Chapter 13
North Branch Nippersink Creek Subwatershed Assessment

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

13.1 Subwatershed Characteristics

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

13.1.1 Subwatershed Location

The North Branch Nippersink Creek subwatershed is the subwatershed located at the north end of the watershed. This subwatershed has an area of 6,757 acres, or 10.56 square miles (5.2% of watershed). The boundary of the subwatershed is shown in Figure 13.1. The subwatershed is located within northwest Richmond Township and extends into the far northeast corner of Hebron Township. The subwatershed is specifically "divided" at the Illinois-Wisconsin border; north of the state line there is an additional 24,500 acres draining to the North Branch Nippersink Creek. This subwatershed and the two other smaller subwatersheds north of the state line are covered in brief summaries in Chapter 16 of this plan.

Figure 13.1

North Branch Nippersink Creek Subwatershed Location Map

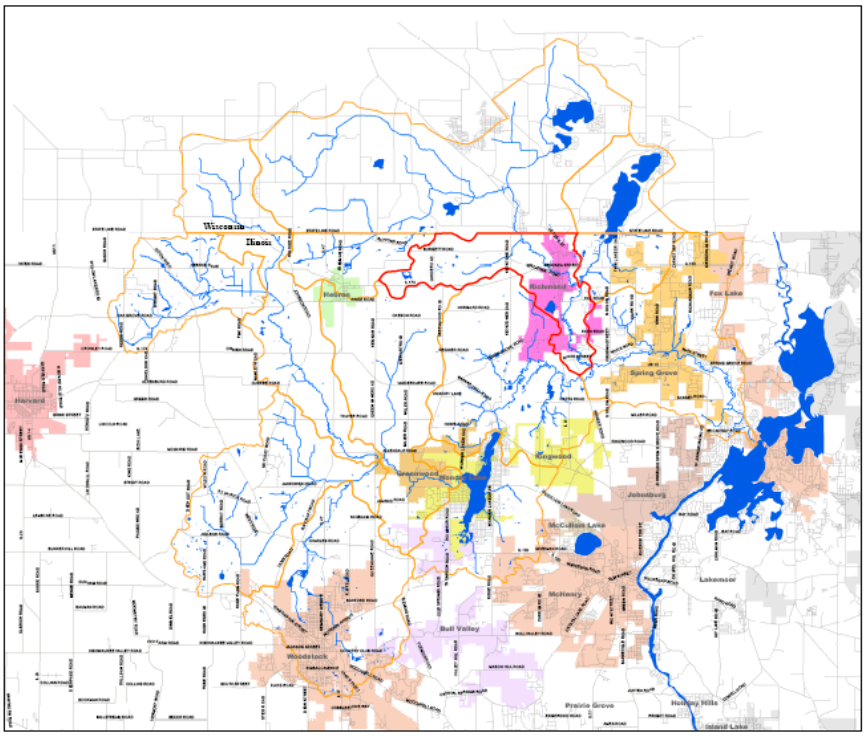
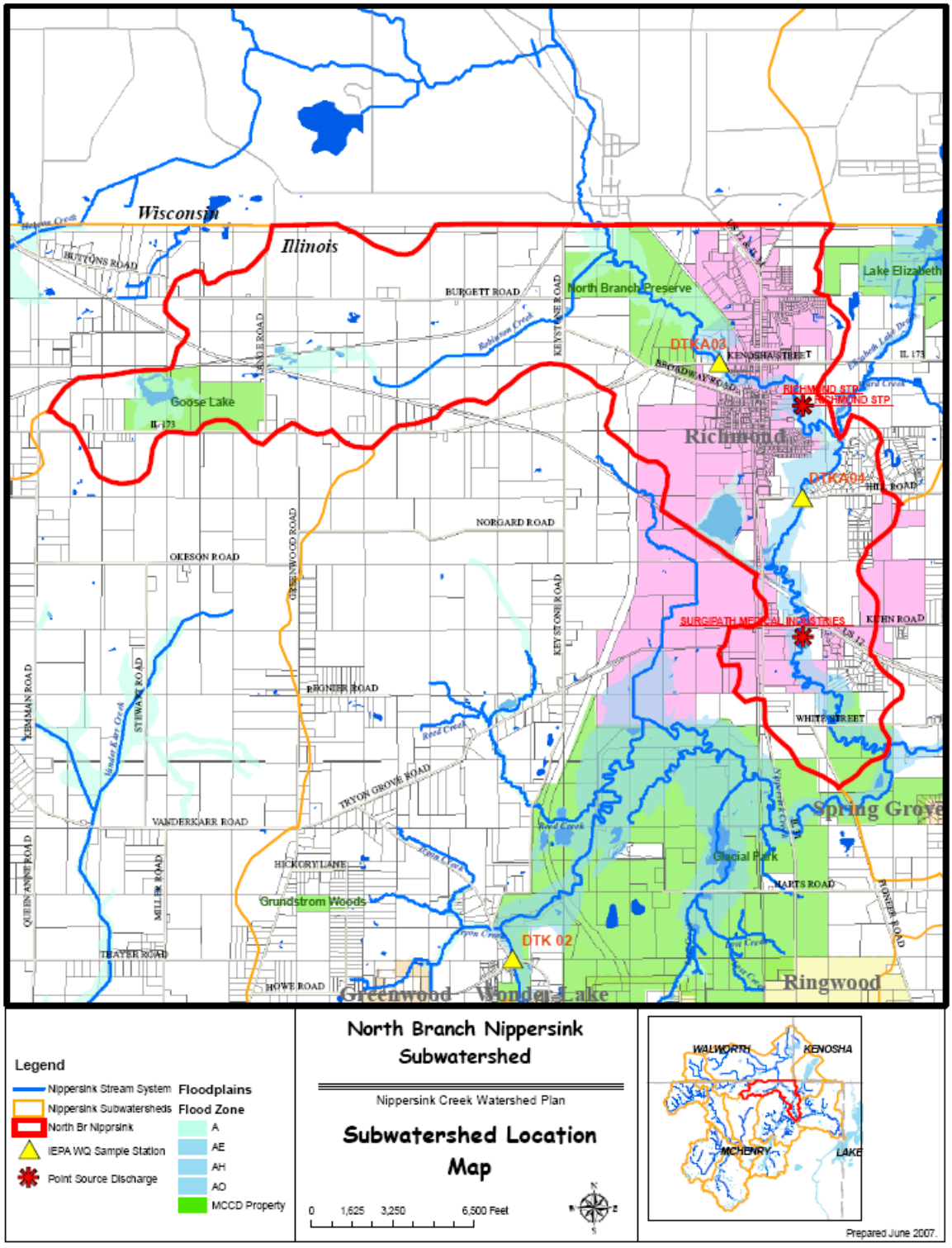


