

Chapter 16

Wisconsin Subwatersheds

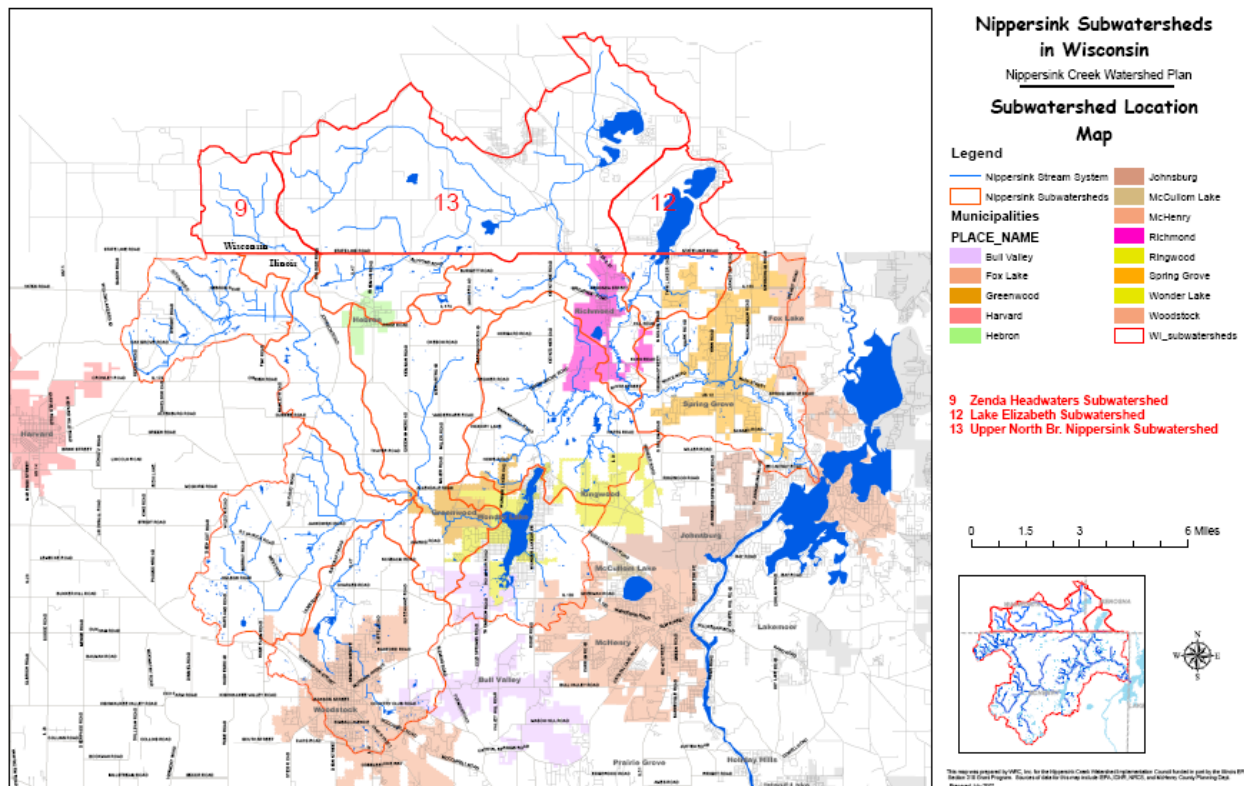
This section presents a summary of the characteristics of the Wisconsin Subwatersheds, as well as specific issues and challenges in these subwatersheds that must be addressed in the Nippersink Creek Watershed Plan, or in future planning efforts conducted on both sides of the Illinois – Wisconsin line.

16.1 Subwatershed Location

Approximately 34,400 acres (53 square miles) of the Nippersink Creek Watershed lie within the State of Wisconsin, as shown in Figure 16.1. This area comprises three separate subwatersheds, including Zenda Headwaters, Upper North Branch Nippersink, and Elizabeth Lake.

The Wisconsin Subwatersheds are located within Linn and Bloomfield Townships of Walworth County, and Randall Township of Kenosha County.

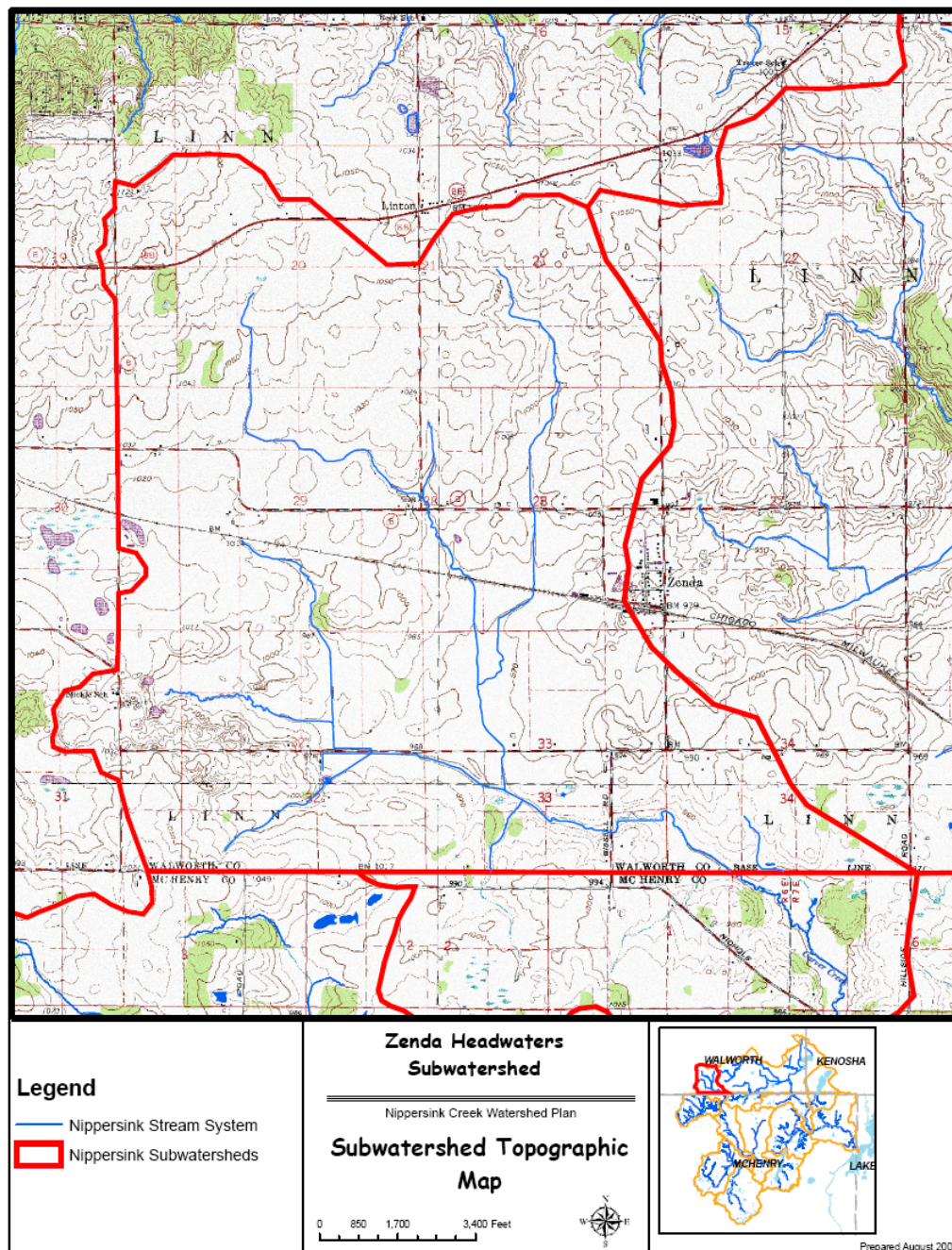
Figure 16.1 Location of Wisconsin Subwatersheds



