Chapter 5
Lower Nippersink Creek Subwatershed Assessment

This section presents a summary of the characteristics of the Lower Nippersink Creek Subwatershed, as well as specific issues and challenges in this subwatershed that must be addressed in the Nippersink Creek Watershed Management Plan.

5.1 Subwatershed Characteristics

The following section provides an overview of the physical characteristics of the subwatershed.

5.1.1 Subwatershed Location

As shown in Figure 5.1, Lower Nippersink Creek is the subwatershed area located furthest downstream, in the eastern portion of the Nippersink Creek Watershed. This subwatershed has a drainage area of 12,432 acres, (19.43 square miles), comprising about 9.6% of the overall Nippersink Creek watershed. Virtually the entire subwatershed is contained in McHenry County, within Richmond, Burton and McHenry Townships, however, approximately 120 acres at the downstream end of the subwatershed is located within Lake County. The subwatershed is roughly bordered by Ringwood Road on the south, Pioneer Road on the west, the McHenry-Lake County line on the east, and the Illinois-Wisconsin State Line on the north.

Figure 5.1 Lower Nippersink Creek Subwatershed Location Map

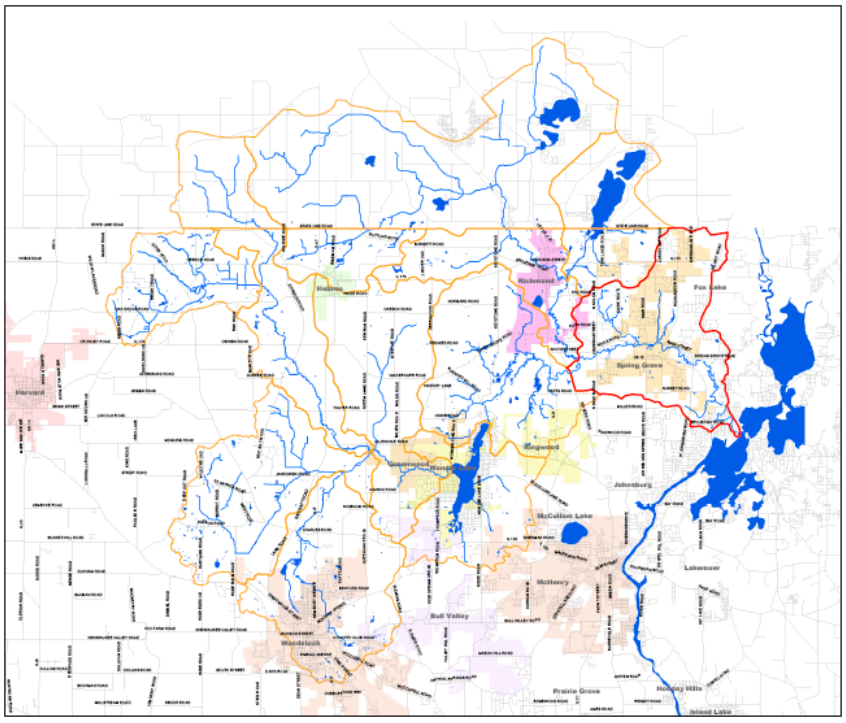
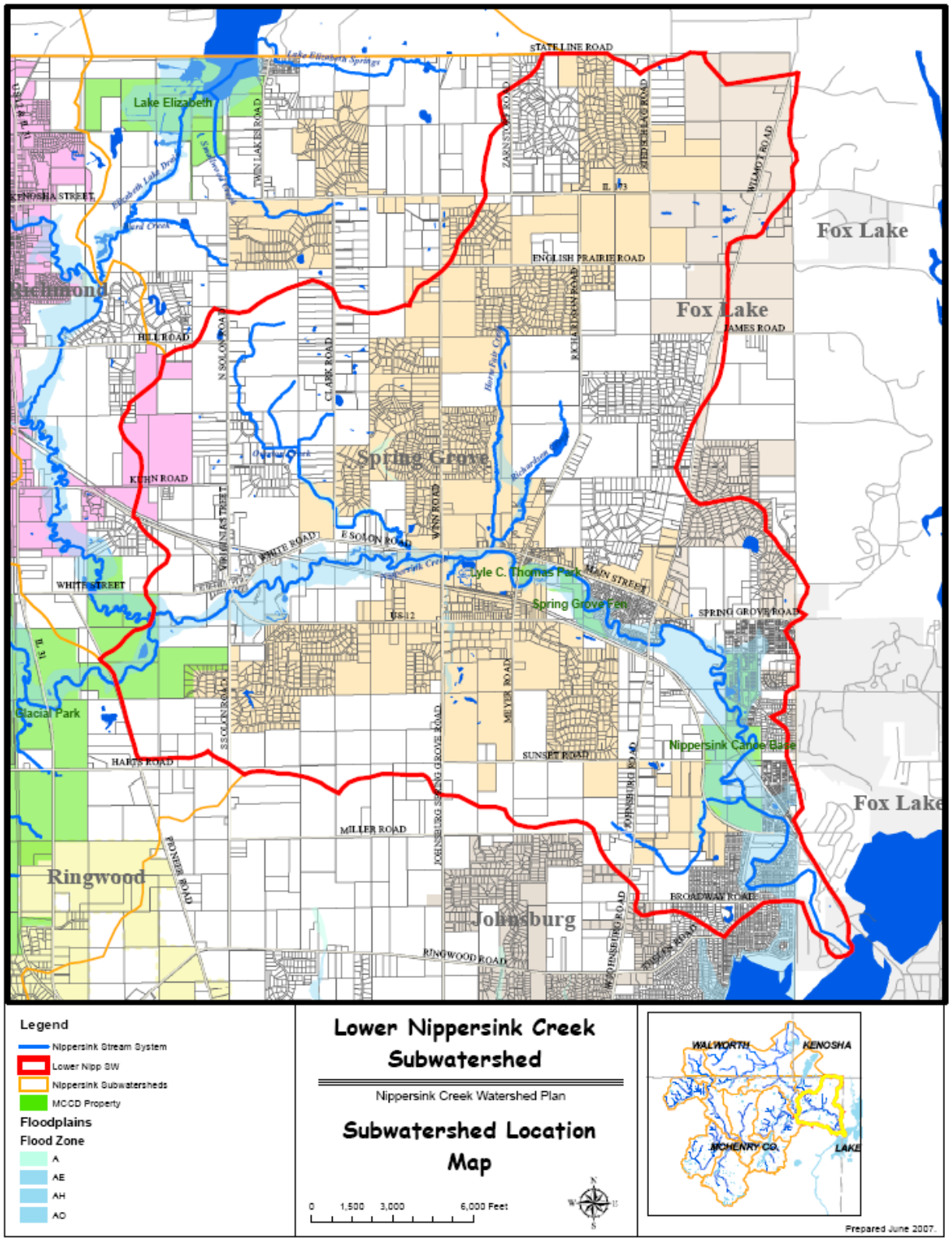


