection include:

- Chapter 106 regulates Floodplains to protect existing and new development and human life from increased flood and drainage damage and hazards. This chapter also ensures Federally subsidized flood insurance is available and undue burden is not placed on the taxpayers for flood control projects, repairs, and flood rescue and relief operations. Preservation of natural waterway systems and their ability to mitigate flooding, improve water quality, provide habitat and recreation, and enhance the community is also recognized as part of this section.
- Chapter 118 regulates Stormwater resources, including storm sewer network connections, acceptable subsoil drainage pipe materials, sizing, and structures, and levels of service. Soil erosion and sediment control standards and flood damage prevention (including floodway and floodplain use regulation, stormwater storage, and conveyance) are also included in this section.
- Chapter 122, Subdivision Control, governs the layout of streets, highways and stormwater features on any piece or parcel of land in unincorporated areas.
- Chapter 126, Tree Preservation, Landscaping, and Screening, which is intended to preserve trees, limit tree removal, and develop tree replacement ratios to preserve ecology and aesthetics. Also included in this section are requirements that preserve indigenous regional vegetation and existing landscape buffers.

Unincorporated Cook County soil erosion and sediment control plan reviews and inspections are completed either by Will-South Cook Soil and Water Conversation District or the North Cook County Soil & Water Conservation District. These agencies work to ensure appropriate soil erosion and sediment control measures are prescribed in development plans, implemented, and maintained until the construction site is re-vegetated and permanently stabilized. The Illinois Urban Manual is used by both organizations as a standard for these practices.

Metropolitan Water Reclamation District of Greater Chicago

The Watershed Management Ordinance (WMO) [80] was first adopted in 2013 and was last amended in 2020. As included verbatim in the WMO, the purpose of these regulations are to:

1. Protecting the public health, safety, and welfare, and reducing the potential for loss of property due to flood damage;
2. Managing and mitigating the effects of urbanization on stormwater drainage throughout Cook County;
3. Protecting existing and new development by minimizing the increase of stormwater runoff volume beyond that experienced under existing conditions and by reducing peak stormwater flows;

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[79] https://library.municode.com/il/cook_county/codes/code_of_ordinances?nodeId=13805

[80] https://mwrd.org/sites/default/files/documents/WMO_050720.pdf

4. Promoting responsible land use practices in Cook County, particularly within floodplains and floodways;
5. Protecting existing water resources, including lakes, streams, floodplains, wetlands, and groundwater from detrimental and unnecessary modification in order to maintain their beneficial functions;
6. Reducing or mitigating the environmentally detrimental effects of existing and future runoff in order to improve and maintain water quality;
7. Preserving and enhancing existing riparian environments;
8. Controlling erosion and the discharge of sediment from all sources including, but not limited to, stormwater facilities, waterways, developments, and construction sites;
9. Requiring appropriate and adequate provisions for site runoff control;
10. Requiring consistency in stormwater management activities within and among the units of government having stormwater management jurisdiction;
11. Ensuring future development in the floodplain does not adversely affect floodplain environments or increase the potential for flood damage;
12. Requiring regular, planned maintenance of stormwater management facilities;
13. Encouraging control of stormwater quantity and quality at the most site-specific or local level;
14. Establishing uniform and minimum countywide stormwater management regulations while recognizing and coordinating with stormwater programs effectively operating within Cook County;
15. Requiring strict compliance with and enforcement of this Ordinance;
16. Meeting the floodway permitting requirements of the Illinois Department of Natural Resources, Office of Water Resources, delineated in the Rivers, Lakes, and Streams Act (615 ILCS 5/18g);
17. Meeting or exceeding the rules and regulations of the National Flood Insurance Program (NFIP) for development;
18. Protecting the ability of the District's sewerage systems, intercepting sewers, TARP structures, sewage disposal and treatment plants, works and facilities to perform the functions for which they were designed;
19. Controlling the nature, volume, and manner of discharge into the District's sewerage systems, intercepting sewers, TARP structures, sewage disposal and treatment plants, works, and facilities;
20. Maintaining stable operation of the District's sewerage systems, intercepting sewers, TARP structures, sewage disposal and treatment plants, works, and facilities;
21. Reducing infiltration and inflow into the District's sewerage systems, intercepting sewers, TARP structures, sewage disposal and treatment plants, works, and facilities; and
22. Protecting waters within Cook County so as to preserve the public health.

Arlington Heights, Palatine, and Rolling Meadows are located completely within MWRD jurisdictional boundaries, while Elk Grove Village, Hoffman Estates, Inverness, and Schaumburg are partially located within MWRD jurisdictional boundaries. All these communities have adopted the WMO, however none are authorized municipalities, and therefore do not administer and enforce the regulations. These communities also have municipal ordinances to regulate other facets of development, but the WMO is by far the most impactful to the study area.

DuPage County[81]

DuPage County's ordinances, codes, and standards within their Countywide Stormwater and Flood Plain Ordinance[82], BMP Manual[83], Building Code[84], Zoning Ordinance and Subdivision Regulations[85], Water Supply and Distribution and Wastewater Treatment Ordinance[86], and Health Codes[87] address a broad range of water quality and hydrologic topics.

The principal purpose of the Stormwater and Flood Plain Ordinance is to promote effective, equitable, acceptable, and legal stormwater management measures. Other purposes of the Ordinance include preventing the further degradation of the quality of ground and surface waters, requiring appropriate and adequate provision for site runoff control, especially when the land is developed for human activity, requiring the design and evaluation of each site runoff control plan consistent with watershed capacities, and encouraging the use of stormwater storage in preference to stormwater conveyance. The Ordinance imposes some restrictions on floodplain development, addresses a range of important soil erosion and sediment control issues, incorporates riparian mitigation into wetland buffer requirements, amends the thresholds for post construction best management practices (PCBMPs) to correlate directly with changes in impervious area, and includes volume control BMP requirements on development sites to promote runoff reduction, groundwater recharge, water quality.

The Zoning Ordinance stands out in its parking codes, allowing flexibility and requiring numerous beneficial standards that reduce impervious cover.

In regard to the DuPage County Ordinance, DuPage communities may be granted full or partial waiver status[88] to administer and enforce the DuPage County Ordinance in their municipality. Itasca, the only DuPage County municipality in the planning area, has been granted partial waiver status, which means they have only adopted certain portions of the DuPage Countywide Stormwater and Flood Plain Ordinance.

According to DuPage County, "For partial waiver communities, only floodplain, floodway, wetlands and buffers in the project are reviewed by DuPage County, unless otherwise requested by the community. All other stormwater requirements of the Ordinance are enforced by the stormwater administrator of the partial waiver community."

3.6.3. Conservation Easement Programs

Conservation easements are effective tools to preserve natural or restored areas and protect them from development in perpetuity. Conservation easements can be placed on all or part of any public or private property to preserve scenic, natural, or historical value or to require certain management practices, as

[81] With overlapping counties and no major changes to regulations since publication, this section has been adapted from the Lower Salt Creek Watershed-Based Plan and updated where appropriate.

[82] https://www.dupagecounty.gov/EDP/Stormwater_Management/Regulatory_Services/1420/

[83] https://www.dupagecounty.gov/EDP/Stormwater_Management/Water_Quality/1424/

[84] https://www.dupagecounty.gov/EDP/Building_Permitting/9652/

[85] https://www.dupagecounty.gov/zoning/

[86] https://www.dupagecounty.gov/Public_Works/1384/

[87] https://library.municode.com/il/dupage_county/codes/code_of_ordinances?nodeId=CH18HE

[88] https://www.dupagecounty.gov/EDP/Stormwater_Management/Stormwater_Regulatory_Services/57625/

are sometimes used in the case of agricultural lands. The easements are permanent but allow the owner to keep the land to sell in the future or pass to heirs.

There are significant tax implications that make easements desirable. Property, estate, and income tax can all see reductions from easements. These tax reductions help lessen the burden of maintain undeveloped land.

Many organizations exist that landowners in the planning area can work with to establish conservation easements. Currently, there are two properties in the planning area with easements held by the Illinois Nature Preserves Commission.

Data from the National Conservation Easement Database indicates that there are 448-acres of land preserved through conservation easements in the planning area. Busse Forest (FPCC) comprises the majority, with 446-acres, and is open to the public. The remaining 2-acres are located at Palatine Prairie Nature Preserve (Palatine Park District) and is also open to the public.

3.6.4. Road Maintenance Jurisdictions

While public roads are an essential component of the built environment, a significant amount of polluted stormwater runs off these surfaces and is conveyed along transportation corridors, either through underground stormwater conveyances or roadside ditches into rivers and streams. The vehicles that travel these roads are one source of pollutants (e.g., petroleum products, tire dust, heavy metals, etc.), as are winter deicing materials, most notably chlorides in road salt. Higher traffic volumes generally increase the amount of pollutant generated from public roads and increases the likelihood of more intense winter maintenance activities (e.g., plowing and salting). A particular concern to surface waters and roadside vegetation is chlorides in road salt, due to its adverse impacts on aquatic organisms and both terrestrial and aquatic plant community composition.

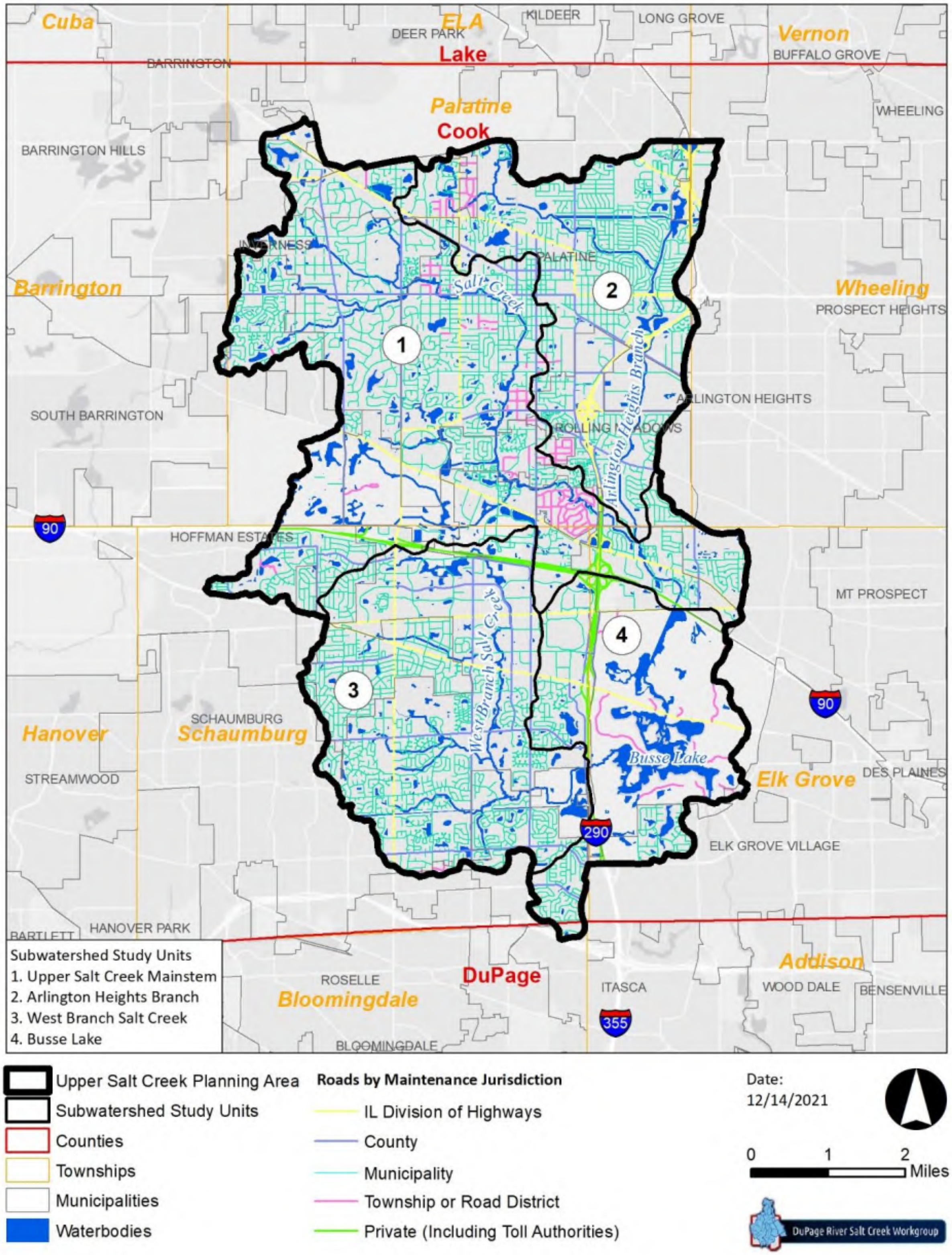
There are approximately 1,548 lane miles (615 road miles) within the Upper Salt Creek planning area (Table 55, Figure 69. Roads by maintenance jurisdiction in the Upper Salt Creek planning area). The traffic volumes of these roadways vary, as does the maintenance and pollutant loads generated. In addition to these public roadways, many other public and private entities maintain a vast network of roads, parking lots, sidewalks, and driveways.

Table 55. Lane miles by road maintenance jurisdiction in the Upper Salt Creek planning area

Subwatershed Study Unit	IL Div. of Highways	County	Municipal	Private (incl. Toll Authority)	Twp. Or Road Dist.	Totals
Salt Creek Mainstem	117.8	48.7	342.1	20.1	34.1	562.9
Arlington Heights Branch	74.5	66.5	220.3	0.3	9.4	371.0
West Branch Salt Creek	127.3	98.1	214.1	7.3	1.5	448.4
Busse Lake	25.2	27.4	58.5	43.8	11.0	165.9
Total	*344.9*	*240.8*	*835.0*	*71.5*	*56.0*	*1,548.2*

Typical roadway maintenance activities include street sweeping and catch basin cleaning, road surface maintenance, underground stormwater infrastructure repair, surface drainage (ditch) maintenance, roadside grass and weed control, and litter and roadkill removal. These maintenance activities can help reduce and control the quantity of pollutants, such as sediment and associated metals and nutrients, which are carried with stormwater into the watershed. Routine street sweeping and catch basin cleaning are particularly important maintenance activities that remove pollutants that accumulate on public roads and in the stormwater conveyance systems before reaching nearby surface waters. Naturalized right-of-way sections can also protect watershed by creating a buffer for pollutants.

Figure 69. Roads by maintenance jurisdiction in the Upper Salt Creek planning area



3.6.5. Community Water Supply Wells, Setbacks, and Groundwater Restricted Use Areas

Municipalities or counties served by community water systems (CWS) are subject to the Illinois Groundwater Protection Act (IGPA; P.A. 85-0863)[89]. Currently, 5 of the municipalities within the Upper Salt Creek planning area have CWS wells. Collectively, there are 29 CWS wells. Two of these are in unincorporated areas. The municipality with the most wells is Schaumburg, with 9. It is important to note that Barrington sources their water from wells, but they are located outside of the planning area[90]. Inverness utilizes groundwater from private wells, therefore does not have any CWS wells. The distribution of wells in the planning area are represented in Table 56 and Figure 70.

The planning area has inventoried 29 CWS wells, but of those 29 wells, 10 have been abandoned and 6 are inactive. The 13 active wells are not regular sources of drinking water for the surrounding communities, but remain maintained for emergency use if Lake Michigan water supply is interrupted.

The IGPA requires that a minimum setback zone be established around all CWS wells to minimize aquifer contamination potential by restricting certain land-use activities. The setback zone is set depending on the sensitivity of the aquifer to possible contamination, either a minimum of a 200-foot radius for wells finished within a confined aquifer or a 400-foot radius for wells finished within an unconfined aquifer[91].

Table 56. Number of community water supply wells in the Upper Salt Creek planning area

Municipality	# CWS Wells	# of Aquifer Wells With No Setback	# of Confined Aquifer Wells (200 ft. Setback)	# of Unconfined Aquifer Wells (400 ft. Setback)
Arlington Heights	2	0	2	0
Hoffman Estates	6	3	3	0
Palatine	7	0	5	2
Rolling Meadows	3	0	3	0
Schaumburg	9	7	2	0
Unincorporated	2	0	2	0
Total	*29*	*10*	*17*	*2*

Under 35 Ill. Adm. Code 742, municipalities have enacted groundwater ordinances to restrict the use of establishing new potable water supply wells that reach IEPA's review. Groundwater restricted use boundaries also specify where new CWS wells are prohibited by local ordinance(s) because of the possible presence of groundwater contamination. However, it is possible that private potable water supply wells established prior to the ordinance adoption may still be operating in these areas. The groundwater restriction ordinances are shown in Figure 70 below.

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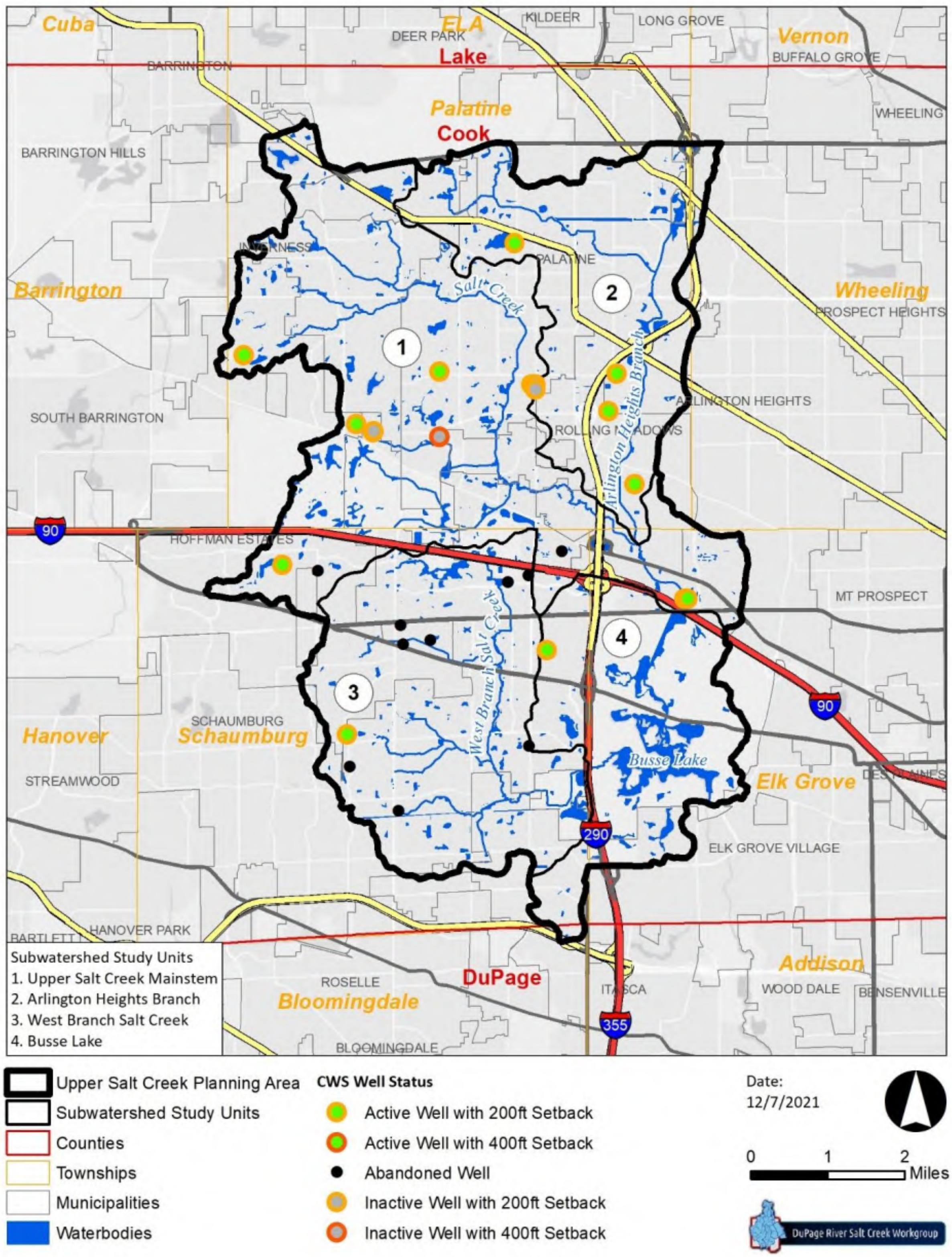
[89] Illinois General Assembly, Illinois Groundwater Protection Act (IGPA; P.A. 85-0863), http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1595&ChapterID=36, (accessed November 16, 2021)
[90] Village of Barrington 2017 Water Report. https://www.barrington-il.gov/Departments/Public%20Works/WaterReport2017.pdf. (Accessed November 16, 2021)
[91] IEPA. "Maximum Setback Zones" https://www2.illinois.gov/epa/topics/water-quality/groundwater/Pages/maximum-setback-zones.aspx (accessed November 16, 2021)

Figure 70. Community water supply wells and groundwater restricted use areas in the Upper Salt Creek planning area



3.7. Pollutant Sources

3.7.1. Nonpoint Sources

One of the primary goals of developing this watershed plan is to address designated-use impairments within the planning area. In addition, protection of good water quality and designated-use attainment where present is a crucial component of this effort. Section 3.5.7. *Surface Water Quality*, compiles specific water quality and condition assessment information for streams and lakes in the planning area, as assessed by IEPA and published in the 2020/2018 Integrated Report (303d List), as well as a summary of DRSCW stream studies, and other collective water quality monitoring.

In addition to the known causes and sources of impairments identified in the 2020/2022 Integrated Report (Table 57), there are numerous other potential causes of impairment and sources of pollution impacting water resources in the Upper Salt Creek planning area. Recommendations made to mitigate and protect water quality from nonpoint source pollution will both yield local benefits and help improve water quality in Salt Creek, its tributaries, local lakes, and the receiving waterways downstream.

Table 57. Known and potential causes and sources of water pollution in the Upper Salt Creek planning area

Known Causes of Impairment	
Streams	**Lakes**
• Algae • Chloride • DO • Flow Regime Modification • Total Phosphorus • Mercury • PCBs • Fecal Coliform	• Total Phosphorus • Total Suspended Solids • Mercury • PCBs • Fecal Coliform

3.7.1.1. Nonpoint Source Pollutant Load Modeling

A critical step in providing water quality recommendations within this plan is the identification of different nonpoint pollutant sources and the relative magnitude of contributing pollutant loads from those sources.

For nonpoint source pollution, an effective method to estimate pollutant loads at the watershed scale is to use variable watershed characteristics that can affect pollutant load contributions, such as land use, soils, etc. The USEPA's planning level tool, Spreadsheet Tool to Estimate Pollutant Loads (STEPL), was used to develop existing conditions nonpoint source pollutant load estimates for total nitrogen, total phosphorus, biological oxygen demand (BOD), and sediment within the planning area at a planning-level scale.

The primary STEPL model data input is land use information. The land use data used in this watershed analysis was based on CMAP's 2015 land use data. For this model, the standard land use categories include urban, cropland, pasture, and forest. STEPL allows for a detailed breakdown of the broader urban land use category into the following categories: commercial, industrial, institutional, transportation, mutifamily residential, single-family urban-cultivated, vacant, and open space. Land use data was sorted into these refined urban categories to develop a more refined pollutant load estimate of the urban areas.

To refine the pollutant load estimates for the planning area, the pollutant load estimates were developed at the subwatershed study unit level. Analyzing pollutant loads at this level yields relative contribution approximations within the planning area. Managers and planners can utilize this information to better evaluate priority study units and inform recommend improvements.

The existing conditions nonpoint source pollutant load estimates for nitrogen, phosphorus, BOD, and sediment are shown in Table 58, Figure 71, and Figure 72. Visual representations of the pollutant load estimates on a study unit basis are also illustrated in Figure 73 - Figure 76. The pollutant load estimates are also presented by pollutant type and land use in Table 59 - Table 62 at the end of this section. Considerations regarding the use, limitations, and capabilities of this model include:

- STEPL does not account for drain tile contributions of pollutants.
- Pollutants from construction sites were not included in the analysis. Pollutant loads from construction sites can be highly variable and should be analyzed on a site-by-site basis and should be addressed through IEPA's NPDES program for construction activities.
- STEPL is not an in-stream response model and only estimates watershed pollutant loading based on coarse data, such as event mean concentrations.
- This model is not calibrated.

Table 58. Land use-based nonpoint source (NPS) pollutant load estimates by subwatershed planning unit in the Upper Salt Creek planning area

Subwatershed Planning Unit	Nitrogen Load		Phosphorus Load		BOD Load		Sediment Load	
	lb/yr	lb/ac/yr	lb/yr	lb/ac/yr	lb/yr	lb/ac/yr	t/yr	t/ac/yr
Upper Salt Creek Mainstem	83,564	6.7	13,672	1.1	312,612	25.2	1,960	0.2
Arlington Heights Branch	50,733	7.7	8,120	1.2	190,455	29.0	1,177	0.2
West Branch Salt Creek	54,999	7.3	8,706	1.1	201,421	26.6	1,286	0.2
Busse Lake	19,059	3.7	3,136	0.6	69,147	13.5	450	0.1
Total	*208,355*	*25.4*	*33,635*	*4.1*	*773,635*	*94.2*	*4,873*	*0.6*

Figure 71. Average annual total nitrogen (N), total phosphorus (P), and biological oxygen demand (BOD) load (pounds/year) by subwatershed planning unit

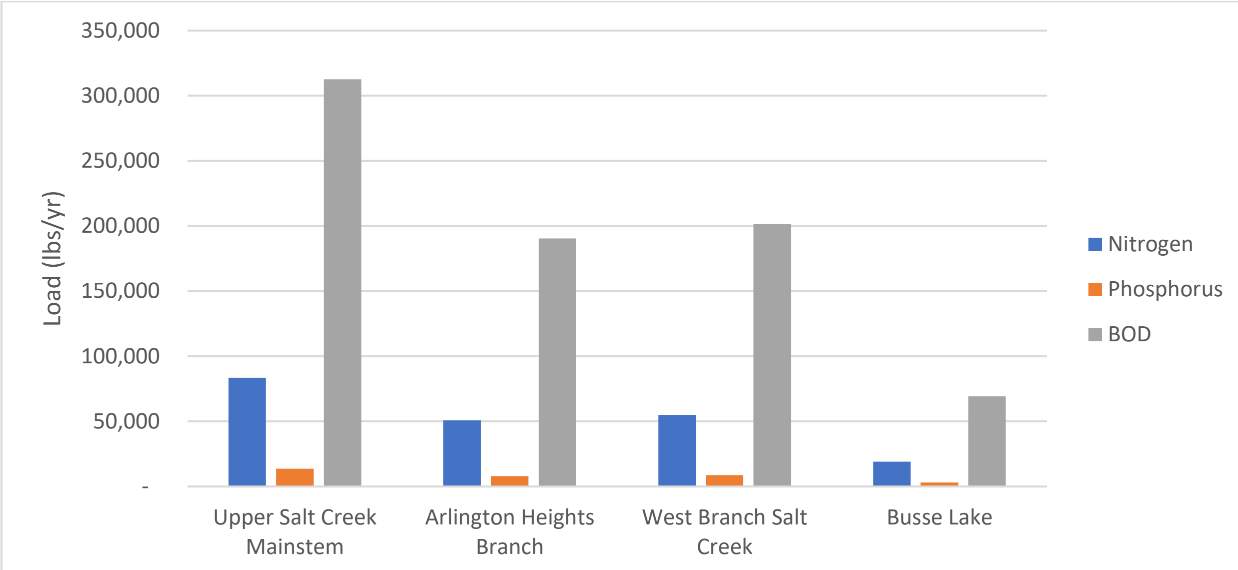


Figure 72. Average annual sediment load (tons/year) by subwatershed planning unit

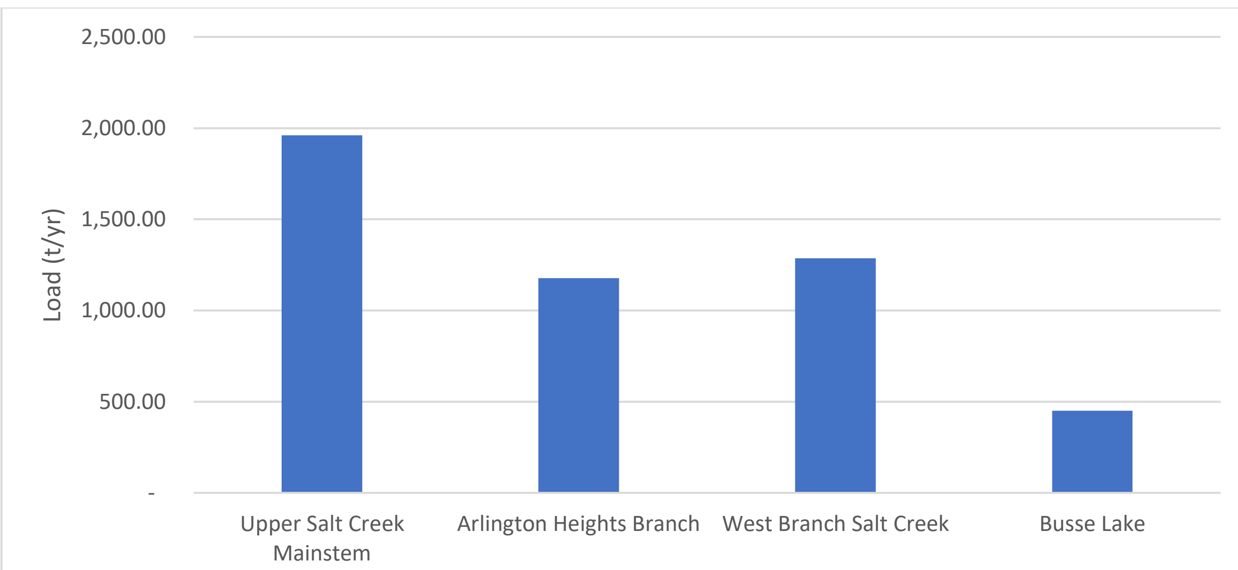


Figure 73. Average annual total nitrogen (TN) loading rate by Upper Salt Creek subwatershed planning area

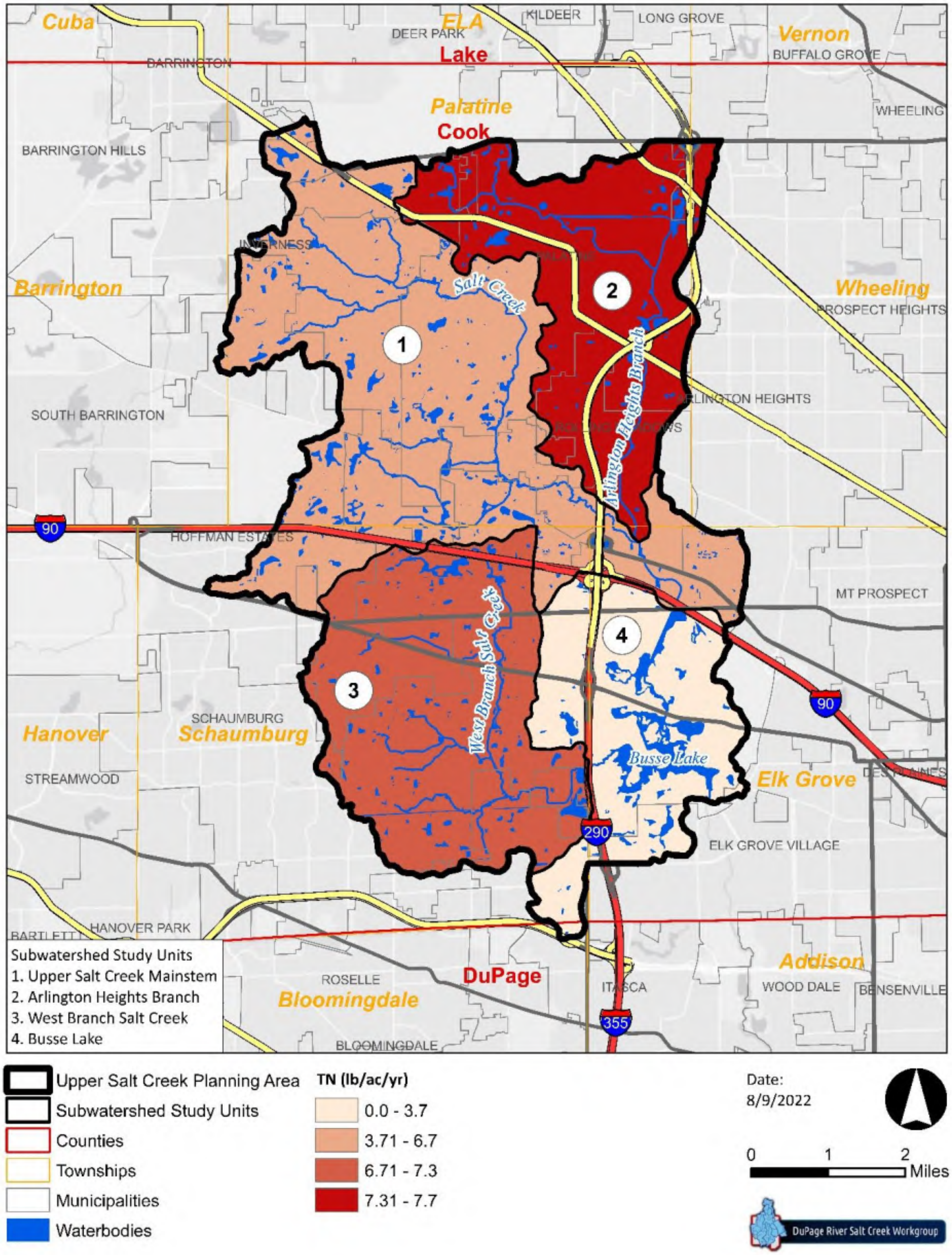


Figure 74. Average annual total phosphorus (TP) loading rate by Upper Salt Creek subwatershed planning area

