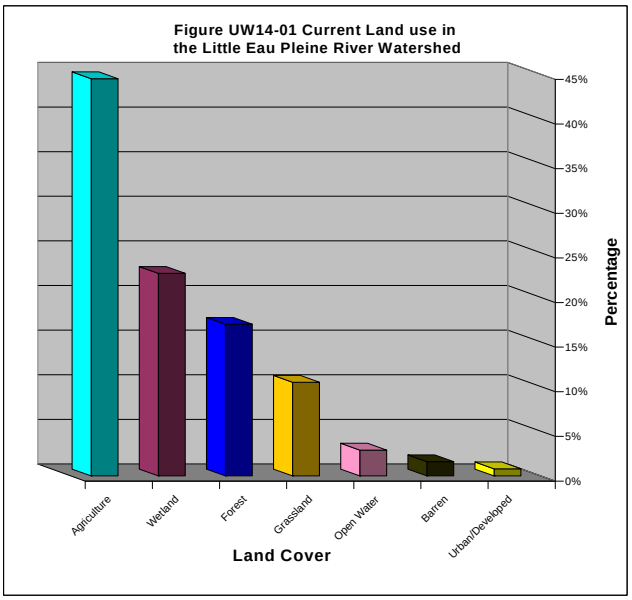
THE LITTLE EAU PLEINE RIVER WATERSHED (UW14)

WATERSHED SUMMARY

The Little Eau Pleine River Watershed (Map UW14) is located in the counties of Clark, Portage, Marathon and Wood. This watershed, one of many watersheds, that drains into the Du Bay Flowage. The Little Eau Pleine River watershed is one of the largest watersheds taking up 264 square miles of the basin.

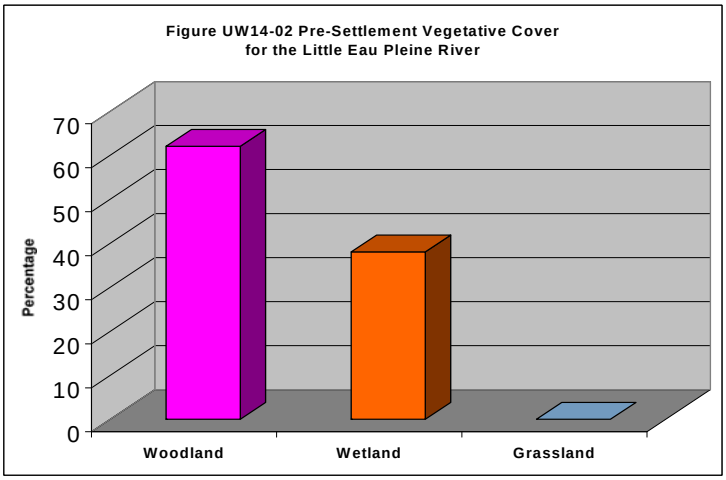
This watershed was ranked using the Nonpoint Source Priority Watershed Selection Criteria. Based on surface and ground water data, the overall ranking is low. A shallow groundwater table allows unused herbicides, pesticides and fertilizers to leach into the groundwater without it being filtered out in the soil profile. Water quality problems are intensified by high rates of surface run-off due to the silty soils. The Marathon County Soil Erosion Control Plan identified the township of Day and Bergen as having high soil erosion rates. The Wood County Soil Erosion Control Plan also identified the Little Eau Pleine River Watershed townships of Auburndale and Milladore as priority areas for soil erosion control.

The Mead Wildlife Area is 27,000 acres of mixed hardwoods and aspen uplands with open marshes that parallel the Little Eau Pleine River and is located in this watershed. The Mead Wildlife Area is located off county highway S and O, it is located about 45 minutes (30 miles) southwest of Wausau, 20 minutes (15 miles) east of Marshfield and 25 minutes (20 miles) northwest of Stevens Point. There are many ways to utilize this wildlife area by exploring more than 70 miles of recreational trails and waterways, hunting waterfowl, deer and small game, or trapping fur bearing animals. Access is restricted in some of the wildlife areas at certain times of the year, but there is plenty of area to discover all year round.



POPULATION DEMOGRAPHICS

The Little Eau Pleine River Watershed has a current population of 14,883 making up over five percent of the basins total population. With the predicted growth of the watershed to only increase by 900 people in the next fifteen years, this watershed is way below the average basin increase (North Central Wisconsin Regional Planning Commission, 2000, Wisconsin Department of Administration, 2000).



The per-settlement vegetative cover was primarily woodlands with several large wetland complexes located along the Little Eau Pleine River (Figure UW14-2). Over time most of the forested land has been removed to make way for dairy farming and other agricultural operations. The current agriculture land use is 44% and the forested land use is 23% (Figure UW14-1). That percentage of agriculture in the past few years have been decreasing due to wetland drainage and farm fields being converted to wetlands. A twelve-percent

reduction in wetlands has occurred within the watershed over the past decade, making it one of the largest wetland losses in the entire basin (Enterprise Information, 1998).

WATERSHED STREAMS

A summary of watershed streams is listed in Table UW14-1. Figure UW14-3 indicates total number of stream miles in the Little Eau Pleine River Watershed.

Carlson Creek
A family biotic index sample collected in 1990 indicated fairly poor water quality.

Little Bear Creek
Animal waste run-off may be impacting water quality. More monitoring data is needed. The Village of Auburndale WWTP discharges to a wetland, which drains to Little Bear Creek.

Little Eau Pleine River
Biotic index sampling indicated fair to fairly poor water quality. The Upper Little Eau Pleine River is affected by animal waste run-off (Kaatz) and streambank erosion. Portions of the stream flow through Mead/McMillan wildlife areas. The Village of Unity discharges WWTP effluent to a riparian wetland of the river.

Scheure Creek
Scheure Creek's use classification is unknown. Animal waste run-off may be impacting water quality in Scheure Creek. More monitoring data is needed. A sand and gravel operation occurs in the N½, of the SE¼, Section 33, T26N, and R3E. This pit drains directly into the headwaters of Scheure Creek.

Squaw Creek
Squaw Creek is now classified as a variance stream with an intermediate and marginal classification due to limited forage fishery or limited aquatic life. Sometimes the stream is quite turbid, probably due to urban run-off from Marshfield, as well as rapid surface run-off during rain because of the tight, silty soils in the area. There are also dense growths of algae and weeds in the stream, which indicate excessive nutrient levels. This may result in wide diurnal changes in dissolved oxygen levels. A family biotic index sample collected in 1990 indicated very good water quality.

Beginning where Squaw Creek enters section 33, T26N, R4E, the land use is mainly agricultural, which continues through the remainder of its length. Streambank pasturing is a major problem in this reach. Much of the streambank is trampled and pools are silted in.

A large gravel pit washing operation and ponds are located on and in Squaw Creek in the S½ of the NW¼, SEC 2, T25N R03E, in Wood County.

The headwaters of Squaw Creek are the storm sewer systems for the city of Marshfield with the first two miles below the city channelized into a wide ditch to improve drainage. Where the stream tries to return to its natural meander, the banks are caving in.

South Squaw Creek
Very little information is available with which to classify or determine use problems in South Squaw Creek. A family biotic index sample collected in 1990 showed very good water quality. Animal waste run-off may be impacting water quality. More monitoring data is needed.

Wild Creek
A family biotic sample collected in 1990 showed good water quality. Additional biotic index sampling in the spring of 1990 indicated very good, good and fair water quality.

Animal waste run-off may be impacting water quality. More monitoring data is needed. The Village of Rozellville has an outfall from a two-cell lagoon system. Because of seepage and evaporation, the lagoons have never been known to discharge. If a discharge did occur, it would flow down a roadside ditch to a tributary of Wild Creek, and then into Wild Creek itself.

Unnamed Ditch (T26N, R2E, Section 10, NE¼, SE¼)
The village of Spencer WWTP discharges effluent to the ditch, which is a tributary to the Little Eau Pleine River.

Unnamed Ditch (T25N, R7E, Section 9, SE¼, SW¼)
A cranberry marsh discharges to this unnamed ditch, which flows into Lake DuBay. It is unknown if this operation is affecting water quality in the ditch or the lake.

