

Chapter 10

UPPER PINGREE CREEK SUBWATERSHED

10.1.1 Subwatershed Location

Upper Pingree Creek is a subwatershed located in the southeastern portion of the Tyler Creek Watershed. This subwatershed has an area of 5,361 acres, or 8.4 square miles. The boundary of the Upper Pingree Creek subwatershed shown in Figure 10.1. The subwatershed is located within Plato Township and is roughly bordered by Tower Road to the west, Plato Road to the south, Muirhead & Switzer Roads on the east, and parts of US Route 20 and Plank Road on the north.

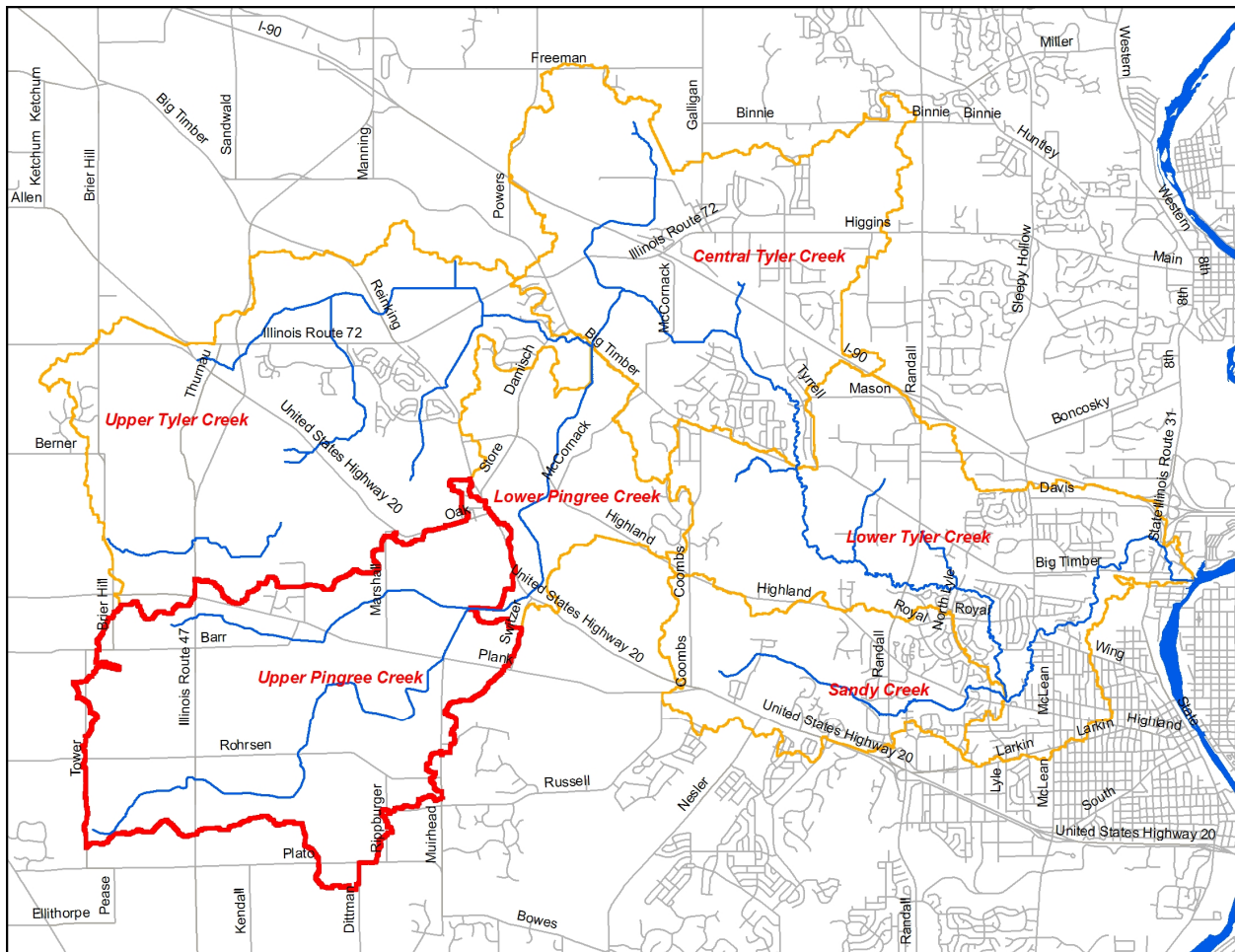


Figure 10.1. Subwatersheds in the Tyler Creek Watershed

10.1.2 Topography & Geology

The topography of the subwatershed ranges from extremely flat (<1%) in the eastern two-third's of the subwatershed to gently sloping (2%) in the western one-third. The high point in the subwatershed is elevation 1,058 feet and the lowest point is at elevation of 902 where Pingree Creek exits the subwatershed.

