OLSON ECOLOGICAL SOLUTIONS

South Fork Kent Creek Watershed Resource Inventory and Watershed Plan

Executive Summary
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Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC

ROCKFORD PARK DISTRICT

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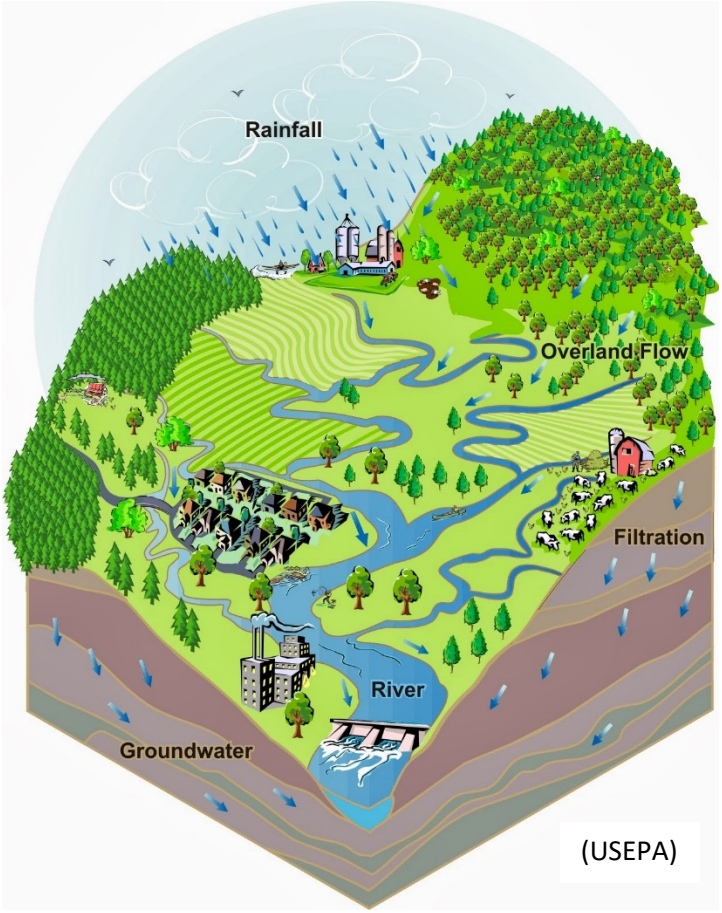
Olson Ecological Solutions: 2221 Hammond Drive, Schaumburg, IL 60173 t) 815.985.2689 rebecca@olsonecosolutions.com

Executive Summary:
South Fork Kent Creek Watershed
Resource Inventory and Plan

The South Fork Kent Creek Watershed Resource Inventory and Plan Executive Summary summarizes the findings and recommendations of the South Fork Kent Creek Watershed Resource Inventory and Watershed Plan. The Executive Summary provides a synopsis of the findings and recommendations in the Resource Inventory and Watershed Plan. The South Fork Kent Creek Watershed Resource Inventory compiles past and present natural resource data and is detailed in Section 1. The South Fork Kent Creek Watershed plan, found in Section 2, provides direction and recommendations to reduce nonpoint source pollution and to improve the quality of the creek, tributaries, ponds, and lake in the watershed. The Rockford Park District initiated these efforts and the Illinois Environmental Protection Agency, in part, funded these efforts through Section 319 of the Clean Water Act.

What is the South Fork Kent Creek watershed?



When precipitation falls to the ground, it takes the path of least resistance to the nearest stream or lake. It may travel over the land, infiltrate through the soil into the groundwater, or get routed through a drainageway or storm sewer to get there. The entire area that leads to the same waterway is a basin called a watershed. This inventory and plan focus on the South Fork Kent Creek Watershed. Any precipitation that falls within the South Fork Kent Creek Watershed flows to South Fork Kent Creek. Levings Lake is located at the downstream end of the watershed and is on the southeast side of the watershed. All watersheds are connected as water continues to flow downstream. Water from South Fork Kent Creek joins the North Fork of Kent Creek, and then runs into the main stem of Kent Creek. Kent Creek flows into the Rock River in Rockford and the Rock River joins the Mississippi River in Rock Island, Illinois. The Mississippi River travels south, emptying into the Gulf of Mexico (USGS StreamStats, 2012). *Figure 1* displays the location of the South Fork Kent Creek Watershed, while *Figure 2* delineates the subbasins, or subwatersheds, within the broader South Fork Kent Creek Watershed.

