Chapter 12
Nippersink Creek Headwaters Assessment

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

12.1 Subwatershed Characteristics

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

12.1.1 Subwatershed Location

The Nippersink Creek Headwaters, located in the northwestern portion of the Nippersink Creek Watershed, drains an area of 6,600 acres (10.3 square miles) in size. As shown in Figure 12.1, the subwatershed is located entirely within Alden Township and is roughly bordered by O'Brien Road on the south, the Illinois-Wisconsin border to the north, and the Alden Township boundaries on both the east and west.

Figure 12.1 Nippersink Headwaters Subwatershed Location Map

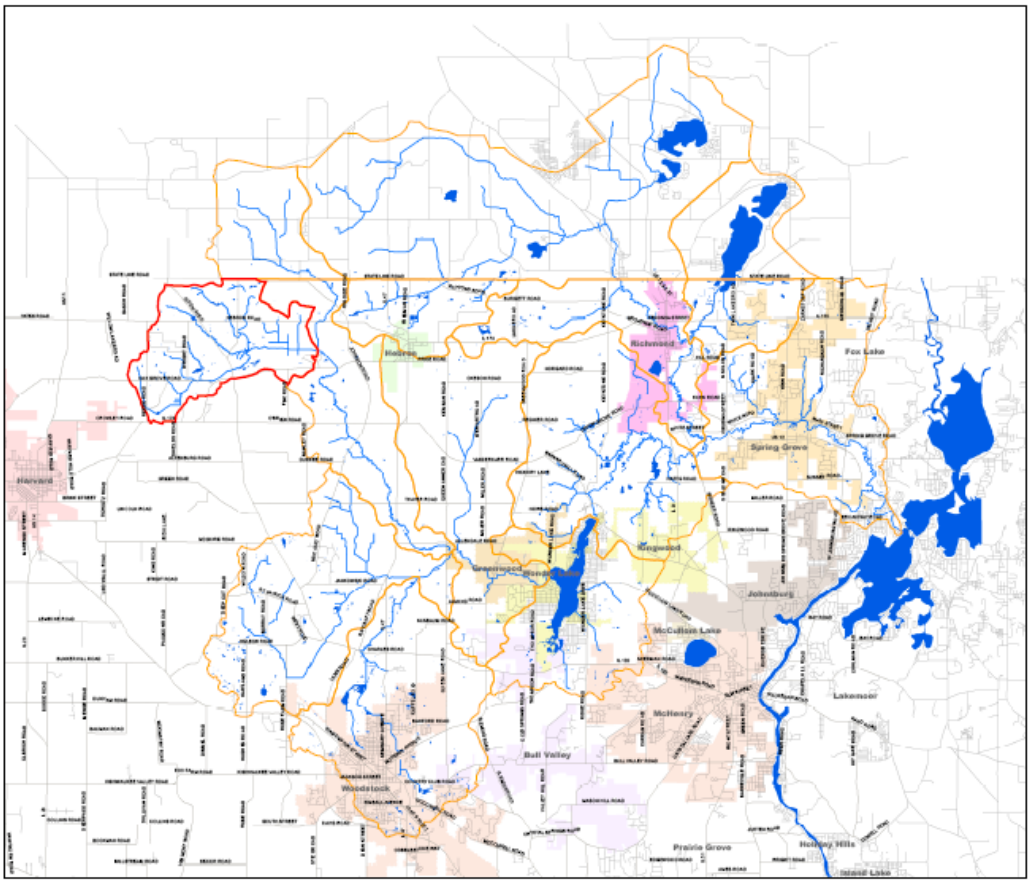
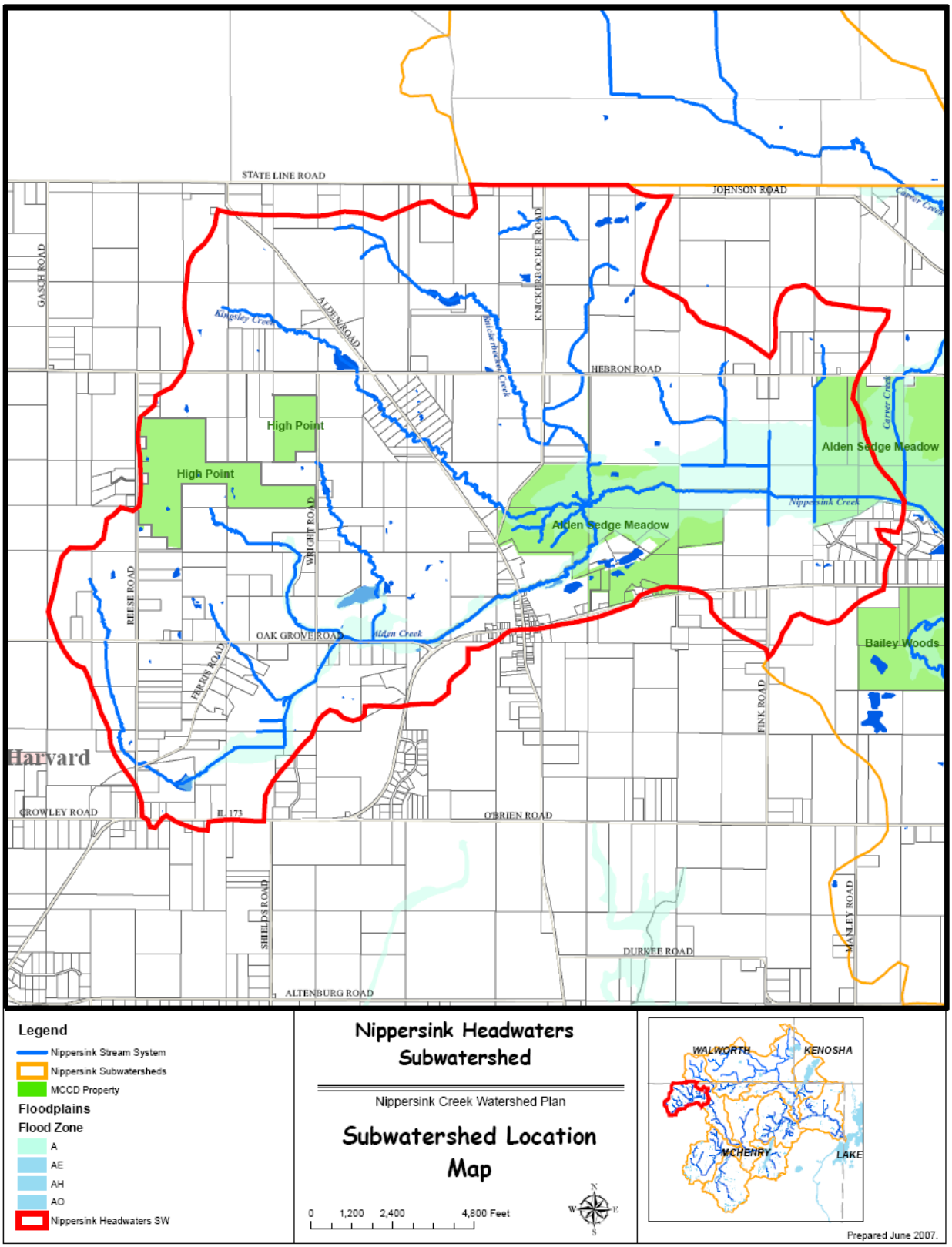


