CHAPTER 3: IMPAIRMENTS IN THE WATERSHED

TYPES OF IMPAIRMENTS / CAUSATIVE AGENTS

On an annual basis, the IEPA reports the quality of the surface water and ground water resources to the United States Environmental Protection Agency (USEPA) as required in Sections 305(b), 303(d), and 314 of the Clean Water Act. Reports were previously compiled separately for each of the Sections, 305(b) for surface water quality and uses, 303(d) for a list of quality-impaired waters, and 314 for publicly owned lakes. As of 2006, the reports are compiled into one "Integrated Report" which contains all the required information. The "Integrated Report" includes analysis of the resources of Illinois including the designated use(s), the levels of support of the designated use(s), a list of identified impairments of non-supporting resources, and a list of potential sources of the identified impairments.

Illinois waters are designated for various uses including aquatic life, agricultural use, primary contact (swimming), fish consumption, industrial use, and several others (IEPA 2004). These designated uses are also considered beneficial uses, or the most likely use of the water resource. To determine whether the quality of the resources are supporting or impairing the designated use, the Illinois Pollution Control Board (IPCB) is responsible for determining the water quality standards that apply for each use. The IEPA is responsible for proposing scientifically based water quality standards to the IPCB for adoption into the state standards. Based on whether or not the water quality standards are being met, basic categories or "Degrees of Support" are identified for each stream segment and its designated uses. These levels are listed as Fully Supporting (Good), meeting the applicable standards and generally good quality, Not Supporting (Fair), exceeds standard on rare occasion or within safe levels and generally fair condition, and Not Supporting (Poor), exceeds standards and generally poor quality. If the resource achieves a Not Supporting designation, the potential pollutant(s) are identified which may be causing the impairment (IEPA 2008). The Not Supporting (Fair) has replaced the Partially Supporting Designation (IEPA 2008, IEPA 2004).

Due to time constraints, budget, and means of recording/processing data, not every resource is surveyed and analyzed each year. All of the resources are resurveyed or analyzed over a five year period. The Aux Sable Creek Watershed was part of the subset of Illinois River Watershed which was in the analysis cycle in 2004. In general, there is a two year lag in presenting data for the reports (IEPA 2004).

For inventory purposes, the IEPA has identified the streams in the Aux Sable Creek Watershed and evaluated them to verify that they are meeting the requirements of their respective designated uses (Table 13, Table 14). General Use Water Quality Standards, as identified by the Illinois Pollution Control Board (IEPA 2004, 2008), apply to Aux Sable Creek and its tributaries. "Primary Contact" is identified as "…any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and waterskiing" (35 Ill. Adm. Code 301.355). In preparing assessments of "Primary Contact" streams, the primary pollutant examined is Fecal Coliform.

Table 13: IEPA Stream Segments, Designated Use, and Support Status (IEPA 2004)

Segment Name	IEPA ID	Designated Use	Use Support Status	Identified Impairment
Aux Sable Cr.	DW 01	Aquatic Life	Full	n/a
Aux Sable Cr.	DW 01	Fish Consumption	Full	n/a
Aux Sable Cr.	DW 01	Primary Contact (Swimming)	Partial	Fecal Coliform Bacteria
Collins Run	DWB	Aquatic Life	Not Evaluated	n/a
Saratoga Cr.	DWBA	Aquatic Life	Not Evaluated	n/a
Valley Run	DWBB	Aquatic Life	Not Evaluated	n/a
Walley Run	DWC	Aquatic Life	Not Evaluated	n/a
E. Aux Sable Cr.	DWD 01	Aquatic Life	Not Evaluated	n/a
Aux Sable Cr.	DWE	Aquatic Life	Not Evaluated	n/a
Lisbon Cr.	DWEA	Aquatic Life	Not Evaluated	n/a
Middle Aux Sable Cr.	DWF 01	Aquatic Life	Not Evaluated	n/a

Table 14: IEPA 303(d) Aux Sable Creek Watershed Stream Segments, Designated Use, and Impairments (IEPA 2008).

