Chapter 9
Silver Creek Subwatershed Assessment

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

9.1 Subwatershed Characteristics

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

9.1.1 Subwatershed Location

The Silver Creek Subwatershed has a drainage area of 12,010 acres (18.8 square miles), and is located in the southwestern portion of the Nippersink Creek Watershed, as shown in Figure 9.1. The subwatershed is located principally in southwestern Greenwood Township and northwestern Dorr Township. The headwaters of the subwatershed are located in the urbanized southeastern portion of the City of Woodstock. From there, Silver Creek flows northwest through Duffield Pond, the McHenry County Fair Grounds, and across northern Woodstock. After flowing through a large complex of wetlands and cropland north of Woodstock, Silver Creek becomes tributary to Slough Creek between Queen Anne Road and Raycraft Road, about 3/4 mile south of Allendale Road.

Figure 9.1

Silver Creek Subwatershed Location Map

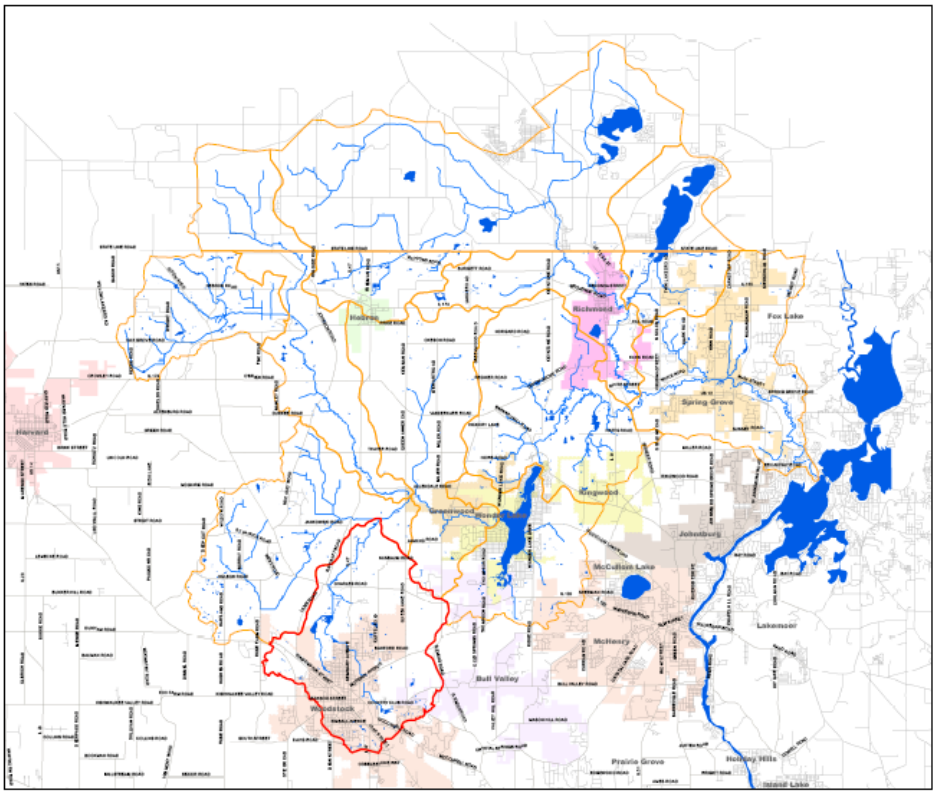
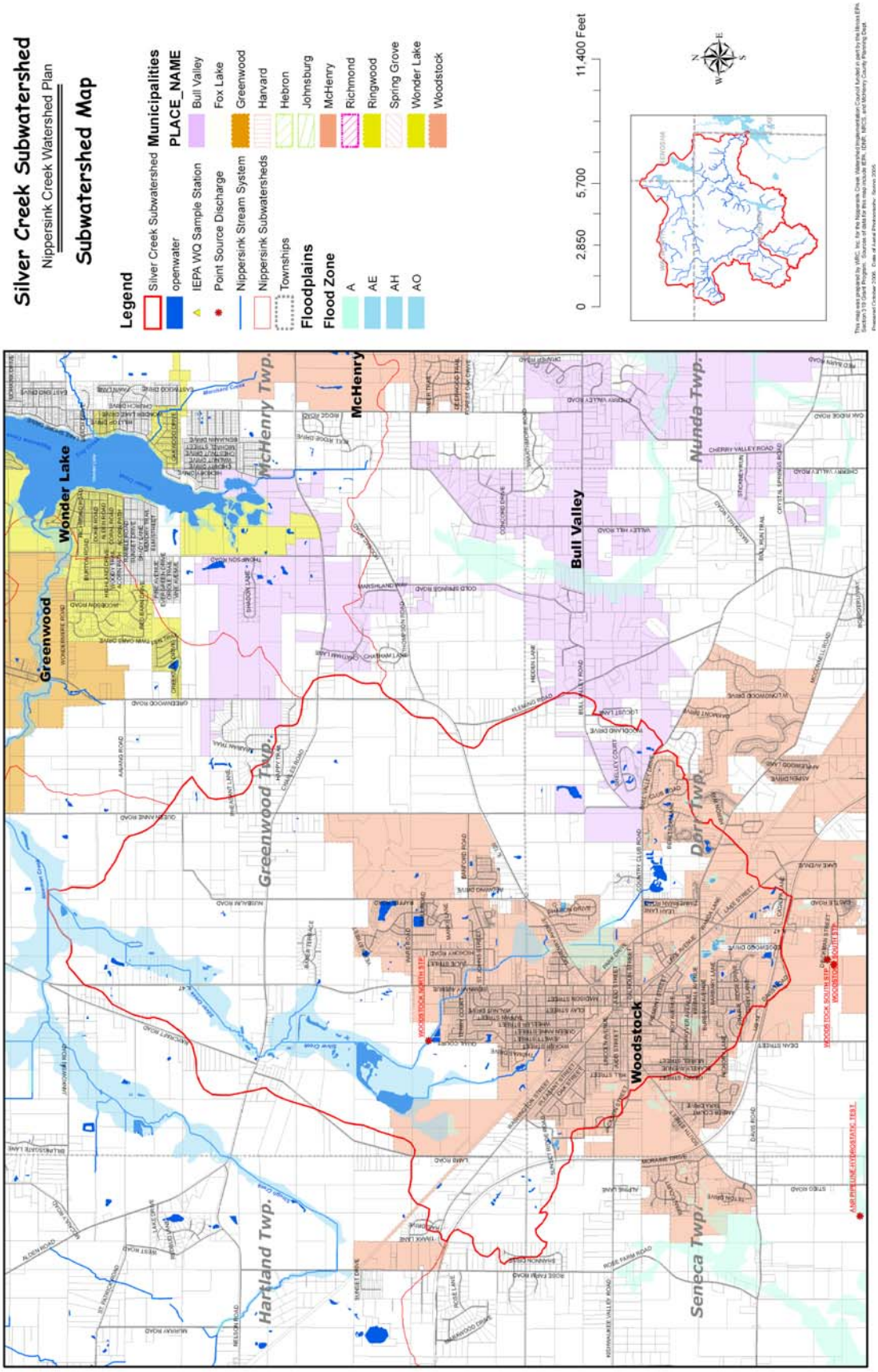