16.1.1 Zenda Headwaters

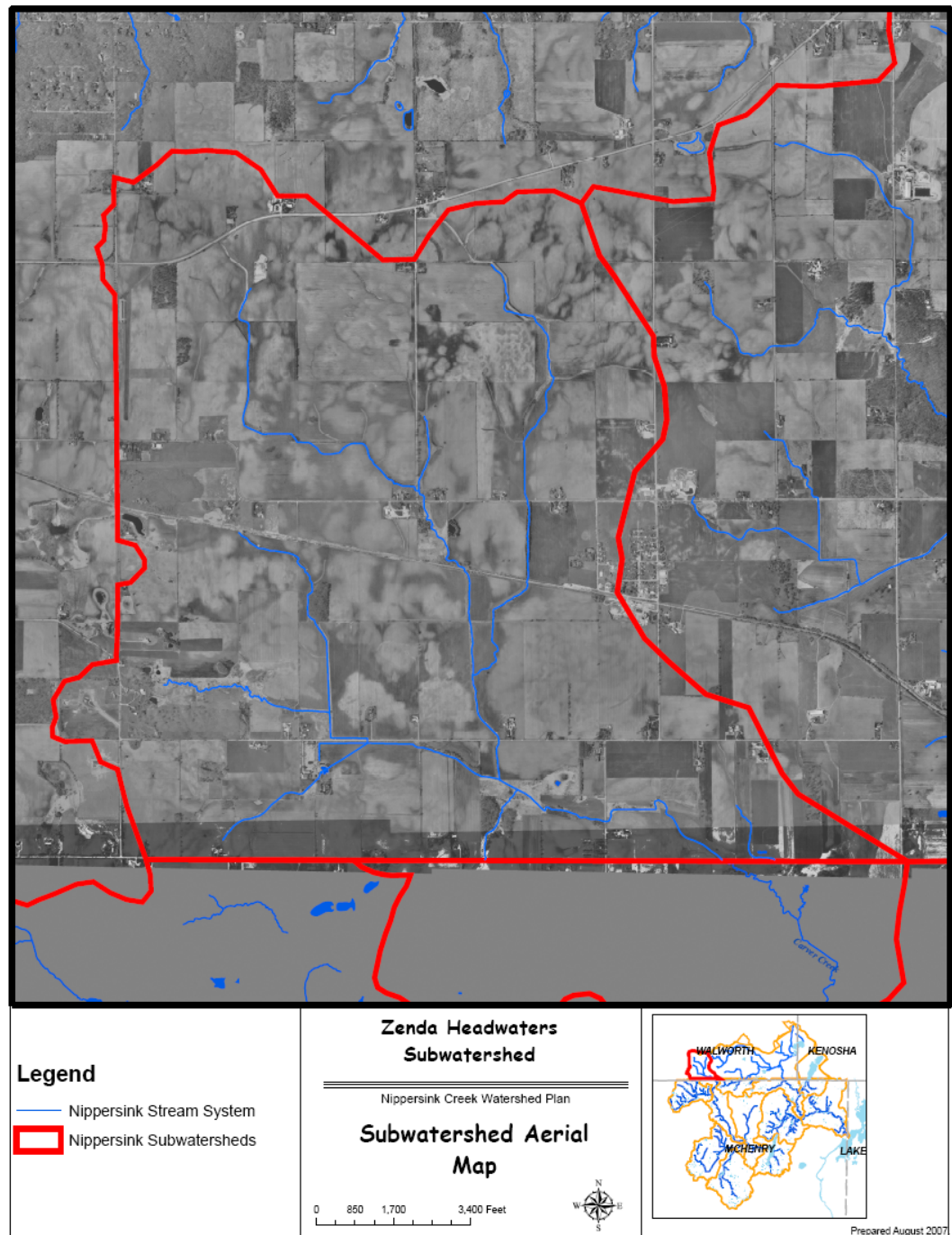
The Zenda Headwaters subwatershed, approximately 4,200 acres in size, is the westernmost of the three Wisconsin subwatersheds. Located entirely within Linn Township of Walworth County, the subwatershed is largely comprised of agricultural land and low density rural residential. As shown in Figure 16.2, the subwatershed is roughly bounded by Highway BB on the north, Highway B on the west, State Line Road on the South, and Zenda Road on the east. The western one-third of the Village of Zenda is located within this subwatershed. This subwatershed drains to Carver Creek in the Nippersink Headwaters subwatershed in Illinois (Chapter 12).