Segment Name	HUC ID#	IEPA ID	Designated Use	Miles/Acres	Identified Impairment
Aux Sable Cr.	0712000501	DW 01	Primary Contact (Recreational)	20.54	Fecal Coliform Bacteria

The streams in the Aux Sable Creek Watershed sustain aquatic life and can be assessed in terms of whether or not impairments exist (IEPA 2004). Assessments for support of Aquatic Life are based on available biological information, physiochemical data, and physical habitat data from the Intensive Basin Survey, Ambient Water Quality Monitoring Network, or Facility-Related Stream Survey programs (IEPA 2008). In the Aux Sable Creek Watershed, The Illinois EcoWatch Network of citizen scientists has been and continues to gather data in the Watershed which can also be used to assist in determining if the designated uses are being supported. Levels of attainment of support are based upon the quality of aquatic life present in the stream, the amount of available habitat, and the frequency of exceedance of specific water quality standards. The smaller streams were evaluated but not monitored by the IEPA in 2004. This means that data used to analyze the streams was not necessarily as accurate as the data from the Aux Sable Creek, which was monitored. The types of data likely used for these streams were data more than 5 years old or volunteer data which has not gone through the IEPA quality control process.

Other impairments not specifically identified by the IEPA have been identified by members of the Aux Sable Creek Watershed Steering Committee. These impairments are addressed elsewhere in this chapter. Means to preventing or eliminating these impairments are addressed in Chapters 4 and 5.

SOURCES OF IMPAIRMENTS

In assessing levels of support for Primary Contact use streams, Fecal Coliform is the only impairment reviewed by the IEPA. Fecal Coliform is a series of bacteria which typically indicate the presence of feces from humans and/or animals in the water. Contaminated water may enter the stream from stormwater runoff which has encountered residual fecal matter along the banks or adjacent fields. Human septic systems discharging directly into the stream or failing at the surface with effluent being carried in stormwater runoff can also contribute to increased levels of high Fecal Coliform. The bacteria may also enter the stream through direct discharge of fecal matter from birds or animals. Within the Watershed, the presence of aquatic fowl and cattle in the streams can contribute greatly to levels of Fecal Coliform measured.

Aquatic Life support assessments are based on available biological assessments. Habitat and physio-chemical data are used to assist in the support attainment assessment when only one biological collection is available (IEPA 2008). Sources of impairments can include dams or other structures that limit the movement of

aquatic species, disturbance in the creek creating high amounts of sediment deposition, lack of available habitat, and increased amounts chemical impairments. A summary of the previous assessments of the Aux Sable Creek indicates that there are no impairments which hamper the supporting of the Aquatic Life use as detailed by the IEPA (Huff and Huff 2006, IEPA 2008).

Impairments associated with flooding may not necessarily contribute to not supporting the designated IEPA defined uses. Flooding along the streams may be caused by the installation of undersized culverts, debris blocking the stream, drain tiles which may have been crushed, plugged, or disconnected, and structures in the creek which may restrict flow.

EXISTING IMPAIRMENTS

The 2004 IEPA Water Quality Report indicated that one section of the Aux Sable Creek (DW01) had higher than allowed quantities of Fecal Coliform Bacteria from an unknown source. Unverified sources of Fecal Coliform Bacteria include livestock and waterfowl defecating or tracking defecated materials into the stream. Open water ponds with mowed turf grass at the edge are prime habitat for various types of waterfowl.

Verbal reports have indicated several areas where livestock are allowed access to the stream. Visual observations of grazed pastures along the banks of the Aux Sable Creek as well as hoof prints in the banks indicate the ingress and egress of livestock into and out of the stream. As of the printing of this report, no pictures have been presented recording instances of livestock in the stream. Another source of Fecal Coliform can be attributed to untreated stormwater runoff from pastures which contain livestock waste which flows directly into the creek or its tributaries.

An additional source of fecal coliform bacteria could be from poorly functioning or failing septic systems which may leach fecal matter into stormwater runoff which can drain into the creek. Currently, there are no published maps of septic systems in the Watershed, but most residences built prior to 2000 are not on a public sewage system.

The following list of impairments (Table 15) was identified by the members of the Aux Sable Creek Watershed Steering Committee as potential or existing sources of impairments within the Watershed. “Existing” impairments are those that are known to occur. “Potential” impairments have been identified as impairments which may occur based on, local information, currently available permits, or local

comprehensive plans. Impairments listed as "Unlikely" are those which have not been identified as occurring in the sub-watersheds or are not identified to occur based on the local comprehensive plans. The listed impairments are not tied to specific designated uses of the streams or specific locations.

Table 15: Stream Impairments and Causes Identified By the Aux Sable Creek Watershed Steering Committee Listed By Sub-Watershed as Either Unlikely Impairment, Existing Impairment, or Potential Impairment.