Figure 1: South Fork Kent Creek Watershed Location

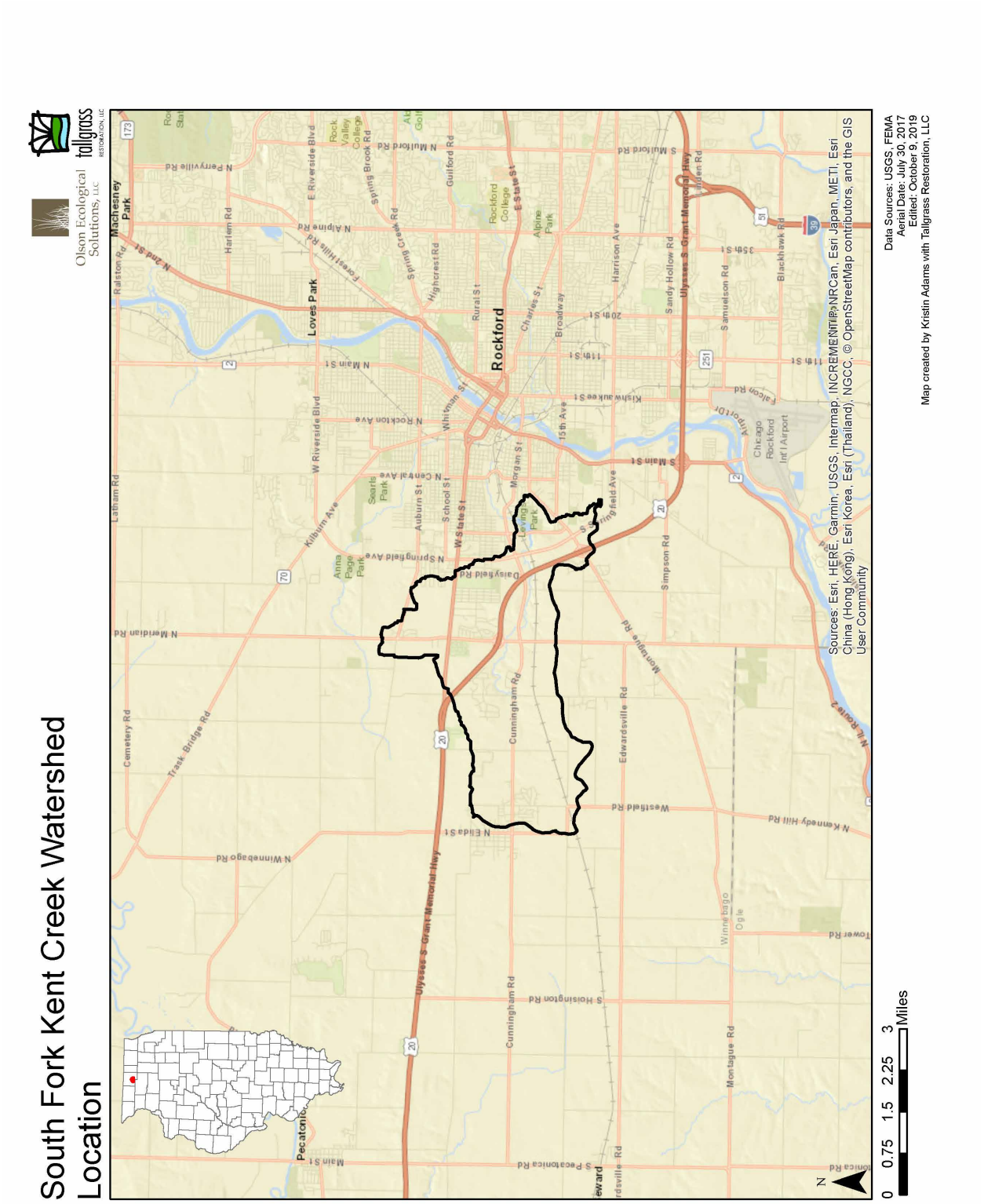
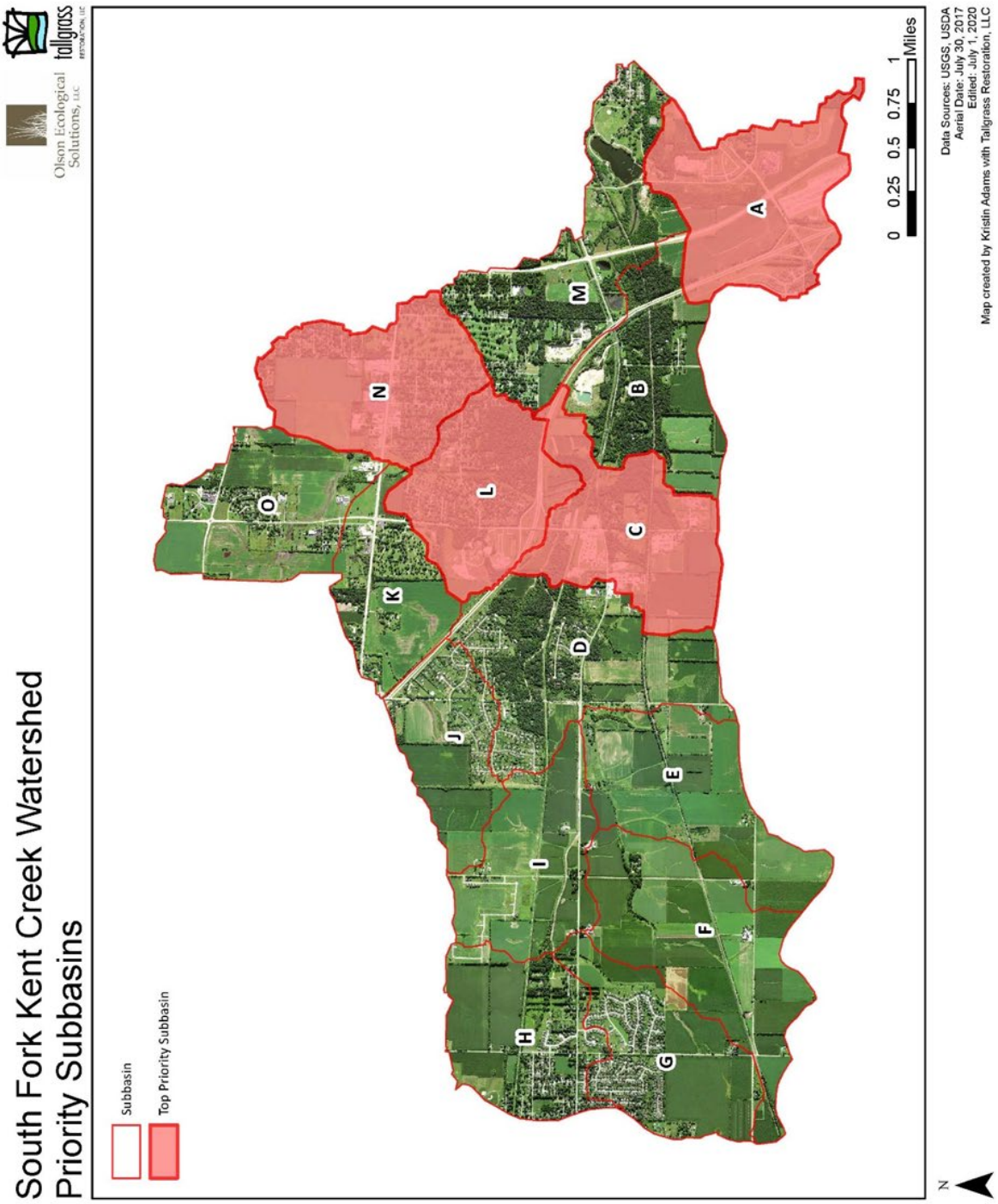


Figure 2: South Fork Kent Creek Watershed Subbasin Boundaries with Priority Subbasins Highlighted



Why are residents concerned about the South Fork Kent Creek Watershed?

Typical of the Midwest, rainfall that hits the land within the watershed and runs into South Fork Kent Creek and Levings Lake picks up pollutants and debris from various land uses, carrying excess nutrients, sediment, and other pollutants from lawns, agricultural production, and hard surfaces such as roads and rooftops to the streams and lake. Excess nutrients can cause algae blooms, elevated levels of harmful bacteria, and fish kills. A fish kill is the sudden decimation of large quantities of fish. Sediment can decrease water clarity and reduce lake depths. Bacteria such as *E. coli* can cause health risks to swimmers and pets. These factors often lead to restricting contact with the water, decreased scenic enjoyment, and diminished quality of wildlife habitat, among other issues.

To determine the issues facing the South Fork Kent Creek Watershed and identify opportunities to improve it, the community worked together with consultants and technical advisors. Stakeholders expressed concerns, technical advisors provided local knowledge, and consultants inventoried the resources of the watershed. Stakeholders identified and prioritized the community's interests, with elevated levels of fecal coliform and flooding issues causing erosion and sedimentation as main concerns. During these discussions, they recognized issues directly and indirectly affecting water quality:

- Issues directly affecting water quality included: nonpoint source pollution, streambank erosion, algae blooms, favorable habitat for nuisance geese, excessive pollutants, litter in the lake and along roadways, and the storms that seemingly were more frequent and intense, bringing an increased amount of rain and runoff.
- Other concerns indirectly affecting water quality included: lack of environmentally conscious lawn care, unknown occurrences of septic system maintenance, impervious surfaces, and lack of knowledge about the creek's impairments, namely elevated levels of fecal coliform.

A watershed resource inventory provided the framework to understand these concerns and their potential causes and sources and to identify the natural resources and opportunities to improve the quality of the streams, ponds, and lake within the South Fork Kent Creek Watershed.

What are the natural resources of the South Fork Kent Creek Watershed?

To understand the issues within the watershed related to water quality, the inventory details landscape features that most directly influence water runoff: topography, soils, water flow connectivity, geology, floodplains, wetlands, and natural areas. Natural resources within this 7,760-acre watershed include:

- 122,463 feet of stream lengths
- 24 waterbodies, totaling 46.3 acres
- 27 retention or detention basins, totaling 47.1 acres
- 20 wetlands with a mean size of about 3 acres, totaling 57.6 acres
- 3,803 acres, or 49%, of the watershed contains hydric soils in varying degrees
- FEMA floodways, 100-year flood zones, and 500-year flood zones covering 854 acres, or 10.9%, of the watershed
- 4,629 acres, or 59.7%, of the watershed is classified as prime farmland
- 134 acres, or 1.73%, of the watershed is highly erodible land and another 149 acres, or 1.92%, of the watershed is potentially highly erodible land

Most of the streams within the watershed are intermittent, carrying stormwater after rain events and snow melt. At lower elevations, streams are perennial, carrying water year-round and supporting fish and other wildlife. Streams are about 76% (92,712 feet) intermittent and 24% (29,751 feet) perennial. Streams generally flow from the west near the Village of Winnebago in a southeastern direction into Levings Lake in the City of Rockford. Most of the 24 waterbodies are small ponds located near the stream, with the exception of Levings Lake, which is a roughly 23-acre impoundment of Kent Creek.