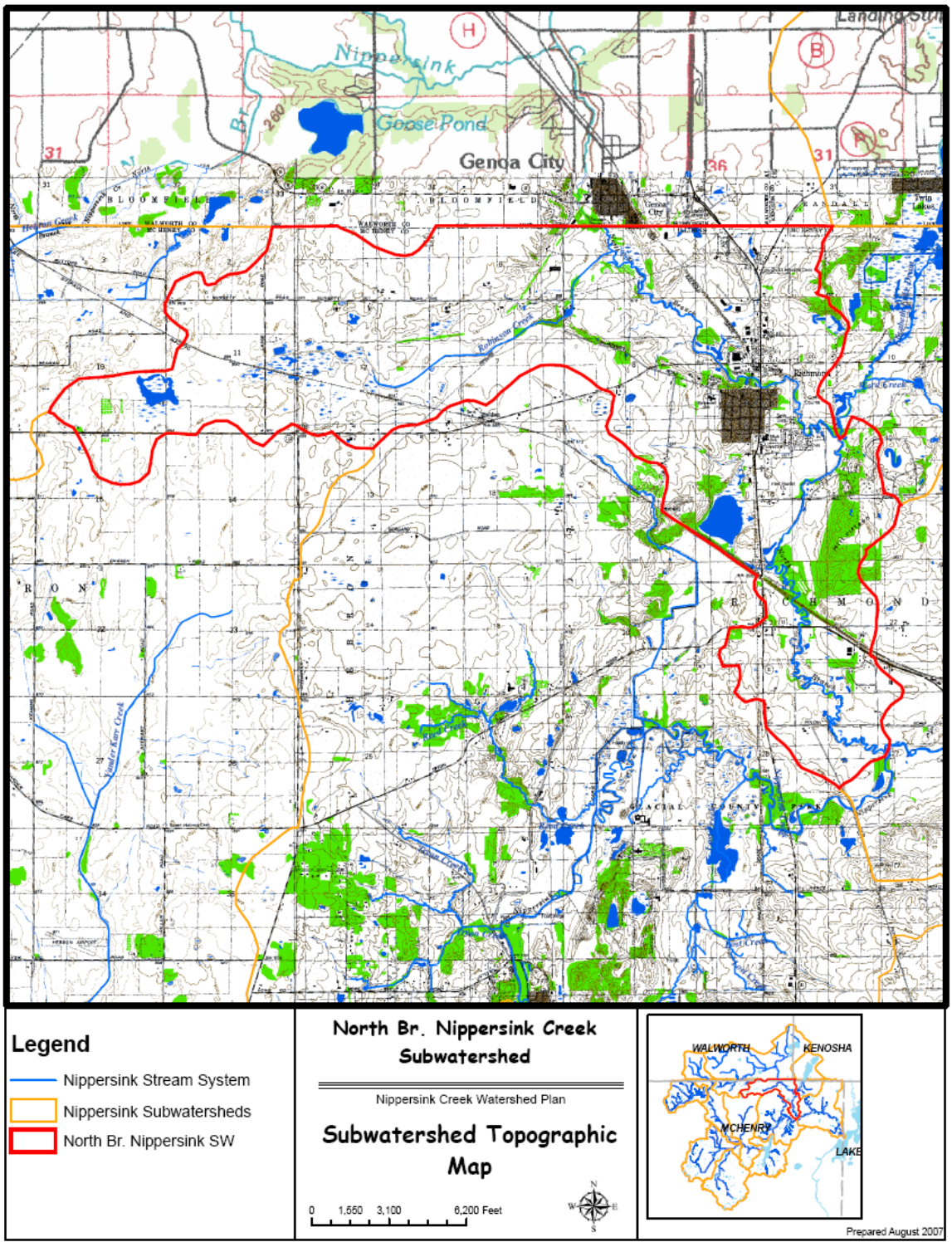
Figure 13.2 North Branch Nippersink Creek Subwatershed Map



13.1.2 Topography & Geology

The topography of the North Branch Nippersink Creek subwatershed is moderately sloping, generally between 2% and 4%, with a maximum elevation of 922 feet near Illinois Route 173 and Kenman Road, and a minimum elevation of 762 feet at the subwatershed outlet near White Street, just west of US Route 12.

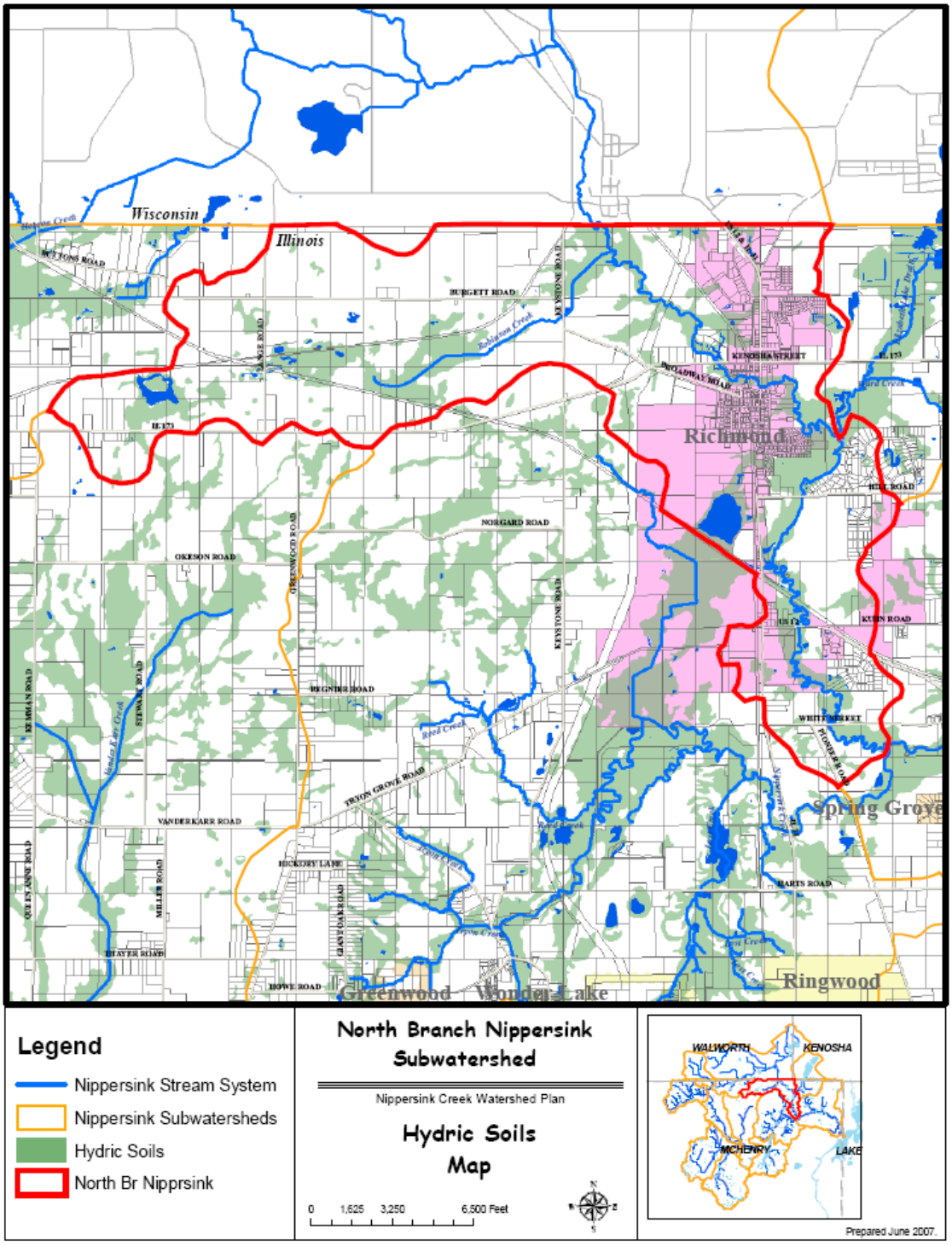
Figure 13.3 USGS Topographic Map for the North Branch Nippersink Creek Subwatershed