Figure 16.2 USGS Topographic Map for the Zenda Headwaters Subwatershed



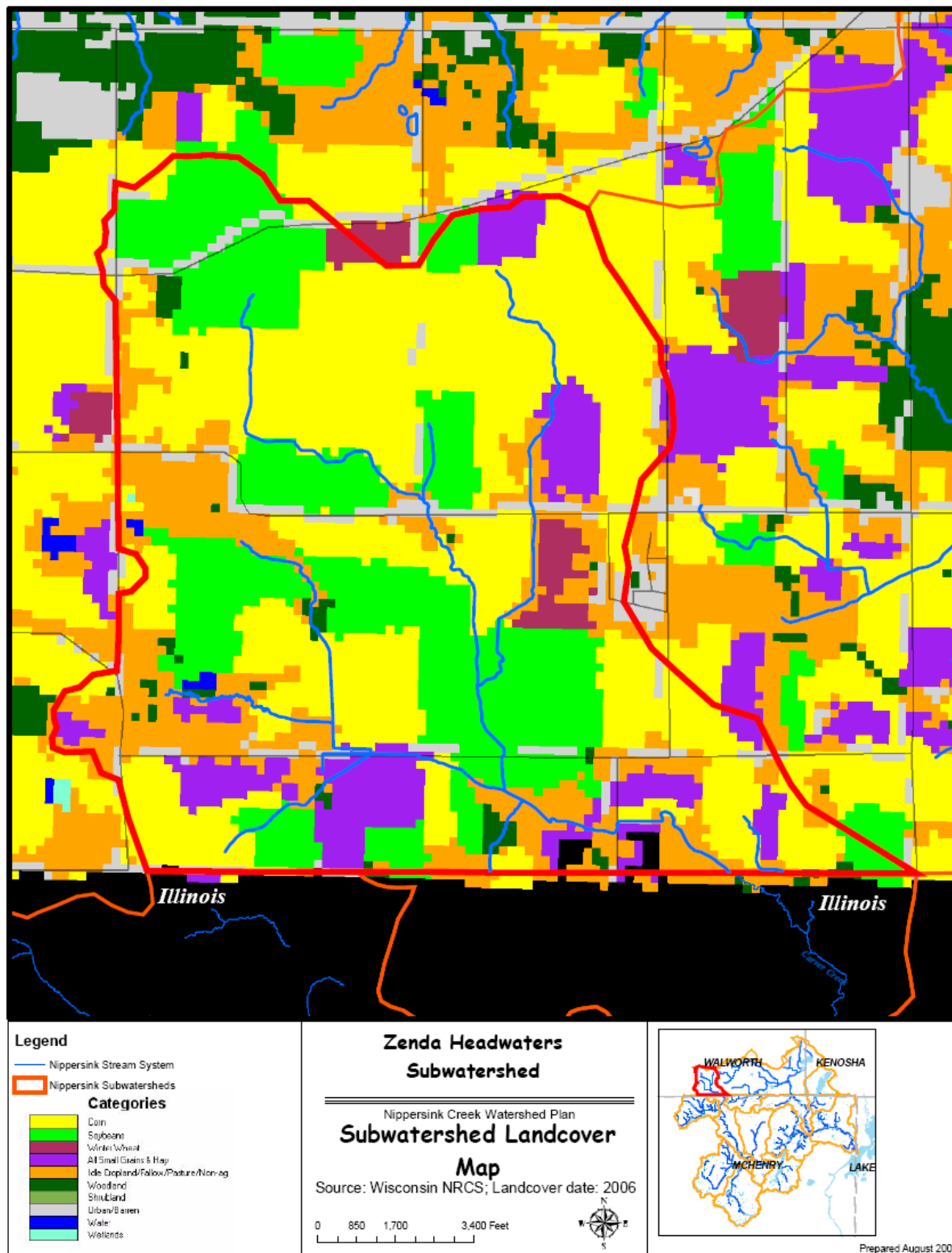
A 2006 aerial photograph of the Zenda Headwaters sub-watershed provides a visual illustration of the predominantly agricultural land use. Most of the subwatershed streams, shown in blue, still feature somewhat sinuous pattern, however, an area in the lower mid-section of this subwatershed features linear stream channels. These linear alignments typically occur where stream channels have been channelized and straightened to facilitate drainage of agricultural fields. The visual presence of somewhat darker hues soils, which can be indicative of highly organic or saturated soils would suggest that a large expanse of wetland was formerly present in this area. These types of areas can often be restored to higher quality wetlands by modifying the existing drainage system.

Figure 16.3 Aerial Photograph of the Zenda Headwaters Subwatershed



The Natural Resource Conservation Service (NRCS) prepared a digital file showing the Land Cover found in Walworth County in 2006. The only color indicative of urban land cover is gray; hues of green shows woodlands or shrub lands; blue hues show water features; all the remaining colors depict different types agricultural crops.