Figure 12.2 **Nippersink Creek Headwaters Subwatershed Map**



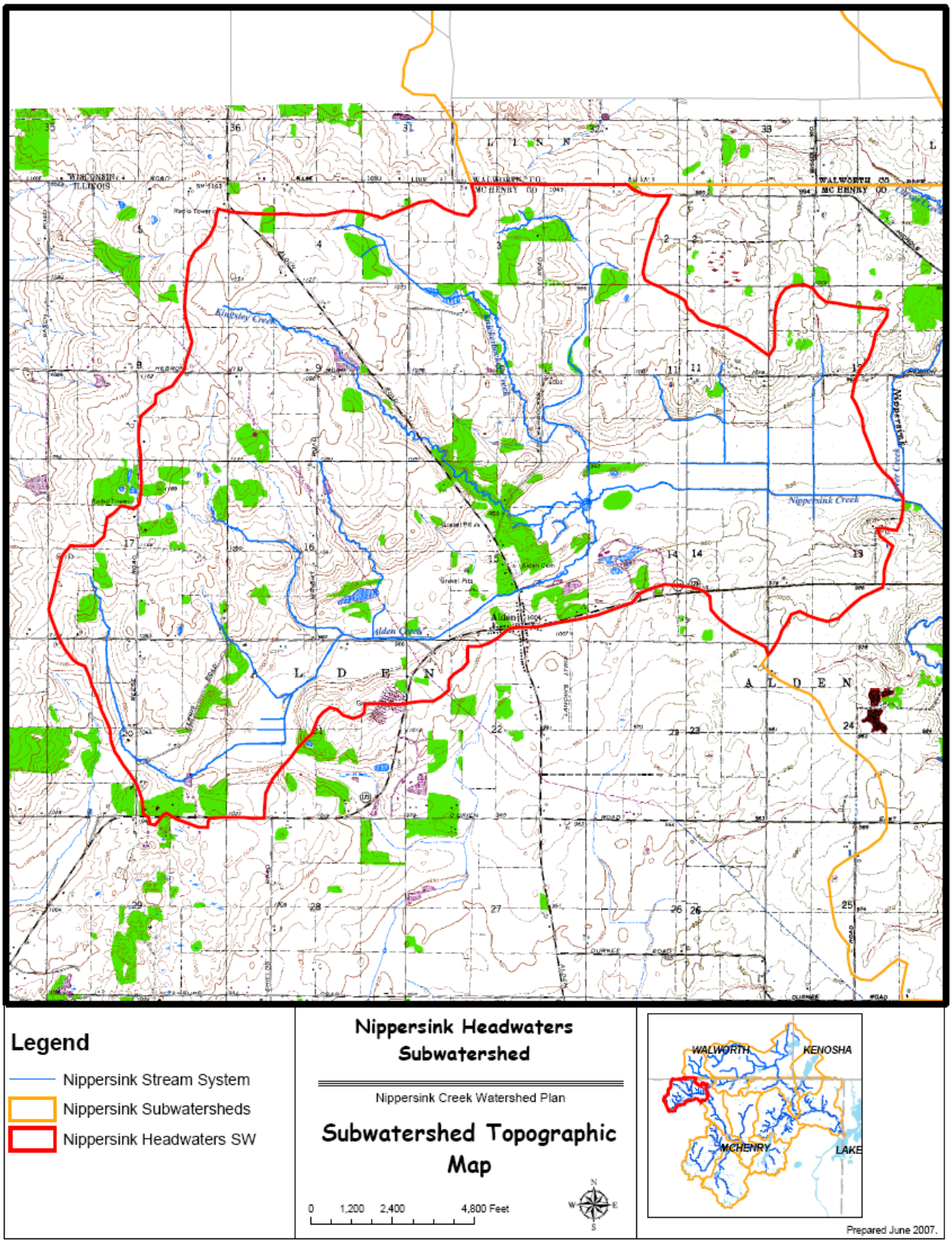
12.1.2 Topography & Geology

The West Chicago Moraine forms the watershed divide between the Fox and Rock Rivers, and also the headwaters boundary of Nippersink Creek. As a result, the highest glaciated point in Illinois (2nd highest overall) featuring an elevation of 1,189 feet, is found in this subwatershed. Native Americans named Nippersink Creek "little waters" for its many springs. Within this "High Point" area, the glacial advances also created the one of the largest concentration of ephemeral wetlands in the Midwest, which provide critical habitat for amphibians. The glacial activity also created uncommon wetlands including calcareous seeps, graminoid fens, and sedge meadows, all of which are found at the Alden Sedge Meadow, a 764 acre unit of the McHenry County Conservation District.

From the "High Point", the landscape descends 261 feet to an elevation of 928 feet at the subwatershed outlet, approximately four miles east. A number of small tributary streams combine to form the main channel of Nippersink Creek, and have relatively steep grades for northeastern Illinois, falling as much as 200 feet in less than 2 miles, or an average slope of nearly 2%. Moving downstream, there is a long, low-lying valley along Alden Creek and Nippersink Creek, which has a slope of less than 0.15%.

Alden Sedge Meadow

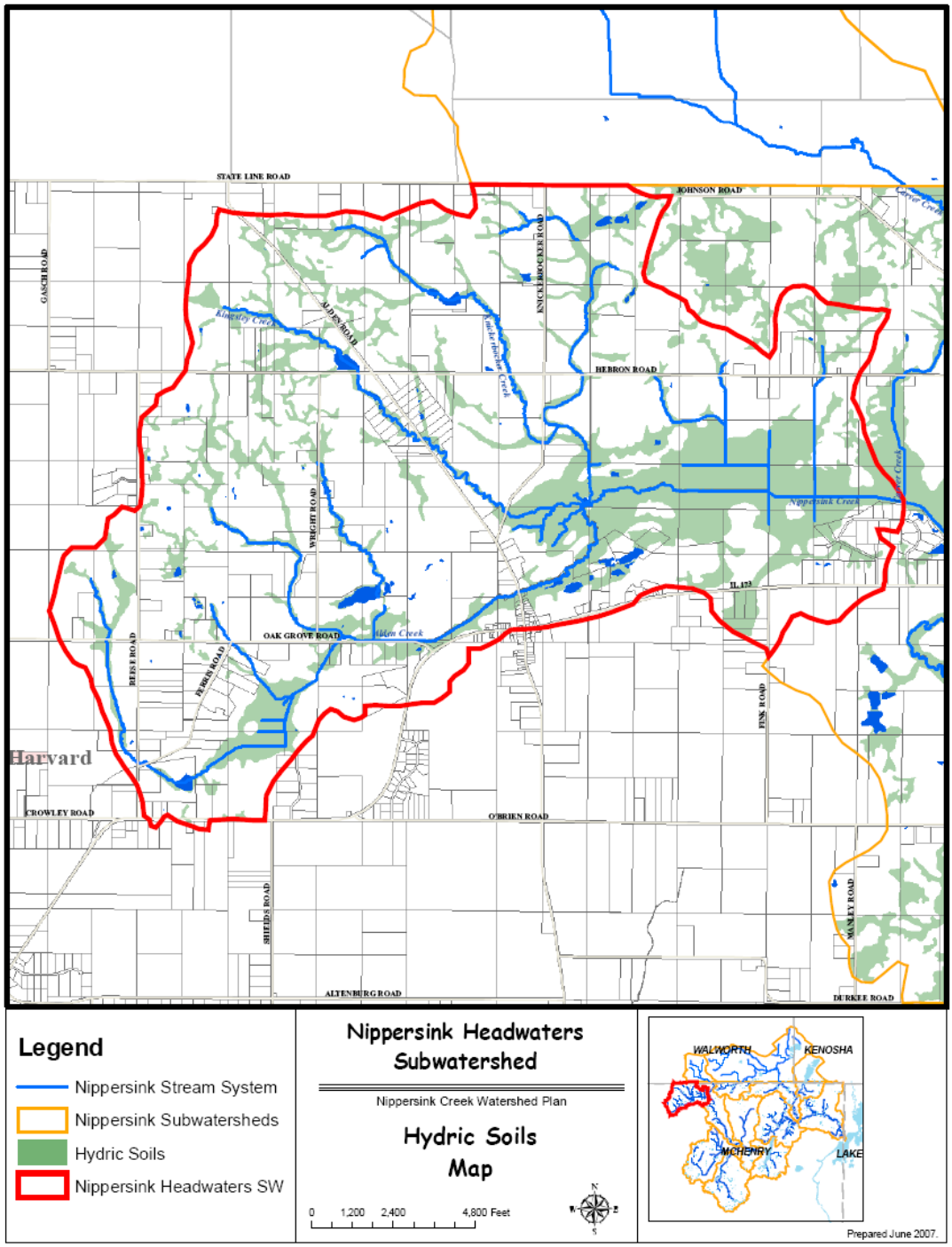
Figure 12.3 **Nippersink Creek Headwaters Topographic Map**



