Chapter 2
Watershed Summary

2.1 Location and Regional Context

The Tyler Creek watershed is located in central Kane County, Illinois. Tyler Creek is a tributary to the Fox River, draining about 40.5 square miles of rural and urbanizing land in Elgin, Rutland, Dundee, and Plato townships. Tyler Creek begins in the farm fields southwest of Starks Corner (west of IL Route 72 & IL Route 47 intersection) and travels east through Rutland Township and then southeast through the City of Elgin, where it enters the Fox River on the Judson College campus about 1.5 miles upstream of the Kimball Street Dam. Tyler Creek is about 16 miles in total length and has 2 major tributaries: Sandy Creek, and Pingree Creek. The other major tributary is North Plato Ditch, which drains into Pingree Creek. Tyler Creek also has 7 smaller, unnamed tributaries.

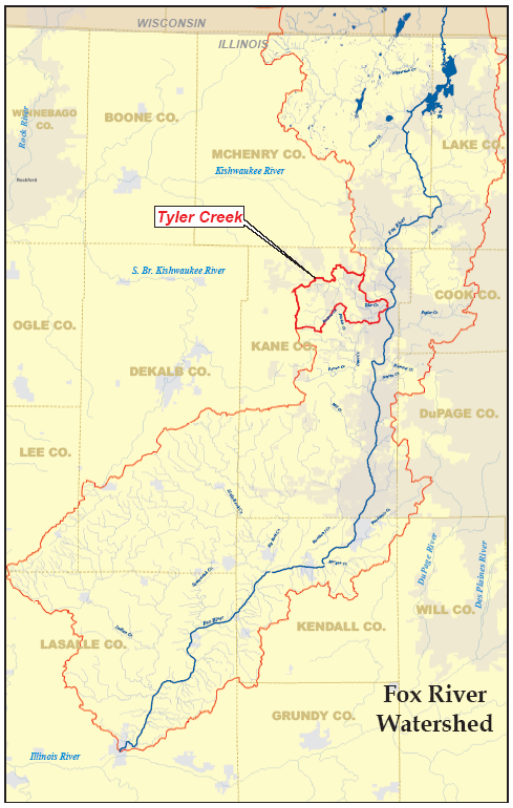

Figure 2.1 Watershed Location Map

The Tyler Creek watershed was formed about 12,500 years ago near the end of the Wisconsinan Glacial Period. The landscape present today in the watershed is a result of ice sheets more than 2,000 feet thick pushing across Kane County from what today is Lake Michigan and leaving behind sand, gravel and soil deposits as the glaciers retreated eastward.

At the westernmost end of the Tyler watershed, the glacier remained in position long enough to create the Marengo Moraine, which is the ridge we observe running parallel to and just west of IL Route 47. This moraine forms the watershed boundary on the west and is the source of the headwaters that form Tyler Creek and its western tributaries. Just east of the moraine, the landscape of western Rutland and Plato townships is very flat, punctuated by a few smaller hills and ridges. These flat plains formed under water, as the quiet deposits of shallow lake beds. The glacial ice melted rapidly in this area, trapping water between the Marengo Moraine on the west and the retreating ice of the glacier to the east. The lakes were temporary, but existed long enough to create distinct types of soil. Geologists have determined that the area around Pingree Grove was once submerged under a large glacial lake of several thousand acres.

Interjected among the lake plains was a confusion of broken ice blocks and materials carried by the receding glacier. As the glacier receded, it created a rough “morainic” area with knobs (hills) and kettles (depressions) known as the Gilberts Moraine, where one can see the kames, eskers and other ice-contact sand and gravel deposits at the far northern edge of the Tyler Creek watershed.

Near the end of the glacial period in the Tyler watershed, the glacier deposited a third moraine at the east end of the watershed, known as the Minooka Moraine. This moraine is the high ground just west of the Fox River, and can be seen in the Tyler watershed where Tyler Creek cuts through it, creating the bluffs in Wing Park and further downstream near Route 31 in the Tyler Creek Forest Preserve.

The first pioneers settled in the Tyler Creek watershed in the late 1830s, and by the 1880s, the landscape had been converted from one of prairies, oak groves and savannas to a landscape dominated by crop fields and pastures.