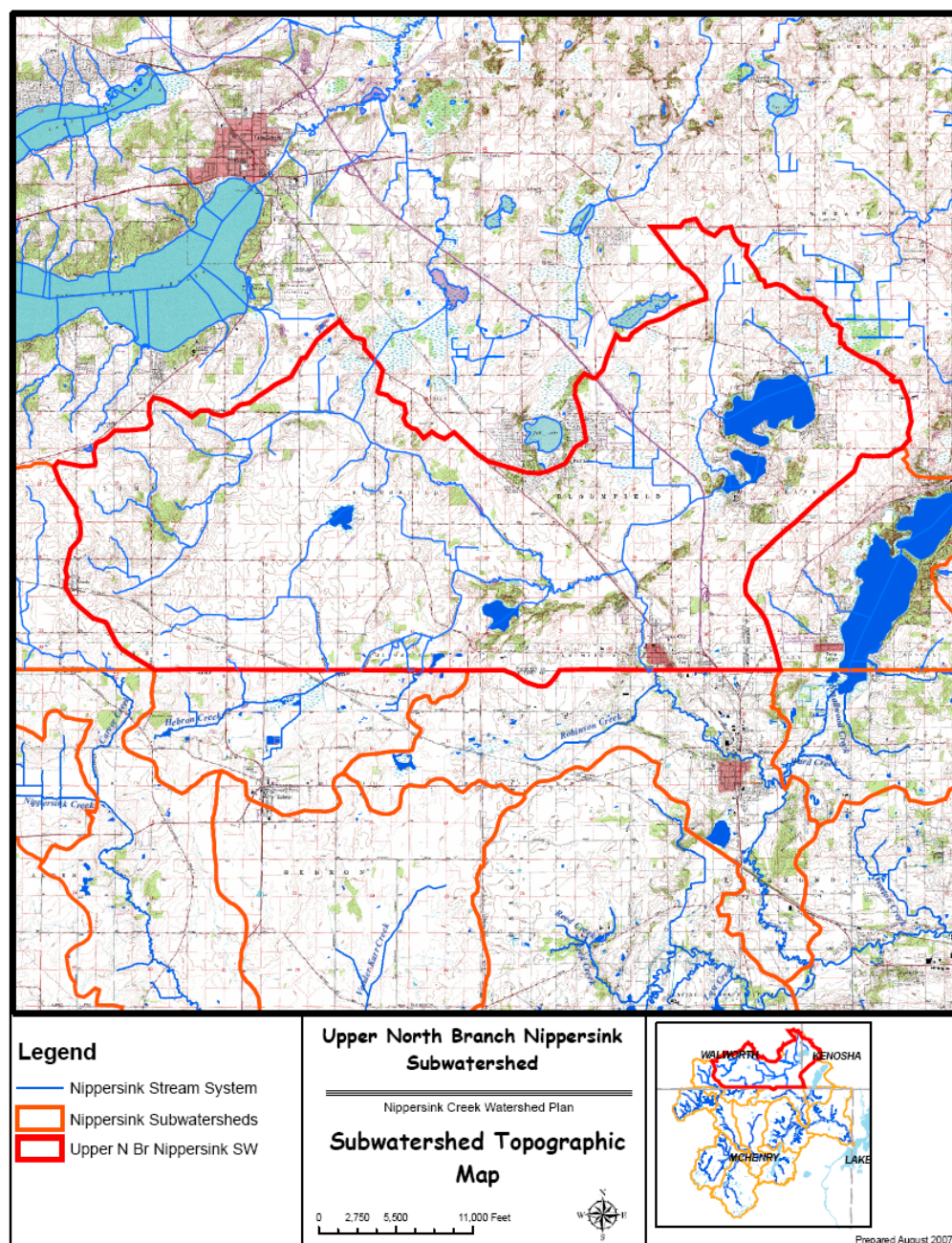
Figure 16.4 NRCS 2006 Land Cover of the Zenda Headwaters Subwatershed



16.1.2 Upper North Branch Nippersink Subwatershed

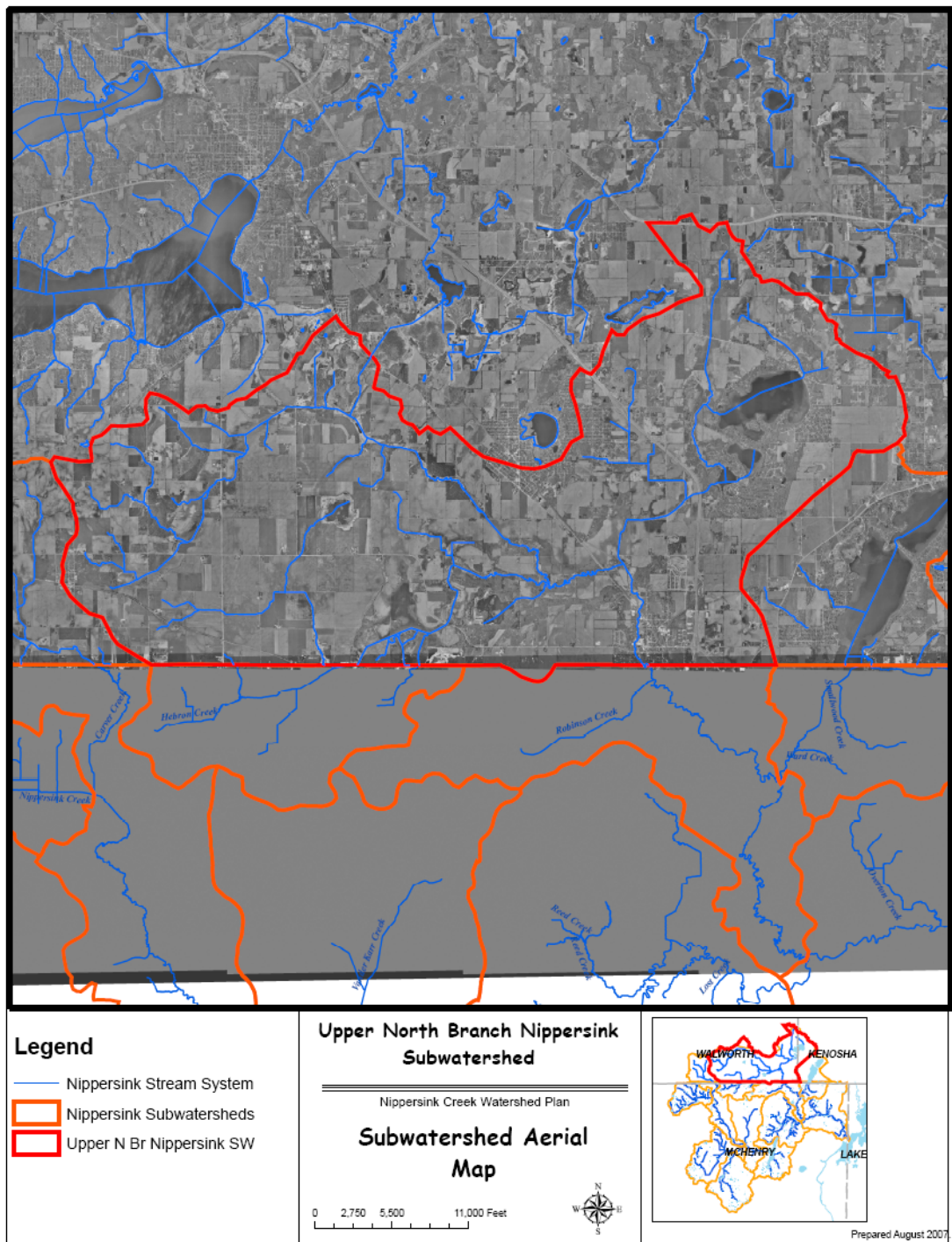
The Upper North Branch Nippersink subwatershed, approximately 25,700 acres in size, is the middle Wisconsin subwatershed. Located within the eastern portion of Linn Township, much of the southern portion of Bloomfield Township, and the western portion of Randall Township, the subwatershed is largely comprised of agricultural land and low density rural residential. Genoa City is located at the downstream (southeast) end of this subwatershed. The Upper North Branch subwatershed receives drainage from the Hebron Peatlands subwatershed in Illinois (Chapter 15). The Upper North Branch subwatershed includes five lakes ranging from 25 to 450 acres in size, that all drain to Nippersink Creek, through the North Branch Nippersink Creek subwatershed in Illinois (Chapter 12).