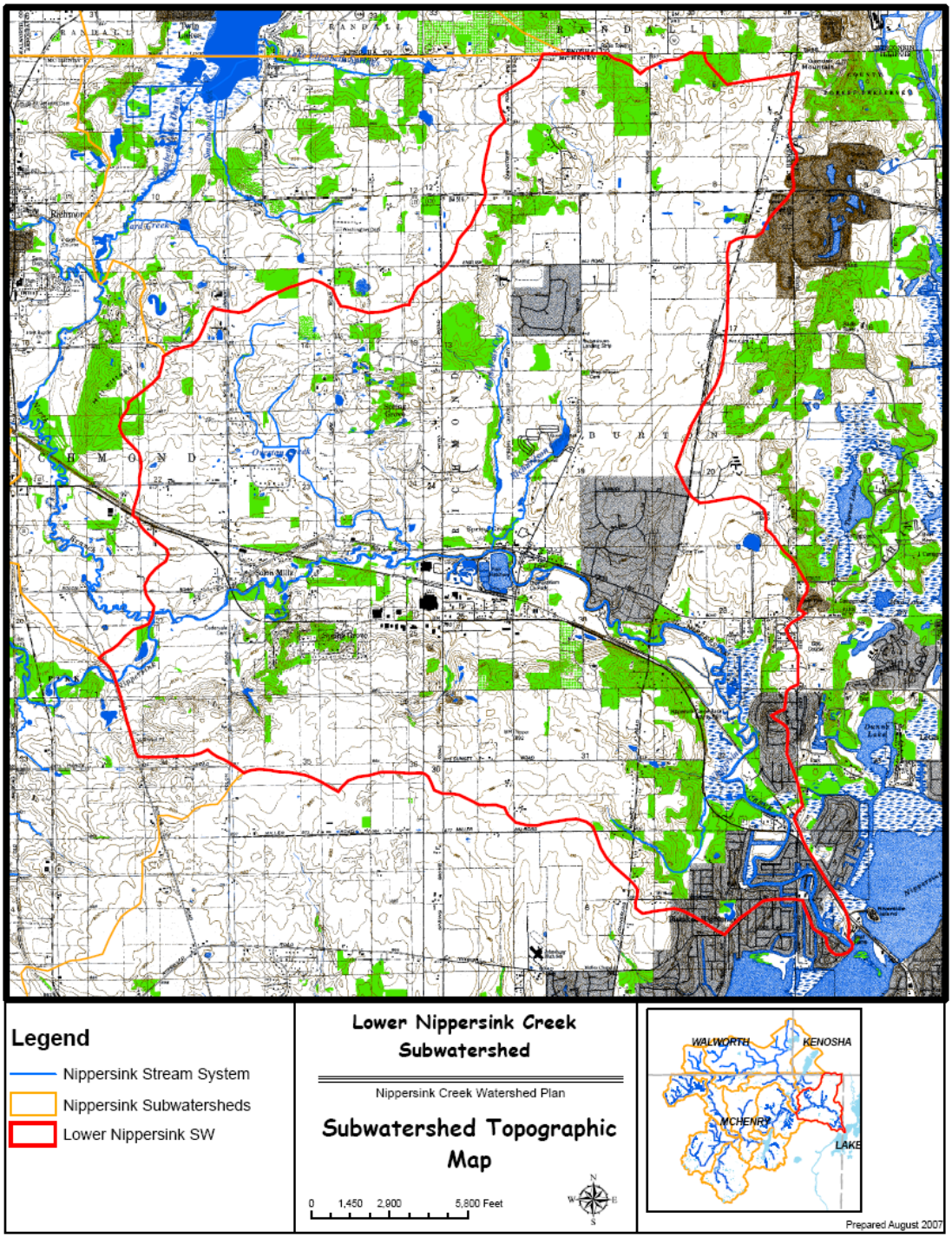
Figure 5.2 Lower Nippersink Creek Subwatershed Map



5.1.2 Topography & Geology

The topography of the Lower Nippersink subwatershed is moderately sloping, generally between 2% and 4%, with a maximum elevation of 972 feet and a minimum elevation of 736 feet, where Nippersink Creek joins the Fox River at the Chain O'Lakes.

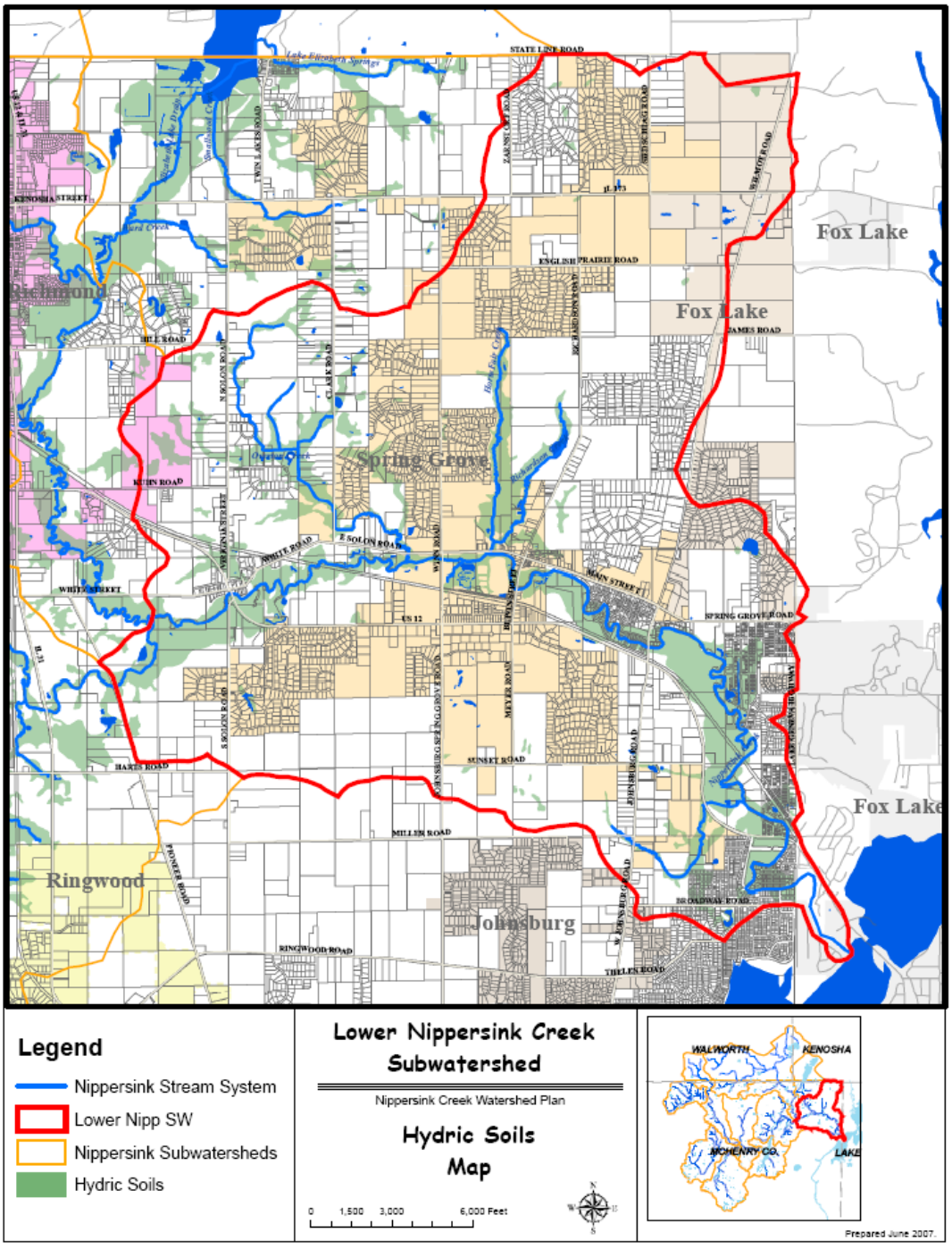
Figure 5.3 USGS Topographic Map for Lower Nippersink Creek Subwatershed



5.1.3 Soil Characteristics

The glacial advances across McHenry County resulted in a wide variety of soil associations. The soils in the subwatershed consist of mainly silty loams soil units on 0% - 2% slopes. Each major grouping of soil associations has potential impacts on current and future land uses within the subwatershed. For example, hydric (wetland) soils constitute 1,670 acres, or 13.4% of the 12,432 acre subwatershed. Hydric soils are poorly suited for urban development, but also contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