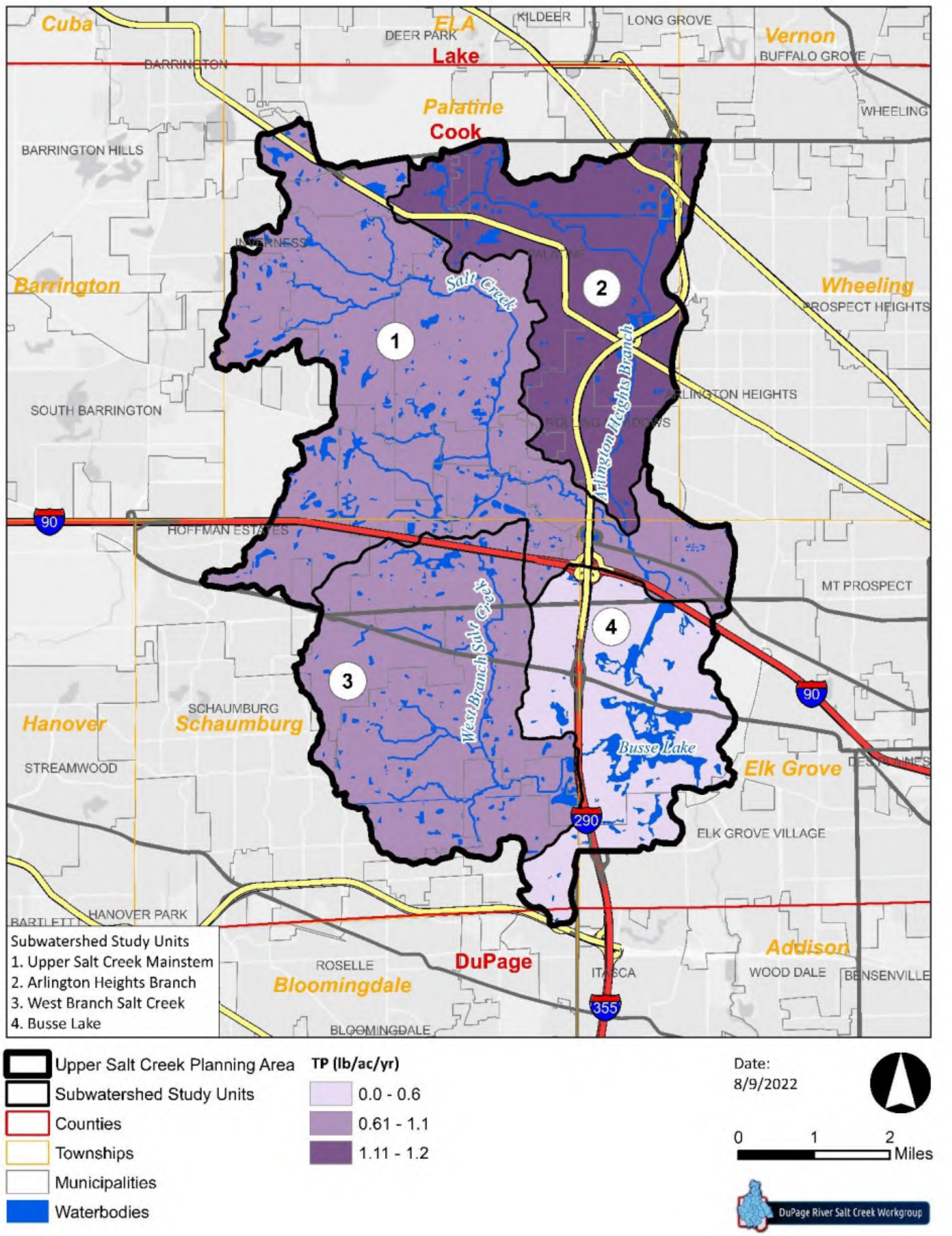


Figure 75. Average annual biological oxygen demand (BOD) loading rate by Upper Salt Creek subwatershed planning unit

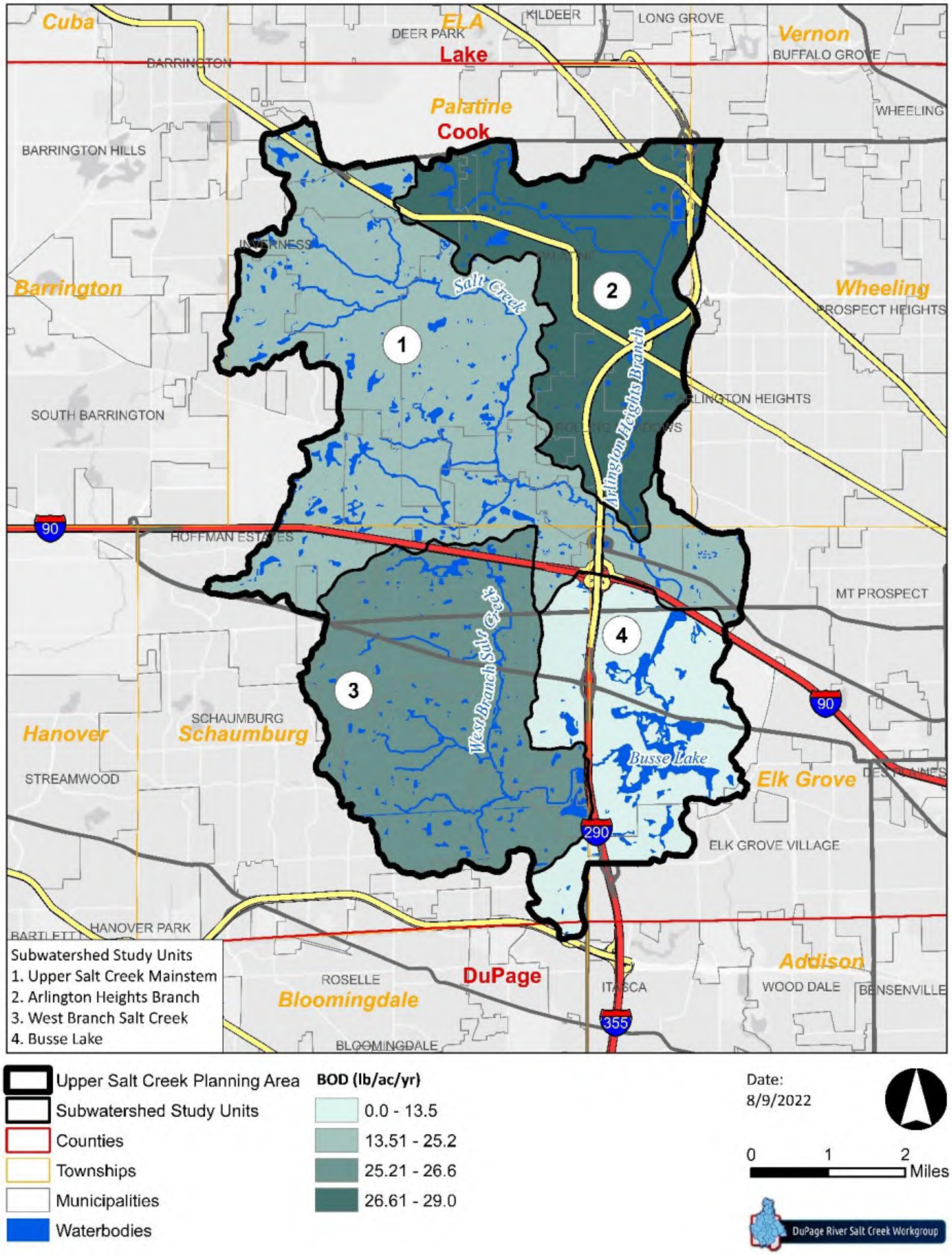


Figure 76. Average annual sediment loading rate by Upper Salt Creek subwatershed planning area

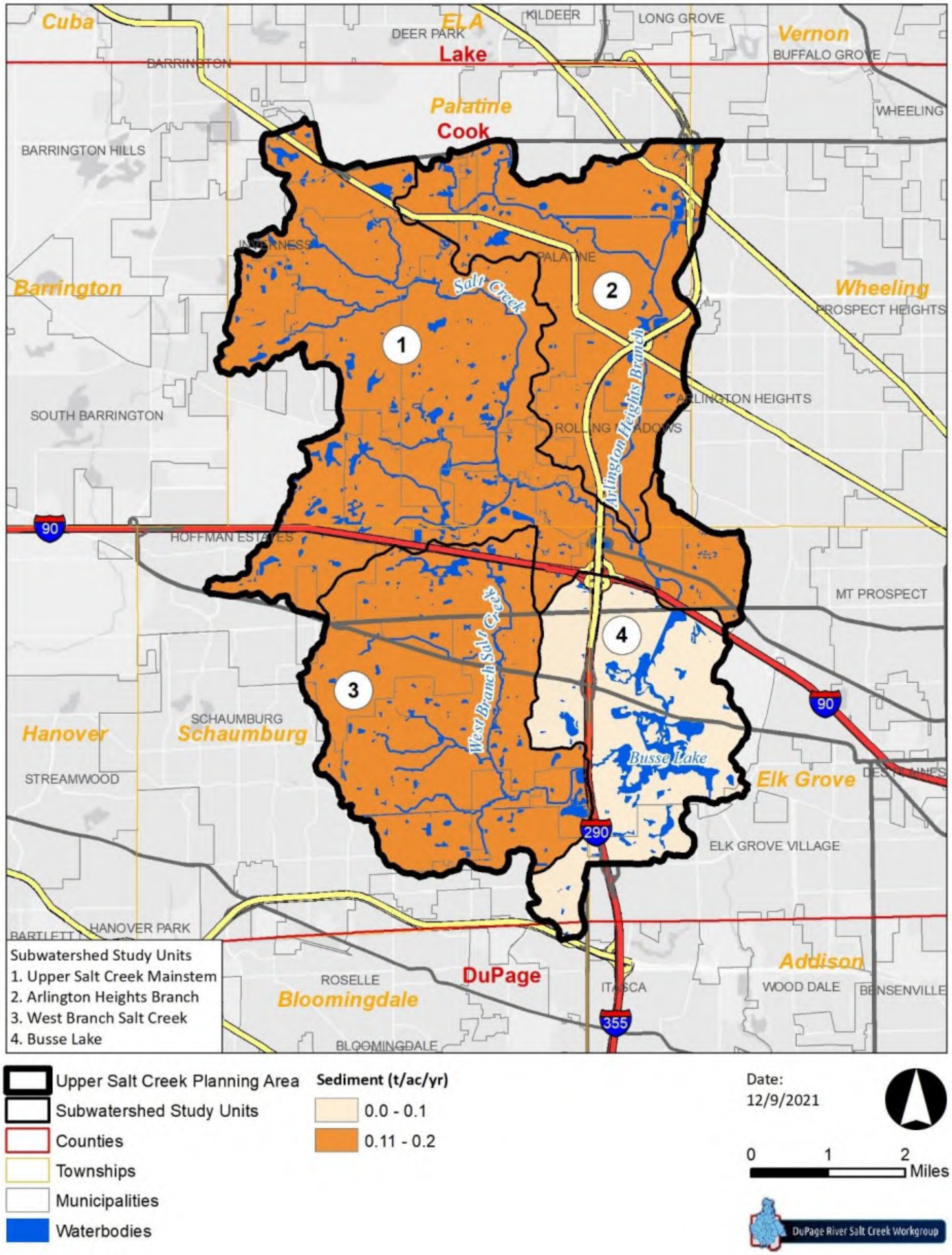


Table 59. Average annual total nitrogen (TN) loading rate (pounds/year) by land use and Upper Salt Creek subwatershed planning area

Land Use	Upper Salt Creek Mainstem	Arlington Heights Branch	West Branch Salt Creek	Busse Lake
Commercial	6,413.2	6,188.6	7,668.2	4,354.8
Industrial	1,505.0	2,756.9	1,978.9	348.8
Institutional	4,277.1	2,519.2	1,486.2	313.8
Transportation	38,030.6	23,733.7	30,087.0	10,879.1
Multi-Family	3,028.7	2,852.5	2,972.2	383.2
Single-Family	24,923.1	10,901.2	8,841.9	1,898.0
Urban-Cultivated	776.5	0.0	0.0	0.0
Vacant (developed)	1,650.8	424.9	905.4	57.6
Open Space	2,772.8	1,340.5	1,017.2	106.9
Non-Urban Open Space	186.5	15.3	41.7	716.6
Total	*83,564.3*	*50,732.8*	*54,998.8*	*19,058.8*

Table 60. Average annual total phosphorus (TP) loading rate (pounds/year) by land use and Upper Salt Creek subwatershed planning area

Land Use	Upper Salt Creek Mainstem	Arlington Heights Branch	West Branch Salt Creek	Busse Lake
Commercial	641.3	618.9	766.8	435.5
Industrial	240.8	441.1	316.6	55.8
Institutional	712.8	419.9	247.7	52.3
Transportation	6,338.4	3,955.6	5,014.5	1,813.2
Multi-Family	550.7	518.6	540.4	69.7
Single-Family	4,531.5	1,982.0	1,607.6	345.1
Urban-Cultivated	122.6	0.0	0.0	0.0
Vacant (developed)	165.1	42.5	90.5	5.8
Open Space	277.3	134.1	101.7	10.7
Non-Urban Open Space	91.6	7.5	20.3	348.5
Total	*13,672.1*	*8,120.2*	*8,706.3*	*3,136.5*

Table 61. Average annual biological oxygen demand (BOD) loading rate (pounds/year) by land use and Upper Salt Creek subwatershed planning area

Land Use	Upper Salt Creek Mainstem	Arlington Heights Branch	West Branch Salt Creek	Busse Lake
Commercial	29,821.3	28,777.1	35,657.3	20,249.7
Industrial	5,417.9	9,924.9	7,124.0	1,255.7
Institutional	18,534.1	10,916.7	6,440.3	1,359.7
Transportation	117,894.8	73,574.4	93,269.7	33,725.2
Multi-Family	13,766.9	12,965.8	13,509.9	1,741.9
Single-Family	113,286.7	49,551.0	40,190.7	8,627.1
Urban-Cultivated	1,634.7	0.0	0.0	0.0
Vacant (developed)	4,402.2	1,133.0	2,414.4	153.6
Open Space	7,394.2	3,574.7	2,712.5	285.2
Non-Urban Open Space	459.0	37.5	102.0	1,748.8
Total	*312,611.8*	*190,455.1*	*201,420.8*	*69,146.9*

Table 62. Average annual sediment loading rate (tons/year) by land use and Upper Salt Creek subwatershed planning area

Land Use	Upper Salt Creek Mainstem	Arlington Heights Branch	West Branch Salt Creek	Busse Lake
Commercial	120.2	116.0	143.8	81.7
Industrial	36.1	66.2	47.5	8.4
Institutional	79.6	46.9	27.7	5.8
Transportation	950.8	593.3	752.2	272.0
Multi-Family	68.8	64.8	67.5	8.7
Single-Family	566.4	247.8	201.0	43.1
Urban-Cultivated	30.7	0.0	0.0	0.0
Vacant (developed)	38.5	9.9	21.1	1.3
Open Space	64.7	31.3	23.7	2.5
Non-Urban Open Space	4.5	0.4	1.4	26.8
Total	*1,960.4*	*1,176.6*	*1,285.9*	*450.3*

3.7.1.2. Streambank Erosion Pollutant Load Estimate

Pollutant loads from eroding streambank locations identified as “moderate” or “severe” in Figure 30 were estimated using USEPA’s STEPL. Results of the spreadsheet tool analyses are provided in Table 63.

Table 63. Pollutant load estimates for streambank areas identified as exhibiting "moderate" or "severe" erosion in the Upper Salt Creek planning area

Subwatershed Planning Unit	Moderate or Severely Eroding Bank Length (ft)	Bank Height Range (ft)	Nitrogen Load (lb/yr)	Phosphorus Load (lb/yr)	BOD Load (lb/yr)	Sediment Load (lb/yr)
Upper Salt Creek Mainstem	18,258	2-4	491.3	189.2	982.6	267.0
Arlington Heights Branch	10,550	1-3	142.0	54.7	283.9	77.1
West Branch Salt Creek	3,975	1-3	53.5	20.6	107.0	29.1
Busse Lake	3,373	2-4	98.4	37.9	196.8	72.4
Total	*36,156*	-	*785.2*	*302.3*	*1,570.3*	*445.6*

3.7.2. Point Sources

There are many avenues through which pollutants can enter the environment. This section breaks down some of the point sources, any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, or factory smokestack, as defined by the USEPA. Identifying pollution and tracing back to its source can help create regulations that in turn manage the total amounts of pollution released.

3.7.2.1. National Pollutant Discharge Elimination System Permittees

Authorized under amendments made to the Clean Water Act in 1987, USEPA uses permits issued through the National Pollutant Discharge Elimination System (NPDES) to manage pollution to waterbodies from a variety of point sources. IEPA issues the permits through delegation of authority by USEPA. In Illinois NPDES permits are administered by the IEPA. Point sources regulated through NPDES include WWTPs, industrial dischargers, concentrated animal feeding operations (CAFOs), combined sewer overflows, sanitary sewer overflows (SSOs), and urban stormwater runoff discharged via a pipe[92]. The NPDES program plays a key role in protecting and restoring water quality. Issued permits set discharge limits specific to the waterbody (within in which the pollution is being discharged), require monitoring and reporting of pollutants and water quality indicators such as DO and BOD, and limit the discharge of specific pollutants including total suspended solids, ammonia nitrogen, fecal coliform, and phosphorus.

NPDES Wastewater Discharge Permittees and Facility Planning Areas

There are three permitted dischargers of wastewater in the planning area (Figure 77). These are Arlington International Racecourse, MWRD's Egan Facility, and Prairie Material Sales' Yard 35. Collectively, they hold 17 outfall permits within the Upper Salt Creek planning area. MWRD's Egan Facility serves the Upper Salt Creek planning area, but discharges to the Lower Salt Creek planning area, just downstream of Busse Lake.

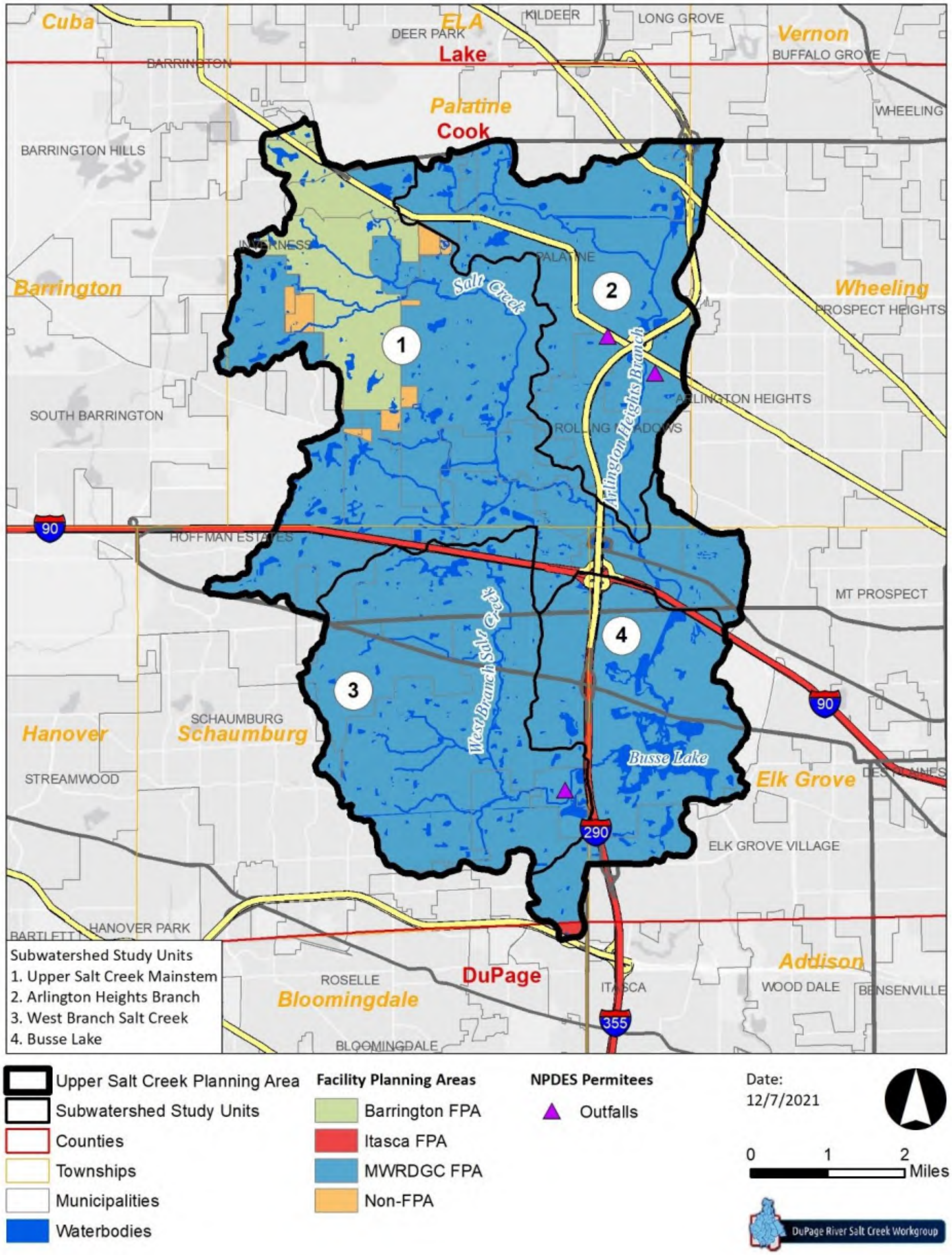
Facility planning areas (FPAs) are also shown in Figure 77. A FPA is the geography served by a WWTP based on plant capacity, development plans, and other nearby FPAs. The FPA includes both the current sewer

[92] https://www.epa.gov/npdes/npdes-permit-basics

service area as well as unsewered areas that are expected to be developed and served in the future. The Upper Salt Creek planning area currently has three FPAs with a small portion not part of an FPA.[93]

[93] https://datahub.cmap.illinois.gov/dataset/facility-planning-areas-fpa

Figure 77. NPDES permittees and Facility Planning Areas in the Upper Salt Creek planning area



The stormwater component of the NPDES Program was implemented in two phases. Phase I of this program was implemented in 1990 and applies to medium and large municipal separate storm sewer systems (MS4s) as well as certain counties with populations of 100,000 or more. Phase I MS4 permittees are regulated under individual permits and are informed by the regulations at 40 C.F.R. 122.26(d).[94] Phase II was implemented in 2003 and expanded the scope of storm sewer systems which are subject to NPDES. Phase II applies to small MS4s including smaller construction or industrial sites that are owned and operated in urbanized areas.[95] Industrial sites or construction activities that disturb one or more acres of land must obtain an NPDES permit before construction activities begin.[96] Most Phase II MS4 permittees are regulated under a general permit.

Under the terms of Phase II permits, industrial, construction, and MS4 Phase II permittees are required to implement certain practices that control pollution in stormwater runoff. To prevent the contamination of stormwater runoff, industrial and construction permittees must develop a stormwater pollution prevention plan (SWPPP), while MS4 permittees must develop a similar stormwater management program. Stormwater runoff carrying pollutants from impervious surfaces can degrade water quality when discharged untreated into local rivers and streams, as is often the case. Programs like Phase II that encourage planning and implementation on a watershed basis are therefore vital for protecting water quality from stormwater runoff from both large and small separate stormwater sewer systems as well as industrial and construction sites. In Illinois, discharges from small MS4s are regulated under IEPA's General NPDES Permit No. ILR40. The central feature of this permit is a requirement that MS4 operators develop, implement, and enforce a stormwater management program to reduce the discharge of pollutants. A Phase II permittee's stormwater management program must include six minimum control measures as outlined in 40 C.F.R. 122.34(b)[97]:

1. Public education and outreach on storm water impacts
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site storm water runoff control
5. Post construction storm water management in new development and redevelopment
6. Pollution prevention / good housekeeping for municipal operations

To define its storm water management program, a permittee must define best management practices (BMPs) and measurable goals for each of the six minimum control measures.

To obtain coverage under the permit, permittees must submit to IEPA a completed Notice of Intent (NOI)[98] describing its BMPs and measurable goals, providing other program specifics, and identifying any arrangements made with others to share program responsibilities. Once coverage has been granted, a permittee must submit an annual report to IEPA by June 1 which must include the following:

[94] https://www2.illinois.gov/epa/topics/forms/water-permits/storm-water/Pages/ms4.aspx
[95] http://www.epa.state.il.us/water/permits/storm-water/ms4-status-report.pdf
[96] https://www2.illinois.gov/epa/topics/forms/water-permits/storm-water/Pages/construction.aspx
[97] https://www3.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf
[98] http://www.epa.state.il.us/water/permits/storm-water/forms/notice-intent-ms4.pdf

1. The status of compliance with the permit conditions, including an assessment of the BMPs and progress toward the measurable goals
2. Results of any information collected and analyzed, including monitoring data
3. A summary of the storm water activities planned for the next reporting cycle
4. A change in any identified best management practices or measurable goals
5. If applicable, notice of relying on another governmental entity to satisfy some of the permit obligations

Current MS4 Communities in the Upper Salt Creek planning area include:

- Arlington Heights Village MS4
- Barrington Village MS4
- Barrington Township MS4
- Bloomingdale Township MS4
- Elk Grove Township MS4
- Elk Grove Village MS4
- Hoffman Estates Village MS4
- Inverness Village MS4
- Itasca Village MS4
- Palatine Township MS4
- Palatine Village MS4
- Rolling Meadows MS4
- Schaumburg Township MS4
- Schaumburg Village MS4
- Wheeling Township MS4

Stormwater Management Ordinances

In addition to the MS4 program, both DuPage and Cook Counties have a county-wide ordinance to manage the impacts of urbanization on stormwater drainage, safeguard public health and safety, protect the environment, and support responsible land use decisions.[99] [100] Each ordinance articulates a set of regulations, procedures, and/or programmatic structures to promote and help implement these objectives.

DuPage County has the DuPage Countywide Stormwater and Flood Plain Ordinance (DCSFPO). The ordinance is enforced by DuPage County Stormwater Management; however, municipalities are given the opportunity to receive authorization to review and process stormwater permits within their jurisdiction.[101] Municipalities that choose to perform these duties are called complete waiver communities; municipalities that chose to review all aspects of the permits except for development in Special Management Areas are called nonwaiver and partial waiver communities. Itasca is the only municipality of the Upper Salt Creek planning area in DuPage County, it has a partial waiver. The DCSFPO was last revised in May 2019 and applies to all development within DuPage County that existed after February 15, 1992.[102]

Cook County has the Watershed Management Ordinance (WMO), which is administered and enforced by the MWRD. Some communities have become authorized to administer certain aspects of the WMO, but there are no currently authorized communities in the Upper Salt Creek watershed. The WMO applies to all development within the boundaries of Cook County, and qualified sewer construction within the

[99] https://www.dupageco.org/EDP/Stormwater_Management/Docs/60593/
[100] https://mwrd.org/
[101] https://www.dupageco.org/EDP/Stormwater_Management/Stormwater_Regulatory_Services/57625/
[102] https://www.dupageco.org/EDP/Stormwater_Management/Docs/40943/

MWRD's corporate boundaries or service agreement areas. Components which are regulated under the WMO include qualified sewer construction, drainage and detention, volume control, floodplain management, isolated wetland protection, riparian environment protection, and soil erosion and sediment control. The WMO was first adopted on October 3, 2013. The current version of the WMO went into effect on May 1, 2014 and was last amended on May 7, 2020.[103]

3.7.2.2. Leaking Underground Storage Tanks

Leaking underground storage tanks (UST) are a source of environmental contamination and threaten the quality and safety of groundwater and surface waters as sources of drinking water. The Office of the State Fire Marshall regulates the daily operation and maintenance of underground storage tank systems, and IEPA becomes involved once a release (i.e., leak) has been reported to the Illinois Emergency Management Agency (IEMA). Following a tank release report to IEMA, IEPA's Leaking UST section begins oversight of remedial operations.[104]

The location and condition of USTs are important considerations when planning for wells and watersheds. The Upper Salt Creek planning area includes 271 leaking UST sites (Table 64,Figure 78). The most sites are in Palatine and Schaumburg with 99 and 87, respectively.

