

# Chapter 9

## LOWER PINGREE CREEK SUBWATERSHED

### 9.1.1 Subwatershed Location

The Lower Pingree Creek subwatershed is the smallest in the Tyler Creek Watershed, located in southeastern Rutland Township and northeastern Plato Township. The subwatershed occupies 1,825 acres, or 2.9 square miles and drains the area between the Pingree Creek / North Plato Ditch confluence and the confluence of Pingree Creek downstream with Tyler Creek. This area is roughly bordered by US Route 20 on the south, Big Timber Road on the north, Reinking Road on the west, and Coombs Road on the east.

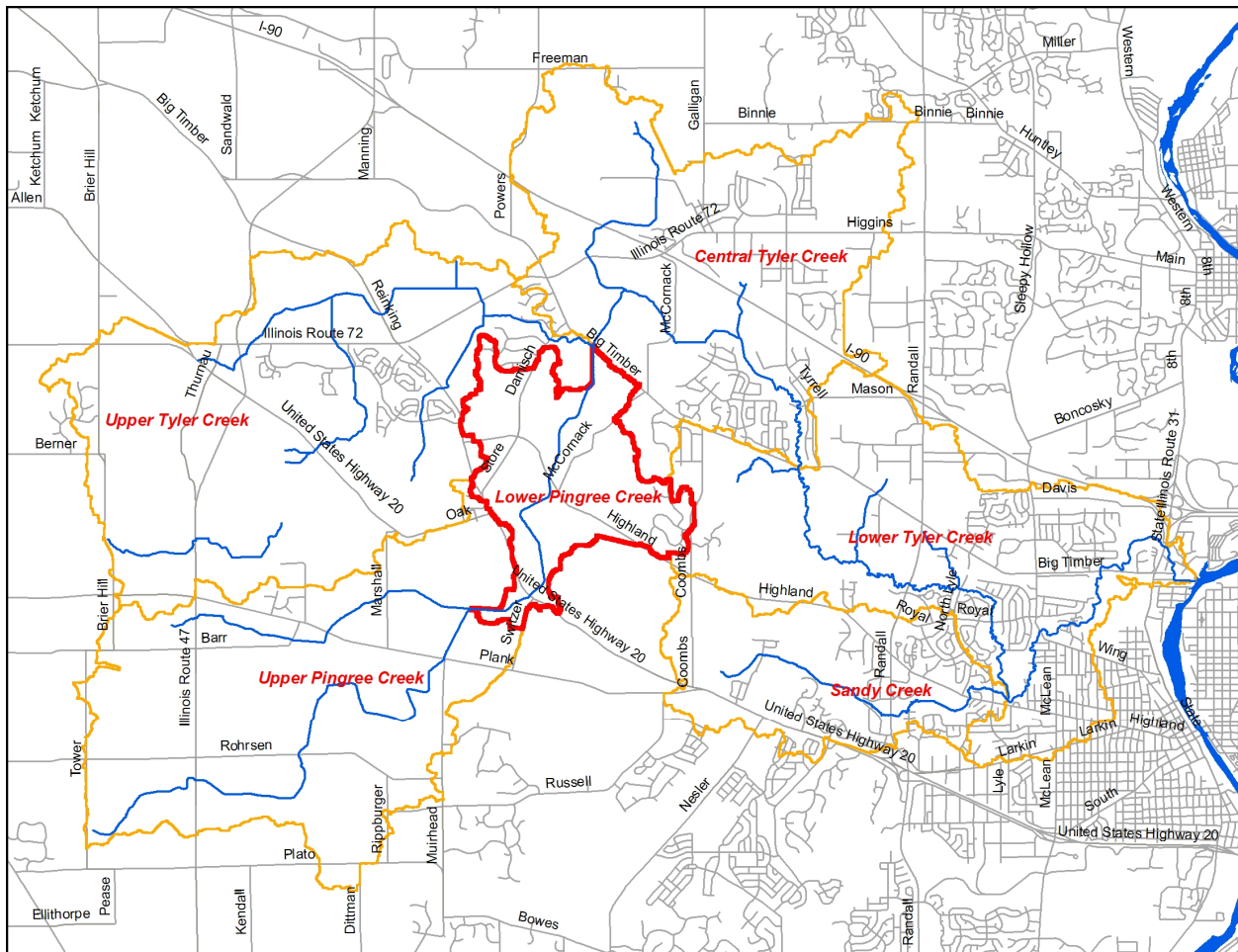


Figure 9.1. Subwatersheds in the Tyler Creek Watershed

### 9.1.2 Topography & Geology

The topography of the Lower Pingree subwatershed varies from 0-2% slopes along the Pingree Creek floodplain to steeper than 10% slopes near the west boundary of the subwatershed. The maximum elevation in the subwatershed is 954 feet and the minimum elevation is 886 feet where Pingree Creek joins Tyler Creek at Big Timber Road.