Figure 5.4 Hydric Soils in the Lower Nippersink Creek Subwatershed



5.1.4 Pre-Settlement Vegetation

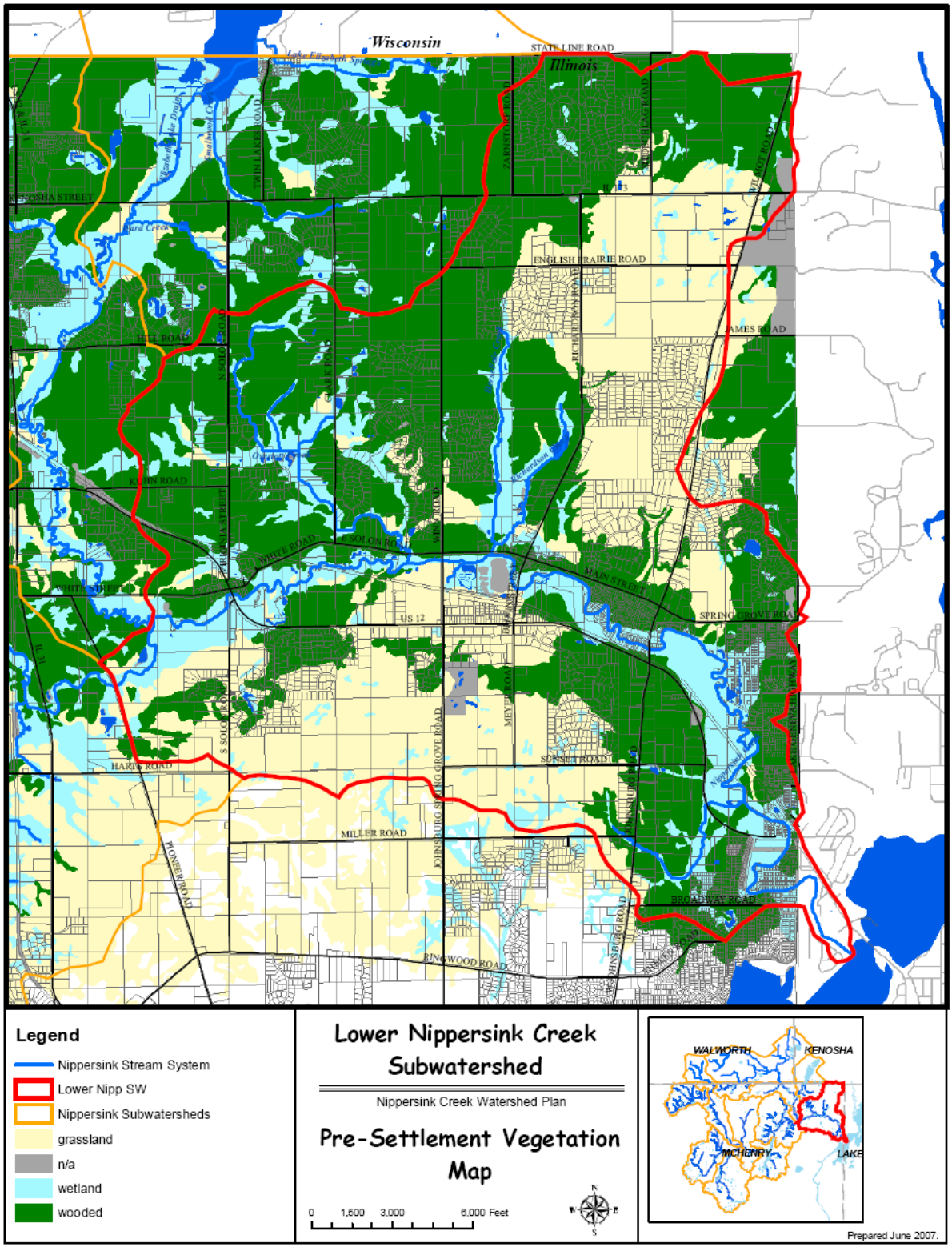
To guide future land management or restoration efforts, it is important to recognize the native plant communities that naturally evolved subsequent to the last glacial advances. Prior to European settlement in the 1830's, the Lower Nippersink Creek Subwatershed was predominantly comprised of woodland, as depicted in Figure 5.5. These woodlands, largely comprised of oak / hickory woodland and savannah, were bisected with wetlands and grassland along the drainageways, as shown in Table 5.1.

Table 5.1 Pre-Settlement Land Cover Conditions

Cover Type	Area	Percent of Subwatershed
Grasslands	4,140.9 acres	33 %
Wooded	6,079.6 acres	48 %
Wetlands	1,857.5 acres	15 %
n/a	233.7 acres	2 %

Note: 120 acre portion of the subwatershed located in Lake County not included
Source: MCCD Soils Analysis using GIS data

Figure 5.5 **Pre-settlement Vegetation Map in the Lower Nippersink Creek Subwatershed**



5.1.5 Subwatershed Drainage Features

Streams

The streams in the Lower Nippersink Creek subwatershed consist of the main stem of Nippersink and four small tributaries (Horse Fair Creek, Richardson Creek; Overton Creek, and one unnamed creek). This section describes the physical conditions of the streams in this subwatershed, including the stream corridor though which they flow.

The main stem of Nippersink Creek is a significant feature of the local landscape. Heavily used by canoeists and kayakers enjoying a water trail originating below Wonder Lake and extending downstream almost 16 miles, it also provides numerous fishing opportunities.

Horse Fair Creek is a small tributary stream extending almost straight north from Nippersink Creek in the approximate center of the subwatershed. Horse Fair Creek drains about 1,400 acres, roughly comprising the area between Winn Road and Richardson Road, and between Solon Road and the Illinois State Line. The stream channel begins in a rural subdivision near Bonner Lane and joins the Nippersink about one quarter west of Blivin Street in Spring Grove. The lower one-third of the stream appears to be channelized, however, the upper two-thirds of the stream channel is not. This upper section also contains the Horse Fair Springs Fen, a McHenry County Natural Area Inventory (MCNAI) site identified by the McHenry County Conservation District.

Richardson Creek drains 1,700 acres in the northeast section of the subwatershed, including much of the land between Richardson Road and Wilmot Road. The stream has one on-line impoundment at the upstream end, located on private property. This stream is also contained within the Horse Fair Springs Fen (MCNAI BUR01). Richardson Creek flows into Horse Fair Creek just north of East Solon Road.

Overton Creek drains about 1,400 acres in the northwest section of the subwatershed, and is comprised of agricultural and rural residential land between the municipalities of Richmond and Spring Grove. The headwaters of Overton Creek are located in the farmed wetland east of the intersection of Clark Road and Hill Road. Overton Creek joins the Nippersink just south of Solon Road, about one quarter mile upstream of the Winn Road bridge. The stream is about 83% channelized.

The unnamed tributary is located in the southeastern portion of the subwatershed, and drains an area extending east from Johnsburg and Miller Roads. Virtually the entire length of this tributary is located within Pease Fen, a McHenry County Natural Area Inventory site identified by the McHenry County Conservation District. This tributary flows into Nippersink Creek about one half mile upstream of Route 12.

Manmade Drainage Systems

Analysis of land uses and aerial photography indicates that nearly all (90 %+) of the developed land is drained by a system of open channel turf grass swales and culverts. Limited field investigations suggest that existing man-made stormwater systems were not designed or constructed to treat the runoff from developed areas prior to discharge to the sensitive streams and wetlands in the subwatershed.

Agricultural Tile Systems

Due to the increasingly urbanized nature of this subwatershed, it is unlikely that there many functioning underground drain tile systems remaining in the subwatershed, particularly in the eastern two-third's of the subwatershed. The western one-third may contain some tile systems, as this region has yet to be fully developed and contains many areas of gently sloping to nearly flat hydric soil complexes. Historically, these were the areas that had poor drainage characteristics, but that farmers could successfully convert to agricultural usage by the installation of agricultural drain tile systems.

Identifying agricultural drain tile networks is important in watershed planning because current local flooding and drainage problems can often be linked to damage or age-related failure of drain tile systems. From a watershed preservation / restoration perspective, it is important to identify functional drain tile systems to determine opportunities for their removal or reconfiguration for the purposes of restoring valuable wetland habitat, and water quality benefits. It is probable that many of the depressional and low lying areas in the subwatershed that are now drained by tile systems were once wetland and wet prairie ecosystems that supported very diverse habitats.

5.1.6 Population

The use and analysis of population data in watershed planning is critical because of there is a direct correlation between the number of people residing in a watershed and the degree of impacts to the quality and quantity of the watershed's natural resources. In 1990, the population in the subwatershed was estimated at 4006, or 208 persons per square mile. According to the 2000 US Census, the population in the Lower Nippersink subwatershed was about 6,620 people, or about 343 persons per square mile, a 65% increase.