Knowledge of leaking UST sites and their cleanup status can work in favor of developing wellhead protection plans for existing community water supply wells. These plans can also reduce the vulnerability of wells to other potential sources of contamination. For more information regarding the status of leaking UST sites, readers are referred to the Leaking UST Incident Tracking database.[105]

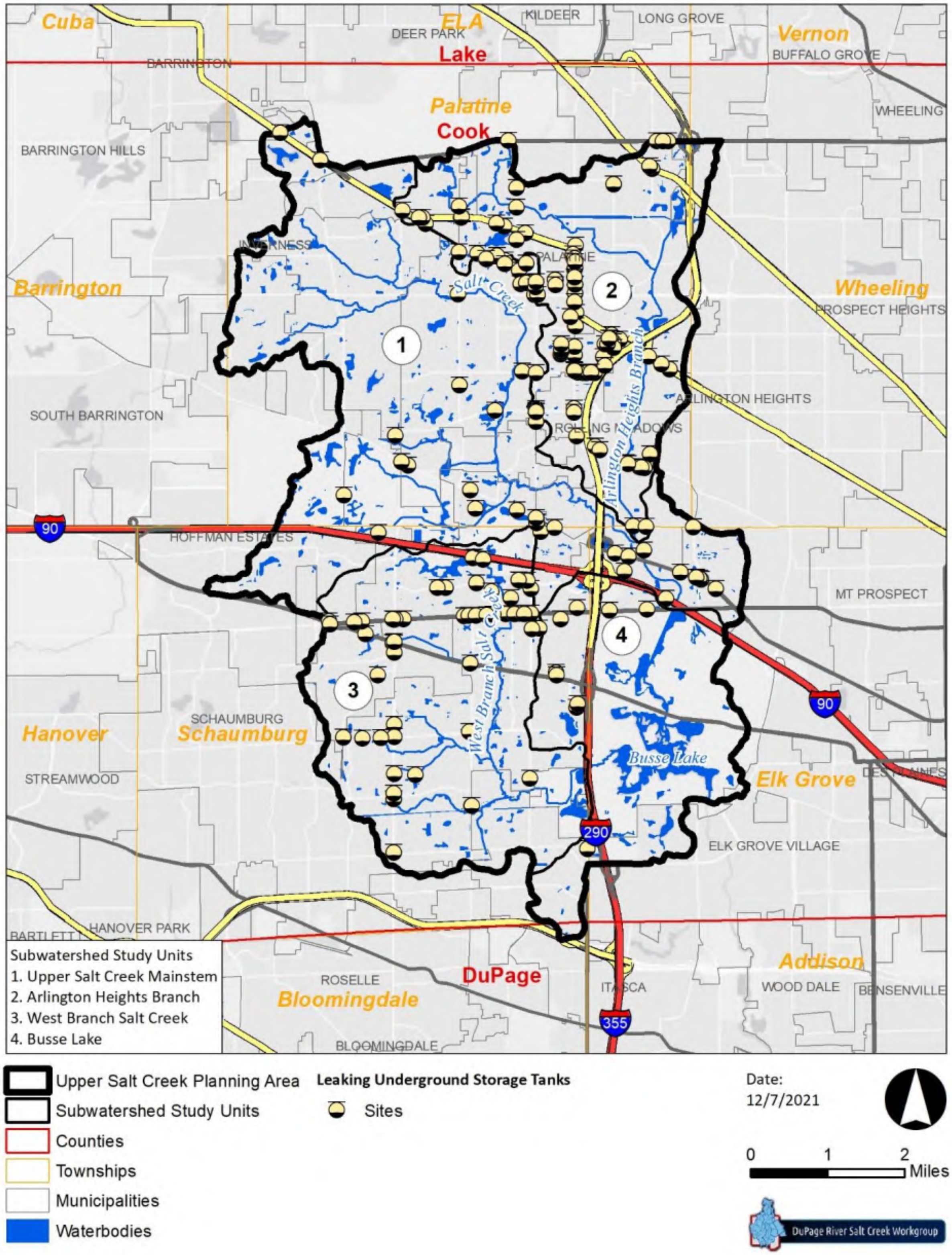
The Underground Storage Tank (UST) Fund helps tank owners and operators pay for cleaning up leaks from petroleum USTs. By doing so, the UST Fund also satisfies the federal financial assurance requirements for all Illinois tank owners and operators. Since its inception in 1989, the UST Fund has paid more than $800 million. Illinois generates money for the UST Fund through a $0.003 per-gallon motor fuel tax and an $0.008 per-gallon environmental impact fee, both of which are due to expire in 2025.[106]

Table 64. Number of leaking underground storage tank sites by Upper Salt Creek subwatershed unit

Subwatershed Study Units	# Leaking USTs
Salt Creek Mainstem	59
Arlington Heights Branch	115
West Branch Salt Creek	82
Busse Lake	15
Total	*271*

[103] https://mwrd.org/watershed-management-ordinance-and-infiltrationinflow-control-program
[104] An Introduction to Leaking Underground Storage Tanks. **https://www2.illinois.gov/epa/topics/cleanup-programs/lust/publications-regs/Pages/introduction.aspx accessed 11/17/2021**
[105] https://www2.illinois.gov/epa/topics/cleanup-programs/bol-database/Pages/leaking-ust.aspx
[106] https://www2.illinois.gov/epa/topics/cleanup-programs/lust/publications-regs/Pages/fund-guide.aspx

Figure 78. Leaking underground storage tank sites in the Upper Salt Creek planning area



3.7.3. Significant Sources of Chloride

Chloride is a permanent pollutant, meaning it does not degrade over time and continues to accumulate. This means once added to the environment, there is no way easy way to remove chloride. Even chloride that ends up at WWTP is discharged back into the environment. The conventional processes at WWTPs do not remove chloride from the water. One teaspoon of salt can permanently pollute five gallons of water.

Chlorides are commonly found in fertilizers, water softeners, and road salt. Chlorides in fertilizer are typically potassium salts, specifically Potassium Chloride, and leech through the soil, polluting the groundwater. Water softeners use salt to replace heavy minerals like calcium and magnesium with sodium to reduce the hardness of the water. For those using groundwater as their primary source of drinking water without a water softener, hard water can lead to mineral build up in pipes and make hot water heaters less efficient over time.

In Northeastern Illinois, road salt used in winter road, parking lot, and sidewalk maintenance is one of the primary sources of chloride. Road salt, commonly made up of rock salt as Sodium Chloride, lowers the freezing point of water causing ice to melt when the temperature is below freezing. When the road salt dissolves, the sodium and chloride ions split apart and help disrupt the hydrogen and oxygen ions of water from forming into the crystal structure of ice. Other materials used in winter maintenance commonly include Magnesium Chloride and Calcium Chloride, which also contribute to chloride pollution.

According to studies by the DRSCW, chloride negatively impacts aquatic life such as fish and macroinvertebrates at concentrations as low as 120 mg/L. This is even lower than EPA's secondary drinking water standard of 250 mg/L and Illinois' water quality standard (WQS) for chloride at 500 mg/L. As the surface water chloride concentrations from road salt applications increase, biodiversity decreases as chlorides inhibit aquatic life from successfully reproducing and surviving in our waterways. Macroinvertebrates and plankton are impacted by chloride and unable to survive at chloride concentrations measured in our local streams during the winter and spring months. This impacts fish and other aquatic life that rely on macroinvertebrates or plankton for food by disrupting the naturally occurring food chain. Amphibians that lay their eggs in our waterways can be impacted by chlorides through malformation, reduced hatching, and reduced survival rates. Chlorides tend to impact native aquatic species most significantly, as they haven't adapted to the saltier water.

Chlorides can also impact riparian and upland vegetation. As native salt intolerant plants die off in our wetlands, they are replaced by salt tolerant non-native species that aren't as well suited to provide habitat for native wildlife. Plants and soil along roads, sidewalks, and parking lots can be damaged by excessive road salt. The salt draws the moisture out of the plants. This kind of salt damage is commonly seen in evergreens as brown or yellow foliage or in deciduous trees as dense clusters of twigs at branch tips. High sodium and chloride levels from road salt can also make the soil more compacted reducing the amount of oxygen available to plant roots, thus decreasing plant growth.

Chlorides aren't just a problem for plants and aquatic wildlife, humans are directly impacted too. High concentrations of salt in drinking water can lead to health problems. We typically taste salty water when the concentration of chloride is above 250 mg/L. Additionally, salt is corrosive, damaging metal pipes, transportation infrastructure, and vehicles, leading to added costs for more frequent repairs and replacements.

3.7.4. Polycyclic Aromatic Hydrocarbons (PAH)[107]

Polycyclic aromatic hydrocarbons (PAHs) are a large group of organic compounds found naturally in coal and petroleum products. PAHs are formed by the incomplete combustion of organic matter from fossil fuels, wood, and cigarettes. As there are many sources of PAHs in the environment such as motor oil, automobile exhaust, and asphalt, it is not uncommon to find these chemical in our stream sediments. However, analysis of twenty-seven (27) sediments samples collected by the DRSCW from the Salt Creek watershed indicated high levels of PAHs. Sixteen (16) of the sites had one (1) or more PAHs above the “Probable Effects Concentration”. The probable effect concentration (PEC) is the level which adverse effects to aquatic life are expected to frequently occur. All sites had one or more PAHs above the above the “Threshold Effect Concentration” (TEC). The TEC is the level which adverse effects to aquatic life are likely to occur. PECs and TECs are determine from a review of dozens of individual studies that then utilized a consensus-based approach to set the limits.

PAHs have documented effects on aquatic life. Fish exposed to high levels of PAHs exhibit chronic effects including fin erosion, liver abnormalities, tumors, and immune system impairments. Benthic macroinvertebrates (or the insects found in streams that serve as the base of the aquatic food chain) that are exposed to PAHs exhibit reproduction impairments and mortality. Amphibians such as frogs and salamanders have also exhibited negative effects including stunted growth and delayed development. PAHs in sediments are one of the primary stressors on aquatic organisms in the Salt Creek watershed.

Given the high levels of PAHs observed in Salt Creek’s sediments and the known impacts on aquatic life, the DRSCW investigated potential sources for elevated PAHs in urban stream sediments. A literature review found research the United States Geological Survey (USGS) conducted in 40 US lakes. This study linked coal tar sealants to elevated PAH levels in stream sediment in urban areas. Since that the publication of that study in 2010, numerous other studies from Illinois, Michigan, Minnesota, New Hampshire, Texas, Washington, Washington DC, Wisconsin, and Utah have confirmed the link between coal tar sealants and elevated PAH levels in the sediment of urban areas. A recent study found that 77% of PAH pollution in Milwaukee streambeds came from coal tar-based sealants

The high costs associated with the removal of high PAH sediments from the environment has also been documented. Due to high PAH levels, soils dredged from storm water management facilities such as detention basins and roadside swales need to be disposed as hazardous and/or special waste to comply with State of Illinois regulations. The disposal cost for hazardous and special wastes is orders of magnitude higher than the disposal cost of uncontaminated sediments. For example, a study in Minnesota estimates that the costs will exceed over 1 billion dollars to remove high PAH sediments from just 10% of the estimated 20,000 municipal storm water ponds in the Minneapolis-St Paul metropolitan area where cleanup in needed.

Coal tar sealants are the black, viscous liquid sprayed or painted on many asphalt parking lots, driveways, and playgrounds to protect and enhance the appearance of the underlying asphalt. It is estimated that 85

[107] This section is adapted from a section written by Deanna Doohaluk, DRSCW, for the Lower Salt Creek Watershed-Based Plan, 2017

million gallons of coal tar sealants are applied each year in the U.S. As these sealants erode from their applied surfaces, they are transported via stormwater runoff into our rivers and streams and into the air via wind, vehicle tires, and on the soles of shoes. In addition to the water and sediment quality impacts of coal-tar based sealants, numerous human health impacts have also been documents. Coal tar and coal-tar pitch are group 1 carcinogens and have been linked to birth defects.

Given the documented impacts of PAHs, several jurisdictions including the States of Washington and Minnesota as well as Washington DC, and more than 20 municipalities and counties including South Barrington, North Barrington, Highland Park, Wilmette, and Winnetka in Illinois, and Milwaukee and Dane County in Wisconsin, have banned the use of coal tar sealants. Additionally, the DRSCW has worked with its member agencies and more than 14 have signed a Memorandum of Understanding (MOU) that bans the use of coal-tar sealants in their operations and by their contractors. Member agencies in the Upper Salt Creek watershed that have signed this MOU include DuPage County and the Forest Preserve District of DuPage County.

4. Watershed Protection Measures

4.1. Planning, Policy, and Programming

4.1.1. General Planning and Ordinance Recommendations

Comprehensive planning, based on a foundational understanding of natural resources functions and key elements of watershed science, is an integral tool in protecting and improving our communities. By working to clearly envision the potential future outcomes, planning ensures movement to meet future needs and a work towards embodiment of a community's values. Of which, accessible and equitable access to safe drinking and clean surface water will help build a more sustainable and resilient future.

These plans not only designate land use plans for development or redevelopment, but also informs the direction of regulations, like land division, stormwater management, floodplain development, and natural areas protections, and more specific plans to manage open spaces, implement green infrastructure, and ensure access to recreational and natural areas.

Many of the municipalities, park districts, and other entities within the planning area have developed, maintained, and recently updated their comprehensive plans. As a general practice, comprehensive plans should be updated every 10-12 years.

Comprehensive plan review has yielded some considerations ad recommendations for future plan refinements to better support their communities and neighboring communities. It's important to remember that watersheds, drainage ways, and waterways don't adhere to jurisdictional boundaries, meaning both positive and negative impacts of land management can be impactful to others.

- All municipalities and counties in the planning area have comprehensive plans, many of which have been updated within the last 10-12 years. Many of the park districts in the planning area have also adopted comprehensive plans, last updated in that timeframe.
- Hoffman Estates (2007), Inverness (1981), and DuPage County (1990) have comprehensive plans that have not been updated in the last 10-12 years, and should consider updating these plans.

- Park Districts, Forest Preserves, and other open space organizations active in the area should consider developing comprehensive plans if they do not already have one and updating them regularly.

General considerations lacking in the comprehensive plans reviewed and recommended for inclusion in plan updates include:

- Natural resources management, including promoting native communities, limiting non-indigenous species, and commitment to management of plant communities
- Groundwater contamination protection
- Recreational corridors to improve walking, biking, and access to natural areas
- Promotes the use of and provides resources to incorporate green infrastructure

4.2. Best Management Practice (BMPs) Implementation Projects

The following list of BMPs have been developed as a toolbox for practices that can aid in nonpoint source pollutant runoff reduction. Some of these tools can be prescribed as a component of an individual development or redevelopment, while others are site-specific and may require a partnership of agencies and organizations to incorporate.

This list was adapted from the Lower Salt Creek Watershed-based Plan and prescribes many similar practices. Certain practices were not included in this plan, as they are likely not best suited for the planning area. Likewise, additional practices have been identified and are describes further in the sections below.

4.2.1. Urban Stormwater Infrastructure Retrofits

The following subsections include recommendations of projects – either standalone or components of larger projects – that can be implemented in the planning area. The selected BMPs are intended to work in more urbanized areas, which should be focal areas, considering urban land uses predominately considered urban (residential, commercial, institutional, industrial, TCUW, and under construction) comprise nearly two thirds (62.5%, Table 16) of the planning area.

Although typically more cost effective when installed as part of new development, considering the relatively developed nature of the planning area, many of these practices have been selected because they can be incorporated into retrofit or redevelopment opportunities.

In addition to naturalized detention basins, which are typically the primary tool used to fulfill volume and rate control requirements of local ordinances, additional BMPs and design components should be considered and hopefully introduced to sites during initial site design phases. This approach is recommended, as it allows the owner and their engineers to select the most suitable and cost-effective practices for the site. Regulations, including the WDO, WMO, and Cook and DuPage’s County Code of Ordinances, are designed to support the implementation of these practices within their respective jurisdictions.

Many additional BMPs not listed in the sections below may be applicable to certain areas within the watershed. The practices included have demonstrated the capacity for pollutant removal and volumetric storage, providing measurable water quality benefits and flood mitigation. Selection components included source management and practicality for installation.

4.2.1.1. Infiltration Practices

Infiltration is the process of moving water through the soil strata. These practices encourage this percolation to filter water and reduce runoff.

The soil matrix can filter water much like the water filter in a refrigerator or at a WWTP. Particulates dissolved in solution or suspended in the water column can be removed by the soil material by physical and chemical processes. These pollutants, if excess nutrients like phosphorus, can then be accessed and utilized by the root systems of plants in the soil matrix, long after the initial saturation of water is gone. Increased soil saturation due to infiltration practices can also collect and store water itself, not just the nutrients, within the soil column to provide more consistent access to water for root systems.

In some cases, pollutants will remain attached to the water particles and can be introduced to groundwater resources. It’s important to identify likely pollutants in the runoff generated to determine whether infiltration practices are appropriate for the site conditions, specific soil types, or should be avoided due to groundwater contamination risks.

Both increasing the volume of water stored in the soil and increasing the time it takes for water to move to a receiving waterbody (as it moves through the soil matrix instead of overland) can reduce overland flow, peak water velocities and elevations, and instances of localized flooding. Reductions in velocities can protect areas vulnerable to erosion, like streambanks, and reductions in volume can protect public safety and limit property and infrastructure damage.

Below are examples of infiltration practices generally recommended in the planning area. Site-specific analysis should be completed to determine which infiltration practices, if any, are appropriate for the site use and potential pollutant load.

Bioswales are vegetated channels that slow velocities, encourage infiltration, and uptake nutrients. Pollutant removal capacity is maximized when swales are planted with and maintained as diverse native vegetative communities. In some cases, rock check dams can be installed as part of the bioswale structure to further decrease velocities and protect against erosion. Any flow path that is designed to convey water over land during a runoff event – like a ditch in a back yard or along a roadside – can typically be designed as or converted to a bioswale.

Bioretention facilities are topographically depressional areas that are designed to collect runoff. These areas are typically designed with special upper strata layers, like mulch and bioengineered soil to promote infiltration. Much like bioswales, native plant communities that are well adapted to the designed wetness conditions are selected to best establish these areas. Rain gardens and extended stormwater facilities in commercial areas are examples of bioretention facilities.

Infiltration trenches are comprised of introducing rock material to the soil strata by excavating linear trenches and filling the trenches with rock material. Sometimes the trenches are filled with rock to the surface, and sometimes the trenches are finished with a layer of topsoil material. In either case, water percolates into the void space of the rock material, is held there, and will release slowly into the underlying soil material. French drains, like are commonly installed around building structures, are a type of infiltration trench. In cases where the trench is finished with topsoil, these areas can be seamlessly integrated into surrounding landscaping areas and even planted with turf grass.

In heavily urbanized areas, smaller practices may be more appropriate, like exposing areas around trees or installing much smaller landscape pockets in the sidewalk corridor and directing water to these areas. Likewise, green roofs and planter boxes are infiltration tools that can be well suited for urban areas. Although not always connected directly into the soil in the ground, these vegetated installments can still capture, store, and utilize runoff. Whether installed on a roof, hanging off a balcony rail, or set on the ground, surrounding impervious areas (sidewalks, roofs) can be sufficiently protected from seepage. Although surface area access to the soil interface is limited or sometimes nonexistent, these strategies can be impactful, serve as educational installments, and introduce more greenspace into the developed corridor.

4.2.1.2. Impervious Surface Reduction

Impervious surfaces prevent water from being absorbed into the ground below and often encourage water to move more quickly through systems, increasing the volume and rate of runoff.

The simplest way to reduce the amount of impervious surface in an area is to physically remove paved areas and buildings that are no longer needed. In developed areas like those in the planning area, removal is rarely a practical option, and therefore conversion of grade-level impervious features is more typically the preferred approach.

When sidewalks, parking lots, roadways, and other impervious areas approach end of life or need substantial repair or replacement, permeable pavement materials can be good alternate material options. Permeable pavement works by incorporating small void spaces that can allow water to pass through the pavement and access the subsoil. Porous asphalt and porous concrete are examples of poured in place materials, while permeable pavers are precast and laid own in a manner akin to bricks. These tools retain the smooth and original function of a paved area, while providing an interface capable of infiltration. Site specific considerations, like soils, subgrade, material-specific installation requirements, and budget can sometimes limit the use of and options for permeable pavement options.

4.2.1.3. Detention Basin Retrofits

Detention basin facilities assessed as part of the water resources inventory were typical of pre-modern-day design. Many of these facilities have steepened side slopes or vertical bank treatments, are experiencing erosion, easily enable short-circuiting, are overgrown with non-native monocultures, and have no or unmaintained buffers. These characteristics, some by original design, and some enabled or exacerbated by maintenance practices, do not capitalize on the opportunities of these detention facilities to improve water quality. In some cases, facilities may have net negative impacts to the health of our waterways.

The good news is that modifying detention basins to integrate key features can significantly improve the function of these areas and support ease and affordability of best maintenance practices. Each assessment to incorporate improved design features is site-specific and considers a variety of factors, many more than were able to be documented during the water resources inventory portion of this study. The paragraphs below highlight some of these key design features that can improve functionality of basins and their abilities to improve water quality.

A **wetland shelf** is a portion of the basin bottom that does not reflect the total basin depth. These shallower areas in the basin are typically situated fully around the edge of a basin, almost like a stair step design from the edge of the basin into the middle of the basin. These shallower areas not only provide depth variation for a larger diversity of aquatic plant species, but also act as a safety feature. The increase in vegetation increases nutrient uptake and supports emergent species that can protect the bank from wind, wave, and ice erosion.

Similar to a wetland shelf, **re-grading** the side slopes of a basin to achieve a more gradual slope can also provide area for emergent wetland plants and physically build in more durable and less erosion-prone banks. This method will be explored further in Section 4.2.2. Stream Channel and Riparian Restoration but can also be implemented at detention basins.

A **sediment forebay** is a contained area of increased depth at a basin's inlet. A forebay can be created by either excavating the basin bottom, or building up an elevated ring, enclosing an area of typical depth. This area forces water to slow down and suspended sediments to settle out before water moves into the main part of the basin. Encouraging deposition in this area enables sediment removal maintenance to be much easier and more contained, reducing costs and extending the life expectancy of the basin.

Installing and maintaining **native vegetation** on the side slopes, shelf, bottom, and buffer areas can significantly improve nutrient uptake. Native species include those that have evolved to best flourish in northeastern Illinois and are typically sourced from resources as close to the site as practicable. Evolving in a particular area gives these species the resiliency to withstand climate variation, soil types, and unique chemical, biological, and physical conditions created in a region over time. These species have complex rot networks, that grow deep into the soil, stabilizing soil and encouraging infiltration. Natives, especially tall grasses, can even deter goose populations in and around pond and wetland areas.

One of the highest levels of nutrient uptake can be achieved by converting dry turf-bottom or traditional wet basins to **naturalized bottom basins**. Naturalized bottom basins sometimes incorporate a sinuous channel to convey smaller amounts of runoff, while still allowing the basin to fill up during large runoff events. Sometimes, the entire bottom of the basin is a wetland, with a permanent pool shallow enough to allow emergent wetland plants to thrive. These basin bottoms are then planted with the appropriate plant communities, in some cases, mesic prairie plants, and in others, wetland and wetland fringe species. Aside from deterring geese, this type of pond is known for low rates of erosion and preventing overabundant algae communities. Retrofitting a dry detention pond with native vegetation can more than double its removal efficiency of phosphorus and TSS, while nitrogen and BOD removals are increased by more than 50%[108].

When detention facilities are explicitly designed with a combination of these features, they are known as constructed wetland detention facilities. Native species, gentle slopes, forebays, and grading designs can come together and comprise what we see as common for most recently constructed detention facilities. Aside from improved short- and long-term maintenance, these facilities are some of the most effective at nutrient removal and improving water quality, as they mimic many features and functions as natural

[108] National Pollutant Removal Performance Database, Illinois Green Infrastructure Study, approved watershed plans (CMAP Boone-Dutch Creek), and STEPL

wetland areas. Upwards of 20% nitrogen removal, 44% phosphorus removal, 77% BOD removal, and 63% TSS removal have been observed in wetland detention facilities[109].

4.2.2. Stream Channel and Riparian Restoration

4.2.2.1. In-Stream and Streambank Practices

The stream corridor itself is vulnerable to degradation. In many cases, historically, these drainages were considered nuisances, undesirable locations, or opportunities for waste disposal and damming, which led to many modifications, development, and a negative cultural sentiment.

Restoring these systems to reclaim basic ecosystem functions can significantly improve water quality, ecosystem function, and communities' relationship with the natural world. Some stream restoration projects aim to re-meander historically straightened channels, lengthening overall flowpaths and creating complex habitats for aquatic organisms. When restoring streams, enhancing natural variation in the form of riffle-pool complexes and establishing transitional native plant communities are integral design components. In more urbanized streams, concrete lined channels can be broken up and stream sections flowing through pipes can be returned to the substrate/water interface. Many eroding sections of streams were identified during the water resources inventory, which are contributing to the overall sediment load in the system.

Reducing erosion, encouraging sediment deposition, and reconnecting streams to their floodplains are all water quality benefits that can be realized through in-stream restoration. Diverse habitat structures support macroinvertebrate, fish, amphibious, and terrestrial species, and the interactions between them, further improving ecosystem health.

Stabilizing eroding streambanks is one of the most cost-effective ways to leverage in-stream work for improved water quality. Over steepened slopes with areas of exposed soil characterize a typical degraded streambank in an urbanized area. Like detention basin banks, streambanks and shorelines experience erosion from moving water, wind and waves, and ice action. Typical treatments include grading the banks to achieve a more gradual slope, installation of stone riprap to protect against erosive flows, and installation of native plants to secure and hold the soil material in place.

4.2.2.2. Dam and Culvert Modification

Dams and culverts are traditionally constructed to artificially modify the natural movement of water through a system. These structures have been constructed for industry, recreation, utility, transportation, and to provide live storage to absorb flood waters.

Dam modifications are sometimes regulatory required to protect public safety, as regulations and assessment techniques are developed to assess and manage structures. More recently, an increasing number of dams have been removed due to safety concerns, growing maintenance burdens, costs of implementation regulatory modifications, and the opportunity for restoration. Dams act as barriers to fish and other aquatic organism passage, interrupt natural sediment transport processes, can create scour and bed recession, and can cause low DO levels, which can produce an inhospitable environment, in the upstream impoundment. Removing a dam can restore natural flow regimes and ecosystem functions to a

[109] National Pollutant Removal Performance Database, Illinois Green Infrastructure Study, approved watershed plans (CMAP Boone-Dutch Creek), and STEPL

large area, far upstream and downstream from the dam footprint. These types of projects are typically comprised of restoration of the upstream impoundment to pre-dam conditions, including in-stream riffle and pool structures and reestablishment of riparian zones.

Like dams, culverts can act as barriers to free-flowing streams in similar ways. Lack of substrate, changes in stream bed elevations, and flow patterns can inhibit aquatic organism movement. Impoundments can be created upstream from culverts due to the elevations at which the culvert is installed at or erosional processes. Changes in water movement can erode the downstream channel bed and eventually may cause the culvert and embankment to collapse. Age of these pipes can also lead to failures. When a culvert is no longer needed, removals are recommended. In many cases, the functionality of a culvert needs to be maintained. In these situations, the recommendation is to evaluate the condition of the system and most often eventual replacement with larger structures that can be partially embedded to maintain the channel substrate conditions.

4.2.2.3. Riparian Buffer Establishment

Corridors along streams and rivers, better known as riparian areas, continue to be impacted by development. These zones are typically comprised of transitional vegetative communities, connecting the floating, submerged, and emergent vegetation with the adjacent banks and uplands. These areas are similar to buffers described in the context of detention basins and wetlands, and protect the adjacent waterway from nonpoint source pollution and erosion, while providing valuable habitat for insect, amphibian, and mammal species in these crucial zones. Depending on the flood regime, soil type, microclimate, and shade conditions, these communities would have been comprised of diverse native species, including grasses, shrubs, and trees.

As urbanization began to impact the planning area, watercourses were significantly modified and so were their riparian zones. Today, impacts to riparian corridors documented in the water resources inventory include construction of structures (sheds, garages, homes, and commercial/industrial complexes), installation of fences, disposal of yard waste, and introduction and management of turf grass or other ornamental species.

Although significant encroachment and impact to these areas is present in the Upper Salt Creek planning area, many opportunities exist to improve these areas. Whether it be improved maintenance and management of existing vegetated buffers at a golf course, conversion of turf grass at a park, or restoration of overgrown buckthorn patches behind a home, reestablishment of these vital areas can drastically improve water quality and improve connections to the waterways.

4.2.3. Chloride Reduction Strategies[110]

4.2.3.1. Road Salt Storage and Applications

As detailed in Section 3.7.3. Significant Sources of Chloride, road salt is the primary source of chloride water quality impairments in the rivers and streams within the planning area. When road salt is used as part of winter maintenance strategies, all salt applied to roadways, parking lots and sidewalks is effectively added to the water column. Thus, it is incumbent that those who use road salt use it as efficiently as

[110] This section was adapted from a section in the Lower Salt Creek Watershed-based Plan, written by Stephen McCracken, DRSCW.

possible, applying the right amount at the right time as required for any given winter precipitation situation. Efficiencies apply to both salt storage, to minimize any loss of road salt, and in applications, to apply the correct amount of salt and to ensure that the salt stays on the pavement surface until it has served its purpose.

Review of Existing BMPs

There are several documents that examine BMPs for road salt storage and usage. One of the more recent is the report by the AASHTO Clear Roads pooled fund consortium entitled *Manual of Best Management Practices for Road Salt in Winter Maintenance*[111] This manual considers BMPs for road salt procurement, storage and applications and is the primary reference manual used by the DRSCW in its chloride reduction efforts.

The DRSCW hosts a webpage[112] that compiles many resources and guidance documents for managing chloride use in the wintertime. The Salt Smart Collaborative[113] is another local resource that provides resources and hosts annual chloride reduction workshops that facilitate sharing BMP success stories to support better deicing practices.

Some of these best practices are mandated by the State MS4 permit. Where this is the case, it is noted. For simplicity, the best practices for these storage and applications are considered separately.

Salt Storage Best Practices

The purpose of these best practices is to minimize any loss of road salt due to precipitation onto the stockpile, or water running into the storage area, and to protect the ground upon which the salt is stored.

The following best storage practices are recommended for adoption by all agencies with winter snow fighting responsibilities in the plan area who store salt. MS4 permit holders must store deicing agents in a permanent storage structure and tarp any materials temporarily stored outside that structure. The permit required Permittees who have previously not had a permanent storage structure to store deicing materials to construct a permanent storage structure by March 1, 2018.

1. Road salt must be stored on an impermeable pad at all times. Temporary storage on permeable surfaces is not acceptable. All pads must be under cover to eliminate exposure to precipitation.

Figure 79. Salt Smart Collaborative's Why Be Salt Smart? Infographic

[111] http://clearroads.org/project/roadway-salt-best-management-practices/ Accessed October 25, 2022.

[112] https://drscw.org/activities/chlorides-and-winter-management/ Accessed October 25, 2022.

[113] https://saltsmart.org/ Accessed October 25, 2022.

2. Pads must be constructed so that rain water or other precipitation does not drain onto the pad. Any rain that drains onto the pad must be drained to a collection point, preferably a specially designed sump area.
3. Salt that is temporally not stored under a permanent structure must be covered by tarping, for example, except when the stockpile is in active use. Such piles should not be placed near storm drains or in areas that are likely to flood.
4. If the agency regularly stores smaller salt piles (5,000 tons or less) outside of a permanent structure the agency with such stockpiles should develop a plan to construct covered storage capable of containing an average year's use of salt.
5. All salt storage facilities must have policies in place for "good housekeeping" when salt is being placed into storage and moved from storage into trucks (either for winter maintenance purposes or for movement to other storage facilities). These policies must reflect the particular conditions on site but should be aimed at ensuring that as little salt as possible is spilled during these trans-shipment processes, and that any salt which is spilled should be swept up and returned to storage in a timely manner to minimize any loss of salt.
6. All employees involved in salt storage must undergo training annually on best practices for road salt storage.
7. Additional information on salt storage is available in the Salt Institute "*Safe and Sustainable Salt Storage Handbook*"[114].
8. Local units of government are recommended to adopt a storage ordinance covering private salt piles. Examples of such ordinances can be found at DRSCW's website.[115]

Road Salt Applications Best Practices

The purpose of these best practices is to ensure that only as much salt as needed is placed upon the road during winter maintenance operations. The purpose of road salt in such operations is not to melt snow or ice, but rather to prevent the bond of snow or ice to the pavement. If snow or ice has already bonded to the pavement the purpose of the salt is to break the bond. As a strategy, the best practice in winter maintenance is to anti-ice, that is to place road salt (in either liquid or solid form, but more often as a liquid brine) on the road surface prior to the start of a winter event, thus providing a protective layer that prevents snow and ice from bonding to the road surface. However, experience has shown that it takes several years for an agency to transition from more traditional winter maintenance operational strategies to anti-icing, so a series of actions leading toward anti-icing are presented here as best practices.

[114] http://www.nwpa.us/uploads/1/2/9/8/129889926/salt-institute-salt-storage-handbook.pdf Accessed October 25, 2022.

[115] http://drscw.org/wp/model-ordinances/ Accessed October 25, 2022.

The following best practices will be required or recommended for dischargers who run snow fighting operations - these best practices are not pertinent to those dischargers that are simply and solely salt storage facilities. They are, however, somewhat applicable to all classes of dischargers, to the extent that all of these classes clear snow and ice from their own facilities.