13.1.3 Soil Characteristics

The glacial advances across McHenry County resulted in a wide variety of soil associations. Each major grouping of soil associations has potential impact on current and future land uses within the subwatershed. For example, hydric (wetland) soils constitute 1,535 acres, or 22.7% of the 6,757 acre subwatershed, and indicate those areas that contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

Figure 13.4 Hydric Soils of the North Branch Nippersink Subwatershed



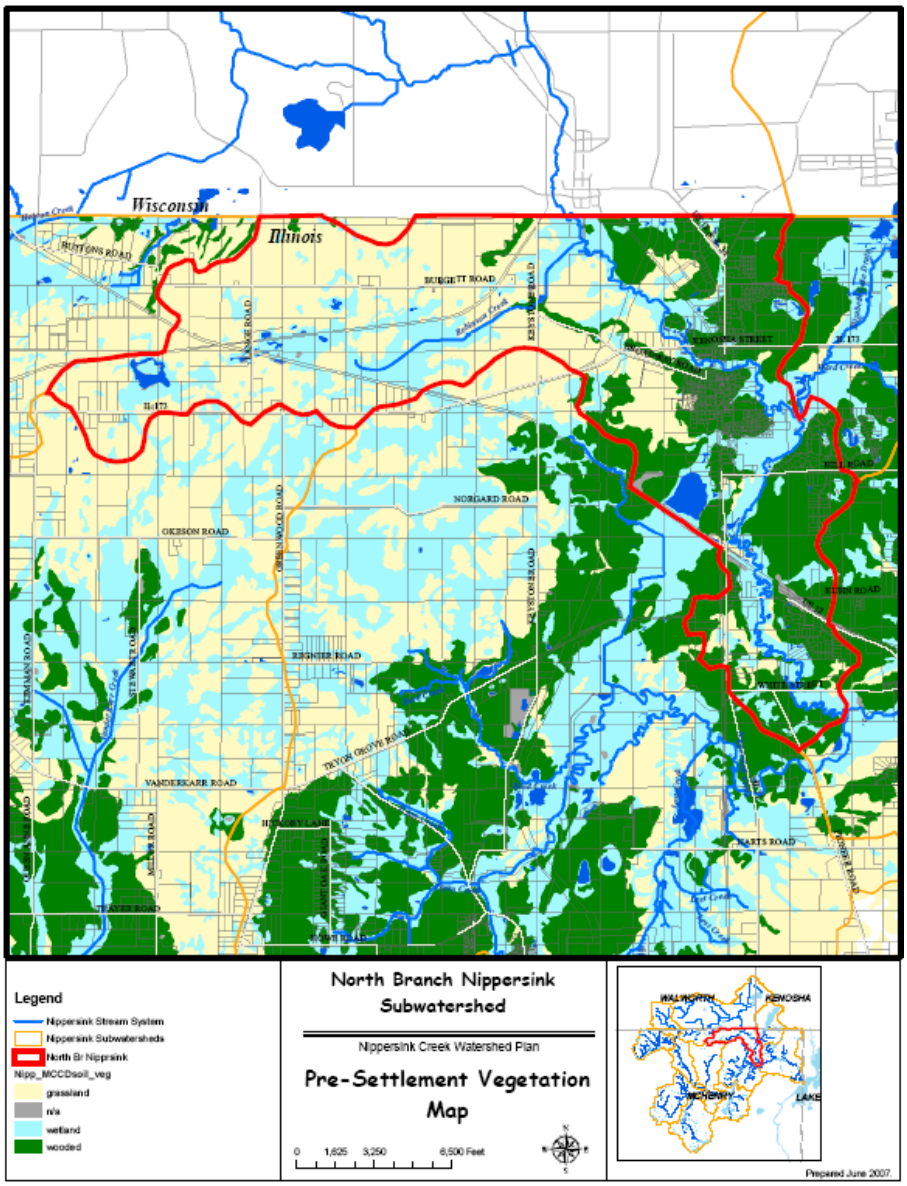
13.1.4 Pre-settlement Vegetation

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 North Branch Nippersink Creek Subwatershed was comprised of a mixture of grassland, woodland, and wetland, as described in Table 13.1, and depicted in Figure 13.5.

Table 13.1 Pre-Settlement Land Cover Conditions

Land Cover Type	Area (acres)	Percent of Subwatershed
Grassland	2,811.4	42%
Wooded	2,123.7	31%
Wetland	1,737.1	26%
n/a	74.8	1%

Figure 13.5 Pre-settlement Vegetation Map in the North Branch Nippersink Creek Subwatershed



13.1.5 Subwatershed Drainage Features

Streams

The principal stream in the North Branch Nippersink Creek subwatershed is, of course, the North Branch of the Nippersink Creek. There are two tributaries to the North Branch in this subwatershed: Robinson Creek and Elizabeth Lake Drain. This section describes the physical conditions of the streams in this subwatershed, including the stream corridor though which they flow.

The North Branch Nippersink Creek, in this subwatershed, flows south for about 9.5 miles from the state line at Genoa City through the Village of Richmond, and enters Nippersink Creek south of White Street, about ½ mile west of South Solon Road.

Robinson Creek is a small tributary to the North Branch that drains the agricultural region northwest of Richmond (north of Illinois Route 173 as far west as Kenman Road). The upstream half of this tributary is entirely channelized and very low gradient (8 ft / mi), with little to no natural stream corridor remaining. The lower half of Robinson Creek (1/2 mile west of Keystone Road to confluence with North Branch) is much steeper, approaching 50 feet / mile (1% slope) in some reaches, and is buffered by heavy tree canopy. There is one on-line recreational / farm pond on Robinson Creek, on the east side of Keystone Road, which likely prohibits fish from utilizing the upper 2/3 of the tributary.

Manmade Drainage Systems

Analysis of land uses and aerial photography indicates that the majority of the man-made drainage features in the subwatershed consist of drained by a system of open channel swales and culverts. Limited field investigations indicate that only about 5% of the subwatershed is drained via storm sewers. Given its age, the existing man-made storm water system was 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 predominantly agricultural nature of the subwatershed, it is likely that there many functioning underground drain tile systems remaining in the subwatershed, particularly in the western half of the subwatershed. 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. 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.

13.1.6 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 1,230, or 117 persons per square mile. According to the 2000 US Census, the population in the North Branch Nippersink subwatershed was about 1,520 people, or about 145 persons per square mile, a 23% increase.