The landscape has slight variation in elevation within the watershed. Topography has some undulation, with highly erodible land near the South Fork Kent Creek, its tributaries, and Levings Lake. Majority of wetlands, as inventoried by the National Wetland Inventory (NWI), are scattered along the stream corridors below the highly erodible lands. Approximately half of the watershed has soils that include some hydric soils, developed under historic wetland conditions, revealing an opportunity to restore wetlands in open areas with these soil types. Soils with a greater percentage of hydric soils included in them follow the stream and its tributaries, usually within their floodplains. FEMA flood hazards include floodways, 100-year flood zones, and 500-year flood zones. Floodways cover 165 acres, or 2.1%, of the watershed. 100-year flood zones, which are areas that have a 1% annual chance of flooding, cover 375 acres, or 4.8%, of the watershed. 500-year flood zones, which are areas that have a 0.2% annual chance of flooding, cover 314 acres, or 4.0%, of the watershed. Soils of the watershed are mainly silt loams. More than half of the soils are classified as prime farmland, mostly located on the west side of the watershed away from stream corridors. *Figures 3* and *4* depict the locations of the waterbodies and *Figure 5* illustrates some of the environmentally sensitive natural resources found in the South Fork Kent Creek Watershed.

Figure 3: South Fork Kent Creek Watershed Streams and Waterbodies

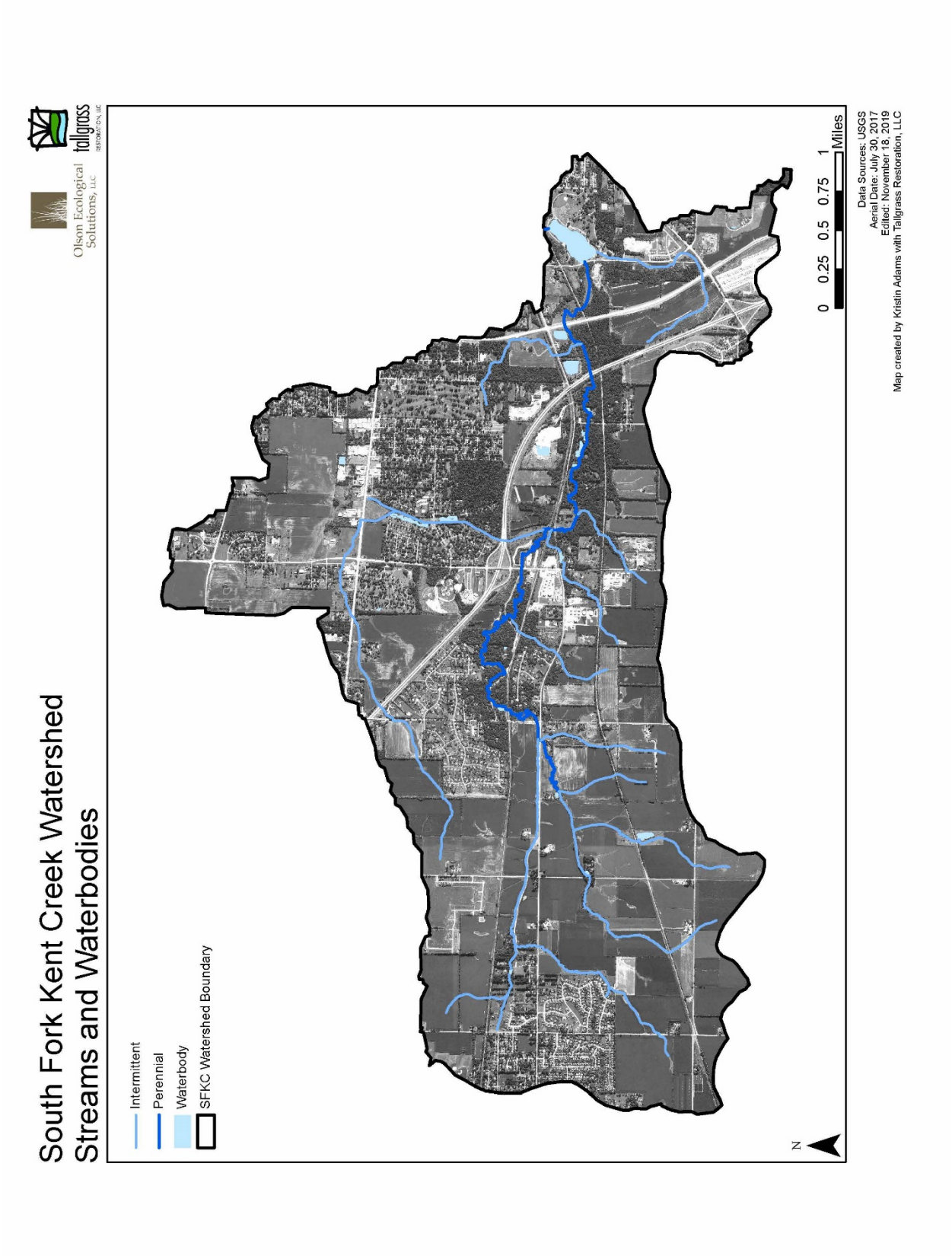


Figure 4: South Fork Kent Creek Watershed Basins

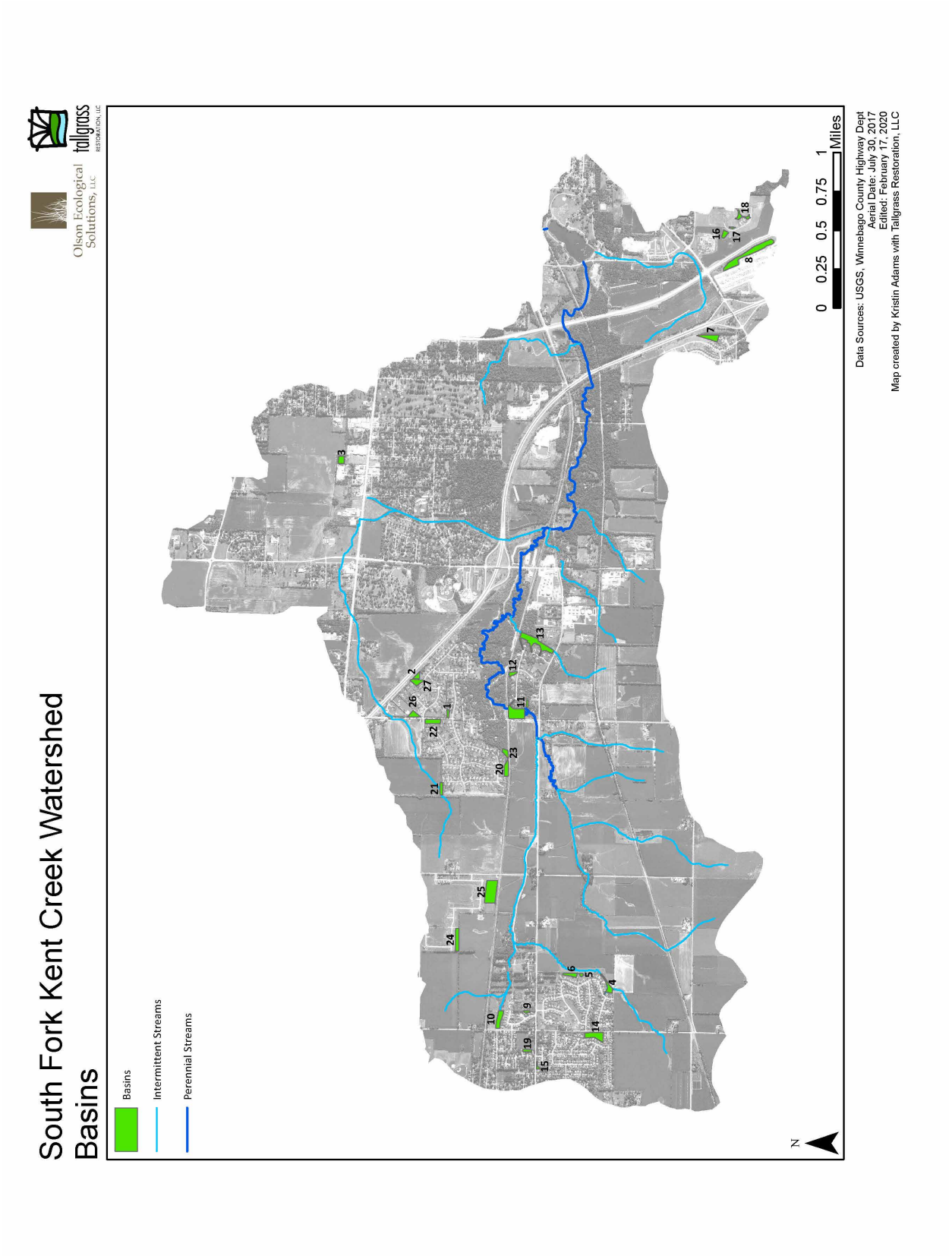
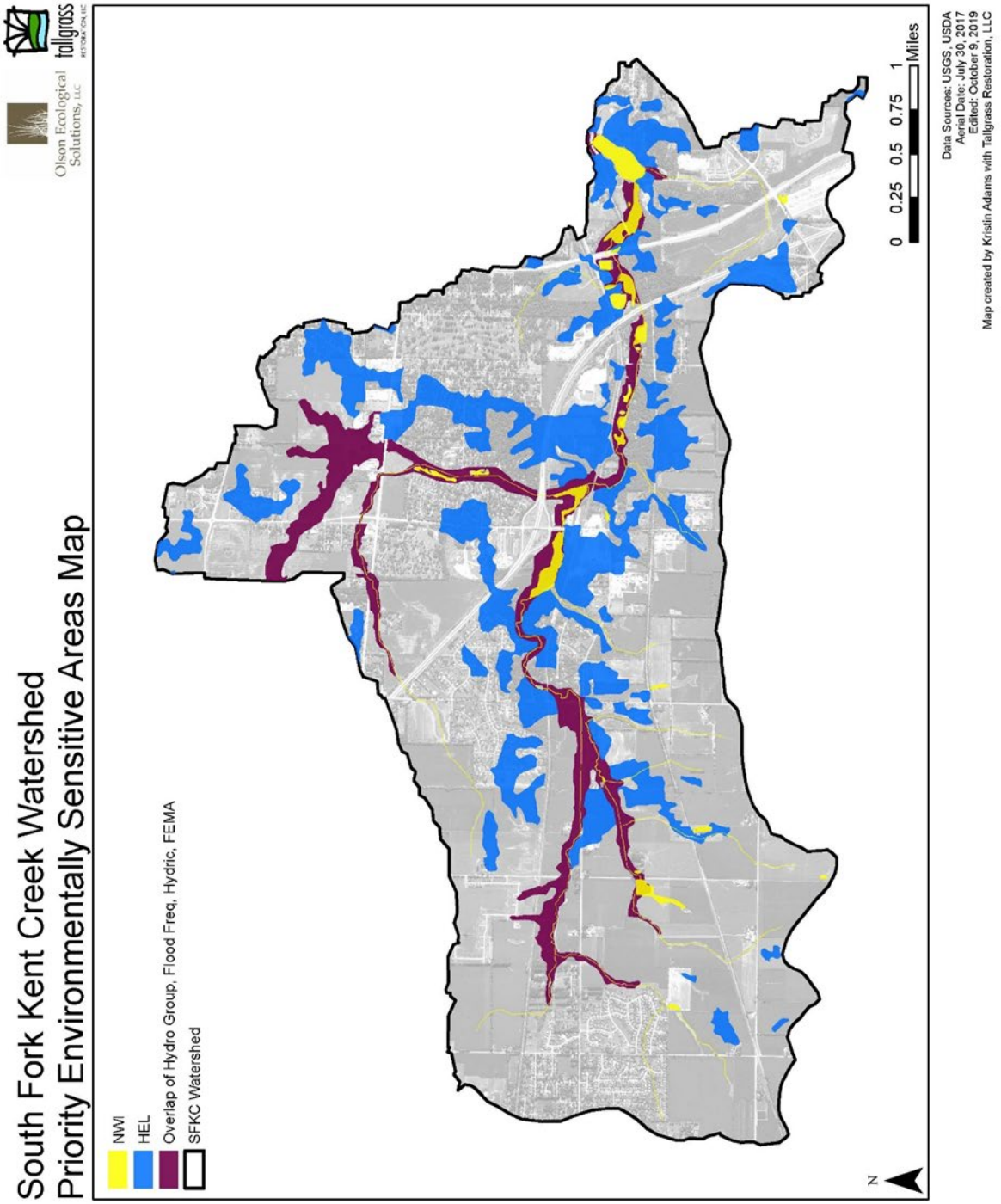


Figure 5: South Fork Kent Creek Priority Environmentally Sensitive Areas



How have people shaped the landscape?

To identify opportunities for water quality improvement, consultants studied nonpoint source pollution in terms of past, present, and future predicted land uses; erodibility of streambanks and shorelines; channelization of streams; conditions within 50 feet of streams, ponds, and the lake; water quality information for Levings Lake and the larger region surrounding the watershed; and estimated amounts of pollutants coming from the various current land uses of the watershed.