2.2 Natural Resources

2.2.1 Landscape Resources

Based upon the Land Cover of Illinois 1999-2000 inventory, the watershed was comprised of 67% agricultural lands (row crops, pastures, etc.), 22% development, and 11% natural landscapes such as wetlands, woodlands, and streams, ponds, etc.. Despite the development and extensive agricultural landuses, the watershed still maintains several hundred acres of upland forests, partial forest savannahs, as well as shallow and deep marsh-emergent wetlands.

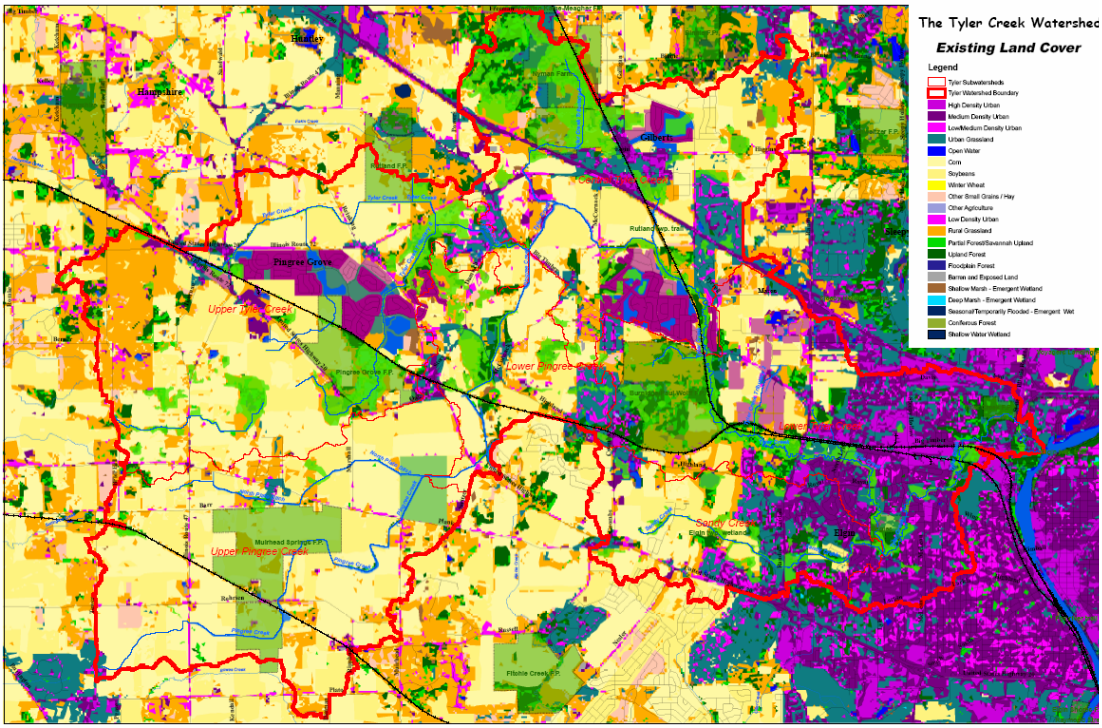

Figure 2.2 Existing Landcover in the watershed (Landcover of Illinois 1999-2000 updated with new developments in watershed as of 2006)

Tyler Creek itself is 16.8 miles long. The lower half (56%) of Tyler Creek is not channelized and still retains a rather natural stream corridor, although the corridor is extremely narrow in areas east of Randall Road due to urban encroachments. Nearly all

of the Tyler Creek and its tributaries upstream of Big Timber Road have been ditched (lowered) and channelized (straightened) in the past to increase agricultural productivity of the rich soils that dominate the Tyler Creek Watershed. These stream channels are characterized as heavily incised, silt or sand bottom channels centered in a very narrow band (< 80 ft) of herbaceous (grass) vegetation.

2.2.1.1 Wetlands

Historically, about 63% (9433 acres) of the Tyler Creek watershed was comprised of wetlands. Today, only 30% (2,800 acres) of those wetlands remain, comprised of 315 complexes including marshes, sedge meadows, floodplain forests, and small fens and seeps. Fifteen of these wetlands, or 837 acres, are classified as High Habitat Quality wetlands, meaning that they possess ecological qualities that make them unique and extremely valuable compared to other wetlands in Kane County.