WATERSHED LAKES

Of the 6,807 acres of named lakes in this watershed (Table UW14-2), the average maximum depth is less than eight and a half feet. The majority of these waterbodies are located in an extensive line along the Little Eau Pleine River. They currently have little value as game fisheries but they are currently maintained and improved for wildlife production, primarily waterfowl. Several management options are available. For over the past 10 the Mead Wildlife Refuge waters have been managed for wildlife, which was determined to be highest and best use for these surface waters.

WISCONSIN POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM (WPDES)

Table UW14-3 summarizes the WPDES in the Little Eau Pleine River Watershed.

Edelweiss Cheese Co.
Edelweiss Cheese Company operates a cheese plant between Marshfield and Stratford. They take in approx. 120 million pounds of milk per year and discharge 30,000 to 50,000 gallons of wastewater per day. A proposal to discharge condensate of whey (COW) water to a farm pond to the East of Stadt Rd. is in review. The pond discharges to an unnamed tributary to the Little Eau Pleine River. The low chloride strength wastewater is treated in aeration ponds then discharged to a 10.8 million-gallon sedimentation pond. Water from this sedimentation pond is spray irrigated on nearby crops. High chloride strength wastewater is collected in a holding tank and hauled off daily to fields in the surrounding farm community.

Grand Meadow Dairy
The Grand Meadow Dairy facility manufactures approximately 6,500 pounds of colby and cheddar cheese from approx. 65,000 pounds of raw milk per day. The wastewater generated at the facility originates from two different sources and is discharged at two different locations. The washwater is landspread and the noncontact cooling water and boiler blowdown water is discharged to an unnamed tributary to the Little Eau Pleine River.

Land O Lakes - Spencer
The Land O Lakes facility further processes cheese into dried cheese and for packaging. Production wastes are pretreated at the plant before being discharged to the Spencer WWTP. Cooling water and boiler blowdown are discharged to an unnamed tributary to the Little Eau Pleine River.

Rozellville Sanitary District
Rozellville operates a three-cell stabilization pond. Discharge is intermittent, typically twice a year (spring and fall). The first pond has a PVC liner while the other two ponds act as seepage ponds. The design life is until 2003, major improvements occurred in 1983 and the average daily flow is 13,000 gallons a day

Village of Spencer
The Village of Spencer operates a municipal wastewater treatment plant serving the community and some industrial sources, including Land O Lakes in town (cheese plant). Land O Lakes pretreats the waste they don't land apply. The design life of the Wastewater treatment faculty is until 2010, major improvements occurred in 1990 and the average daily flow is 198,200 gallons a day.

Village of Unity
The Village of Unity recently completed construction on a new wastewater treatment plant. The new two cell aerated lagoon with intermittent sand filter replaced a two cell stabilization lagoon system. The design life of the Wastewater treatment faculty is until 2020, major improvements occurred in 2000 and the average daily flow is 36,500 gallons a day

Village of Auburndale
Auburndale lies in Wood County in the Little Eau Pleine River Watershed (UW14). The WWTP discharges to an unnamed tributary to Little Bear Creek. The treatment plants design life is until 2003, the Wastewater Treatment plant was built in 1982. The village of Auburndale operates a two cell stabilization pond that has a daily design flow of 123,000 gallons pre day with an average BOD Load of 226 #/day.

The Village of Auburndale should continue to reduce clearwater inflow to the sanitary sewer.

Wiskerchen Cheese Factory
The permittee operates a cheese making facility located at 5710 EAST CTH H in Wood County. The factory makes about 10,000 pounds of feta cheese per day, five days a week. Approximately 58,000 to 73,000 pounds of milk are taken in each day. The west cell of the ridge and furrow system treats about 2700 gallons per day. The east cell is no longer used. Plans are underway for a five-acre replacement ridge and furrow system to be constructed next year.

The facility should obtain preliminary engineering plan approval and complete construction of the new ridge and furrow system by next summer.

Quality Ingredients Corporation
Quality Ingredients is the new operator of the facility formally owned by Beatrice Cheese Company and Armour Food Ingredients Group. The facility is located at 112 East Depot Street, Marshfield, Wisconsin. The facility discharges to groundwaters of the Little Eau Pleine Watershed in the Upper Wisconsin River Central Sub-Basin in Wood County.

The facility produces dried dairy and non-dairy products. The majority of wastewater produced is the result of cleaning and sanitizing activities which is subsequently landspread on Department approved lands. Average daily discharge to land application is 12,500 gallons per day. The facility does not condense liquid whey. Process and domestic wastewaters are discharged to the City of Marshfield's wastewater treatment facility.

Maple Grove Cheese Factory
The permittee operates a cheese making facility located at 10498 Mayflower Road (NWQ NWQ SEC 27 T25N R5E), approximately three mills northwest of Milladore. The factory makes between 10,000 and 15,000 pounds per day of American cheese. Approximately 2,000 gallons per day of process wash wastewater is generated at the facility. The wastewater is disposed of in a one half-acre ridge and furrow system. Sanitary waste is discharged to a separate septic tank. Whey byproduct is hauled to Lynn Protein in Granton, Wisconsin.

Maple Grove Cheese, Inc. should continue its efforts to improve the efficiency of and prevent flooding of the ridge and furrow system.

GROUNDWATER

The Little Eau Pleine River Watershed contains wells for three municipalities. The Village of Milladore has both of their wells in this watershed, the City of Marshfield has nine wells located in this watershed and the Village of Spencer has one well located here. Municipal Water Supply summary is found in Table UW14-4, including NPS rankings for groundwater and well descriptions.

The Village of Milladore had to go nearly two miles out of the village to even find water. The granite bedrock is very dense in this area and well yields are very low. As is characteristic of finding water in the granite aquifer, the areas of highly fractured granite have the highest yields. These areas generally show up on the surface as drainage areas and are typically designated as wetlands. The village had to get permits to fill a wetland and build up the area surrounding the well to prevent flooding in order to develop their wells. The two wells will each produce about 50-gpm and are very good quality with the exception of manganese.

The village is attempting to control the manganese concentration by sequestration with polyphosphates, but the concentrations may be two high to effectively use this method. Some brown water complaints are common in the village and frequent flushing is used to purge the oxidized manganese from the system.

Nitrates are very low, with concentrations below 1 ppm. A Well Head Protection program consists mainly of public education efforts with local farmers.

Most of the water used by the City of Marshfield comes out of this watershed. The wells are generally shallow sand and gravel wells tapped into thin sand and gravel lenses and small buried glacial valleys trapped between the glacial tills and the granite bedrock. A few wells will manage to produce over 300 gpm but the majority average between 100 and 200 gpm. All eight of the functional wells pump to a centralized treatment plant where the water is aerated to reduce carbon dioxide, radon and hydrogen sulfide. The water is then treated with chlorine and potassium permanganate and run through a rapid sand filter to remove iron and manganese. On its way to the clearwell, fluoride and sodium hydroxide are also added.

The City of Marshfield is a member of the Groundwater Guardians, which emphasize the importance of public education in Well Head Protection. Even though most of Marshfield's wells are located outside of the city in agricultural areas, the nitrate levels are fairly low, averaging 2.3 ppm.

The Village of Spencer has one of their wells located in this watershed. This well is a very shallow sand and gravel well producing about 150 gpm. There is some historical evidence suggesting that if this well is pumped hard, the water level in a nearby pond will begin to drop. This well is not used very much because the treatment system serving this well must be operated manually. Treatment consists of aeration and filtration with chlorine, sodium hydroxide and potassium permanganate added. Fluoride is also added after filtration. The nitrate concentration in this well is low at 0.14 ppm and other than the iron and manganese; the water quality is very good. The village has been searching for an additional source of water to supplement the existing supply, unfortunately, no suitable well locations have been found. The village does not have a Well Head Protection program established at this time.