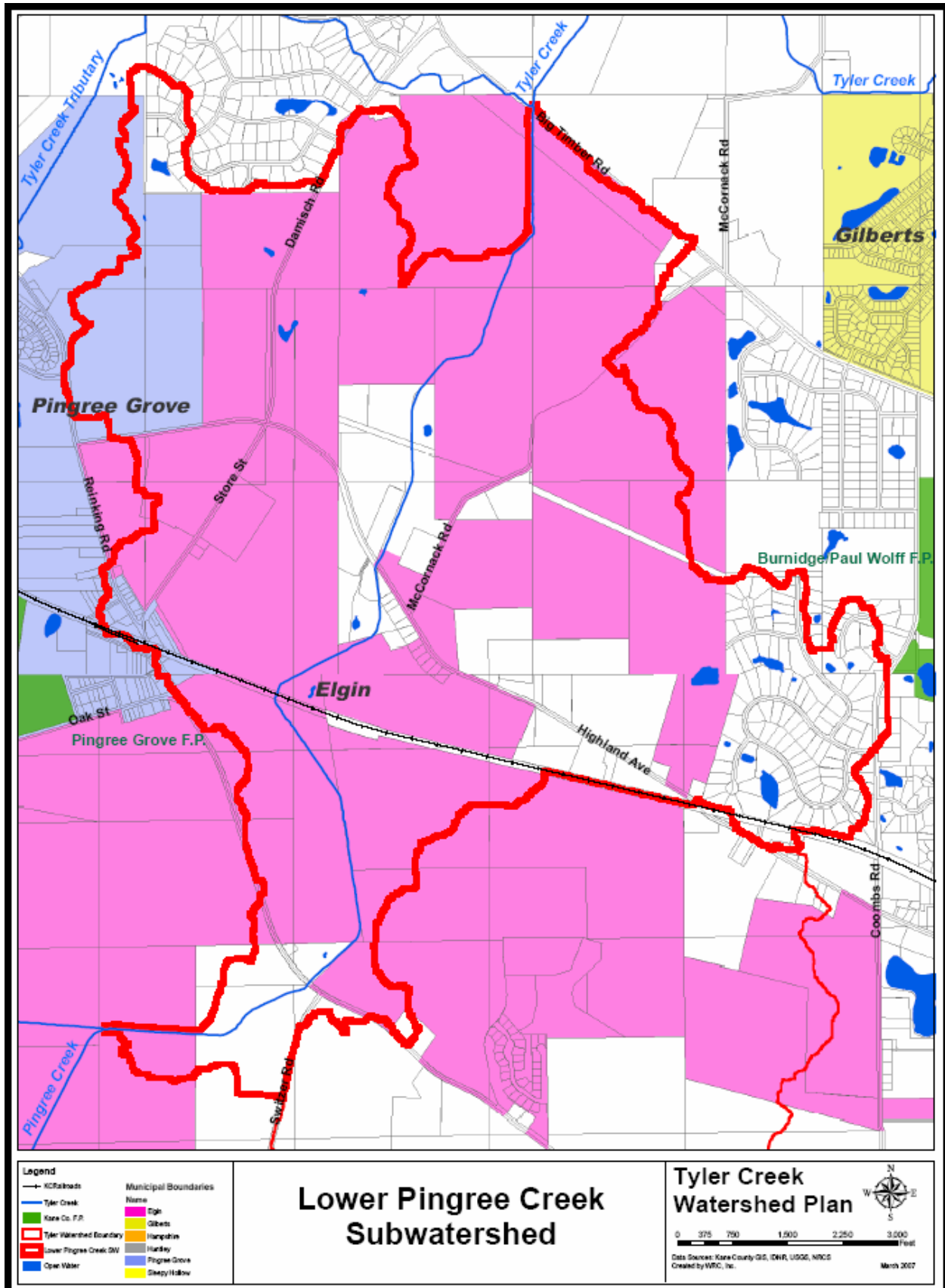


Figure 9.2. Subwatershed Map

### 9.1.3 Soil Conditions

The glacial advances result in a wide variety of soil units. The soils in the Lower Pingree subwatershed consist of mainly silt loams soil units on 0% to 2% slopes. Each major grouping of soil map units has potential impact on current and future land uses within the subwatershed. For example, hydric (wetland) soils constitute 723 acres, or 40% of the 1,825 acre subwatershed, and indicate those areas that contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