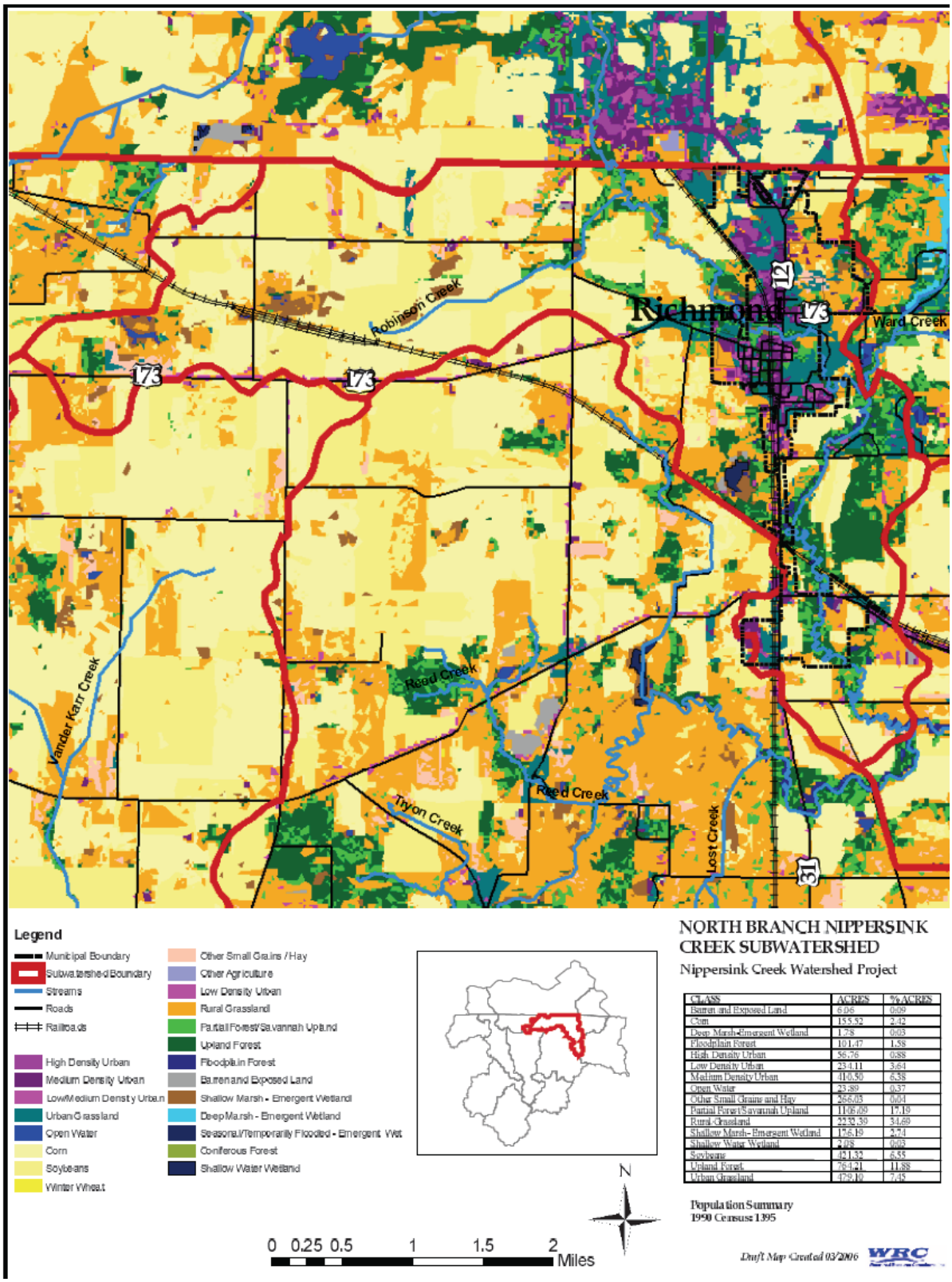
13.1.7 Land Cover

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 13.1.8) 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 (69%). Urban landscapes accounted for roughly 13% of the Lower Nippersink Creek subwatershed while wooded areas and wetlands account for an additional 18%.

Table 13.2 1999 Land Cover for the North Branch Nippersink Creek Subwatershed

Land Cover Description	Total Acres	Percent of Subwatershed
Barren & Exposed Land	16.2	0.2%
Corn, Soybeans, Other Small Grains & Hay	3,424.4	50.7%
Rural Grassland	1,262.0	18.7%
Low Density Urban	119.7	1.8%
Medium Density Urban	211.3	3.1%
High Density Urban	55.7	0.8%
Urban Grassland	484.2	7.2%
Shallow Marsh – Emergent Wetland	179.2	2.7%
Shallow Water Wetland	13.9	0.2%
Partial Forest /Savannah Upland	350.2	5.2%
Upland Forest	572.5	8.5%
Floodplain Forest	49.3	0.7%
Deep Marsh / Emergent Wetland	1.0	0.0%
Open Water	17.4	0.3%
TOTAL	**6,757**	**100.0%**

Figure 13.6 1999-2000 Land Cover Map for North Branch Nippersink Creek Subwatershed



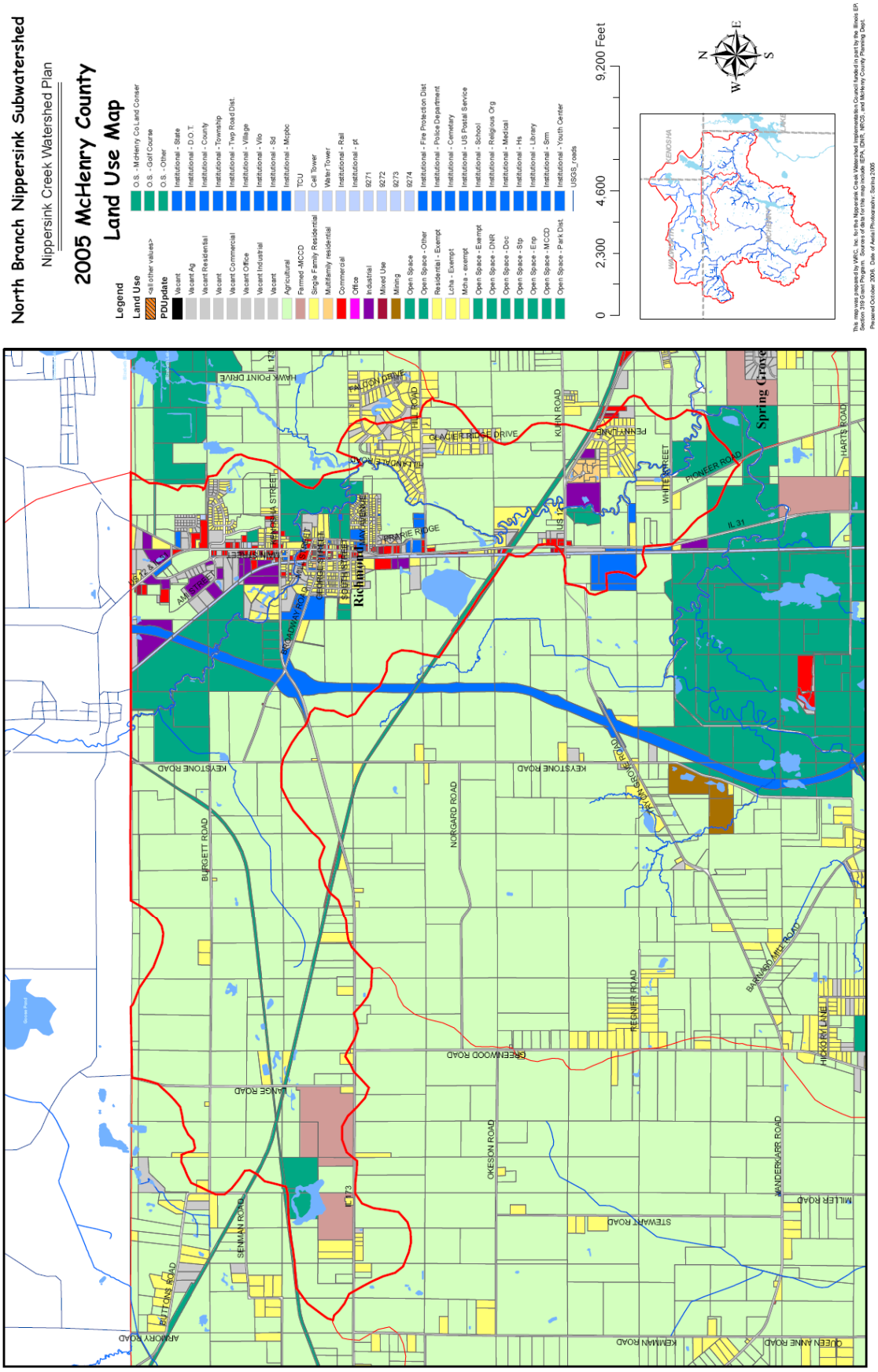
13.1.8 Land Use / Existing Watershed Development