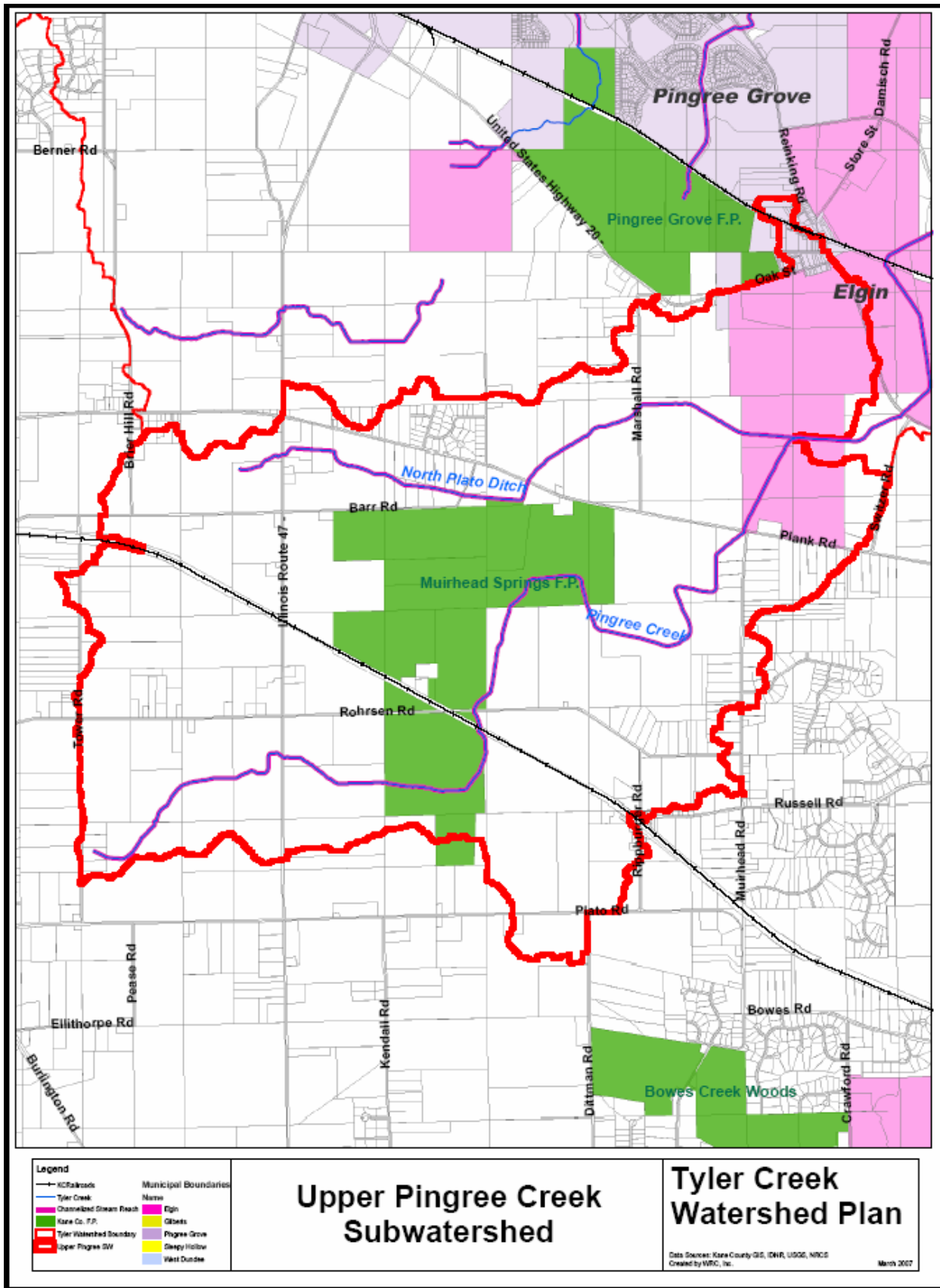


Figure 10.2 Upper Pingree Creek Subwatershed Map

10.1.3 Soil Conditions

The glacial advances result in a wide variety of soil map units. The soils in the Lower Pingree subwatershed consist of mainly silty 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 2,265 acres, or 42% of the 5,361 acre subwatershed, and indicate those areas that contain functional wetlands, or former / degraded wetland areas that could be restored or enhanced.