5.1.7 Land Cover

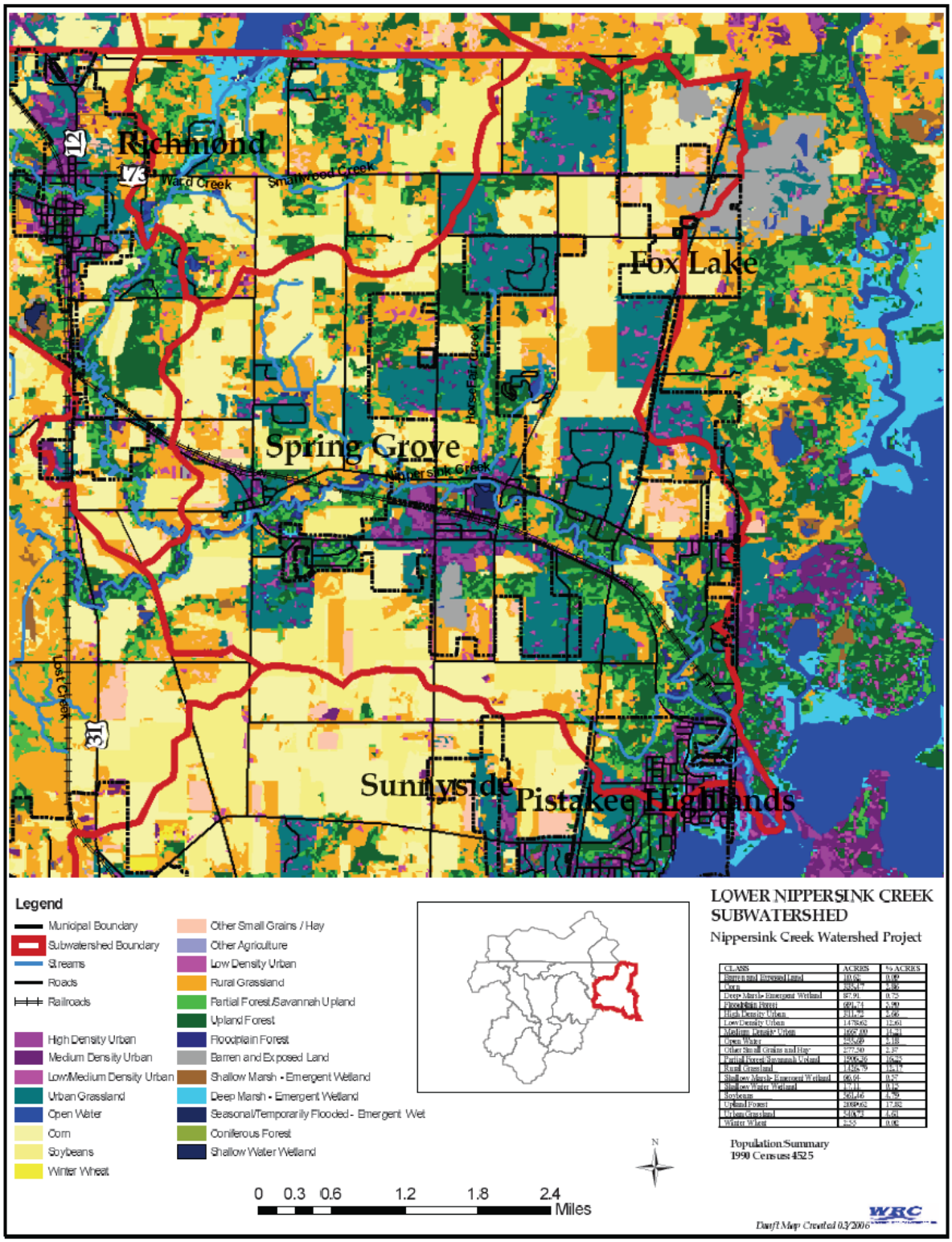
Often, the terms Land Cover and Land Use are used interchangeably. However, there are differences. Land Cover refers to the vegetation, structures, or other features that cover the land. On the other hand, Land Use (as discussed in Section 5.1.8) refers to how land is used by humans.

Land Cover data for the Nippersink Creek Watershed is available from the Illinois Department of Natural Resources using LANDSAT data collected between 1998 and 1999. The dominant land cover, according to this data, was rural grasslands and agricultural row crops, comprising about 51% of the subwatershed. Urban landscapes accounted for an additional 27%, while wooded areas and wetlands account for the remaining 22% of the subwatershed.

Table 5.2 1999 Land Cover for the Lower Nippersink Creek Subwatershed

Land Cover Description	Total Acres	Percent of Subwatershed
Barren & Exposed Land	205.8	1.7%
Corn, Soybeans, Other Small Grains & Hay	3,992.9	32.1%
Winter Wheat	2.1	0.0%
Rural Grassland	2,349.9	18.9%
Low Density Urban	304.3	2.4%
Medium Density Urban	405.8	3.3%
High Density Urban	113.6	0.9%
Urban Grassland	2,360.4	19.0%
Shallow Marsh – Emergent Wetland	56.1	0.5%
Shallow Water Wetland	31.4	0.3%
Partial Forest / Savannah Upland	775.1	6.2%
Upland Forest	1,531.8	12.3%
Floodplain Forest	183.6	1.5%
Coniferous Forest	0	0.0%
Deep Marsh / Emergent Wetland	54.9	0.4%
Open Water	65.1	0.5%
TOTAL	**12,432.8**	**100.0%**

Figure 5.6 1999-2000 Land Cover Map for Lower Nippersink Creek Subwatershed



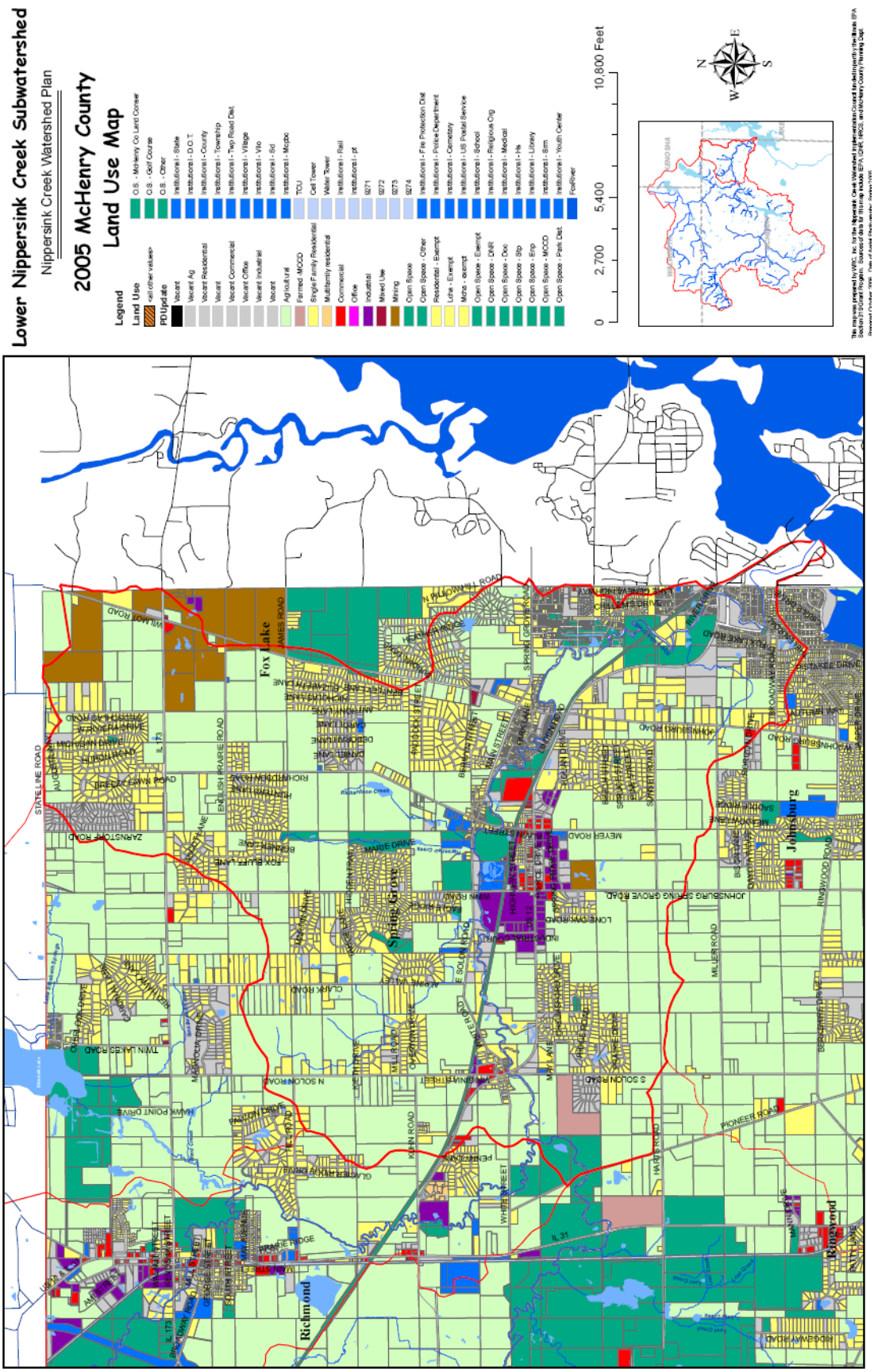
5.1.8 Land Use / Existing Watershed Development

According to the 2005 McHenry County Land Use / Zoning map, 49% of the subwatershed is zoned for agricultural use, while about 46% is either already developed or zoned for development in the future. Almost 5% is classified as open space.