Figure 16.5 USGS Topographic Map for the Upper North Branch Nippersink Subwatershed



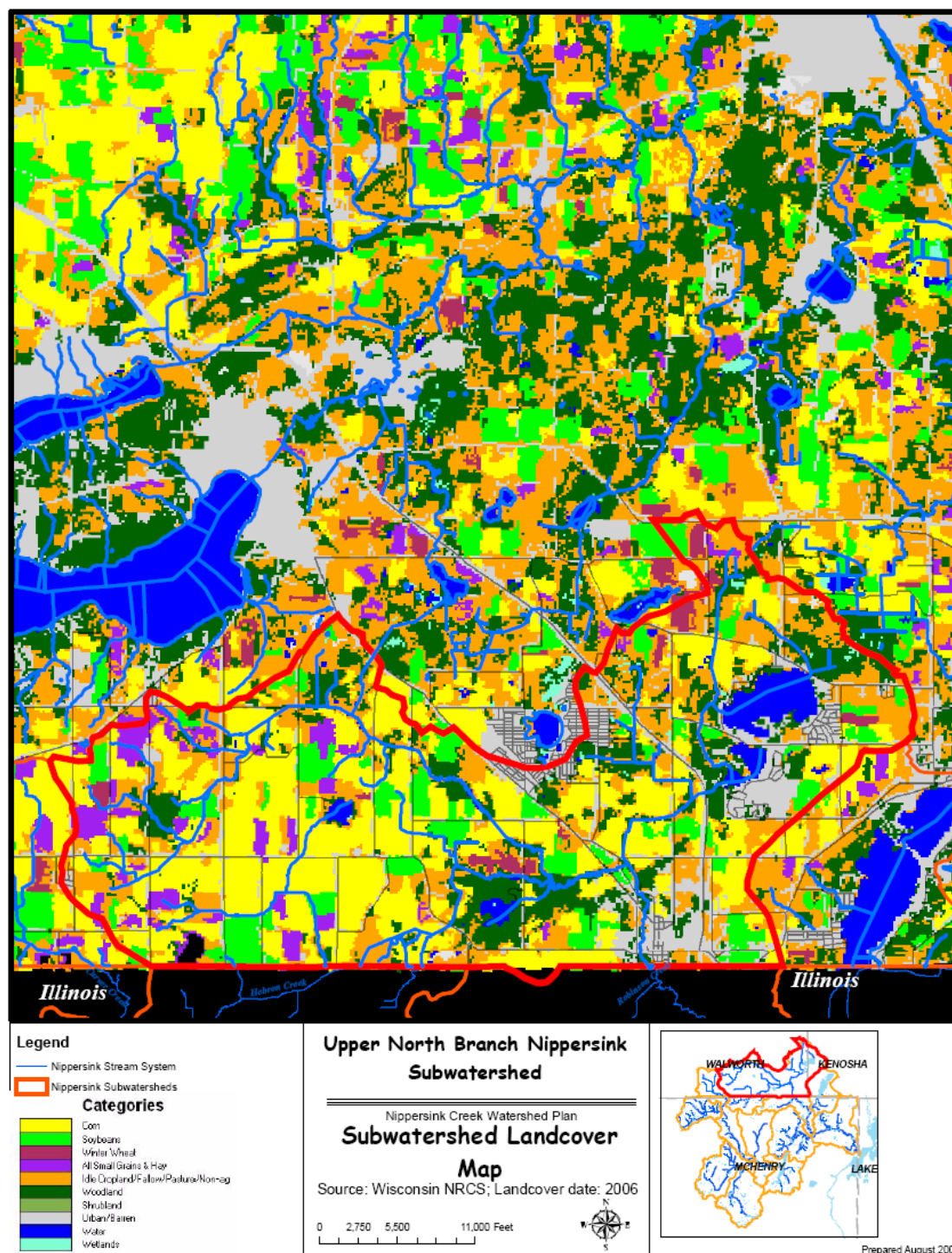
A 2006 aerial photograph of the Upper North Branch Nippersink Creek subwatershed provides a visual illustration of the predominantly agricultural land use. Genoa City and the outskirts of the lake communities of Pell Lake and Powers Lake are the only concentrated urban areas within the subwatershed. However, the subwatershed is bordered on the north by the City of Lake Geneva, and Wisconsin Route 50, a divided highway extending east to the Tri-State Tollway and City of Kenosha. The eastern portion of this subwatershed is also bisected by U.S. Route 12, which in this area is a limited access expressway. The potential for significant future growth exists along these transportation corridors.

Figure 16.6 Aerial Photograph of the Upper North Branch Nippersink Subwatershed



The Natural Resource Conservation Service (NRCS) prepared a digital file showing the Land Cover found in Walworth County and Kenosha County in 2006. The only color indicative of urban land cover is gray; hues of green shows woodlands or shrub lands; blue hues show water features; all the remaining colors depict different types agricultural crops.