1. All salt spreading equipment, whether designed to spread dry road salt, pre-wet road salt or salt brine, must be calibrated at least annually. Whenever the hydraulics on a truck are adjusted or repaired, the spreader equipment will need recalibration. Records of the calibration results must be maintained for each piece of spreading equipment. Proper calibration of equipment can reduce salt application by 50% or more, depending upon how far out of calibration the equipment was originally.
2. Using pre-wet road salt allows an agency to reduce salt application rates by 30%. Prewetting can be accomplished in two ways – by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road. It is generally accepted that the second method is more efficient, but requires modification to spreading equipment, and that an agency have storage capacity for liquid chemicals (most typically salt brine, but other chemicals can also be used). Agencies must make use of pre-wetting, either using treated salt in the stockpile, or preferably by use of liquids applied on the truck during the spreading process.
3. The quantity of salt applied to the road should vary according to the pavement temperature. Accordingly, agencies must have equipment that allows them to measure the pavement temperature. While it may take some time to equip the complete winter maintenance fleet with temperature measuring devices, agencies must, at the start of the variance period, have pavement temperature sensors on enough vehicles to provide operational information during storms that allow salt application rates to be adjusted to the most efficient levels. This requirement is a pre-requisite for the requirement detailed in item 4 below.

Figure 80. One of Salt Smart Collaborative's Social Media Graphics

4. Agencies should adopt or develop a chart with suggested application rates that are a function of storm type and pavement temperature. An example of such a chart is available in the *Manual of Best Management Practices for Road Salt in Winter Maintenance* referenced above. Additionally, agencies should develop a methodology whereby they can determine whether each truck in their fleet applied salt at the recommended rate, and if not, why the variation from the recommended rate occurred and what needs to be changed in their procedures to be sure that the variation only occurs when strictly necessary. Varying application rates according to pavement temperature allows for reductions in total applications of as much as 50% or more.

5. As pavement temperatures decline, salt takes longer to go into solution and thus to become effective. Practice has shown that once pavement temperatures drop below 15° F the time for salt to go into solution is such that it is often plowed off the road by subsequent operations before it can be effective. Clearly, this is not an optimal use of road salt. Agencies must develop procedures for those rare situations when pavement temperatures drop below 15° F, including methods to track when these situations occur and what actions were taken under these extreme conditions. Avoiding application of salt in conditions where pavement temperatures are too low obviously results in a 100% reduction in salt usage for those conditions.
6. Agencies must have in place a methodology to track how much road salt was applied during each storm, together with some measure of how operationally severe the storm was. While this methodology does not result in a reduced application rate per se, it does address the issue that "if you do not measure it you cannot manage it."
7. Anti-icing has been shown to allow agencies to achieve their desired levels of service using about a quarter of the salt that a more traditional de-icing operational strategy requires to achieve the same levels of service (i.e. as much as a 75% reduction in salt application totals). Accordingly, agencies must develop a plan with clearly delineated milestones for the implementation of anti-icing in their agency.
8. All employees involved in winter maintenance operations must undergo annual training in best practices in the use of road salt in such operations. Annual training in snow and ice management is required under the State MS4 permit.

4.2.3.2. Status Review of Winter Road Management Best Practices Adoption

DRSCW periodically prepares and administers questionnaires to member communities the summarize their salting practices, including salt storage, equipment calibration, utilization of deicing, anti-Icing, pre-wetting, and deicing agents, road temperature data collection, and application rates. The DRSCW typically sends this questionnaire to all agencies responsible for winter transportation management in the Upper DuPage River and Salt Creek watersheds (County DOTs, Municipal Public Works, Township Highway Departments, Illinois Tollway, and Illinois DOT). At the time of this report, a new questionnaire is in progress. The most recent historical survey was conducted by DRSCW in 2016. DRSCW maintains these historical records[116] and will collect the results of the survey in process.

4.2.4. PAH Reduction Strategies

As described in section 3.7.4. Polycyclic Aromatic Hydrocarbons (PAH), polycyclic aromatic hydrocarbons (PAHs) have documented negative effects on aquatic life. Given the high levels of PAHs observed in Salt Creek's sediments and the known impacts on aquatic life, the following actions are recommended:

- Encourage municipalities to sign onto the DRSCW MOU
- Encourage home rule municipalities to ban the use of coal tar-based sealants within their jurisdiction
- Encourage homeowners to use asphalt-based or other non-coal tar-based sealants
- Encourage institutions (hospitals, school districts, churches) to use asphalt-based or other non-coal tar-based sealants

[116] https://drscw.org/activities/project-identification-and-prioritization-system/

4.2.5. Other Source Reduction Strategies

In 2021, the DRSCW and permit holders in the Salt Creek and DuPage River Basins, as part of their Illinois NPDES permit, evaluated the impact of area street sweeping and leaf litter management practices on non-point source loadings of total phosphorous (TP). This analysis sought to quantify phosphorous capture by current street sweeping and leaf litter removal practices, and then make recommendations on how such practices might be expanded or optimized.

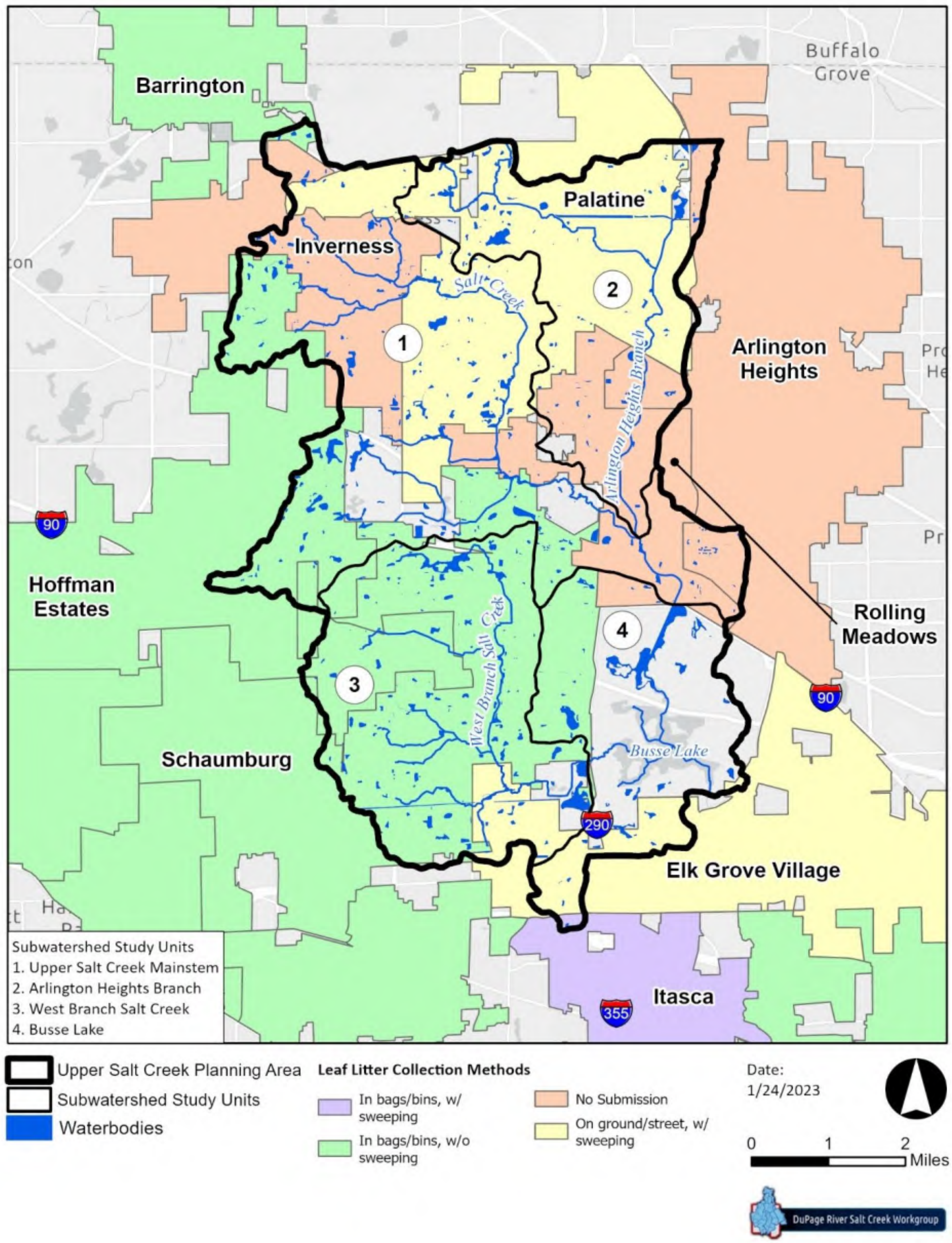
A survey was sent to 75 municipalities, 16 townships, and 4 agencies (95 total) to collect data on current leaf litter collection and street sweeping practices. 48 municipalities, 6 townships, and 1 agency responded (55 total). The jurisdiction of the responding agencies accounts for 77% of the watershed area. 51 of the 55 respondents maintain a street sweeping program, with 60% increasing sweeping frequency in the fall when leaf litter and subsequent TP loading is highest. All 48 municipalities and 2 townships maintain leaf litter collection programs, although through varying methods of collection. Additional information in the survey includes curb mile distances and types, type of street sweeping equipment, public education, schedule modifications, and catch basin cleanout practices.

Within the Upper Salt Creek watershed, 6 of the 10 municipalities responded. All 6 agencies operate a street sweeping program although only 3 operate a leaf litter removal service. 5 of the 6 agencies increase street sweeping frequency in the fall on account of leaf litter.

In addition to the survey data, the DRSCW obtained a GIS dataset of high-resolution canopy coverage developed by the Spatial Analysis Laboratory (SAL) of the University of Vermont with the assistance of The Morton Arboretum. This data was used in conjunction with right of way (ROW) data to develop a metric called Effective Canopy Cover (ECC). ECC was used to identify areas of high leaf litter burden upon roadways where TP loading to storm sewers would be highest. This enabled the DRSCW to make community specific recommendations on how to prioritize leaf collection and street sweeping resources for the highest level of load reductions.

Within the Upper Salt Creek watershed, the majority of ROW is comprised within residential areas (63%) which also tend to have the highest levels of ECC (40%). Commercial and transportation/communication/utility land uses are the second most prevalent (11.5 and 8.6%) with open space (5.6%), industrial (4.6%), institutional (3.2%), and other (2.9%) making up the remainder. Of note is agricultural land which makes up 0.2% of ROW area but has a fairly high ECC of 14%. The percentage of land use in each type is fairly representative of the entire DuPage River/Salt Creek watershed as a whole, varying by less than 4% at the most disparate land use type. However, ECC values are higher in the Upper Salt Creek than the watershed wide average in every category, indicating more canopy cover and a higher contribution of non-point Total Phosphorus inputs into the watershed.

Figure 81. Leaf Litter Collection Methods in the in the Upper Salt Creek planning area



4.2.6. Watershed-wide Urban Stormwater Retrofit BMP Scenarios

Stakeholders were asked to submit site-specific projects that align with the goals of this plan, which are discussed further in Section 4.2.7. Site-Specific BMPs. Typical unit costs were derived from resources[117] and applicable project cost estimations and utilized to estimate the planning-level cost of implementing BMPs. As many opportunities for project identification and implementation have not yet developed, a list of BMPs was derived to estimate the potential load reductions from urban retrofit practices implemented in the planning area, as shown in Table 66. These BMP types and implementation distributions are estimates, can be used as targets, and are designed to be prescribed in locations as stakeholders find appropriate. The scenarios modeled treat 20% to 38% of the planning area. The percent of each subwatershed's land area to be treated by each BMP was determined by land use assessments, GIS analyses, and other regional watershed plans. These BMP types and distributions were used to model pollutant load reductions in the planning area. A GIS analysis was used to derive assumptions for design drainage area ratios and contributing land uses to these projects. Appendix G includes Watershed-wide urban stormwater infrastructure retrofit BMPs with pollutant load reduction and planning-level implementation cost estimates by subwatershed.

Table 65. Assumed planning-level unit costs for select BMPs

BMP List	Unit Cost	Unit
Bioretention/Bioinfiltration Facility	$47	sq ft
Bioswale	$28	sq ft
Porous & Permeable Pavements	$35	sq ft
Detention Basin Retrofit	$37	sq ft
Green Roof	$14	sq ft
Oil & Grit Separator	$9,400	#
Infiltration Trench	$60	sq ft
Native Buffer	$2	sq ft
Tree Box Filter	$17,520	#
Denitrifying Bioreactor	$35,040	#
Saturated Buffer	$2,340	#
Prairie Restoration	$2,920	ac
Wetland Restoration	$12,270	ac
Riparian Corridor Restoration (miles)*	$252	lf

[117] Eskin et al. (2021). A Design Guide for Green Stormwater Infrastructure Best management Practices
The Water Research Foundation et al. (2018). Urban BMP Cost Database (V. 1.0).
Geosyntec Consultants (2019). Estimated Load Reductions from Implementation of Best Management Practices in the Mill Creek Watershed.
Chicago Metropolitan Agency for Planning (2018). Lower Salt Creek Watershed-based Plan. Cost estimates from DuPage County Stormwater Management.

Table 66. Urban stormwater retrofit BMP distributions, design drainage area ratio, and BMP removal rates

BMP Type	% Subwatershed Treated	Design Drainage Area Ratio	Removal Rate			
			N	P	BOD	TSS
Bioretention/Bioinfiltration Facility	2-4%	30:1	43%	81%	60%	78%
Bioswale	2-4%	4:1	8%	18%	0%	48%
Porous & Permeable Pavements	2-5%	10:1	0%	40%	0%	80%
Detention Basin Retrofit	2-7%	50:1	55%	69%	63%	86%
Green Roof	1-3%	1:1	25%	25%	0%	72%
Oil & Grit Separator	1-2%	5:1	5%	5%	0%	15%
Infiltration Trench	2-3%	50:1	55%	60%	0%	75%
Native Buffer	1-3%	$L^2/3$	19%	52%	0%	52%
Tree Box Filter	1-3%	5:1	15%	15%	10%	99%
Denitrifying Bioreactor	1-2%	40:1	30%	0%	0%	0%
Saturated Buffer	1-2%	25:1	42%	20%	0%	10%
Prairie Restoration	0-2%	2:1	73%	82%	50%	10%
Wetland Restoration	1-2%	10:1	24%	48%	60%	72%
Riparian Corridor Restoration (miles)*	1-3%	ND	50%	50%	50%	50%
Total	*20-38%*					

*not included in Totals

Table 67. Summary of pollutant load reduction and planning-level implementation cost estimates for the watershed-wide urban stormwater retrofit BMPs, by subwatershed

Subwatershed	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sed. Reduction (ton/yr)	Estimated Cost ($)
Upper Salt Creek Mainstem	7,029	1,624	12,959	372	$389,038,100
Arlington Heights	5,673	1,269	13,117	279	$295,146,781
West Branch Salt Creek	6,545	1,480	18,275	315	$259,423,800
Busse Lake	3,408	752	8,334	134	$94,968,405
Total	*22,655*	*5,125*	*52,684*	*1,101*	*$1,038,577,085*

4.2.7. Site-Specific BMPs

Eighteen (18) potential site-specific best management practice (BMP) projects were identified throughout the Upper Salt Creek planning area by stakeholders. This initial list was supplemented with additional site-specific projects derived from the water resources inventory (Figure 85, Appendix D – Site-specific BMPs with Associated Landowners, Potential Partners and Timeframe, and Estimated Quantities and Planning Level Costs). An online web map, utilizing ESRI's ArcGIS Online interface, was created to collect site-specific potential projects from the stakeholder group. In addition, an in-person meeting was held at FPCC's Ned Brown Preserve (Busse Woods), in which paper maps were provided to markup over conversations between stakeholders and the planning team.

The following paragraphs highlight a few of the site-specific projects identified by the stakeholders throughout the planning process:

Lake Park Estates subdivision, in unincorporated Palatine Township, is bisected by a tributary of the Arlington Heights, and includes an on-line stormwater facility. The Palatine Lake Park Estates Home Owners Association expressed interest in pursuing a project to address streambank and shoreline erosion and sedimentation in the on-line facility. Bank stabilization, buffer installation, facility retrofits, and installation of BMPs may be included in the project.

Figure 82. Lake Park Estates Subdivision

Virginia Lake Estates Property Owners Association is active in monitoring and managing their resource. Once an active member of the VLMP since 1987, this group continues to monitor the lake following the program suspension. Once a borrow pit for construction of adjacent roadways, this waterbody does not have public access, and therefore was not accessible as part of the Water Resources Inventory portion of this plan. In conversations with CMAP, as part of the planning process, this resource was identified as a potential location for a variety of management activities focused on improving water quality. Potential projects and activities included aquatic plant management, including native buffer improvements, expanded and enhanced monitoring, and a phosphorus inactivation feasibility study and subsequent execution if determined practical.

Figure 83. Virginia Lake Historical Aerial Imagery, 1939 (left) and 2021 (right)

The City of Rolling Meadows identified multiple potential projects throughout the planning process that would further water quality and management goals of this plan. Their vision for periodic improvements in their municipality included a multi-pronged approach of targeting multiple improvements during project development. For example, enhancing public access and repairing streambanks as part of replacing aging infrastructure and engaging in outreach efforts as part of stabilizing streambanks. Potential future opportunities may include:

- Enhancing stormwater systems and installing urban-focused BMPs as part of potential future redevelopment of an industrial complex northwest of Arlington International Racecourse
- Incorporation of BMPs and enhanced stormwater management as part of potential future redevelopment of Arlington International Racecourse
- Engagement of riparian residents, development of educational campaigns and programmatic management, and bank stabilization throughout the Arlington Heights Branch
- Improving access, stabilizing banks, and riparian enhancements as part of frontage road bridge improvements
- Shoreline stabilization, bank improvements, and engagement of the community and students at and near Rolling Meadows High School
- Mitigating localized flooding, installing BMPs, and improving stormwater systems in the vicinity of Elizabeth Place

MWRD's extensive system of flood control systems and facilities offer opportunities for various improvements to improve water quality and increase storage. Among other broad-based strategies, potential future projects in the planning area include BMP installation, flood storage expansion, and sediment removal at Twin Lakes (Lake Irene and Doughnut Lake), Peregrine Lake and in the vicinity of the Renaissance Convention Center.

FPCC has expressed interest in improvements at Busse Woods, namely associated with Busse Lake. This site offers many opportunities for natural areas improvements, including, but certainly not limited to:

- channel restoration
- habitat improvements
- enhancing management for more native and diverse aquatic plant species
- enhancing native vegetative communities
- removing sediment from the system
- installation of BMPs in and adjacent to parking facilities and picnic areas
- public access improvements

Figure 84. Busse Woods Canoe Launch

Categories were derived to better classify the potential projects, which include Hydrologic, Nutrient, Urban, and Other. Hydrologic BMPs primarily include streambank and shoreline restoration and stabilization but also reflect flood protection and conveyance improvements. Nutrient projects include improved aquatic plant management, general water quality improvements, and potential nutrient inactivation projects. Urban BMPs are comprised of retrofitting detention basins, primarily lengthening flowpaths (primarily in short-circuiting detention basins), improving and expanding native buffers, and restoring and creating wetlands in more urban areas. Other BMP types include education and outreach activities and monitoring.

Building upon the existing conditions pollutant loading model, USEPA's STEPL model was utilized to estimate the potential pollutant load reductions for the proposed site-specific BMPs where enough project information was provided by the submitters or was quantified by the water resources inventory. Model assumptions were made to best capture the potential impact of BMP implementation. Model limitations include the inability to quantify impacts of certain BMPs, including education and outreach activities, water quality studies, and monitoring efforts. Cost estimations were derived in the same manner as the watershed-wide BMPs.

Figure 85. Site-specific BMP opportunities as identified by stakeholders and utilizing the water resources inventory

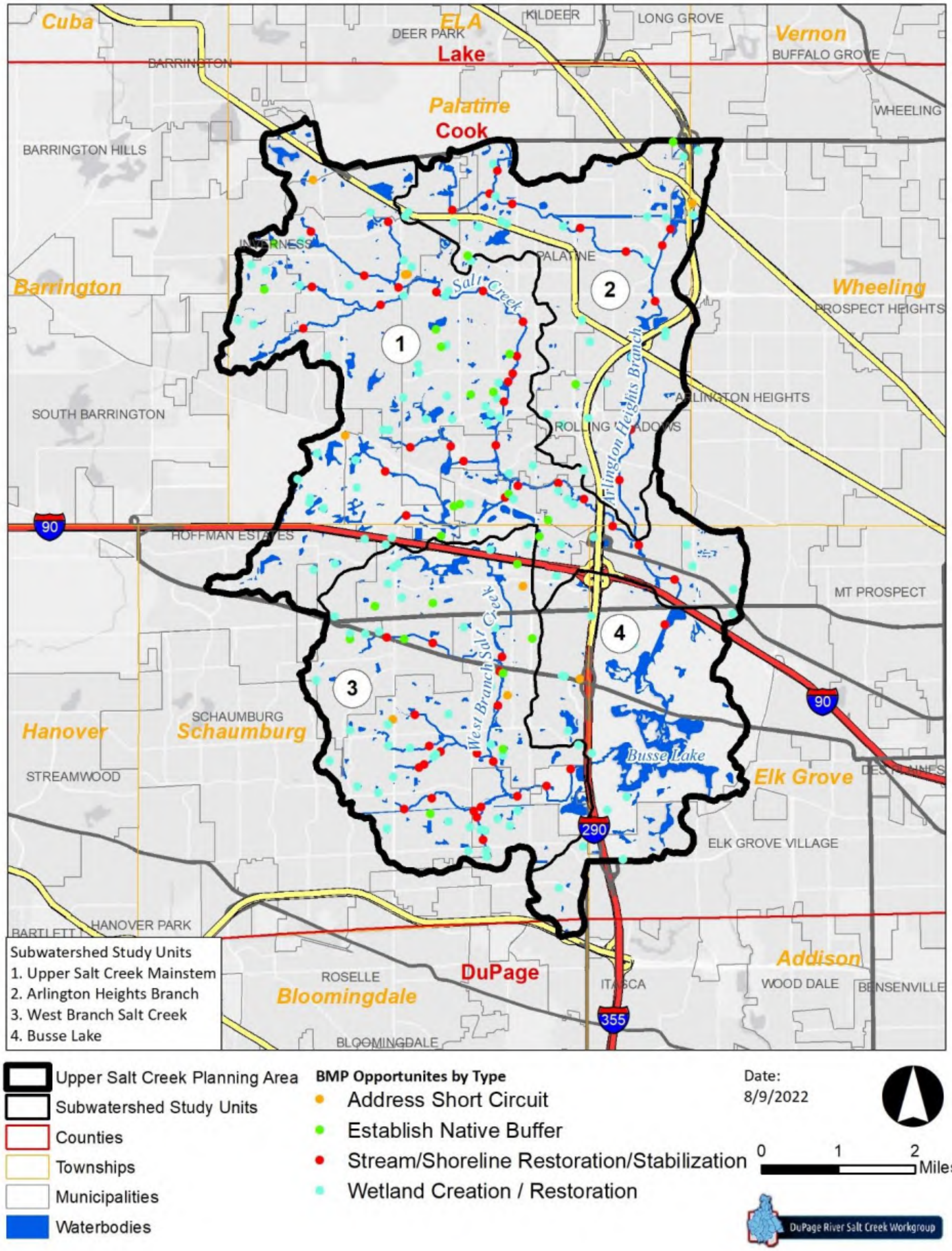


Table 68. Summary of pollutant load reduction and planning-level implementation cost estimates for the site-specific BMPs, by subwatershed

Subwatershed	# of BMPs Modeled	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sediment Reduction (ton/yr)	Estimated Cost ($)
Upper Salt Creek Mainstem	105	3,034	989	18,974	161	$18,215,189
Arlington Heights	43	1,394	418	10,954	79	$13,688,884
West Branch Salt Creek	76	1,442	403	11,068	80	$11,092,369
Busse Lake	13	752	238	5,523	44	$1,761,006
Total	*237*	*6,622*	*2,048*	*46,519*	*364*	*$44,757,448*

4.2.8. Summary of Watershed-wide and Site-Specific BMP Implementation Projects

Waterside-wide (WW) and site-specific (SS) BMP types identified in this plan are compiled in Table 69 below. Aggregate associated pollutant load reductions and cumulative implementation cost estimates are also summarized.

The proposed conditions modeling shows that there is opportunity to significantly reduce pollutant loading in the planning area. Costs associated with implementing these BMPs and achieving these load reductions are substantial. The importance of restoring natural areas and redeveloping with these goals in mind, must be guided by effective planning, policy and code development. Preservation and protection of these valuable natural areas and water resources prior to land development can minimize incurring additional costs.

Table 69. Summary of site specific and watershed-wide BMP implementation projects estimated pollutant load reduction and implementation costs, by BMP type

BMP Type	Scenario	Estimated Quantity	Unit	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sediment Reduction (ton/yr)	Estimated Cost ($)
Address Short Circuit	SS	25.9	ac	204	46	1,502	14	$318,193
Bioretention/ Bioinfiltration Facility	WW	30.5	ac	3,178	923	15,762	135	$62,443,260
Bioswale	WW	241.3	ac	623	230	0	89	$294,247,800
Porous & Permeable Pavements	WW	122.2	ac	0	625	0	181	$186,306,120
Detention Basin Retrofit	WW	26.8	ac	6,035	1,137	25,077	217	$43,258,565

BMP Type	Scenario	Estimated Quantity	Unit	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sediment Reduction (ton/yr)	Estimated Cost ($)
Green Roof	WW	649.0	ac	885	138	0	53	$395,786,160
Oil & Grit Separator	WW	98	#	191	27	0	13	$921,200
Infiltration Trench	WW	18.0	ac	4,328	785	0	141	$46,992,528
Native Buffer	SS	25.5	ac	421	186	0	28	$2,217,815
Native Buffer	WW	43.1	ac	1,210	528	0	78	$3,758,255
Tree Box Filter	WW	158	#	821	126	2,050	123	$2,768,160
Denitrifying Bioreactor	WW	30	#	1,435	0	0	0	$1,051,200
Saturated Buffer	WW	39	#	2,027	155	0	11	$91,260
Prairie Restoration	WW	111.5	ac	1,123	192	2,407	4	$325,580
Wetland Creation/ Restoration	SS	239.3	ac	5,131	1,482	43,286	322	$2,936,145
Wetland Creation/ Restoration	WW	51.1	ac	800	259	7,387	56	$626,997
Riparian Corridor Restoration	SS	6.9	mi	865	333	1,731	0	$9,111,312
			Total	*29,277*	*7,173*	*99,203*	*1,465*	*$1,053,160,550*

Notes: SS = site specific, WW = watershed-wide

4.2.9. Summary of Pollutant Loads and Potential BMP Pollutant Load Reductions

Table 70 reports the nitrogen, phosphorus, biological oxygen demand (BOD), and sediment pollutant loadings modeled in the existing condition. This table also includes the pollutant load reductions potentially realized from implementation of the watershed-wide and site-specific BMPs identified in this plan. Results are also summarized as total percent reductions.

Table 70. Summary of pollutant loads and potential BMP load reductions

Pollutant Load	Nitrogen Load (lbs/yr)	Phosphorus Load (lbs/yr)	BOD Load (lbs/yr)	Sediment Load (t/yr)
Land use-based	208,355	33,635	773,635	4,873
Stream/shoreline Erosion	785	302	1,570	446
Total	*209,140*	*33,937*	*775,205*	*5,319*
BMP Load Reduction	**Nitrogen Reduction (lbs/yr)**	**Phosphorus Reduction (lbs/yr)**	**BOD Reduction (lbs/yr)**	**Sed. Reduction (t/yr)**
SS Urban SW retrofits	5,749	1,712	44,676	364
SS Streambank Stabilization	393	151	785	223
WW BMPs	23,316	5,122	52,637	1,100
Total	*29,458*	*6,986*	*98,098*	*1,686*
Pollutant Load after BMP Load Reduction	179,682	26,951	677,107	3,632
Percent Load Reduction	14.1%	20.6%	12.7%	31.7%

4.2.10. Priority Areas and Practices

Most of this watershed is substantially developed. Some of this development took place before the current extent of regulations that require stormwater practices, prescribe BMPs, and aim to protect some level of ecosystem function. The built-out nature of these areas support opportunistic and creative implementation of best practices included in this report, and those potentially not yet invented or widely prescribed. A primary focus of implementing these practices should be somewhat opportunistic; capitalizing on opportunities when redevelopment takes place. Similarly, retrofitting existing structures and supplementing existing systems with additional practices can help integrate more of these design features into more sites. The efficacy of these practices, with special emphasis on infiltration and detention basin retrofits, for nutrient removal and streamlined maintenance can introduce enhanced function to many existing areas.

Cumulatively, the Salt Creek Mainstem contributes the modeled most total nitrogen, total phosphorus, BOD, and sediment to the planning area. However, this is primarily due to the total size in comparison to the other subwatersheds. The Arlington Heights Branch subwatershed presented the modeled highest total nitrogen, total phosphorus, and BOD loading *per acre*. This area is comprised of primarily the eastern portion of Palatine, the northern portion of Rolling Meadows, and smaller portions of Arlington Heights and unincorporated Cook County. Spatially, the Arlington Heights Branch subwatershed should be an area of focus for plan implementation, as there may be the most opportunity to improve loading conditions. That being said, potential impact can vary greatly and should be assessed on a project-by-project basis.

Modeled sediment loading suggests that the majority of sediment is generated in the three contributing subwatersheds to the Busse Lake subwatershed. Levels of moderate and high streambank and shoreline erosion were documented primarily in these three subwatersheds, which is a likely driver of the model results. Due to the direct connection of on-line features and streambanks to the concentrated flows of the main tributaries and branches in the system, and the level of erosion observed, addressing erosion in these locations should be prioritized. If left unchecked, progressive erosion in these locations can potentially threaten infrastructure and continue contributing to sediment loads.

4.3. Public Information, Education, and Outreach

Many of the watershed impairments are due to historical and present human activities. The best practices discussed to reduce and limit these impairments are also human action oriented. Improved education about the impacts of land use decisions can help collectively expand better choices and implementation of watershed plan components.

Watershed restoration and protection necessitates community buy-in and support. Educating residents, businesses and organizations, and users about their watershed is a fundamental component to increase engagement and action. Education opens the door to further develop deep connections between people and their communities, including the landscapes around them.

Developing tools for education and outreach help the community understand their impacts to the watershed and encourage diverse collaborations to develop and implement solutions. Adoption of BMPs, whether by municipalities, districts, neighborhoods, or individual homeowners, can set precedent and motivate others to make changes to collectively improve water quality and the overall watershed system. Continuing to share a vision, building more partnerships to share stories, and discussing tools and resources will better outfit planning area entities to work towards plan implementation.

Many different avenues of education and outreach should be pursued concurrently. The subsections below offer recommendations for target audiences, priority topics, potential outreach activities, and partners to help implement these actions. Implementation of these activities should be tailored as appropriate to each audience and opportunity.

4.3.1. Resources for Watershed Information and Education Outreach Campaigns

Tremendous research has been conducted, producing resources that can assist in developing a watershed information and education outreach campaign. USEPA's *Getting in Step: a Guide for Conducting Watershed Outreach Campaigns*[118] and *Guidance for Watershed Action Plans in Illinois*[119], produced by CMAP and IEPA are two such recommended resources.

Although many nationwide organizations are suited to provide resources, including the Center for Watershed Protection and Center for Neighborhood Technology, local organizations can provide more tailored resources and opportunities that are more accessible and specific to watershed users. Some of these local organizations that provide information and outreach materials, support volunteer opportunities, amongst other activities include:

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[118] https://cfpub.epa.gov/npstbx/files/getnstepguide.pdf Accessed October 25, 2022.

[119] https://www2.illinois.gov/epa/topics/water-quality/watershed-management/documents/watershed-action-plan-guidance.pdf Accessed October 25, 2022.

- The Conservation Foundation
- DuPage River Salt Creek Workgroup
- Chicago Metropolitan Agency for Planning
- Metropolitan Water Reclamation District of Greater Chicago
- Salt Creek Watershed Network
- Salt Smart Collaborative
- Chicago Wilderness
- Environmental Education Association of Illinois
- Illinois Department of Natural Resources
- Forest Preserve District of Cook County
- University of Illinois Extension
- School & Community Assistance for Recycling and Composting Education (SCARCE)
- Environment and Nature Training Institute for Conservation Education (ENTICE)
- Chicago Zoological Society
- Sierra Club, IL Chapter and North Cook Chapter
- Illinois Paddling Council
- Kane-DuPage Soil and Water Conservation District
- North-Cook Soil and Water Conservation District

Figure 86. The Conservation Foundation's Conservation@Home Program signage for DuPage County. Program provided by in Cook County through a partnership between the Forest Preserves of Cook County and the University of Illinois Extension.