Figure 9.2 Silver Creek Subwatershed Map



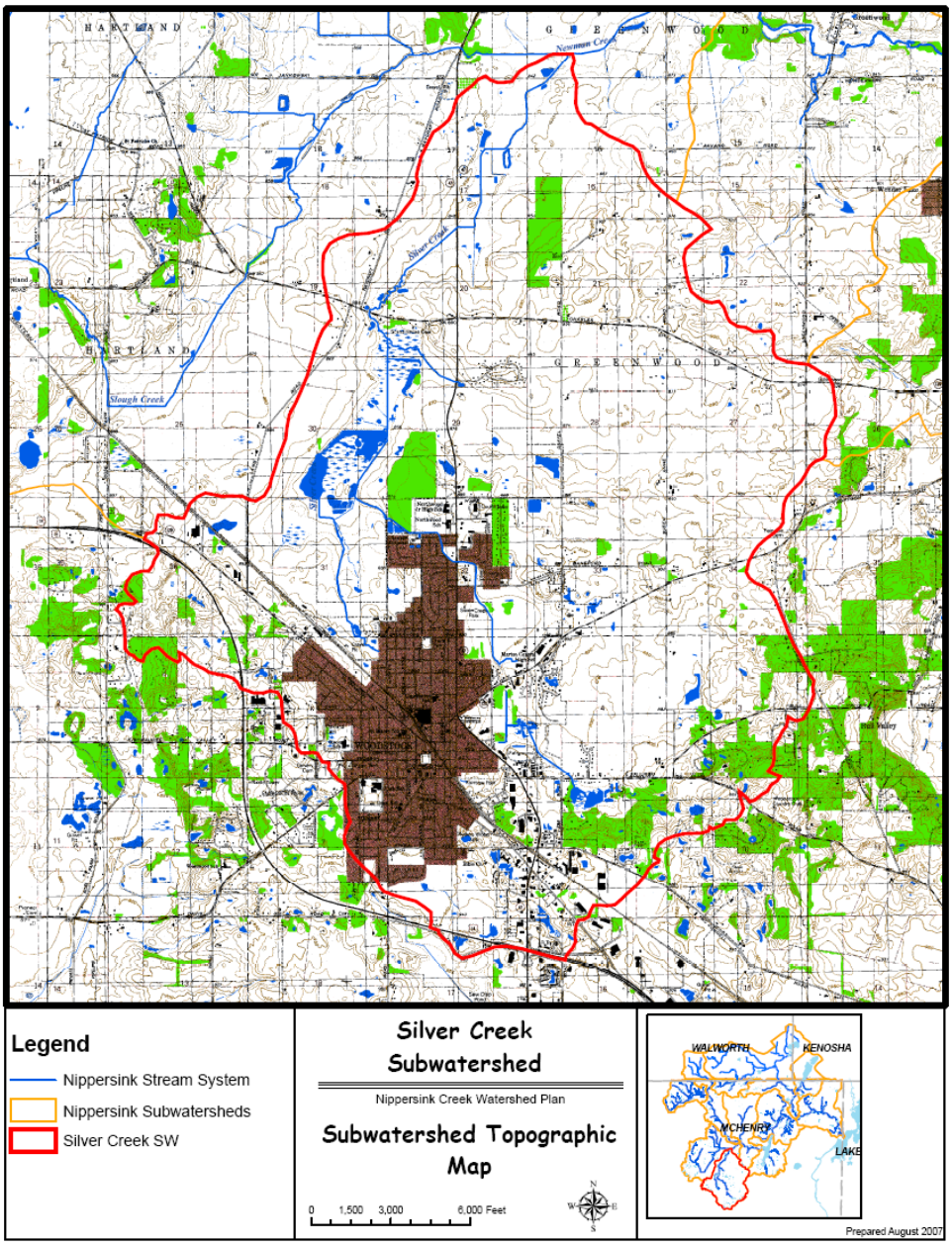
9.1.2 Topography & Geology

The topography of the subwatershed features a highly glaciated landscape, with the southern half of the subwatershed boundary sharing drainage divides with Boone Creek to the southeast, and the North Branch Kishwaukee River to the southwest.

Within the subwatershed, the high terrain and steeper slopes (3% - 5%) found along the southwest, southern and southeast drainage divide boundaries slope away to the north. The northern portion of the subwatershed features somewhat flatter slopes, where the subwatershed shares watershed boundaries with Slough Creek to the northwest and Nippersink Creek to the northeast. The maximum elevation in the subwatershed is around 990′ feet above MSL near the southern end and the minimum elevation is 836′ at the subwatershed outlet just west of Queen Anne Road.