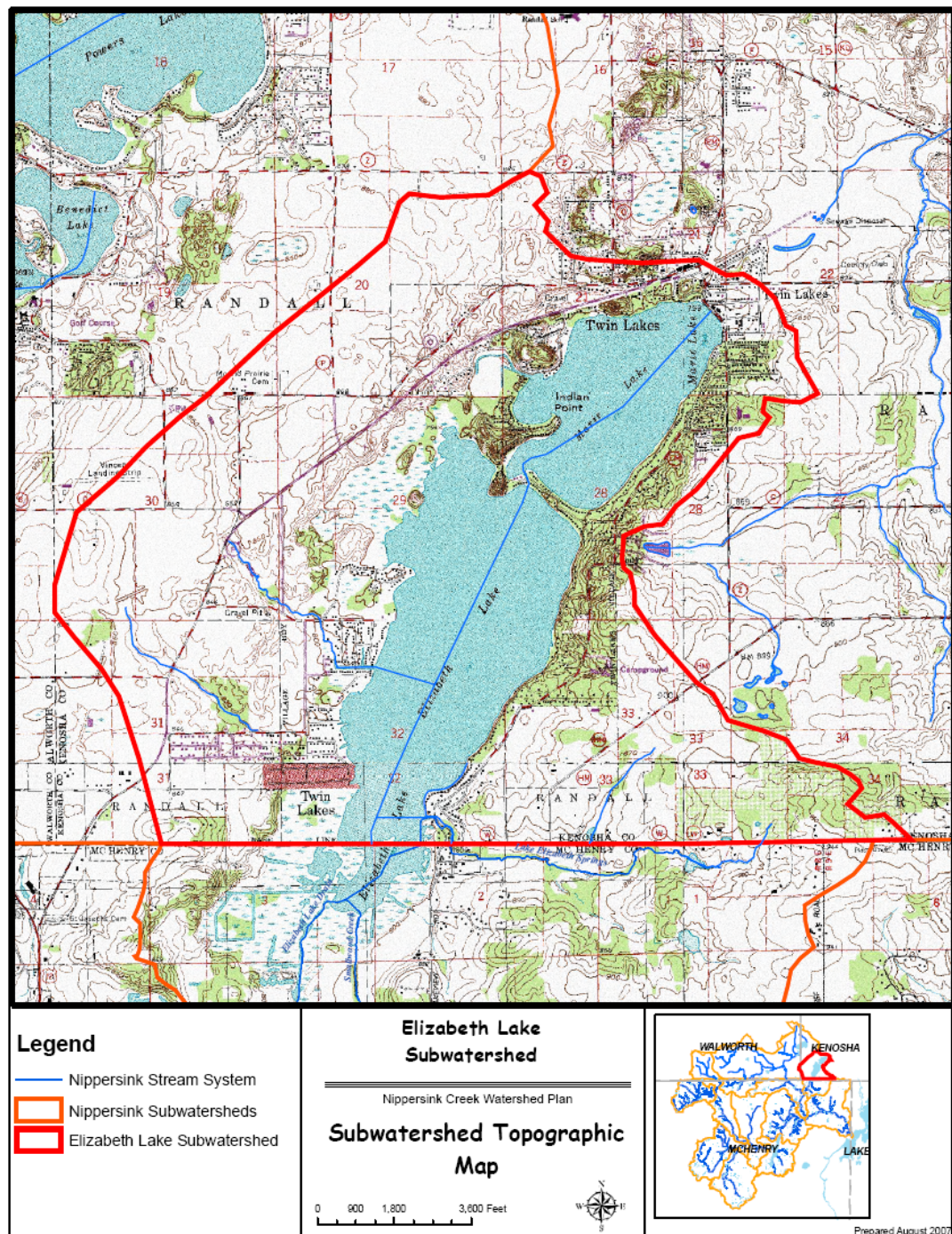
Figure 16.7 NRCS 2006 Land Cover of the Upper North Branch Nippersink Subwatershed