Table 5.3 McHenry County 2005 Land Use in Lower Nippersink Creek Subwatershed

Land Use	Total Acres	Percent of Subwatershed
Vacant	10.8	0.1%
Vacant; Zoned Residential	952.8	7.8%
Vacant; Zoned Commercial	30.3	0.2%
Vacant; Zoned Office	0	0.0%
Vacant; Zoned Industrial	39.2	0.3%
Agricultural	5,902.8	48.6%
Single Family Residential	3,101.9	25.5%
Multi-Family Residential	0.6	0.0%
Commercial	81.3	0.7%
Office	0	0.0%
Industrial	197.8	1.6%
Mixed Use	8.9	0.1%
Mining	395.9	3.3%
Open Space	587.1	4.8%
Institutional	89.8	0.7%
Right of Way	750.0	6.2%
TOTAL	**12,149.2**	**100.0%**

Figure 5.7 2005 McHenry County Land Use Map for Lower Nippersink Creek Subwatershed



To date, development in the subwatershed has occurred principally through municipal annexation, in the form of low density development (1/2 to 1 acre lots).

Table 5.4 Municipal Areas in the Lower Nippersink Creek Subwatershed

Municipality	Area (acres)	Percent of Subwatershed
Village of Spring Grove	4,204.6	33.8%
Village of Fox Lake	933.0	7.5%
Village of Richmond	182.2	1.5%
Village of Johnsburg	13.4	0.1%
Unincorporated McHenry County	7,099.0	57.1%

There are 90.3 miles of roads in the subwatershed, which equates to more than 300 acres of impervious cover (roadway pavement only – excludes parking lots, sidewalks, and driveways).

Point Source Discharges

There are three permitted point sources that discharge into Nippersink Creek in the Lower Nippersink Subwatershed. Intermatic, a factory located just upstream of Winn Road in Spring Grove, is permitted by the IEPA to discharge up to 783,000 gallons of treated industrial wastewater into Nippersink Creek. Scot Forge recently received an NPDES permit to discharge an average of 235,000 gallons per day of groundwater, stormwater and forged metal quench water into the creek. The Village of Spring Grove also has a currently permitted discharge of 75,000 gallons per day of treated wastewater into the creek; the Village is also making plans to increase its wastewater treatment capabilities to over 2 million gallons per day.

5.1.9 Natural Resources

McHenry County Conservation District Properties

There are four McHenry County Conservation District (MCCD) properties in the subwatershed, totaling about 435 acres, or 3.5% of the Lower Nippersink subwatershed area.

Table 5.5 MCCD Properties in the Lower Nippersink Creek Subwatershed

Name	Area in SW (acres)	Total MCCD Property (acres)
Spring Grove Fen	35.5	35.5
Nippersink Canoe Base	206.1	206.1
Glacial Park	184.6	3264
Lyle C. Thomas Park	9.0	9.0
Total	**435.2**	

Table 5.6 Other Publicly Protected Land in the Lower Nippersink Creek Subwatershed

Name	Area (acres)	# of Parcels
IDNR – Chain O' Lakes State Park	28.1	5
Village of Spring Grove	50.9	11
McHenry County Conservation District	1.9	8
Wisconsin River Rail Transit Commission	49.8	11
Total	**130.7**	

McHenry County Natural Areas Inventory

There are eight McHenry County Natural Area Inventory (MCNAI) sites within the subwatershed, representing about 7% of the entire subwatershed.

Table 5.7 McHenry County Natural Areas Inventory Sites in the Lower Nippersink Creek Subwatershed

MCNAI ID	Name	Area in SW (acres)	Total NAI Site Area (acres)	Ownership
BUR01	Horse Fair Springs Fen	177.2	177.2	Private
BUR02	Lotus Pond*	16.3	16.3	Private
BUR03	Nippersink Canoe Base Wetlands	303.6	303.6	MCCD
BUR04	Pease Fen	174.9	174.9	Private
BUR05	Spring Grove Fen	38.7	38.7	MCCD
RIC06	Glacial Park / Tamarack Farms	102.8	4,673.8	MCCD / Private
RIC10	Solon Mills Fen	78.8	78.8	Private
RIC11	Solon Mills Prairie	3.9	3.9	Private
	TOTAL	**896.2**		

* Lotus Pond MCNAI appears to have been destroyed due to conversion to a residential stormwater pond.

Wetlands

McHenry County completed an Advanced Identification (ADID) Wetland Study in 2003. This study identified a total of 96 wetlands, totaling 1,300.4 acres, or 10% of the Lower Nippersink subwatershed. Of these wetlands, 911 acres (70%) were determined to be of High Quality.

Table 5.8 Mapped Wetlands in the Lower Nippersink Creek Subwatershed

ADID Code	Wetland Type	Number of Wetlands	Total Area (acres)
HFV	High Functional Value	4	86.0
HQW	High Quality Wetland	7	911.4
FW	Farmed Wetland	30	66.7
W	Other Wetlands (lower quality)	55	236.3
	TOTAL	**96**	**1,300.4**

The wetlands classified as High Quality are located along the Nippersink stream corridor upstream of US Route 12, and along the Horse Fair and Richardson Creek stream corridors.

Threatened & Endangered Species

Threatened and Endangered (T&E) species data were extracted from T&E data records documented in the McHenry County Natural Areas Inventory (MCNAI) Database. The data were collected by the McHenry County Conservation District during field studies undertaken at subwatershed Natural Area Inventory Sites. The data indicate that there are at least two threatened or endangered species living in the subwatershed. T&E Species information from the Glacial Park / Tamarack Farms MCNAI is not included in this total, given that only about 2% of that site is in the LNCSW, although it is worth noting that that large MCNAI on the western edge of the subwatershed is habitat for more than 27 state threatened or endangered species of fish, mussels, plants, insects and reptiles.

Table 5.9 Threatened and Endangered Species in the Lower Nippersink Creek Subwatershed

Common Name	Scientific Name	Type	Status	MCNAI Site
Two-Seeded Sedge	Carex disperma	Plant	IL Endangered	BUR01
Pale Vetchling	Lathyrus ochroleucus	Plant	IL Threatened	BUR03

Source: McHenry County Natural Areas Inventory Database, 2005

Existing Greenways

There are no formal greenways established in the Lower Nippersink subwatershed, although Nippersink Creek functions as a water trail throughout this area, with landings at Lyle Thomas Park and Nippersink Canoe Base.

5.2 Analysis of Subwatershed Data and Problem Identification

5.2.1 Water Quality Data & Identified Problems

The Illinois Environmental Protection Agency (IEPA) is tasked with assessing the quality of the surface water resources of Illinois. The IEPA has determined Nippersink Creek's designated uses are:

- Aquatic Life
- Fish Consumption
- Primary Contact
- Secondary Contact
- Aesthetic Quality

The IEPA periodically produces a 303(d) list, which identifies waterways that are not achieving certain designated uses. In the 2006 IEPA 303(d) list, Nippersink Creek is identified as being in Full Support of its Aquatic Life Designated Use, which is notable for a stream in northeastern Illinois.

However, Nippersink Creek was also determined to be Non-supporting of its Primary Contact Designated Use, due to excessive levels of fecal coliform. This pollutant, associated with human and animal waste, was listed as coming from an unknown source. The IEPA also identified fish consumption, secondary contact and aesthetic quality as designated uses for Nippersink Creek, although the ratings for these uses were classified as "not assessed".

The Illinois Environmental Protection Agency maintains two water quality sampling stations in the Lower Nippersink Creek. They are listed in the Table 5.10.

Table 5.10 IEPA Water Quality Sampling Stations in the Lower Nippersink Creek Subwatershed

Station	Stream	Location
DTK01	Nippersink Creek	Nippersink Creek at US Route 12
DTK04	Nippersink Creek	Nippersink Creek at Winn Road

The Fox River Watershed Monitoring Network (FRWMN), administered by the not-for-profit group, *Friends of the Fox River*, maintains four volunteer stream monitoring sites on Nippersink Creek; one is located in the Lower Nippersink subwatershed at Lyle C. Thomas Park near Richardson Road. During 2005 and 2006 monitoring periods, FRWMN volunteers in the subwatershed reported water quality index values (based on macroinvertebrate sampling) as Good (Taxa rating between 24 and 30).