The Central Wisconsin Groundwater Center of University of Wisconsin-Stevens Point conducted 158 well samples for nitrates in the Little Eau Pleine River Watershed. Of all the wells tested 13.3 percent had nitrate concentration over 10 parts per million which is above the safe drinking limitations. The Department of Health sets the safe drinking water standards for the State of Wisconsin and any water sample that has nitrate concentrations greater than 10 part per million is considered unsafe for human consumption. Of the 13.3 percent that are over 10 parts per million, none of the wells have nitrate concentration of 20 parts per million or greater.

Of the 35 wells tested for triazine in the Little Eau Pleine River Watershed, 2.9 percent of the wells tested had concentrations at 1.1 parts per billion or greater of triazine. None of the wells sampled were over 3.0 parts per billion. Since triazine can not be used to set standards for drinking water limitations, it is strongly recommended that if a test result comes back above 1 part per billion of triazine, the well should be tested further for total concentrations of atrazine.

This watershed has some very poorly constructed existing wells in several areas. Short-cased drilled and improperly constructed or unused dug wells do contribute to the bacteriologically unsafe water quality in some properly constructed wells. Several significant VOC contamination cases existing within this watershed.

WATERSHED RECOMMENDATIONS

1. Fish and Aquatic Habitat Staff should conduct baseline monitoring on watershed streams specifically Squaw and Scheuer Creeks and Little Eau Pleine Flowage.

2. Watershed Staff should conduct a water quality standards review on Little Bear Creek, Wild Creek, the tributary to Wild Creek and the roadside ditch for the Village of Rozellville WWTP.

3. Watershed Staff should conduct a water quality standards review of the Unnamed Ditch (T26N, R2E, S9, NE ¼, and SE ¼) receiving discharge from the Village of Spencer WWTP.

4. Watershed Staff should conduct a water quality standards review of the wetland that receives Unity WWTP discharge.

Table UW14-1. Little Eau Pleine River Watershed. Marathon, Portage & Wood Counties. Square Miles:264, Stream Miles: 197.2
NPS Stream Rank: Low

Stream Name	Length (miles)	Codified Use	Biolgical Use (Existing)	Biological Use Potential	SUPPORTING USE FULLY-PART-NOT-THR/MILES	303(d) Listed Water	Assess. Categ. M E U	Trend	Integ Indic	Integ Status	Data Level[i]	PROBLEMS SOURCE//IMPACT	COM N R	REF.
Bear Creek T26NR05ES23 WBIC: 1415500	9.0	DEF	WWSF/0-9.0[e]	Same	PART/9.0		E	U			B	CL,BY,PSB,PWL./ NUT	R	8,109,34,3
Carlson Creek T26NR02ES02 WBIC: 1423100	6.0	DEF	WWFF/0-6.0[e]	Same	UNK/6.0		E	U			B,P,H		N,R	8,44
Little Bear Creek T26NR05ES23 WBIC: 1415500	8.0	DEF LFF LAL	WWSF/0-1.5[e] LFF1.5-6.8[ac] LAL/6.8-8[ac]	Same Same Same	PART/1.5 FULLY/5.3 FULLY/1.2		M	U			B,P	CL,BY,PSB,PWL/ NUT	R	109,34,60, 147,3
Little Eau Pleine River T25NR07ES09 WBIC: 1416900	57.0	DEF DEF	WWSF/0-28.6[e] WWFF/28.6-57[e]	Same Same	PART/12.9 PART/28.4		E	U		F - P	B,H,P	BY/ SB/ PSM	R	8,34,40,77 144,94,95, 142,19, 161
Scheure Creek None None	6.0	DEF	UNK/0-6.0	UNK/6	UNK/6		E	U		NMM	B			
South Squaw Creek T26NR04ES28 WBIC: 1420500	8.0	DEF	UNK/0-8.0	UNK/8.0	UNK/8.0		E	U					R	
Squaw Creek T26NR04ES32 WBIC: 1420700	9.0	DEF	UNK/0-9.0	UNK/9.0	UNK/9.0		E	U			B,P, H,C	NMM/SED,TURB PSB,URB,SB/NUT,SED, HAB,CL,BY,PWL/NUT	R	8,34,79,3, 201
Wild Creek T26NR04ES27 WBIC: 1420400	10.0	LFF	LFF/0-10.0[ac]	Same	FULLY/10.0		E	U		VG, G, F	B,P, H,C		R	8,147,66
Unnamed Creek T26NR04ES27 WBIC: 1413700	5.0	DEF	UNK/0-5.0	UNK/5.0	UNK/5.0		E	U						8
Unnamed Ditch T25NR06ES03 WBIC: 1413700	6.0	DEF	UNK/0-6.0	UNK/6.0	UNK/6.0		E	U						28
Unnamed Ditch T26NR02ES10 WBIC: 1423000	4.0	LAL	LAL/0-4.0[ac]	Same	FULLY/4.0		E	U			B,	PSM	R	147,70
Unnamed Ditch T25NR07ES09 WBIC: 1412300	1.0	DEF	UNK/0-1.0	UNK/1.0	UNK/1.0		E	U			B	CM/	R	157
Unnamed Ditch WBIC: None	0.4	LAL	LAL/0-0.4[a]	Same	FULLY/0.4		E	U					R	147,66
Un. Trib. To Wild Cr.	0.8	LAL	LAL/0-0.8[a]	Same	FULLY/0.8		E	U				PSM	R	147,66
33 Unnamed Ditches	48.0													
12 Unnamed Creeks	19.0													

Table UW14-2. Little Eau Pleine River Watershed. Marathon, Portage & Wood Counties. NPS Lake Rank: Low

Lake Name	Fishery Use	Access	Area (acres)	Max/Mean Depth (Feet)	Lake Type	Watershed Drainage	Phos. Class	TSI Range	Fish Advis.	LMO	Impair Source/Impact	Aquatic Plant Data	Exotics	Self-Help Monitoring	Rem.
Mead WLA Pool # 5 T26NR06ES34 1413600		T	336.0	8/NR	DN	.7	2C		NT	No	NPS/NUT,SED	No			
Townline Reservoir T26NR06ES32 1414800	N. Pike	T	675.0	10/NR	DN	1.4	2C		NT	No	NPS/NUT,SED	No			
North Townline Flowage T26NR06ES30 1415100		T	255.0	9/NR	DN	.6	2C		NT	No	NPS/NUT,SED	No			
Berkhahn Flowage T26NR05ES25 1415400	N. Pike	T	1100.0	12/NR	DN		2C		NT	No	NPS/NUT,SED	No			
Honey Island Flowage T26NR05ES26 1415900	N. Pike	T	552.0	7/NR	DN	.4	2C		NT	No	NPS/NUT,SED	No			
North Honey Island Flowage T26NR05ES26 1416200		T	707.0	7/NR	DN	.4	2C		NT	No	NPS/NUT,SED	No			
Teal Flowage T26NR05ES23 1417600		T	375.0	13/NR	DN	1.5	2C		NT	No	NPS/NUT,SED	No			
N. Smoky Hill Flowage T26NR05ES21 1418100		T	325.0	10/NR	DN	1.1	2C		NT	No	NPS/NUT,SED	No			
North Rice Lake T26NR05ES29 1418400		T	220.0	5/NR	DG	1.7	2C		NT	No	NPS/NUT,SED	No			
Smoky Hill Flowage T26NR05ES28 1419300	N. Pike	T	135.0	10/NR	DN	.2	2C		NT	No	NPS/NUT,SED	No			
West Honey Island Flowage T26NR05ES28 1419600	N. Pike	T	123.0	8/NR	DN	.3	2C		NT	No	NPS/NUT,SED	No			
Rangeline Flowage T26NR04ES25 1420100		BR	250.0	9/NR	DN	.8	2C		NT	No	NPS/NUT,SED	No			
McMillan WLA Pool #2 T26NR03ES20 1421800		T	270.0	9/NR	DN	1.0	2C		NT	No	NPS/NUT,SED	No			
Main Flowage T26NR03ES18 1422100		T	620.0	8/NR	DG	1.8	2C		NT	No	NPS/NUT,SED	No			
Unnamed Lake T25NR06ES14 1413200			3.0							No	NPS/NUT,SED	No			