Figure 9.3

USGS Topographic Map of the Silver Creek Subwatershed

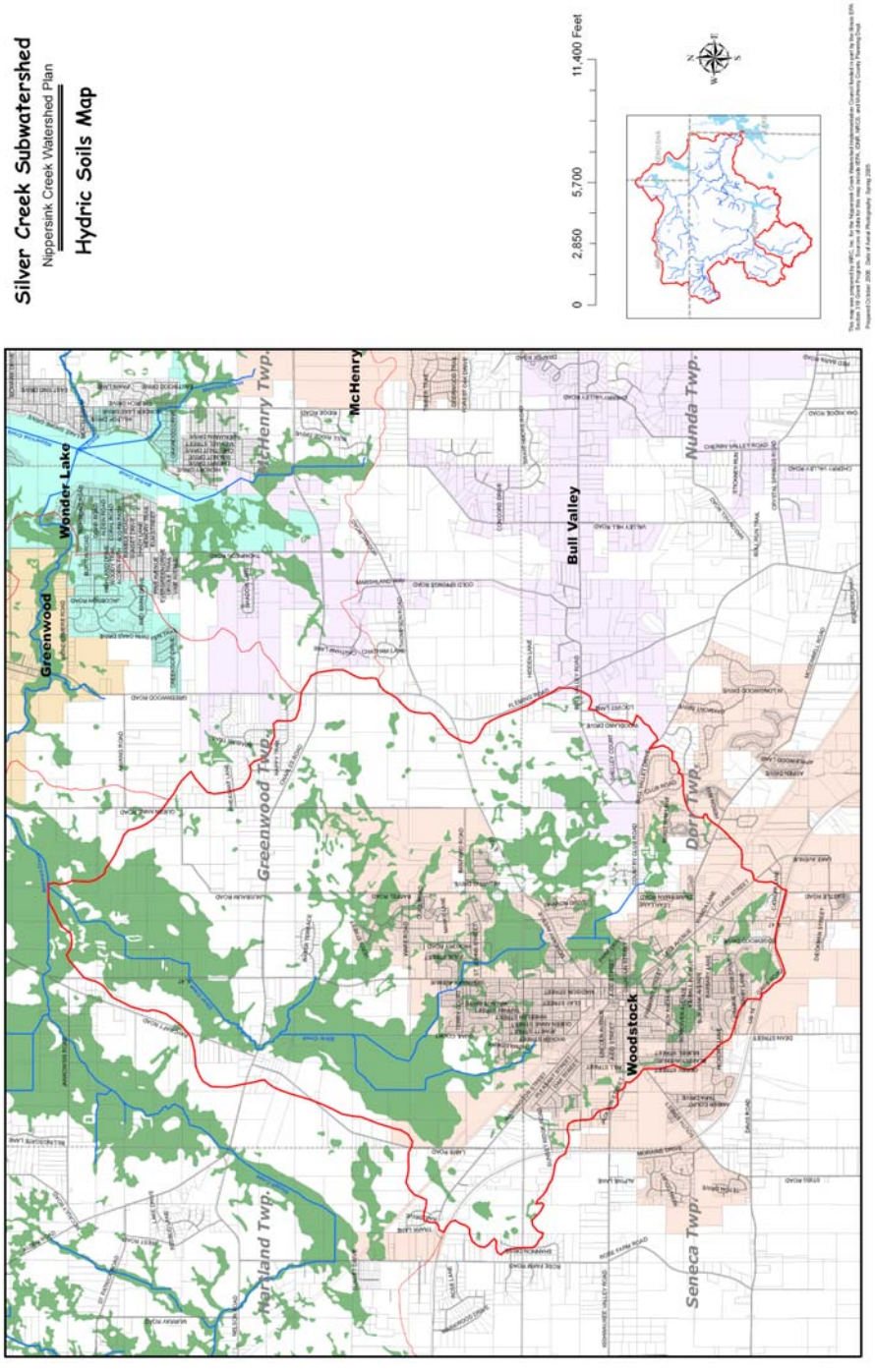


9.1.3 Soil Characteristics

The soils in the subwatershed, as depicted in Figure 9.4, consist of mostly silty and silty loam soil units on 2% - 4% slopes. 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 3,387 acres, or 28% of the 12,010 acre subwatershed, and indicate those areas that contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

Figure 9.4

Hydric Soils Map of the Silver Creek Subwatershed



9.1.4 Pre-settlement Vegetation

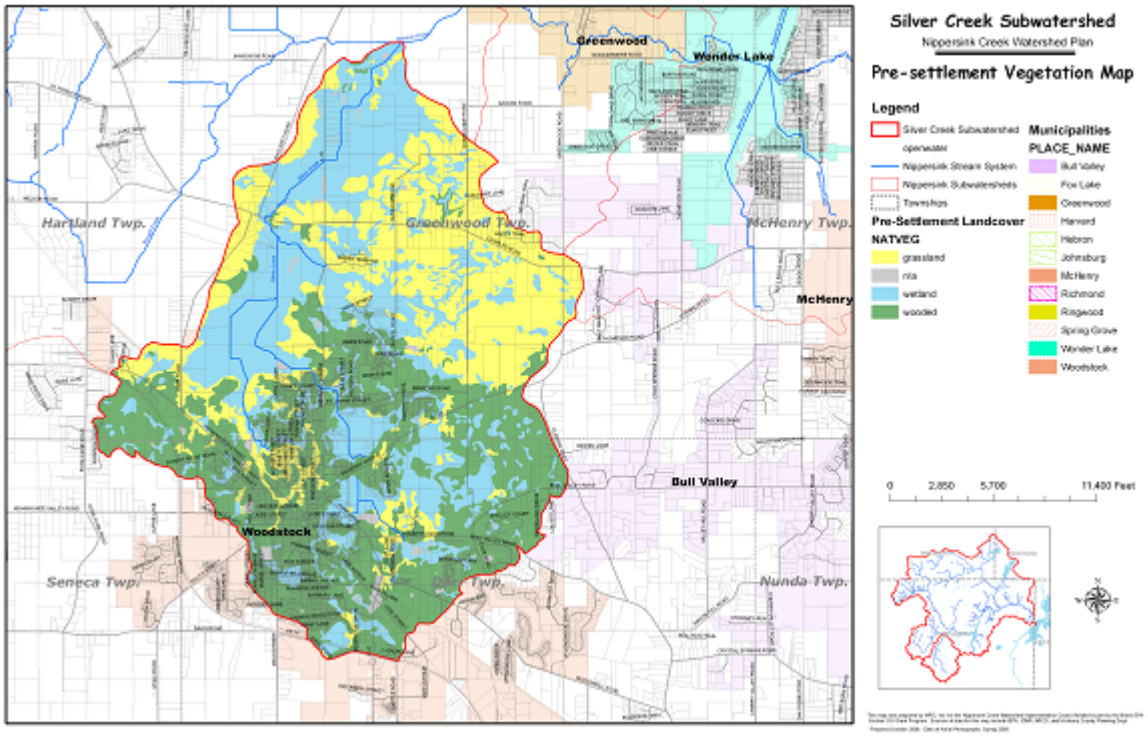
Prior to European settlement in the 1830's, the Silver Creek Subwatershed was fairly evenly divided between grasslands, woodlands, and wetlands. As described in Table 9.1, and depicted in Figure 9.5, woodlands dominated the southern half; wetlands the northwestern portion, and prairie the northeastern portion.

Table 9.1 Pre-Settlement Land Cover Conditions of the Silver Creek Subwatershed

Land Cover Type	Area (acres)	Percent of Subwatershed
Grasslands	3,430 acres	29%
Wooded	4,460 acres	37%
Wetlands	3,978 acres	33%
n/a	141 acres	1%

Source: MCCD Soils Analysis using GIS data

Figure 9.5 Pre-settlement Vegetation of the Silver Creek Subwatershed



9.1.5 Subwatershed Drainage Features

Streams

Silver Creek is the principal stream in the Silver Creek Subwatershed. The main branch of Silver Creek originates near Wicker Street and Donovan Street on the northeast side of Woodstock. Silver Creek flows north through a tree nursery and into Silver Creek Marsh. From there, it flows north under Charles Road, and through low-lying areas that parallel the east side of Raycraft Road Silver Creek. It then flows into Slough Creek about one mile east of the intersection of Illinois Route 47 and Raycraft Road.

There are two tributary streams in the subwatershed. The largest tributary is the East Branch Silver Creek (EBSC), which has its origins near Country Club Road and Zimmerman Road. The EBSC tributary is perhaps the most heavily urbanized and impacted stream in the entire Nippersink Creek Watershed. Channelized for nearly all of its length, the East Branch Silver Creek stream corridor is dominated by residential and other urban land uses, and is generally bordered by a narrow, yet thick dense growth of invasive and low quality trees and shrubs, such as Box Elder, Buckthorn, and Honeysuckle.

The second Silver Creek tributary is a short ephemeral stream that originates from a small, private recreational pond at Illinois Route 47 and Cooney Drive, and flows for less than a mile northwest to its confluence with Silver Creek at the north end of the Silver Creek Marsh McHenry County Natural Areas Inventory (MCNAI) site.

Channelization Analysis of aerial photography indicates that Silver Creek has historically been subjected to extensive channelization. Of the 10.44 miles of stream channels in the subwatershed, about 87% have been ditched and channelized to provide improved agricultural drainage relief. The only significant reach of Silver Creek that is not channelized is located immediately upstream and downstream of Charles Road.

Stream Channel Condition There is no documented information regarding the stream condition of Silver Creek or its tributaries. Most of the stream reaches are unmanaged and confined within a corridor of herbaceous grasses or low quality deciduous trees. The stream corridor is often extremely narrow (< 100 feet) in the urbanized upstream portion and through parcels that are used exclusively for row crop agriculture. The corridor widens to 200 to 400 feet wide near Charles Road. Through Silver Creek Marsh, the natural corridor widens to the limits of the wetland ranging from 500 to more than 2,000 feet.