Historically, prairie covered about 80% of the watershed and timber covered another 16%. Surface water, marshes, sloughs, and cropland covered the remaining 4%. The stream ran a similar course to its current path; however, there was once more natural meandering. Now agricultural production covers 45% of the watershed, residential areas make up 20%, areas with a considerable amount of pavement cover 9%, and turf areas and parks make up another 7%. Forest and other natural lands continue to cover about 18% of the watershed.

Land Use

Land Use Type	Acres	%
High Intensity, Developed	85	1.1%
Medium Intensity, Developed	161	2.1%
Low Intensity, Developed	1,514	19.5%
Roads	367	4.7%
Railroad	42	0.54%
Trail	29	0.37%
Golf Course	123	1.6%
Cemetery	69	0.89%
Turf	373	4.8%
High Residue Till	2,726	35.1%
Low Residue Till	717	9.2%
Orchard	2	0.02%
Pasture	37	0.5%
Quarry	74	1.0%
Mulch Yard	23	0.30%
Forest	1,090	14.0%
Grassland	212	2.7%
Wetland	54	0.69%
Water	63	0.81%
Total:	**7,760**	**100%**

About 134 acres of the soils are classified as highly erodible land (HEL). Most of the HEL is located near stream corridors. About 17% of the watershed is covered with an impervious surface like rooftops, roads, driveways, and parking lots. Current land uses are expected to change, according to the 2030 Land Resource Management Plan for Winnebago County. The goals and objectives of this plan are further detailed in Section 2. Future impervious surfaces are estimated to more than double, covering 37% of the watershed. The changes in land use that result in this increase in impervious surface are an increase in high, medium, and low intensity development such as commercial, industrial, and residential construction paired with a decrease in agricultural land and natural resources, like forest, grasslands, and wetlands. Agricultural land is estimated to be cut in half of its current amount, going from 3,443 acres to 1,659 acres. Natural areas are estimated to also decrease to half its current amount, going from 1,419 acres to 766 acres. High, medium, and low intensity development is estimated to increase by 2.5 times its current amount going from 1,760 acres to 4,370 acres. Maps depicting the changing land uses in past, current, and predicted future conditions are shown in *Figures 6, 7, and 8*.