Lake Name Continued	Fishery Use	Access	Area (acres)	Max/Mean Depth (Feet)	Lake Type	Watershed Drainage	Phos. Class	TSI Range	Fish Advis.	LMO	Impair Source/Impact	Aquatic Plant Data	Exotics	Self-Help Monitoring	Rem.
Fisher Flowage T26NR05ES14 1417800		T	30.0	9/NR	DN	.3	2C		NT	No	NPS/NUT,SED	No			
Mead WLA Pool # 10 T26NR05ES33 1419000		T	45.0	3/NR	DN	.5	2C		NT	No	NPS/NUT,SED	No			
McMillan WLA Pool #6 T26NR03ES19 1421600		T	46.0	7/NR	DN	.1	2C		NT	No	NPS/NUT,SED	No			
Horseshoe Flowage T26NR02ES14 1422800		T	50.0	5/NR	DN	1.8	2C		NT	No	NPS/NUT,SED	No			
McMillan Reservoir T26NR02ES13 1422400		T	690.0	12/NR	DG	.1	2C		NT	No	NPS/NUT,SED	No			

Table UW14-3. Little Eau Pleine Watershed. Marathon, Portage & Wood Counites; Wisconsin Pollution Discharge Elimination System (WPDES) Program

Facility	Permit No./ Expires	Industrial Or Municipal	Receiving Stream/ Classification G = groundwater	Q710 of Receiving Stream	Design Flow (MGD)	Variances	Phosphorus Limit	Facility Plan Candidate? Y/N	Waste Load Allocation	Recommendations
Edelweiss Cheese Co	0053694 31 Mar 2002	I	G & Farm pond to unnamed tributary	Zero	0.06	None	NA, monitoring while land spreading only	No	No	Classify unnamed tributary to West
Grand Meadow Dairy	0054658 30 Sep 2004	I	G and Unnamed trib	NA	0.008	None	Monitoring only on land spread wastewater	No	No	None
Land O Lakes – Spencer	0002739 30 Sep 2000	I	G & unnamed tributary	NA	0.0255	None	Monitoring only on land spread wastewater	No	No	Pretreatment process to remove Phosphorus before discharging to Spencer WWTP due to be complete Fall 2000
Rozellville Sanitary District	0029076 31 Dec 2004	M	Unnamed tributary to Wild Creek	Zero	0.021	None	NA	Yes	No	Investigate leaking to groundwater problem, possible plant upgrade in next 2-5 years
Spencer, Village of	0021521 30 June 2002	M	Unnamed Tributary	0.01	0.52	Copper	1.0, effective 1/1/01	No	No	Freezing problems should be corrected by Spring 2001, compliance schedules for phosphorus, copper and Whole Effluent Toxicity (WET) testing
Unity, Village of	0060526 30 June 2005	M	Riparian wetland to Little Eau Pleine River	Zero	0.072	None	NA	No	No	Ammonia sampling should be done in the 4th year of the permit
Auburndale Wastewater Treatment Facility	0022411 31-Dec-04	M	Little Bear Creek unnamed tributary	0.0 cfs	0.123	Yes	No	No	No	None
Wiskerchen Cheese, Inc.	0051802 31-Mar-02	I	G	NA	0.003	No	No	Yes	No	The facility should obtain preliminary engineering plan approval and complete construction of the new ridge and furrow system by next summer.
Quality Ingredients Corporation	0040410 31-Mar-05	I	G	NA	0.0125	No	No	No	No	None
Maple Grove Cheese, Inc.	0052043 30-Jun-05	I	G	NA	0.0025	No	No	No	No	None

Table UW14-4.Little Eau Pleine River Watershed. Marathon, Portage & Wood Counties. NPS Groundwater Rank: High

Municipal Water Supply

Milladore — Sanitary Survey Date 2000 — Population 317 — PWSID 77209946 — Ave. Day Use 12,000 Gallons

Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Borehole Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
1	1	HI 443	Yes	Granite	260'	41'	41'-260'	50	0.59	Cl, PO4	Yes	<1200'	No*	No*
2	2	HW286	Yes	Granite	275'	40.5'	40.5'-275'	50	0.04	Cl, PO4	Yes	<1200'	No*	No*

Marshfield — Sanitary Survey Date 1998 — Population 19,991 — PWSID 77201652 — Ave. Day Use 2.15 MGD (MGD = Million Gallons per Day)

Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screened Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
13	400	BH556	No	Sand & Gravel	94'	79'	79'-94'	150	2.3	A, I, Cl, FL, pH	Yes	<1200'	No*	No*
15	400	BH557	No	Sand & Gravel	95'			125	2.3	A, I, Cl, FL, pH	Yes	<1200'	No*	No*
16	400	BH558	No	Sand & Gravel	56.5'			130	2.3	unused	Yes	<1200'	No	No
17	400	AR304	Yes	Sand & Gravel	58'	43'	43'-58'	210	2.3	A, I, Cl, FL, pH	Yes	1832'	No	No
18	400	BH560	Yes	Sand & Gravel	60'	45'	45'-60'	380	2.3	A, I, Cl, FL, pH	Yes	1994'	No	No
19	400	BH561	Yes	Sand & Gravel	58.5'	43.5'	43.5'-58.5'	175	2.3	A, I, Cl, FL, pH	Yes	1865'	No	No
20	400	BH562	Yes	Sand & Gravel	59.5'	44.5'	44.5'-59.5'	190	2.3	A, I, Cl, FL, pH	Yes	2312'	No	No
21	400	AR319	Yes	Sand & Gravel	85'	55'	55'-85'	300	2.3	A, I, CL, FL, pH	No	1453'	No	No*
22	400	AR323	Yes	Sand & Gravel	90'	55'	55'-90'	350	2.3	A, I, CL, FL, pH	No	1264'	No	No*

Spencer — Sanitary Survey Date 1998 — Population 1861 — PWSID 73701089 — Ave. Day Use 130,000 Gallons

Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screened Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
3	3	BG318	Yes	Sand & Gravel	33'	26'	26'-33'	150	0.14	A, I, CL, Fl, pH	No	1999'	No	No

* Area around the wells may have been floodplain or wetland designation, but was filled during construction.

JOHNSON CREEK WATERSHED (UW15)

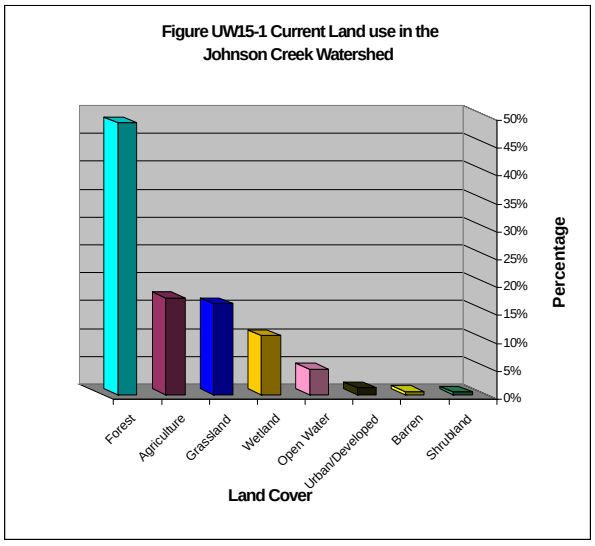
WATERSHED SUMMARY

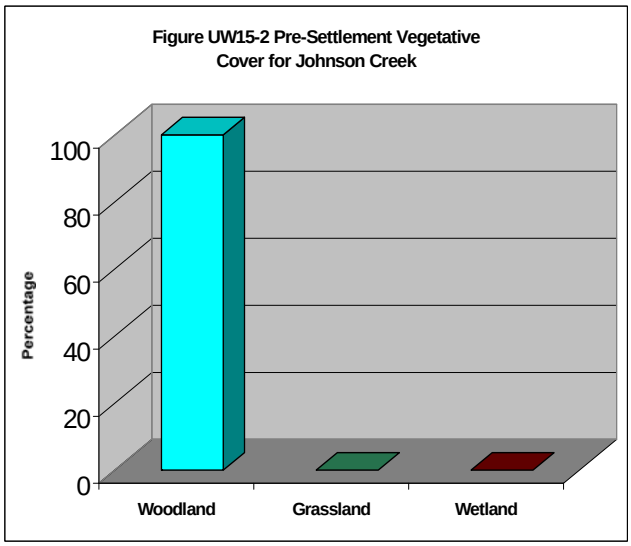
Johnson Creek Watershed (Map UW15) is located in Marathon County. This watershed was ranked using the Nonpoint Source Priority Watershed Selection Criteria. Based on surface and ground water data, the overall ranking is low.