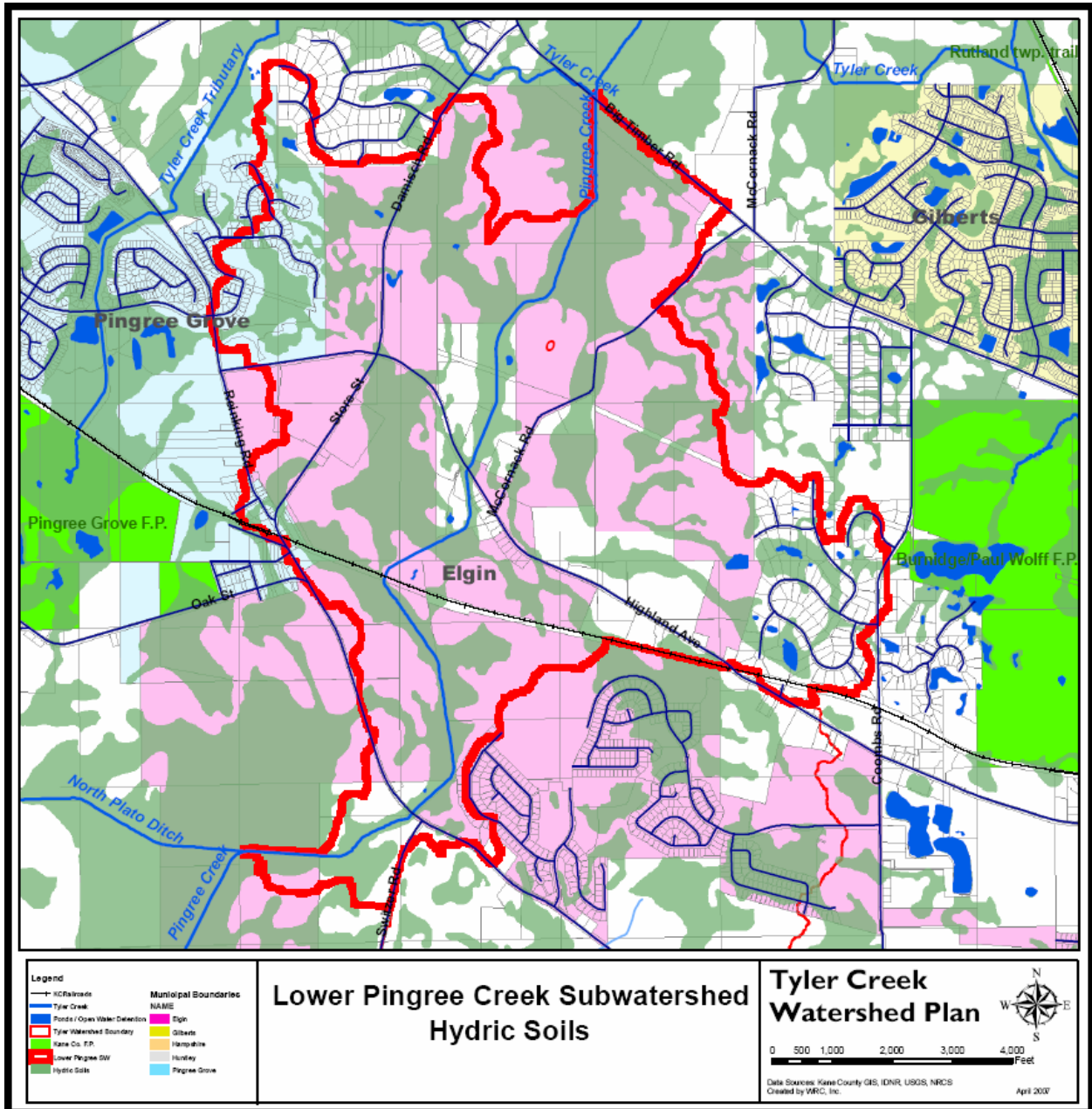


Figure 9.3: Hydric Soils

## **9.1.4 Subwatershed Drainage Features**

### **Streams**

There is only one stream in the Lower Pingree Creek Subwatershed – Pingree Creek. Pingree Creek in this region is extremely flat, with an average slope of less than 0.08%. The 1860 Atlas of Kane County suggests that Pingree Creek likely did not exist as a stream channel south of Highland Avenue and was probably extended southward by farmers as part of their agricultural ditch system to improve field drainage. The stream corridor between Big Timber Road and US Route 20 is narrow (< 100 feet in most places), and dominated by a thick canopy of low quality deciduous trees and invasive shrubs. Downstream of US Route 20, the stream channel is heavily incised below the agricultural lands adjacent to the stream. In this reach, the stream corridor is less than 60 feet wide and dominated by invasive herbaceous vegetation (grasses & weeds).