Figure 6: Past Land Uses in the South Fork Kent Creek Watershed

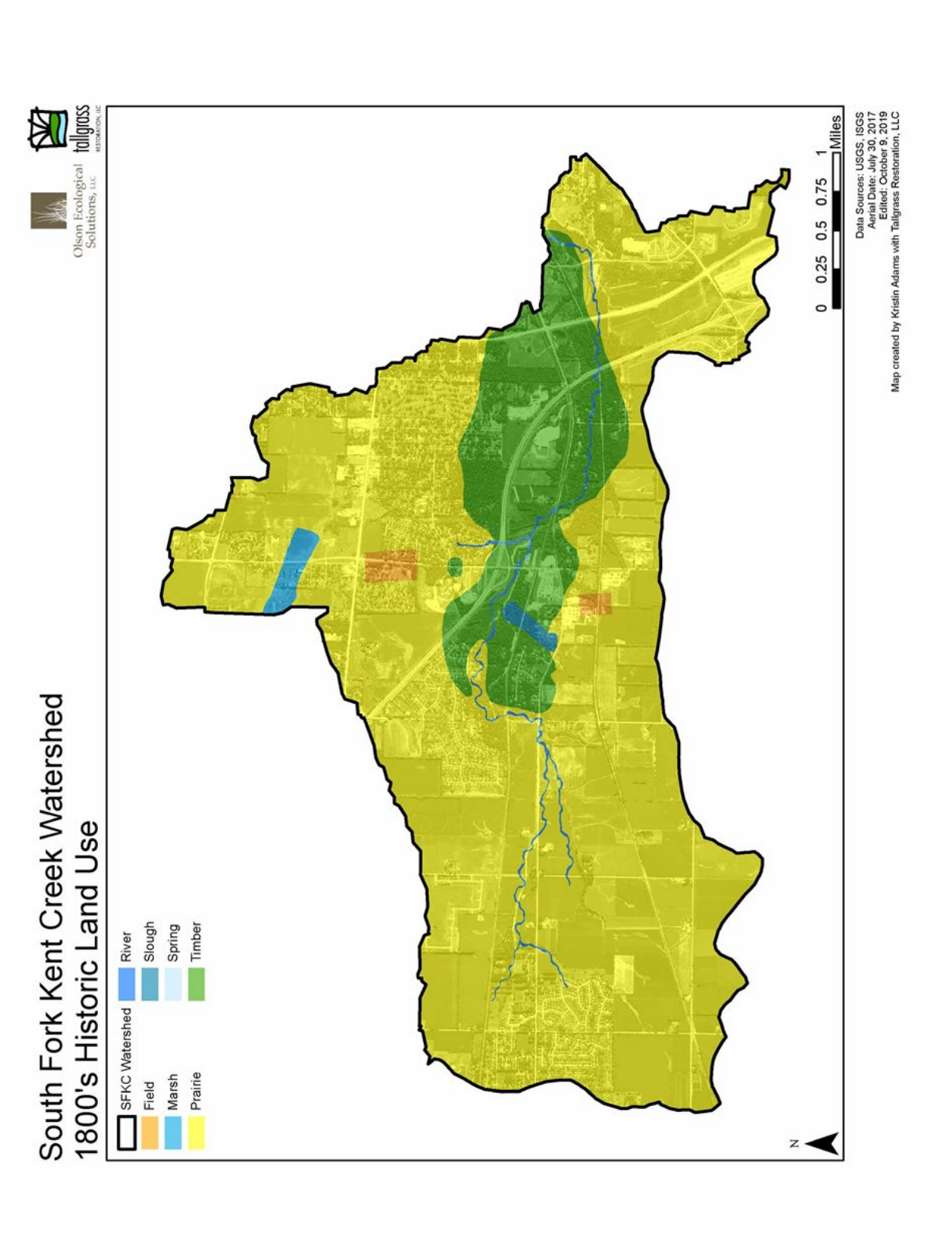


Figure 7: Current Land Uses in the South Fork Kent Creek Watershed

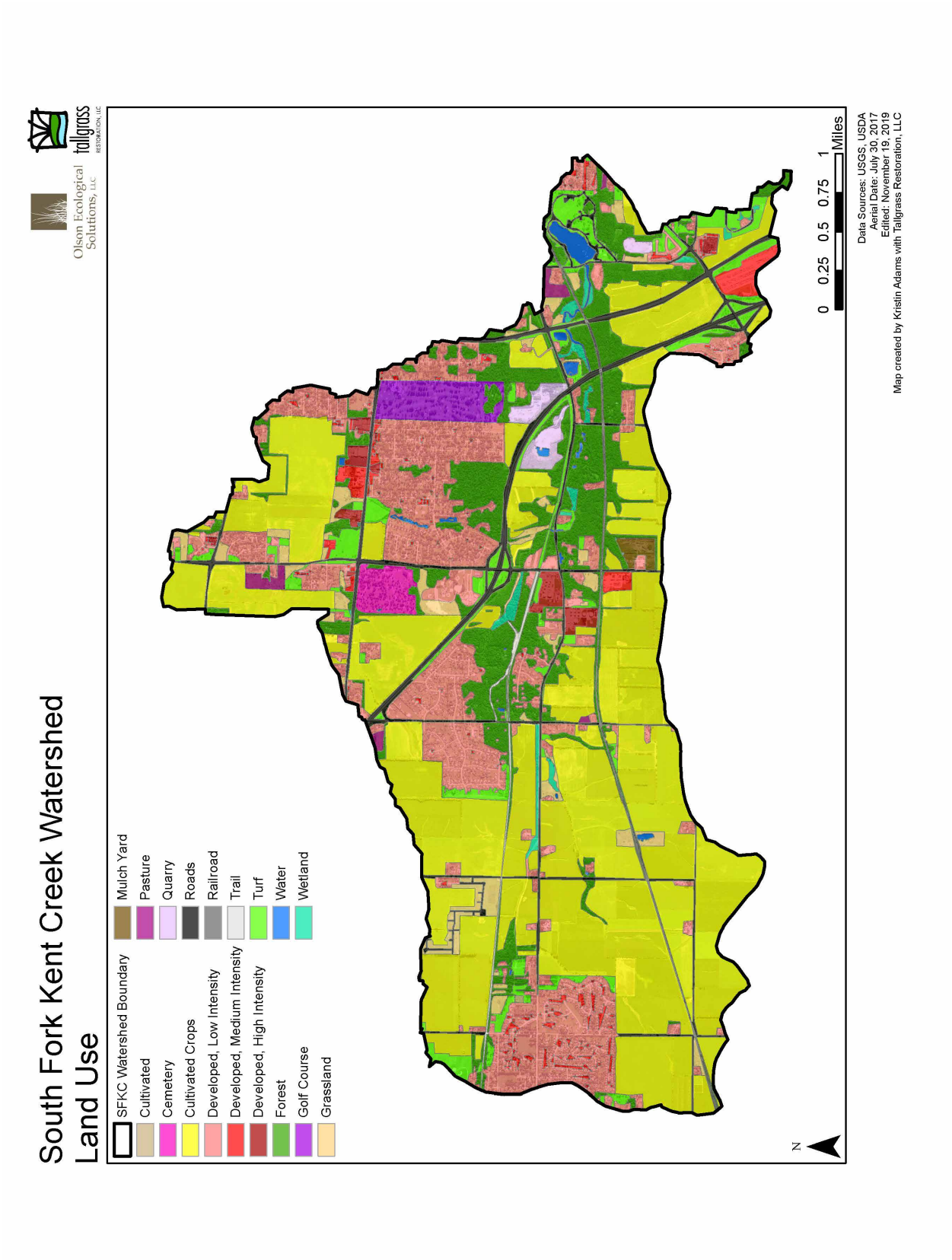
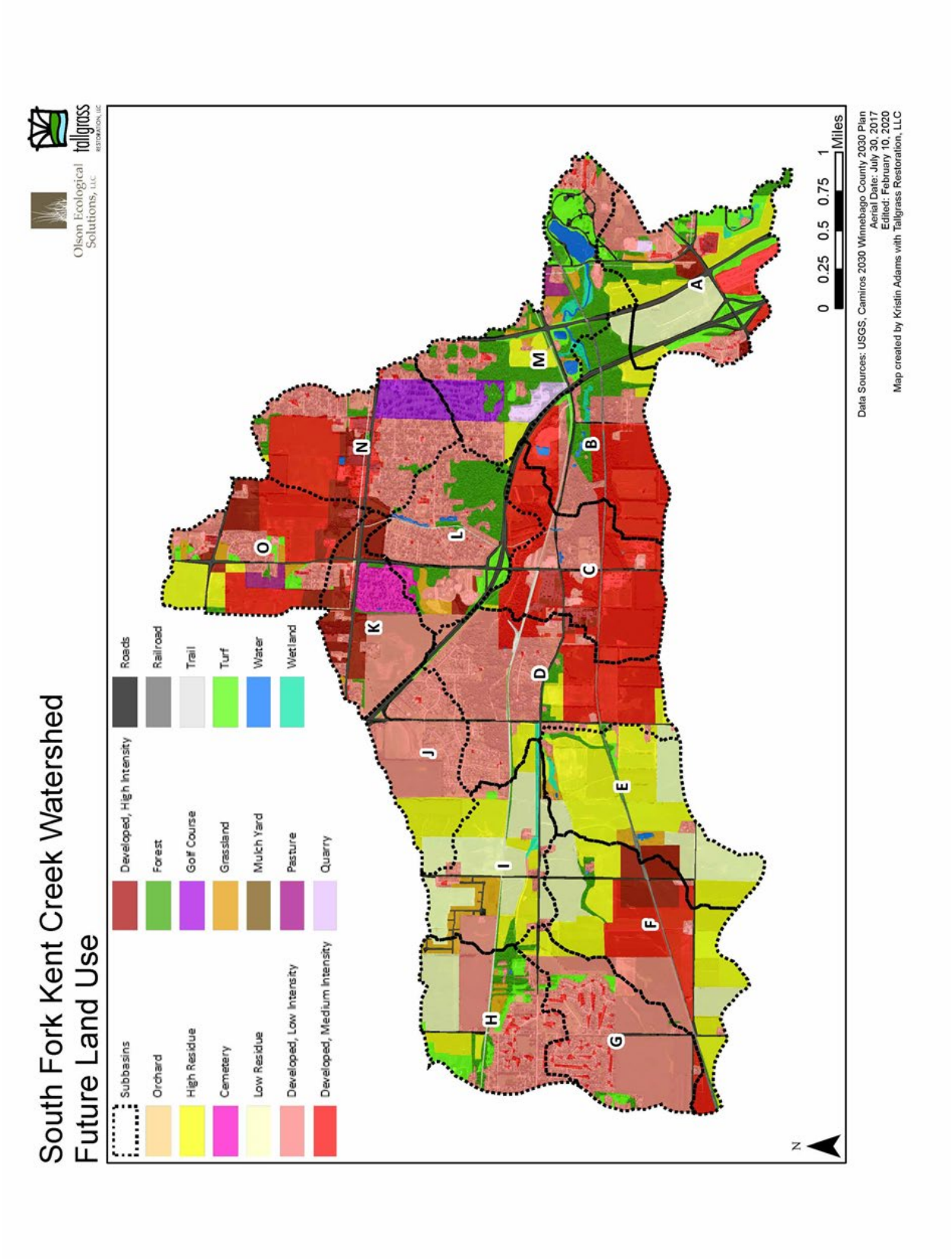