Impoundments There may be as many as three on-line dams on Silver Creek; all of which are within the Silver Creek Marsh. Two appear to be beaver dams, and one may be the remnants of an older, manmade structure built to raise the water level in the marsh.

There are 148 impoundments (ponds, lakes, or wet bottom stormwater facilities) within the subwatershed, ranging in size from less than a 1/10th acre to more than 11 acres. About half of the impoundments appear to have been manmade ponds or small lakes constructed for recreation. Many of them may have been isolated wetland pockets that were excavated to create a permanent open water feature.

Manmade Drainage Systems

Although the City of Woodstock and Village of Bull Valley did not provide storm sewer infrastructure data or maps, there is no doubt an extensive network of storm sewers in the Woodstock portion of the subwatershed. The Village of Bull Valley, with its largely rural residential land uses, does not appear to have a significant network of storm sewers. Given the higher density developments within the City of Woodstock, there are an estimated 3,100 acres of developed land that is drained via storm sewers. A limited field investigation revealed that this stormwater drainage system consists of catch basins, inlets, small diameter pipe, and about a dozen stormwater detention basins. There do not appear to be any type of water quality treatment devices in place, which is not surprising given much of the area developed before the onset of stormwater detention or water quality regulations.

Agricultural Tile Systems

There are likely extensive underground drain tile systems in the northern and western portions of the subwatershed, as these areas are largely agricultural in use. These systems, installed to remove excess soil moisture to increase the productivity of the regions rich soils, were likely installed over the last century by private property owners. Therefore, little documented information is available about their size and exact location, although their probable distribution and occurrence can be roughly 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. These are likely present on the many farmed parcels that are adjacent to the tributary streams, particularly in the northern portion of the subwatershed.

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. Many of the depressional and low lying areas in the subwatershed that are serviced by agricultural drain tiles today were likely once wetland habitats that supported a very diverse ecosystem.

Floodplains

The 100-year Floodplain for Silver Creek and East Branch Silver Creek was calculated and mapped during the 1980s. The regulatory floodway has also been determined for both streams, although, as with the floodplain, the detailed mapping stops short of the entire stream lengths. In the case of the East Branch Silver Creek (EBSC), the mapping of regulatory floodplain and floodway was terminated just north of McHenry Avenue (Illinois Route 120), even though the stream system continues upstream for another mile through a heavily developed landscape.

9.1.6 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. Using US Census data compiled by the Fox River Study Group for the Nippersink Creek subwatershed, past population data are available for the Silver Creek Subwatershed. This data indicated that in 1990 about 13,925 people lived in the subwatershed, which equated to 748 persons per square mile. According to the 2000 US Census, the population increased to 17,527 people, or about 941 persons per square mile. This represents an increase of about 26% in 10 years.

9.1.7 Land Cover

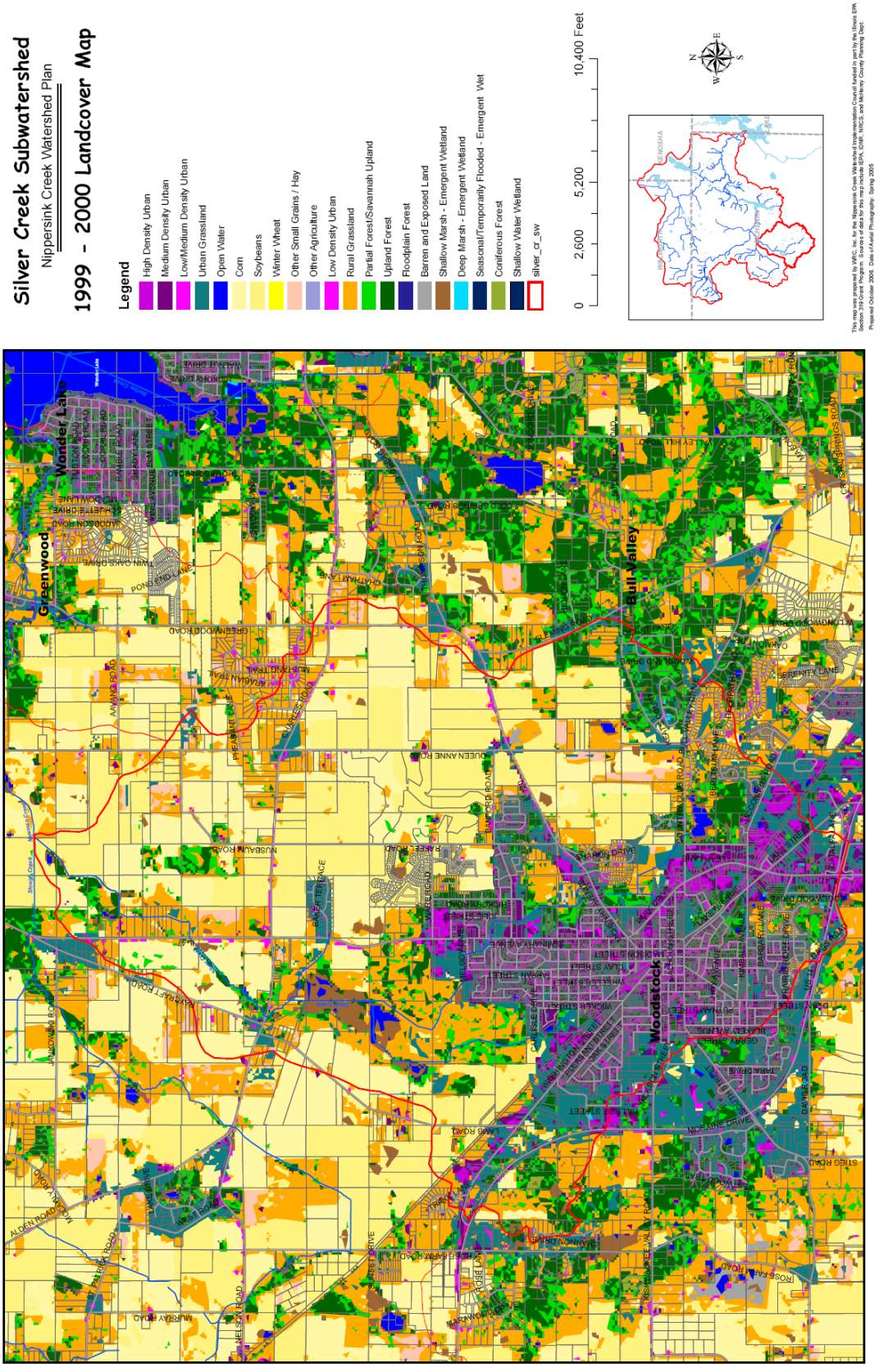
Often, the terms Land Cover and Land Use are used interchangeably. However, there are differences. Land Cover refers to the vegetation, structures, or other features that cover the land. On the other hand, Land Use (as discussed in Section 9.1.8) refers to how land is used by humans.