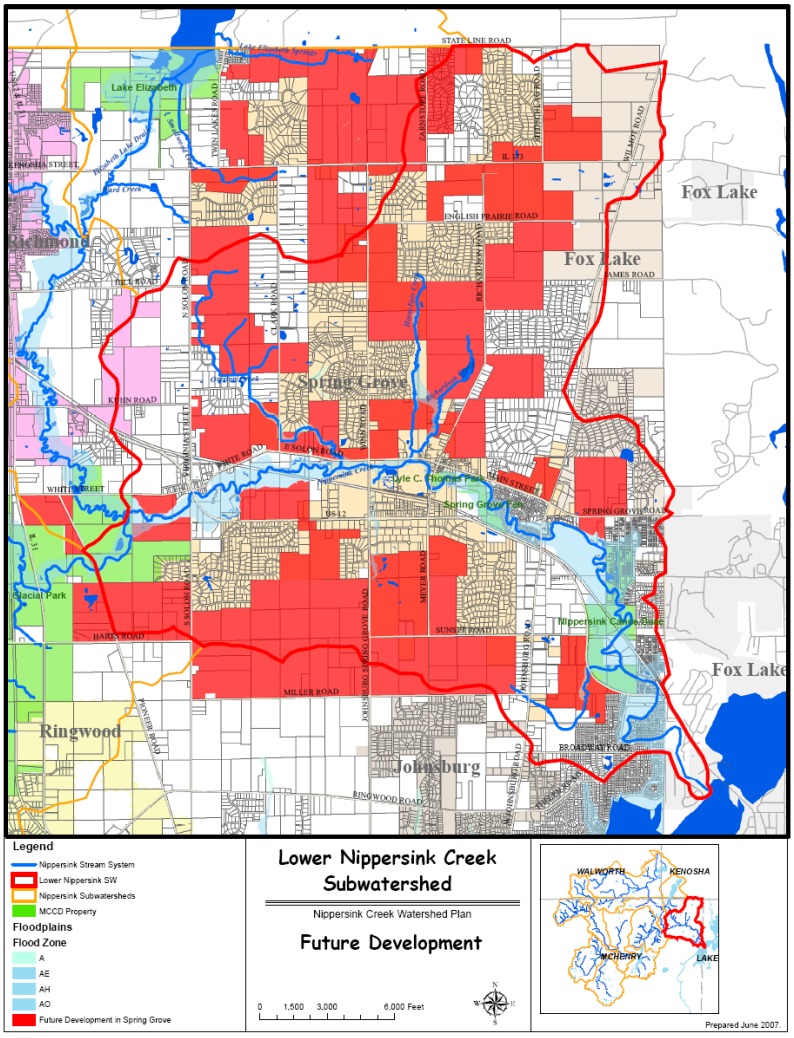
5.2.2 Flooding Problems

At the time of this report, no data were provided by the County or municipalities regarding existing flooding problems. Analysis of available floodplain information suggests that there may be as many as 100 homes in the FEMA 100-year Floodplain. The majority of these homes are located near the stream's outlet into the Chain O' Lakes, near US Route 12 and Lake Road.

5.2.3 Projected Development & Growth

Development in the Lower Nippersink Creek Subwatershed is likely to occur as part of construction within existing municipal jurisdictions, as well as future annexations by Spring Grove, Fox Lake, and Richmond. The current Spring Grove Land Use Map suggests that an additional 4,500 acres of development will occur in and contiguous to the Village of Spring Grove. The current Richmond Land Use Map suggests that an additional 350 acres of development will occur in and contiguous to the Village of Richmond. No future land use data were available for the Village of Fox Lake at the time of this writing.

Figure 5.8 Future Development in the Lower Nippersink Subwatershed



5.2.4 Natural Area Protection / Preservation Issues

McHenry County Natural Area Inventory Sites

In the subwatershed, about 41% of the high quality McHenry County Natural Area Inventory (MCNAI) sites are protected through public ownership (MCCD or Village of Spring Grove).

Horse Fair Springs Fen (MCNAI BUR01) is a 177 acre wetland containing a calcareous seep and spring, graminoid fen, and sedge meadow. Located north of Nippersink Creek between Richardson Road and Winn Road, the wetland was identified as being threatened by water table alterations associated with the upstream impoundment, brush encroachment, invasive aquatic species, and Reed Canary Grass. About 32 acres (18%) of this natural area is protected by the Village of Spring Grove.

Nippersink Canoe Base Wetlands (MCNAI BUR03) is a 303 acre natural area located along the north side of US Route 12 between State Park Road and Johnsburg Road. The site contains a high quality section of Nippersink Creek, a bluff / ravine system, a graminoid fen, sedge meadows, streamside marshes, and mesic silt loam woodland. This natural area is under threat from invasive species (Reed Canary Grass, Purple Loosestrife, and brush encroachment), artificial pond, water table alteration, and grazing. About 70% of this natural area is protected by the MCCD.

Pease Fen (MCNAI BUR04) located between US Route 12 and Johnsburg Road, just south of Sunset Road, is a 175 acre high quality wetland containing a graminoid fen and sedge meadow. The MCNAI database identified this site as being threatened by aquatic invasive species, brush encroachment, siltation, water table alteration, and development.

Spring Grove Fen (MCNAI BUR05) located along Nippersink Creek north of US Route 12, between Johnsburg Road and Blivin Street. This 39 acre wetland contains a high quality section of Nippersink Creek, and graminoid fens and sedge meadows. MCCD identified threats to the integrity of this natural area as invasive species (Cattails, Purple Loosestrife, and brush encroachment), dumping, filing, water table alteration, and siltation. About 75% of this natural area is protected by the MCCD, and 33.4 acres were dedicated as an Illinois Nature Preserve in 1988.

Solon Mills Fen (MCNAI RIC10) a 79 acre wetland complex located north of US Route 12 near South Solon Road contains a high quality section of Nippersink Creek, a graminoid fen, and a sedge meadow. This natural area is currently unprotected from development and appears to be lacking natural area management needed to preserve the high quality plant community. The MCNAI database lists the site as being threatened by brush encroachment, siltation, and development, and degraded to some degree by the artificial pond constructed in the wetland.

Solon Mills Prairie (MCNAI RIC11) is a 4 acre prairie complex located west of South Solon Road about 1 mile south of US Route 12. This natural area is a high quality dry gravel prairie (very few remain in Illinois) on private property. The MCNAI database suggests that this natural area is facing challenges with future development as well as encroachment by weedy and non-native brush species.

There are seven High Quality Wetland areas in the subwatershed totaling about 911 acres. Many of these wetlands area also identified within McHenry County Natural Area Inventory sites, which were addressed above. There are about 260 acres of high-quality wetland along Nippersink Creek between the North Branch Nippersink confluence (west of South Solon Road) and Johnsburg Road that are not protected from future land disturbance (agriculture, development, or otherwise). Most of the 260 acres is also in need of restoration and land management to preserve the natural integrity of the stream corridor.

5.3 Subwatershed-Specific Recommendations to Protect Water Resources

The following section discusses the Best Management Practices (BMP's) identified for this subwatershed that should be implemented to address existing or potential water quality impairments. The location of each recommended BMP project is presented in Figure 5.9

Pollutant Loading Modeling, as discussed in Chapter 3, identified current and future pollutant loadings, based upon land use, soils, slopes, etc., and quantified these loadings. The results of this Pollutant Loading modeling were then used to identify the types of BMP's that should be implemented to create a loading reduction of those pollutants. Table 5.11 presents a summary of the recommended BMP projects, as well as the expected pollutant loading reductions expected if the BMP's are implemented, and function as intended.

Table 5.12 presents detailed cost and logistical information on each of the recommended BMP projects. Below is a summary list of recommendations for the subwatershed to help stakeholders and decision makers meet the Goals and Objectives set forth for Nippersink Creek. Background information regarding how each type of recommendation addresses watershed concerns and/or impairments (existing or future) can be found in Chapter 4.

Type:	Education / Outreach; Regulatory; Site Restoration; Monitoring; Permanent Habitat Protection, Water Quality
Target Goals:	Which watershed plan goals the recommendation is intended to address.
Initial Implementation Cost:	The initial cost, in 2007 dollars to initiate the recommended action, if applicable.
Initial Outreach Cost:	The initial cost, in 2007 dollars to initiate the recommended action, if applicable.

Annual Cost:	The long term expected annual cost (in 2007 dollars) to successfully implementation of the recommendation
Responsible Party:	Identifies the LEAD agency, entity, or landowner who will ultimately have to execute the recommendation. SUPPORTING parties, such as government agencies, grant sources, etc. may also be identified here.
Priority:	A ranking of the BMP recommendations, based upon the nature / urgency of the existing / potential impairment; the availability of willing landowners)/ partners; short-term vs. long-term development pressure; and whether the project is a new effort, or a retrofit of an existing practice.

The project cost estimates contained in this report should be considered preliminary, and are only presented to identify the potential magnitude of cost, from a watershed scale perspective. No site-specific investigation, analysis, or design of any recommended project, from which accurate cost information could be obtained, was completed as part of the preparation of the 2008 Nippersink Creek Watershed Plan. If a watershed stakeholder decides to apply for grant funding assistance to implement any of the recommended projects presented in this report, they should first undertake any additional studies / research needed to determine an updated / accurate project cost. They should not solely rely on the cost estimates presented in the NCWP report as the basis for their grant request.