12.1.3 Soil Characteristics

The glacial advances across McHenry County resulted in a wide variety of soil associations. Each major grouping of soil associations has potential impacts on current and future land uses within the subwatershed. For example, hydric (wetland) soils constitute 1,680 acres, or 25.5% of the subwatershed, and indicate those areas that contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

Figure 12.4 Hydric Soils Map for the Nippersink Creek Headwaters Subwatershed



12.1.4 Pre-Settlement Vegetation

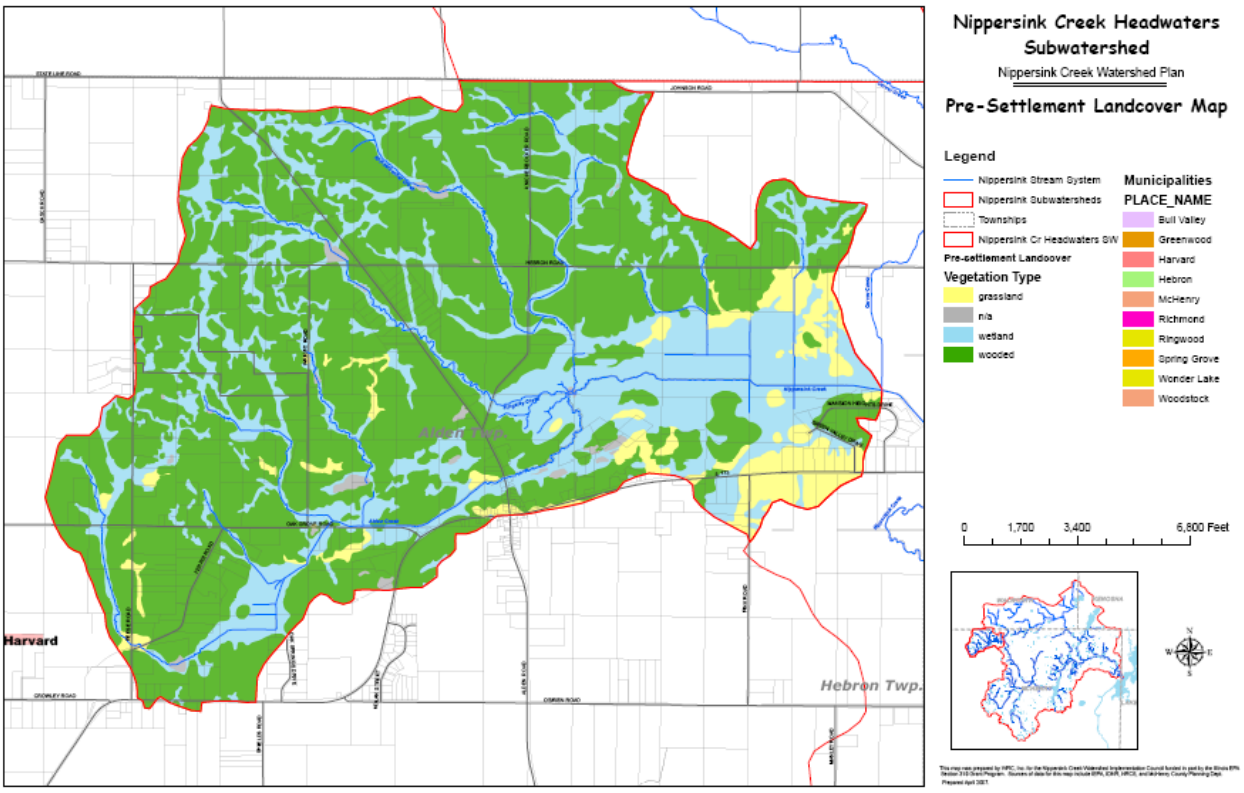
To guide future land management or restoration efforts, it is important to recognize the native plant communities that naturally evolved subsequent to the last glacial advances. Prior to European settlement in the 1830's, the Nippersink Headwaters Subwatershed was largely dominated by woodland, due to its location on the glacial moraine. As described in Table 12.1, and depicted in Figure 12.5, these woodlands, largely comprised of oak / hickory woodland and savannah, were bisected with wetlands and grassland along the drainageways.

Table 12.1 Pre-Settlement Land Cover Conditions

Cover Type	Area	Percent of Subwatershed
Grasslands	398 acres	6%
Wooded	4,291 acres	65%
Wetlands	1,857 acres	28%
n/a	51 acres	1%

Source: MCCD Soils Analysis using GIS data

Figure 12.5 Pre-settlement Vegetation for the Nippersink Creek Headwaters Subwatershed



12.1.5 Subwatershed Drainage Features

Streams

The Nippersink Headwaters Subwatershed features six small tributary streams that come together to form Nippersink Creek. Nippersink Creek has its origins between Reese and Wright Road, north of Oak Grove Road. There are four named streams that drain into Nippersink Creek at or upstream of the Alden Sedge Meadow. They are Knickerbocker Creek, Kingsley Creek, and Alden Creek. There is also one tributary to Nippersink Creek which is officially unnamed, but unofficially referred to as Johnson Creek, and it drains the area between Reese and Wright Road.

Channelization Analysis of aerial photography indicates that the subwatershed contains approximately 22.25 miles of stream channel. Of this distance, about 45% of all the stream channels in the subwatershed have been subjected to historic channelization by agricultural activities.