### **Urban Drainage Systems**

Analysis of land uses and aerial photography indicates that there is only a small portion of the subwatershed that is serviced by storm sewer networks. The sewered area is found in the 130+ acres of the Cambridge Lakes subdivision under construction along Reinking Road within the Village of Pingree Grove. The Maplehurst and Wildwood West subdivisions likely do not have an underground storm sewer system, as rural residential landscapes such as these often rely upon grassed swales for stormwater conveyance. Both of these subdivisions, as well as Cambridge Lakes, have stormwater detention basins (five or six in total) to temporarily detain stormwater to reduce 100-year flood discharges into Pingree Creek.

### **Agricultural Drainage Systems**

Given the soils and gentle slopes of the agricultural land that dominates the western half of the subwatershed, it is estimated that about 70% (1,825 acres) of the Lower Pingree subwatershed has been modified with the installation of agricultural ditch and 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. It is probable that many of the depressional and low lying areas in the subwatershed that are now drained by tile systems were once wetland and wet prairie ecosystems that supported very diverse habitats.

## **9.1.5 Population**

The use and analysis of population data in watershed planning is critical because 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.

According to the 2000 US Census, the population in the subwatershed was about 652 people, or only 229 persons per square mile.

### 9.1.6 Landuse / Landcover

Land cover data for the Tyler 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 row crop agriculture, which accounted for roughly 51% of the subwatershed area. Rural grasslands accounted for another 20%, while wooded areas and wetlands account for an additional 12% of the subwatershed. Urban land cover, including urban grassland comprised the remaining 17% of the subwatershed.

Land Cover Description	Total Acres	Percent of SW
Barren & Exposed Land	2.8	0.15%
Corn, Soybeans, Other Small Grains & Hay (row crop agriculture)	922.9	50.56%
Winter Wheat	0	0.00%
Rural Grassland	370.6	20.30%
Low Density Urban	87.8	4.81%
Medium Density Urban	31.7	1.74%
High Density Urban	0.8	0.04%
Urban Grassland	194.2	10.64%
Shallow Marsh – Emergent Wetland	19.4	1.06%
Shallow Water Wetland	0	0.00%
Partial Forest /Savannah Upland	31.2	1.71%
Upland Forest	157.2	8.61%
Floodplain Forest	3.7	0.20%
Coniferous Forest	0	0.00%
Deep Marsh / Emergent Wetland	0	0.00%
Open Water	3	0.16%
<b>TOTAL</b>	<b>1,825.3</b>	<b>100.0%</b>

Table 9.1

### 9.1.7 Existing Watershed Development

Development in the subwatershed has historically occurred as unincorporated, rural residential development on 1+ acre parcels, except for the smaller lots developed along in downtown Pingree Grove. According to the Land Cover analysis, the subwatershed had about 315 acres of development, or 17% of the subwatershed. Almost half of this developed land is contained in the Wildwood West unincorporated subdivision near Highland Avenue and Coombs Road. Since 2000, there has been an additional 31 acres of medium density residential development in the Cambridge Lakes subdivision and an additional 20 acres of rural residential development in the Maplehurst subdivision, bringing the total estimated development in the subwatershed to 366 acres, or 20% of the total area.

Although development to date in the subwatershed has been mainly unincorporated residential development or recent residential development on the west side by Pingree Grove, the City of Elgin currently has jurisdiction over 66% of the subwatershed as a result of recent annexations.

Municipality	Area (acres)	Percent of SW
Village of Pingree Grove	138.1	7.6%
City of Elgin	1207.7	66%
Unincorporated Kane County	479.2	26.2%

Table 9.2

There are 8.4 miles of roads in the subwatershed, which equates to about 28 acres of impervious cover (roadway pavement only – excludes parking lots, sidewalks, and driveways).