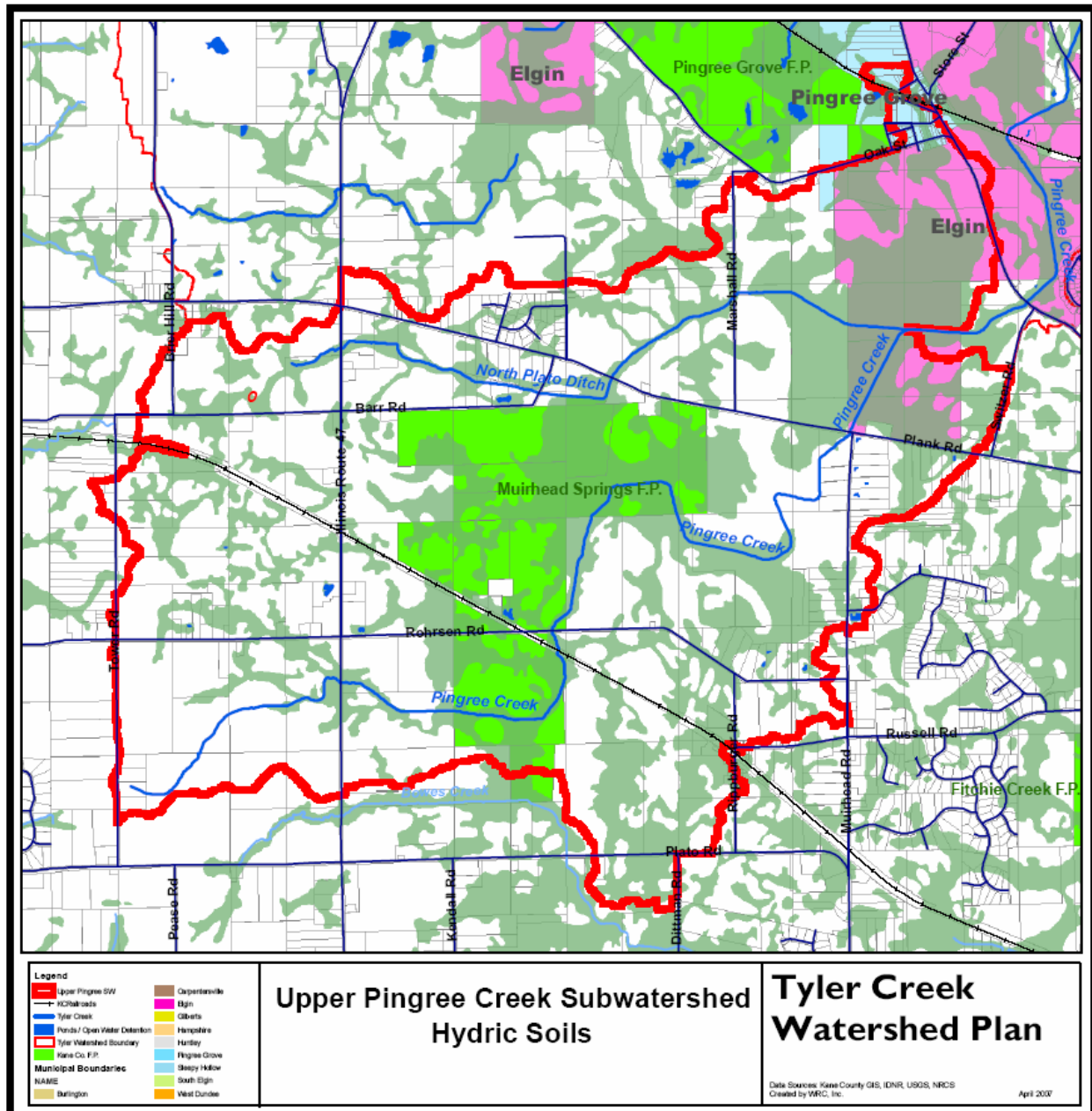


Figure 10.3: Hydric Soils

10.1.4 Subwatershed Drainage

Streams

The stream system of the Upper Pingree Creek subwatershed has been completely disturbed by human activities. Historically, the drainage system of the Upper Pingree Creek Subwatershed was likely made up of wide, shallow wet prairies which retained and infiltrated most of the precipitation and snowmelt. These wet swales exhibited few characteristics similar to those of what we now consider a “normal” stream channel. This type of wetland drainage system was not conducive for the agricultural demands set forth by the early settlers of the region, and so, by the 1920’s these flat, slow-draining landscapes were ditched and channelized to lower the water table and more efficiently move runoff downstream and away from the farmer’s crops. The result is the Upper Pingree subwatershed has experienced 100% channelization and has lost nearly all of its natural features.

There are only two stream channels in the subwatershed. The first is Pingree Creek, which extends from the subwatershed outlet upstream to the southwest, near the intersection of Tower Road and Plato Road. The Pingree Creek stream corridor is only 15 to 30 feet wide on either stream bank and is largely composed of brome grass and to some degree invasive species, such as Reed Canary Grass. Trees only the stream corridor are typically isolated and almost all are low quality or invasive species, such as Box Elder and Buckthorn.

The only tributary to Pingree Creek in this subwatershed is the North Plato Ditch. The characteristics of this stream channel can be inferred by its very name – the stream exists today as a channelized ditch through agricultural fields. The stream corridor surrounding North Plato Ditch has likewise been narrowed to 15 to 30 feet on either side of the channel and is mostly composed of perennial grasses. About one-third of the stream’s length (near Plank Road) has some tree cover along the channel.