Note: The following acronyms for responsible parties identified in Table 5.12 are presented below:

NCWPC	Nippersink Creek Watershed Planning Committee
NRCS	Natural Resource Conservation Service
SWCD	McHenry County Soil and Water Conservation District
MCCD	McHenry County Water Conservation District
TLC	The Land Conservancy of McHenry County
IDOT	Illinois Department of Transportation
IEPA	Illinois Environmental Protection Agency
MCDOT	McHenry County Department of Transportation
MCDEF	McHenry County Defenders

Figure 5.9 Lower Nippersink Subwatershed Site Recommendations Map

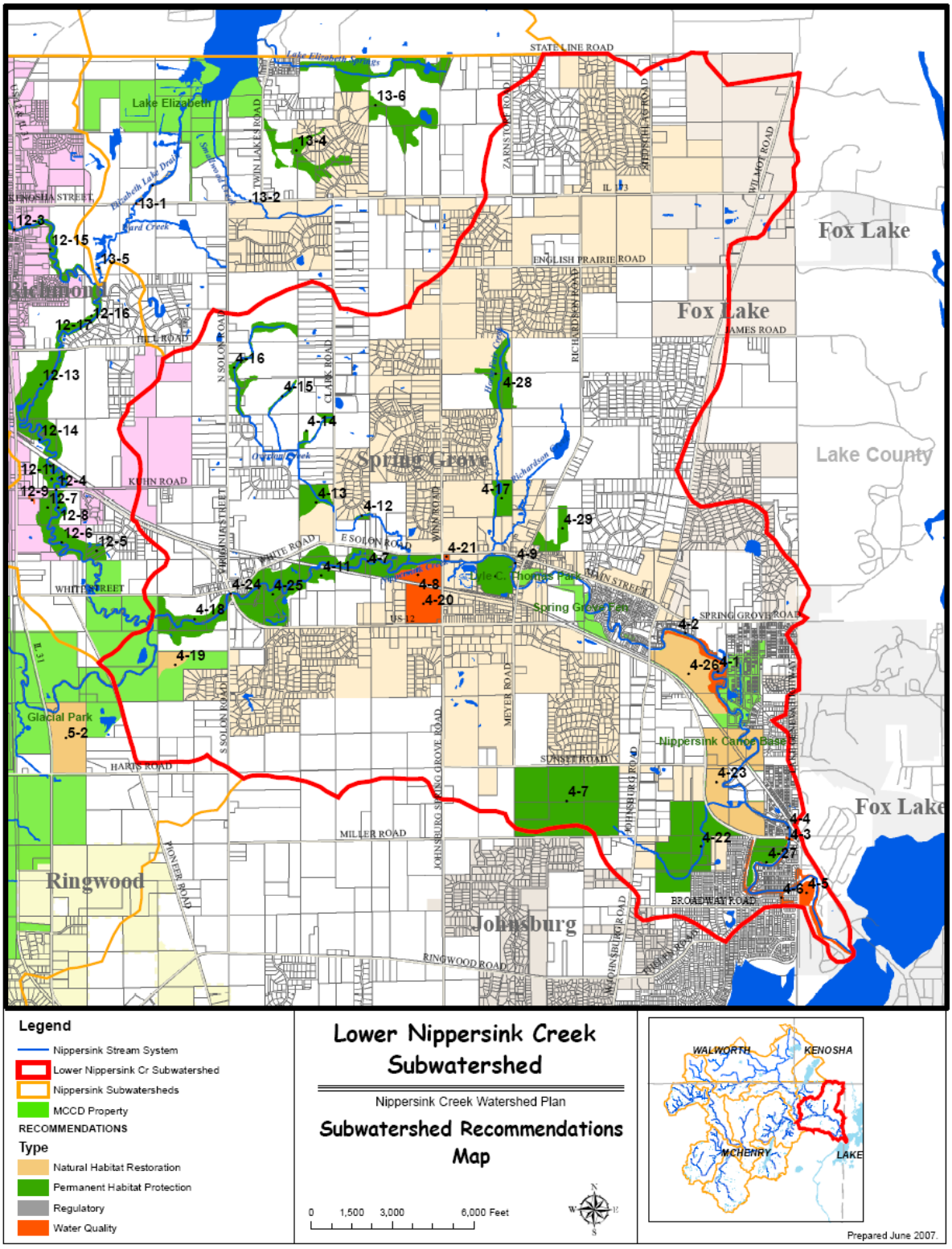


Table 5.11 BMP Selection & Associated Pollutant Load Reduction for the Lower Nippersink Creek Subwatershed

BMP	BMP Type**	Project Locations***	BMP		Removal Efficiency****				Pollutant Load Reduction (lbs/year)*****				Percentage Reduction			
			Size	Unit	TN	TP	TSS	FC	TN	TP	TSS	FC	TN	TP	TSS	FC
Natural Habitat Protection	SS	4-9, 4-19, 4-23, 4-26	16	acres	30%	35%	60%	-	95	5	7	-	0.2	0.2	0.4	-
Conservation Development Practices	SS	4-7, 4-27, 4-28, 4-29	234	acres	52%	58%	64%	-	2,417	127	101	-	4.9	5.5	6	-
Permanent Habitat Protection	SS	4-7, 4-10, 4-12 to 4-17, 4-19, 4-20, 4-22, 4-23, 4-25	900	acres	53%	51%	88%	78%	9,476	429	537	22,076	19.2	18.5	31.9	28.2
Wetland Restoration	SS	4-18, 4-19, 4-24	496	acres	53%	51%	88%	78%	5,222	236	296	12,166	10.6	10.2	17.6	15.6
Stream Buffers	SS	4-1, 4-2, 4-4, 4-6, 4-9, 4-11	238	acres	36%	95%	95%	75%	1,702	211	153	5,613	3.4	9.1	9.1	7.2
Point Source Control/Monitoring	SS	4-20, 4-21	2	each	0%	0%	0%	0%	0	0	0	0	0	0	0	0
Regulatory*	WS	Subwatershed	1	water-shed	5%	5%	5%	5%	2,469	116	84	3,908	5	5	5	5
Nutrient Management	WS	Subwatershed wide	25	acres	70%	28%	-	-	348	7	-	-	0.7	0.3	-	-
Stormwater BMPs	SS	4-3, 4-5, 4-8, 4-24	3	each	36%	95%	95%	75%	651	81	59	2,146	1.3	3.5	3.5	2.7
Street Sweeping (bi-weekly)	WS	City wide	90.3	curb miles	-	-	-	2%	-	-	-	189	-	-	-	0.2
Sand Filters	SS	4-8, 4-19, 4-24	50	each	-	-	83%	37%	-	-	336	5,771	-	-	20	7.4
Pet Waste Management	WS	Subwatershed wide	1	water-shed	-	-	-	90%	-	-	-	3,285	-	-	-	4.2
Education and Outreach	WS	Residential areas	1	each	3%	3%	3%	3%	1,234	58	42	1,954	2.5	2.5	2.5	2.5
Total									23,615	1,270	1,615	57,107	47.8	54.7	95.9	73.1

*Regulatory programs are assumed to have nominal pollutant reduction rates of 5%; “Education and Outreach” programs are assumed to have 2.5%.