Land cover data for the Silver Creek Subwatershed are available from the Illinois Department of Natural Resources using LANDSAT data collected between 1998 – 1999. The dominant land cover, according to the 1999-2000 data, was row crop agriculture, which accounted for roughly 39% of the subwatershed area. Rural grasslands accounted for another 19%, while wooded areas and wetlands account for an additional 14% of the subwatershed. These three land cover categories account for 72% of the subwatershed, with the remaining 28% comprised of urban land cover.

Table 9.2 1999 Land Cover for the Silver Creek Subwatershed

Land Cover Description	Total Acres	Percent of Subwatershed
Barren & Exposed Land	8.4	0.1%
Corn, Soybeans, Other Small Grains & Hay	4,644.8	38.7%
Winter Wheat	0	0.0%
Rural Grassland	2,286.9	19.0%
Low Density Urban	457.7	3.8%
Medium Density Urban	1012.0	8.4%
High Density Urban	337.6	2.8%
Urban Grassland	1,466.8	12.2%
Shallow Marsh – Emergent Wetland	266.1	2.2%
Partial Forest / Savannah Upland	543.6	4.5%
Upland Forest	889.5	7.4%
Floodplain Forest	18.2	0.2%
Coniferous Forest	7.4	0.1%
Deep Marsh / Emergent Wetland	5.9	0.0%
Open Water	59.9	0.5%
TOTAL	**12,004.8**	**100.0%**

Figure 9.6 **1999-2000 Land Cover Map for the Silver Creek Subwatershed**



9.1.8 Land Use / Existing Watershed Development

According to the 2005 McHenry County Land Use / Zoning map, 53% of the subwatershed is zoned for agricultural use, while about 42% is either already developed or zoned for development in the future. Only 5% is classified as open space.

Table 9.3 McHenry County 2005 Land Use in Silver Creek Subwatershed

Land Use	Total Acres	Percent of Subwatershed
Vacant	21	0.2%
Vacant; Zoned Residential	697.3	5.8%
Vacant; Zoned Commercial	91.1	0.8%
Vacant; Zoned Office	0.25	0.0%
Vacant; Zoned Industrial	83.2	0.7%
Agricultural	6,398.0	53.3%
Single Family Residential	2,181.5	18.2%
Multi-Family Residential	134.5	1.1%
Commercial	280.9	2.3%
Office	12.9	0.1%
Industrial	225.9	1.9%
Mixed Use	3.0	0.0%
Mining	0	0.0%
Open Space	567.5	4.7%
Institutional	455.7	3.8%
Right of Way	857.5	7.1%
TOTAL	**12,010.3**	**100.0%**

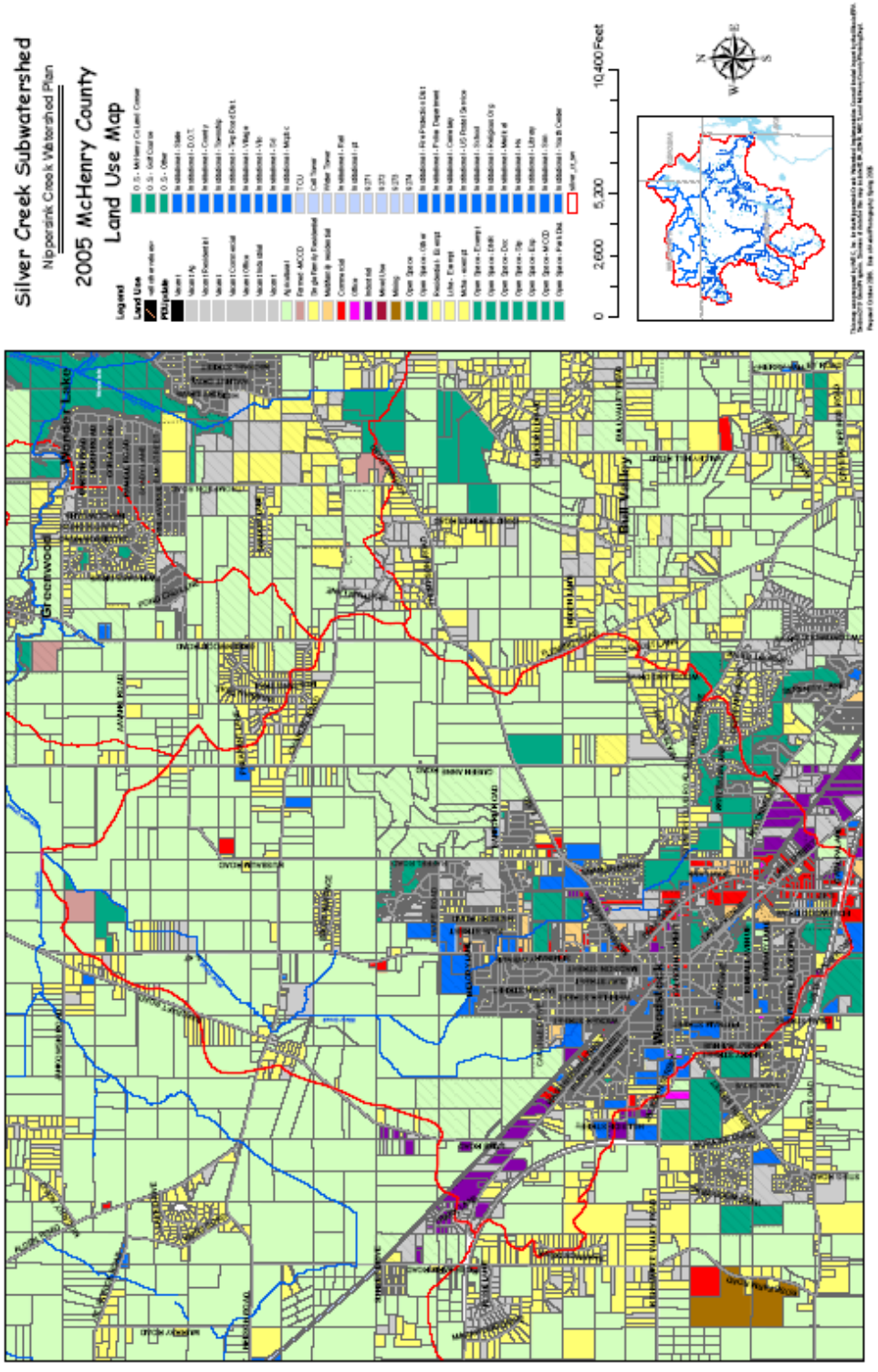
Source: 2005 McHenry County Land Use Zoning Data for Silver Creek Subwatershed

Developed land accounted for about 28% of the subwatershed, consisting mostly of medium density urban lands and adjacent urban grasslands (lawns). Roughly 40% of the subwatershed was classified as being located within municipal boundaries in 2005.

Table 9.4 Municipal Areas in the Silver Creek Subwatershed

Municipality	Area (acres)	Percent
Village of Bull Valley	309	2.6%
Village of Woodstock	4,457	37.1%
Unincorporated	7,244	60.3%

Figure 9.7 McHenry County 2005 Land Use in Silver Creek Subwatershed



Permit Point Source Discharges There is one permitted point source discharge in the subwatershed. According to the Illinois IEPA NPDES database, the Woodstock North Waste Water Treatment Plan holds a NPDES permit (# IL0031861) to discharge up to 3,000,000 gallons per day of effluent into the East Branch of Silver Creek near Illinois Route 47 and Melody Lane.