Analysis of aerial photography and field investigations revealed that the entire stream system in the subwatershed has is more or less a constructed agricultural ditch.

Urban Drainage Systems

Analysis of land uses and aerial photography suggests that there are very few, if any, storm sewers or stormwater detention basins. There may be a few small networks of storm sewers and a couple of small detention basins in the two urbanized areas that partially extend into the subwatershed – downtown Pingree Grove and the northwest portion of Plato Center. Both of these areas are far from the two stream channels and runoff from these areas likely drain either overland or through old agricultural field tiles to the streams.

Agricultural Tile Systems

Identifying agricultural drain tile networks is important because local flooding & drainage problems are often due to drain tile failure or the inadvertent removal or disconnection of a tile from a contributing tile system. 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 recreating valuable wetland habitat. No doubt 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 diverse ecosystem. In the case of the Upper Pingree Creek Subwatershed, there is evidence that as much as 50% of the subwatershed is drained by agricultural drain tile networks.

10.1.5 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 419 people, or 50 persons per square mile.

10.1.6 Landuse / Landcover

Land cover data for the Tyler Creek Watershed is available from the IDNR using LANDSAT data collected between 1998 and 1999. The dominant land cover, according to this data, was row crop agriculture, which accounted for roughly 83% of the subwatershed area. Rural grasslands accounted for another 11%, while wooded areas and wetlands account for an additional 2% of the subwatershed. Urban land cover, including urban grassland comprised the remaining 4% of the subwatershed.