16.1.3 Elizabeth Lake Subwatershed

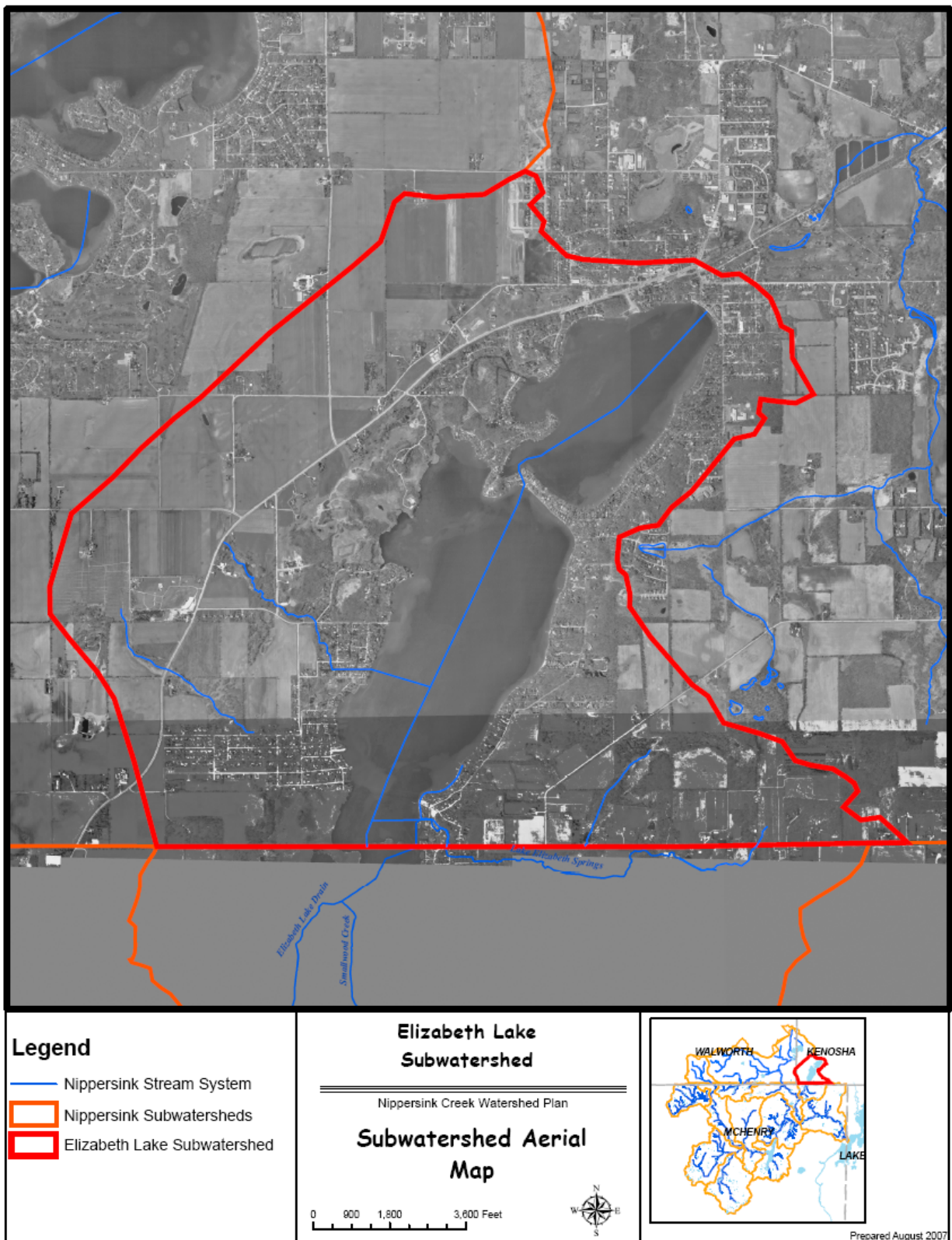
The Elizabeth Lake subwatershed, approximately 4,500 acres in size, is the eastern Wisconsin subwatershed. Located within the eastern portion of Randall Township of Kenosha County, almost 1,000 acres of the subwatershed is comprised of Lake Marie and Lake Elizabeth (Twin Lakes). The remaining balance of the subwatershed is comprised of lakeside residential subdivisions and the Village of Twin Lakes and moving farther away from the lakes, agricultural areas and low density residential. Lake Elizabeth drains into the North Branch of Nippersink Creek, through the adjacent Elizabeth Lake Drain subwatershed (Chapter 14).

Figure 16.8 USGS Topographic Map for the Elizabeth Lake Subwatershed



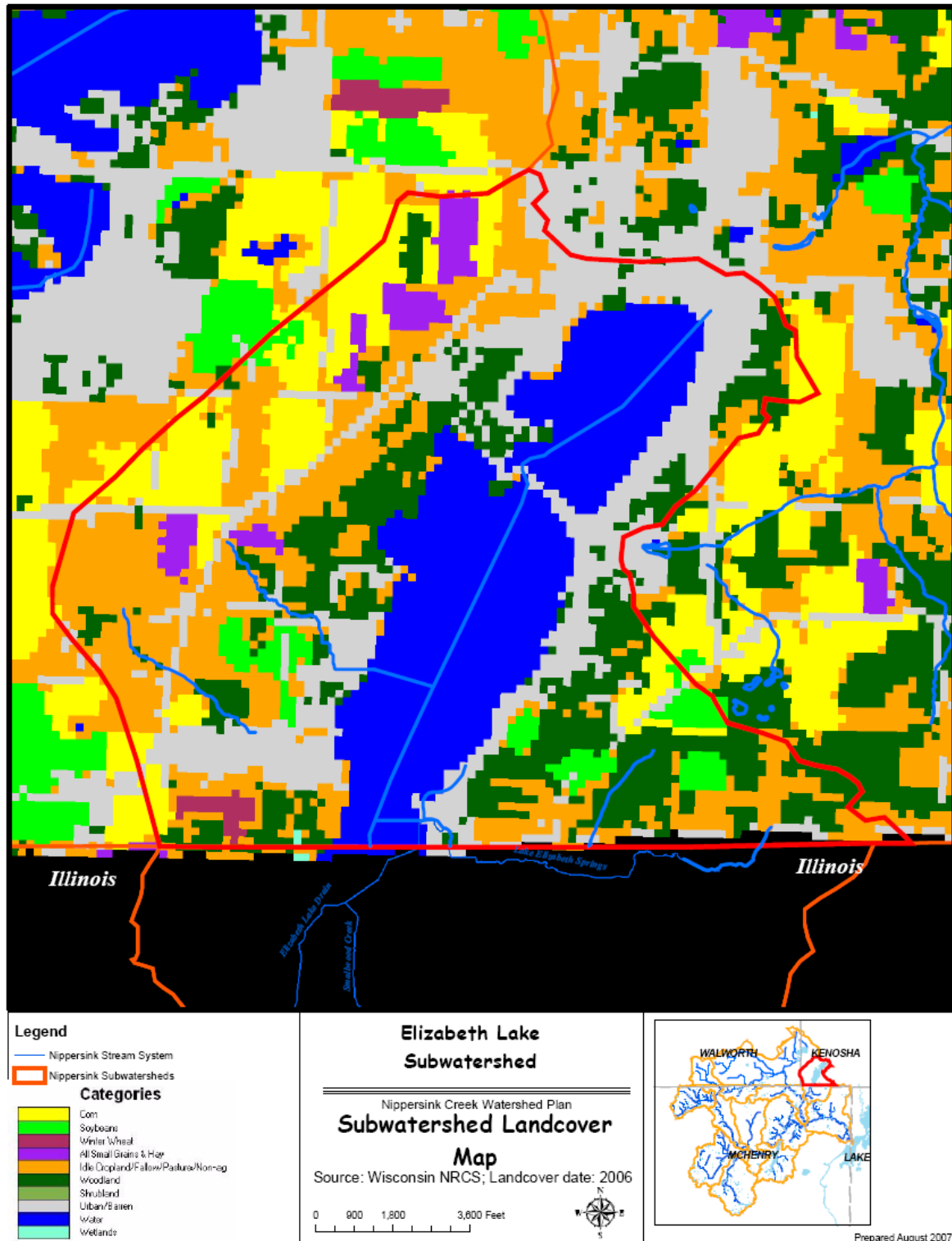
A 2006 aerial photograph of the Elizabeth Lake sub-watershed provides a visual illustration of the predominantly agricultural land use. The Village of Twin Lakes, and the lakeside residential areas are the only concentrated urban areas within the subwatershed.