### 9.1.8 Natural Resources

#### Kane County Forest Preserve Properties

There are no Kane County Forest Preserve properties in the Lower Pingree Creek Subwatershed; the Pingree Grove F.P. and Burnidge / Paul Wolff F.P. are located immediately adjacent to the subwatershed on its east and west boundaries.

#### Other Publicly Protected Land

The Village of Pingree Grove owns 23 parcels totaling 66 acres within the subwatershed. These parcels appear to be outlots given to the Village within Unit 16 of the Cambridge Lakes subdivision. It appears that about half of this land is planned for future subdivision stormwater management basins and the other half is designated open space to protect the portion of ADID Wetland #466 that extends into the Cambridge Lakes subdivision. The City of Elgin owns one parcel that covers about 15.2 acres, located at the far upstream end of the subwatershed at a future city park site where the North Plato Ditch and Pingree Creek merge.

Name	Area (acres)
Village of Pingree Grove	66.0
City of Elgin	15.2
<b>Total</b>	<b>81.2</b>

Table 9.3

#### Wetlands

Kane County completed an Advanced Identification (ADID) Wetland Study in 2004. This study identified a total of 29 wetlands, totaling 305 acres, or 16.7% of the Lower Pingree subwatershed. Of these, 5 wetlands, totaling 221.9 acres (73%) were determined to be of High Quality or High Functional Value, rating an ADID classification.

ADID Code	Wetland Type	Number of Wetlands	Total Area (acres)
HFV	High Functional Value	5	221.9
HHQ	High Habitat Quality	0	0
APH	Artificial Pond in Hydric Soils	3	3.2
APN	Artificial Pond in Non-hydric Soils	0	0
LWF	Linear Water Feature	3	29.4
NOW	Natural Open Water	0	0
R	Fox River	0	0
W	Other Wetlands (lower quality)	18	50.5
	<b>TOTAL</b>	<b>29</b>	<b>305.0</b>

Table 9.4

While there are no High Habitat Quality wetlands in the Lower Pingree subwatershed, there is a large interconnected complex of High Functional Value wetlands that extends from the Maplehurst Subdivision southeast for 1.5 miles to Pingree Creek, where it flows under the Iowa, Chicago & Eastern Railroad. Nearly all of this wetland complex is located on private property that is planned for a large mixed use development under the jurisdiction of the City of Elgin.

### **Threatened & Endangered Species**

The Kane County ADID Wetland Study does not indicate the presence of any Threatened or Endangered Species. The Illinois Department of Natural Resources' on-line Ecological Compliance Assessment Tool (EcoCAT) lists the following species may be present within this subwatershed:

<b>Common Name</b>	<b>Scientific Name</b>	<b>Type</b>	<b>Status</b>
Slippershell Mussel	<i>Alasmidonta viridis</i>	Mussel	IL Threatened
Sandhill Crane	<i>Grus Canadensis</i>	Bird	IL Threatened
Swainson's Hawk	<i>Buteo swainsoni</i>	Bird	IL Endangered
Least Bittern	<i>Ixobrychus exilis</i>	Bird	IL Threatened
Common Moorhen	<i>Gallinula chloropus</i>	Bird	IL Threatened

Table 9.5 (Source: INDR EcoCAT webpage)

### **Existing Greenways**

There are no existing greenways in the Lower Pingree Creek Subwatershed.

## 9.2 Analysis of Subwatershed Data and Problem Identification

### 9.2.1 Water Quality Data

The IEPA is tasked with assessing the quality of the surface water resources of Illinois. The IEPA has determined Tyler 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, Tyler Creek is identified as being in Full Support of its Aquatic Life Designated Use, which is notable for a stream in northeastern Illinois.

However, Tyler 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 urban runoff, storm sewers, and runoff from forest / grassland / parklands. The IEPA also identified fish consumption, secondary contact and aesthetic quality as designated uses for Tyler Creek, although the ratings for these uses were classified as "not assessed".

The IEPA does not sample water quality on Pingree Creek at this time (2007). The nearest water quality sampling station maintained by the State is on Tyler Creek at Randall Road.

The FRWMN, administered by the not-for-profit group, *Friends of the Fox River*, maintains ten volunteer stream monitoring sites on Tyler Creek. The FRWMN has a monitoring station in the Lower Pingree Creek Subwatershed where Pingree Creek crosses Highland Avenue (FRWMN Site #28). This site was monitored 11 times between September 2004 and September 2005. FRWMN protocols classified this section of Pingree Creek as having "poor" water quality based on poor instream habitat and very low numbers of pollution intolerant macroinvertebrates. Limited chemical monitoring was also done at this site, and reported nitrate concentrations as high as 8.26 mg/L during the winter (12/6/04 & 1/26/05) and phosphorus concentrations as high as 6.10 mg/L during the summer (9/30/04). All measurements were taken during low flow periods, in which there was little or no precipitation.