Land Cover Description	Total Acres	Percent of SW
Barren & Exposed Land	5.2	0.10%
Corn, Soybeans, Other Small Grains & Hay (row crop agriculture)	4,469.6	83.37%
Winter Wheat	0	0.00%
Rural Grassland	605.6	11.30%
Low Density Urban	99.8	1.86%
Medium Density Urban	41.8	0.78%
High Density Urban	3.3	0.06%
Urban Grassland	50.8	0.95%
Shallow Marsh – Emergent Wetland	7	0.13%
Shallow Water Wetland	0	0.00%
Partial Forest /Savannah Upland	31.8	0.59%
Upland Forest	44.4	0.83%
Floodplain Forest	0.6	0.01%
Coniferous Forest	0	0.00%
Deep Marsh / Emergent Wetland	0.005	0.00%
Open Water	1.2	0.02%
TOTAL	5,361.1	100.00%

Table 10.1

10.1.7 Existing Watershed Development

Development in the subwatershed to date has been limited almost exclusively to large lot, rural / estate residential, where parcel sizes are larger than 1.25 acres. There about 100 of these residential lots in the subwatershed as of 2006. There are approximately 13 smaller residential lots in Pingree Grove in the Upper Pingree subwatershed, and there about six residential lots in Plato Center which drain towards Pingree Creek. The only other development to speak of in the subwatershed is the presence of about 20 commercial / industrial parcels totaling 21 acres.

These properties are located either in Pingree Grove or on the northwest side of Plato Center, of which a portion lies within the Upper Pingree subwatershed.

Municipality	Area (acres)	Percent of SW
Elgin	465.3	8.7%
Pingree Grove	49.2	0.9%
Unincorporated	4,846.5	90.4%

Table 10.2

There are 17.6 miles of roads in the subwatershed, which equates to about 60 acres of impervious cover (roadway pavement only – excluding parking lots, sidewalks, and driveways).

10.1.8 Natural Resources

Kane County Forest Preserve Properties

There is one Kane County Forest Preserve in the Upper Pingree Creek subwatershed; Muirhead Springs Forest Preserve. It has an area of 742 acres, or 13.8% of the subwatershed area.

Name	Area (acres)
Muirhead Springs FP	742

Other Publicly Protected Land

The City of Elgin owns five parcels totaling 205 acres within the subwatershed. This property is located at the confluence of Pingree Creek and North Plato Ditch. This land is planned to become a future park site for the Elgin Park District for both active (ballfields) and passive recreation.

Wetlands

Kane County completed an Advanced Identification (ADID) Wetland Study in 2004. This study identified a total of 32 wetlands, totaling 150.1 acres, or 3% of the Upper Pingree subwatershed. Of these, two wetlands, totaling 33.5 acres (22%) were determined to be of High Quality or High Functional Value, the highest rating under the ADID classification system.

ADID Code	Wetland Type	Number of Wetlands	Total Area (acres)
HFV	High Functional Value	2	33.5
HHQ	High Habitat Quality	0	0
APH	Artificial Pond in Hydric Soils	4	2.9
APN	Artificial Pond in Non-hydric Soils	1	0.2
LWF	Linear Water Feature	6	75.7
NOW	Natural Open Water	0	0
FW	Farmed Wetlands	6	20.0
R	Fox River	0	0
W	Other Wetlands (lower quality)	13	17.8
	TOTAL	32	150.1

Table 10.3 ADID Wetlands

There are no known fens or fen recharge areas identified within the Upper Pingree subwatershed.

Threatened & Endangered Species

The Kane County ADID Wetland Study indicates that there are no Threatened or Endangered species located in the Upper Pingree subwatershed.

Existing Greenways

There are no formal greenways established in the subwatershed, as almost all of the land is privately owned and used for row crop agricultural. Kane County Forest Preserve owns about 1.5 miles of stream corridor along Pingree Creek where it passes through the Muirhead Springs Forest Preserve. However, this forest preserve is still being used for agricultural uses and the stream corridor is less than 50 feet wide in most places.

10.2 Analysis of Subwatershed Data and Problem Identification

10.2.1 Water Quality Data

The EPA 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. At this time, the FRWMN does not have a monitoring station in the Upper Pingree Creek subwatershed. The closest station is about two miles downstream in the Lower Pingree subwatershed, where Pingree Creek crosses Highland Avenue.