Figure 8 Predicted Future Land Uses in the South Fork Kent Creek Watershed



What is the condition of the watershed's streams, ponds, and lake?

The Illinois Environmental Protection Agency (Illinois EPA) tests waters in watersheds for water quality. The waterbodies that do not meet the standard for one or more of the designated uses are referred to as "impaired." According to the ILEPA's 303(d) list, South Fork Kent Creek is an impaired waterbody because it does not support primary contact recreation like swimming, but Levings Lake is not impaired. The cause of impairment is fecal coliform originating from unknown sources.

From surrounding lands, waterbodies receive sediment, excess nutrients, and bacteria via stormwater runoff. Although this occurs naturally, the rate at which it occurs increases exponentially by intensive human land uses like developed areas with many impervious surfaces, residential areas, and agricultural production. Consultants utilize computer models to predict the rate at which pollutant loading occurs within the watershed. It is estimated that 49,739 pounds of nitrogen, 10,570 pounds of phosphorus, 1,424,300 pounds of total suspended solids, 1,845 tons of sediment, and 278,052 billion counts of bacteria enter South Fork Kent Creek every year from the watershed's land uses and stream erosion.

Some lands uses are high pollutant contributors per acre yet are not well represented within the watershed, while other land uses rise in their pollutant loading to waterbodies based on their number of acres found in the watershed. Land uses with the highest total pollutant loading for the South Fork Kent Creek Watershed, based on their current configuration and representation, are the same for all four pollutants. Low intensity development, roads, and high residue till are the land uses with the highest total nitrogen (TN), total phosphorous (TP), total suspended solids (TSS), and bacteria loading in the watershed. Land uses can be compared more directly by pollutant loading *per acre*, regardless of their representation throughout the watershed. Six land uses found in the watershed contribute most of the loading for the four pollutants per acre: high, medium, and low intensity developed areas; roads;

railroads; and trails. High and low residue tilled farmland join the other land uses as main contributors of TSS per acre, and pasture joins as a main contributor of bacteria per acre. Focusing efforts to control pollutants from these land uses will be more effective than the same efforts targeted at less polluting land uses.

Natural vegetation cover between land uses and waterbodies can filter pollutants from stormwater before it enters the water. Along the streambanks and shorelines, OES inventoried a 50-foot width for protective vegetative cover. OES found that 41% of the stream buffer areas have good vegetative cover providing filtration of water runoff prior to it entering the stream. Another 3% have fair vegetative cover, and 55% are in poor condition, resulting from little to no vegetative cover within 50 feet of the streambanks. Small ponds were also surveyed for presence of vegetative buffers, finding that about 66% of waterbody buffers are in poor condition, having little to no vegetative cover within a 50-foot-wide perimeter of the waterbody. Approximately 18% of the surveyed waterbodies have vegetative buffers in fair condition and 16% have buffers in good condition.

In addition to pollutants coming from land uses throughout the watershed, bank erosion and washing out of streambanks during heavy storms are of concern. According to a bank erosion survey conducted by OES, approximately 9% of surveyed streambanks have very severe erosion, 27% have severe erosion, 26% have moderate erosion, and 38% have slight erosion. There is little erosion along the shorelines of small ponds and basins throughout the watershed. Subbasins B and C have the largest amount of very severe and severe streambank erosion. These conditions are likely exacerbated by invasion of non-native buckthorn shading out forest floors of their stabilizing vegetation. About one-fifth of streams are

highly channelized (21%), while moderate channelization characterizes 19% of the streams, and little to no channelization is found on 60% of the streams.

OES compiled the information about community concerns, natural resources, and opportunities within the watershed to identify the most probable causes and sources of water quality impairments. Next, stakeholders, technical advisors, and consultants partnered to develop a course of action to address them in a watershed-based plan.

What does the South Fork Kent Creek Watershed Plan contain?

Watershed plans are valuable because they create a plan of action for the community to reduce nonpoint source pollution and improve water quality within their local watershed. After inventorying the area for natural resources, concerns, and opportunities, stakeholders determined what needed to be accomplished to improve their waters. These desires are encompassed in a community-driven watershed plan to address nonpoint source pollutants as an important first step in improving water quality in South Fork Kent Creek and Levings Lake. These actions will have positive impacts on the local economy, property values, and recreational opportunities, and they will preserve the local heritage for future generations. In addition, they will provide benefits downstream for the greater good of the people and wildlife of the Mississippi River and Gulf of Mexico.

During a two-year planning process, stakeholders, consultants, and technical advisors came together to plan vision and direction toward better stewardship of the area's land and water. The resulting watershed plan uses the group's feedback combined with the results of the watershed resource inventory to address their problem statement, put in place goals and measurable objectives, decide which best management practices would be most applicable to the watershed and acceptable to stakeholders, determine how the chosen projects and practices would positively affect the area's streams and lakes, decide how and when to implement the practices and educate stakeholders, weigh costs and benefits of chosen activities, and put in place monitoring efforts. It also provides guidance toward appropriate local financial and technical resources.