Manmade Drainage Systems

There are no known storm sewer systems within the subwatershed. Developed areas are drained via overland swales, roadside ditches and culverts installed along road right-of-ways. There are also no known detention basins within the subwatershed.

Agricultural Tile Systems

Due to the predominantly agricultural nature of the subwatershed, it is likely that there are extensive underground drain tile systems that were installed to increase productivity of the area's rich soil. These systems were likely installed more than fifty years ago by private property owners and therefore there is little documented information about there size and exact location, although their distribution can be general determined by inspection of a combination of aerial photographs, hydric soils and topography. Based on preliminary observations as part of this subwatershed assessment, it appears that there are several small to medium size agricultural drain tile networks that provide subsurface drainage to many farmed parcels that are adjacent to the tributary streams in the subwatershed, as well as the low lying area east of Alden Sedge Meadow.

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. There is little doubt that many of the depressional and low lying areas in the subwatershed that are serviced by drain tiles today for agriculture were once wetland habitats that supported a very diverse ecosystem.

12.1.6 Population

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 US Census data indicated that about 450 people lived in the subwatershed, which equated to 44 persons per square mile. According to the 2000 US Census, the population only increased to 472 people, or about 46 persons per square mile. This represents an increase of only 5%, indicating that the growth in the subwatershed has been very slow to date.

12.1.7 Land Cover

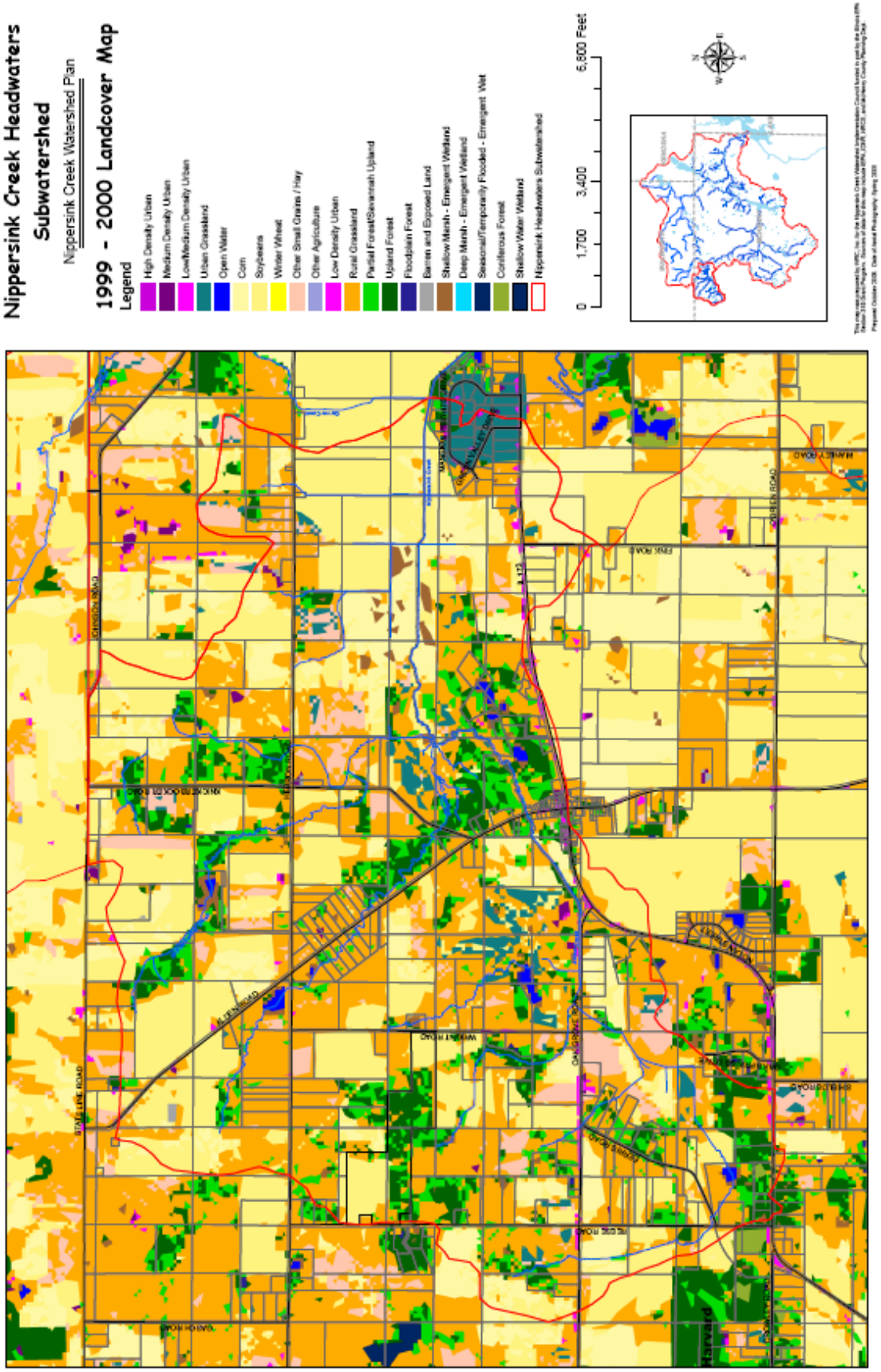
Often, the terms Land Cover and Land Use are used interchangeably. However, there are differences. Land Cover refers to the vegetation, structures, or other features that cover the land. On the other hand, Land Use (as discussed in Section 12.1.8) refers to how land is used by humans.

Land Cover data for the Nippersink Headwaters Subwatershed is available from the Illinois Department of Natural Resources using LANDSAT data collected in 1999. The dominant land cover, according to this data, was row crop agriculture, which accounted for roughly 42% of the subwatershed area. Rural grasslands accounted for another 38%, while wooded areas and wetlands account for an additional 16% of the subwatershed. These three land cover categories account for 96% of the subwatershed, with the remaining 4% comprised of urban land cover.

Table 12.2 1999 Land Cover for the Nippersink Headwaters Subwatershed

Land Cover Description	Total Acres	Percent of Subwatershed
Barren & Exposed Land	4.5	0.1%
Corn, Soybeans, Other Small Grains & Hay	2,735.0	41.5%
Rural Grassland	2,504.3	38.0%
Low Density Urban	45.5	0.7%
Medium Density Urban	18.6	0.3%
Urban Grassland	184.8	2.8%
Shallow Marsh – Emergent Wetland	70.7	1.1%
Partial Forest / Savannah Upland	453.8	6.9%
Upland Forest	543.2	8.2%
Floodplain Forest	3.6	0.1%
Coniferous Forest	2.3	0.0%
Open Water	24.7	0.4%
TOTAL	**6,591**	**100.0%**

Figure 12.6 1999-2000 Land Cover Map for the Nippersink Headwaters Subwatershed



12.1.8 Land Use / Existing Watershed Development

According to the 2005 McHenry County Land Use / Zoning map, 79% of the subwatershed is zoned for agricultural use, while about 12% is either already developed or zoned for development in the future. Almost 9% is classified as open space.