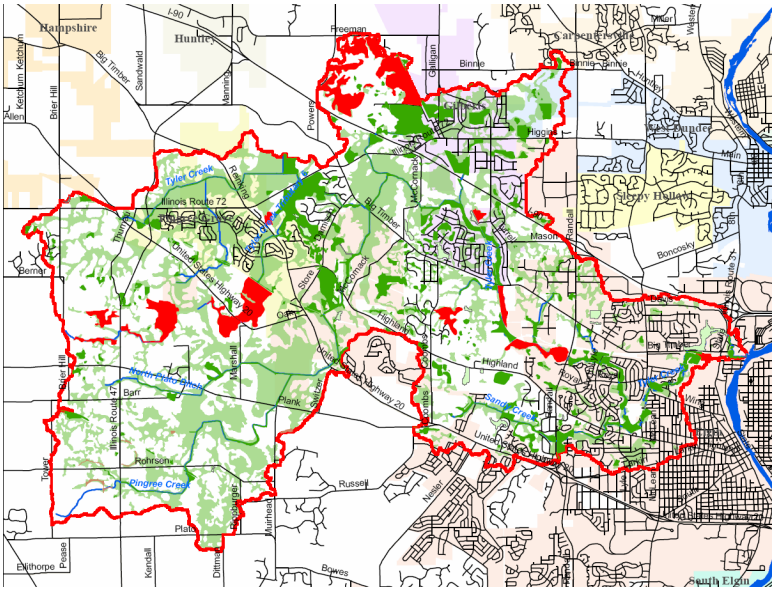

Figure 2.3 Map of Tyler Creek watershed indicating High Quality Wetlands & Stream Corridors in red. Hydric soils are light green and other wetlands are shown in dark green.
Source: Kane County ADID Wetland Study

These high quality natural areas are generally located in 3 areas of the watershed: the far north edge of the watershed northwest of Gilberts near Freeman Kame; the west of downtown Pingree Grove in the Pingree Grove Forest Preserve and along the upstream low lying areas that drain eastward into the Forest Preserve; and the Tyler Creek stream corridor between Big Timber and Randall Road.

2.2.1.2 Forest Preserves & Publicly Owned Land

There are nine County Forest Preserves in the watershed, totaling 2,385 acres, or 9% of the watershed. The City of Elgin, Village of Gilberts, and the Village of Pingree Grove own additional 121 parcels of land totaling 760 acres (3% of the watershed). This total only includes parcels that are used for open space or stormwater management (excludes fire stations, village halls, etc.).

2.2.2 Biological Resources

2.2.2.1 Fishery

Tyler Creek supports more than 30 species of fish, including large and smallmouth bass, channel catfish, sunfish (Green Sunfish & Bluegills), and various lesser-known species of chubs, minnows, darters. While not generally seen (or known about) by the general public, many of these lesser known fish species are extremely sensitive to pollutants in the water and are therefore excellent indicators as to the quality of the water in a stream. As of the last IDNR fish survey in 2002, Tyler Creek is home to 6 pollution-intolerant species, which were found mostly between Big Timber Road and Randall Road. This indicates that the water quality in Tyler Creek near Randall Road was fairly good at that time. Downstream of Randall Road, only 2 pollutant tolerant species of fish were found (within the Tyler Creek F.P.).

Aside from the water quality, the other major factor that determines the health of Tyler Creek's fishery is the presence of good habitat. Good habitat is represented by sand and gravel channel bottom, alternating pool and riffle stream features, stable stream banks, and lush vegetation buffering the stream channel. The segment of Tyler Creek that contains these characteristics can be found between the Gilberts WWTP (just north of Big Timber Road west of Tyrell Road) and Randall Road.

Almost all the fish species in Tyler Creek are native to the Fox watershed, except for the common carp, which has invaded virtually all of our streams and lakes in northeastern Illinois.

2.2.2.2 Mussels

There are 27 species of mussels found in the Fox River and it's tributaries within Kane County. Of these, only 5 species are documented as being found in Tyler Creek. They include:

- Slippershell (St-Threatened)
- Cylindrical papershell
- White heelsplitter
- Creek heelsplitter
- Ellipse

2.2.2.3 Threatened and Endangered Species

There is limited information available about the presence of Threatened or Endangered Species in the Tyler Creek Watershed. The Kane County Forest Preserve does not currently have a database or formal system of records that documents the occurrence of T&E species inhabiting any of it's properties in the watershed. Personel communications with KCFPD staff suggest there are at least a dozen Threatened or Endangered bird species in the Tyler Watershed, the State Threatened Blanding's Turtle and Franklin Ground Squirrel, and many rare species of native plants in the remaining wetlands and woodlands. There are no documented species of T&E fish in the watershed. The only documented aquatic T&E species is the State-Threatened

Slippershell Mussel, which has been found in the vicinity of the Big Timber Road bridge adjacent to the Camp Big Timber Boy scout Camp.

