

**Initial Water Quality Statement Outline
 Prioritized Uses and Impairments**

GALIEN RIVER WATERSHED

Designated and Desired Uses

IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES	
#1 - Partial Body Contact Recreation (fishing, boating) minimum water quality standard E.coli - 1000 count/100 ml	#1 - E. coli (Water quality standard exceedances)	Livestock in streams ³	Unrestricted access	
		Septic systems	Failing or poorly maintained	
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate	
	#2 - Nutrients		Livestock in streams ³	Unrestricted access
			Septic systems	Failing or poorly maintained
			Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
			Agricultural sources ³	Poor tillage practices Over or misapplication of fertilizer/manure Lack of buffer and filter strips
	#3 - Obstructions		Cables strung across river	Landowners marking property
			Debris ³	Illegal dumping
			Road/stream crossings too small or blocked ³	Design of crossing and lack of erosion control measures on embankment
			Log jams ³	Streambank erosion
	#4 - Flow		Hydrology ¹	Altered stream banks and flow paths
				Sedimentation
				Increased imperviousness (s)
				Wetland destruction

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IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES
#2 - Warm Water Fishery (Bass, pike, walleye) minimum water quality standard DO \geq 7 ml/L	#1 - Sediment/Degraded habitat²	Sheet flow	Lack of riparian buffer ³
		Cropland erosion ¹	Lack of riparian buffer Deforestation ¹
		Livestock in stream ³	Unrestricted access ³
		Streambank erosion ³	Groundwater seeps ⁵
	#2 - Nutrients² (nuisance algal growths ⁷)	Livestock in streams ³	Unrestricted access ³
		Septic systems	Failing or poorly maintained
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
		Streambank erosion ³	Debris diverts flow path at banks Lack of buffers
		Agricultural sources ³	Poor tillage practices
			Over or misapplication of fertilizer/manure Lack of buffer and filter strips
	#3 - Flow	Hydrology ¹	Altered stream banks and flow paths
			Sedimentation
			Increased imperviousness (s)
			Wetland destruction
	#4 - Chemicals (s)	Orchard pest management	Over or misapplication of pesticides and chemicals ¹
#5 - Temperature	Reduced shade	Removal of riparian vegetation ³	
#3 - Cold Water Fishery (S. Branch - from Martin Road downstream to Forest Lawn, by landfill)	#1 - Temperature	Reduced shade	Removal of riparian vegetation ³
	#2 - Sediment	Sheet flow	Lack of riparian buffer
		Cropland erosion ¹	Lack of riparian buffer Deforestation
		Livestock in stream ³	Unrestricted access, animals disturb bank
		Streambank erosion ³	Groundwater seeps ⁵
#4 - Other Indigenous Aquatic Life and Wildlife (habitat condition and continuity)	#1 - Degraded habitat	Forest fragmentation ¹	Rural residential development ¹
		Wetlands drainage ¹	Agricultural use ¹
			Residential development ¹
	Degraded quality of habitat ¹	Marina, golf courses	

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IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES
	#2 - Invasive/exotic species	Road Commission using fill from offsite ⁵	Lack of knowledge about dangers of invasive and non-native species
		Transfer through human activity (s)	Boat and bait buckets (s)
		Spread of species through watercourses	Extensive drainage system acts as conduit ¹
	#3 - Sediment ²	Sheet flow	Lack of riparian buffer
		Cropland erosion ¹	Lack of riparian buffer
			Deforestation ¹
		Livestock in stream ³	Unrestricted access ³
	Streambank erosion ³	Groundwater seeps ⁵	
	#4 - Nutrients (nuisance algae and bacterial slime growth ⁷) Deer Creek	Livestock in streams ³	Unrestricted access ³
		Septic systems ⁷	Untreated sewage discharge
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
			Streambank erosion ³
		Agricultural sources ³	Poor tillage practices
			Over or misapplication of fertilizer/manure
			Lack of buffer and filter strips
	#5 - Altered and high flow	Hydrology ¹	Altered stream banks and flow paths
			Sedimentation
			Increased imperviousness (s)
			Wetland destruction
	#6 - Chemicals (s)	Orchard pest management	Over or misapplication of pesticides and chemicals ¹
	#7 - Heavy metals	Storm water	Road and parking lot runoff drained to surface waters
Wastewater plant cannot handle all storm water and alternative storm water management not			