Table 12.3 McHenry County 2005 Land Use in the Nippersink Headwaters Subwatershed

Land Use	Total Acres	Percent of Subwatershed
Vacant	18.5	0.3%
Vacant; Zoned Residential	145.1	2.2%
Vacant; Zoned Commercial	1.7	0.0%
Vacant; Zoned Office	0	0.0%
Vacant; Zoned Industrial	0	0.0%
Agricultural	5,204.5	78.9%
Single Family Residential	386.9	5.9%
Multi-Family Residential	0	0.0%
Commercial	10.2	0.2%
Office	0	0.0%
Industrial	0	0.0%
Mixed Use	0	0.0%
Mining	0	0.0%
Open Space	570.0	8.6%
Institutional	86.7	1.3%
Right of Way	173	2.6%
TOTAL	**6,596.6**	**100.0%**

Source: 2005 McHenry County Land Use Zoning Data

There is a small unincorporated town in the center of the subwatershed called Alden, which, in land planning terms, is considered a rural crossroads hamlet. In actuality, it consists of roughly 45 homes, a gas station, a church, and a re-sale shop.

The principal development in the subwatershed has been rural or estate residential. Development to date is governed by McHenry County. In 1995, Alden Township formed a Plan Commission, which has created a land use plan that calls for the preservation of agricultural areas, and the protection and enhancement of existing natural areas within the Township. Through objections filed by Alden Township, a proposed five lot subdivision that would have been bisected by Knickerbocker Creek, was voted down by the McHenry County Board, and withstood a lawsuit by the developer. Plan Commission actions have also resulted in the creation of two conservation easements within the Township

Roads are maintained by the Alden Township Highway Department, McHenry County, and the State of Illinois.

Until recently, Alden Township was the only Township in McHenry County that did not have an incorporated municipality within its borders. The City of Harvard has recently annexed land within Alden Township (within the Lawrence Creek subwatershed of the Kishwaukee River), and approved two high density residential subdivisions on steeply sloped woodland and cropland. Based upon these recent annexations, the City of Harvard is within one parcel of entering the Nippersink Watershed.

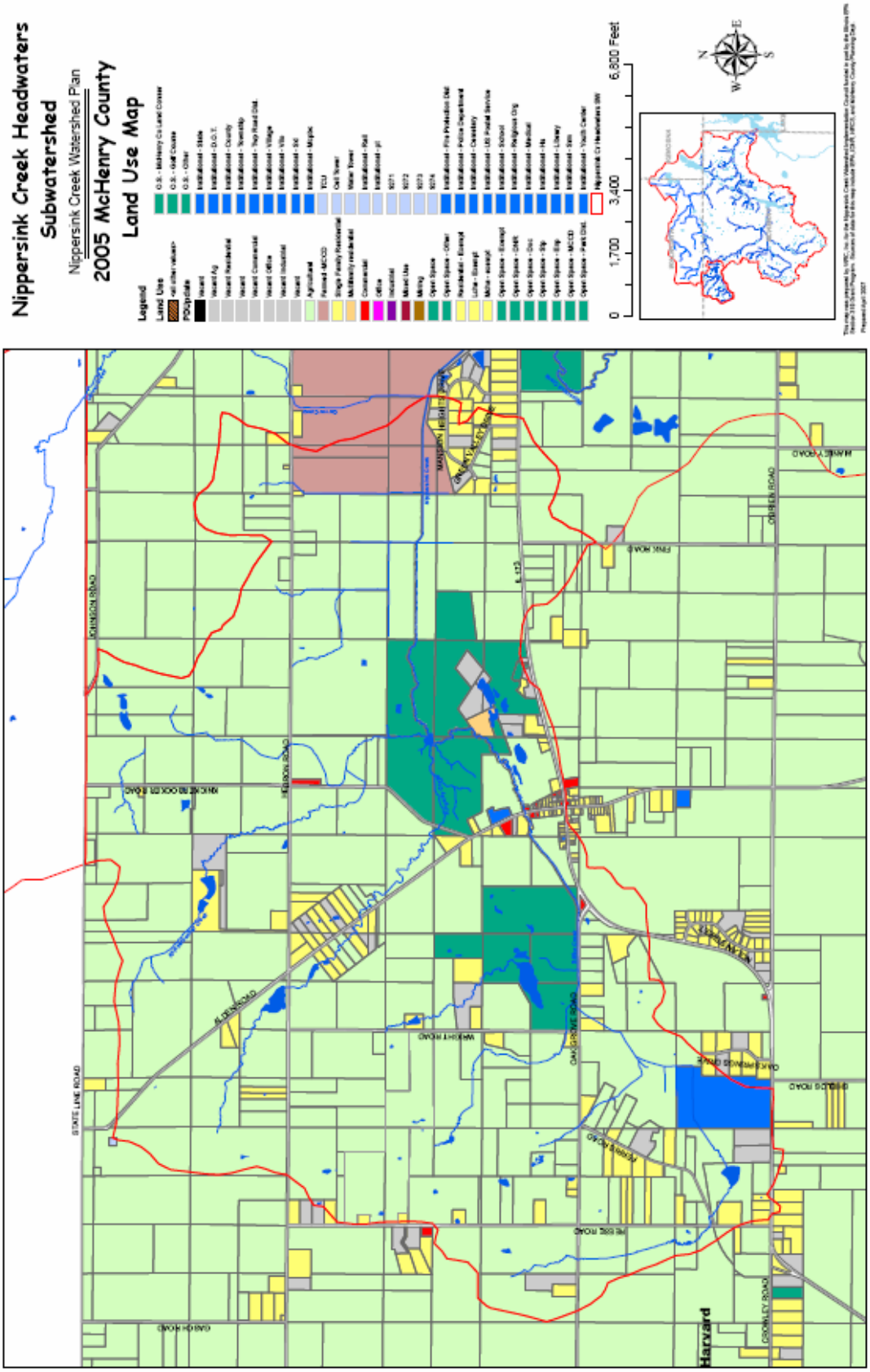
Table 12.4 Municipal Areas in the Lower Nippersink Creek Subwatershed

Municipality	Area (acres)	Percent of Subwatershed
Unincorporated McHenry County	6,600.0	100.0%

There are no documented point source discharges within the subwatershed. However, one potential water quality issue may exist at a sawmill located along Knickerbocker Creek. This sawmill, which makes pallets, stockpiles large volumes of wood chips and mulch in areas directly adjacent to the Creek. Concern about the quality of the water leaving the site, and flowing down to the Alden Sedge Meadow, has been expressed over the years. Ironically, a major fire at the site in February 2007 destroyed the sawmill. If the sawmill is rebuilt, opportunities may exist to have water quality Best Management Practices (BMP's) incorporated into the site redevelopment.

Another potential water quality issue involves plans by the McHenry County Division of Transportation (MCDOT) to extensively re-build Alden Road over its entire length. This project would include the removal of the existing pavement and installation of a new roadway sub-grade, pavement, and drainage improvements. As part of this project, the installation of left-turn lanes and other improvements may result in the increase in amount of paved surfaces, and in turn, a higher volume of stormwater runoff, and associated pollutants. Particular concern exists about the proposed replacement of the Alden Road Bridge at Nippersink Creek proposed to be undertaken in 2009. MCDOT preliminary engineering plans call for an expansion of roadway surface, and improvements to the existing drainage system leading to the creek. However, no provisions for providing stormwater detention capacity or water quality "Best Management Practices" were included in the preliminary plans.