Road Network An analysis of GIS roadway data indicates that there are 105.7 miles of roads in the subwatershed. This represents approximately 359 acres of pavement.

9.1.9 Natural Resources

McHenry County Conservation District Property

The McHenry County Conservation District (MCCD) owns five natural area properties within the Silver Creek Subwatershed. These properties account for about 2% of the subwatershed area.

Table 9.5 MCCD Properties in the Silver Creek Subwatershed

Name	Area (acres)
Duffield Pond / McConnell Woods	77.8
Bystricky Prairie	100.9
Ryder's Woods Park	23.6
Silver Creek Park	64.2
Queen Anne Prairie Macrosite	0.7
Total	**267.2**

It should be noted that of the 723.3 acres of identified Natural Area Inventory Sites, only the Bystricky Prairie and Queen Anne Road Prairie sites are protected through ownership by the MCCD. These protected properties represent only about 15% of NAI sites in the subwatershed. Bystricky Prairie is also protected through its designation as an Illinois Nature Preserve.

McHenry County Natural Areas Inventory

There are five McHenry County Natural Area Inventory (MCNAI) Sites within the subwatershed, representing nearly about 6.0% of the subwatershed area.

Table 9.6 McHenry County Natural Areas Inventory Sites in the Silver Creek Subwatershed

MCNAI Site ID #	Name	Area (acres)
DOR02	Bull Valley Golf Course Wetlands	69.4
DOR06	Woodstock Marsh	29.2
GRE03	Bystricky Prairie	18.2
GRE06	Queen Anne Prairie	0.7
GRE07	Silver Creek Marsh	605.8
	Total	**723.3**

These MCNAI sites contain several significant natural features, including a graminoid fen, basin marshes, sedge meadows, wet silt loam prairies, mesic silt loam prairies, wet mesic silt loam woodland, and a streamside marsh.

Wetlands

McHenry County completed an Advanced Identification (ADID) Wetland Study in 1998. This study identified a total of 1,251.8 acres of wetlands, or 10.4 % of the subwatershed. Of these wetlands 1,129 acres (90%) were determined to be of High Quality or High Functional Value, rating an ADID classification.

Table 9.7 Mapped Wetlands in the Silver Creek Subwatershed

ADID Code	Wetland Type	# of Wetlands	Total Area
FW	Farmed Wetlands	35	76.7
HFVW	High Functional Value Wetlands	13	463.8
HQL	High Quality Lakes	0	0
HQW	High Quality Wetlands	4	666.6
L	Lakes	0	0
W	Other Wetlands (lower quality)	77	121.4
	TOTAL	**129**	**1,251.8**

The most significant wetland in the subwatershed is the 603 acre high quality wetland found within the Silver Creek Marsh (MCNAI GRE07). Currently considered a high-quality wetland complex, this wetland is threatened by invasive species intrusion (Reed Canary Grass, Cattails), artificially manipulated water levels, siltation, and encroachment by development.

Threatened & Endangered Species

The McHenry County Natural Area Inventory (MCNAI) database has identified several threatened or endangered (T&E) species of plants and animals that inhabit the remaining subwatershed natural areas. They are listed below:

Table 9.8 Threatened and Endangered Species in the Silver Creek Subwatershed

Common Name	Scientific Name	Type	Status	MCNAI Site
White Lady's Slipper	Cypripedium candidum	Plant	St Threatened	GRE03
Small Yellow Lady's Slipper	Cypripedium parviflorum makasin	Plant	St Endangered	GRE03
Common Moorhen	Gallinula chloropus	Bird	St Threatened	DOR02
Yellow-Headed Blackbird	Xanthocephalus xanthocephalus	Bird	St Endangered	DOR02

Existing Greenways

There are no formal greenways established in the subwatershed, although the City of Woodstock has identified a greenway element in its 2002 Comprehensive Plan. This greenway element, referred to as "Resource Conservation" in the City's plan, calls for the protection of existing wetlands and stream corridors within the City's planning jurisdiction, including Silver Creek and East Branch Silver Creek.

9.2 Analysis of Subwatershed Data and Problem Identification

9.2.1 Water Quality Data & Identified Problems

The Illinois Environmental Protection Agency (IEPA) is the lead agency in Illinois that monitors and regulates water quality in our rivers, lakes, and streams.

The IEPA has determined that the designated uses for Nippersink Creek are to support:

- Aquatic Life
- Fish Consumption
- Primary Contact (swimming, etc.)
- Secondary Contact (canoeing, etc.)
- 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.

Unfortunately, Silver Creek and its tributaries were not assessed in this IEPA report, probably due to the fact that Silver Creek is a small tributary to the Nippersink, and the IEPA has very limited funds for their state-wide water quality monitoring program.

The Illinois Environmental Protection Agency does not maintain any water quality sampling stations on Silver Creek. Likewise, the Fox River Watershed Monitoring Network, administered by the not-for-profit Friends of the Fox River, also has not established any volunteer stream monitoring sites on Silver Creek as of 2006. However, it is presumed that the City of Woodstock collects water quality data along the East Branch Silver Creek as part of their use of the creek as a receiving water for their treated waste water effluent.

9.2.2 Flooding Problems

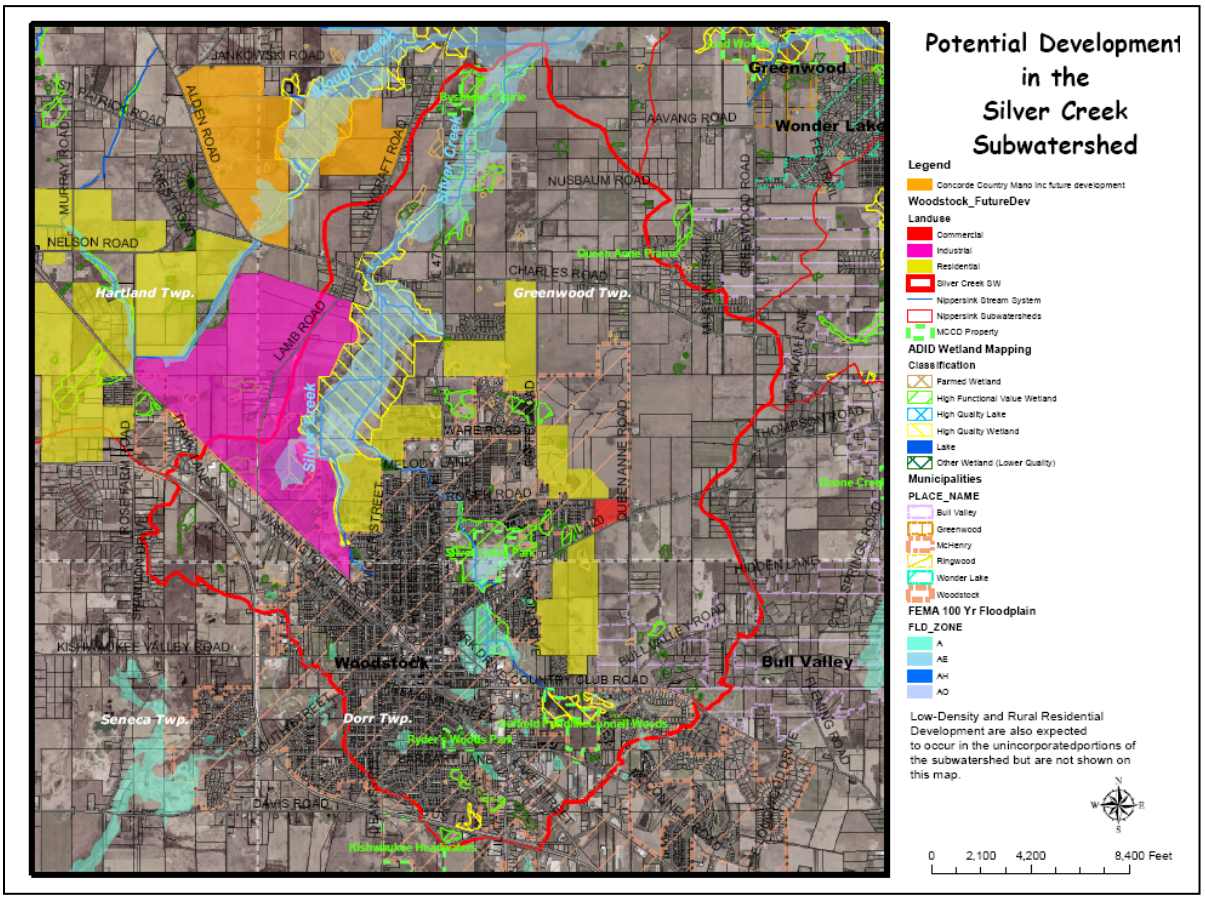
There are no known flooding problems in the subwatershed. The existing FEMA 100-year Floodplain Map suggests that there may be 8 to 10 structures (residential dwellings or non-residential buildings) in the 100-year floodplain, however, the horizontal boundaries shown on the floodplain maps may be inaccurate as the 100-year flood profiles have not been overlaid onto the County two-foot topographic mapping that is now available.