Impairment	East Aux Sable	Middle Aux Sable	Lisbon Creek	Saratoga Creek	Walley Run	Minooka Branch
Fecal Coliform	Potential	Potential	Potential	Potential	Potential	Potential
Residential Development	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential
Commercial Development	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential
Industrial Development	Unlikely	Unlikely	Unlikely	Existing/ Potential	Existing/ Potential	Existing/ Potential
Mining/Quarries	Unlikely	Unlikely	Existing/ Potential	Existing/ Potential	Unlikely	Unlikely
Nutrient Loading/ Fertilizer Use	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential	Existing/ Potential
Undersized Culverts	Existing	Existing	Existing	Existing	Existing	Existing
Discontinuous Drainage	Existing	Existing	Existing	Existing	Existing	Existing
Erosion of Stream Banks	Existing	Existing	Existing	Existing	Existing	Existing
Fallen Trees/Debris in Creek	Existing	Existing	Existing	Existing	Existing	Existing
Sewage or Septic Failures	Existing	Existing	Existing	Existing	Existing	Existing
Improperly Constructed Bridges/Structures	Existing	Existing	Existing	Existing	Existing	Existing
Crushed/Undersized Drainage Tiles	Existing	Existing	Existing	Existing	Existing	Existing

Impairment	East Aux Sable	Middle Aux Sable	Lisbon Creek	Saratoga Creek	Walley Run	Minooka Branch
Buried/ Submerged Outfalls	Existing	Existing	Existing	Existing	Existing	Existing
Prairie Parkway and Associated Traffic	Potential	Potential	Potential	Potential	Potential	Potential

POTENTIAL FUTURE IMPAIRMENTS

The most noted concern and one of the reasons for initiating the update of the Watershed plan, is to address the concern of potential rapid urbanization that has started to occur in the predominantly agricultural watershed. Urbanization, if improperly managed or designed, can cause a variety of impairments. Increased traffic and traffic related pollutants can be deposited throughout the Watershed which can be transported into the streams through stormwater runoff. The change in surface characteristics can alter the natural drainage patterns by either increasing or decreasing the amount of stormwater runoff reaching certain areas of the Watershed. In general, the impoundment and release of stormwater with the use of storm sewer and stormwater detention basins can increase the initial amount of water discharging to the streams and cause more erosion to the channels.

In addition to the change in surface characteristic altering the amount of runoff reaching the streams, the temperature change of the runoff can also be considered an impairment. An increase in temperature can cause a decrease in available nutrients to aquatic species or increase the concentration of naturally occurring compounds which may be toxic in large quantities to some animals. Some species are physically sensitive to changes in temperature and an increase by only a few degrees can be fatal. Urbanization typically increases the temperature of streams by removing the shade trees and vegetation and increasing the amount of dark colored surfaces which absorb heat.

Rapid urbanization can also include the development of commercial and industrial areas as well. Without proper precautions and design, commercial and industrial areas can contribute pollutants and impairments to the Watershed. Increased levels of chemicals can be discharged into the Watershed as waste products or as chemical spills. Pollutant discharges may also come from exhaust through the air, noise from traffic and machinery, and permitted discharges of waste water.

Another potential impairment concern addressed within the committee is excess nutrients reaching the water from untreated stormwater runoff from the improper fertilization and herbiciding of residential lawns and agricultural fields. In recent years, the use of chemicals has become more controlled due to governmental mandating (Department of Agriculture) training and licensing of proper pesticide/herbicide application which needs to be renewed every three years. Residential fertilization is far less controlled due to the ability of individual landowners being able to purchase and apply less restrictive chemicals. Fertilizers used in lawns may be washed away during storm events and degrade water quality if not properly treated before reaching the streams. The increased regulation of nutrient application has not prevented additional chemicals from being introduced to waterways. Residents may dump used household chemicals into storm sewers instead of properly disposing of them.

An additional potential impairment identified by the committee is associated with further development of mining within the Watershed. Several quarries are located in the Lisbon Creek, Saratoga Creek, and Lower Aux Sable Creek sub-watersheds. There are several quarries proposed adjacent to existing mines near Lisbon. Mines can cause impairments to the Watershed due to increased traffic hauling materials out of the quarries. Improper drainage controls and stormwater treatment within the property can cause dust and fine particulates to be washed into the streams increasing turbidity. Increased turbidity, the amount of suspended sediment causing cloudiness, can negatively affect the health and habitat of aquatic wildlife.