2.2.3 Water Quality

The Illinois Environmental Protection Agency (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 waterbodies (?) 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 bacteria. This bacteria, 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 maintains three water quality sampling stations in the watershed; all located in the Lower Tyler Creek Subwatershed. They are listed in the table below:

Station	Stream	Location
DTZP01	Tyler Cr.	Tyler Creek at Illinois Route 31 Bridge
DTZP02	Tyler Cr.	Tyler Creek below stone bridge at Tyler Creek Forest Preserve
DTZP04	Tyler Cr.	Tyler Creek at Randall Road

Table 2.1: IEPA Sampling Stations in the Tyler Creek watershed

The Fox River Watershed Monitoring Network (FRWMN), administered by the not-for-profit group, *Friends of the Fox River*, maintains ten volunteer stream monitoring sites on Tyler Creek. During 2005 and 2006 monitoring periods, the ten FRWMN sites in the watershed reported water quality index values (based on macroinvertebrate sampling) as Fair to Poor. Many of the "Poor" classifications occurred during 2005 when the watershed experienced a severe drought, which likely impacted the number and distribution of macroinvertebrates in the stream channel at the sampling sites.

In 2004, the Valley of the Fox Chapter of the Illinois Sierra Club published a short report on the water quality of streams in the Middle Fox River Area. This study used data collected by Sierra Club volunteers for 12 streams in the Fox Watershed over a three year period.

Stream Name	Phosphate-P	Nitrate – N	Ammonia – N	Chloride	Sulfate	Turbidity
	mg/L	mg/L	mg/L	mg/L	mg/L	Ftu
Tyler Cr.	0.31	2.61	0.13	49.6	60.0	21.4

Table 2.1 Sierra Club Tributary Streams Project Monitoring Results for Tyler Creek
mg/L = milligrams per liter
Ftu =Formazin **Turbidity** Unit

Sierra Club Notes:

1. There currently is no Illinois water quality standard for phosphorus. US EPA recommends 0.08 mg/l total phosphorus as a level indicative of a pristine stream in our ecoregion. Statewide, the average level of total phosphorus (of which phosphates are a subset) in Illinois rivers and streams is 0.38 mg/l.
2. There currently is no Illinois water quality standard for nitrates. USEPA recommends 2.18 mg/l total nitrogen as a level indicative of a pristine stream in our ecoregion. The average level of nitrate-N found in Illinois streams is 3.89 mg/l.
3. Ammonia water quality standards are based on the pH and temperature of the stream as well as the presence of sensitive early life stages of fish. For example, ammonia-nitrogen levels in Tyler Creek should not exceed a monthly average of 1.6 mg/l when early life stages are present. The average level of ammonia found in Illinois streams is 0.32 mg/l ammonia-N.
4. The Illinois water quality standard for both chloride and sulfate is 500 mg/l.
5. There currently is no Illinois water quality standard for turbidity.

The Sierra Club report summarized that of all the streams sampled, Tyler Creek received a “B” grade. The report indicated that water quality of Tyler Creek was roughly the same as Brewster Creek and Mill Creek, but was lower than that found on other Fox River tributaries, such as Poplar Creek, Norton Creek, Waubonsee Creek, Ferson Creek, and Indian Creek.

In 2004, Huff & Huff, Inc, completed a biological and water quality assessment of Tyler Creek between McCornack Road and Randall Road (Central Tyler Subwatershed & Lower Tyler Subwatershed). This study, prepared for the Village of Gilberts relating to expansion of their wastewater treatment plant, collected data on fish species, mussels, macroinvertebrates, and some water quality parameters (dissolved oxygen, phosphorus, nitrogen, and ammonia). The report indicated that during August 2004, dissolved oxygen levels dropped below 5 mg/L between McCormack Road and just downstream of the Gilberts WWTP. Dissolved oxygen in the higher quality sections of Tyler Creek (from Big Timber Road extending downstream to Randall Road) did not drop below the minimum 5 mg/L limit. This is in part due to the changes in stream channel gradient. Upstream of the Gilberts WWTP, the stream channel descends roughly four feet in elevation per mile, while downstream; the stream channel descends almost 24 feet per mile. The low gradient, and somewhat sluggish current in the upper reach, can contribute to warmer water temperatures and lower dissolved oxygen levels. In contrast, the much steeper channel gradient in the downstream reach provides opportunities for oxygenation of the water column, and the more heavily shaded stream corridor helps keep water temperatures lower.