POPULATION DEMOGRAPHICS

The current population of the watershed is just under 5,000 people and is only predicted to increase by 150 people in the next ten years. Very little development has occurred due to the size of the watershed and the small population (North Central Wisconsin Regional Planning Commission, 2000, Wisconsin Department of Administration, 2000).

Before the land was settled, it was entirely comprised of woodlands (Figure UW15-2). According to current land use records, the watershed is made up of 50% forested, 17% agriculture, 16% grassland and 11% wetland (Figure UW15-1) (Enterprise Information, 1998).





WATERSHED STREAMS

A summary of watershed streams is listed in Table UW15-1. Figure UW15-3 indicates the total number of stream miles in the Johnson Creek Watershed.

Johnson Creek
Johnson Creek is classified as a warm water forage fishery. Minimal information is available concerning use problems. A rotten granite deposit is located nearby, covering approximately nine square miles, and it is unknown if this deposit is actively mined or if it is causing environmental impacts.

Peplin Creek
Peplin Creek is classified as a forage fishery. Minimal information is available concerning use problems.

WISCONSIN POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM (WPDES)

Table UW15-3 summarizes the WPDES for the Johnson Creek Watershed.

Wausau Mosinee Paper Corp Specialty Paper Group Mosinee Mill

The Mosinee Mill produces 268 tons per day (TPD) of unbleached kraft hardwood and softwood pulps. From the unbleached pulp and purchased bleach pulp, the Mosinee Mill produces 386 TPD of unbleached and bleached kraft papers, primarily for specialty industrial markets.

The Mosinee Mill treats its process wastewaters prior to discharge to the Wisconsin River. The Mill's wastewater treatment system provides pH neutralization, primary clarification and secondary biological treatment via a three-stage oxygen activated sludge process. Alum and polymer are added to the secondary clarifier. Treatment system sludge is de-watered and burned in the boilers on site.

The Mosinee Mill also operates a treated effluent holding pond (TEHP) to store influent or effluent during the summer months when wasteload allocation limits are more restrictive. The mill can slowly return the water from the pond to the treatment plant.

Production activities at the Mosinee Mill generate on average 13.7 million gallons per day (MGD) of treated process wastewaters and 10.9 MGD of noncontact cooling water.

Figure UW15-3. Total number of stream miles in the Johnson Creek Watershed.

Exceptional Resource Waters = 0.0 (ERW or Cold I)

Outstanding Resource Waters = 0.0 (ORW or Cold II)

Cold III = 0.0

Warm Water Sport Fishery = 0.0 (WWSF)

Warm Water Forge Fishery = 27.0 (WWFF)

Limited Forage Fishery = 0.0 (LFF)

Limited Aquatic Life = 0.0 (LAL)

Unknown Classification = 17.0
Total of Stream Miles = 44
Number of Streams / Ditches= 16

Mullins Cheese

Mullins Cheese, Inc. processes approximately 1.25 million pounds of milk into 125,000 pounds of cheese of cheese per day. Process water, washwater and condensate of whey and cooling water are treated at an activated sludge type wastewater treatment facility and discharged to the Wisconsin River. All other wastes are land applied via spreading or spray irrigation.

GROUNDWATER

The Central Wisconsin Groundwater Center of the University of Wisconsin-Stevens Point conducted 55 well water samples for nitrates in the Johnson Creek Watershed. Of all the wells tested, 14.5 percent of had nitrate concentrations over 10 parts per million. The Department of Health sets the safe drinking water standards for the State of Wisconsin with nitrate at 10 parts per million or greater as unsafe to drink. Of the 14.5 percent that is over 10 parts per million, 3.6 percent of the wells tested had a nitrate concentrations of 20 parts per million or greater; this is 1.0 percent higher than the basin average.

One well was tested for triazine in Johnson Creek Watershed; the well had a concentration between 1.1 and 3.0 parts per billion. Since triazine can not be used to set standards for drinking water limitations, it is strongly recommended that if a test result comes back above 1 part per billion of triazine, the well should be tested further for total concentrations of atrazine.

This watershed has some very poorly constructed existing wells in several areas. Short-cased drilled and improperly constructed or unused dug wells do contribute to the bacteriologically unsafe water quality in some properly constructed wells. Several significant VOC contamination cases existing within this watershed.

WATERSHED RECOMMENDATIONS

1. Fish and Aquatic Habitat Staff should conduct wadable baseline monitoring on watershed streams focusing on Nonpoint Source Impacts.

Table UW15-1. Johnson Creek Watershed Marathon County Square Miles: 44 Stream Miles: 44 NPS Stream Rank: Low

Stream Name	Length (miles)	Codified Use	Biolgical Use (Existing)	Biological Use Potential	SUPPORTING USE FULLY-PART-NOT-THR/MILES	303(d) Listed Water	Assess. Categ. M E U	Trend	Integ Indic	Integ Status	Data Level[i]	PROBLEMS SOURCE//IMPACT	COM N R	REF.
Johnson Creek TN26R07ES26 WBIC: 1424900	18.0	DEF	WWFF/0-18[e]	Same[e]	UNK/18.0	No	E	U			B		R	8,199,44,200
Peplin Creek T26NR07ES22 WBIC: 1426200	9.0	DEF	WWFF/0-9.0[e]	Same[e]	UNK/9.0	No	E	U			B		R	8,44
14 Unnamed Creeks	17.0													

Table UW15-2. Johnson Creek Watershed. Marathon County. NPS Lake Rank: Low

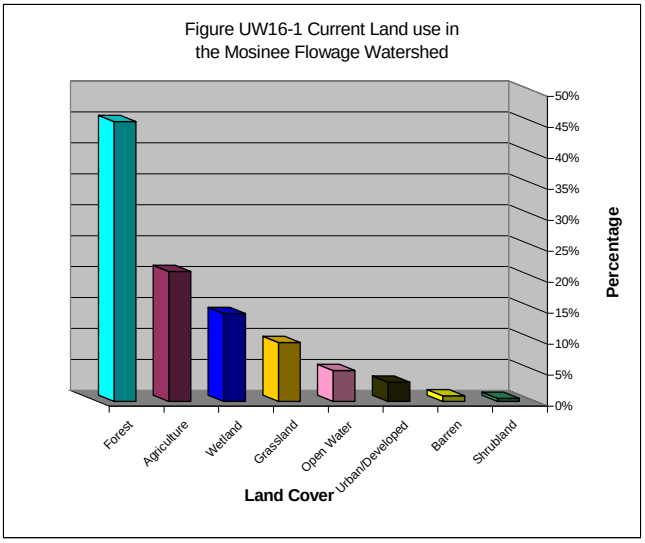
Lake Name	Fishery Use	Access	Area (acres)	Max/Mean Depth (Feet)	Lake Type	Watershed Drainage	Phos. Class	TSI Range	Fish Advis.	LMO	Impair Source/Impact	Aquatic Plant Data	Exotics	Self-Help Monitoring	Recommends.
6 Unnamed Lakes			6.0						No	No	Unknown				

Table UW15-3. Johnson Creek Watershed. Marathon County; Wisconsin Pollution Discharge Elimination System (WPDES) Program

Facility	Permit No./ Expires	Industrial Or Municipal	Receiving Stream/ Classification G = groundwater	Q710 of Receiving Stream	Design Flow (MGD)	Variances	Phosphorus Limit	Facility Plan Candidate? Y/N	Waste Load Allocation	Recommendations
Mosinee Mill	0003671 31 March 2005	I	WWSF	911	16.5	None	1.0 mg/l	N	Y	None
Mullins Cheese	0054127 31 March 2004	I	WWSF/G	911	0.125	Phosphorus	8.0 mg/l	N	N	None