## 9.2.2 Flooding Problems

There are no documented flooding problems along Pingree Creek in the subwatershed. The 100-year floodplain for Pingree Creek has been calculated and accurately mapped in the subwatershed as far upstream as US Route 20, and indicates that there are no dwellings in the floodplain.

## 9.2.3 Projected Development & Growth

The biggest challenge in maintaining the ecological and hydrologic integrity of the Lower Pingree Creek subwatershed is implementing environmentally sustainable development practices. Elgin has currently annexed 66% of the subwatershed, and their comprehensive land use plan suggests that all unincorporated land not presently developed will eventually become developed in the future. Assuming that no development occurs within the existing 100-year floodplain or ADID wetlands, and does not encroach within 100 feet of Pingree Creek, the total amount of development / land use change in the subwatershed could be more than 1,350 acres, or 74% of the subwatershed.

If not carefully planned and designed, the proposed land use changes in the subwatershed will result in profoundly negative impacts on water quality, total runoff, stream stability, and the ecological integrity of this portion of Tyler Creek.

## 9.2.4 Estimated Pollutant Loads

Pollutant load estimates in the Lower Pingree Creek subwatershed under existing and future condition land uses are summarized below. This watershed is mostly rural. Nutrient loads are expected to decrease significantly as agricultural uses decline. The future load estimates assumed low-density replacing agriculture. Higher loads may be generated if higher density residential or commercial development occurs. In addition, as discussed above, urbanization may result in rapid deterioration of water quality because of the additional pollutants associated with urban runoff such as oils and grease, road salt, and heavy metals. Strategies for reducing existing pollutant loadings are discussed in Chapter 10.

Pollutant	Existing Condition	Future Condition
Total N (lbs/yr)	8,241	4,372
Total P (lbs/yr)	821	273
Sediment (tons/yr)	487	292
Runoff (acre-ft per yr.)	491	587
Fecal Coliform (in 10 <sup>9</sup> FCU)	10,949	11,057

Table 9.6 Estimated annual pollutant loads from the Lower Pringree Creek Subwatershed

## 9.2.5 Natural Area Protection Problems

### ADID Wetland Sites

In the Lower Pingree subwatershed, only 305 acres of wetland remain, compared to an estimated 723 acres that existed before settlement. That means about 57% of the wetland 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 continue to benefit from the functions these wetlands provide.

## 9.3 Subwatershed-specific Recommendations to Protect Watershed Resources

The following is a summary list of recommendations for the Lower Pingree Creek Subwatershed to help stakeholders and decision makers meet the Goals and Objectives set forth for Tyler Creek. Background information regarding how each type of recommendation addresses watershed concerns and/or impairments (existing or future) can be found in Chapter 3. Note that there are several general, or watershed-wide recommendations contained in Chapter 3, Watershed Plan Recommendations.

**Type:** Education/Outreach; Regulatory; Natural Habitat Restoration; Monitoring; Permanent Habitat Protection, Water Quality; Flood Control

**Target Goals:** Which watershed plan goals the recommendation is intended to address.

**Initial 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 High, Medium, or Low, where High is represents a recommendation of utmost importance to be pursued immediately and Low represents those recommendations which may take more time and are less critical in terms their impact on meeting the watershed plan goals.

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 2007 Tyler 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 TCWP report as the basis for their grant request.

### **Natural Habitat Restoration Projects**

The following recommendations are site-specific natural area restoration projects that should be implemented to increase natural habitat quality and diversity along the Tyler Creek stream corridor.

#### **Recommendation 5-1**

Encourage new developments along Pingree Creek north of Highland Avenue to include stream corridor restoration plans in their overall development plan. The goal is to remove invasive species and noxious trees that have completely over-shaded the stream channel.

**Type:** Natural Habitat Restoration

**Target Goals:** Goal 1, Objective 2; Goal 2, Objective 3

**Initial Cost:** unknown (municipal staff & elected official time)

**Annual Cost:** unknown (municipal staff & elected official time)

**Responsible Party:** City of Elgin

**Priority:** High

## **Recommendation 5-4**

Encourage new developments along Pingree Creek south of Highland Avenue to include stream corridor restoration plans in their overall development plan. The goal is to remove invasive species and noxious trees that have completely over-shaded the stream channel.