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Designated and Desired Uses

IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES
			adequate
		Sewage	Improper disposal of hazardous household wastes
#5 - Navigation (Partial reaches of Galien)	#1 - Obstructions ³	Cables strung across river	Landowners marking property
		Debris	Illegal dumping
		Road crossing too small or blocked	Design of crossing and lack of erosion control measures on embankment
		Log jams	Streambank erosion
	#2 - Water levels	Hydrology ¹	Altered streambanks and flow paths ⁴
			Sedimentation ²
			Increased imperviousness (s) ⁶
		Wetland destruction ⁶	
#3 - Aesthetics ⁶	Development of riparian areas	Lack of riparian protection	
#6 - Agriculture (irrigation and livestock watering)	#1 - Bacteria	Livestock in streams ³	Unrestricted access
		Septic systems	Failing or poorly maintained
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
	#2 - Flow	Hydrology ¹	Altered stream banks and flow paths ⁴
			Sedimentation ^{2,4}
			Increased imperviousness (s) ⁶
			Wetland destruction ⁶
	#3 - Sediment ¹	Sheet flow ⁶	Lack of riparian buffer
			Lack of riparian buffer ³
		Cropland erosion ^{1,3}	Deforestation ¹
			Tillage practices
			Unrestricted access
	#4 - Flooding ¹	Loss of wetlands and floodplain function	Development
			Wetland drainage
		Backing up of water and reduced flow ¹	Log jams and debris ³
#7 - Total Body Contact	#1 - Bacteria	Livestock in streams ³	Unrestricted access ³

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IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES
Not historically a use in the Galien River itself (swimming at New Buffalo public beach between May 1 and October 1) Minimum water quality standard E.coli - 130 count/100 ml		Septic systems	Failing or poorly maintained
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
	#2 - Nutrients	Livestock in streams ³	Unrestricted access
		Septic systems	Failing or poorly maintained
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate
		Streambank erosion ³	Debris diverts flow path at banks
			Lack of buffers
		Agricultural sources ³	Poor tillage practices
	Over or misapplication of fertilizer/manure		
	#3 - Petroleum products	Storm water	Road and parking lot runoff drained to surface waters
			Wastewater plant cannot handle all storm water and alternative storm water management not adequate
	#4 - Chemicals (s)	Orchard pest management	Over or misapplication of pesticides and chemicals ¹
	#8 - Industrial Water Supply (potential future use)	#1 - Sediment	Sheet flow
Cropland erosion ¹			Lack of riparian buffer ³
			Deforestation ¹
Livestock in stream ³		Unrestricted access ³	
Streambank erosion ³		Groundwater seeps ⁵	
#2 - Nutrients		Livestock in streams ³	Unrestricted access
	Septic systems	Failing or poorly maintained	

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IMPAIRED DESIGNATED USE	POLLUTANTS/IMPAIRMENTS	SOURCES	CAUSES	
		Combined Sewer Overflows	Wastewater plant cannot handle all storm water and alternative storm water management not adequate	
		Streambank erosion ³	Debris diverts flow path	
			Lack of buffers	
		Agricultural sources ³	Poor tillage practices	
			Over or misapplication of fertilizer/manure	
			Lack of buffer and filter strips	
		#3 - Flow	Hydrology ¹	Altered stream banks and flow paths
				Sedimentation
				Increased imperviousness (s)
				Wetland destruction
#4 - Chemicals (s)		Orchard pest management	Over or misapplication of pesticides and chemicals ¹	

(s) = Suspected

1. Johnson, Cathy. 2001. Natural Resources and Conservation Directions. Berrien County, Michigan. Chikaming, Galien, Lake, New Buffalo, Three Oaks, and Weesaw Townships, Prepared for Chikaming Open Lands.
2. MDEQ Biological Surveys.
3. Inventory conducted by Ms. Anne Hendrix and Mr. Mike Mahler of the Office of the Berrien County Drain Commissioner, August-October 2001.
4. Quote of Spike Bruce in "Galien River Log Jam Clearing Begins" by Stan Maddux in the *South Bend Tribune*.
5. Observations during Galien Watershed Tour, October 2001.
6. Technical Team discussions.
7. MDEQ - SWQD, GLEAS, 303(d) list.