MOSINEE FLOWAGE WATERSHED (UW16)

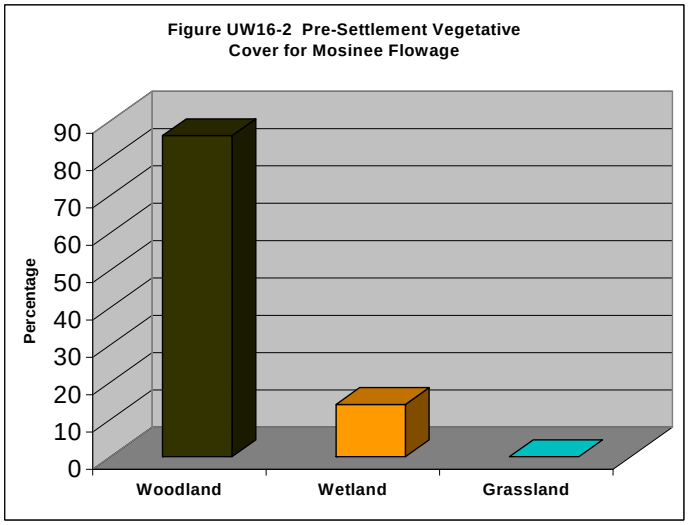
WATERSHED SUMMARY



The Mosinee Flowage Watershed (Map UW16) located in Marathon County. This watershed was ranked using the Nonpoint Source Priority Watershed Selection Criteria. Based on surface and ground water data, the overall ranking is medium. The overall NPS ranking establishes the Mosinee Flowage Watershed as a priority for grant eligibility through the Nonpoint Source Program. Municipal Water Supply summary is found in Table UW16-4 including ranking of ground water and well descriptions.

This watershed lies within the towns of Mosinee and Rib Mountain. Soil erosion rates in these towns range from 3.4-3.9 tons/acre/year (Kaatz, 1988). Soil erosion rates rank in the top 10 of 42 towns in Marathon County. The soil erosion of the entire watershed is unknown at this time.

Excessive erosion and decrease of aesthetic views of the landscape are two concerns regarding current building locations. Strict erosion control methods should be enforced to reduce the amount of siltation in the surface water run-off in the Mosinee Flowage Watershed. Rotten granite, or Grus, deposits occur in the Mosinee Flowage Watershed. One site, Hog Creek, is currently being excavated and excess water is being removed from the site. Whether the other deposits will be mined in the future is unknown.



POPULATION DEMOGRAPHICS

The current watershed population is 9,049 people and is projected to increase to 10,394 by the year 2015, an increase of over 15 percent for the current population. Steep hillsides, valleys, lowlands and wetlands in this watershed restrict suitable residential buildings. Urban sprawl is occurring although there are limited suitable building sites (North Central Wisconsin Regional Planning Commission, 2000, Wisconsin Department of Administration, 2000).

According to land records in the mid-1800s, original vegetation consisted of primarily woodlands with some wetlands (Figure UW16-2). The current land use in this watershed consists of forests(45%), agriculture (21%), wetland(14%) and grassland (10%) (Figure UW16-1) (Enterprise Information, 1998).

WATERSHED STREAMS

A summary of watershed streams is listed in Table UW16-1. Figure UW16-3 indicates total number of stream miles in the Mosinee Flowage Watershed.

Black Creek

Black Creek is classified as a Class II trout stream. Beaver and beaver dams throughout are affecting the water quality, reducing stream flows and raising water temperature. Streambank pasturing is a problem below county HWY N. A rotten granite deposit lies adjacent to Black Creek. Whether the site is being excavated is unknown.

Four-mile Creek

Four-mile Creek is classified as a warm water game, and Class I and II trout stream. It is subject to natural water level fluctuations and has a low gradient at some locations. Streambank pasturing has destroyed fish habitat in some sections of the stream. A rotten granite deposit is located adjacent to Four-mile Creek but it is unknown whether this site is currently being excavated.

Hog Creek

A rotten granite deposit is being excavated adjacent to Hog Creek. Although not classified trout water, brook trout were found in the upper reaches of stream during 1975. Sampling during 2001 did not find trout at those locations, however evidence of moderate beaver damage was observed in the areas.

Figure UW16-3. Total number of stream miles in the Mosinee Flowage Watershed.

Exceptional Resource Waters = 7.0
(ERW or Cold I)

Outstanding Resource Waters = 16.6
(ORW or Cold II)

Cold III = 0.0

Warm Water Sport Fishery = 1.4
(WWSF)

Warm Water Forge Fishery = 11.0
(WWFF)

Limited Forage Fishery = 0.0
(LFF)

Limited Aquatic Life = 0.0
(LAL)

Unknown Classification = 13.0
Total of Stream Miles = 49.0
Number of Streams / Ditches= 17

WISCONSIN POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM (WPDES)

Table UW16-3 summarizes the WPDES in the Mosinee Flowage Watershed.

Mosinee WWTP

The City of Mosinee operates an activated sludge type wastewater treatment plant with disinfection and aerobic digestion of sludge. There is not a significant industrial loading to this plant.

Rib Mountain Metropolitan Sewerage District

RMMSD operates a municipal wastewater treatment plant located along the Wisconsin River between Wausau and Mosinee. It services parts of the Village of Rothschild, City of Schofield, Village of Weston, Town of Kronenwetter and Town of Rib Mountain. There are very few industrial dischargers to RMMSD (i.e. Wausau Tile, which pretreats, and Schuette Metals, which is a low volume, intermittent discharger). Treatment processes include primary and secondary clarification, aeration, chlorination and dechlorination. Sludge is processed in an anaerobic digester, dewatered and stored on before it is land spread.

GROUNDWATER

Mosinee Wells 3, 4 and 5 are all shallow sand and gravel wells located in very close proximity to each other. They each have elevated levels of iron and manganese and are run through a centralized treatment plant. Iron and manganese are oxidized with ozone and the pH is adjusted with an addition of lime. The water is then filtered through rapid sand filters, removing the iron and manganese, and discharge to a ground storage reservoir. The water is chlorinated prior to the reservoir for disinfections, and polyphosphates are added after the reservoir for corrosion control. The average nitrate concentration for

these three wells is 0.69 ppm. The City of Mosinee is currently working on a project to set up a comprehensive Well Head Protection program.

The Rib Mountain Sanitary District has three wells, which draw water from the sand and gravel aquifer located near the Wisconsin River. A fourth well, located in the same aquifer is currently under construction. Two of the wells (Well 1 and Well 2) have elevated concentrations of naturally occurring iron and manganese. Rib Mountain was approved for the use of an experimental technology for iron and manganese treatment called Vyredox. The treatment consists of pumping treated water, which has been conditioned with oxygen into the aquifer through recharge wells, which surround the production well. The object is to oxidize the iron and manganese under ground into insoluble forms and withdraw water low in soluble iron and manganese. The ratio of injection to withdrawal is roughly 1:6, therefore if 300,000 gallons of water is injected into the aquifer; approximately 1,800,000 gallons of water can be withdrawn before the iron and manganese concentrations again become elevated. The process is then repeated. The Rib Mountain system is the only system in the State using this technology for iron and manganese control.

Besides the iron and manganese concentrations in the two wells, the water quality supplied by the Rib Mountain Sanitary district is very good. Chlorine is added to insure bacterial growth in the distribution system is minimized and fluoride is added to optimize the prevention of dental cavities. The pH is also increased with sodium hydroxide to stabilize the water and prevent corrosion of plumbing systems. Rib Mountain was one of the first municipal water systems to adopt a Wellhead Protection Program to protect this precious resource.