What is the community's problem statement?

Overall, the watershed's biggest concerns, discussed in depth above, include erosion, sedimentation, flooding, future land use development, nonpoint source pollution degrading the quality of waterbodies, and elevated levels of fecal coliform. The creation of this watershed plan is a step towards addressing these concerns. A vision statement and specific goals will help guide the stakeholders in addressing these concerns and aid in measuring success.

What are the community's vision and goals for the watershed?

The primary motive of stakeholders is to confront the causes of nonpoint pollution impairing the South Fork Kent Creek and Levings Lake, namely elevated levels of bacteria, excess nutrients, and total suspended solids and sediment. Goals and specific recommendations were created to make the community's vision a reality. The following vision statement captured these desires:

We envision improving the water quality in South Fork Kent Creek Watershed by reducing and preventing nonpoint source pollution in order to preserve and enhance the natural beauty, wildlife habitat, recreational attractions, and agricultural use of this natural resource for future generations to come.

Eight overarching goals are set to achieve this vision.

This plan's goals are to:

1. *Decrease contaminants in the water, including fecal coliform bacteria.*
2. *Minimize erosion, sediment, and nutrient loading into surface waters.*
3. *Address water volume and velocity to improve water quality and prevent flooding.*
4. *Protect, enhance, and manage wildlife habitat.*
5. *Sustain and enhance the recreational opportunities of the watershed.*
6. *Educate the community about water quality and this plan.*
7. *Work with governing and policy-making bodies to protect water quality currently and in future land use planning.*
8. *Preserve prime farmland during future land use changes.*

The community agreed upon pollutant reduction targets to reduce the amount of nitrogen, phosphorous, total suspended solids, and bacteria loading into the streams and lake. These targets represent amounts that the stakeholders, technical advisors, and consultants thought to be achievable within the life of the plan.

This plan targets a reduction for the following pollutant loads:

- *Total nitrogen loading by 7.5%*
- *Total phosphorus loading by 12.5%*
- *Total suspended solids loading by 7%*
- *Sediment by 4%*
- *Bacteria loading by 20%*

To meet these goals and targets, stakeholders, technical advisors, and consultants chose projects and practices that were appropriate for their area, cost-effective, likely to be implemented by stakeholders, and had highest pollutant load reduction efficiencies.

What conservation practices are already in place?

The community currently practices conservation efforts. Some of the efforts practiced by the community are listed below:

Community Efforts

- Approximately 20% of the watershed's roadway ditches are vegetated swales.
- There are about 115.3 acres of riparian filter strips along streambanks and 5.3 acres of riparian filter strips along waterbody shorelines, totaling 120.6 acres.
- The watershed has a total 27 retention or detention basins covering 47.1 acres.
- The watershed has a total 24 ponds, or waterbodies, totaling 46.3 acres.
- There are approximately 1,090 acres of forest, 212 acres of grassland, and 54 acres of wetlands. In total there are approximately 1,356 acres of natural areas, of varying degrees of quality, in the watershed.
- Rockford Park District installed 20 BioHaven floating islands within Levings Lake in 2018 and a 0.64-acre constructed stormwater wetland in 2019. They are in the process of installing filter strips surrounding Levings Lake, and they plan to expand acreage upon this existing constructed wetland and install vegetated swales and additional bioislands.
- Approximately 80% of agricultural fields are farmed using conservation tillage practices to reduce runoff.
- About 9% of the agricultural fields use cover crops.
- Agricultural producers utilize grassed waterways. There are approximately 132.5 acres of grassed waterways across the total watershed.

An agricultural field within the watershed currently utilizes conservation tillage and grassed waterways.

What more can landowners, business owners, and homeowners do?

Consultants and technical advisors recommended projects and practices that were adopted and prioritized by stakeholders. These six best management practices were selected based on several factors: high pollutant reduction efficiencies, favorable cost to benefit ratios, high applicability to the watershed, and stakeholder interest. To achieve the plan's pollutant load reduction targets listed above, the top six prioritized best management practices to be implemented watershed-wide were to:

- Install 41.3 acres of grassed waterways.
- Install 21.9 acres vegetated swales into existing ditches.
- Install 286.4 acres of herbaceous filter strips.
- Install 18.3 acres of constructed stormwater wetlands on existing hydric soils.
- Convert 328 acres of land into natural areas.
- Stabilize 5,145 feet, or 13.3%, of very severely eroded and severely eroded streambank.

If the watershed community implements the top six prioritized BMPs at the recommended amounts, pollutant loading into the watershed's surface water each year will be reduced by the following:

- 7,933 pounds of nitrogen per year
- 1,321 pounds of phosphorous per year
- 653,679 pounds of TSS per year
- 360 tons of sediment per year
- 2,808 billion counts of bacteria per year

Consultants prioritized other practices beyond these six BMPs, ranging from BMPs with high applicability within the watershed to BMPs with low applicability within the watershed. These other BMP options are based on stakeholder interest and watershed applicability. Highly applicable practices include:

- Forest stabilization by addressing erosion and invasive brush invasion in forest, particularly in forest riparian zones and 100-year floodplains.
- Wetland restoration and prairie restoration to restore ecosystem functions and protect wildlife habitat.
- Septic system maintenance and inspection
- Lawn care
- Rain gardens
- Rain barrels
- Livestock exclusion fencing
- Stream crossing
- Critical area planting
- Cover crops
- Conservation tillage
- Agricultural easements to preserve prime farmland

All these BMPs can be used to reach the pollutant reductions in place of the top six when desired by the landowner, business owner, or homeowner. All estimates are based on the implementation of the top

size prioritized BMPs. The table below breaks down the pollutant load reductions to be achieved by each prioritized BMP when the plan is fully implemented:

#	Recommended BMPs - Watershed Wide	Description (All possible in the watershed)	Amount	Unit	Total Nitrogen Reduction (lbs/yr)	Total Phosphorus Reduction (lbs/yr)	TSS Reduction (lbs/yr)	Sediment (ton/yr)	Bacteria Reduction (bil counts/yr)
1	Grassed Waterways	Install 41.32 acres of 30 ft-wide grassed waterways in waterways that are currently bare throughout the watershed (dimensions of 30 ft by 60,000 ft) to treat 1033 acres of drainage area.	41.32	ac.	945	66	54266	N/A	3003
2	Vegetated Swales	Install vegetated swales into 10.52% of existing roadway ditches throughout the watershed (21.88 acres, dimmensions of 15 ft by 63,539.52 ft) to treat 547 acres of drainage area.	21.88	ac.	637	357	187822	N/A	13263
3	Herbaceous Filter Strips	Install 286.47 acres of 35 ft-wide herbaceous filter strips along streambanks, ponds, basins, roadways, etc. (dimensions of 35 ft by 356,532.37 ft) to treat 1061 acres of drainage area.	287.47	ft.	2283	242	100939	N/A	11539
4	Constructed Stormwater Wetlands	Install 18.3 acres of constructed stormwater wetlands on existing hydric soils to treat 610 acres of drainage area.	18.30	ac.	1184	136	72524	N/A	21049
5	Conversion to Natural Area	Convert 328 acres of land into natural areas.	328	ac.	2233	194	58758	N/A	15182
6	Streambank Stabilization - Very Severe & Severe	Stabilize 8% of very severely eroded streambanks, or 1,835 feet, and 5% of severely eroded streambanks, or 3,310 feet, throughout watershed.	5,145	ft.	652	326	N/A	360	2808
TOTAL POLLUTANT REDUCTION POST IMPLEMENTATION					**7,933**	**1,321**	**474,309**	**360**	**66,844**
POLLUTANT REDUCTION TARGETS					**3,730**	**1,321**	**99,701**	**295**	**55,610**

The table below depicts the watershed's baseline pollutant loading and pollutant loading if the top six prioritized BMPs are implemented at the recommended amounts.