**Type:** Natural Habitat Restoration

**Target Goals:** Goal 1, Objective 2; Goal 2, Objective 3

**Initial Cost:** unknown (municipal staff & elected official time)

**Annual Cost:** unknown (municipal staff & elected official time)

**Responsible Party:** City of Elgin

**Priority:** High

## **Water Quality Projects**

There are no recommendations for site-specific water quality improvement projects identified in the Lower Pingree Creek Subwatershed. Water quality improvements may be realized through the implementation of a green infrastructure plan that will require new developments along Tyler Creek to restore natural stream channel and stream corridor functions and implement ecologically and hydrologically sensitive stormwater management practices (i.e. wetland setbacks, level spreader outlets, more on-site infiltration, etc.).

## **Permanent Habitat Protection Recommendations**

### **Recommendation 5-2:**

Encourage developers of the Pingree Creek Subdivision to preserve and protect all of ADID Wetlands #466 from encroachment by new development. This 80+ acre wetland complex extends northwest of the Damisch Road / Highland Avenue intersection.

**Type:** Permanent Habitat Protection / Site Restoration

**Target Goals:** Goal 1, Objective 1, Goal 2, Objective 3

**Initial Cost:** (planning & coordination time between developer and municipal staff)

**Annual Cost:** \$0

**Responsible Party:** City of Elgin

**Priority:** High

### **Recommendation 5-3:**

Encourage developers of the Pingree Creek Subdivision to preserve and protect all of ADID Wetlands #535 from encroachment by new development. This wetland occupies 85 acres of low lands extending southeast of the Damisch Road / Highland Avenue intersection.