According to the 2005 McHenry County Land Use / Zoning map, 66% of the subwatershed is zoned for agricultural use, while about 23% is either already developed or zoned for development in the future. Over 11% is classified as open space.

Table 13.3 McHenry County 2005 Land Use in North Branch Nippersink Creek Subwatershed

Land Use	Total Acres	Percent of Subwatershed
Vacant	6.9	0.1%
Vacant; Zoned Residential	147.1	2.2%
Vacant; Zoned Commercial	29.8	0.4%
Vacant; Zoned Office	0	0.0%
Vacant; Zoned Industrial	66	1.0%
Agricultural	4,454.9	65.9%
Single Family Residential	522.4	7.7%
Multi-Family Residential	21.3	0.3%
Commercial	69.1	1.0%
Office	0	0.0%
Industrial	123.8	1.8%
Mixed Use	7.6	0.1%
Mining	0	0.0%
Open Space	763.4	11.3%
Institutional	238.8	3.5%
Right of Way	305.9	4.5%
TOTAL	**6,757**	**100.0%**

Figure 13.7 2005 McHenry County Land Use Map for North Branch Nippersink Creek Subwatershed



Development in the subwatershed has historically occurred through unincorporated residential development, although this subwatershed is currently experiencing development growth through municipal annexations by the Village of Richmond.

Table 13.4 Municipal Areas in the North Branch Nippersink Creek Subwatershed

Municipality	Area (acres)	Percent of Subwatershed
Village of Richmond	1,562	23%
Unincorporated McHenry County	5,196	77%

There are 30.2 miles of roads in the subwatershed, which equates to more than 100 acres of impervious cover (roadway pavement only – excludes parking lots, sidewalks, and driveways).

Point Source Discharges

There are two point source discharges into the North Branch Nippersink Creek in this subwatershed. It is also important to note that there are two additional point source discharges that discharge into the North Branch Nippersink or one of its tributaries upstream of this subwatershed; Wastewater Treatments in Hebron, and Genoa City, Wisconsin.

Table 13.5 NPDES Point Source Discharges in the North Branch Nippersink Creek Subwatershed

Name	Average Discharge (mgd)	Receiving Stream	IEPA Permit Number
Richmond WWTP	0.375	North Branch Nippersink Creek	IL0026093
Surgipath Medical Industries	0.048	Wetland adjacent to NB Nippersink Creek	IL0070645

Water quality and discharge information for Richmond WWTP can be found on the EPA's website at:

http://oaspub.epa.gov/enviro/pcs_det_reports.detail_report?npdesid=IL0026093

13.1.9 Natural Resources

McHenry County Conservation District Properties

There are three McHenry County Conservation District properties in the subwatershed, totaling about 843.5 acres, or 12.5% of the North Branch Nippersink subwatershed area.

Table 13.6 MCCD Properties in the North Branch Nippersink Creek Subwatershed

Name	Area is SW (acres)	Total MCCD Property Area
Glacial Park	143.7	3264.2
Goose Lake	256.2	269.8
North Branch Preserve	443.6	443.6
Total	**843.5**	

Other Publicly Protected Land

There is a proposed roadway alignment running north-south through the center of the subwatershed that was assembled to allow a divided highway linkage to Route 12 at the Wisconsin state line. Much of this alignment, owned by the State of Illinois, passes through MCCD property.

Table 13.7 Other Publicly Protected Land in the North Branch Nippersink Creek Subwatershed

Name	Area (acres)	# of Parcels
State of Illinois	70.2	3
Village of Richmond	32.3	22
Total	**102.5**	

McHenry County Natural Areas Inventory

There are four McHenry County Natural Area Inventory (MCNAI) Sites within the subwatershed, representing about 16% of the entire subwatershed.

Table 13.8 McHenry County Natural Areas Inventory Sites in the North Branch Nippersink Creek Subwatershed

MCNAI Site ID	Name	Area is SW (acres)	Total MCNAI Site Area	Ownership
RIC06	Glacial Park	415.1	4670	Public / Private
RIC05	Genoa City Wetlands & Barrens	282.2	282.2	Public / Private
RIC02	Elizabeth Lake	1.3	578	Public / Private
HEB05	Lange Road Bog	74.9	74.9	private
HEB02	Goose Lake	104.1	105	Public / Private
RIC09	Prairie Trail North Wetland	131.8	132	Public / Private
RIC12	South Richmond Sedge Meadow	88.4	88.4	Public / Private
	TOTAL	**1,097.8**		

Wetlands

McHenry County completed an Advanced Identification (ADID) Wetland Study in 2003. This study identified a total of 58 wetlands, totaling 1,139 acres, or 17% of the North Branch Nippersink subwatershed. Of these wetlands, 908.6 acres (80%) were determined to be of High Quality.

Table 13.9 Mapped Wetlands in the North Branch Nippersink Creek Subwatershed

ADID Code	Wetland Type	Number of Wetlands	Total Area (acres)
HFV	High Functional Value	3	36.3
HQW	High Quality Wetland	7	908.6
FW	Farmed Wetland	23	105.1
W	Other Wetlands (lower quality)	25	88.8
	TOTAL	**58**	**1,138.8**

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 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 six threatened or endangered animal species living in the subwatershed.