The Central Wisconsin Groundwater Center of the University of Wisconsin-Stevens Point conducted 155 well water samples for determining nitrate concentrations in the Mosinee Flowage Watershed. Of all the wells tested 5.1 percent of the wells were over 10 parts per million in nitrate concentrations. The Department of Health sets the safe drinking water standards for the State of Wisconsin; the safe drinking water limit for nitrate concentrations is anything less than 10 parts per million. Of the 5.1 percent that is over 10 parts per million, .6 percent of nitrate samples had concentration of 20 parts per million or greater, which is slightly below the basin average.

Of the 9 wells tested for triazine in the Mosinee Flowage Watershed, 11.1 percent of the wells tested had concentrations at 1.1 parts per billion or greater of triazine. None of the wells sampled were over 3.0 parts per billion. Since triazine can not be used to set standards for drinking water limitations, it is strongly recommended that if a test result comes back above 1 part per billion of triazine, the well should be tested further for total concentrations of atrazine.

This watershed has some very poorly constructed existing wells located in pockets south of the Big Eau Pleine Flowage in several areas. Short-cased drilled and improperly constructed or unused dug wells do contribute to the bacteriologically unsafe water quality in some properly constructed wells. Several significant VOC contamination cases exist within this watershed.

Several Non-Metallic Mining pits are actively operated in this watershed. As these operations expand to within 1200’ of a private well, the well in most, if not all cases will no longer be considered in compliance with the minimum standards of the State Well Code Chapter NR 812. This is because the minimum requirements for construction of wells within 1200’ of an existing or active quarry begin from the final proposed depth of the quarry.

Wells west from Mosinee west for a few miles as well as north along the Wisconsin River do provide for use of the sand and gravel aquifer, whereas in the remainder of the watershed wells are typically constructed in the granite formation.

WATERSHED RECOMMENDATIONS

1. Fish and Aquatic Habitat Staff should conduct baseline monitoring on watershed streams.

2. Mosinee Flowage watershed should be considered a priority for future grant eligibility under the State Nonpoint Source Pollution Abatement Program.

3. Watershed Staff should conduct a stream segment impact assessment on selected streams where rotten granite excavations occur once mining operations are identified.

Table UW16-1 Mosinee Flowage Watershed Marathon, Taylor Counties Square Miles: 193 Stream Miles: 209.6
NPS Stream Rank: Medium

Stream Name	Length (miles)	Codified Use	Biolgical Use (Existing)	Biological Use Potential	SUPPORTING USE FULLY-PART-NOT-THR/MILES	303(d) Listed Water	Assess. Categ. M E U	Trend	Integ Indic	Integ Status	Data Level[i]	PROBLEMS SOURCE//IMPACT	COM N R	REF.
Black Creek T37NR07ES04 WBIC: 1437100	7.0	Cold	Cold/ II/0-7.0[b]	Same[b]	PART/1.0	No	M	U			B	GRUS/ PSB/HAB BDAM/HAB	R	8,153,42,199,200,95
Fourmile Creek T27NR07ES008 WBIC: 1436200	11.0	DEF Cold Cold	WWSF/0-1.4[e] Cold II/1.4-7[e] Cold I/7-11[e]	Same Same Same[e]	UNK/1.4 UNK/5.6 PART/4.0	No	M	U			B,H	GRUS/ PSB/HAB,TRUB, SED	R	8,153,199,86,95
Hog Creek T26NR06ES01 WBIC: 1434500	9.0	DEF Cold	WWFF/0-8.0[e] Cold I/8-9[e]	Same Same[e]	UNK/8.0 UNK/1.0	No	E	U			B	GRUS/	N	8,199,44,200
Roberts Creek T27NR07ES19 WBIC: 1435900	3.0	DEF	WWFF/0-3.0[e]	Same[e]	UNK/3.0	No	U	U						8,44
Unnamed Creek T27NR07ES06 WBIC: 1436400	2.0	ERW	Cold I/0-2.0[b]	Same[b]	UNK/2.0	No	U	U						153,86
Unnamed Creek T28NR06ES27 WBIC: 1436800	1.0	Cold	Cold II/0-1.0[b]	Same	UNK/1.0	No	U	U						153
Unnamed Creek T28NR06ES28 WBIC: 1436900	1.0	Cold	Cold II/0-1.0[b]	Same	UNK/2.0	No	U	U						153
Unnamed Creek T28NR07ES33 WBIC: 1437200	2.0	Cold	Cold II/0-2.0[b]	Same	UNK/2.0	No	U	U						153
7 Unnamed Creeks	10													
2 Unnamed Ditches	3													

Table UW16-2. Mosinee Flowage Watershed. Marathon and Taylor Counties; WPDES Program

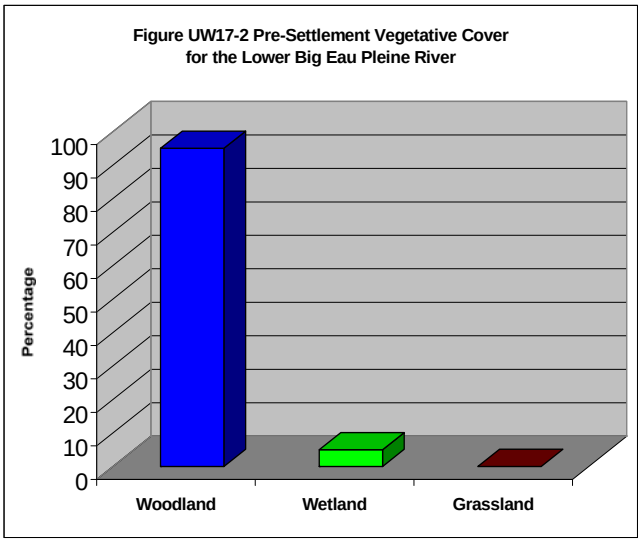
Facility	Permit No./ Expires	Industrial Or Municipal	Receiving Stream/ Classification G = groundwater	Q710 of Receiving Stream	Design Flow (MGD)	Variances	Phosphorus Limit	Facility Plan Candidate? Y/N	Waste Load Allocation	Recommendations
Mosinee WWTP	0022390 31 march 2003	M	WWSF	911	0.825	CBOD 25 mg/l	1.0 mg/l	No	Yes	Complete copper source reduction activities
Rib Mountain Metro Sewerage District	0035581 30 Sep 2004	M	WWSF	846	4.27	None	1.0 mg/l	No	Yes	None

Table UW16-3. Mosinee Flowage Watershed. Marathon and Taylor Counties; Municipal Water Supply Data.
NPS Groundwater Rank: High

Mosinee		Sanitary Survey Date 1997			Population 4054		PWSID 73701595				Ave. Day Use 600,000 Gallons		
Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screened Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
3	200	BG302	Yes	Sand & Gravel	55'	45'	45'-55'	520	0.69	O, I, Cl, PO4	No	<1200'	No	No
4	200	BG303	Yes	Sand & Gravel	45'	35'	35'-45'	210	0.69	O, I, Cl, PO4	No	2159'	No	No
5	200	BG304	Yes	Sand & Gravel	45'	35'	35'-45'	230	0.69	O, I, Cl, PO4	No	2159'	No	No

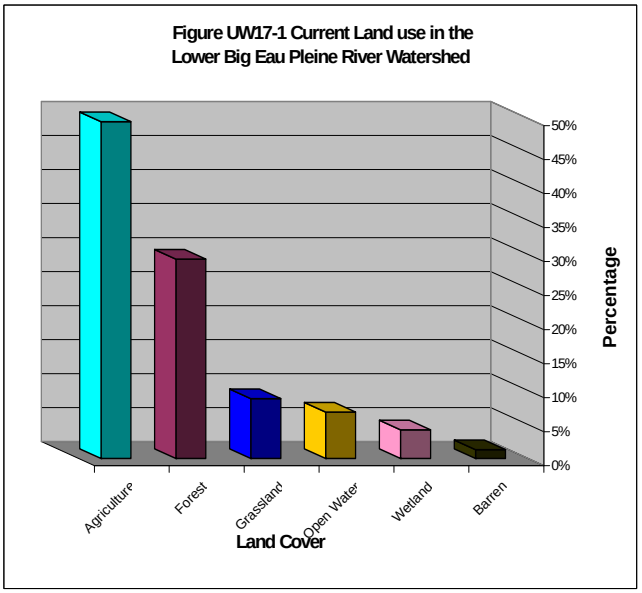
LOWER BIG EAU PLEINE RIVER WATERSHED (UW17)

WATERSHED SUMMARY



The Lower Big Eau Pleine River Watershed (Map UW17) is located in Marathon County. The Lower Big Eau Pleine has similar water quality concerns to those of the Upper Big Eau Pleine River Watershed. There are high rates of surface run-off due to the silty soils and steep gradients in the area. This results in pollution transport to the streams during run-off. Water quality concerns include stream sedimentation, turbidity, filamentous algae growths, excessive nutrient enrichment and diurnal shifts in dissolved oxygen levels.