2.3 Human Resources

2.3.1 Population

There are 6 municipalities that have jurisdiction within the Tyler Creek Watershed, although only 3 have significant holdings with any potential for future growth in the watershed.

Municipality	Area in Watershed (acres)	Percent of Watershed	Total Population in 2000[1]	Projected Total Population in 2030[1]
City of Elgin	6,484	25%	94,487	167,375
Village of Gilberts	2,074	8%	1,279	14,045
Village of Pingree Grove	1,878	7%	124	14,147
Village of West Dundee	300	1%	*	*
Village of Carpentersville	25.2	< 0.1%	**	**
Village of Hampshire	0.25	< 0.1%	**	**
Total	10,761	41%		

Table 2.2 Population and area of municipalities in the Tyler Creek watershed.

1. Northeastern Illinois Planning Commission 2030 Forecasts of Population, Households, and Employment by County and Municipality; Revised September 27, 2006

* Of the 300 acres of West Dundee in the Tyler Watershed, 180 acres are owned by the Dundee Park District (Randall Oaks). Dundee has a boundary agreement along the western edge with Gilberts and cannot annex any more property within the watershed. The other 120 acres of land currently under Dundee's jurisdiction is currently in agricultural and planned to become a business park in the future (Ii.e. no population increase). Therefore, population data for West Dundee is not used in the Tyler Creek Watershed Plan.

** Neither Hampshire nor Carpentersville have significant area within the watershed, and therefore their population data is not included in the Tyler Creek Watershed Plan.

The existing total population in the watershed was 23,064 in 2000, according to the U.S. Census Bureau. The Chicago Metropolitan Agency for Planning has prepared population projections for 2030 based on anticipated development patterns in Kane County. Using the municipal population projections and the municipal comprehensive land use plans, it is estimated that the population in the watershed will increase to about 44,000 residents (a 90% increase).

2.3.2 Development

2.3.2.1 Existing Development

There are more than 7,000 acres of urban/suburban development in the watershed as of 2006. Most of the development has occurred in the downstream eastern portion of the watershed, where 51% of the development is located in the lower 28% of the watershed (Lower Tyler and Sandy Creek subwatersheds). New development in the watershed between 1999 and 2006 amounted to about 1,200 acres, increasing the total amount of development in the watershed to about 27%. Nearly all of this new development

occurred in the upper reaches of Tyler Creek – within the Central Tyler and Upper Tyler Creek subwatersheds.

Subwatershed	Total Area (acres)	% Developed	% Agriculture	% Woodland / Forests	% Wetlands & Open Water
Lower Tyler	5,007	53%	29%	17%	1%
Central Tyler	5,194	24%	62%	12%	3%
Upper Tyler	6,366	7%	84%	7%	2%
Sandy Creek	2,217	42%	48%	8%	2%
Lower Pingree Creek	1,825	17%	71%	11%	1%
Upper Pingree Creek	5,361	4%	95%	1.5%	< 1%

Table 2.3 Summary of 1999 Landcover in Tyler Creek subwatersheds.

2.3.2.2 Future Development

The watershed is expected to undergo extensive and rapid development over the next 20 years. The City of Elgin's current inventory of development projects already in the planning/design phase amount at least 11 subdivisions constituting another 3,028 acres of development in the watershed that will be built in the next 5-6 years. This will raise the amount of development in the watershed to more than 38%. Analysis of undeveloped parcels in the watershed and Elgin's comprehensive land use plan indicate that an additional 5,480 acres will be developed into residential, commercial, and office/reaserch developments. The Village of Gilbert's comprehensive plan suggests that it will add 1,475 acres of office/industrial & residential development and the Village of Pingree Grove has plans for at least 740 more acres of development.