4.3.2. Tools to Conduct a Successful Outreach Campaign[120]

4.3.2.1. Establishing a Sense of Place

Connection to a place is enhanced when a person knows when they are in that place and why it is unique and important. This sense of connection fosters a need to protect and share these special places. Many sites exist in the Upper Salt Creek planning area including rich and rare ecosystems and scenic landscapes, like those at the Paul Douglas Preserve and Wilke Marsh and beloved community resources, like the Spring Valley Nature Center and Heritage Farm and the Ned Brown Preserve. Outreach activities should be designed to help build and grow a sense of place among community members and visitors.

4.3.2.2. Identifying and Understanding the Audience

Identifying the targeted audience(s) based on their role in implementing aspects of the watershed plan is an essential first step in conducting a successful outreach campaign. Once identified, targeted audiences should be broken down into the smallest segment possible to achieve the best results. Messaging should be created that resonates with the targeted audience and inspires them to act. Targeted audiences for future outreach campaigns include the following:

- Volunteers: residents, environmental organizations interested in managing water resources within the watershed.

[120] This section is adapted from the Lower Salt Creek Watershed-Based Plan, 2017

- Residents and Landowners: residents, homeowners associations (HOAs), businesses, institutions, civic organizations.
- Government officials and agencies: municipalities, townships, counties, forest preserve and conservation districts, park districts, schools, library districts, drainage districts.
- Land and resource managers and organizations: environmental organizations, HOAs, lake management associations, business and institutional facility managers, nurseries, agricultural producers, environmental organizations, special interest groups.
- Developers: contractors, consultants, developers, and homebuilders working in the watershed.
- Students: primary and secondary schools in the planning area.

Knowing some information about the target audience(s) is essential. Campaign audiences have varied values and beliefs, and they will not necessarily be the same as those implementing the watershed plan. The following is a list of a few questions that are important to know about the target audience(s), before education and outreach activities begin:

- What does the audience know already?
- What are their existing beliefs and perceptions?
- How does the audience best receive messages and information?
- What will make the audience consider changing their behavior?

To create a successful education and outreach campaign, it is necessary to understand the audience(s). What causes the audience to engage in the behaviors we want to change? How can we most effectively convey that message to them? How can we motivate the audience(s) to change? The understanding of the audience can be completed at the same time or subsequent to identifying the audience(s). Open discussions with partner organizations, surveys, focus groups, and even simple observations can lead to a greater understanding of the audience and a successful campaign.

4.3.2.3. Setting Outreach Priorities for Targeted Audiences

Once the targeted audience has been identified and understood, outreach priorities and activities for targeted audiences should be identified. These should directly support this watershed plan's goals thereby aiding successful plan implementation. Stakeholders identified the following goals, which serve as priority topics for education and outreach activities.

- Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.
- Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.
- Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.
- Continue to build, strengthen, and support local partnerships and expertise to protect streams, lakes, and wetlands via plan implementation.
- Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.

4.3.2.4. Choosing Message Formats and Delivery Methods

There are many communication tools to help support successful outreach campaigns. Each may be customized to support the education effort and help foster relationships and a sense of community, build understanding, and motivate people to action. The following toolbox identifies some of these strategies:

Printed	**Electronic**	**Visuals**	**Events**	**Other**
• Brochures • Posters • Flyers • Mail surveys • Fact sheets • Manuals & technical resources • News releases • Newsletters • Bumper stickers • Promotional items	• Websites • Social media • Bulletin boards • Watershed wikis • Web syndications (podcasts, RSS feeds) • Public service announcements (TV, radio)	• Signage • Exhibits • Demonstration projects • Bulletin boards • Presentations • Storm drain stenciling	• Focus groups • Field trips • Classes • Cleanup events • Restoration field days • Hands on events • Public hearings & meetings	• DRSCW • SCWN • Partnerships • Cooperative agreements • Local ordinances • Comprehensive plans

Costs to implement these various strategies included above may vary greatly. To provide support for potential costs, the following examples of activities and their associated costs are included below:

- Development of a seasonal campaign[121] (includes 6-8 blog posts, 9-12 social media posts, 2 posters, 1-2 graphics, 1-2 videos/webinars): $8,000-10,000
- Preparation time, travel, and presentation to a stakeholder group, elected official, or school group (assuming local travel), approximately $1,000
- Conducting a survey and reporting the results (similar to the Non-point Source Phosphorous Reduction Feasibility Analysis recently completed by the DRSCW, including survey development, survey administration, data analysis, GIS work, modeling, report writing), approximately $85,000
- Producing a technical guidance manual for residents, businesses, and stakeholders (assuming 75 pages of content, graphics, no preparation of hard copies) approximately $25,000
- Printing and mailing a quarterly newsletter (assuming non-profit status, 500 recipients), approximately $2,000 annually
- Magazine (similar to the TCF Heron, assuming 500 recipients), approximately $3500 for design and layout, $4 each to print
- Brochure printing (assuming tri-fold style, color printing, low quantity, not including design), approximately $1.75 for 8.5-inch by 11-inch

[121] See https://ldpwatersheds.org/outreach/detention-basins/ for an example seasonal campaign

- Poster printing (not including design): approximately $25 for a foam core 8.5-inch by 11-inch and approximately $75 for a 24-inch by 36-inch
- SaltSmart Cups (assuming order size of 500-1000), approximately $0.60/cup, totaling $300-$600
- Signs, Dispensers, and Bags for Pet Waste Pick-Up Campaign (assuming 100 signs, 30 dispensers, and 6,000 bags), approximately $3,600
- Hosting a cleanup event or restoration workday (including planning, assuming shared hand tools, 2 paid employees, 4-6 hours), approximately $2,000

Figure 87. Sign and bag dispenser for Pet Waste Pick-Up Campaign

- Website Hosting/Design Fees, including general maintenance, security monitoring, and content changes/updates (assuming non-profit status and a multipage website, not including design), approximately $200/month

4.3.2.5. Selecting Program Activities for Targeted Audiences

Once the targeted audience has been identified and outreach priorities, messages, and delivery formats determined, an outreach strategy should be developed. It should include priority topics, targeted audiences, vehicles to communicate the messages, and potential partners to lead information and education outreach efforts. Several information and education opportunities to support each of this plan's goals are summarized in the following table.

Table 71. Existing and potential information and education opportunities for the Upper Salt Creek planning area

Targeted Audience	Existing and Potential Opportunities	Potential Partners
Goal: Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.		
• Volunteers	Conservation@Home[122] and Conservation@Work[123] encourages use of ecofriendly landscapes among landowners. The program recognizes the importance of native plants and their effect on water resources. TCF provides a detailed guide to making and maintaining rain gardens and rain barrel installation. They also sell discounted rain barrels year-round.	• DuPage: TCF • Cook: FPCC and University of Illinois Extension

[122] DuPage: https://www.theconservationfoundation.org/conservation-home/ Accessed October 26, 2022. and Cook: https://extension.illinois.edu/cook/conservationhome Accessed October 26, 2022.
[123] https://www.theconservationfoundation.org/conservation-home/conservation-at-work/ Accessed October 26, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
• Volunteers • Students	Increase citizen knowledge through the Illinois Volunteer Lake Monitoring Program (VLMP)[124]. Data used from the program is used to document water quality impacts to local lakes and aid in lake management decision-making.	• IEPA • CMAP
• Volunteers • Students	Through the Illinois River Watch Program[125], volunteers can become citizen scientists and conduct habitat and biological surveys on streams. The macroinvertebrates collected are used as bio-indicators of water quality.	• The National Great Rivers Research and Education Center
• Volunteers • Residents • Landowners • Businesses	The SCWN's website[126] includes educational resources about watersheds, and how residents, landowners and businesses can protect water systems.	• SCWN
• Volunteers • Residents • Landowners • Businesses	The Salt Smart Collaborative's website[127] includes educational resources about watersheds, and how residents, landowners and businesses can protect water systems.	• SCWN
• Volunteers • Residents • Landowners • Businesses	The DRSCW[128] is performing in a number of monitoring programs and remediation projects in order to protect the watershed. Some of their projects involve bioassessment, chlorides, DO, nutrient management, etc.	• DRSCW
• Residents • Landowners • Businesses	The WaterSense Program[129] promotes the need for water efficiency by offering alternatives to use less water with water efficient products.	• USEPA • Northwest Water Planning Alliance
• Volunteers	The DuPage County River Sweep is an annual self-coordinated stream cleanup and restoration event. The river sweep involves volunteers helping to clean up the rivers and streams by picking up garbage and debris in and along the local waterways and restoring nearby land back to its natural state.	• TCF • DuPage County
• Residents • Landowners	DuPage County Water Quality Collector Web App[130] is an online citizen reporting tool that allows residents, landowners, and businesses to document various waterway	• DuPage County Stormwater Management

[124] https://www2.illinois.gov/epa/topics/water-quality/monitoring/vlmp/Pages/default.aspx Accessed October 26, 2022. All three tiers of the VLMP were suspended in 2019 and will remain suspended until the Agency determines if the program can be reinstated.
[125] http://www.ngrrec.org/Riverwatch/ Accessed October 26, 2022.
[126] http://www.saltcreekwatershed.org/ Accessed October 26, 2022.
[127] https://saltsmart.org/ Accessed October 26, 2022.
[128] https://drscw.org/ Accessed October 26, 2022.
[129] https://www.epa.gov/watersense Accessed October 26, 2022.
[130] https://gis.dupageco.org/citizenreporter/#:~:text=If%20you%20have%20an%20immediate,org%20or%20your%20local%20municipality Accessed December 27, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
• Businesses	issues in the area. Some of the reported issues include stream blockage, streambank erosion, sediment and water quality issues. The web app tool documents the reported issues and informs the county about the issues.	
• Volunteers • Residents • Landowners • Businesses • Land Resource Managers	MWRD's Small Streams Maintenance Program[131] allows people to report obstructions and debris in waterways. MWRD's field crews then work to clear these areas to relieve and prevent flooding. This program has collectively removed 11,909 cubic yards of debris from Upper Salt Creek from 2007-2021!	• MWRD
• Residents • Landowners • Businesses	DuPage County Stormwater Management's website[132] provides a number of educational resources that have been developed to protect the quality of groundwater and conserve water.	• DuPage County Stormwater Management
Goal: Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.		
• Residents • Landowners • Businesses	The FPCC[133] seeks to protect, restore, and expand natural areas within the County. The FPCC offers a number of education and special events aimed at its mission, and owns or manages numerous natural areas. The FPCC partners with the Chicago Zoological Society[134] to conduct plant and animal species conservation efforts.	• FPCC • Chicago Zoological Society (Brookfield Zoo)
• Residents • Landowners • Businesses	The FPDDC[135] seeks to protect, restore, and expand natural areas within the DuPage County. The FPDDC offers a number of education and special events aimed at its mission, and owns or manages numerous natural areas.	• FPDDC
Goal: Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.		
• Residents • Landowners • Government Officials • Government Agencies	Meetings, local government websites, school websites, newsletters, email blasts, workshops, demonstration projects, public meetings, streambank and shoreline assessments	• Elected Officials • Park & Forest Preserve Districts • Non-Profit Groups • Landscape Contractors • HOAs

131 https://mwrd.org/small-streams-maintenance-program Accessed October 26, 2022.
132 https://www.dupagecounty.gov/swm/ Accessed October 26, 2022.
133 https://fpdcc.com/ Accessed October 26, 2022.
134 https://www.czs.org/Chicago-Zoological-Society/Home.aspx Accessed October 26, 2022.
135 https://www.dupageforest.org/ Accessed October 26, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
• Government Officials • Government Agencies	Develop a regional floodplain management plan. Potential benefits of the plan include: reduction of flood damage costs to communities; improvement of riparian vegetation, wildlife habitat and water quality; retention of natural beauty in the area.	• FEMA
• Government Officials • Government Agencies	Develop a local stormwater or floodplain management plan. Potential benefits of the plan include: reduction of flood damage costs to communities; improvement of riparian vegetation, wildlife habitat and water quality; retention of natural beauty in the area.	• DuPage County • Cook County • MWRD • Municipalities
• Government Officials • Government Agencies	Village newsletters may be used by local governments to tie the educational component of their MS4 program to this watershed plan and its implementation such that collaborative efforts might benefit from a consistent message and efficiencies to be gained from cooperation.	• Elected Officials • IEPA
• Volunteers • Residents • Landowners • Government Officials • Government Agencies • Land Resource Managers • Developers	Targeted mailings, county/municipal websites, home owner's association workshops, handouts at permit facilities, local codes, ordinances	• Elected Officials • DuPage County • Cook County • MWRD • CMAP
Goal: Continue to build, strengthen, and support local partnerships and expertise to protect our streams and lakes via plan implementation.		
• Government Officials • Government Agencies • Land Resource Managers • Non-Profit Organizations	CMAP's Local Technical Assistance (LTA) Program[136] provides assistance to local governments, nonprofits, and intergovernmental organizations to address sustainable development.	• CMAP
• Government Officials	Municipal/Technical Training in the form of a variety of workshops that teach BMPs for stormwater management and stream restoration.	• TCF

[136] https://www.cmap.illinois.gov/programs/lta?saveLastPath=0&_58_struts_action=%25252Flogin%25252Flogin Accessed October 26, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
• Government Agencies		• DuPage County Stormwater Management
• Volunteers • Residents • Students	SCARCE[137] is a non-profit in DuPage County that focuses on providing hands-on environmental education programs for schools and organizations. SCARCE also hosts several community-wide events focused on public outreach about environmental stewardship and sustainability. SCARCE offers a program that teaches K-12 students about the 'Enviroscape Watershed Model' that identifies point and NPS pollution.	• School & Community Assistance for Recycling and Composting Education (SCARCE)
• Volunteers • Residents • Students	Environmental and nature related professional development training/workshops that provide educators information about natural resources, as well as supplement materials and instructional methods to incorporate into lessons with students. The trainings/ workshops are meant to promote stewardship of natural resources.	• Environment and Nature Training Institute for Conservation Education (ENTICE) • IDNR Division of Education
• Volunteers • Residents • Students	Zoo Adventure Passport (ZAP!)[138] is a free program offered through the Brookfield Zoo that gives families with young children the opportunity to explore the natural world through hands-on, real-life learning experiences.	• Chicago Zoological Society (Brookfield Zoo) • Chicago Public Library
• Volunteers • Residents • Students	The Mighty Acorns® program[139] incorporates classroom curriculum, hands-on restoration activities and exploration as it seeks to provide children with multiple, meaningful, sustained interactions with the land. Classes adopt a natural area in their community and visit it throughout the school year in order to participate in stewardship activities. Each field trip is preceded by a classroom lesson on related ecological concepts.	• TCF
• Volunteers • Residents • Students	The Kane-DuPage Soil & Water Conservation District (SWCD)[140] provides several outreach programs for K- 12 classrooms, home schools, and boy/girl scout groups. Programs are interdisciplinary, aligned to the state learning standards, and can be designed to meet the needs of	• Kane-DuPage SWCD

[137] https://www.scarce.org/ Accessed October 26, 2022.
[138] https://www.czs.org/earlylearners Accessed October 26, 2022.
[139] https://www.theconservationfoundation.org/educating-empowering/youth/mighty-acorns-program/ Accessed October 26, 2022.
[140] https://kanedupageswcd.org/kd/ Accessed October 26, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
	classroom curriculum. Possible outreach program topics include, but are not limited to, changing landscapes, land and water conservation, soils, trees, and stewardship.	
• Volunteers • Residents • Students	The North Cook Soil & Water Conservation District (SWCD)[141] provides youth workshops and stewardship opportunities.	• North Cook SWCD
• Volunteers	Water Sentinels[142] is a Sierra Club program that deals with water related issues across the country. The program explores the ways in which waterways are impacted by pollution, climate, and development, while also actively working to empower local activists with accurate information and training them in water-quality monitoring techniques and grassroots advocacy.	• Sierra Club
• Volunteers	Illinois Water Trailkeepers[143] of the Illinois Paddling Council take on a stewardship responsibility with paddleable waterways in Illinois. The Trailkeepers monitor and maintain several water bodies in the state, including the Des Plaines River and Salt Creek. They perform the needed stewardship tasks specific to each body of water.	• Illinois Paddling Council
Goal: Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.		
• Students • Residents • Landowners • Government Officials • Government Agencies	Print, Electronic, Visuals, Events, and other tools (see table in Section 4.3.2.4. Choosing Message Formats and Delivery Methods)	• Municipalities • Townships • Library Districts • Park & Forest Preserve Districts • Primary & Secondary Schools • SWCDs • CMAP • TCF • SCARCE
• Residents • Landowners • Businesses	Storm Drain Stenciling is a social marketing technique used to educate and remind the public not to dump waste into storm drains in order to avoid runoff and to help keep our waterways clean.	• TCF • SCARCE • Residents • HOAs

141 https://www.northcookswcd.org/nc/ Accessed October 26, 2022.
142 https://www.sierraclub.org/grassroots-network/water-sentinels Accessed October 26, 2022.
143 http://www.illinoispaddling.info/trailkeepers/ Accessed October 26, 2022.

Targeted Audience	Existing and Potential Opportunities	Potential Partners
		• School Groups • Scouting Groups • Church Groups • Service Organizations
• Students • Residents • Landowners • Government Officials • Government Agencies	Love Blue. Live Green. is a campaign that promotes the DuPage County mission to protect and enhance the quality of streams and rivers within the county. The social media campaign platforms provide updates, newsletters, and educational resources about local waterways, and how residents, landowners and businesses can protect them.	• DuPage County
• Schools • Businesses • Churches • Park Districts • Library Districts • Municipal Organizations • Non-Profit Organizations	The Water Quality Flag program[144] encourages schools, businesses, churches, etc. to participate in activities that promote water quality by providing a water quality flag when they complete two activities. Some of these activities include, but are not limited to, installing storm drain markers, planting rain gardens, and installing rain barrels. The water quality flag is both an incentive and a symbol of commitment to water quality.	• SCARCE • DuPage County
• Schools • Businesses • Churches • Park Districts • Library Districts • Municipal Organizations • Non-Profit Organizations	Picture Posts are wooden markers installed in natural areas that help guide visitors to photograph a location in different orientations at different times. Photos are dated, geotagged, uploaded, and shared to allow for environmental monitoring, as well as to increase public awareness of a site. Picture Posts are accessible to anyone, and are easy to install, use and maintain.	• DuPage County • Cook County • Municipalities • Park & Forest Preserve Districts

4.3.3. Recommendation for Public Information, Education, and Outreach

Recommendations for public information, education, and outreach activities within and adjacent to the Upper Salt Creek planning area include the following practices, which have largely been adapted from the

[144] https://www.scarce.org/water-quality/ Accessed October 26, 2022.

Lower Salt Creek Watershed-based Plan to support continuity, introduce consistency, and reinforce both plans.

1. Local and regional organizations, predominantly those that are conservation-oriented, as well as local agencies and governments should promote the Upper Salt Creek Watershed-based Plan and its recommendations in either special or regularly occurring communications with members and residents. Special emphasis should be placed on reference to the Lower Salt Creek efforts and how these two documents work together for the downstream reaches.
2. DRSCW should issue a press release about the Upper Salt Creek Watershed-based Plan upon approval by IEPA.
3. County, township, and municipal governments should create a dialogue with neighborhood groups and/or HOAs to continue to raise awareness of stormwater management issues and responsibilities. Lake County Stormwater Management Commission recently hosted a similar workshop[145]. Potential partner organizations for collaboration include local conservation-oriented organizations, educators, and stormwater professionals.
4. County, township, and municipal governments should promote installation of rain gardens, rain barrels, pervious pavements, and other property-level green infrastructure practices. This can be done by educating and incentivizing HOAs and local businesses and collaborating with local conservation-oriented organizations, educators, and professionals. Tours of successful green infrastructure installments is a good wat to promote these practices.
5. Local governments and organizations should promote:
    a. Deicing BMP adoption and attendance at the Salt Smart Collaborative's workshops and training sessions by municipal applicators, homeowners, and winter maintenance professionals
    b. Leaf litter BMP implementation by homeowners and lawn maintenance professionals
    c. Installation of on-demand water softeners by homeowners and other private individuals and businesses,
    d. Responsible disposal of pet waste by pet owners
6. The Salt Smart Collaborative should continue to offer their workshops and training sessions and conduct campaigns to encourage participation and continued implementation.

4.4 Funding and Technical Assistance

Avenues for funding and technical assistance are crucial in supporting plan implementation. Table 72 includes programs and resources that may be used to assist with plan implementation.

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[145] https://www.lakecountyil.gov//3548/Homeowner-Best-Practices Accessed October 27, 2022.

Table 72. Funding and Technical Assistance Programs and Resources

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Section 319(h) Nonpoint Source Pollution Control Financial Assistance Program	IEPA	Up to 60% of eligible project costs; minimum 40% local match requirement in cash and/or in-kind services. No set limit on awards.	Any entity that has legal status to accept funds from the state of Illinois, incl. state & local gov'ts, nonprofit orgs, citizen & environmental groups, individuals, businesses.	Funds may be used for the development, update, and implementation of watershed-based management plans incl. the development of information/education programs and for the installation of BMPs	https://www2.illinois.gov/epa/topics/water-quality/watershed-management/nonpoint-sources/Pages/grants.aspx
Section 604(b) Water Quality Management Planning Grants	IEPA	Unknown	Regional public comprehensive planning organizations and other entities	Funds may be used to determine the nature, extent, and causes of point and nonpoint source water pollution; develop water quality management plans; develop technical and administrative guidance tools for water pollution control; develop preliminary designs for BMPs to address water quality problems; implement administrative water pollution controls; and educate the public about the impact and importance of water pollution control	https://www2.illinois.gov/epa/topics/water-quality/watershed-management/wqmp/Pages/grants.aspx

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Green Infrastructure Grant Opportunities Program (GIGO)	IEPA	Up to 75% of eligible project costs (85% if a disadvantaged area); $75,000 - $2,500,000 This is a reimbursement program. No more than 50% of the program total, per funding cycle, shall be allocated to any one applicant or project.	GIGO funds are available to any Grant Accountability and Transparency Act Pre-Qualified entity that has legal status to accept funds from the State. These include local watershed groups, land conservancies or trusts, public and private profit and nonprofit organizations and institutions, units government, universities and colleges, park districts and other local land managing agencies, soil and water conservation districts, and conservation organizations.	Reconnection of a stream with its floodplain; Treatment and flow control of stormwater runoff at sites directly upstream or downstream of an impervious area that currently impacts river, stream, or lake water quality through stormwater runoff discharge; and/or Treatment and flow control of water generated from impervious surfaces associated with urban development (such as roads and buildings). Projects include: Bioinfiltration, Retention/ Infiltration, Detention Pond Creation/Retrofit, Wetland Creation/ Modification, Floodplain Reconnection, Watershed-Wide Projects, Rainwater Harvesting, Downspout Disconnections, and BMP Design and Construction	https://www2.illinois.gov/epa/topics/grants-loans/water-financial-assistance/Pages/gigo.aspx

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Streambank Cleanup and Lakeshore Enhancement (SCALE)	IEPA	$3,500	Any entity eligible to receive funds from the state.	Provides funds to assist groups that have established a recurring stream or lakeshore cleanup.	https://www2.illinois.gov/epa/topics/water-quality/surface-water/scale/Pages/default.aspx
Open Space Lands Acquisition & Development (OSLAD) and Federal Land & Water Conservation Fund (LWCF)	IDNR	Up to 50% of approved costs Maximum $750k/ acquisition & $400k development	Local units of gov't	Acquisition and/or development of public outdoor recreation/ natural areas and facilities	https://www2.illinois.gov/dnr/grants/Pages/OpenSpaceLandsAquisitionDevelopment-Grant.aspx
Illinois Schoolyard Habitat Action Grant Program	IDNR	Up to $1k	Teachers, nature center personnel, & youth group leaders for pre-K through 12th grade students	Enhancing or establishing and maintaining a schoolyard habitat plot, butterfly garden, rain garden, wetland, nesting platform or watering station; designing/building a bird feeding station; and constructing/installing bat roosting boxes.	https://www2.illinois.gov/dnr/education/Pages/GrantsSHAG.aspx
Stream Bank Stabilization & Restoration Program	Illinois DOA; Kane-DuPage SWCD	When funding available. Cost share required.	Proposals must be sponsored by local SWCD	Streambank stabilization using vegetative or other bioengineering techniques	https://www2.illinois.gov/sites/agr/Resources/Conservation/Pages/default.aspx
Local Technical Assistance (LTA) Program	CMAP	Graduated local contribution requirement	Local gov'ts, nonprofits, inter-gov't organizations	Technical assistance is provided to address local issues incl. transportation, land use, housing, natural environment, economic growth and community development.	https://www.cmap.illinois.gov/programs/LTA

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Water Quality Improvement Program	DuPage County	Up to 25% reimbursement of project aspects with a water quality benefit	All DuPage County entities	Projects providing a regional water quality benefit, e.g., streambank stabilization, habitat improvements, riparian buffer rehabilitation, etc.	https://www.dupagecounty.gov/EDP/Stormwater_Management/Water_Quality/1312/
Stormwater Partnership Program	MWRD	Varies – see link for more detail	Local gov't entities within MWRD's service boundary	The program funds projects that address flooding and drainage concerns, utilizing a variety of traditional engineered solutions such as localized detention, upsizing critical storm sewers and culverts, pumping stations, and establishing drainage ways, alongside green infrastructure.	https://mwrd.org/stormwater-partnership-program
Voluntary Flood-Prone Property Acquisition	MWRD	Varies	Local gov't entities within MWRD's service boundary	Acquisition of flood-pone property to include the removal of structures and placement of deed restrictions to ensure the property remains as open space in perpetuity.	https://mwrd.org/flood-prone-property-acquisition
Clean Water State Revolving Fund (CWSRF)	USEPA with IEPA	Loan program	Local gov't, individuals, citizens (septic systems), not for-profit groups	Green projects, wastewater treatment, NPS, watershed management, restoration and protection of groundwater.	https://www.epa.gov/cwsrf
Drinking Water State Revolving Fund (DWSRF)	USEPA, with IEPA	Loan program	Local gov't, individuals, citizens (septic systems), not for-profit groups	Green projects, wastewater treatment, NPS, watershed management, restoration and protection of groundwater.	https://www.epa.gov/dwsrf

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Water Pollution Control Loan Program (WPCLP)	IEPA	Loan program	Typically local gov’	Wastewater infrastructure improvements and stormwater–related projects that benefit water quality [e.g., green infrastructure, water and energy efficiency improvements, other environmentally innovative activities as directed by federal law (see 33 U.S. code 1274)]	https://www2.illinois.gov/epa/topics/grants-loans/state-revolving-fund/Pages/default.aspx
Public Water Supply Loan Program (PWSLP)	IEPA	Loan program	Typically local gov’	Drinking water infrastructure improvements	https://www2.illinois.gov/epa/topics/grants-loans/state-revolving-fund/Pages/default.aspx
Wetland Program Development Grants	USEPA	±$75k - ±$300k with at least 1:3 matching funds	States, tribes, local gov’ts, interstate associations, intertribal consortia	Projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys and studies to protect, manage, and restore wetlands.	https://www.epa.gov/wetlands/wetland-program-development-grants-and-epa-wetlands-grant-coordinators
North American Wetlands Conservation Act – Standard Grants	USFWS	$100,001-$1M+ with at least 1:1 matching funds	Tribal, State, or local unit of gov’t, non-gov’t org., or individual	Long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats for the benefits of all wetlands-associated migratory birds	https://www.fws.gov/service/north-american-wetlands-conservation-act-nawca-grants-us-standard

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
North American Wetlands Conservation Act – Small Grants	USFWS	Up to $100,000 with at least 1:1 matching funds	Tribal, State, or local unit of gov't, non-gov't org., or individual	Long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats for the benefits of all wetlands-associated migratory birds	https://www.fws.gov/service/north-american-wetlands-conservation-act-nawca-grants-us-small
Environmental Education Grants	USEPA	Up to 75% of project costs; max. award set each cycle	Local, state or tribal education agency, environmental agency, college or university, non-profit org.	Environmental education projects that promote environmental awareness and stewardship. Projects may design, demonstrate, and/or disseminate environmental education practices, methods, or techniques.	https://www.epa.gov/education/grants
5 Star Wetland and Urban Waters Restoration Grant Program	National Fish & Wildlife Foundation	$10k - $40k	Non-profit 501(c) orgs, state gov't agencies, local & municipal gov'ts, Indian tribes, educational institutions	Environmental education and training for students, conservation corps, youth groups, citizen groups, corporations, landowners and gov't agencies through projects that restore wetlands and streams.	https://www.nfwf.org/programs/five-star-and-urban-waters-restoration-grant-program

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Brownfields Assessment Grants	USEPA	Up to $200k or $350k with grant limit waiver. $1M if a coalition of three or more eligible applicants apply under the name of one coalition member	State gov't agencies, local & municipal gov'ts, Indian tribes	The inventory, characterization, and assessment of brownfields sites contaminated by petroleum and hazardous substances, pollutants, or contaminants (incl. hazardous substances comingled with petroleum), as well as conducting planning and community outreach related to brownfield site assessment.	https://www.epa.gov/brownfields/types-brownfields-grant-funding
Brownfields Revolving Loan Fund Grants	USEPA	Revolving Loan Fund Program	State gov't agencies, local & municipal gov'ts, Indian tribes	Capitalize on a revolving loan fund or to provide subgrants for cleanup activities at brownfield sites contaminated by petroleum and hazardous substances, pollutants, or contaminants (incl. hazardous substances comingled with petroleum)	https://www.epa.gov/brownfields/types-brownfields-grant-funding
Brownfields Cleanup Grants	USEPA	Up to $200k with 20% cost share per site requirement (max 3 sites)	Non-profit 501(c) orgs, state gov't agencies, local & municipal gov'ts, Indian tribes. Applicant must have sole ownership of brownfield site.	Cleanup activities at brownfield sites contaminated by petroleum and hazardous substances, pollutants, or contaminants (incl. hazardous substances comingled with petroleum)	https://www.epa.gov/brownfields/types-brownfields-grant-funding
Brownfields Area Wide Planning Grants	USEPA	Not specified. Funding available every other year	State gov't agencies, local & municipal gov'ts, Indian tribes	Development of an area-wide plan for a specific area affected by high priority brownfield site(s) in need of assessment, cleanup, and redevelopment.	https://www.epa.gov/brownfields/types-brownfields-grant-funding

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
Conservation Stewardship Program (CSP)	USDA - NRCS	Not more than $200k	Private & tribal ag lands, grassland, rangeland, pastureland, non-industrial private forestland	Helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities.	https://www.nrcs.usda.gov/programs-initiatives/csp-conservation-stewardship-program
Conservation Innovation Grants (CIG)	USDA - NRCS	Up to &75k under state component	non-Federal gov't or non-gov't orgs, Native American Tribes, individuals	Projects targeting innovative on-the-ground conservation, including pilot projects and field demonstrations.	https://cig.sc.egov.usda.gov/?utm_source=nrcs-cig&utm_medium=site&utm_campaign=obv-redirect
Healthy Forests Preserve Program	USDA - NRCS	50%, 75% or 100% of the enrolled land/cost of cons. practice. Funding based on 10- or 30-year contract	Private landowners	10-year restoration agreements and 30-year permanent easements for specific conservation actions.	https://www.nrcs.usda.gov/programs-initiatives/rcpp-regional-conservation-partnership-program
Emergency Watershed Protection Program (EWP)	USDA - NRCS	Up to 75% of the construction cost of emergency measures	Public & private landowners represented by a project sponsor (e.g., city county, conservation district, Native American tribe)	Watershed impairments incl. debris-clogged stream channels; undermined & unstable streambanks; jeopardized water control structures & public infrastructures; wind-borne debris removal; & damaged upland sites stripped of protective vegetation by fire or drought	https://www.nrcs.usda.gov/programs-initiatives/ewp-emergency-watershed-protection
Pre-Disaster Mitigation Grant Program	FEMA	Not specified	States, U.S. territories, tribes, local gov'ts	Implementation of a sustained pre-disaster natural hazard mitigation program	https://www.fema.gov/grants/mitigation/pre-disaster

Program	Funding Agency	Funding Amount	Eligibility	Eligible Activities	Website
American Water Environmental Grant Program	American Water	Up to $10k	Municipalities, non-profits, schools	Source water and watershed protection projects (e.g., watershed cleanup, habitat restoration, stream buffer restoration, wellhead protection, hazardous waste collection, surface or groundwater protection education)	https://www.amwater.com/corp/customers-and-communities/environmental-grant-program
Green Region Program	ComEd	Up to $10k, 50% match requirement	Public agencies w/in ComEd's service territory	Open space planning, acquisition, or improvements for local parks, natural areas, and recreation resources.	https://openlands.org/get-involved/greenregion/

5. Monitoring Success

This planning process and identifying actions that can improve water quality are a critical first step in the process. Implementation of programmatic recommendations, additional planning efforts, and information and education outreach components identified in this plan will transition the effort put towards this plan into action. Subsequent project implementation, BMP adoption, and policy changes will realize measurable water quality improvements in the Upper Salt Creek watershed planning area.