Because there are no monitoring stations in the subwatershed, it is impossible to quantify the water quality characteristics of Pingree Creek or its tributaries in this subwatershed. At least one water quality monitoring station should be established to collect periodic data on water quality constituents or benthic macroinvertebrates. Sampling benthic macroinvertebrates (as done by the FRWMN) is a simple procedure that could be accomplished with volunteers and would provide at least qualitative information about the habitat in the stream channel and the quality of the water flowing through the sample reach.

10.2.2 Flooding Problems

There are no documented flooding problems along Pingree Creek or North Plato Ditch in this subwatershed. The 100-year floodplain has not been accurately mapped in the subwatershed, as the floodplain shown on both streams is only estimated by FEMA (Zone A). It is likely that the lower portions of the subwatershed (eastern half) contain vast expanses of floodplain, given the flat topography and hydric soils that predominate this area. A detailed mapping effort should be undertaken to accurately map the 100-Year Floodplain for Pingree and North Plato Ditch before the subwatershed undergoes any further development on a large scale.

10.2.3 Projected Development & Growth

More than 95% of the Upper Pingree Creek subwatershed falls within the City of Elgin's Comprehensive Plan Area. Of the remaining undeveloped land (estimated to be about 4,000 acres), all but 175 acres is planned for residential or office/commercial/light industrial development. Past development history in the region has shown that the developments of this type create huge amounts of new impervious surfaces, strip existing topsoil and create pervious surfaces (lawns) which have almost no infiltrative properties, and cram "ecologically poor quality" stormwater control facilities (detention basins) in the floodplain as close as possible to the receiving stream (or sometimes ON the stream).

10.2.4 Estimated Pollutant Loads

Annual pollutant load estimates in the Upper Pingree Creek subwatershed under existing and future condition land uses are summarized below. Future loads calculations assumed low density residential development will replace farmland. Presently, less than 2% of the watershed is urbanized. Therefore nutrient and sediment loads will be the major pollutants of concern for the foreseeable future. Agricultural BMPs for reducing nutrient loads are discussed in Chapters 3 and 4.

Pollutant	Existing Conditions	Future Conditions
Total N (lbs./yr)	37,757	30,723
Total P (lbs./yr)	3,893	3,016
Sediment (tons/yr)	2,082	1,938
Runoff (acre-ft per yr.)	1,518	1,588
Fecal Coliform (in 10 ⁹ FCU)	29,661	29,729

Table 10.4 Estimates of annual pollutant loads in the Upper Pingree Creek Subwatershed

10.2.5 Natural Area Protection Problems

Wetlands

Nearly all of the historic wetlands that once dominated the subwatershed (40+ percent of the area) have already been lost to agricultural activities of the last 150 years. Only 150 acres remain, and half of that total is limited to the narrow ribbon of vegetation that borders the two stream channels. Therefore, it is imperative that the existing wetland resources be protected from further encroachment when the land is converted from agricultural landuse to suburban landuses.

10.3 Subwatershed-specific Recommendations to Protect Watershed Resources

The following is a summary of recommendations for the Upper 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 Section 2.4. Note that there are several general or watershed-wide recommendations contained in Chapter 4, Watershed Plan Recommendations.

Type: Education/Outreach; Regulatory; 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.

Ordinance/Planning Recommendations

Recommendation 6-1

Direct development plans for parcels in this subwatershed to implement the maximum number of water quality BMPs possible. Given the extensive amount of development proposed, the limited natural area resources (wetlands) in this subwatershed, and the proliferation of high quality wetlands and stream reaches in downstream subwatersheds, the goal in this subwatershed is to protect what little natural areas remain (narrow stream corridors) while making every effort possible to infiltrate stormwater and treat runoff leaving developments before it enters Pingree Creek or North Plato Ditch.

Type: Regulatory

Target Goals: Goal 2, Objective 1

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

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

Responsible Party: City of Elgin

Priority: High

Natural Area Restoration

Recommendation 6-2

Construct broad wetland treatment basins (235 ac.) on KCFP property for to recreate much-needed natural habitat in the subwatershed. Additional benefits include pollutant removal from upstream agricultural as well as treating runoff discharged onto KCFPD property from future upstream developments.