All totaled, the Tyler Creek subwatershed will see at least 3,028 acres of new development in the next 5-6 years and another 7,695 acres by the year 2030; possibly sooner. This will increase the total developed area in the watershed to 17,700 acres, or 68% of the total watershed area. Without a doubt, the future quality of Tyler Creek and remaining its natural areas will be largely determined by the land use decisions made by the officials and their constituents in the City of Elgin, the Village of Gilberts, and the Village of Pingree Grove.

Point Source Discharges

There is one permitted point source discharge in the watershed, according to IEPA NPDES data. The Gilberts WWTP, located about 1 mile upstream of Big Timber Road, has a NPDES permit (IL0068764) to discharge up to treated waste water effluent into Tyler Creek It is reported that this WWTP has an average discharge of 300,000 to 400,000 gallons per day. Plant discharge records can be found on-line at the IEPA's Envirofacts wetbsite at:

http://oaspub.epa.gov/enviro/ef_home2.water (enter “Gilberts, IL” in search box)

These records indicate that the plant is discharging within the restrictions set forth by IEPA and no violations have occurred to date.

The Village of Pingree Grove also maintains a wastewater treatment plant in the watershed, however their plant is a land application system that does not discharge into Tyler Creek or it’s tributaries (hence, no NPDES point source discharge permit is needed). Instead, the treated effluent is spray irrigated in designated areas and infiltrates the ground to recharge the underlying aquifers.

2.4 Watershed Impacts & Impairments

2.4.1 Existing Watershed Impacts & Impairments

The IEPA monitors the water quality of the lakes, streams, and rivers of the state. As part of their analysis, the IEPA identifies those water bodies that are not meeting their designated uses.

2.4.1.1 Watershed Impairment Causes Listed on the IEPA 303(d) List

Fecal Coliform

The year 2006 was the first time that Tyler Creek was listed on the Illinois 303(d) list. The cause of the Tyler Creek impairment was identified as the presence of fecal coliform. Specific sources identified in the 303(d) list included urban runoff from storm sewers, and runoff from forest / grassland / parkland. No consistent water quality samplings are available for Tyler Creek to verify the fecal coliform impairments. The IEPA standards for fecal coliform impairments are concentrations higher than 200 numbers per 100 milliliter of sample between the months of May and October.

Potential sources of fecal coliform bacteria include all warm blooded animals (humans, pets, domesticated livestock, birds, and wildlife). Due to the presence of municipal wastewater treatment throughout much of the developed portion of the Tyler Creek watershed, it is somewhat unlikely that that human waste is the source of fecal coliform. For instance, the Gilbert waste water treatment plant NPDES records show no fecal coliform violations. More likely sources include pastures where cattle or horses have access to the stream; flocks of Canada Geese congregating at stream-side parks and golf courses; or even domestic pet waste washed into storm sewers.

One of the major difficulties in developing management strategies for waters contaminated by fecal coliform bacteria is that there are numerous potential sources of bacteria, and the degree of contribution from any given source cannot be easily determined, without extensive water quality analysis. Bacterial source tracking (BST) is a recently developed technology for identifying the sources of fecal coliform bacteria and it may be helpful in targeting where water quality Best Management Practices may need to be implemented.

2.4.1.2 Watershed Impairment Causes NOT Listed on the IEPA 303(d) List

Poor Water Quality Upstream of Stream Segments Evaluated by IEPA

Although not specifically identified or listed by IEPA for Tyler Creek, other 303(d) watershed impairment causes often cited in urban / urbanizing watersheds can include:

- Oils and Grease
- Excessive Nutrients
- Chlorides
- Low Dissolved Oxygen
- Sedimentation / Siltation

Generally speaking, Oils and Grease, Excessive Nutrients, and Chlorides can often be associated with urban stormwater runoff, where highly efficient stormwater systems can rapidly deliver materials deposited on streets into the stream system. This potential likely exists in the older, urbanized portions of the watershed, such as Lower Tyler or Sandy Creek.

Above: Condominium parking lot runoff routed directly to Tyler Creek (Lower Tyler Creek Subwatershed).