**SS = Site-specific; WS = Watershed-specific.

*** Project locations and details are described in the corresponding chapter.

**** TN = total Nitrogen; TP = total Phosphate; TSS = total suspended solids or Sediment; FC = Fecal coliform.

***** Units of “TSS” and “FC” are “Tons/year” and “FCU/year”, respectively.

Table 5.12 Recommended Projects in the Lower Nippersink Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY	
Lower Nippersink	4-1	Water Quality	Landowner Outreach to install minimum 100 foot vegetative Stream Buffer on agricultural property	NCWPC / NRCS / SWCD	26.9	$3,000	$80,757	$1,000	$2,692	D	
Lower Nippersink	4-2	Water Quality	Landowner Outreach along north bank of Nippersink Creek east of Johnsburg Road to re-establish a native Stream Buffer; create Conservation Easements	NCWPC / TLC / MCDEF	1.9	$3,000	$5,706	$500	$190	D	
Lower Nippersink	4-3	Water Quality	Government Outreach to install Stormwater BMP's along US 12 at Nippersink Creek to treat roadway runoff prior to discharge to the stream	NCWPC / IDOT			$50,000	$1,000	$2,500	F	
Lower Nippersink	4-4	Water Quality	Landowner Outreach along Nippersink Creek north of US 12 to re-establish Stream Buffer; create Conservation Easement	NCWPC / TLC / MCDEF	1.8	$3,000	$5,430	$500	$181	D	
Lower Nippersink	4-5	Water Quality	Landowner Outreach to develop a Stormwater BMP plan for marina at Nippersink Creek mouth on Broadway Road	NCWPC			$25,000	$500		F	
Lower Nippersink	4-6	Water Quality	Landowner Outreach along Nippersink Creek south of US 12 to re-establish a Stream Buffer, create Conservation Easement	NCWPC / TLC / MCDEF	38.9	$3,000	$116,664	$1,000	$3,889	D	
Lower Nippersink	4-7	Permanent Habitat Protection	Require Conservation Design practices for future development planned at Miller and Meyer Roads; parcel is headwaters of small, sensitive tributary	NCWPC / TLC / VILLAGE OF SPRING GROVE	230.9	$500	$115,429	$1,000	$5,771	B	
Lower Nippersink	4-7	Permanent Habitat Protection	Landowner Outreach to establish Conservation Easements to protect existing high quality wetlands and stream corridor	NCWPC / TLC / MCDEF	69.3	$3,000	$207,756	$1,000	$6,925	D	
Lower Nippersink	4-8	Water Quality	Landowner Outreach to plan / implement Stormwater BMP to be implemented by industrial landowners (Scot Forge) to treat runoff before discharge to Nippersink Creek	NCWPC			$50,000	$1,000		F	

Table 5.12 Recommended Projects in the Lower Nippersink Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY	
Lower Nippersink	4-9	Natural Habitat Restoration	Landowner Outreach along Nippersink Creek east of Blivin Street to re-establish a Stream Buffer, create Conservation Easement	NCWPC / TLC / MCDEF	0.6	$3,000	$1,764	$500	$59	D	
Lower Nippersink	4-10	Permanent Habitat Protection	Government Outreach to protect, restore, and enhance high quality ADID N87 on former IDNR fish hatchery property	NCWPC / TLC / VILLAGE OF SPRING GROVE	40.9	$3,000	$122,574	$1,000	$4,086	D	
Lower Nippersink	4-11	Permanent Habitat Protection	Landowner Outreach landowner to expand buffer between stream and crops. Pursue conversion of low-lying portions of ag field to floodplain wetland	NCWPC / NRCS	9.6	$5,000	$47,765	$500	$955	D	
Lower Nippersink	4-12	Permanent Habitat Protection	Landowner Outreach on Saint Moritz Drive to restore ADID Wetland N261 and establish a Conservation Easement to protect wetland and segment of Overton Creek	NCWPC / TLC / MCDEF	2.6	$3,000	$7,695	$500	$257	D	
Lower Nippersink	4-13	Permanent Habitat Protection	Encourage Conservation Design for land development on parcel west of Clark Road to protect Overton Creek and ADID Wetland N261	NCWPC / TLC / VILLAGE OF SPRING GROVE	23.5	$500	$11,760	$1,000	$588	B	
Lower Nippersink	4-14	Permanent Habitat Protection	Encourage Conservation Design for land development on parcel west of Clark Road to protect Overton Creek and ADID Wetland N281	NCWPC / TLC / VILLAGE OF SPRING GROVE	8.9	$500	$4,448	$500	$222	B	
Lower Nippersink	4-15	Permanent Habitat Protection	Encourage Conservation Design for land development on parcel west of Clark Road to protect Overton Creek and ADID Wetland N251	NCWPC / TLC / VILLAGE OF SPRING GROVE	4.6	$500	$2,293	$500	$115	B	
Lower Nippersink	4-16	Permanent Habitat Protection	Encourage Conservation Design for land development on parcel west of Clark Road to protect Overton Creek and ADID Wetland N225	NCWPC / TLC / VILLAGE OF SPRING GROVE	31.5	$500	$15,762	$1,000	$788	B	

Table 5.12 Recommended Projects in the Lower Nippersink Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Lower Nippersink	4-17	Permanent Habitat Protection	Encourage Conservation Design for land development on parcel east of Winn Road to protect Horsefair Creek and Horse Fair Springs Fen MCNAI Site	NCWPC / TLC / VILLAGE OF SPRING GROVE	22.0	$500	$10,996	$1,000	$550	B
Lower Nippersink	4-18	Permanent Habitat Protection	Protect high-quality wetland ADID N87 from adjacent agricultural impacts (row crop runoff, animal grazing in stream, etc.)	NCWPC / NRCS / SWCD	54.4	$3,000	$163,275	$1,000	$5,443	D
Lower Nippersink	4-19	Natural Habitat Restoration	**MCCD Glacial Park** Restore historic wetland in hydric soils on MCCD parcel northwest of South Solon Road and Northgate Drive; habitat benefits plus increases pollutant removal from upstream residential development	MCCD	15.9	$2,000	$31,876			A
Lower Nippersink	4-20	Water Quality	Agency Outreach to develop and implement a monitoring plan to insure no future pollutant discharges (such as TCE) to Nippersink Creek or shallow groundwater aquifer	VILLAGE OF SPRING GROVE / MCHENRY COUNTY HEALTH DEPARTMENT / IEPA			$5,000	$1,000		F
Lower Nippersink	4-21	Water Quality	Agency Outreach to develop and implement a monitoring plan to insure no pollutant discharges to Nippersink Creek or shallow groundwater aquifer for former gas station site	VILLAGE OF SPRING GROVE / MCHENRY COUNTY HEALTH DEPARTMENT / IEPA			$5,000	$1,000		F
Lower Nippersink	4-22	Permanent Habitat Protection	Encourage Conservation Design for proposed development on parcel south of US 12 containing Pease Fen MCNAI site	NCWPC / TLC / VILLAGE OF SPRING GROVE	135.6	$500	$67,790	$1,000	$3,389	B
Lower Nippersink	4-23	Natural Habitat Restoration	**MCCD Nippersink Canoe Base** Wetland, prairie, and woodland restoration on property	MCCD	139.1	$2,000	$278,134			A

Table 5.12 Recommended Projects in the Lower Nippersink Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY	
Lower Nippersink	4-24	Water Quality	Government Outreach to install Stormwater BMP's to treat roadway runoff at US 12 and South Solon Road prior to discharge into Nippersink Creek	NCWPC / IDOT			$50,000	$1,000	$2,500	E	
Lower Nippersink	4-25	Permanent Habitat Protection	Landowner Outreach to establish Conservation Easements to protect existing high quality wetlands and stream corridor	NCWPC / TLC / MCDEF	91.9	$3,000	$275,643	$1,000	$9,188	D	
Lower Nippersink	4-26	Natural Habitat Restoration	**MCCD Kattner Parcel (Nippersink Canoe Base)** tile removal and ditch closure, marsh / sedge meadow / wet prairie restoration (MCNAI Site BUR03)	MCCD	78.6	$2,000	$157,270			A	
Lower Nippersink	4-27	Permanent Habitat Protection	Landowner Outreach landowner to correct wetland filling violations and implement Conservation design practices for future developments on the parcel	USACE / MCHENRY COUNTY / TLC / MCCD	26.3	$500	$13,145	$500		F	
Lower Nippersink	4-28	Permanent Habitat Protection	Landowner / Government Outreach for Conservation Design for proposed development on parcels containing headwaters of Horse Fair Creek and Horse Fair Springs Fen MCNAI site	NCWPC / TLC / VILLAGE OF SPRING GROVE	42.0	$500	$20,978	$1,000	$1,049	B	
Lower Nippersink	4-29	Permanent Habitat Protection	Landowner / Government Outreach for Conservation Design for proposed development on parcels northeast of Richardson Road and Main Street to protect ADID wetland N340	NCWPC / TLC / VILLAGE OF SPRING GROVE	20.9	$500	$10,464	$1,000	$523	B	
				SW TOTALS	**1,118.4**		**$1,960,371**	**$22,500**	**$51,860**		

PRIORITY

- **A Projects that have cooperating partners, can move to implementation quickly. Implementation Timeframe 1 to 3 years**
- **B Projects subject to imminent development pressure, Implementation Timeframe 1 to 2 years**
- **C Projects needed to protect sensitive areas. Timeframe 1 to 2 years**
- **D Restoration projects, Timeframe 1 to 5 years**
- **E Retrofit Projects, Timeframe 1 to 5 years**
- **F Existing Pollution Potential, Timeframe 1 to 2 years**
- **G Policy / Opportunity Review Project, Timeframe 1 to 3 years**