Figure 12.7 2005 McHenry County Land Use Map for the Nippersink Headwaters Subwatershed



12.1.9 Natural Resources

McHenry County Conservation District Property

The McHenry County Conservation District (MCCD) currently owns 1,059 acres of land within the subwatershed, representing nearly 16 percent of the subwatershed.

Table 12.5 MCCD Properties in the Nippersink Headwaters Subwatershed

Name	Area (acres)
Alden Sedge Meadow (west)	410
Alden Sedge Meadow (east)	354
High Point	188
High Point – North	55
High Point - Southwest	52
Total	**1,059**

MCCD has expressed a desire to increase land holdings in areas adjacent to the Alden Sedge Meadow, with the hopes of creation a "Macrosite" similar to their Glacial Park unit, downstream of Wonder Lake. The recent High Point site acquisition also represented a unique situation for MCCD in that adjacent private landowners agreed to place conservation easements on adjacent environmentally sensitive portions of their property, increasing the amount of open space protected.

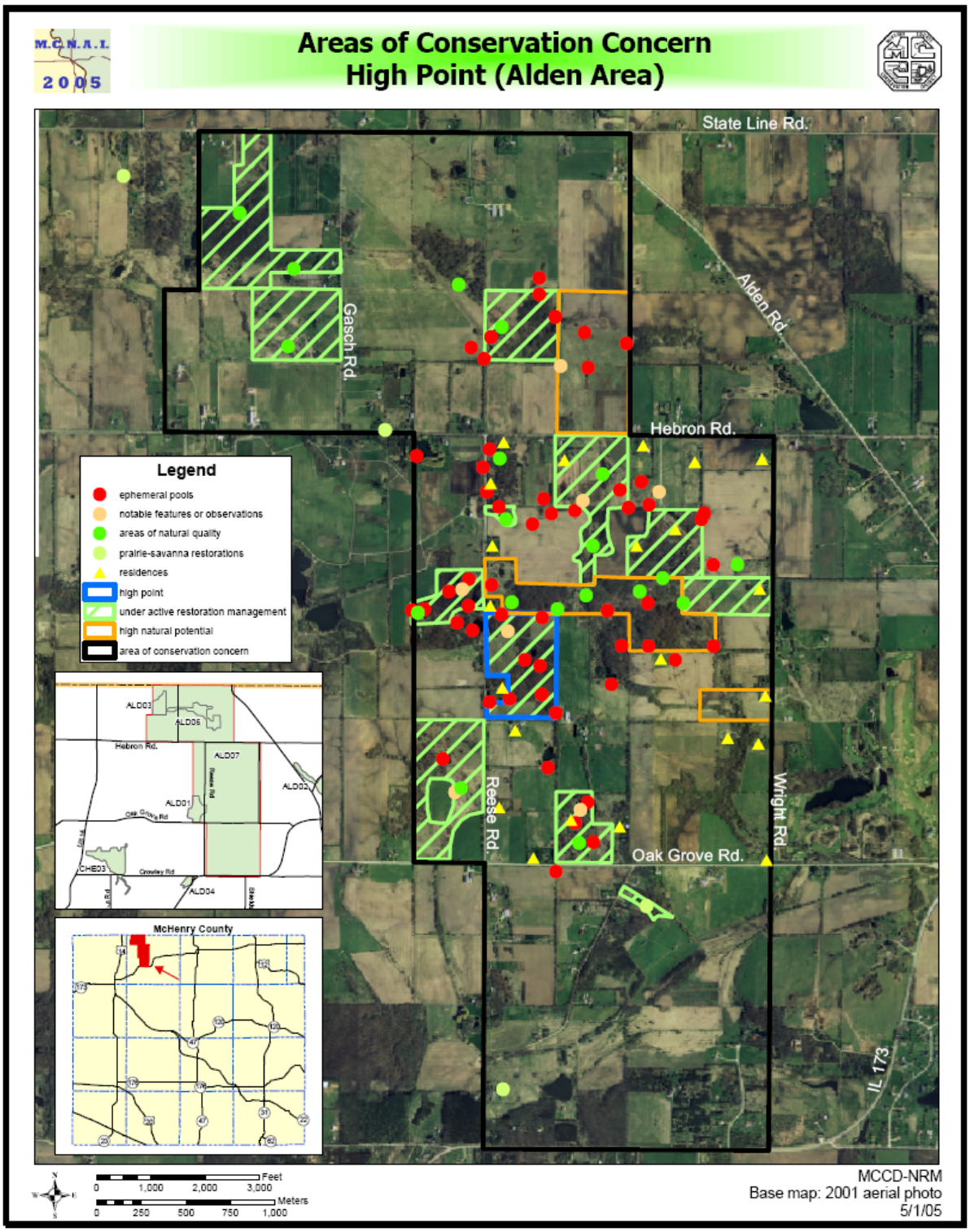
McHenry County Natural Areas Inventory

There are four McHenry County Natural Area Inventory (MCNAI) Sites within the subwatershed, totaling 2,211 acres, representing nearly one-third of the entire subwatershed. Proportionally, this is by far the largest concentration of MCNAI sites of any Nippersink Creek subwatershed, and is due to the presence of the High Point Area of Conservation Concern (ACC), one of only two locations in McHenry County that include a geographic region as an MCNAI site, rather than specific parcels. The High Point Area of Conservation Concern is shown on Figure 12.8.

Table 12.6 McHenry County Natural Areas Inventory Sites in the Nippersink Headwaters Subwatershed

Name	Area (acres)
High Point Area of Conservation Concern	1,673
Alden Sedge Meadow	441
Alden Fen	65
Bailey Woods / Nichols Valley	32
Total	**2,211**

Figure 12.8 McHenry County Natural Areas Inventory Map – Alden High Point ACC



McHenry County Wetlands

McHenry County completed an Advanced Identification (ADID) Wetland Study in 1998. This study identified a total of 795.4 acres of wetlands, or 12 % of the subwatershed. Of these wetlands, 521.2 acres (65%) were determined to be of High Quality or High Functional Value, rating an ADID classification.

Table 12.7 Mapped Wetlands in the Nippersink Headwaters Subwatershed

ADID Code	Wetland Type	# of Wetlands	Total Area
FW	Farmed Wetlands	5	90.9
HFVW	High Functional Value Wetlands	7	205.3
HQL	High Quality Lakes	0	0
HQW	High Quality Wetlands	1	315.9
L	Lakes	0	0
W	Other Wetlands (lower quality)	52	183.3
	TOTAL	**65**	**795.4**

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 indicates that there are at least seven threatened or endangered species present in the subwatershed.

Table 12.8 Threatened and Endangered Species in the Nippersink Headwaters Subwatershed

Common Name	Scientific Name	Type	Status	MCNAI Site
American Bittern	Botaurus lentiginosus	Bird	St Endangered	ALD02
Sandhill Crane	Grus Canadensis	Bird	St Threatened	ALD02
Slippershell Mussel	Alasmidonta viridis	Mussel	St Threatened	ALD02
Blanding's Turtle	Emydoidea blandingii	Reptile	St Threatened	ALD02
Grass Pink	Calopogon tuberosus	Plant	St Endangered	ALD02
Pitcher Plant	Sarracenia purpurea	Plant	St Endangered	ALD02
Common Bog Arrow Grass	Triglochin maritime	Plant	St Threatened	ALD02

Existing Greenways

While there are no formal greenways established in the subwatershed, a former railroad alignment (now abandoned) formerly crossed the subwatershed. This rail line passed through Richmond, Hebron, Alden, Harvard, and continued on towards Boone County. Efforts are underway to try and re-establish a bicycle trail between Hebron and Harvard which would allow connections to existing trails within those communities. This is one of the final missing trail links in creating the "Grand Illinois Trail".