Low Dissolved Oxygen, Sedimentation and Siltation, and Excessive Nutrients can often be found in channelized stream segments, where sufficient stream gradient does not exist to allow natural re-oxygenation of the water column; eroding streambanks are delivering sediment to the channel; or where nutrients bound up in eroding soil are being washed into the stream. This potential certainly exists in the upper reaches of the Tyler Creek Watershed (above the IEPA upper most sampling station at Randall Road). However, the same impairment causes could result from sediment laden storm water discharges from a construction site with poor Soil Erosion and Sediment Control practices.

Hydromodification

Hydromodification is a term used to describe human induced activities that changes the dynamics of surface or subsurface water flow. In the Midwest, the most prevalent hydromodification was the historic channelization of streams to improve agricultural productivity. Early settlers recognized that the soils found in the broad expanses of wetlands and wet prairies were ideal for crop production, provided the excess water could be removed. This resulted in the installation of sub-surface drainage tiles to remove the excess groundwater and route it to a point where it could be discharged. In order to have these tiles drain by gravity flow, a receiving drainageway was needed that was at an elevation lower than the drain tile. To achieve this, the receiving drainageway,

often a natural stream channel, would be excavated to a deeper depth. As part of this channelization effort, natural stream channels were typically straightened as well, to facilitate drainage, and to allow fields to be squared off.

By removing this excess water, the areas could be successfully cropped. This gain in agricultural productivity was unfortunately at the expense of large expanses of wetlands, wet prairie, and riparian habitats. The bright side is that in many of these altered areas, if these drainage improvements are modified or removed, those lost habitats can often be restored to some degree to their former function and quality. In the Tyler Creek watershed, this type of hydromodification occurred primarily in the Upper Tyler and Upper Pingree Creek subwatersheds.

Another form of hydromodification that occurred in the Tyler Creek watershed was the filling of wetland and floodplain areas to facilitate development. The loss of these natural flood storage areas forces the receiving waterway to both store and convey the stormwater runoff, which became increasingly difficult as the magnitude of the flow event increased. The short-term result of this is overbank flooding; the longer-term impact is the expansion of the stream channel to accommodate the increased flow volume. This channel expansion can result in significant sediment delivery to the stream channel as the channel deepens and widens.

The deepening (incision) of the stream channel into the landscape can cause a further disconnect between the stream and its floodplain, forcing more frequent flow events to remain within the channel, increasing the scour potential. The incision of the stream channel can also cause groundwater elevations in the streambanks to drop, further stressing any remaining wetland / wet prairie plant communities.

The loss of the depressional wetland and floodplain areas, and their associated pre-disturbance habitats, also served to adversely impact water quality, as these areas were no longer available to trap streamborne pollutants (suspended sediments, nutrients, etc.) The most prevalent current day hydromodification is the result of land development. As the conversion of undeveloped ground to rooftops, pavement, and highly compacted ground, as well as highly efficient storm sewer systems, greatly reduce the potential for precipitation to infiltrate into the ground. Instead, the runoff is routed to stormwater detention ponds, detained for a period of time (per stormwater ordinances) and is released into the receiving stream. However, the detention times mandated by stormwater ordinances are typically not long enough to allow for any significant water quality benefits to occur within the detention pond.

While the use of stormwater detention certainly helps reduce the risk of downstream flooding, it still results in a greater volume of water being discharged to the stream (as compared to pre-development conditions), in the period shortly after the storm is over. This is in contrast to the pre-development condition, when the vast majority of precipitation would infiltrate into the ground, and slowly move towards the receiving stream, providing a year-round source of groundwater discharge of cool, filtered water into the stream.

Downstream of Randall Road, the stream flows have been altered due to the extensive amount of high and medium density development that occurred through the 1980's without any urban stormwater detention controls. For the upper half of this area between Illinois Route 31 and Randall Road, this was due to a plan in the 1970's to

construct a large on-line reservoir west of Randall Road. This facility was intended to provide stormwater detention for a number of different subdivisions planned northwest Elgin at that time.

The developments were built, but the on-line reservoir not built, as it was rejected by the regulatory agencies who sited substantial negative environmental impacts that outweighed the positive benefits to be realized by the flood control it would have provided. This outcome resulted in a loss of stream corridor habitat in many areas and a tremendous influx of untreated, undetained stormwater from high-density development on Elgin's west side.