Figure 16.9 Aerial Photograph of the Elizabeth Lake Subwatershed



The Natural Resource Conservation Service (NRCS) prepared a digital file showing the Land Cover found in Kenosha County in 2006. The only color indicative of urban land cover is gray; hues of green shows woodlands or shrub lands; blue hues show water features; all the remaining colors depict different types agricultural crops.

Figure 16.10 NRCS 2006 Land Cover of the Lake Elizabeth Subwatershed



16.2 Wisconsin Subwatersheds Planning and Growth Issues

While the Wisconsin Subwatersheds were specifically not included in this watershed planning effort, it is still beneficial to determine the trends in land use planning in the Wisconsin portion of the Nippersink Creek watershed.

The following documents were accessed over the internet, and were briefly reviewed to identify any trends in resource protection, land use planning, or regulatory / zoning matters that would impact the Nippersink Creek Watershed.

Generally speaking, all of these documents reflect awareness of, as well as a desire to, protect and enhance water resources, implement smart growth strategies, and protect environmentally sensitive corridors. All of these areas reflect the goals and objectives of the Nippersink Creek Watershed Plan.

One shortcoming of these documents was determined by conducting a search of each document to determine the number of occurrences within the text of the term “Nippersink”. In each of these documents, any reference to Nippersink Creek tended to only identify it as a geographical feature, rather than as a specific resource in need of planning. No reference could be found about the need to have “cross-border” collaboration or discussion on future land use issues, water quality protection, or other items critical to comprehensive watershed planning.

The need for this dialogue will become increasingly important as development continues within the Nippersink Creek Watershed, regardless which side of the state line it occurs on.

Figure 16.11 List of Wisconsin Planning Documents Reviewed

“The State of the Southeast Fox River Basin, February, 2002”

Wisconsin Department of Natural Resources Wisconsin DNR PUBL WT-701-2002

http://dnr.wi.gov/org/gmu/foxil/southeastfox_final_202.pdf

“A Park and Open Space Plan for Walworth County”

Southeastern Wisconsin Regional Planning Commission, September 2000

http://www.sewrpc.org/publications/capr/capr-35_2nd_ed_park_plan_walworth_co.pdf

“A Land Use Plan for Walworth County, Wisconsin: 2020”

Southeastern Wisconsin Regional Planning Commission, April 2001

http://www.co.walworth.wi.us/Land%20Management/Website/images/Forms/capr-252_lu_plan_walworth_cty_web.pdf

“Town of Linn Year 2025 Comprehensive Plan”

Foth & Van Dyke, Inc., June 2004

<http://townoflinn.com/notices/2025plan.pdf>

“Town of Randall and Village of Twin Lakes - Smart Growth Comprehensive Plan: 2005 – 2024”

Mid-America Planning Services, Inc., March 2005

<http://www.villageoftwinlakes.net/compplan.cfm>

16.2.1 Point Source Discharges

There is one point source discharge in the Wisconsin subwatersheds; the Village of Genoa City maintains a municipal waste water treatment plant which discharges into the North Branch of Nippersink Creek.

Table 16.1 NPDES Point Source Discharges within the Wisconsin Subwatersheds

Name	Average Discharge (mgd)	Receiving Stream	Wisconsin Permit Number
Genoa WWTP	0.216	North Branch Nippersink	WI0021083

Water quality and discharge information for Genoa City WWTP can be found on the EPA's website at: http://oaspub.epa.gov/enviro/pcs_det_reports.detail_report?npdesid=IL0026433

16.3 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.

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 16.2 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 16.3 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 potentially identified in Table 16.3 are presented below:

NCWPC	Nippersink Creek Watershed Planning Committee
NRCS	Natural Resource Conservation Service
USFWS	U.S. Fish and Wildlife Service
NPS	National Park Service

Table 16.2 BMP Selection & Associated Pollutant Load Reduction for the Wisconsin Subwatersheds

BMP	Type of BMP	Project Locations**	BMP		Removal Efficiency***			****			Percentage Reduction		
			Size	Unit	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS
WWTP Effluent Improvements	Site-specific	15-1	1	lump sum	10%	10%	10%	6,548	680	458	10	10	10
Permanent Habitat Protection	Site-specific	15-2	100	acres	53%	51%	88%	707	71	82	1.1	1	1.8
Regulatory*	Watershed-Specific	Subwatershed wide	1	Watershed	5%	5%	5%	3,274	340	229	5	5	5
Nutrient Management	Watershed-specific	Subwatershed wide	750	acres	70%	28%	-	7,005	291	-	10.7	4.3	-
Total								17,534	1,382	770	26.8	20.3	16.8

*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 16.3 Recommended Projects within the Wisconsin Subwatersheds

SUB WATERSHED	RECOMMENDATION #	TARGET GOAL	DESCRIPTION	RESPONSIBLE PARTY	ACRES	UNIT COST	INITIAL IMPLEMENTATION COST	INITIAL OUTREACH COST	ANNUAL MAINTENANCE COST	PRIORITY
Upper North Branch Nippersink Creek	15-1	Water Quality	Government Outreach to Investigate feasibility of increasing pollutant removal standards at Genoa City WWTP	NCWPC / GENOA CITY					\$5,000	G
Upper North Branch Nippersink Creek	15-2	Permanent Habitat Protection	Possible land acquisition for proposed Hackma-Tack National Wildlife Refuge & Nippersink Trail on abandoned Rail ROW	USFWS, NPS						G
				SW TOTALS		0.0		\$0	\$5,000	\$0

- 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