**Type:** Permanent Habitat Protection / Natural Habitat Restoration

**Target Goals:** Goal 1, Objective 1, Goal 2, Objective 3

**Initial Cost:** (planning & coordination time between developer and municipal staff)

**Annual Cost:** \$0

**Responsible Party:** City of Elgin

**Priority:** High

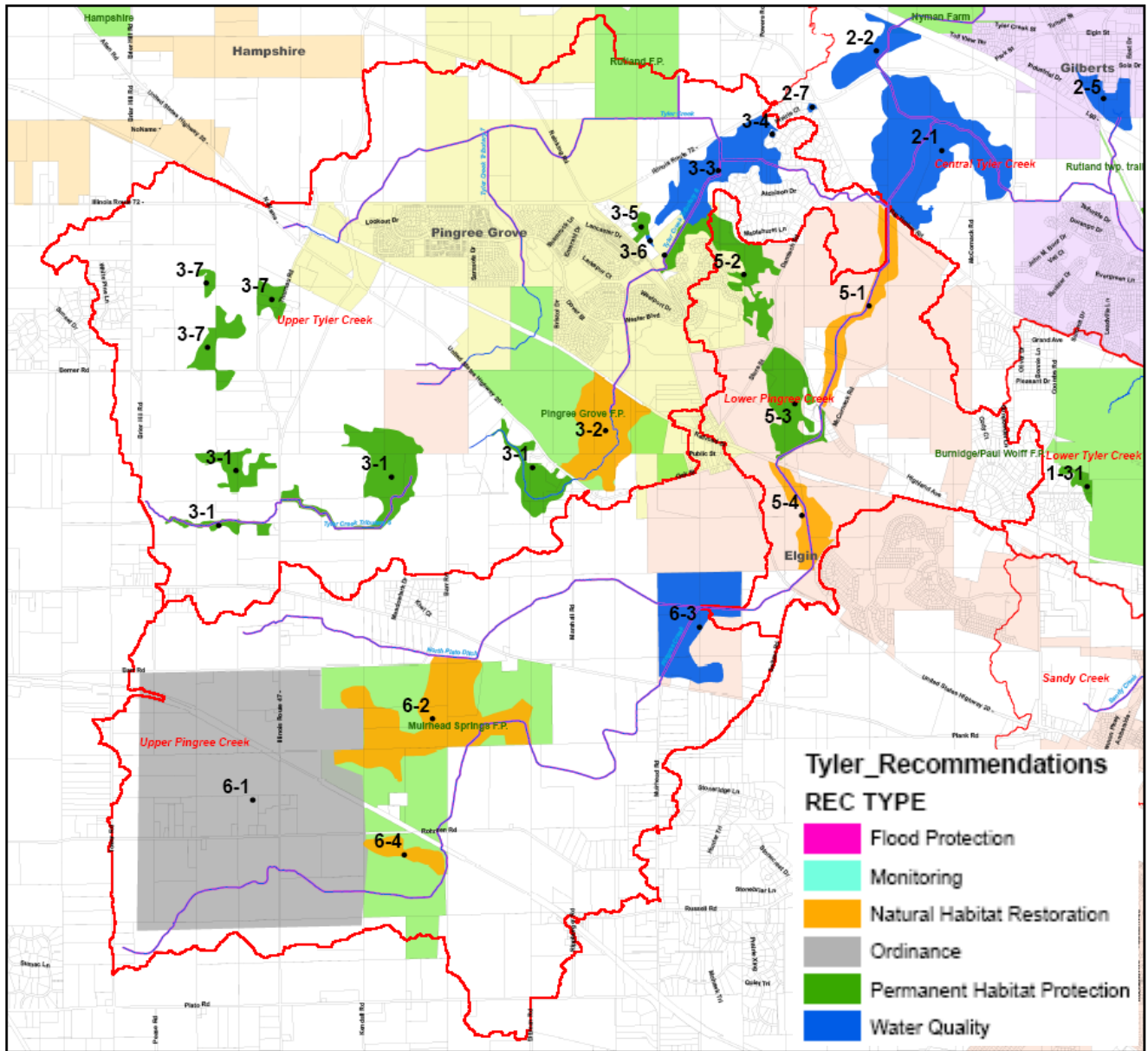


Figure 9.5 Lower Pingree Creek subwatershed recommendations location map

REC NUMBER	REC TYPE	DESCRIPTION	RESPONSIBLE PARTY	INITIAL COST	ANNUAL COST	PRIORITY
5-1	Natural Habitat Restoration	Encourage new developments along Pingree Creek to include stream corridor restoration plans in development construction to remove invasive species and restore stream corridor habitat	City of Elgin	N/A	N/A	High
5-2	Permanent Habitat Protection	Permanently protect ADID Wetland 466	City of Elgin	N/A	N/A	High
5-3	Permanent Habitat Protection	Permanently protect ADID Wetland 535	City of Elgin	N/A	N/A	High
5-4	Natural Habitat Restoration	Encourage new developments along Pingree Creek to include stream corridor restoration plans in development construction to remove invasive species and restore stream corridor habitat	City of Elgin	N/A	N/A	High

Table 9.9 Lower Pingree Creek Subwatershed Recommendations Summary Table

Recommended BMPs, costs and projected load reductions in the Lower Pingree Creek subwatershed are summarized in Table 9.10. Based on the monitoring results of one site, nutrients do appear to cause impairments such as low DO. There are many opportunities for restoring wetlands. Wetlands provide multiple benefits such as habitat enhancement and water quality improvements. The monitoring plan presented in the Chapter 13 will assess the effectiveness of these measures when they are implemented.

Table 9.10 Recommended BMPs for the Lower Pingree Creek Subwatershed

BMP Category	BMP Location	Project Locations <sup>2</sup>	BMP		Removal Efficiency**			Total Cost (\$)	Pollutant Load Reduction (lbs/year)			Percentage Reduction (%)		
			Size	Unit	TN	TP	TSS		TN	TP	Size	Unit	TN	TP
Natural Habitat Restoration	Site-specific	5-1, 5-4	135	acres	30%	35%	60%	-	914	106	108	11.1	12.9	22.2
Permanent Habitat Protection	Site-specific	5-2, 5-3	165	acres	53%	51%	88%	-	1,974	189	194	24.0	23.1	39.8
Rain Gardens	Watershed	Subwatershed wide – urban parcels	1	acres	46%	61%	10%	\$10,700	10	1	0	0.1	0.2	0.0
Nutrient Management	Watershed-specific	Subwatershed wide – agricultural parcels	180	acres	70%	28%	-	\$18,000	2,845	113	-	34.5	13.8	-
Regulatory	Watershed-Specific	Subwatershed wide	1	lump sum	-	-	-	\$10,000	412	41	24	5.0	5.0	5.0
Total								\$38,700	6,156	451	326	74.7	55.0	67.0

<sup>2</sup> = Site specific location numbers correspond with BMPs specified in table 9.9 and map figure 9.5

\*\* TN = total Nitrogen; TP = total Phosphate; TSS = total Suspended Solids or Sediment; “-“ = “not available” or nominal values have been applied.

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