Invasive Species

Although not typically classified as an impairment to water quality, a threat to health and diversity of the watershed's natural areas is the rapid spread of invasive species of vegetation into the remaining natural areas, such as wetlands, woodlands, and stream corridors. Nearly every stream corridor, wetland, woodland, prairie, or other natural open space is facing an onslaught of invasive species, including Reed Canary Grass, Phragmites (Common Reed), Garlic Mustard, Honey Suckle, and Buckthorn. These aggressive invaders can out-compete native species, diminisnihing the floristic quality and wildlife habitat quality.

Of particular concern are the woody species, such as Box Elder, Common Buckthorn, and Honeysuckle which can dominate unmanaged stream corridors, and create a dense shady canopy that can prevent soil stabilizing herbaceous (grassy) vegetation from establishing on the streambanks. The lack of groundcover vegetation can make the streambank soil more prone to erosion, and as the streambank erosion progresses, and the trees / brush are undermined, they can slump into the channel, causing debris blockages and flow diversion into other unstabilized streambanks.

It must be noted that stream shading and woody debris are critical components of a healthy stream system. Shade cast over the surface of the stream can keep water temperatures cooler, which allows more dissolved oxygen to remain in the water column, available for use by aquatic organisms. However, in much of the upper Tyler Creek watershed, wildfires in pre-settlement times kept much of the stream system brush- and tree-free. The dominant riparian vegetation was dense stands of prairie grasses and forbs, that overhung the stream channel, providing shade and cover.

The key to proper stream corridor management is to still provide shade for water temperature moderation, but to provide it from a variety of vegetation sources, at different elevations.

Similarly, woody debris in a stream channel is the base of the food chain of a stream system, and needs to be present to allow a diversity of small aquatic organisms to prosper. Again, moderation is the key in balancing between a debris clogged channel, and one stripped of every last stick or branch.

2.4.2 Future Impacts and Impairments

Degraded Waters Quality from Development

While existing stormwater ordinances for Kane County provide for adequate flood control for large events (like the 100 year flood) and construction site runoff (if enforced through inspection) during development construction, the ordinances were not designed specifically to mitigate water pollution from development. The ordinance contains many recommendations encouraging new development to utilize innovative practices, however they are not requirements to which all new development must adhere to. The required stormwater retention component provides some opportunities for pollutants to settle out or be assimilated, but as the intent of stormwater management is to only store the water as long as necessary to meet detention requirements, the resulting retention times are often insufficient to achieve any substantial water quality improvement.

Additional Channel Hydromodification

Current stormwater and subdivision ordinances do an adequate job of preventing an increase in peak stormwater discharges for the larger, infrequent events, such as the 100 year event, but recent studies have shown that the further you go downstream in a watershed, the peak discharges for smaller events that effect stream ecology and stream channel stability increases by as much as 66% (reference: Blackberry Creek Alternative Futures Study, 2003).

Loss of Natural Wetlands & Stream Corridor

Current regulations still allow for remaining farmed or lower quality wetlands to be filled or converted to stormwater basins. Developments are currently allowed to build their stormwater infrastructure right up to the edge of the streambank. This is especially true in upper areas of the watershed where stream corridors have long since been drained and streams ditched and channelized to maximize farmable area. The problem is that when new developments are planned, they are allowed to build up to the edge of the current day stream corridor, which today is reduced to a 30 to 60 foot wide strip. This does not reflect the previous expanse of the historic stream corridor, which was perhaps 3 to 5 times that width, when using hydric soils as an indicator. Development infrastructure this close to the existing channelized stream does not account for the possibility of the stream channel reverting to a more natural, meandering pattern, which can occur (and is desired from an environmental resource point of view) if the stream gradient is sufficient.

Reduced Groundwater Recharge

Another impairment threatening the watershed is a reduction in groundwater recharge to the underlying aquifers. The reduction is a result of poorly planned land development that does not consider how and where precipitation is infiltrated into the soil to maintain the groundwater supply. New developments add impervious surface, which creates more runoff, and the runoff is directed into a stormwater collection system rather than directed to areas where it can be infiltrated into the soil. Low quality wetlands and farmed wetlands (depressions one sees in an agricultural field) are usually excavated and converted into detention basins, which by design are drained via a surface outlet. Another contributing factor is the loss of the pervous stream corridor that once buffered

the stream channels in the watershed. Many streams were channelized to maximize usable area for agriculture. When the agricultural parcel is converted to development, the development rarely restores the once-functional stream corridor and instead replaces it with more impervious surfaces or relatively impermeable stormwater storage basins.

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