Type: Restoration & Water Quality

Target Goals: Goal 2, Objective 1

Initial Cost: \$2,350,000

Annual Cost: \$40,000

Responsible Party: Kane County Forest Preserve District

Priority: Low

Recommendation 6-3

Construct regional-scale water quality best management practices at the 224 acre park site under development by the City of Elgin. Park development should include site-scale BMPs to mitigate pollutant loading from the proposed active-recreation / playing field areas of the park as well. If possible, implement a water quality monitoring program to measure effectiveness of various BMPs installed to accommodate specific landuse types (parking lot, playing field, etc.)

Type: Natural Habitat Restoration & Water Quality

Target Goals: Goal 2, Objective 1

Initial Cost: \$1,600,000

Annual Cost: \$25,000 (for monitoring and water quality reporting)

Responsible Party: City of Elgin

Priority: High (since project is already in design process)

Recommendation 6-4

Construct broad wetland treatment basins (29 ac.) on KCFP property south of Rohrsen Road to recreate much-needed natural habitat in the subwatershed. Additional benefits include pollutant removal from upstream agricultural runoff in the and as well as to treat runoff discharged onto KCFPD property from future upstream developments.

Type: Natural Habitat Restoration & Water Quality

Target Goals: Goal 2, Objective 1

Initial Cost: \$435,000

Annual Cost: \$10,000

Responsible Party: Kane County Forest Preserve District

Priority: Low

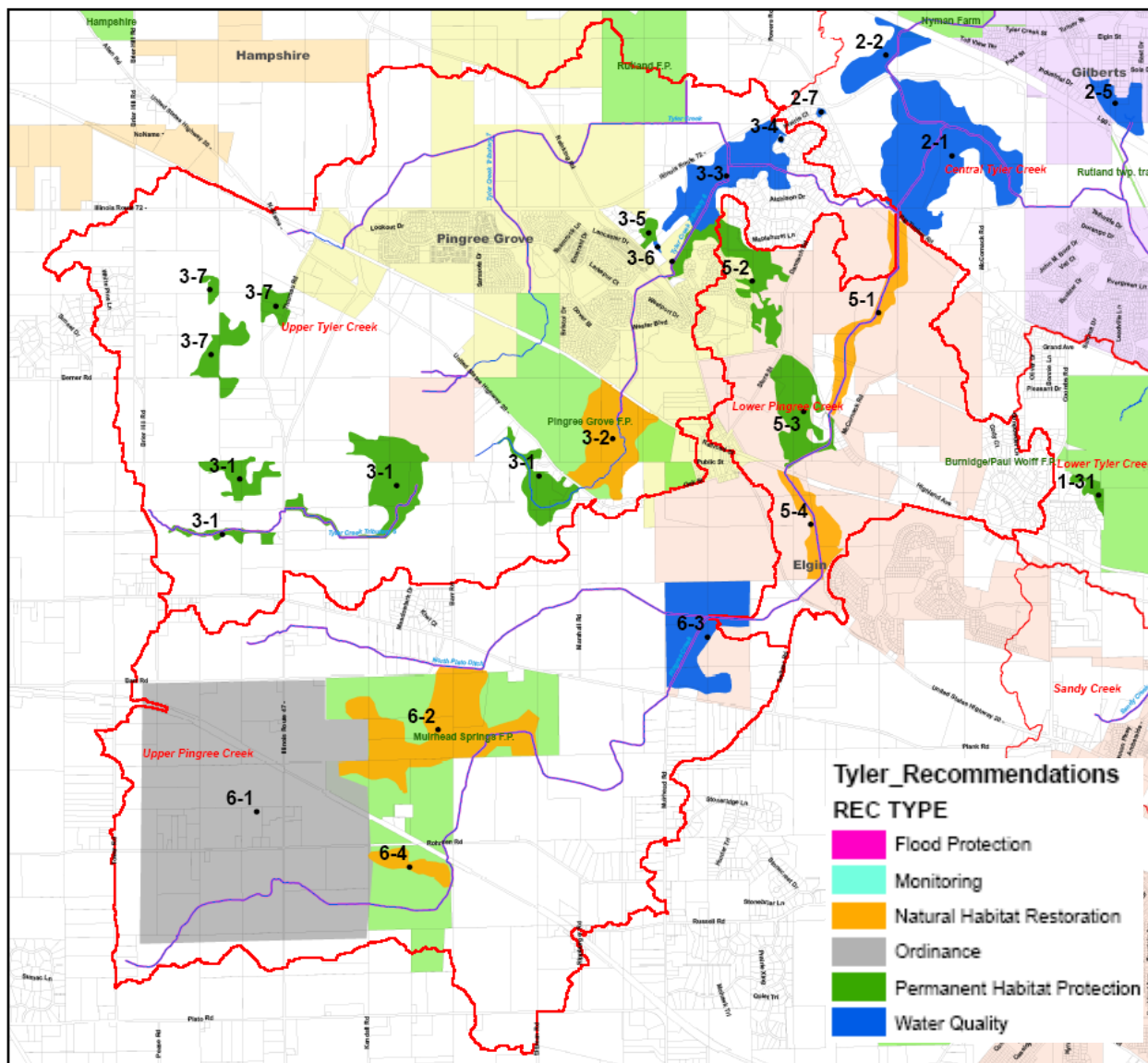


Figure 10.5 Site-specific recommendations for the upper watershed area.

REC NUMBER	REC TYPE	DESCRIPTION	RESPONSIBLE PARTY	INITIAL COST	ANNUAL COST	PRIORITY
6-1	Ordinance	Implement BMP programs for all future developments in Upper Pingree Cr SW	City of Elgin	N/A	N/A	High
6-2	Natural Habitat Restoration	Reconstruct wetland on KCFP property north of Rohrsen Road for habitat and treatment of runoff from future developments upstream	KCFPD	\$2,350,000	\$40,000	Low