Table 13.10 Threatened and Endangered Species in the North Branch Nippersink Creek Subwatershed

Common Name	Scientific Name	Type	Status	MCNAI Site
Sandhill Crane	Grus canadensis	Bird	IL Threatened	RIC05 HEB02 HEB05
Yellow-Headed Blackbird	Xanthocephalus xanthocephalus	Bird	IL Endangered	RIC05 HEB02 HEB05
Black Tern	Chlidonias niger	Bird	IL Endangered	HEB02
Common Moorhen	Gallinula chloropus	Bird	IL Threatened	HEB02 HEB05
Least Bittern	Ixobrychus exilis	Bird	IL Threatened	HEB02
Blanding's Turtle	Emydoidea blandingii	Reptile	IL Threatened	HEB02

Source: McHenry County Natural Areas Inventory Database, 2005

Fishery

According to a 1999 Anti-degradation Study for the Village of Richmond (completed by Smith Engineering), the McHenry County Conservation District conducted fishery surveys on the North Branch Nippersink between West Solon Road and the state line between 1994 and 1996. As many as 30 native fish species were found, with 6-8 species being classified as pollution intolerant. Index of Biotic Integrity ratings at several stations were above 51, indicating that much of the North Branch is classified as a Class A Stream (Unique Aquatic Resource).

Mussels

The above mentions study also documented that the North Branch Nippersink Creek in the Richmond area is home to at least 5 species of mussels, including Three-ridge, Elktoe, Plain Pocketbook, and Fat Mucket species (the fifth species was not identified in the report). A 1995 survey by the MCCD found as many as 12 species of mussels, including the state endangered Rainbow mussel (Villosa iris).

Existing Greenways

Although there are no formal greenways in the North Branch Nippersink Subwatershed, about 3.3 miles (13%) of the North Branch Nippersink Creek and its tributaries are protected from disturbance due to acquisition by the McHenry County Conservation District.

13.2 Analysis of Subwatershed Data and Problem Identification

13.2.1 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 quality of the North Branch Nippersink Creek itself has historically been very good. Numerous biological studies conducted on the North Branch indicate high quality in-stream habitat (pools and riffles; gravel & sand substrate) and excellent species diversity, including many fish and macroinvertebrate species that are very intolerant of pollution in the water column.

The Illinois Environmental Protection Agency maintains two water quality sampling stations in the North Branch Nippersink Creek subwatershed.

Table 13.11 IEPA Water Quality Sampling Stations in the North Branch Nippersink Creek Subwatershed

Station	Stream	Location
DTKA04	North Branch Nippersink Creek	N. Br. Nippersink at Hill Road
DTKA03	North Branch Nippersink Creek	N. Br. Nippersink at IL Route 173

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, however there are no established FRWMN monitoring stations on the North Branch Nippersink Creek.

The 1999 Village of Richmond Anti-Degradation Study (Smith Engineering) reported in-stream phosphorus levels at the old WWTP to range between 0.15 and 0.29 mg/L with an average of 0.19 mg/L (7 week period in summer of 1999). The study also indicated that phosphorus data from IEPA's DTKA04 station was found to range between 0.04 and 0.39 mg/L (1982-1996 time period). Data from the Wisconsin DNR for 1998 indicated that phosphorus concentrations in the North Branch just upstream of the Genoa City WWTP ranged from 0.05 to 0.11 mg/L.

13.2.2 Flooding Problems

At the time of this writing, no data were provided by the County or municipalities regarding existing flooding problems. Analysis of available floodplain information suggests that there are less than 10 homes in the FEMA 100-year Floodplain.

13.2.3 Projected Development & Growth

Development in the North Branch Nippersink Creek Subwatershed is likely to occur as part of construction within existing municipal jurisdictions as well as future annexations by Richmond and Spring Grove.

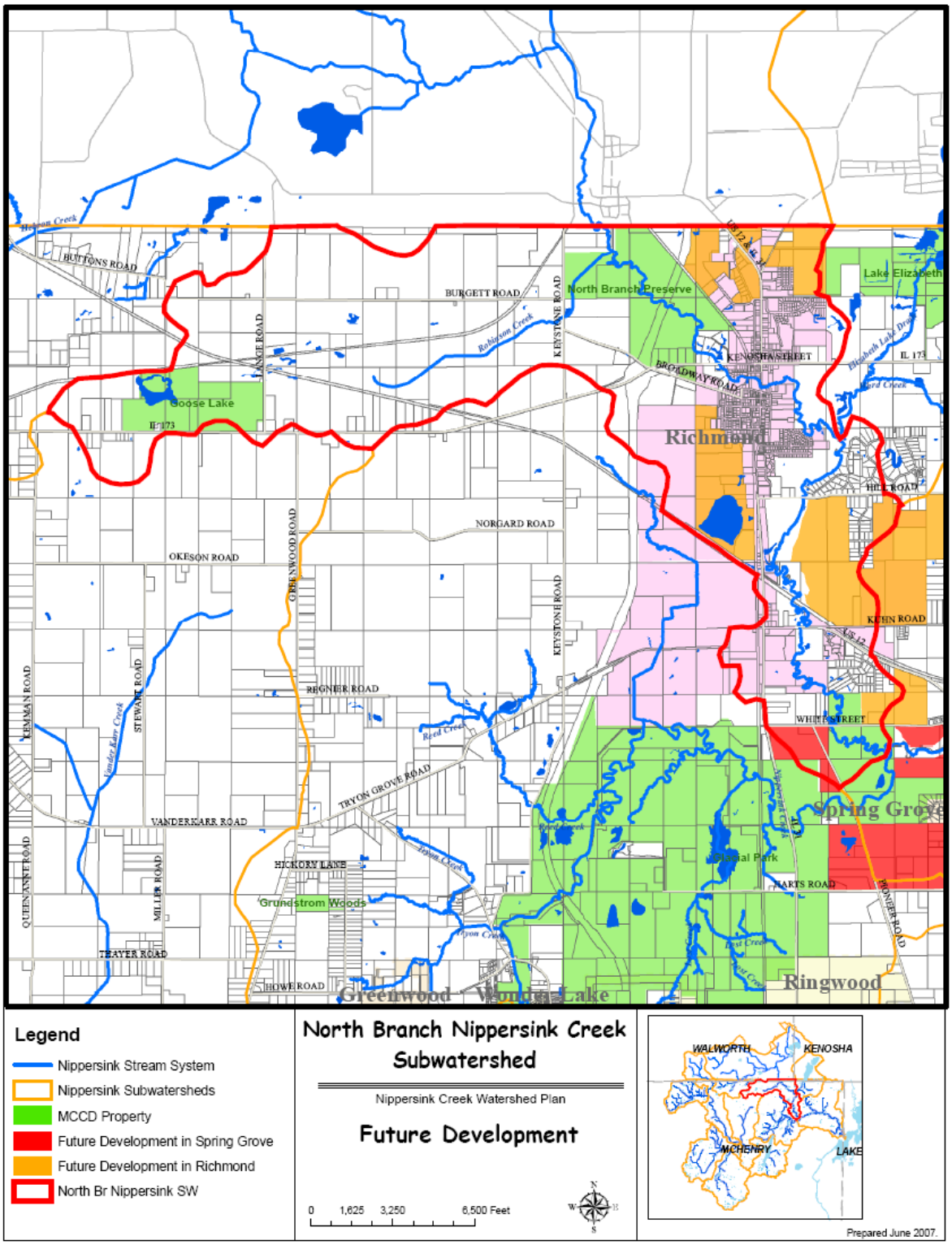
Development in the North Branch Nippersink subwatershed is expected to be significant. According to the 1999 Village of Richmond Anti-Degradation Study, the Village of Richmond anticipates adding more than 2,500 homes and 90 acres of commercial/office/light-industrial developments over the next several years. NIPC population projections for 2030 indicate that Richmond's population is expected to increase from 1,091 to 15,059 (1,280% increase). Approximately 50% of this projected population will reside in the North Branch Nippersink Subwatershed (7,500 residents; a 600% increase from the 2000 Census).