Pollutant	Current Pollutant Loading from Land Use	Current Pollutant Loading from Stream Erosion	Current Total Pollutant Loading (Baseline)	Pollutant Reduction After Top 6 BMP Implementaiton	Pollutant Loading After Top 6 BMP Implementation
Nitrogen (lbs/yr)	36,250	13,489	49,739	7,933	41,806
Phosphorous (lbs/yr)	3,826	6,744	10,570	1,321	9,249
TSS (lbs/yr)	1,424,300	N/A	1,424,300	474,309	949,991
Sediment (tons/yr)	N/A	7,384	7,384	360	7,024
Bacteria (billion counts/yr)	218,980	59,072	278,052	66,844	211,208

When will we reach our targets?

Each of the prescribed best management practices above plays a role in reducing all target pollutants. Their ability to address each pollutant varies, but all are chosen because they are highly effective. As these best management practices are implemented over the upcoming five years, pollutants entering the waterbodies will be reduced, meeting milestone targets at different times as follows.

- *Milestone #1: Meet 7% reduction target for suspended solids, install 22% of prescribed BMPs.* The current amount of TSS loading from land uses and stream erosion is estimated to be 1,424,200 pounds per year. If all top six prioritized BMPs are implemented at the recommended amounts listed above, then the watershed will experience a TSS loading reduction of 474,309 pounds, or 33%, every year. The 7% reduction target will be met after installing only 22% of these BMPs, likely being the first reduction target met and milestone reached.

- *Milestone #2: Meet 7.5% reduction target for nitrogen by installing 47% of prescribed BMPs.* Currently in the watershed, the amount of nitrogen loading from land uses and stream erosion is at a baseline loading of 49,739 pounds per year. If all top six prioritized BMPs are implemented at the recommended amounts listed above, then the watershed will experience a nitrogen loading reduction of 7,933 pounds per year, or a 15.95% reduction in total nitrogen loading every year. The 7.5% reduction target for nitrogen will be met after about half of the BMPs have been installed.

- *Milestone #3: Meet 4% reduction target for sediment by installing 80% of prescribed BMPs.* The current amount of sediment loading from bank erosion of streams and other waterbodies is at a baseline loading of 7,384 tons per year. If all top six prioritized BMPs are implemented at the recommended amounts listed above, then the watershed will experience a sediment loading reduction of 360 tons per year, or a 4.8% reduction in sediment. The reduction target of 4% will likely be reached when about 80% of the BMPs have been installed.

- *Milestone #4: Meet 20% reduction target for bacteria by installing 83% of prescribed BMPs.* The current number of bacteria counts from land uses and stream erosion is at a baseline loading of 278,052 billion counts/year. If all top six prioritized BMPs are implemented at the recommended amounts listed above, then the watershed will experience a bacterium loading reduction of 66,844 billion counts/year, or a 24% reduction in bacteria loading every year. The reduction target of 20% will likely be met when about 83% of the BMPs have been installed.

- *Milestone #5: Meet 12.5% reduction target for phosphorus, install 100% of prescribed BMPs.* The current amount of phosphorus loading from land uses and stream erosion is at a baseline loading of 10,570 pounds per year. If all top six prioritized BMPs are implemented at the recommended amounts listed above, then the watershed will experience a phosphorous loading reduction of 1,321 pounds per year, or a 12.5% reduction in total phosphorus loading every year, meeting the reduction target. Because it will require installing all prescribed BMPs to meet this reduction target, it will be the last milestone reached.

For each project and practice, stakeholders will consider the potential to incorporate habitat for wildlife, the use of native vegetation, the enhancement of recreational opportunity, partnerships with governing and policy-making bodies, and preservation of prime farmland.

How to accomplish the recommended projects and practices?

Constructing and implementing the recommended projects and practices throughout the watershed will take time, money, and expertise. The possibilities are greater than what can reasonably be expected by the community. Therefore, stakeholders, technical advisors, and consultants decided what priority projects are likely to be accomplished within a five-year time frame, resulting in the amounts stated above for each of the top six prioritized best management practices. There is financial and technical assistance available! The main sources of technical and financial support to implement this watershed plan are:

- Region 1 Planning Council assists with grant applications and administration for a fee.
- Illinois Environmental Protection Agency's Section 319 Program accepts grant applications for implementation projects.
- Winnebago County Natural Resources Conservation Service, Winnebago County Soil and Water Conservation District, and Winnebago-Boone Farm Bureau have a selection of conservation programs available to agricultural producers.
- Several private foundations and public entities have missions that align with this watershed plan and focus within the watershed's geographic location.

The estimated annual low-end and high-end costs for implementing the top six prioritized BMPs are depicted in the table below.

Years	Interim Milestones	Potential Funding/Technical Support	Annual Low End Installation Cost	Annual High End Installation Cost
1 to 5	Install 8.26 acres of 30 ft-wide grassed waterways in waterways that are currently bare throughout the watershed.	NRCS, SWCD, IEPA, USFWS, IDOA, NWTF, PF	$ 45,410.68	
1 to 5	Install vegetated swales into 2.10% of existing roadway ditches throughout the watershed (4.38 acres).	NRCS, TU, IEPA	$ 76,404.96	
1 to 5	Install 57.29 acres of 35 ft-wide herbaceous filter strips along streambanks, ponds, basins, roadways, etc.	NRCS, SWCD, Trees Forever, TU, IEPA	$ 47,554.02	$ 188,497.26
1 to 5	Install 3.66 acres of constructed stormwater wetlands on existing hydric soils.	NRCS, SWCD, IEPA, IDNR, USFWS, Trees Forever, PF	$ 52,246.50	58,194.00
1 to 5	Convert 65.6 acres of land into natural areas.	IEPA, IDNR, USFWs, Trees Forever, Grand Victoria, AmeriCorps, PF	$ 44,280.00	$ 215,824.00
1 to 5	Stabilize 367 feet of very severely eroded streambanks and 662 feet of severely eroded streambanks throughout watershed.	IEPA, Patagonia	$ 72,030.00	$ 123,480.00
TOTAL ANNUAL COST (Low End & High End)			**$ 337,926.16**	**$ 707,810.90**

How to educate our community about water quality?

Educating the community about the importance of water quality and the contents of this plan are vital to the success of implementing the watershed plan. Some of the major educational efforts prioritized in this plan are to:

- Increase awareness of septic system maintenance and its relationship to the fecal coliform impairment of the stream.
- Increase awareness of lawn care practices and native plantings and their relationship to water quality of the stream.
- Increase awareness of this plan, the importance of implementing BMPs, potential for funding assistance, and educational topics.
- Promote partnerships with community groups that can assist in creating public awareness.
- Invite local municipalities and developers to educational events and meetings and provide them with educational publications and materials.

How to know if the plan is successful?

Ongoing monitoring of Levings Lake water quality and shorelines will be a good way to measure if added conservation practices are helping, including annual water sample analysis, annual shoreline inspections, and sediment depth measurements every 10 years. It may take a while to see dramatic differences. In the meantime, a dedicated group of stakeholders will annually distribute and collect monitoring worksheets to document conservation activities in the watershed, record watershed improvements, update the plan accordingly, and inform the community of updates and new funding opportunities via emails, website updates, and newsletters.

What should the community do next?

Now that the watershed plan is completed, the community strives to implement it over the next five years. In order to keep the plan alive, it is essential for the community to become involved. Homeowners, educators, agricultural producers, and governmental, private, and non-profit organizations all have something to contribute to the implementation of the plan. For more information, please contact the following agencies:

- Rockford Park District: 815-987-8800, TomLind@rockfordparkdistrict.org
- Region 1 Planning Council: 815-319-4185, sbest@r1planning.org
- Illinois Environmental Protection Agency's Bureau of Water: christine.davis@illinois.gov
- Olson Ecological Solutions: 815-985-2689, rebecca@olsonecosolutions.com
- A friend or neighbor who was instrumental in the planning process