

**CHAPTER FIVE:
PRIORITY POLLUTANTS THEIR SOURCES AND CAUSES**

The Thunder Bay River Watershed steering committee reviewed the results of the nonpoint source pollution inventories and based on this information prioritized the pollutants, sources and causes utilizing the nominal group process. Members were allowed six votes (no more than four allowed on one pollutant) to cast for the pollutant thought to be the most detrimental to the watershed. The same process was then performed for the sources and causes of the pollutants.

Priority Pollutants

As indicated on *Table 16* sediment and nutrient loading ranked the top two pollutants of concern. Increased temperature, pesticides, heavy metals/organic compounds, brine and bacteria were also identified and being pollutants of concern for the Thunder Bay River Watershed.

Table 16: Thunder Bay River Priority Pollutants	
Pollutants	Ranking
Sediment	1
Nutrients	2
Increased Temperature	3
Pesticides	4
Heavy metals/Organic Compounds	5
Brine	6
Bacteria	7

Designated Use Pollutants

The following designated uses were determined by the steering committee to be adversely affected by one or more of the pollutants stated above. Sediment and nutrients are the priority pollutants to control for protecting the coldwater fisheries, total/partial body contact, aquatic life, navigation and public water supply. Increased temperature, bacteria, heavy metals/organic compounds and pesticides were also identified as threatening the designated uses. *Table 17* shows the relationship between the pollutants and their impact on each designated use.

Table 17: Designated Use Pollutants		
Designated Use	Pollutant	Ranking
Coldwater Fishery	Sediment	1
	Nutrient	2
	Increased Temperature	3
	Heavy Metals/Organic Compounds	4
	Brine	5
Indigenous Aquatic Life	Sediment	1
	Heavy Metals/Organic Compounds	2
	Pesticides	3
Navigation	Sediment	1
Total/Partial Body Contact	Bacteria	1
Public Water Supply	Stormwater	1
	Bacteria	2
	Nutrients	3
	Heavy Metals/Organic Compounds	4

Sources of Pollution

The main sources of pollution, as identified by the steering committee were road/stream crossings, streambank erosion, stormwater runoff, lawn fertilizers, septic systems and livestock management. Other sources of pollution include cropland management, land clearing, construction practices, golf course maintenance, residential practices, road maintenance and impoundments. Ranking of these sources was then conducted by the steering committee using the same nominal group process with one being the highest concern. *Table 18* lists and ranks these sources of pollutants.

Table 18: Sources of Pollution			
Pollutant	Rank	Source	Rank
Sediment	1	Road/stream crossings	1
		Streambank erosion	2
		Stormwater runoff	3
		Cropland management	4
		Livestock management	5
		Construction Practices	6
		Land Development	7
		ORV Crossings	8
		Oil and Gas	9
Nutrients	2	Lawn Fertilizers	1
		Septic systems	2
		Livestock Management	3
		Golf Course	4
		Cropland Management	5
		Impoundments	6
Increased Temperature	3	Impoundments	1
		Land clearing	2
		Forest management	3
		Stormwater runoff	4
		Water withdrawal	5
		Residential practices	6
Pesticides	4	Lawn fertilizers	1
		Golf courses	2
		Cropland management	3
Heavy metals/Organic Compounds	5	Stormwater runoff	1
		Sites of Environmental Contamination	2
		Road/stream crossings	3
Brine	6	Road maintenance	1
Bacteria	7	Livestock management	1
		Septic systems	2

Causes of Pollution

In order to correct existing nonpoint source pollution and prevent future pollution problems from occurring, sources and causes for each pollutant were identified. The steering committee members then identified the causes and provided a rank of high, medium or low priority within the Thunder Bay River Watershed. As shown in *Table 19*, road/stream crossings, streambank erosion and stormwater runoff ranked high. Septic systems, livestock management, residential practices, land development, impoundments, land clearing, brine and construction practices ranked medium.

Table 19: Pollutant Sources and Causes		
Pollutant Source	Causes	Rank
Road Crossings	Short culverts, steep slopes, runoff directed to river, chemicals from automobiles	High
Streambanks	Road stream crossings, angler access, unrestricted livestock, past logging practices, hydrologic fluctuations	High
Stormwater Runoff	Injection of untreated runoff directly into the watershed Industrial/Residential toxins in runoff, improper use and/or disposal Influence of warmer waters, sedimentation and chemicals into the river	High
Livestock Management	Unrestricted access to the river Animal waste containment	Medium
Residential Practices	Increased lawn fertilization/loss of greenbelts Improper application	Medium
Land Development	Community wide plans needed, elimination of greenbelts Increased residential and commercial areas	Medium
Septic Systems	Improperly designed and maintained septic systems	Medium
Impoundments	Man-made impoundments Beaver activity	Medium
Land Clearing	Improper erosion and sedimentation control, removing greenbelts	Medium
Brine	Dust control, snow and ice removal Stormwater discharge directly into watershed	Medium
Construction Practices	Improper erosion and sedimentation control, removing greenbelts	Medium
Golf Course	Improper application	Low
Cropland Management	Fall plowing Winter spreading of manure Improper fertilizer application	Low
ORV Crossings	Improper stream crossings	Low
Forest Management	Land fragmentation, lack of adequate shade	Low
Water Withdrawal	Loss of water for agriculture, residential practices	Low
Sites of Environmental Contamination	Accidental spills, unregulated/illegal activities	Low
Oil and Gas	Improper erosion and sedimentation control, removing greenbelts, stream crossings	Low