Table 13.12 Summary of Village of Richmond Projected Development.

Current Flow through Richmond WWTP	220,000 GPD
New High School Facility	25,000 GPD
Proposed May Development	171,500 GPD
Proposed Orsolini Development	25,000 GPD
Proposed Smith Development	17,500 GPD
ComDisco Office Park	10,000 GPD
Varga Property (225 homes)	85,400 GPD
Varga Property (40 acres business/commercial)	20,000 GPD
Hunt Club Estates (100 homes)	35,000 GPD
Remington Ridge (21 homes)	7,350 GPD
May Development – North (230 homes)	80,500 GPD
Eldredge Property (49.5 acre business/commercial)	24,750 GPD
ComDisco (500 homes)	175,000 GPD
ComDisco Development (1500 homes)	525,000 GPD
Total: 2575+ homes; 90 acres business/commercial	1,422,000 GPD

Source: Village of Richmond Anti-Degradation Study (1999, Smith Engineering)

Figure 13.8 Future Development in the North Branch Nippersink Creek Subwatershed



13.2.4 Natural Area Protection / Preservation Issues

McHenry County Natural Area Inventory Sites

In the North Branch Nippersink subwatershed, about 40% of the McHenry County Natural Area Inventory (MCNAI) sites are protected through public ownership (421 of 1097 acres on MCCD property).

Genoa City Wetlands & Barrens (MCNAI RIC05) is the second largest NAI site in the North Branch Nippersink Watershed. This 282 acre site contains sedge meadows, basin marshes, a graminoid fen, mid order low-gradient stream, and silt loam barrens. The MCNAI database indicates that the Genoa City Wetlands & Barrens site is currently impaired by water table alterations, brush encroachment, and invasive species (Reed Canary Grass, Cattails). It also lists development as a future problem that will impact the site.

The Goose Lake (MCNAI HEB02) is a 105 acre basin marsh located in the far northwest corner of the subwatershed. The MCNAI database indicates that the Goose Lake site is currently impaired by water table alterations, siltation from adjacent agricultural land uses, and invasive species (Reed Canary Grass & Purple Loosestrife). About 90% of this MCNAI site is protected by the MCCD.

The Lange Road Bog (MCNAI HEB05) is a 75 acre natural area located just east of the Goose Lake MCNAI site. This site contains a mesic silt loam prairie, basin marshes, sedge meadows, a calcareous floating mat, and a graminoid bog. The site is noted as having an "exceptional concentration of boreal wetland plants". The MCNAI database indicates that the Goose Lake site is currently impaired by water table alterations, siltation from adjacent agricultural land uses, and invasive species (Reed Canary Grass, Purple Loosestrife & Cattails). This natural area is not protected through any public agency or conservation easement.

The Prairie Trail North Wetland (MCNAI RIC09) is a 132 acre natural area located along the North Branch Nippersink, upstream of Main Street, in the Village of Richmond. A large portion of this natural area is unprotected on private property and contains a wet silt loam prairie and a sedge meadow. The MCNAI database indicates that this site is currently impaired by brush encroachment, invasive species (Reed Canary Grass) and filling by private landowners. About 30% of this MCNAI site is protected by the MCCD.

About 415 acres (8%) of the 4670 acre Glacial Park / Tamarack Farm MCNAI site extends into the southwest end of the subwatershed. This portion of the GP / TF MCNAI site is located entirely on private property (Tamarack Farms LLC) and includes a high quality shallow water / emergent wetland complex and several areas of mature woodlands and partial forest / savanna habitat. As most of this portion of the MCNAI site is within the Village of Richmond current municipal boundary, it is likely that much of this unprotected MCNAI will be converted to suburban development if a concerted effort is not made soon to protect the non-agricultural features of this site.

The South Richmond Sedge Meadow (MCNAI RIC12) is an 88 acre natural area along the North Branch Nippersink Creek stream corridor between US Route 12 and White Street. This site contains the creek as well as a sedge meadow and streamside marshes. About 14 acres on the north end of this NAI site are owned by the Village of Richmond (16%). An additional 10.5 acres on the south end area also protected – through the MCCD. This leaves the middle 70% of the site on private property, with a significant portion of that area planned for future development.

13.3 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 13.9

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 13.13 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 13.14 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 13.14 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 13.9 North Branch Nippersink Creek Subwatershed Site Recommendations Map