5.1 Implementation Schedule

Table 73. Recommended Plan Implementation Schedule

Task	Year										
	1	2	3	4	5	6	7	8	9	10	11
Conduct outreach to elected officials, conservation organizations, and the general public about the Upper Salt Creek Watershed-based Plan, including funding and technical assistance opportunities	X	X	X	X	X	X	X	X	X	X	
Identify plan recommendations to implement	X		X		X		X		X		
Identify available grant funding and technical assistance programs		X		X		X		X		X	
Develop and submit grants and technical assistance applications	X		X		X		X		X		
Implement policy and education and outreach projects and programs		X		X		X		X		X	
Update comprehensive plans	as needed to target 10-year recurring updates										
Identify resources that do not have plans and begin development	X	X									
Implement on-the-ground projects and BMPs		X		X		X		X		X	
Report progress to DRSCW	X	X	X	X	X	X	X	X	X	X	
Share success stories with the pubic and other stakeholder entities	X	X	X	X	X	X	X	X	X	X	
Evaluate accomplishments and milestones			X		X		X		X		
Consider plan addendums					X	X	X	X	X	X	
Update the watershed-based plan											X

5.1.1. Interim Measurable Milestones

A requirement for developing a watershed-based plan is to establish interim measurable milestones. These milestones can determine if nonpoint source pollution reduction measures and other actions are being implemented, and to what extent. The table below identifies numerical milestones that can be measured and tracked in Year 2, Year 5, and Year 10 (please note goals are cumulative). Each of the milestones is tied to one of the goals developed as part of initial plan development, included in Section 1. Introduction.

Progress will be measured annually, and stakeholders will identify where implementation strategies need to be furthered or changed. Sharing strategies and efforts will be a crucial step in interim assessments. The plan is scheduled to be updated in year 11 (2034), but interim addendums should be issued if and when necessary.

As with development of the goals, it was important to incorporate a level of consistency with the Lower Salt Creek Watershed-based Plan. Many of the indicators proposed below have been developed from the Lower Salt Creek efforts and will support streamlined reporting efforts for DRSCW. Evaluation of the plan implementation will rely on stakeholder reporting. DRSCW will utilize the same or similar processes and database system that are being executed for the Lower Salt Creek Watershed to document BMPs implemented.

Please note that the numbers presented in this table are cumulative.

Table 74. Interim Measurable Milestones

Goal	Indicator	Two-year milestone	Five-year milestone	Ten-year milestone
Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality	Acres of bioretention/ bioinfiltration/ rain gardens	2	5	10
	Acres of bioswales	2	5	10
	Acres of permeable or porous pavements/ pavers	2	5	10
	Acres of infiltration trenches	0	0.5	1
	Acres of new riparian buffer/ urban filter strips	0	5	10
	Acres of new wetland	0	1	3
	LF of shoreline stabilization	0	300	750
	LF of streambank/ stream channel stabilization	0	500	1000
	No. of chloride applicators applying at an average rate of less than 300 lbs per lane mile	1	2	4
	No. of dams removed/ modified	0	0	0
	No. of detention basin retrofits	0	3	7
	No. of municipalities and institutions that discontinue use of coal-tar sealants for their operations	0	1	2
	No. of oil & grit separators	0	1	2
	Acres of ecological habitat restoration	1	10	30

Goal	Indicator	Two-year milestone	Five-year milestone	Ten-year milestone
Protect, restore, and expand natural areas and open space, and increase native aquatic and terrestrial plant and animal species diversity	Acres of wetland restoration	1	10	30
	No. of restoration workday volunteers	10	20	40
Reduce flooding and attendant bank erosion and infrastructure risk through initiatives to improve and protect water quality	Acres of green roof	0	0.5	1
	Acres of impervious surface reduction	0.5	1	3
	Acres of floodplain reconnection	0	0.5	1
	No. of new flood control facilities	0	0	2
	No. of flood prone property buyouts	0	0	1
Continue to build, strengthen, and support local partnerships and expertise to protect our streams, lakes, and wetlands via plan implementation	No. of presentations made to elected officials	2	5	10
	No. of presentations made to stakeholder groups	3	7	15
	No. of public events where water quality outreach & education provided	1	3	7
	No. of organizations involved in plan implementation	5	7	15
Continue to raise public awareness and increase understanding of the impacts of land use and land/ water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices	No. of municipalities whose comprehensive plans/ updates support water quality protection in new and retrofit design practices	2	4	7
	No. of municipalities whose ordinance updates improve water quality protections*	2	4	7
	No. of workshops/webinars/trainings made available to road salt applicators (primarily through Salt Smart)	14	35	70
	No of municipalities that require outside/contracted salt applications to be certified as a	5	7	15

Goal	Indicator	Two-year milestone	Five-year milestone	Ten-year milestone
	Salt Smart Parking Lot and Sidewalk Applicator			
	No of institutions that require outside/contracted salt applications to be certified as a Salt Smart Parking Lot and Sidewalk Applicator	2	4	8
	No. of public road maintenance departments participating in "sensible-salting" training/ retraining workshops	12	15	20
	No. of private contractors participating in "sensible-salting" training/ retraining workshops	2	5	10
	No. of institutions participating in "sensible-salting" training/ retraining workshops	0	1	3
	No. of new Conservation@Home properties	2	5	10
	No. of stream cleanup events	0	1	3
	No. of WQ flags awarded (by DuPage Co.) to schools and community organizations	0	0	1

* Please note that the planning area is largely governed by MWRD's Watershed Development Ordinance and DuPage County's Stormwater and Floodplain Ordinance. Municipal ordinance updates referred to will most likely be comprised of elements like enhanced vegetation standards and zoning updates.

5.2. Criteria for Determining Progress

Plan implementation, predominately in-the-ground projects and BMPs, will result in measurable water quality improvements. The scale at which they are implemented will largely govern the resulting magnitude of benefits.

Progress will be measured by monitoring pollutant load reductions and biological index scores. Criteria for determining progress have been identified and compiled in Table 75. Both five and ten-year timeframes have been included to reflect the notion that it will take time to see water quality impacts resulting from project and BMP implementation.

Delisting of waterbodies is another criterion for determining progress. The transition from not-attaining to attaining target use, as determined by the biennial integrates water quality report represents a milestone in water quality improvement.

Table 75. Criteria for Determining Progress in Pollutant Load Reductions and Attaining or Maintaining Water Quality Standards or Criteria

Criteria	Current Load, Score, or Rating	Five-year Target	Ten-year Target
Watershed-wide			
Nitrogen load reduction	22,655 lbs/yr	5% load reduction = 1,133 lbs/yr	15% load reduction = 3,398 lbs/yr
Phosphorus load reduction	5,125 lbs/yr	10% load reduction = 513 lbs/yr	25% load reduction = 1,281 lbs/yr
BOD load reduction	52,684 lbs/yr	5% load reduction = 2,634 lbs/yr	15% load reduction = 7,903 lbs/yr
Sediment load reduction	1,101 t/yr	10% load reduction = 110 t/yr	25% load reduction = 275 t/yr
Waterbody-specific			
Busse Woods (IL_RGZX)			
Annual avg. total phosphorus concentration	Avg. 0.0473 mg/L	Maintain ≤0.050 mg/L	Maintain ≤0.050 mg/L

5.3. Monitoring to Evaluate Effectiveness

To quantify load reductions and other impacts of project and BMP implementation, a water quality monitoring network is needed. The modeled existing pollutant loads and pollutant load reductions based on on-the-ground project implementation is not calibrated to site-specific data. Best available research, primarily in regard to removal efficiencies, was used to determine the impact of prescribed practices. But real pollutant load reductions will be a product of site-specific and system-specific factors, so monitoring and correlation to work in a given study area is important.

Water Quality Monitoring

Monitoring of water quality and aquatic life response will largely depend on the following agencies, organizations, and programs:

DRSCW - Every 4-years: water quality monitoring; cyclic macroinvertebrate, fish, and habitat assessments; and special studies (e.g., sediment oxygen demand).

FPCC - As part of multiple projects, FPCC has collected various data for Busse Lake. Water chemistry parameters and fish surveys have historically been part of those data collection efforts.

IEPA and IDNR – Once every five years, these agencies collaborate on the Des Plaines River Basin survey. This survey collects water and sediment quality, macroinvertebrate, fish, and habitat data. The data is used by IEPA for its biannual assessment as required under the Clean Water Act.

Volunteer Programs:

- *VLMP*: Volunteer lake monitors conduct Secchi transparency readings annually throughout the growing season and may collect water chemistry and DO and temperature profile data. CMAP serves as the regional coordinator for this IEPA program, which has been suspended as of 2019.

- *Illinois RiverWatch Network*: Volunteers can adopt a stream site and conduct habitat and biological surveys. The program is coordinated by the National Great Rivers Research and Education Center. Interested volunteers are encouraged to coordinate with the DRSCW to identify locations where macroinvertebrate data would be additive and not duplicative.

List of Acronyms

Abbreviation	Definition
ALMP	Ambient Lake Monitoring Program
BMP	Best Management Practice
BOD	Biologically Available Oxygen Demand
CAFO	Concentrated Animal Feeding Operation
CMAP	Chicago Metropolitan Agency for Planning
CSO	Combined Sewer Overflow
CWS	Community Water System
DAF	Design Average Flow
DCSFPO	DuPage Countywide Stormwater and Flood Plain Ordinance
DMF	Design Maximum Flow
DO	Dissolved Oxygen
DRSCW	DuPage River Salt Creek Workgroup
DWP	Detailed Watershed Plan
ECC	Effective Canopy Cover
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FEQ	Full Equations
FIS	Flood Insurance Study
FPA	Facility Planning Area
FPCC	Forest Preserves of Cook County
GIS	Geographic Information Systems
GRC	Greenest Region Compact
HSG	Hydrologic Soil Group
HSPF	Hydrological Simulation Program - FORTRAN
HOA	Homeowners Association
HUC	Hydrologic Unit Code
IBI	Index of Biotic Integrity
ICM	Impervious Cover Model
IDNR	Illinois Department of Natural Resources
IEMA	Illinois Emergency Management Association
IEPA	Illinois Environmental Protection Agency
IGPA	Illinois Groundwater Protection Act
IL	Illinois
ILLUDAS	Illinois Urban Drainage Area Simulator
INAI	Illinois Natural Areas Inventory
IPCB	Illinois Pollution Control Board
LF	Linear feet
MBI	Macroinvertebrate Biotic Index
MGD	Million Gallons per Day

MPCA	Minnesota Pollution Control Agency
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer Systems
MWRD	Metropolitan Water Reclamation District of Greater Chicago
NAVD	North American Vertical Datum
NHD	National Hydrography Dataset
NID	National Inventory of Dams
NLCD	National Land Cover Database
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NTCHS	National Technical Committee for Hydric Soils
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyl
PLSS	Public Land Survey System
POTW	Publicly Owned Treatment Works
QHEI	Qualitative Habitat Evaluation Index
RM	River Mile
SARA	Sensitive Aquifer Recharge Area
SCS	Soil Conservation Service, now NRCS
SCWN	Salt Creek Watershed Network
SSO	Sanitary Sewer Overflow
STEPL	Spreadsheet Tool for Estimating Pollutant Loads
STP	Sewage Treatment Plant
SWCD	Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
TCF	The Conservation Foundation
TCUW	Transportation/Communication/Utilities/Waste
TEC	Threshold Effect Concentration
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
US	Unites States (of America)
USA	United States of America
USBR	United States Bureau of Reclamation
USDA	Unites States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	Unites States Geological Survey

UST	Underground Storage Tank
VLMP	Volunteer Lake Monitoring Program
WDO	Watershed Development Ordinance
WMO	Watershed Management Ordinance
WPC	Watershed Planning Council
WQ	Water Quality
WQS	Water Quality Standard
WRF	Water Reclamation Facility
WRP	Water Reclamation Plant
WWTP	Wastewater Treatment Plant

Appendix A – Upper Salt Creek Planning Meeting Agendas

TOPIC:	Meeting 1	☐	**PHONE CALL**
DATE:	October 14, 2021; 3:00 to 4:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan), USCWPC	☐	**OTHER**

- **Project/Plan Introduction**
- **Project Team Introductions (DRSCW/TCF, Hey, Geosyntec)**
- **Ongoing data and Water Resources Inventory (WRI) preparation discussion**
- **Discussion of Goals and Problem Statements with USCWPC**
- **Discussion of project website and digital data gathering approach (on-line mapping application)** www.uppersaltcreek.com
- **Project Schedule**
    - Future USCWPC Meetings (bi-monthly):
        i. Meeting 2: Identification of existing/future water quality protection projects.
        ii. Meeting 3: Continued discussion of BMPs and discussion on planning and policy recommendations and outreach and education concepts
        iii. Meeting 4: Update on plan development and solicitation for input on implementation schedule, measurable milestones, criteria for determining success, and monitoring components from USCWPC
        iv. Meeting 5: Presentation and request for comments on the Draft Upper Salte Creek Watershed-Based Plan, including funding and technical resources for plan implementation
        v. Meeting 6: Presentation of the Final Upper Salte Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding
- **USCWPC Member Comments**

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 2	☐	**PHONE CALL**
DATE:	January 11, 2021; 1:00 to 3:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan), USCWPC	☐	**OTHER**

- **Project/Plan Recap**
- **Educational Presentation**
    - Kirsten James of Hey and Associates and Alex Handel of The Conservation Foundation walk through a subset of GIS tools available for spatial data collection. Focusing on those deployed as part of the Upper Salt Creek Watershed-based Plan, learn how reporting interfaces were developed to crowdsource valuable site-specific information from local authorities and how GPS-driven field applications were designed to conduct large-scale field data collection. Why did we choose GIS tools instead of traditional pen and paper data collection methods? How did we tailor and configure templates to streamline data collection? What can we automate and how can we build in QA processes? How did all this data become a report? Explore other applications of these tools to save time and money, while collecting high quality data to make better decisions.
    - Call for future presentations
- **Ongoing data and Water Resources Inventory (WRI) preparation discussion**
    - Wrap up Draft WRI by the end of the month for interim IEPA submittal
    - Post Draft WRI on our website after this meeting
    - Call for review of Draft WRI and send your comments by February 11
        1. Section 3.5.2.1. Introduction and Methods – Please pass along local names for reaches included in Figure 25 that are not already referenced in the numeric list of reaches
        2. Section 3.6.1. Comprehensive and Other Local Plans – Please review the brief description of your municipal or local plan using Table 1 (included at the end of this document) and recommend revisions. We have not yet included Park District plans but intend to do so. Please review Table 55 for accuracy regarding Greenest Region Compact adoption.
        3. Section 3.6.2. Local Ordinances – Does your local ordinance contain any pertinent amendments to DuPage County or MWRD Ordinances? Are there any ordinance requirements that address facets listed in Table 1?
    - Call for reporting of potential problem areas AND potential projects utilizing the online mapping application available at www.uppersaltcreek.com
- **Project Schedule**
    - Future USCWPC Meetings (bi-monthly):

i. Meeting 3 (Tuesday, March 8): Discussion of BMPs, planning and policy recommendations, and outreach and education concepts
ii. Meeting 4 (Tuesday, May 10): Update on plan development and solicitation for input on implementation schedule, measurable milestones, criteria for determining success, and monitoring components
iii. Meeting 5: Presentation and request for comments on the Draft Upper Salt Creek Watershed-Based Plan, including funding and technical resources for plan implementation
iv. Meeting 6: Presentation of the Final Upper Salt Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding

- **USCWPC Member Comments**
- **Other**
    - Call for Leaf Litter/Street Sweeping questionnaire responses, if not already provided

Table 1. *Does your municipal or local plan…*

Natural Resources	Identify, map, and encourage protection of critical natural resource areas? (e.g., wildlife habitat, forests) Establish and enforce areas which are available for development and which lands are a priority for preservation?
Water Resources	Identify, map, and encourage protection of critical water resource areas? Outline protection measures for source water protection areas through land use controls and stewardship activities?
Open Space	Identify adequate open space in both developed and greenfield areas of the community? Contain an open space/parks element that recognizes the role of open space in sustainable stormwater management?
Trees	Encourage tree preservation, replacement, and planting as community goals?
Development Type and Location	Direct development to previously developed areas (redevelopment) or areas with existing infrastructure, such as sewer, water, and roads? Identify potential brownfield and greyfield sites and support their redevelopment? Permit or encourage mixed-use and transit-oriented developments? Identify appropriate areas for higher-density mixed use developments and encourage their development?
Transportation and Parking	Emphasize alternative modes of transportation (walking, biking, and transit), transportation demand management, or other methods to reduce vehicle miles traveled and width and prominence of roads/streets? Call for distributing traffic across several parallel streets, reducing the need for high capacity streets with wide rights-of-way? Include or recommend the creation of a bicycle/pedestrian master plan? Recommend supporting “safe routes to school” programs or other pedestrian/bike safety initiatives? Recommend improvements to walking/biking conditions? Promote green infrastructure practices in parking lots and street design to help reduce stormwater runoff? Recommend alternative, flexible approaches to meeting parking demands (e.g., shared parking, counting on-street spaces towards site parking requirements)?

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 3	☐	**PHONE CALL**
DATE:	March 8, 2021; 1:00 to 3:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan), USCWPC	☐	**OTHER**

- **Project/Plan Recap**
- **Educational Presentation**
    - The Conservation Foundation's Director of Watershed Programs, Jennifer Hammer, will discuss chlorides. This presentation will cover the impact chlorides have on water quality and what groups are doing to help reduce and mitigate the impacts. Jennifer will share information available through Salt Smart Collaborative, including winter deicing workshop opportunities, best management practices, and outreach materials.
    - Call for future presentations
- **Watershed Protection Measures summary**
    - Discussion of Planning and Policy Recommendations
        i. Comprehensive Plan Development and Updates
        ii. Emerging concepts: green infrastructure, PAHs, chloride management
    - Outreach and Education Concepts
        i. Crucial for implementation strategies
        ii. Toolbox: engagement, connection, messaging, activities
        iii. Ideas and resources, MS4 Requirements
- **Ongoing data and Water Resources Inventory (WRI) preparation discussion**
    - Draft WRI was submitted to IEPA in January
    - Call for review of Draft WRI and send your comments by February 11
        i. Section 3.6.1. Comprehensive and Other Local Plans – Please review the brief description of your municipal or local plan using Table 1 (included at the end of this document) and recommend revisions. We have not yet included Park District plans but intend to do so.
        ii. Section 3.6.2. Local Ordinances – Does your local ordinance contain any pertinent amendments to DuPage County or MWRD Ordinances? Are there any ordinance requirements that address facets listed in Table 1?
- **Remainder of Plan preparation update**
    - Development of Executive Summary and remaining plan elements underway

- Call for reporting of potential problem areas AND potential projects utilizing the online mapping application available at www.uppersaltcreek.com

- **Project Schedule**
  - We will be sending out invitations to Meeting 5 and 6 shortly
  - Future USCWPC Meetings (bi-monthly):
    i. Meeting 4 (Tuesday, May 10): Update on plan development and solicitation for input on implementation schedule, measurable milestones, criteria for determining success, and monitoring components

    ii. Meeting 5: Presentation and request for comments on the Draft Upper Salt Creek Watershed-Based Plan, including funding and technical resources for plan implementation

    iii. Meeting 6: Presentation of the Final Upper Salt Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding

- **USCWPC Member Comments**
- **Other**
  - IEMA Hazard Mitigation Grant Funding Opportunity

Table 1. *Does your municipal or local plan…*

Natural Resources	Identify, map, and encourage protection of critical natural resource areas? (e.g., wildlife habitat, forests)
	Establish and enforce areas which are available for development and which lands are a priority for preservation?
Water Resources	Identify, map, and encourage protection of critical water resource areas?
	Outline protection measures for source water protection areas through land use controls and stewardship activities?
Open Space	Identify adequate open space in both developed and greenfield areas of the community?
	Contain an open space/parks element that recognizes the role of open space in sustainable stormwater management?
Trees	Encourage tree preservation, replacement, and planting as community goals?
Development Type and Location	Direct development to previously developed areas (redevelopment) or areas with existing infrastructure, such as sewer, water, and roads?
	Identify potential brownfield and greyfield sites and support their redevelopment?
	Permit or encourage mixed-use and transit-oriented developments?
	Identify appropriate areas for higher-density mixed use developments and encourage their development?

Transportation and Parking	Emphasize alternative modes of transportation (walking, biking, and transit), transportation demand management, or other methods to reduce vehicle miles traveled and width and prominence of roads/streets? Call for distributing traffic across several parallel streets, reducing the need for high capacity streets with wide rights-of-way? Include or recommend the creation of a bicycle/pedestrian master plan? Recommend supporting “safe routes to school” programs or other pedestrian/bike safety initiatives? Recommend improvements to walking/biking conditions? Promote green infrastructure practices in parking lots and street design to help reduce stormwater runoff? Recommend alternative, flexible approaches to meeting parking demands (e.g., shared parking, counting on-street spaces towards site parking requirements)?

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 3	☐	**PHONE CALL**
DATE:	June 21, 2022; 1:00 to 3:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Gordon	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan), USCWPC	☐	**OTHER**

- **Location**
    - In-person at Busse Grove 12 in Busse Woods Forest Preserve
    - Open-house style - drop by any time from 1pm to 3pm!
- **Educational Presentation**
    - The Forest Preserves' Chief Fisheries Biologist, Steve Silic, will discuss site management, water quality, and fisheries at Busse Lake. Steve graduated from the University of Illinois at Urbana-Champaign with a bachelor's degree in Biology, and a master's degree in Molecular Biology. He has been with the Forest Preserve District of Cook County for more than 20 years, working at various Nature Centers, along with the Wildlife and Fisheries sections, before holding his current position as the Chief Fisheries Biologist. Steve enjoys working outdoors and helping to protect the natural areas that the Forest Preserves of Cook County have to offer, including the Upper Salt Creek Planning Area's Busse Lake!
    - Call for future presentations - watershed success stories?
- **Project/Plan Discussion**
    - We will have maps and computers set up to identify and discuss potential projects to include in the plan. Including these projects in the watershed plan is a key component of meeting eligibility criteria to receive funding through IEPA's 319 program to address non-point source pollution. This plan will serve as a cornerstone for identifying potential costs and project partners, as well as quantifying potential nutrient reductions for the projects included. These elements can help build grant submittals and position you all as stakeholders to secure funding for these water quality improvements!
    - Call for reporting of potential projects utilizing the online mapping application available at www.uppersaltcreek.com
- **Project Schedule**
    - Meeting 5: Presentation and request for comments on the Draft Upper Salt Creek Watershed-Based Plan, including funding and technical resources for plan implementation
    - Meeting 6: Presentation of the Final Upper Salt Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding
- **USCWPC Member Comments**
- **Other**

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 5	☐	**PHONE CALL**
DATE:	November 15, 2022; 1:00 to 2:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan, Vandermus, Helfrich), USCWPC	☐	**OTHER**

- **Project/Plan Recap**
    - Status of the plan – Draft by EOY, Final by March 31, 2023
        1. Input on implementation schedule, interim measurable milestones, criteria for determining success, and a monitoring component
    - Existing Conditions Modeling
    - Proposed Conditions Modeling
- **Educational Presentation**
    - David Souther and Rufus Ajayi from the Illinois Environmental Protection Agency's Bureau of Water will present on the Section 319 Grant Program. The development of this plan will enable projects in the Upper Salt Creek planning area to consider funding opportunities through this program. David and Rufus will cover some background and history of the program, define program goals, and share examples of successful projects.
    - Call for future presentations – success stories
- **Project Schedule**
    - Future USCWPC Meetings:
        - i. Meeting 6 (Tuesday, January 15, 2023): Presentation and request for comments on the Draft Upper Salt Creek Watershed-Based Plan, including funding and technical resources for plan implementation
        - ii. Meeting 7 (TBD): Presentation of the Final Upper Salt Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding
- **USCWPC Member Comments**
- **Other**

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 5	☐	**PHONE CALL**
DATE:	January 17, 2023; 1:00 to 2:00 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan, Vandermus, Helfrich), USCWPC	☐	**OTHER**

- **Project/Plan Recap**
  - Status of the plan – working to take Draft to Final by March 31
    i. Draft submitted to IEPA last month
    ii. Presentation of the Draft Upper Salt Creek Watershed-Based Plan!
    iii. What are we still working on?
    iv. Highlight funding and technical assistance resources for plan implementation
  - Check www.uppersaltcreek.com – the draft report will be posted by the end of this week
  - Please send your comments to saltcreekplan@gmail.com
- **Educational Presentation**
- **Project Schedule**
  - Future USCWPC Meetings:
    i. Meeting 7 (TBD): Presentation of the Final Upper Salt Creek Watershed-Based Plan and discussion of next steps in pursuing/obtaining 319(h) funding Future presentations – potential IEPA presentation on the Section 319 Grant online application process/ interface
  - Final by March 31, 2023
- **USCWPC Member Comments**
- **Other**

TOPIC:	Upper Salt Creek Watershed Planning Council: Meeting 5	☐	**PHONE CALL**
DATE:	March 21, 2023; 1:00 to 2:30 PM	☐	**SITE VISIT**
STAFF:	Kraft, James, Wickenkamp	☒	**MEETING**
WITH:	DRSCW/TCF (Doohaluk, Handel), Geosyntec (Mahajan, Vandermus, Helfrich), USCWPC	☐	**OTHER**

- **Project/Plan Recap**
  - Status of the plan – working to take Draft to Final by March 31
    i. Presentation of the FINAL Upper Salt Creek Watershed-Based Plan!
  - Check www.uppersaltcreek.com – the FINAL report will be posted by the end of this week
- **Educational Presentation**
  - IEPA will once again join us to review their Section 319 Grant Program. Last time, IEPA covered some background and history of the program, defined program goals, and shared examples of successful projects. This time, the focus will be on the application process, including pre-award requirements, the GATA portal, what the implementation NOFO generally looks like, navigation through the Additional Details Spreadsheets, and using the Integrated Report App Tool. The development of this plan will enable projects in the Upper Salt Creek planning area to consider funding opportunities through this program.
- **Project Schedule**
  - Submittal to IEPA March 31, 2023
- **USCWPC Member Comments**
- **Other**

Appendix B – Detention Basin Assessment Data and Retrofit Opportunities

Table 76. Upper Salt Creek watershed planning area detention basin inventory and assessment information including retrofit opportunities

Municipality	Subwatershed Study Unit	Basin Type	WQ Benefit	Retrofit Opportunities	Maintenance Needs	Latitude	Longitude
Arlington Heights	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.0913	-88.0207
Arlington Heights	Arlington Heights Branch	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0935	-88.0260
Arlington Heights	Arlington Heights Branch	Dry-Nat	NA	Consider establishing native buffer,	Consider regular management of non-native vegetation	42.1382	-88.0036
Arlington Heights	Arlington Heights Branch	Wet Bottom	Unknown	Consider installing safety shelf,		42.1372	-88.0025
Arlington Heights	Arlington Heights Branch	Wet Bottom	Fair	Address short circuit,		42.1273	-88.0039
Arlington Heights	Arlington Heights Branch	Wet Bottom	Unknown	Consider installing safety shelf,		42.1251	-88.0039
Arlington Heights	Arlington Heights Branch	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1243	-88.0033
Arlington Heights	Arlington Heights Branch	Dry-Nat	NA	Consider establishing native buffer,	Consider regular management of non-native vegetation	42.1363	-88.0035

Arlington Heights	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1386	-88.0072
Arlington Heights	Busse Lake	Wet Bottom	Minimal			42.0543	-88.0156
Arlington Heights	Busse Lake	Wet Bottom	Good			42.0541	-88.0196
Arlington Heights	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0518	-88.0097
Arlington Heights	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0630	-88.0058
Arlington Heights	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0546	-87.9940
Arlington Heights	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0589	-88.0043
Barrington	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1405	-88.1085
Barrington	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1407	-88.1058
Barrington	Upper Salt Creek Mainstem	Wet Bottom	Fair	Address short circuit,		42.1406	-88.1020
Elk Grove Village	Busse Lake	Wet Bottom	Minimal			42.0056	-88.0149
Elk Grove Village	Busse Lake	Vol. Wetland	Good			42.0186	-87.9954
Elk Grove Village	Busse Lake	Vol. Wetland	Good			42.0171	-88.0110
Elk Grove Village	Busse Lake	Vol. Wetland	Good			42.0165	-88.0123
Elk Grove Village	Busse Lake	Vol. Wetland	Good			42.0151	-88.0187
Elk Grove Village	Busse Lake	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0062	-88.0323
Elk Grove Village	Busse Lake	Vol. Wetland	Good			42.0071	-88.0217
Elk Grove Village	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		41.9986	-88.0366

Elk Grove Village	Busse Lake	Dry-Nat	Good	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0037	-88.0222
Elk Grove Village	Busse Lake	Wet Bottom	Fair			42.0111	-88.0146
Elk Grove Village	Busse Lake	Wet Bottom	Good	Consider installing safety shelf,		42.0130	-88.0261
Elk Grove Village	Busse Lake	Vol. Wetland	Good	Consider installing safety shelf,		42.0155	-88.0213
Elk Grove Village	Busse Lake	Wet Bottom	Fair			42.0109	-88.0108
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Good			42.0060	-88.0417
Elk Grove Village	West Branch Salt Creek	Dry-Turf	Minimal	Address short circuit, Consider establishing native buffer, Consider installing safety shelf, Consider naturalizing vegetated cover		42.0114	-88.0539
Elk Grove Village	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider installing safety shelf, Consider naturalizing vegetated cover		42.0130	-88.0489
Elk Grove Village	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider installing safety shelf, Consider naturalizing vegetated cover		42.0101	-88.0508
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0150	-88.0575
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0142	-88.0577
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0203	-88.0531
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	0.0000	0.0000
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0171	-88.0521
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal			42.0162	-88.0516
Elk Grove Village	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0171	-88.0479

Elk Grove Village	West Branch Salt Creek	Dry-Nat	Fair	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0094	-88.0581
Elk Grove Village	West Branch Salt Creek	Vol. Wetland	Good	Consider installing safety shelf,		42.0092	-88.0596
Elk Grove Village	West Branch Salt Creek	Constr. Wetland	Fair	Consider installing safety shelf,		42.0312	-88.0663
Hoffman Estates	Upper Salt Creek Mainstem					42.1125	-88.1050
Hoffman Estates	Upper Salt Creek Mainstem	Constr. Wetland	Good			42.1126	-88.1046
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1120	-88.1036
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1108	-88.0975
Hoffman Estates	Upper Salt Creek Mainstem					42.1246	-88.1030
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1206	-88.0993
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1197	-88.0974
Hoffman Estates	Upper Salt Creek Mainstem					42.1108	-88.0841
Hoffman Estates	Upper Salt Creek Mainstem					42.1128	-88.0816
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1235	-88.0854
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1259	-88.0855
Hoffman Estates	Upper Salt Creek Mainstem					42.1233	-88.0831
Hoffman Estates	Upper Salt Creek Mainstem					42.1210	-88.0805
Hoffman Estates	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0677	-88.1083
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,	Address erosion issue,	0.0000	0.0000
Hoffman Estates	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0597	-88.1088
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1160	-88.1158

Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1139	-88.1167
Hoffman Estates	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.1165	-88.1089
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.1135	-88.1102
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0636	-88.1028
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0627	-88.1031
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0649	-88.0976
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0591	-88.0996
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0585	-88.1003
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0596	-88.0948
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0631	-88.0820
Hoffman Estates	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0643	-88.0872
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1055	-88.1193
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1047	-88.1152
Hoffman Estates	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1003	-88.1137
Hoffman Estates	Upper Salt Creek Mainstem	Constr. Wetland	Fair	Consider establishing native buffer,		42.1113	-88.1125
Hoffman Estates	Upper Salt Creek Mainstem	Dry-Nat			Consider regular management of non-native vegetation	42.0856	-88.0928

Hoffman Estates	West Branch Salt Creek	Wet-Ext. Dry	Minimal	Address short circuit, Consider establishing native buffer, Consider installing safety shelf,		42.0454	-88.0773
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Fair			42.0430	-88.0880
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,	Address erosion issue, Manage Non-native plants	42.0438	-88.0862
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Minimal		Manage Non-native plants	42.0379	-88.0962
Hoffman Estates	West Branch Salt Creek	Constr. Wetland	Good			42.0564	-88.0882
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Fair			42.0496	-88.0950
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0528	-88.0874
Hoffman Estates	West Branch Salt Creek	Wet-Ext. Dry	Minimal	Consider establishing native buffer,		42.0516	-88.0846
Hoffman Estates	West Branch Salt Creek	Vol. Wetland	Good			42.0559	-88.0815
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Fair	Consider installing safety shelf,		42.0589	-88.0799
Hoffman Estates	West Branch Salt Creek	Wet Bottom	Fair			42.0617	-88.0800
Hoffman Estates	West Branch Salt Creek	Constr. Wetland	Good	Consider installing safety shelf,		42.0454	-88.0911
Inverness	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1251	-88.0768
Inverness	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0825	-88.0794
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1144	-88.0790
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	0.0000	0.0000

Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1182	-88.1026
Inverness	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1195	-88.1045
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1192	-88.1081
Inverness	Upper Salt Creek Mainstem	Constr. Wetland	Fair	Consider establishing native buffer,		42.1200	-88.1100
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1208	-88.1145
Inverness	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1327	-88.1019
Inverness	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1321	-88.1023
Inverness	Upper Salt Creek Mainstem	Wet-Ext. Dry	Fair	Address short circuit,		42.1320	-88.1000
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1073	-88.1066
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1054	-88.1043
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1050	-88.1044
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1051	-88.1049
Inverness	Upper Salt Creek Mainstem	Vol. Wetland	Fair			42.1020	-88.0927
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1019	-88.0919
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1169	-88.1065
Inverness	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1156	-88.1058
Inverness	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.1163	-88.1016
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.1167	-88.0772

Inverness	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.1155	-88.0752
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.1141	-88.0768
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Address short circuit, Consider installing safety shelf,		42.1141	-88.0761
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1269	-88.0820
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair	Address short circuit,		42.1139	-88.0933
Inverness	Upper Salt Creek Mainstem	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1120	-88.0911
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair	Address short circuit,		42.1204	-88.0841
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1170	-88.0839
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,	Address erosion issue,	42.1100	-88.0784
Inverness	Upper Salt Creek Mainstem					42.1031	-88.0827
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0910	-88.0796
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair	Consider installing safety shelf,		42.0848	-88.0825
Inverness	Upper Salt Creek Mainstem	Dry-Turf	Fair	Consider naturalizing vegetated cover		42.0848	-88.0811
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Good	Address short circuit,		42.0859	-88.0784
Inverness	Upper Salt Creek Mainstem	Wet Bottom	Fair	Consider installing safety shelf,		42.0824	-88.0788
Itasca	Busse Lake	Wet Bottom	Fair			41.9898	-88.0364
Palatine	Arlington Heights Branch	Vol. Wetland	Good			42.1286	-88.0081
Palatine	Arlington Heights Branch	Vol. Wetland	Good			42.1247	-88.0069
Palatine	Arlington Heights Branch	Dry-Turf	Minimal	Consider establishing native buffer, Consider installing		42.1246	-88.0107

				safety shelf, Consider naturalizing vegetated cover			
Palatine	Arlington Heights Branch	Dry-Turf	Minimal	Consider establishing native buffer, Consider installing safety shelf, Consider naturalizing vegetated cover		42.1248	-88.0155
Palatine	Arlington Heights Branch					42.1249	-88.0336
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1348	-88.0679
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1304	-88.0656
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1293	-88.0676
Palatine	Arlington Heights Branch					42.1291	-88.0697
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1279	-88.0594
Palatine	Arlington Heights Branch	Wet Bottom	Minimal		Manage Non-native plants	42.1271	-88.0564
Palatine	Arlington Heights Branch	Constr. Wetland	Fair			42.1167	-88.0157
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider installing safety shelf,	Address erosion issue, Manage Non-native plants	42.1230	-88.0368
Palatine	Arlington Heights Branch	Wet Bottom	Minimal		Manage Non-native plants	42.1237	-88.0359
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1266	-88.0419
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1254	-88.0503
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1258	-88.0521
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider installing safety shelf,		42.1288	-88.0539

Palatine	Arlington Heights Branch	Wet Bottom	Fair	Consider establishing native buffer,		42.1268	-88.0546
Palatine	Arlington Heights Branch	Wet Bottom	Minimal			42.1243	-88.0566
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider installing safety shelf,		42.1230	-88.0582
Palatine	Arlington Heights Branch	Wet Bottom	Minimal			42.1227	-88.0588
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1203	-88.0579
Palatine	Arlington Heights Branch	Vol. Wetland	Good			42.1205	-88.0549
Palatine	Arlington Heights Branch	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1240	-88.0525
Palatine	Arlington Heights Branch	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1236	-88.0510
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.1217	-88.0445
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1204	-88.0334
Palatine	Arlington Heights Branch	Constr. Wetland	Fair			42.1002	-88.0390
Palatine	Arlington Heights Branch	Wet Bottom	Minimal		Address erosion issue,	42.1079	-88.0384
Palatine	Arlington Heights Branch	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.1161	-88.0623
Palatine	Arlington Heights Branch	Constr. Wetland	Good			42.1176	-88.0610
Palatine	Arlington Heights Branch	Dry-Turf	Minimal	Consider naturalizing vegetated cover		42.1259	-88.0760
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1364	-88.0108

Palatine	Arlington Heights Branch	Constr. Wetland	Minimal	Consider establishing native buffer,		42.1389	-88.0089
Palatine	Arlington Heights Branch	Wet Bottom	Minimal			42.1374	-88.0075
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider installing safety shelf,		42.1361	-88.0063
Palatine	Arlington Heights Branch	Wet Bottom	Minimal			42.1346	-88.0066
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1313	-88.0136
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1316	-88.0134
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.1315	-88.0130
Palatine	Arlington Heights Branch	Wet Bottom	Minimal		Address erosion issue,	42.1303	-88.0118
Palatine	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1294	-88.0148
Palatine	Arlington Heights Branch	Wet Bottom	Unknown	Consider installing safety shelf,		42.1033	-88.0110
Palatine	Arlington Heights Branch	Dry-Turf	NA	Consider naturalizing vegetated cover		42.1023	-88.0110
Palatine	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1006	-88.0172
Palatine	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1057	-88.0332
Palatine	Arlington Heights Branch	Dry-Turf	NA	Consider naturalizing vegetated cover		42.1053	-88.0321
Palatine	Arlington Heights Branch	NA	NA			42.1045	-88.0300

Palatine	Arlington Heights Branch	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0951	-88.0380
Palatine	Arlington Heights Branch	Wet Bottom	Good			42.1370	-88.0597
Palatine	Arlington Heights Branch	Wet Bottom	Fair	Consider installing safety shelf,		42.1349	-88.0545
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1355	-88.0509
Palatine	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1336	-88.0600
Palatine	Arlington Heights Branch	Dry-Turf	NA	Consider naturalizing vegetated cover		42.1239	-88.0644
Palatine	Arlington Heights Branch	Constr. Wetland	NA			42.1243	-88.0658
Palatine	Arlington Heights Branch	Wet Bottom	Good		Address erosion issue,	42.1211	-88.0615
Palatine	Arlington Heights Branch	Wet Bottom				42.1371	-88.0572
Palatine	Arlington Heights Branch	Wet Bottom	Fair			42.1273	-88.0518
Palatine	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1284	-88.0505
Palatine	Arlington Heights Branch	Wet Bottom	Fair	Address short circuit,		42.1344	-88.0252
Palatine	Arlington Heights Branch	Wet Bottom	Fair	Address short circuit,		42.1229	-88.0057
Palatine	Arlington Heights Branch	Dry-Turf	NA	Consider naturalizing vegetated cover		42.1118	-88.0286
Palatine	Arlington Heights Branch	Dry- Non-native	NA		Consider regular debris and waste removal	42.1066	-88.0210
Palatine	Arlington Heights Branch	Wet Bottom	Good	Address short circuit,		42.1085	-88.0158
Palatine	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1082	-88.0050
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0830	-88.0729

Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1129	-88.0679
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Good			42.1014	-88.0482
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0945	-88.0500
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0936	-88.0510
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0907	-88.0539
Palatine	Upper Salt Creek Mainstem	Wet-Ext. Dry	Fair			42.0892	-88.0567
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0878	-88.0564
Palatine	Upper Salt Creek Mainstem					42.1133	-88.0723
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider installing safety shelf,		42.0732	-88.0384
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0885	-88.0723
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0882	-88.0760
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Address short circuit,	Manage Non-native plants	42.0886	-88.0786
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Fair	Consider establishing native buffer,	Consider regular management of non-native vegetation	42.1004	-88.0678
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1037	-88.0691
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1093	-88.0665
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1100	-88.0667
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Minimal		Manage Non-native plants, Consider regular management of non-native vegetation	42.1097	-88.0677
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0980	-88.0636
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair			0.0000	0.0000

Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0984	-88.0520
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0990	-88.0503
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0965	-88.0432
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0880	-88.0504
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0862	-88.0528
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair	Address short circuit,		42.0838	-88.0512
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Good			42.1311	-88.0929
Palatine	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.1318	-88.0976
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.1167	-88.0601
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1135	-88.0567
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.1156	-88.0557
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal		Address erosion issue, Manage Non-native plants	42.1120	-88.0551
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1179	-88.0657
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1159	-88.0660
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.1173	-88.0687
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0919	-88.0546
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0943	-88.0584

Palatine	Upper Salt Creek Mainstem	Wet-Ext. Dry	Minimal	Consider establishing native buffer,		42.0914	-88.0603
Palatine	Upper Salt Creek Mainstem	Wet-Ext. Dry	Minimal	Consider establishing native buffer,	Address erosion issue,	0.0000	0.0000
Palatine	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0956	-88.0735
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0956	-88.0742
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal		Address erosion issue,	0.0000	0.0000
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair		Address erosion issue,	42.0918	-88.0720
Palatine	Upper Salt Creek Mainstem	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0911	-88.0664
Palatine	Upper Salt Creek Mainstem	Constr. Wetland	Good			42.0868	-88.0651
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.1339	-88.0770
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.1304	-88.0773
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Fair	Consider establishing native buffer,	Consider regular management of non-native vegetation	42.0677	-88.0408
Palatine	Upper Salt Creek Mainstem	Dry-Nat	NA		Consider regular management of non-native vegetation	42.1101	-88.0772
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.1110	-88.0659
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.1120	-88.0608

Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.1119	-88.0547
Palatine	Upper Salt Creek Mainstem	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.1146	-88.0512
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.1007	-88.0665
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0908	-88.0774
Palatine	Upper Salt Creek Mainstem	Dry-Nat	NA	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0868	-88.0717
Palatine	Upper Salt Creek Mainstem	Dry-Nat	NA		Consider regular management of non-native vegetation	42.0900	-88.0525
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown			42.0934	-88.0506
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0860	-88.0560
Palatine	Upper Salt Creek Mainstem	Dry-Nat	Unknown	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0852	-88.0548
Palatine	Upper Salt Creek Mainstem	Dry-Nat	NA	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0879	-88.0553

Palatine	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0871	-88.0531
Palatine	Upper Salt Creek Mainstem	Wet Bottom	Fair	Consider installing safety shelf,	Address erosion issue,	42.0814	-88.0797
Palatine	West Branch Salt Creek	Vol. Wetland	Good			42.0282	-88.0911
Palatine	West Branch Salt Creek	Wet Bottom	Fair			42.0284	-88.0849
Palatine	West Branch Salt Creek	Constr. Wetland	Fair			42.0303	-88.0802
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Minimal		Manage Non-native plants	42.0819	-88.0195
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Minimal	Consider establishing native buffer,		42.0936	-88.0306
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Minimal	Address short circuit, Consider establishing native buffer,		42.0933	-88.0337
Rolling Meadows	Arlington Heights Branch	Dry-Turf	NA	Consider naturalizing vegetated cover		42.0869	-88.0306
Rolling Meadows	Arlington Heights Branch	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0804	-88.0288
Rolling Meadows	Arlington Heights Branch	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0795	-88.0246
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.1013	-88.0302
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0877	-88.0410

Rolling Meadows	Arlington Heights Branch	Wet Bottom	Unknown	Consider installing safety shelf,	Address erosion issue,	42.0856	-88.0372
Rolling Meadows	Arlington Heights Branch	Dry-Nat	NA		Consider regular management of non-native vegetation	42.0850	-88.0320
Rolling Meadows	Arlington Heights Branch	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0819	-88.0311
Rolling Meadows	Arlington Heights Branch	Wet Bottom	Unknown	Consider installing safety shelf,		42.0771	-88.0318
Rolling Meadows	Busse Lake	Wet Bottom	Fair			42.0517	-88.0133
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0786	-88.0557
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0633	-88.0197
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0564	-88.0136
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0760	-88.0610
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0762	-88.0538
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0761	-88.0589
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0545	-88.0032
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0551	-88.0043
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0533	-88.0027

Rolling Meadows	Upper Salt Creek Mainstem	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0634	-88.0263
Rolling Meadows	Upper Salt Creek Mainstem	Dry-Nat	Unknown	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0615	-88.0176
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0499	-87.9942
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0841	-88.0679
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0779	-88.0447
Rolling Meadows	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0765	-88.0507
Schaumburg	Busse Lake	Wet Bottom	Good	Consider installing safety shelf,		42.0279	-88.0360
Schaumburg	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0261	-88.0353
Schaumburg	Busse Lake	Dry-Nat	Fair	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0496	-88.0301
Schaumburg	Busse Lake	Wet Bottom	Fair		Address erosion issue,	42.0424	-88.0323
Schaumburg	Busse Lake	Constr. Wetland	Fair	Address short circuit, Consider installing safety shelf,	Conduct site visit to identify source of sheen and odor	42.0378	-88.0329
Schaumburg	Busse Lake	Dry-Nat	Fair	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0383	-88.0374

Schaumburg	Busse Lake	Dry-Nat	Fair	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0382	-88.0367
Schaumburg	Busse Lake	Wet Bottom	Minimal			42.0355	-88.0339
Schaumburg	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,	Address erosion issue,	42.0339	-88.0371
Schaumburg	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,	Address erosion issue,	42.0281	-88.0431
Schaumburg	Busse Lake	Constr. Wetland	Good	Consider installing safety shelf,		41.9983	-88.0346
Schaumburg	Busse Lake	Constr. Wetland	Good			42.0555	-88.0322
Schaumburg	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer,		42.0544	-88.0319
Schaumburg	Busse Lake	Wet Bottom	Minimal			42.0510	-88.0408
Schaumburg	Busse Lake	Wet Bottom	Minimal	Consider establishing native buffer,		42.0514	-88.0316
Schaumburg	Busse Lake	Wet Bottom	Fair			42.0295	-88.0341
Schaumburg	Busse Lake	Wet Bottom	Fair			42.0363	-88.0346
Schaumburg	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0648	-88.0679
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0657	-88.0677
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0650	-88.0647
Schaumburg	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0698	-88.0560
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0714	-88.0566
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0745	-88.0506
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Address short circuit, Consider establishing native buffer,	Address erosion issue,	42.0727	-88.0508

Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider installing safety shelf,		42.0730	-88.0516
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0681	-88.0923
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0631	-88.0376
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0628	-88.0354
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0617	-88.0373
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0625	-88.0407
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0621	-88.0411
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0620	-88.0422
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0627	-88.0434
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0615	-88.0418
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0759	-88.0933
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0816	-88.0934
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0838	-88.0921
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0738	-88.0927
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0741	-88.0922
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0682	-88.0464
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0708	-88.0840
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0739	-88.0893
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0763	-88.0796

Schaumburg	Upper Salt Creek Mainstem	Constr. Wetland	Fair			42.0555	-88.0402
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Fair	Consider installing safety shelf,	Address erosion issue,	42.0572	-88.0388
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Consider establishing native buffer,		42.0654	-88.0431
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal	Address short circuit, Consider establishing native buffer,		42.0646	-88.0430
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Minimal			42.0538	-88.0445
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	Good		Consider regular management of non-native vegetation	42.0658	-88.0738
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Good			42.0671	-88.0729
Schaumburg	Upper Salt Creek Mainstem	Constr. Wetland	Fair	Consider establishing native buffer,		42.0707	-88.0631
Schaumburg	Upper Salt Creek Mainstem	Constr. Wetland	Fair	Consider establishing native buffer,		42.0704	-88.0646
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Good			42.0675	-88.0622
Schaumburg	Upper Salt Creek Mainstem	Vol. Wetland	Fair	Consider establishing native buffer,		42.0654	-88.0596
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	NA		Consider regular management of non-native vegetation	42.0645	-88.0292
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0751	-88.0503
Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider installing safety shelf,		42.0717	-88.0496
Schaumburg	Upper Salt Creek Mainstem	Dry-Nat	NA	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0645	-88.0804

Schaumburg	Upper Salt Creek Mainstem	Wet Bottom	Good			42.0661	-88.0875
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0157	-88.0663
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0162	-88.0678
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good			42.0254	-88.0555
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0211	-88.0754
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0213	-88.0777
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Address short circuit, Consider establishing native buffer, Consider naturalizing vegetated cover		42.0231	-88.0700
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Address short circuit, Consider establishing native buffer, Consider naturalizing vegetated cover		42.0236	-88.0694
Schaumburg	West Branch Salt Creek	Wet Bottom	Good			42.0277	-88.0831
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal		Manage Non-native plants	42.0253	-88.0815
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0247	-88.0760
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0267	-88.0682
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0312	-88.0770
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0289	-88.0691
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal		Manage Non-native plants	42.0594	-88.0789
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good			42.0592	-88.0720

Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0562	-88.0703
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0565	-88.0680
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0573	-88.0717
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue,	42.0548	-88.0705
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0377	-88.0524
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0246	-88.0524
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,		42.0168	-88.0752
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0185	-88.0740
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0192	-88.0765
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0176	-88.0893
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0205	-88.0934
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0226	-88.0923
Schaumburg	West Branch Salt Creek					42.0248	-88.0931
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0224	-88.0963
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0282	-88.0878
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair		Manage Non-native plants	42.0311	-88.0833
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			0.0000	0.0000
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal		Address erosion issue, Manage Non-native plants	42.0081	-88.0837

Schaumburg	West Branch Salt Creek	Wet-Ext. Dry	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0096	-88.0819
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair	Consider installing safety shelf,	Address erosion issue,	42.0067	-88.0693
Schaumburg	West Branch Salt Creek					42.0109	-88.0663
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider installing safety shelf,		42.0099	-88.0608
Schaumburg	West Branch Salt Creek	Wet-Ext. Dry	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0053	-88.0612
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0055	-88.0613
Schaumburg	West Branch Salt Creek	Wet Bottom	Good	Consider installing safety shelf,		42.0239	-88.0386
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider installing safety shelf,		42.0253	-88.0334
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider establishing native buffer,		42.0124	-88.0708
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,		42.0113	-88.0763
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0283	-88.0531
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			42.0290	-88.0542
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0318	-88.0550
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider establishing native buffer,		42.0326	-88.0529
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			42.0347	-88.0512
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			42.0349	-88.0491
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider establishing native buffer,		42.0388	-88.0524

Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0395	-88.0553
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0363	-88.0555
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0339	-88.0614
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0285	-88.0624
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0294	-88.0582
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0164	-88.0840
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			42.0182	-88.0803
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0188	-88.0802
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0194	-88.0804
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0267	-88.0850
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0148	-88.0822
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0608	-88.0480
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0611	-88.0490
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,		42.0631	-88.0460
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0272	-88.0485

Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0187	-88.0492
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0234	-88.0525
Schaumburg	West Branch Salt Creek	Vol. Wetland	Good			42.0225	-88.0583
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0368	-88.0749
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0365	-88.0712
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0343	-88.0716
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0335	-88.0694
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0321	-88.0661
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0359	-88.0794
Schaumburg	West Branch Salt Creek	Dry-Nat	Good	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0043	-88.0566
Schaumburg	West Branch Salt Creek	Dry-Turf	Minimal	Consider establishing native buffer, Consider installing safety shelf, Consider naturalizing vegetated cover		42.0054	-88.0567
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0434	-88.0603
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0476	-88.0638
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0475	-88.0623
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good	Consider installing safety shelf,		42.0293	-88.0815
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider installing safety shelf,		42.0463	-88.0872
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good	Consider installing safety shelf,		42.0464	-88.0910
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good	Consider installing safety shelf,		42.0376	-88.0997

Schaumburg	West Branch Salt Creek	Constr. Wetland	Good	Consider installing safety shelf,		42.0468	-88.0837
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider installing safety shelf,		42.0532	-88.0779
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0535	-88.0740
Schaumburg	West Branch Salt Creek	Dry-Nat	Fair		Consider regular management of non-native vegetation	42.0478	-88.0532
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,		42.0475	-88.0543
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair			42.0486	-88.0554
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider establishing native buffer,		42.0522	-88.0701
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0529	-88.0668
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0571	-88.0632
Schaumburg	West Branch Salt Creek	Constr. Wetland	Good			42.0580	-88.0602
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0561	-88.0787
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0554	-88.0788
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0502	-88.0731
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal			42.0462	-88.0523
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0451	-88.0496
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0410	-88.0498
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,		42.0410	-88.0492
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0418	-88.0521
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair		Address erosion issue,	42.0407	-88.0535

Schaumburg	West Branch Salt Creek	Wet Bottom	Fair		Address erosion issue,	42.0411	-88.0537
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Address short circuit,		42.0553	-88.0472
Schaumburg	West Branch Salt Creek	Constr. Wetland	Fair	Consider establishing native buffer,		42.0594	-88.0487
Schaumburg	West Branch Salt Creek	Dry-Nat	Minimal		Manage Non-native plants, Consider regular management of non-native vegetation	42.0595	-88.0533
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer,	Address erosion issue,	42.0602	-88.0562
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair			42.0613	-88.0757
Schaumburg	West Branch Salt Creek	Wet Bottom	Minimal	Consider establishing native buffer, Consider installing safety shelf,		42.0624	88.0782
Schaumburg	West Branch Salt Creek	Wet Bottom	Unknown	Consider installing safety shelf,		42.0621	-88.0555
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair	Address short circuit,		42.0569	-88.0537
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair	Address short circuit,		42.0454	-88.0449
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair	Consider installing safety shelf,		42.0596	-88.0789
Schaumburg	West Branch Salt Creek	Dry-Nat			Consider regular management of non-native vegetation	42.0218	-88.0366
Schaumburg	West Branch Salt Creek	Wet Bottom	Good	Consider installing safety shelf,		42.0353	-88.0533
Schaumburg	West Branch Salt Creek	Wet Bottom	Fair	Address short circuit,		42.0303	-88.0765
Unincorporated	Busse Lake					42.0391	-88.0074
Unincorporated	Busse Lake					42.0327	-87.9965

Unincorporated	Busse Lake	Dry-Nat	NA	Consider installing safety shelf,	Consider regular management of non-native vegetation	42.0443	-88.0193
Unincorporated	Busse Lake	Wet Bottom	Minimal	Consider installing safety shelf,		42.0237	-88.0301
Unincorporated	Busse Lake					42.0481	-88.0100
Unincorporated	Upper Salt Creek Mainstem	Dry-Turf	NA	Consider establishing native buffer, Consider naturalizing vegetated cover		42.0717	-88.0359
Unincorporated	Upper Salt Creek Mainstem	Wet Bottom	Unknown	Consider establishing native buffer, Consider installing safety shelf,		42.0707	-88.0343
Unincorporated	Upper Salt Creek Mainstem	Concrete	NA	Consider installing safety shelf,		42.0803	-88.0442
Unincorporated	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0881	-88.0834
Unincorporated	Upper Salt Creek Mainstem	Wet Bottom	Fair			42.0834	-88.0834
Unincorporated	West Branch Salt Creek	Dry-Turf		Consider naturalizing vegetated cover		42.0102	-88.0323
Unincorporated	West Branch Salt Creek	Wet Bottom	Minimal	Consider installing safety shelf,		42.0172	-88.0401

Appendix C – Watershed-Wide Urban Stormwater Retrofit BMP Scenarios and Associated Pollutant Load Reduction and Implementation Cost Estimates

Table 77. Watershed-wide urban stormwater infrastructure retrofit BMPs with pollutant load reduction and planning-level implementation cost estimates by subwatershed

Subwatershed	% Treated	BMP Type	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sediment Reduction (ton/yr)	Estimated Cost ($)
Upper Salt Creek Mainstem	2	Bioretention/Bioinfiltration Facility	822	238	4,039	35	$16,856,268
	3	Bioswale	236	90	0	34	$113,430,240
	2	Denitrifying Bioreactor	596	0	0	0	$350,400
	2	Detention Basin Retrofit	1,086	204	4,524	39	$7,994,131
	2	Filter Strip	383	168	0	25	$1,101,060
	2	Green Roof	343	56	0	20	$152,460,000
	3	Infiltration Trench	1,717	319	0	56	$19,445,184
	2	Oil & Grit Separator	114	17	0	8	$488,800
	4	Porous & Permeable Pavements	0	281	0	81	$75,467,700
	1	Prairie Restoration	241	27	440	1	$181,040
	2	Saturated Buffer	853	66	0	5	$30,420
	2	Tree Box Filter	296	45	733	45	$928,560
	2	Wetland Creation / Restoration	341	112	3,223	24	$304,296
Total	*29*		*7,029*	*1,624*	*12,959*	*372*	*$389,038,100*
Arlington Heights	4	Bioretention/Bioinfiltration Facility	806	230	4,066	33	$17,948,172
	4	Bioswale	166	58	0	23	$80,193,960
	2	Denitrifying Bioreactor	339	0	0	0	$245,280
	7	Detention Basin Retrofit	1,824	337	7,740	65	$14,827,824
	3	Filter Strip	383	167	0	24	$1,103,266
	3	Green Roof	280	42	0	17	$119,528,640
	3	Infiltration Trench	1,080	196	0	36	$10,297,584
	1	Oil & Grit Separator	33	5	0	2	$141,000
	5	Porous & Permeable Pavements	0	140	0	40	$50,006,880
	0	Prairie Restoration	0	0	0	0	$0
	2	Saturated Buffer	475	36	0	3	$21,060
	3	Tree Box Filter	208	31	533	31	$753,360
	1	Wetland Creation / Restoration	79	26	776	6	$79,755
Total	*38*		*5,673*	*1,269*	*13,117*	*279*	*$295,146,781*

Subwatershed	% Treated	BMP Type	Nitrogen Reduction (lbs/yr)	Phosphorus Reduction (lbs/yr)	BOD Reduction (lbs/yr)	Sediment Reduction (ton/yr)	Estimated Cost ($)
West Branch Salt Creek	4	Bioretention/Bioinfiltration Facility	1,124	328	5,547	48	$20,677,932
	3	Bioswale	125	45	0	17	$69,216,840
	2	Denitrifying Bioreactor	326	0	0	0	$245,280
	7	Detention Basin Retrofit	2,673	514	10,806	98	$17,116,466
	3	Filter Strip	346	150	0	22	$1,105,321
	2	Green Roof	183	27	0	11	$92,695,680
	3	Infiltration Trench	890	157	0	28	$11,918,016
	1	Oil & Grit Separator	28	4	0	2	$169,200
	4	Porous & Permeable Pavements	0	132	0	39	$45,280,620
	0	Prairie Restoration	0	0	0	0	$0
	2	Saturated Buffer	456	34	0	2	$23,400
	3	Tree Box Filter	246	38	610	37	$858,480
	1	Wetland Creation / Restoration	150	49	1,311	11	$116,565
Total	*35*		*6,545*	*1,480*	*18,275*	*315*	*$259,423,800*
Busse Lake	2	Bioretention/Bioinfiltration Facility	426	126	2,110	18	$6,960,888
	2	Bioswale	96	36	0	14	$31,406,760
	1	Denitrifying Bioreactor	173	0	0	0	$210,240
	2	Detention Basin Retrofit	451	82	2,007	16	$3,320,143
	1	Filter Strip	98	43	0	6	$448,608
	1	Green Roof	80	12	0	5	$31,101,840
	2	Infiltration Trench	641	113	0	21	$5,331,744
	1	Oil & Grit Separator	16	2	0	1	$122,200
	2	Porous & Permeable Pavements	0	71	0	21	$15,550,920
	2	Prairie Restoration	882	165	1,967	3	$144,540
	1	Saturated Buffer	243	18	0	1	$16,380
	1	Tree Box Filter	72	11	174	11	$227,760
	2	Wetland Creation / Restoration	231	72	2,077	16	$126,381
Total	*20*		*3,408*	*752*	*8,334*	*134*	*$94,968,405*
		Grand Total	*22,655*	*5,125*	*52,684*	*1,101*	*$1,038,577,085*

Appendix D – Site-specific BMPs with Associated Landowners, Potential Partners and Timeframe, and Estimated Quantities and Planning Level Costs

Table 78. Site-specific BMPs, potential partners, municipality, estimated quantities and planning-level costs, and location coordinates

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
1	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1700 ft		Elk Grove Village	$428,400	42.0074	-88.0575
2	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1820 ft		Elk Grove Village	$458,640	42.0117	-88.0591
3	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1133 ft	Fox Run Golf Links	Elk Grove Village	$285,516	42.0129	-88.0598
4	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	2410 ft	Fox Run Golf Links	Elk Grove Village	$607,320	42.0156	-88.0488
5	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1000 ft		Unincorporated	$252,000	42.0176	-88.0415
6	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	5539 ft		Unincorporated	$1,395,828	42.0207	-88.0353
7	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1889 ft	Schaumburg Park District	Schaumburg	$476,028	42.0222	-88.0549
8	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	4803 ft	Schaumburg Park District	Schaumburg	$1,210,356	42.0238	-88.0590
9	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1954 ft		Schaumburg	$492,408	42.0252	-88.0711

[146] 1: Upper Salt Creek Mainstem, 2: Arlington Heights, 3: West Branch Salt Creek, 4: Busse Lake