There are several greenway "segments" of substantial length located along the streams upstream of Alden Sedge Meadow. A number of water resource enhancement projects have been funded and implemented through the Habitat Restoration Program (HRP) administered by the McHenry County Soil & Water Conservation District. These projects have included wetland, woodland, and stream corridor rehabilitation projects, a number of which have resulted in the creation of conservation easements on Nippersink Headwaters stream segments.

The Land Conservancy of McHenry County has also received a Conservation 2000 grant from the Illinois Department of Natural Resources to develop a land management plan for private lands within the MCNAI High Point Area of Special Conservation Concern.

12.2 Watershed Analysis and Problem Identification

12.2.1 Water Quality Data

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

Below Wonder Lake, Nippersink Creek is identified as being in Full Support of its Aquatic Life and Fish Consumption Designated Uses, which is notable for a stream in northeastern Illinois. Upstream of Wonder Lake (including this subwatershed), Nippersink Creek is identified as being in Full Support of its Fish Consumption Designated Use, however, the Aquatic Life Designated Use was not assessed.

This information, obtained from the 2006 IEPA 303(d) list, also identifies waterways that are not achieving certain designated uses.

Nippersink Creek, upstream of Wonder Lake, as well as the segment of the Creek that flows through Wonder Lake, was not listed as impaired. However, the reach of Nippersink Creek downstream of Wonder Lake, extending all the way downstream to its confluence with the Fox River, is listed as "impaired" due to fecal coliform entering the stream water from an as yet unidentified source.

Although the IEPA has been monitoring the water quality throughout the Nippersink Creek Watershed for more than 20 years, there are no known IEPA water quality sampling stations located within the Nippersink Creek Headwaters. With little water quality information available for streams in this subwatershed, there is no documentation of quantifiable water quality problems.

12.2.2 Flooding Problems

There are no known flooding problems in the subwatershed.

12.2.3 Projected Development & Growth

The projected growth in the subwatershed is expected to remain relatively slow, with the predominant land use change being the conversion of larger agricultural parcels into smaller, subdivided rural residential estates (> 5 acres). Rapid development may occur in the subwatershed if the City of Harvard continues to annex parcels along the west boundary of the Nippersink Watershed. While the County has a Watershed Development Ordinance that effectively regulates and minimizes large stormwater flows that could cause flooding, there are several deficiencies with regards to water quality and protection/restoration of farmed wetlands.

12.2.4 Natural Area Protection / Preservation Issues

McHenry Natural Area Inventory Sites

Alden Sedge Meadow (MCNAI ALD02) is threatened by water table alteration, brush encroachment, and invasive species (Common Reed Grass, Purple Loosestrife, Reed Canary Grass).

Alden Fen (MCNAI ALD01) is threatened by bank erosion, water table alteration, brush encroachment, and agricultural runoff. This MCNAI site is also not protected, in that it is not owned by MCCD, and has no conservation easement.

ADID Wetland Sites

ADID Wetland N190 consists of a wetland stream corridor through golf course up to Wright Road. The ADID study lists this wetland as "very disturbed, managed for game hunting" and "surrounding golf course construction". However, when this golf course was constructed, the owners enrolled the course in an Audubon certification program that works to minimize environmental impacts.

12.3 Subwatershed-specific Recommendations to Protect Watershed 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 12.9.

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 12.11 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 12.12 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 12.10 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 12.9 Nippersink Headwaters Subwatershed Site Recommendation Map

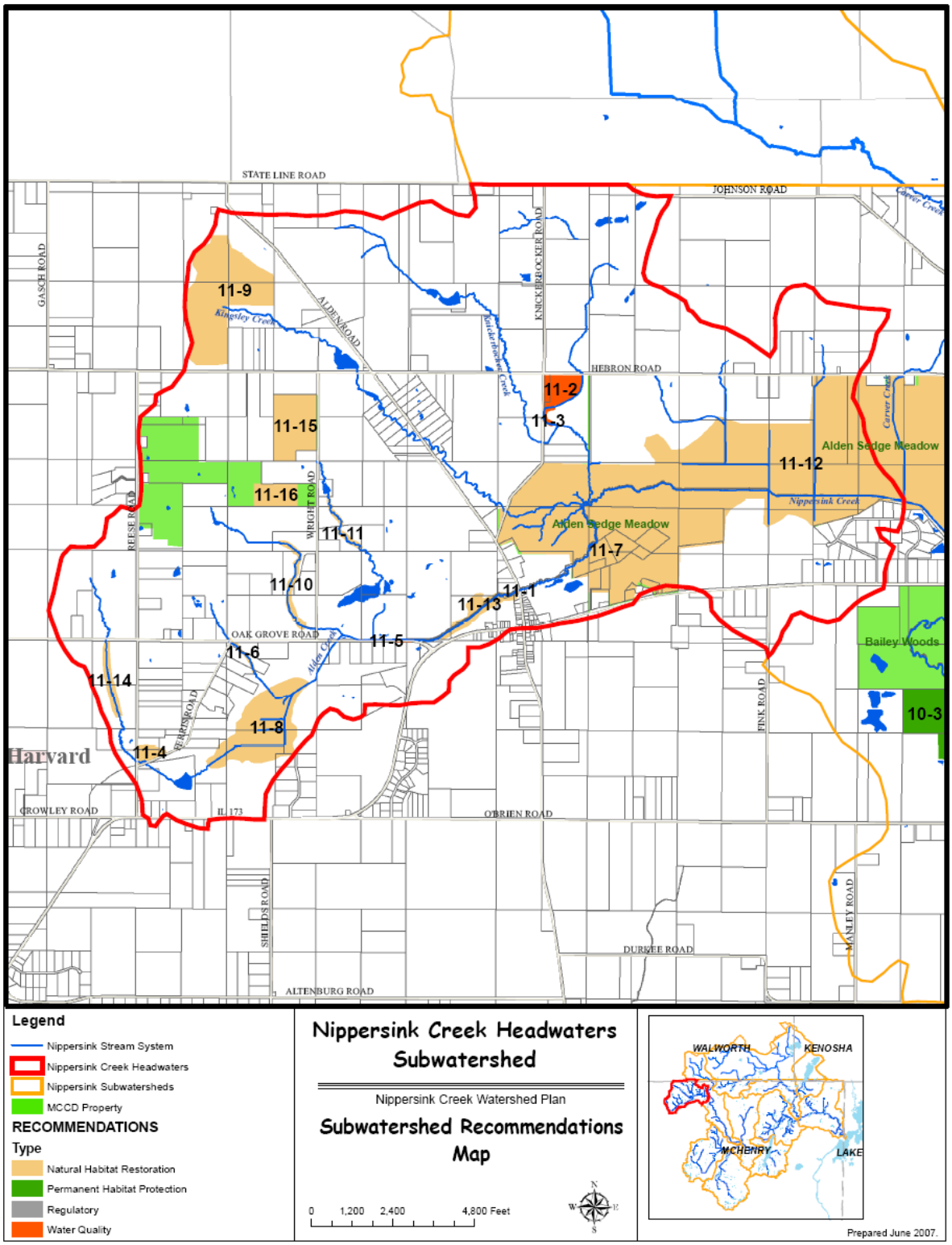


Table 12.9 BMP Selection & Associated Pollutant Load Reduction for the Nippersink Headwaters Subwatershed