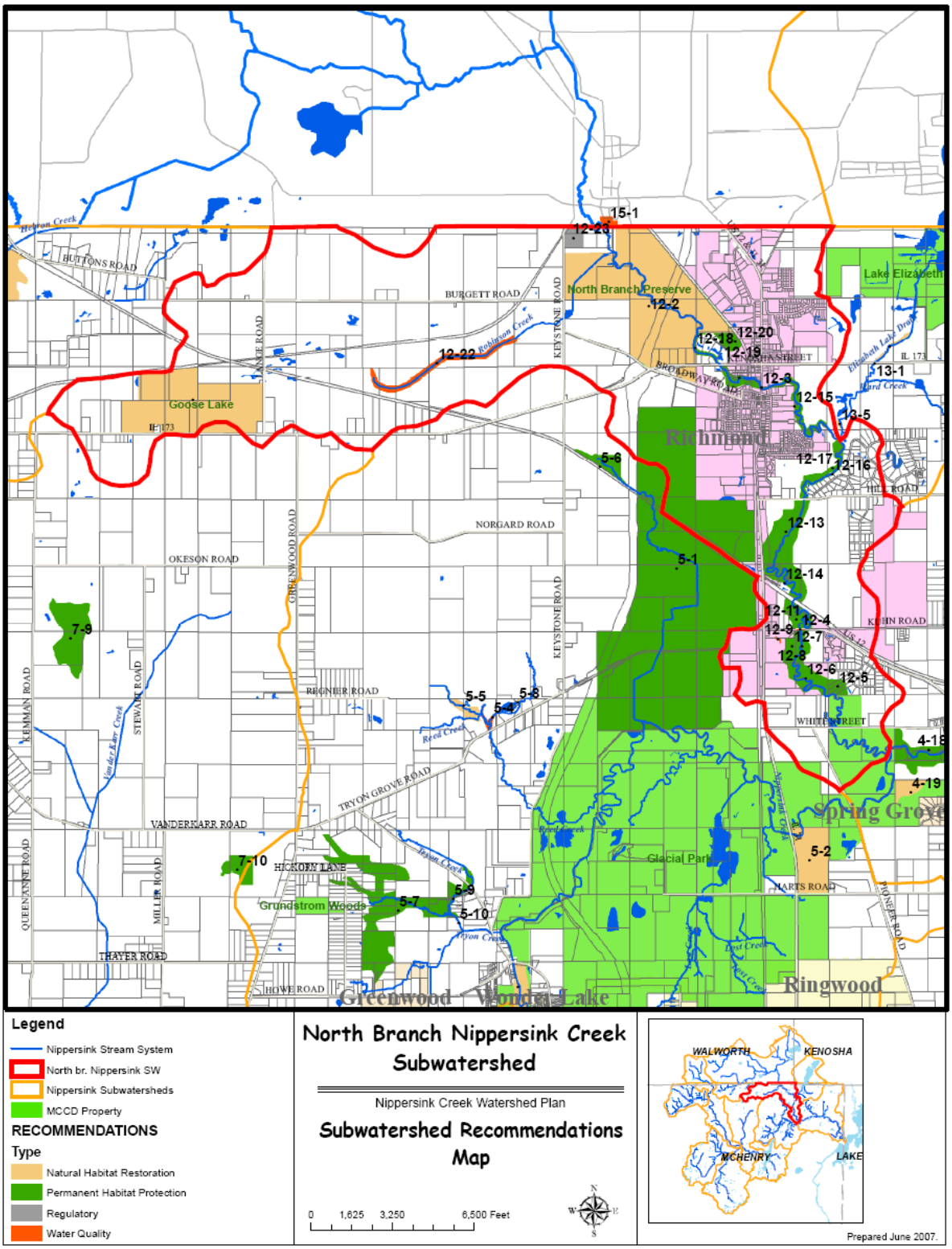


Table 13.13 BMP Selection & Associated Pollutant Load Reduction for the North Branch Nippersink Subwatershed

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	12-1, 12-2	203	acres	30%	35%	60%	1,083	90	103	4.5	5.3	9
Permanent Habitat Protection	Site-specific	12-5 to 12-8, 12-10 to 12-21	707	acres	53%	51%	88%	6,662	457	526	27.7	26.7	46.1
Point Source Control/Monitoring	Site-specific	12-9	1	lump sum	0%	0%	0%	0	0	0	0	0	0
Regulatory*	Watershed-Specific	Subwatershed	1	Water-shed	5%	5%	5%	1,201	86	57	5	5	5
Nutrient Management	Watershed-specific	Subwatershed wide	216	acres	70%	28%	-	2,688	77	-	11.2	4.5	-
Review Fish Hatchery Non native Species Policy	Site-specific	12-23	1	lump sum	0%	0%	0%	0	0	0	0	0	0
Stormwater BMPs	Site-specific	12-3, 12-4	6	acres	36%	95%	95%	38	7	5	0.2	0.4	0.4
Stream Buffers	Site-specific	12-15, 12-17, 12-22	20	acres	36%	95%	95%	128	24	16	0.5	1.4	1.4
Wetland Restoration	Site-specific	12-1	14	acres	53%	51%	88%	132	9	10	0.5	0.5	0.9
Total								11,932	750	718	49.7	43.8	62.8

*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 13.14 Recommended Projects in the North Branch Nippersink Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
North Branch	12-1	Natural Habitat Restoration	**MCCD Goose Lake** Purchase adjacent parcels to facilitate drain tile removal; add douser valve to lake tile system; prairie/wetland restoration on 460 acres	MCCD	268.9	$2,000	$537,820			A
North Branch	12-2	Natural Habitat Restoration	**MCCD Goose Lake** Purchase adjacent parcels to facilitate complete drain tile removal and subsequent fen restoration	MCCD	438.5	$2,000	$876,902			A
North Branch	12-3	Water Quality	Government Outreach to install Stormwater BMP's to treat roadway runoff prior to discharge into North Branch Nippersink Creek	NCWPC / MCDOT / IDOT			$50,000	$1,000	$2,500	E
North Branch	12-4	Water Quality	Government Outreach to install Stormwater BMP's to treat roadway runoff prior to discharge into North Branch Nippersink Creek	NCWPC / MCDOT / IDOT			$50,000	$1,000	$2,500	E
North Branch	12-5	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	9.9	$1,500	$14,910	$500	$994	C
North Branch	12-6	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	30.2	$1,500	$45,347	$1,000	$3,023	C
North Branch	12-7	Permanent Habitat Protection	Encourage Village of Richmond to actively manage High Quality ADID wetland on vllage parcel	NCWPC / VILLAGE OF RICHMOND / TLC	15.6	$500	$7,819	$1,000	$1,564	D

Table 13.14 Recommended Projects in the North Branch Nippersink Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY	
North Branch	12-8	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	8.6	$1,500	$12,954	$500	$864	C	
North Branch	12-9	Water Quality	Investigate possible dump site and potential for runoff / groundwater contamination to North Branch Nippersink Creek	IEPA / MCHD				$1,000		F	
North Branch	12-10	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	4.0	$1,500	$5,955	$500	$397	C	
North Branch	12-11	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	6.9	$1,500	$10,385	$500	$692	C	
North Branch	12-12	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	8.6	$1,500	$12,917	$500	$861	C	
North Branch	12-13	Permanent Habitat Protection	Require Conservation Design practices for future development planned on this parcel, which contains substantial high quality ADID wetlands	NCWPC / VILLAGE OF RICHMOND / TLC	59.8	$500	$29,906	$1,000	$1,495	B	
North Branch	12-14	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	34.7	$1,500	$52,055	$1,000	$3,470	C	
North Branch	12-15	Permanent Habitat Protection	Landowner / Government Outreach to re-establish Stream Buffer, create Conservation Easement	NCWPC / VILLAGE OF RICHMOND / TLC	25.1	$1,500	$37,707	$1,000	$2,514	D	
North Branch	12-16	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	5.2	$1,500	$7,752	$500	$517	C	

Table 13.14 Recommended Projects in the North Branch Nippersink Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY	
North Branch	12-17	Permanent Habitat Protection	Landowner / Government Outreach to re-establish Stream Buffer, create Conservation Easement, Conservation Design on future development	NCWPC / VILLAGE OF RICHMOND / TLC	14.4	$1,500	$21,609	$500	$1,441	D
North Branch	12-18	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	6.1	$1,500	$9,188	$500	$153	C
North Branch	12-19	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	6.2	$1,500	$9,252	$500	$617	C
North Branch	12-20	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	6.6	$1,500	$9,950	$500	$663	C
North Branch	12-21	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Quality ADID Wetland	NCWPC / TLC / MCDEF	14.7	$1,500	$22,077	$500	$1,472	C
North Branch	12-22	Water Quality	Landowner Outreach to expand Stream Buffer zone along stream corridor to mitigate impacts of row-crop agriculture	NCWPC / NRCS / SWCD	39.1	$1,500	$58,706	$1,000	$3,914	D
North Branch	12-23	Regulatory	Landowner Outreach to private fish hatchery's management plan to prevent non-native fish / plants from entering the stream system	NCWPC				$5,000		G
				SW TOTALS	**1,003.3**		**$1,883,207**	**$19,500**	**$29,650**	

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