9.2.3 Projected Development & Growth

The Silver Creek Subwatershed probably faces more challenges in coping with future land use changes than any other subwatershed in the Nippersink Watershed. Development in this subwatershed will likely occur in the form of moderate to high density residential land uses, as well as commercial/office and industrial land uses. Most of the projected development will occur as part of annexation and expansion northward by the City of Woodstock. Analysis of their current Comprehensive Land Use Plan (5/7/2002) indicates that an additional 1,400+ acres of new development is expected. The City has also indicated that there are several developments being planned for future annexation that are outside of the current proposed planning area, as developers seek to develop their land using City sewer and water.

Therefore, if current plans hold true, the City of Woodstock will have jurisdiction over at least 50% of the land within the subwatershed. While the current stormwater ordinances will likely prevent significant encroachment into subwatershed sensitive natural areas, the current land development practices and stormwater management methods will probably create a significant increase in total stormwater runoff volume and a decrease in water quality in the streams.

Figure 9.8 Potential Development in the Silver Creek Subwatershed



9.2.4 Natural Area Protection / Preservation Issues

McHenry County Natural Area Inventory Sites

The Silver Creek Marsh McHenry County Natural Area Inventory (MCNAI GRE07) site is one of the largest wetland complexes in the entire watershed that is entirely in private ownership. This status, along with its close proximity to the City of Woodstock, ranks the Silver Creek Marsh MCNAI site highest on the list of watershed protection items for the Silver Creek Subwatershed. The MCCD has indicated that this wetland complex is threatened by invasive species intrusion (Reed Canary Grass, Cattails), and is being degraded due to the artificial water level alterations that have occurred. MCCD also indicated that the wetland will be threatened by the negative effects of new development, which is planned to encircle nearly the entire natural area.

Wetlands

In the subwatershed, only 1,250 acres of wetland remain, compared to an estimated 3,387 acres that existed before settlement. That means that roughly 63% of the wetlands have already been lost and can no longer provide their valuable functions. Therefore, it is critical that the remaining wetland resources in the subwatershed be protected and managed so that stakeholders can gain from benefits these wetlands provide.

There are four High Habitat Quality wetland complexes in the subwatershed, ranging in size from six acres to more than 600 acres. The two of the three smallest wetlands, ADID N961 and N909, are partially protected as significant portions of the wetlands are owned by the MCCD. Wetland N962 is a sedge meadow / fen that is located on the Bull Valley Golf Course Property. It is considered high quality but is suffering from encroachment activities and runoff from the golf course.

9.3 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 9.9

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 9.9 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 9.10 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 9.12 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 9.9 Silver Creek Subwatershed Site Recommendations Map