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
10	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	3000 ft		Schaumburg	$756,000	42.0153	-88.0704
11	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	442 ft		Schaumburg	$111,384	42.0311	-88.0746
12	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	314 ft		Schaumburg	$79,128	42.0241	-88.0683
13	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	300 ft		Schaumburg	$75,600	42.0217	-88.0723
14	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	297 ft		Schaumburg	$74,844	42.0211	-88.0737
15	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	2325 ft		Schaumburg	$585,900	42.0328	-88.0537
16	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	196 ft	Fox Run Golf Links	Elk Grove Village	$49,392	42.0136	-88.0580
17	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	3009 ft		Schaumburg	$758,268	42.0133	-88.0774
18	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	2956 ft		Hoffman Estates	$744,912	42.0446	-88.0701
19	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1160 ft		Hoffman Estates	$292,320	42.0457	-88.0817
20	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1784 ft		Schaumburg	$449,568	42.0424	-88.0561
21	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	1610 ft		Schaumburg	$405,720	42.0392	-88.0533
22	3	Stream / Shoreline Restoration / Stabilization	Hydrologic	446 ft		Schaumburg	$112,392	42.0419	-88.0526

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
23	4	Stream / Shoreline Restoration / Stabilization	Hydrologic	5747 ft	FPDCC	Unincorporated	$1,448,244	42.0479	-88.0114
24	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2019 ft		Rolling Meadows	$508,788	42.0564	-88.0088
25	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	3020 ft		Rolling Meadows	$761,040	42.0629	-88.0179
26	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	4600 ft		Rolling Meadows	$1,159,200	42.0665	-88.0245
27	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2195 ft		Unincorporated	$553,140	42.0716	-88.0317
28	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2841 ft		Unincorporated	$715,932	42.0746	-88.0381
29	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2216 ft		Schaumburg	$558,432	42.0742	-88.0484
30	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1197 ft		Schaumburg	$301,644	42.0720	-88.0516
31	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2065 ft	St. Michael the Archangel Cemetery	Unincorporated	$520,380	42.0686	-88.0767
32	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1064 ft	Highland Woods Golf Course	Unincorporated	$268,128	42.0769	-88.0820
33	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2036 ft	Harper College	Rolling Meadows	$513,072	42.0789	-88.0622
34	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2167 ft	Harper College	Unincorporated	$546,084	42.0816	-88.0654

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
35	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1592 ft	Harper College	Palatine	$401,184	42.0815	-88.0757
36	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	3294 ft		Rolling Meadows	$830,088	42.0818	-88.0540
37	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2565 ft		Palatine	$646,380	42.0900	-88.0519
38	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	4220 ft	Rolling Meadows Park District	Rolling Meadows	$1,063,440	42.0751	-88.0228
39	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	4957 ft	Rolling Meadows Park District	Unincorporated	$1,249,164	42.0847	-88.0197
40	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	985 ft		Palatine	$248,220	42.0938	-88.0507
41	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	685 ft	Palatine Park District	Palatine	$172,620	42.0953	-88.0496
42	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1752 ft		Palatine	$441,504	42.0986	-88.0485
43	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	3251 ft		Palatine	$819,252	42.1051	-88.0470
44	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	4373 ft		Palatine	$1,101,996	42.1109	-88.0570
45	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	3089 ft		Palatine	$778,428	42.1089	-88.0135
46	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	3255 ft		Palatine	$820,260	42.1194	-88.0117

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
47	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	928 ft	Palatine Park District	Palatine	$233,856	42.1225	-88.0096
48	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	4747 ft		Palatine	$1,196,244	42.1183	-88.0209
49	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	4618 ft		Palatine	$1,163,736	42.1228	-88.0324
50	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1799 ft		Palatine	$453,348	42.1107	-88.0689
51	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1847 ft		Inverness	$465,444	42.1084	-88.0830
52	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1081 ft	Inverness Golf Club	Inverness	$272,412	42.1117	-88.0785
53	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	1491 ft		Inverness	$375,732	42.1040	-88.1027
54	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	759 ft		Inverness	$191,268	42.1118	-88.1004
55	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	766 ft		Inverness	$193,032	42.1222	-88.1006
56	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2654 ft		Inverness	$668,808	42.1139	-88.0872
57	1	Stream / Shoreline Restoration / Stabilization	Hydrologic	2487 ft		Inverness	$626,724	42.1240	-88.0811
58	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	2792 ft		Palatine	$703,584	42.1262	-88.0648
59	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	683 ft	Palatine Hills Golf Course	Palatine	$172,116	42.1293	-88.0553

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
60	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	5020 ft	Palatine Hills Golf Course	Palatine	$1,265,040	42.1336	-88.0533
61	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	2690 ft	Palatine Hills Golf Course	Palatine	$677,880	42.1274	-88.0496
62	1	Address Short Circuit	Urban	1.16 ac		Inverness	$14,233	42.1320	-88.1000
63	2	Address Short Circuit	Urban	0.16 ac		Arlington Heights	$1,963	42.1273	-88.0039
64	1	Address Short Circuit	Urban	1.51 ac	FPDCC	Unincorporated	$18,528	42.0838	-88.0921
65	3	Address Short Circuit	Urban	0.46 ac		Schaumburg	$5,644	42.0553	-88.0472
66	3	Address Short Circuit	Urban	0.02 ac		Hoffman Estates	$245	42.0454	-88.0910
67	3	Address Short Circuit	Urban	0.08 ac		Schaumburg	$982	42.0302	-88.0802
68	1	Native Buffer	Urban	320 ft		Schaumburg	$25,600	42.0727	-88.0508
69	2	Native Buffer	Urban	0.72 ac		Rolling Meadows	$62,726	42.0932	-88.0337
70	1	Native Buffer	Urban	0.72 ac		Schaumburg	$62,726	42.0646	-88.0430
71	3	Native Buffer	Urban	0.02 ac		Hoffman Estates	$1,742	42.0454	-88.0910
72	3	Native Buffer	Urban	0.02 ac		Hoffman Estates	$1,742	42.0454	-88.0773
73	3	Native Buffer	Urban	0.48 ac		Schaumburg	$41,818	42.0454	-88.0449
74	3	Wetland Creation / Restoration	Urban	2.06 ac		Elk Grove Village	$25,276	42.0114	-88.0539
75	4	Address Short Circuit	Urban	0.13 ac		Schaumburg	$1,595	42.0378	-88.0330
76	1	Address Short Circuit	Urban	0.10 ac		Inverness	$1,227	42.1141	-88.0768
77	1	Address Short Circuit	Urban	0.28 ac		Inverness	$3,436	42.1141	-88.0761

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
78	2	Wetland Creation / Restoration	Urban	0.12 ac		Arlington Heights	$1,472	42.1372	-88.0025
79	2	Wetland Creation / Restoration	Urban	0.29 ac		Unincorporated	$3,558	42.1361	-88.0062
80	2	Wetland Creation / Restoration	Urban	0.74 ac		Palatine	$9,080	42.1167	-88.0157
81	2	Wetland Creation / Restoration	Urban	0.82 ac		Arlington Heights	$10,061	42.1251	-88.0039
82	2	Wetland Creation / Restoration	Urban	1.25 ac		Palatine	$15,338	42.1033	-88.0110
83	2	Wetland Creation / Restoration	Urban	0.90 ac		Palatine	$11,043	42.1230	-88.0368
84	2	Wetland Creation / Restoration	Urban	0.62 ac	Palatine Hills Golf Course	Palatine	$7,607	42.1288	-88.0538
85	2	Wetland Creation / Restoration	Urban	1.00 ac	Palatine Hills Golf Course	Palatine	$12,270	42.1349	-88.0545
86	1	Wetland Creation / Restoration	Urban	1.64 ac		Palatine	$20,123	42.1167	-88.0601
87	1	Wetland Creation / Restoration	Urban	0.44 ac		Palatine	$5,399	42.1120	-88.0608
88	1	Wetland Creation / Restoration	Urban	0.10 ac		Palatine	$1,227	42.1110	-88.0659
89	1	Wetland Creation / Restoration	Urban	12.80 ac		Palatine	$157,056	42.1100	-88.0667
90	1	Wetland Creation / Restoration	Urban	0.52 ac		Inverness	$6,380	42.1155	-88.0752
91	1	Wetland Creation / Restoration	Urban	0.17 ac		Unincorporated	$2,086	42.1167	-88.0772
92	2	Wetland Creation / Restoration	Urban	1.12 ac		Palatine	$13,742	42.1251	-88.0767
93	1	Wetland Creation / Restoration	Urban	5.11 ac	Palatine Park District	Hoffman Estates	$62,700	42.1120	-88.1036
94	1	Wetland Creation / Restoration	Urban	0.12 ac		Inverness	$1,472	42.1120	-88.0911
95	1	Wetland Creation / Restoration	Urban	1.99 ac		Palatine	$24,417	42.0868	-88.0651
96	2	Wetland Creation / Restoration	Urban	0.11 ac		Rolling Meadows	$1,350	42.0856	-88.0372

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
97	2	Wetland Creation / Restoration	Urban	0.26 ac		Rolling Meadows	$3,190	42.0771	-88.0318
98	1	Wetland Creation / Restoration	Urban	0.07 ac		Rolling Meadows	$859	42.0779	-88.0447
99	1	Wetland Creation / Restoration	Urban	0.19 ac		Rolling Meadows	$2,331	42.0765	-88.0507
100	1	Wetland Creation / Restoration	Urban	0.35 ac		Schaumburg	$4,295	42.0717	-88.0496
101	3	Wetland Creation / Restoration	Urban	5.83 ac		Schaumburg	$71,534	42.0621	-88.0555
102	1	Wetland Creation / Restoration	Urban	0.81 ac		Arlington Heights	$9,939	42.0630	-88.0058
103	1	Wetland Creation / Restoration	Urban	1.33 ac		Arlington Heights	$16,319	42.0589	-88.0043
104	1	Wetland Creation / Restoration	Urban	0.36 ac		Arlington Heights	$4,417	42.0546	-87.9940
105	1	Wetland Creation / Restoration	Urban	0.51 ac	FPDCC	Rolling Meadows	$6,258	42.0498	-87.9942
106	4	Wetland Creation / Restoration	Urban	0.08 ac	IDOT	Schaumburg	$982	42.0496	-88.0301
107	3	Wetland Creation / Restoration	Urban	0.10 ac		Schaumburg	$1,227	42.0532	-88.0779
108	3	Wetland Creation / Restoration	Urban	0.56 ac		Schaumburg	$6,871	42.0468	-88.0837
109	3	Wetland Creation / Restoration	Urban	0.11 ac		Hoffman Estates	$1,350	42.0463	-88.0872
110	3	Wetland Creation / Restoration	Urban	0.06 ac		Hoffman Estates	$736	42.0464	-88.0910
111	3	Wetland Creation / Restoration	Urban	0.39 ac		Schaumburg	$4,785	42.0376	-88.0997
112	3	Wetland Creation / Restoration	Urban	0.28 ac		Schaumburg	$3,436	42.0293	-88.0815
113	3	Wetland Creation / Restoration	Urban	0.31 ac		Schaumburg	$3,804	42.0312	-88.0663

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
114	4	Wetland Creation / Restoration	Urban	0.11 ac		Schaumburg	$1,350	42.0383	-88.0374
115	4	Wetland Creation / Restoration	Urban	0.08 ac		Schaumburg	$982	42.0382	-88.0367
116	3	Wetland Creation / Restoration	Urban	1.05 ac		Schaumburg	$12,884	42.0253	-88.0334
117	4	Wetland Creation / Restoration	Urban	0.77 ac	FPDCC	Unincorporated	$9,448	42.0237	-88.0301
118	4	Wetland Creation / Restoration	Urban	15.25 ac		Schaumburg	$187,118	42.0280	-88.0360
119	4	Wetland Creation / Restoration	Urban	4.10 ac	FPDCC	Unincorporated	$50,307	42.0155	-88.0213
120	3	Wetland Creation / Restoration	Urban	2.04 ac		Elk Grove Village	$25,031	42.0130	-88.0489
121	3	Wetland Creation / Restoration	Urban	1.15 ac		Elk Grove Village	$14,111	42.0092	-88.0570
122	3	Wetland Creation / Restoration	Urban	0.70 ac		Elk Grove Village	$8,589	42.0094	-88.0581
123	3	Wetland Creation / Restoration	Urban	0.58 ac		Schaumburg	$7,117	42.0099	-88.0609
124	3	Wetland Creation / Restoration	Urban	1.81 ac		Schaumburg	$22,209	42.0043	-88.0566
125	4	Wetland Creation / Restoration	Urban	0.35 ac		Elk Grove Village	$4,295	41.9983	-88.0385
126	4	Wetland Creation / Restoration	Urban	1.63 ac	FPDCC	Elk Grove Village	$20,000	42.0037	-88.0222
127	1	Wetland Creation / Restoration	Urban	4.89 ac		Hoffman Estates	$60,000	42.0596	-88.0948
128	1	Wetland Creation / Restoration	Urban	0.10 ac	Extended Stay America	Schaumburg	$1,227	42.0631	-88.0820
129	1	Wetland Creation / Restoration	Urban	1.03 ac	IDOT	Schaumburg	$12,638	42.0645	-88.0804
130	3	Wetland Creation / Restoration	Urban	2.08 ac		Schaumburg	$25,522	42.0589	-88.0799
131	3	Wetland Creation / Restoration	Urban	0.11 ac		Schaumburg	$1,350	42.0596	-88.0789
132	1	Wetland Creation / Restoration	Urban	1.53 ac		Schaumburg	$18,773	42.0572	-88.0388

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
133	4	Wetland Creation / Restoration	Urban	0.08 ac	FPDCC	Unincorporated	$982	42.0443	-88.0193
134	3	Wetland Creation / Restoration	Urban	0.24 ac		Schaumburg	$2,945	42.0475	-88.0543
135	3	Wetland Creation / Restoration	Urban	1.22 ac	Schaumburg	Schaumburg	$14,969	42.0253	-88.0815
136	1	Wetland Creation / Restoration	Urban	7.53 ac	IDOT	Schaumburg	$92,393	42.0645	-88.0292
137	1	Wetland Creation / Restoration	Urban	0.23 ac		Palatine	$2,822	42.0879	-88.0552
138	3	Wetland Creation / Restoration	Urban	3.13 ac		Schaumburg	$38,405	42.0475	-88.0623
139	1	Wetland Creation / Restoration	Urban	0.79 ac		Palatine	$9,693	42.0868	-88.0717
140	1	Wetland Creation / Restoration	Urban	0.09 ac		Inverness	$1,104	42.0848	-88.0825
141	3	Wetland Creation / Restoration	Urban	0.39 ac		Hoffman Estates	$4,785	42.0496	-88.0950
142	4	Wetland Creation / Restoration	Urban	1.04 ac	FPDCC	Unincorporated	$12,761	42.0130	-88.0261
143	1	Wetland Creation / Restoration	Urban	1.44 ac		Unincorporated	$17,669	42.0732	-88.0384
144	1	Wetland Creation / Restoration	Urban	0.08 ac		Unincorporated	$982	42.0717	-88.0359
145	2	Wetland Creation / Restoration	Urban	0.19 ac		Palatine	$2,331	42.1230	-88.0582
146	3	Wetland Creation / Restoration	Urban	0.98 ac		Schaumburg	$12,025	42.0631	-88.0460
147	1	Wetland Creation / Restoration	Urban	0.39 ac	Renaissance Schaumburg	Schaumburg	$4,785	42.0615	-88.0418
148	1	Wetland Creation / Restoration	Urban	1.57 ac	Renaissance Schaumburg	Schaumburg	$19,264	42.0631	-88.0376
149	1	Wetland Creation / Restoration	Urban	0.58 ac		Palatine	$7,117	42.1259	-88.0855
150	2	Wetland Creation / Restoration	Urban	0.29 ac		Palatine	$3,558	42.1259	-88.0760
151	2	Wetland Creation / Restoration	Urban	0.25 ac		Unincorporated	$3,068	42.1239	-88.0644
152	2	Wetland Creation / Restoration	Urban	0.44 ac		Palatine	$5,399	42.1118	-88.0286
153	2	Wetland Creation / Restoration	Urban	0.73 ac		Palatine	$8,957	42.1053	-88.0321
154	2	Wetland Creation / Restoration	Urban	0.52 ac		Palatine	$6,380	42.1023	-88.0110

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
155	2	Wetland Creation / Restoration	Urban	0.77 ac	IDOT	Rolling Meadows	$9,448	42.0869	-88.0306
156	1	Wetland Creation / Restoration	Urban	0.06 ac		Inverness	$736	42.0848	-88.0811
157	1	Wetland Creation / Restoration	Urban	0.09 ac		Unincorporated	$1,104	42.0848	-88.0825
158	3	Wetland Creation / Restoration	Urban	0.72 ac		Unincorporated	$8,834	42.0102	-88.0323
159	2	Wetland Creation / Restoration	Urban	4.25 ac		Palatine	$52,148	42.1246	-88.0107
160	2	Wetland Creation / Restoration	Urban	2.20 ac		Palatine	$26,994	42.1248	-88.0155
161	1	Wetland Creation / Restoration	Urban	3.17 ac		Palatine	$38,896	42.0891	-88.0567
162	3	Wetland Creation / Restoration	Urban	1.54 ac		Elk Grove Village	$18,896	42.0101	-88.0508
163	3	Wetland Creation / Restoration	Urban	0.59 ac		Schaumburg	$7,239	42.0054	-88.0567
164	3	Wetland Creation / Restoration	Urban	2.64 ac		Schaumburg	$32,393	42.0054	-88.0612
165	3	Wetland Creation / Restoration	Urban	1.78 ac		Schaumburg	$21,841	42.0097	-88.0819
166	3	Wetland Creation / Restoration	Urban	0.50 ac		Schaumburg	$6,135	42.0247	-88.0760
167	1	Wetland Creation / Restoration	Urban	5.67 ac	FPDCC	Hoffman Estates	$69,571	42.0701	-88.0977
168	1	Wetland Creation / Restoration	Urban	0.43 ac	FPDCC	Hoffman Estates	$5,276	42.0711	-88.1012
169	1	Wetland Creation / Restoration	Urban	0.14 ac	FPDCC	Hoffman Estates	$1,718	42.0720	-88.1011
170	1	Wetland Creation / Restoration	Urban	1.45 ac	FPDCC	Hoffman Estates	$17,792	42.0755	-88.1041
171	1	Wetland Creation / Restoration	Urban	5.83 ac	FPDCC	Hoffman Estates	$71,534	42.0804	-88.0993
172	1	Wetland Creation / Restoration	Urban	24.10 ac	FPDCC	Unincorporated	$295,707	42.0791	-88.0895
173	1	Wetland Creation / Restoration	Urban	0.06 ac		Schaumburg	$736	42.0709	-88.0608

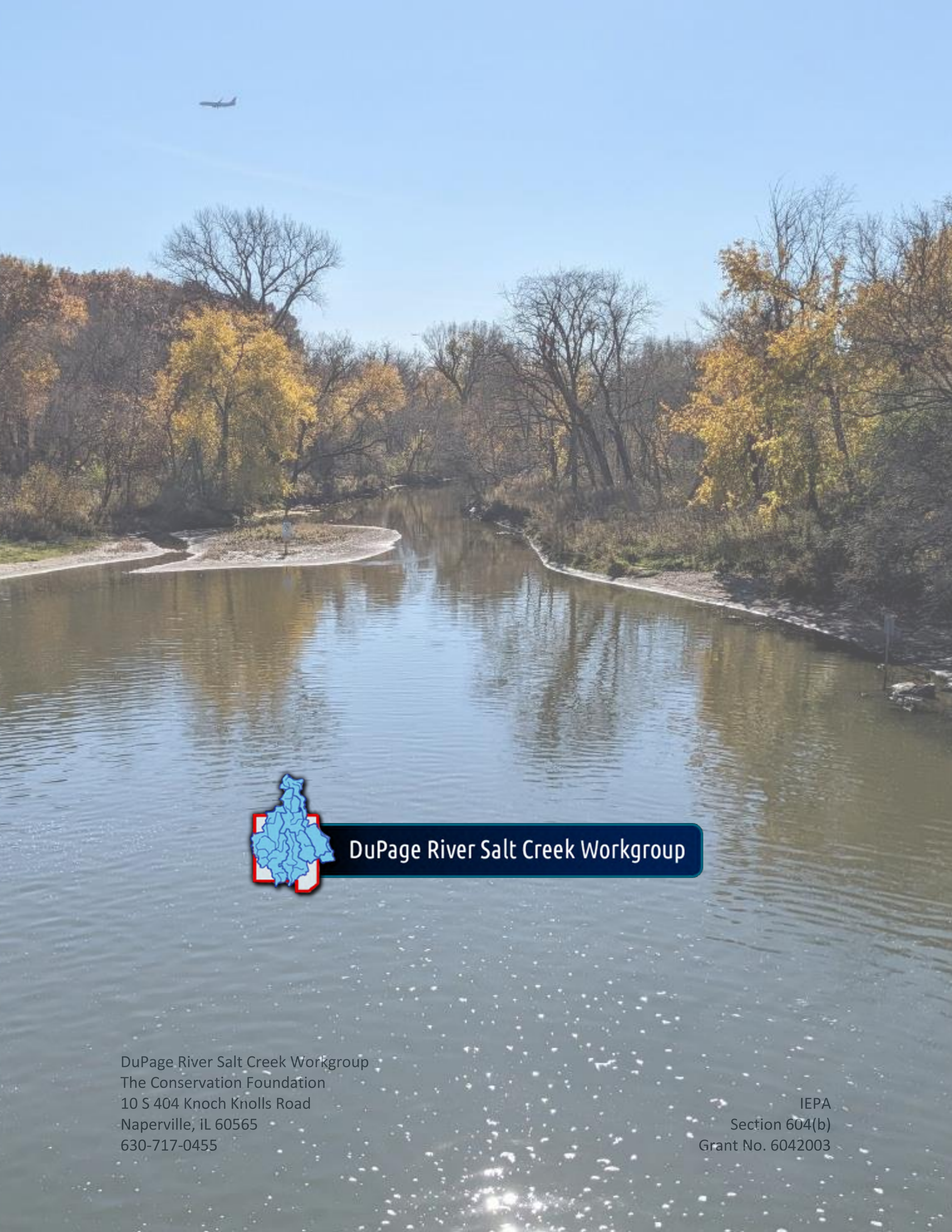
Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
174	1	Wetland Creation / Restoration	Urban	0.14 ac		Unincorporated	$1,718	42.0707	-88.0343
175	2	Wetland Creation / Restoration	Urban	0.24 ac		Rolling Meadows	$2,945	42.0877	-88.0410
176	1	Wetland Creation / Restoration	Urban	0.15 ac		Palatine	$1,841	42.0871	-88.0531
177	1	Wetland Creation / Restoration	Urban	2.41 ac		Palatine	$29,571	42.0860	-88.0560
178	1	Wetland Creation / Restoration	Urban	0.20 ac		Palatine	$2,454	42.0908	-88.0774
179	1	Wetland Creation / Restoration	Urban	0.87 ac		Palatine	$10,675	42.0970	-88.0736
180	1	Wetland Creation / Restoration	Urban	0.13 ac		Palatine	$1,595	42.1007	-88.0665
181	1	Wetland Creation / Restoration	Urban	1.56 ac		Inverness	$19,141	42.0988	-88.0967
182	1	Wetland Creation / Restoration	Urban	0.03 ac		Palatine	$368	42.1119	-88.0547
183	2	Wetland Creation / Restoration	Urban	1.74 ac		Rolling Meadows	$21,350	42.1013	-88.0302
184	2	Wetland Creation / Restoration	Urban	11.53 ac	Arlington International Racecourse	Arlington Heights	$141,473	42.0983	-88.0194
185	1	Wetland Creation / Restoration	Urban	3.62 ac		Hoffman Estates	$44,417	42.1149	-88.1122
186	1	Wetland Creation / Restoration	Urban	0.30 ac		Palatine	$3,681	42.0936	-88.0533
187	1	Wetland Creation / Restoration	Urban	0.50 ac		Inverness	$6,135	42.1205	-88.1031
188	3	Wetland Creation / Restoration	Urban	0.79 ac		Schaumburg	$9,693	42.0224	-88.0963
189	3	Wetland Creation / Restoration	Urban	0.94 ac	Schaumburg Park District	Schaumburg	$11,534	42.0175	-88.0893
190	3	Wetland Creation / Restoration	Urban	2.48 ac		Schaumburg	$30,430	42.0164	-88.0840
191	3	Wetland Creation / Restoration	Urban	0.70 ac		Schaumburg	$8,589	42.0194	-88.0803
192	3	Wetland Creation / Restoration	Urban	2.79 ac	Schaumburg Park District	Schaumburg	$34,233	42.0254	-88.0555

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
193	3	Wetland Creation / Restoration	Urban	1.49 ac	Schaumburg Park District	Schaumburg	$18,282	42.0234	-88.0525
194	3	Wetland Creation / Restoration	Urban	1.15 ac		Schaumburg	$14,111	42.0363	-88.0555
195	3	Wetland Creation / Restoration	Urban	1.04 ac		Schaumburg	$12,761	42.0394	-88.0553
196	1	Wetland Creation / Restoration	Urban	0.50 ac		Schaumburg	$6,135	42.0585	-88.1002
197	1	Wetland Creation / Restoration	Urban	0.85 ac	Highland Woods Golf Course	Unincorporated	$10,430	42.0739	-88.0893
198	1	Wetland Creation / Restoration	Urban	2.17 ac		Hoffman Estates	$26,626	42.1047	-88.1152
199	1	Wetland Creation / Restoration	Urban	2.37 ac		Hoffman Estates	$29,080	42.1055	-88.1193
200	1	Wetland Creation / Restoration	Urban	1.74 ac	Hoffman Estates Parks	Hoffman Estates	$21,350	42.1160	-88.1158
201	1	Wetland Creation / Restoration	Urban	0.71 ac		Palatine	$8,712	42.0911	-88.0664
202	1	Wetland Creation / Restoration	Urban	0.43 ac		Palatine	$5,276	42.0956	-88.0735
203	2	Wetland Creation / Restoration	Urban	0.86 ac		Palatine	$10,552	42.1236	-88.0510
204	2	Wetland Creation / Restoration	Urban	0.29 ac	Arlington International Racecourse	Palatine	$3,558	42.1240	-88.0525
205	2	Wetland Creation / Restoration	Urban	2.66 ac	Arlington International Racecourse	Arlington Heights	$32,638	42.0935	-88.0260
206	4	Wetland Creation / Restoration	Urban	1.87 ac		Elk Grove Village	$22,945	42.0062	-88.0323
207	3	Wetland Creation / Restoration	Urban	3.61 ac	Schaumburg	Schaumburg	$44,295	42.0282	-88.0911

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
208	3	Wetland Creation / Restoration	Urban	3.83 ac		Schaumburg	$46,994	42.0109	-88.0663
209	3	Wetland Creation / Restoration	Urban	1.01 ac		Schaumburg	$12,393	42.0559	-88.0815
210	1	Wetland Creation / Restoration	Urban	0.63 ac		Schaumburg	$7,730	42.0643	-88.0872
211	1	Wetland Creation / Restoration	Urban	0.43 ac		Schaumburg	$5,276	42.0654	-88.0596
212	1	Wetland Creation / Restoration	Urban	0.93 ac		Palatine	$11,411	42.0907	-88.0539
213	1	Wetland Creation / Restoration	Urban	1.04 ac		Palatine	$12,761	42.1101	-88.0772
214	3	Address Short Circuit	Urban	0.45 ac		Schaumburg	$5,522	42.0347	-88.0512
215	3	Wetland Creation / Restoration	Urban	0.75 ac		Schaumburg	$9,203	42.0231	-88.0700
216	3	Wetland Creation / Restoration	Urban	0.62 ac		Schaumburg	$7,607	42.0236	-88.0694
217	3	Native Buffer	Urban	0.21 ac		Schaumburg	$18,295	42.0124	-88.0708
218	3	Native Buffer	Urban	2.06 ac	Schaumburg Park District	Schaumburg	$179,467	42.0246	-88.0523
219	3	Native Buffer	Urban	0.24 ac		Schaumburg	$20,909	42.0388	-88.0524
220	3	Native Buffer	Urban	0.21 ac		Schaumburg	$18,295	42.0522	-88.0701
221	3	Native Buffer	Urban	0.28 ac		Schaumburg	$24,394	42.0515	-88.0846
222	1	Native Buffer	Urban	1.60 ac	Medieval Times Dinner & Tournament	Unincorporated	$139,392	42.0648	-88.0679
223	1	Native Buffer	Urban	0.10 ac		Unincorporated	$8,712	42.0704	-88.0646
224	1	Native Buffer	Urban	0.12 ac		Schaumburg	$10,454	42.0707	-88.0631
225	3	Native Buffer	Urban	0.08 ac		Schaumburg	$6,970	42.0594	-88.0486
226	1	Native Buffer	Urban	0.60 ac		Unincorporated	$52,272	42.0677	-88.0408
227	1	Native Buffer	Urban	2.69 ac		Palatine	$234,353	42.0914	-88.0603
228	1	Native Buffer	Urban	0.32 ac		Palatine	$27,878	42.0919	-88.0545
229	1	Native Buffer	Urban	0.23 ac		Palatine	$20,038	42.1004	-88.0678

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
230	1	Native Buffer	Urban	15.99 ac		Palatine	$1,393,049	42.1037	-88.0691
231	1	Native Buffer	Urban	0.25 ac		Palatine	$21,780	42.0990	-88.0503
232	2	Native Buffer	Urban	0.87 ac		Palatine	$75,794	42.1176	-88.0610
233	1	Native Buffer	Urban	2.76 ac		Inverness	$240,451	42.1200	-88.1100
234	1	Native Buffer	Urban	3.26 ac		Hoffman Estates	$284,011	42.1113	-88.1125
235	2	Native Buffer	Urban	0.27 ac		Unincorporated	$23,522	42.1389	-88.0089
236	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	1.55 ac	Lake Park Estates HOA	Unincorporated	$425,363	42.1282	-88.0592
237	2	Aquatic Plant Management, including Native Buffer	Nutrient	9.16 ac	Virginia Lake Estates POA	Palatine	-	42.1265	-88.0142
238	2	Monitoring	Other	9.16 ac	Virginia Lake Estates POA	Palatine	-	42.1270	-88.0125
239	2	Phosphorus inactivation feasibility study, execution, and monitoring	Nutrient	9.16 ac	Virginia Lake Estates POA, CMAP	Palatine	$130,000	42.1265	-88.0110
240	2	Stream / Shoreline Restoration / Stabilization	Hydrologic	12.23 ac	MWRD	Palatine	$3,356,254	42.1056	-88.0171
241	2	Dredging	Hydrologic	12.23 ac	MWRD	Palatine	-	42.1041	-88.0158
242	2	Water Quality Improvements	Nutrient	11.69 ac	MWRD	Palatine	-	42.1051	-88.0134
243	2	Education / Outreach / Planning	Other	N/A	Rolling Meadows	Rolling Meadows	-	42.0939	-88.0222
244	2	Education / Outreach / Planning	Other	N/A	Rolling Meadows	Rolling Meadows	-	42.0785	-88.0223
245	1	Education / Outreach / Planning	Other	N/A	MWRD	Palatine	-	42.0892	-88.0682
246	1	Education / Outreach / Planning	Other	N/A	MWRD	Schaumburg	-	42.0633	-88.0397

Map #	Subwatershed[146]	BMP Type	Category	Est. Qty	Potential Project Lead Partner	Municipality (Located In)	Estimated Cost ($)	Latitude	Longitude
247	1	Bridge Corridor Improvements	Hydrologic	1	Rolling Meadows	Rolling Meadows	-	42.0567	-88.0100
248	1	Bridge Corridor Improvements	Hydrologic	1	Rolling Meadows	Rolling Meadows	-	42.0643	-88.0195
249	1	Education / Outreach / Planning	Other	N/A	Rolling Meadows	Rolling Meadows	-	42.0779	-88.0217
250	1	Flood Protection/Improvements	Hydrologic	TBD	Rolling Meadows	Rolling Meadows	-	42.0641	-88.0348
251	4	Aquatic Plant Management	Nutrient	20 ac	FPDCC	Unincorporated	-	42.0308	-88.0180
252	4	Dredging	Hydrologic	20 ac	FPDCC	Unincorporated	-	42.0299	-88.0129
253	4	Education / Outreach / Planning	Other	N/A	FPDCC	Unincorporated	-	42.0510	-88.0185



DuPage River Salt Creek Workgroup

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