BMP	Type of BMP	Project Locations**	BMP		Removal Efficiency***			(lbs/year) ****			Percentage Reduction		
			Size	Unit	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS
Natural Habitat Protection	Site-specific	11-4, 11-6, 11-8 to 11-16	64	acres	30%	35%	60%	402	25	27	1.5	1.7	2.9
Stormwater BMPs	Site-specific	11-1, 11-2, 11-5, 11-7	1	lump sum	36%	95%	95%	149	21	13	0.5	1.4	1.4
Regulatory*	Watershed-Specific	Subwatershed	1	Water-shed	5%	5%	5%	1,381	75	46	5	5	5
Nutrient Management	Watershed-specific	Subwatershed wide	659	acres	70%	28%	-	9,662	209	-	35	14	-
Stream Buffers	Site-specific	11-2, 11-3, 11-4, 11-5	10	acres	36%	95%	95%	75	11	7	0.3	0.7	0.7
Stream Corridor Restoration	Site-specific	11-2, 11-6, 11-10, 11-11, 11-13, 11-14, 11-15	256	acres	53%	51%	88%	2,842	148	156	10.3	9.9	17.1
Wetland Restoration	Site-specific	11-8, 11-9, 11-12, 11-13, 11-15	87	acres	53%	51%	88%	966	50	53	3.5	3.4	5.8
Total								15,477	540	302	56	36.1	32.9

*Regulatory programs are assumed to have nominal pollutant reduction rates of 5%.

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

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

**** The unit of “TSS” is “Tons/year”.

Table 12.10 Recommended Projects in the Nippersink Headwaters Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Nippersink Headwaters	11-1	Water Quality	Government Outreach to install BMP's to treat roadway runoff at Alden Road prior to discharge into Alden Creek	NCWPC / MCHENRY DOT			$25,000	$1,000	$1,250	E
Nippersink Headwaters	11-2	Water Quality	Landowner Outreach landowner to develop a Stormwater BMP plan to minimize discharge of mulch pile leachate to Knickerbocker Creek or the shallow groundwater aquifer; establish Stream Buffer along stream corridor	NCWPC / ALDEN TOWNSHIP / NORThWEST WOOD PRODUCTS	19.6	$1,500	$29,361	$1,000	$1,468	E
Nippersink Headwaters	11-3	Water Quality	Landowner / Government Outreach to relocate Kickerbocker Creek at Knickerbocker Road to the west to reduce bank erosion and maximize buffer between road and stream channel	NCWPC / ALDEN TOWNSHIP	2.5	$7,500	$18,570	$500	$929	E
Nippersink Headwaters	11-4	Natural Habitat Restoration	Landowner Outreach landowner to enhance stream corridor at NE corner of Ferris Road and Reese Road and recreate drained wetland	NCWPC / TLC / MCDEF	7.4	$5,000	$36,960	$500	$739	D
Nippersink Headwaters	11-5	Water Quality	Government Outreach to install Stormwater BMP / Buffer Strip along Oak Grove Road at Alden Creek to treat roadway runoff prior to discharge to Alden Creek	NCWPC / MCHENRY DOT	2.6	$12,500	$32,913	$1,000	$1,646	E
Nippersink Headwaters	11-6	Natural Habitat Restoration	Landowner Outreach to private landowners to stabilize steep gradient stream and restore degraded stream corridor	NCWPC / TLC / MCDEF	3.2	$5,000	$16,145	$500	$323	D
Nippersink Headwaters	11-7	Water Quality	Landowner Outreach to Shagbark Condo Association to determine feasibility of alternative water softener treatement to minimze chloride loading to adjacent Alden Sedge Meadow	NCWPC / SHAGBARK HOA			$20,000	$500		F

Table 12.10 Recommended Projects in the Nippersink Headwaters Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Nippersink Headwaters	11-8	Natural Habitat Restoration	Landowner Outreach to determine potential for 90+ acre wetland restoration on Alden Creek 1/4 mile south of Oak Grove Road in Nippersink Bottoms area	NCWPC / TLC / MCDEF	92.3	$2,000	$184,504	$1,000	$9,225	D
Nippersink Headwaters	11-9	Natural Habitat Restoration	Landowner Outreach to determine feasibility of removing agricultural drain tiles and restoring prairie & wetland landscapes wherever possible	NCWPC / NRCS / SWCD	131.1	$2,000	$262,126	$1,500	$13,106	D
Nippersink Headwaters	11-10	Natural Habitat Restoration	Landowner Outreach to private landowners to stabilize steep gradient stream and restore degraded stream corridor along Johnson Creek upstream of Wright Road	NCWPC / TLC / MCDEF	12.6	$5,000	$63,230	$500	$1,265	D
Nippersink Headwaters	11-11	Natural Habitat Restoration	Landowner Outreach private landowners to stabilize steep gradient stream and restore degraded stream corridor along Alden Creek tributary east of Wright Road; discourage livestock access directly into the creek.	NCWPC / TLC / NRCS	6.6	$5,000	$32,755	$500	$655	D
Nippersink Headwaters	11-12	Natural Habitat Restoration	**MCCD Alden Sedge Meadow** Develop and implement restoration plan (MCNAI ALD); 800 acres tile removal; 3.2 miles stream dechannelization; 700 acres wetland restoration; marsh/sedge meadow/wet prairie and prairie restoration	MCCD	1,015.1	$1,000	$1,015,109			A
Nippersink Headwaters	11-13	Natural Habitat Restoration	Landowner Outreach to investigate potential for re-meandering Alden Creek upstream of Alden Road; potential for 20+ acres of wetland recreation along stream corridor	NCWPC / TLC / MCDEF	19.7	$5,000	$98,670	$1,000	$1,973	D

Table 12.10 Recommended Projects in the Nippersink Headwaters Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Nippersink Headwaters	11-14	Natural Habitat Restoration	Landowner Outreach private landowners to stabilize steep gradient stream and restore degraded stream corridor along Alden Creek south of Oak Grove Road west of Reese Road	NCWPC / TLC / MCDEF	12.8	$5,000	$64,125	$500	$1,283	D
Nippersink Headwaters	11-15	Natural Habitat Restoration	**MCCD High Point North** remove ag field tiles, stabilize stream channel, 55 acres of re-forestation, savanna and wet swale recreation	MCCD	53.8	$2,500	$134,485			A
Nippersink Headwaters	11-16	Natural Habitat Restoration	**MCCD High Point South** parcel; restore 15 acres of forest / savanna habitat	MCCD	19.5	$4,000	$77,864			A
				SW TOTALS	**1,398.7**		**$2,111,817**	**$10,000**	**$33,861**	

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