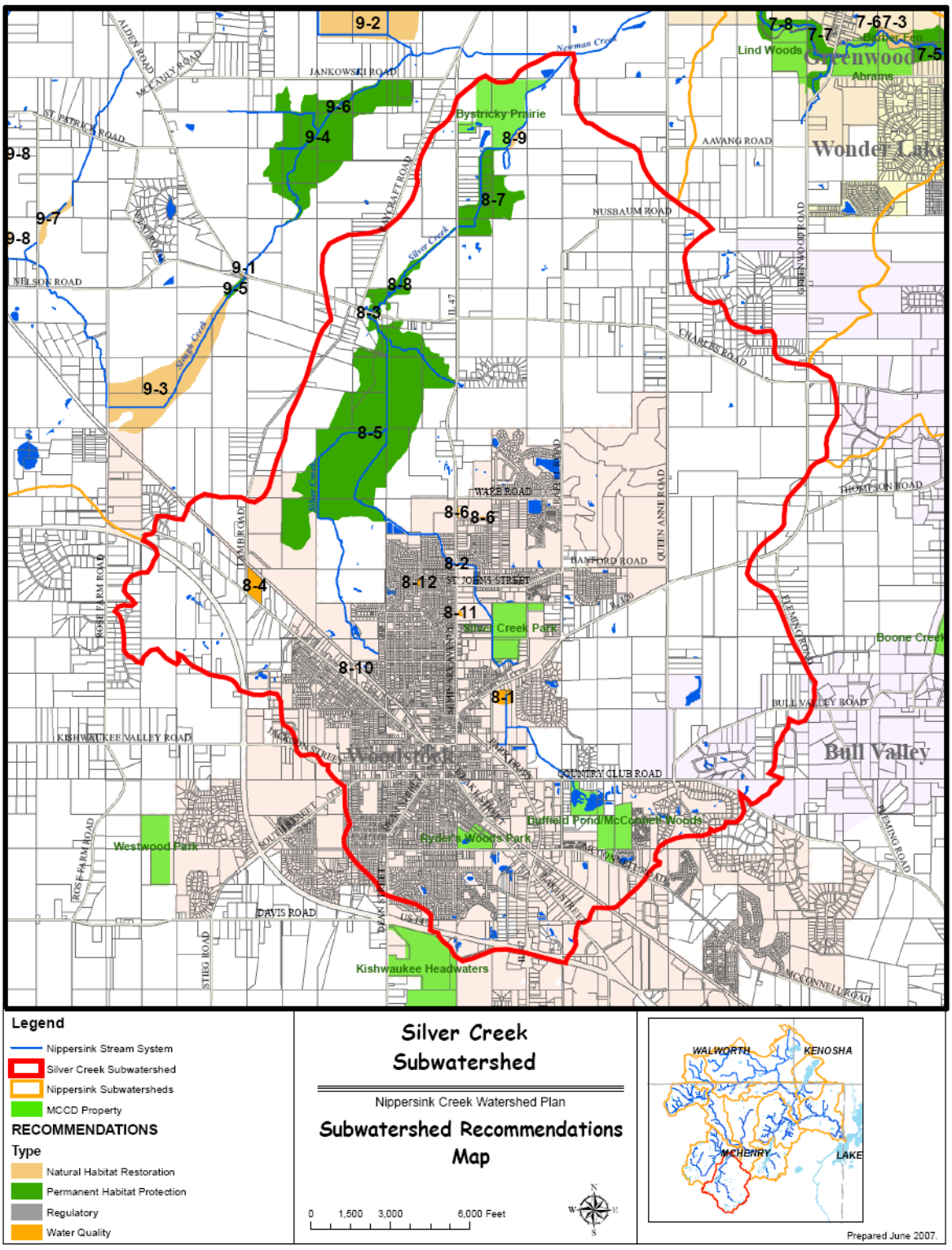


Table 9.9 BMP Selection & Associated Pollutant Load Reduction for the Silver Creek Subwatershed

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
Permanent Habitat Protection	SS	8-5, 8-7, 8-8	13	acres	53%	51%	88%	78%	120	6	8	322	0.3	0.3	0.5	0.4
Stream Buffers	SS	8-7, 8-9	94	acres	36%	95%	95%	75%	588	86	64	2,236	1.4	3.7	3.7	2.9
Stormwater BMPs	SS	8-1, 8-2, 8-3, 8-10	1	each	36%	95%	95%	75%	134	7	6	244	0.3	0.3	0.3	0.3
Point Source Control/Monitoring	SS	8-4	1	each	0%	0%	0%	0%	0	0	0	0	0	0	0	0
Detention Basin Retrofit	SS	8-6, 8-11, 8-12	94	acres	32%	55%	68%	71%	523	50	46	2,117	1.3	2.2	2.7	2.8
Nutrient Management	WS	Subwater-shed wide	1,201	acres	70%	28%	-	-	14,610	325	-	-	35	14	-	-
Regulatory	WS	Subwater-shed	1	Water-shed	5%	5%	5%	5%	2,086	116	86	3,807	5	5	5	5
Street Sweeping (Bi-weekly)	WS	City wide	106	curb miles	-	-	-	2%	-	-	-	228	-	-	-	0.3
Sand Filters	SS	8-1, 8-3, 8-6, 8-10, 8-11, 8-12	59	each	-	-	83%	37%	-	-	348	6,864	-	-	20.2	9
Pet Waste Management	WS	Subwater-shed wide	1	Water-shed	-	-	-	90%	-	-	-	3,285	-	-	-	4.3
Illicit Discharge Detection and Elimination	SS	Sewer & Stormwater Drainage system	1	Water-shed	3%	3%	3%	3%	1,252	70	52	2,284	3	3	3	3
Education and Outreach	WS	Residential areas	1	each	3%	3%	3%	3%	1,043	58	43	1,904	2.5	2.5	2.5	2.5
Total									20,356	719	653	23,290	48.8	31	37.9	30.6

*Regulatory programs are assumed to have nominal pollutant reduction rates of 5%; "Education and Outreach" programs are assumed to have 2.5%; Illicit discharge detection and elimination" programs

** 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 9.12 Recommended Projects in the Silver Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Silver Creek	8-1	Water Quality	Government Outreach to IInvestigate feasibility of reconfiguring stream to allow for construction of BMP basin or structural BMP device to treat runoff from industrial area with auto & materials storage along stream channel	NCWPC / CITY OF WOODSTOCK			$125,000	$1,000	$6,250	E
Silver Creek	8-2	Water Quality	Government Outreach to Install Stormwater BMP's (structural BMP device) where IL 47 crosses Silver Creek	NCWPC / CITY OF WOODSTOCK / IDOT			$75,000	$1,000	$2,500	E
Silver Creek	8-3	Water Quality	Government Outreach to install BMP's to treat roadway runoff at Charles Road prior to discharge into Silver Creek	NCWPC / MCHENRY DOT			$50,000	$1,000	$2,500	E
Silver Creek	8-4	Water Quality	Agency Outreach to monitor water quality of runoff from auto junkyard at Lamb Road and Washington Street; flows under railroad NE to Silver Creek Marsh MCNAI Site; determine feasibility of structural BMP for urban pollutant removal	CITY OF WOODSTOCK / MCHENRY COUNTY HEALTH DEPARTMENT / IEPA			$2,500	$500		F
Silver Creek	8-5	Permanent Habitat Protection	Government Outreach to protect high quality ADID Wetland N766 from future land development; Investigate feasibility of reconfiguring channel to increase pollutant removal efficiency	NCWPC / MCHENRY COUNTY	549.7	$2,500	$1,374,368	$2,000	$13,744	D
Silver Creek	8-6	Water Quality	Government Outreach to retrofit dry bottom detention basin at McHenry County Government Center - West Basin	NCWPC / MCHENRY COUNTY			$17,500	$750	$2,000	E
Silver Creek	8-6	Water Quality	Government Outreach to retrofit dry bottom detention basin at McHenry County Government Center - Southeast Basin	NCWPC / MCHENRY COUNTY			$17,500	$750	$2,000	E
Silver Creek	8-7	Permanent Habitat Protection	Landowner Outreach to create Conservation Easement to protect High Functional Value ADID Wetland;	NCWPC / TLC / MCDEF	90.8	$1,500	$136,259	$1,000	$9,084	C

Table 9.12 Recommended Projects in the Silver Creek Subwatershed

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Silver Creek	8-8	Permanent Habitat Protection	Landowner Outreach to protect high quality ADID Wetland N766 north of Charles Rd. Develop & help landowners implement management plan	NCWPC / TLC / MCDEF	34.8	$2,000	$69,652	$1,000	$3,483	C
Silver Creek	8-9	Natural Habitat Restoration	Landowner Outreach to expand natural Stream Buffer to minimum 100 ft with on agricultural parcel east of Bystricky Prairie	NRCS / SWCD	2.9	$3,000	$8,649	$500	$288	D
Silver Creek	8-10	Water Quality	Landowner / Government Outreach to determine feasibility of installing BMP basin or structural BMP device to treat runoff from industrial storage site at end of Elm Lane just upstream of railroad culvert	NCWPC / MCHENRY COUNTY			$25,000	$500	$1,000	E
Silver Creek	8-11	Water Quality	Landowner / Government Outreach to retrofit existing dry bottom detention basin with native vegetation and minor regrading to increase pollutant removal	NCWPC / MCHENRY COUNTY			$15,000	$750	$1,000	E
Silver Creek	8-12	Water Quality	Landowner / Government Outreach to retrofit existing dry bottom detention basin at Tappan Street and Ash Avenue with native vegetation and minor regrading to increase pollutant removal	NCWPC / CITY OF WOODSTOCK / MEADOWS OF WOODSTOCK HOA			$15,000	$750	$1,500	E
				SW TOTALS	**678.3**		**1,931,427.0**	**11,500.0**	**45,348.5**	

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**