6-3	Water Quality	Reconstruct wetlands at future Elgin park site for habitat and treatment of runoff from future upstream development	City of Elgin	\$1,600,000	\$25,000	High
6-4	Natural Habitat Restoration	Reconstruct wetland on KCFP property south of Rohrsen Road for habitat and treatment of runoff from future developments upstream	KCFP	\$435,000	\$10,000	Low

Table 10.5 Summary of Best Management Practices recommended for the Upper Pingree Creek Subwatershed

Table 10.6 presents BMPs costs and projected load reductions in the Pingree Creek subwatershed. There are no water quality monitoring stations in this subwatershed. Therefore in order to monitor the effectiveness of the BMPs in improving water quality and enhancing ecological conditions, a monitoring station has been recommended for this watershed. The pollutants of concern currently are nutrients produced from agricultural land uses & activities.

Table 10.6 Recommended BMPs for the Upper Pingree Creek Subwatershed

BMP Category	BMP Location	Project Locations ²	BMP		Removal Efficiency**			Total Cost (\$)	Pollutant Load Reduction (lbs/year)			Percentage Reduction (%)		
			Size	Unit	TN	TP	TSS		TN	TP	TSS	TN	TP	TSS
Natural Habitat Restoration	Site-specific	6-2, 6-4	264	acres	30%	35%	60%	\$2,785,000	2,789	335	308	7.4	8.6	14.8
Conservation Development Practices	Site-specific	6-1	1	lump sum	52%	58%	64%	-	3,479	400	236	9.2	10.3	11.3
Construct Water Quality Facility	Site-specific	6-3	224	acres	52%	58%	64%	\$1,600,000	4,102	472	278	10.9	12.1	13.4
Regulatory	Watershed-Specific	Subwatershed wide	1	lump sum	5%	5%	5%	\$10,000	1,888	195	104	5.0	5.0	5.0
Nutrient Management	Watershed-specific	Subwatershed wide – agricultural parcels	200	acres	70%	28%	-	\$20,000	4,930	203	-	13.1	5.2	-
Rain Gardens	Watershed	Subwatershed wide – urban parcels	1	acres	46%	61%	10%	\$10,700	16	2	0	0.0	0.1	0.0
Total								\$4,425,700	17,204	1,608	926	45.6	41.3	44.5

² = Site specific location numbers correspond with BMPs specified in table 10.5 and map figure 10.5

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

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