Accelerated soil erosion rates along with manure handling practices within the townships of Bergen, Mosinee, Cassel, and Day warrant conservation assistance.



The Lower Big Eau Pleine River Watershed was ranked per the Nonpoint Source Priority Watershed Selection Criteria. Based on surface and ground water data, the overall ranking is high establishing the Lower Big Eau Pleine River Watershed a high priority for future grant eligibility through the Wisconsin Nonpoint Source Water Pollution Abatement Program. In 1993, a nonpoint source control plan was approved for the Lower Big Eau Pleine River Watershed. The anticipated completion date is December 2002 (Haynes, 1993).

Another area of concern involving surface water is non-metallic mining in the lower Big Eau Pleine River Watershed in the Hadler-Mosinee area. Due to the decreasing availability of sand and gravel, excavations of rotten granite (grus) have increased. One particular area of concern is the Freeman Creek Watershed, where a large deposit is being mined. Studies of the current and long-term environmental impacts are warranted.

POPULATION DEMOGRAPHICS

The current population in the Lower Big Eau Pleine River is around 4,600 people. In the last 30 years the population of this watershed has only increased by 660 people and is only predicted to increase by another 150 people in the next 15 years. This is only an increase in the total population by 810 people in a 45-year span. The overall grow rate in this watershed is far below the average for the basin and is considerably below one percent for annual growth (North Central Wisconsin Regional Planning Commission, 2000, Wisconsin Department of Administration, 2000).

According to land survey records from the mid-1800s, original vegetation consisted primarily of woodlands (Figure UW17-2). Current land use in the watershed consists primarily of agriculture (50%) and forested (29%) (Figure UW17-1). Forested land throughout this watershed has been severally impacted and destroyed since the settlement of this area (Enterprise Information, 1998).

WATERSHED STREAMS

A summary of watershed streams is listed in Table UW17-1. Figure UW17-3 indicates the total number of stream miles in the Low Big Eau Pleine River Watershed.

Lower Big Eau Pleine River

The Lower Big Eau Pleine River is classified as a warm water game fishery. This watershed receives a significant amount of nutrients and sediment from NPS run-off, particularly animal waste. The entire Big Eau Pleine River is listed on the EPA 303 (d) list as an impaired waterbody for low dissolved oxygen and high levels of bacteria.

Wisconsin Valley Improvement Company (WVIC) owns and operates a dam on the Lower Big Eau Pleine River. The present operation practices at the dam may contribute to increased suspension of oxygen-demanding sediments. It is unknown if this or other factors such as decomposing algal blooms, reduced iron and manganese species from sediment poor water, are the major contributors to formation of low dissolved oxygen sag (Gunnison, 1988). Future studies could determine which of the above is the major factor; so possible remediation can be conducted. In any event, reduction of nutrients and sediment from NPS run-off is needed.

Figure UW17-3. Total number of stream miles in the Lower Big Eau Pleine River Watershed.

Exceptional Resource Waters = 0.0
(ERW or Cold I)

Outstanding Resource Waters = 7.6
(ORW or Cold II)

Cold III = 1.0

Warm Water Sport Fishery = 22.4
(WWSF)

Warm Water Forge Fishery = 6.5
(WWFF)

Limited Forage Fishery = 15.5
(LFF)

Limited Aquatic Life = 4.0
(LAL)

Unknown Classification = 37.0
Total of Stream Miles = 94.0
Number of Streams / Ditches= 22

Burns Creek

DNR lacks water quality data on Burns Creek. More information is needed to determine NPS impacts on water quality.

Fenwood Creek

A 1977 wastewater receiving stream classification indicated Fenwood Creek appeared to be affected by agricultural NPS run-off. Two biotic index samples collected in 1978 showed fair water quality.

Freeman Creek

Freeman Creek is presently classified as warm water game, and Class II and III trout waters. The Class II portion is not up to its potential use due to non-metallic mining and NPS pollution. This 4.6-mile portion could potentially be Class I trout waters. A biotic index sample collected in 1978 showed fair water quality.

Rotten granite (grus) mining occurs extensively in the Freeman Creek Watershed (Hadler-Mosinee deposit). Six different sites were either dewatering or discharging sediment-laden water to tributaries of Freeman Creek or Freeman Creek itself in 1986. A 1985 inspection of Freeman Creek (T27N, R5E, Section 13, S½, SE¼) identified a turbid sediment plume entering the creek via an unnamed tributary. It was concluded this sediment-laden water is damaging to the aquatic life in Freeman Creek.

One potential impact of rotten granite dewatering is that decreased stream flow, can occur in those segments of stream within the cone of depression caused by granite dewatering. This decreased flow may be occurring in Freeman Creek. There are at least five or six dewatering sites in Sections 6, 7, 18, 19, T27N, R06E and Section 24, T27N, R05E.

Rock Creek
DNR lacks water quality data on Rock Creek.
Rocky Run Creek
DNR lacks water quality data on Rocky Run Creek.

Unnamed Creek (T27N, R4E, SECTION 20, SE¼, SE¼)
The village of Stratford WWTP discharges effluent to this unnamed creek, which drains to the Big Eau Pleine River.

WATERSHED LAKES

The Big Eau Pleine Reservoir is the third largest reservoir in the Central Wisconsin Basin (Table UW17-2). The reservoir was built to supplement flows to the Wisconsin River during low flow events. The Wisconsin River must maintain a steady year round flow to sustain a healthy aquatic population. One of the ways this is done is by building a large supply of water up in adjacent reservoirs and letting it go during low flow periods on the Wisconsin River. This is one of the main reasons the Big Eau Pleine River was impounded.

The Big Eau Pleine Reservoir was added to the fish consumption advisory in April 1991. The DNR should continue to monitor walleye and panfish for mercury contamination. The Big Eau Pleine Reservoir is listed on the 303 (d) list for low dissolved oxygen, high levels of bacteria and a fish consumption advisory for mercury (Appendix I).

The Big Eau Pleine Reservoir has a history of fish kills and massive algae blooms; they can be attributed to nutrient and sediment loading (Shaw, 1979). Although the last winterkill was prior to 1990, winter oxygen levels still reach critical levels in portions of the reservoir. Reduction of excess nutrients and sediment would improve water quality in the Big Eau Pleine Reservoir.

WISCONSIN POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM (WPDES)

Table UW17-3 summarizes the WPDES for the Big Eau Pleine River Watershed.

Village of Fenwood
The Village of Fenwood operates a 3 celled lagoon system. There is little or no industrial loading. Discharge is seasonal (spring and fall) to Fenwood Creek. The design life is until the year 1995, major improvements occurred in 1975 and the average daily flow is 11,300 gallons a day with a BOD load of 25 (#/day)

Village of Stratford
Stratford operates an activated sludge plant. There is not a significant industrial loading to the plant. The design life is until the year 2008, major improvements occurred in 1987 and the average daily flow is 154,300 gallons a day with a BOD load of 414 (#/day).

GROUNDWATER

The city has five wells serving their community. Unfortunately, little is known about the well construction or geology of these wells. All the wells are low yield and are either tapped into the granite or are screened into localized sand and gravel pockets. A recent search for additional source capacity resulted in the drilling of Well 8, a bedrock well that produces 40 gpm. Several dry holes were constructed before Well 8 was finally located. Municipal Water Supply summary is found in Table UW17-4 including NPS ranking for ground water and well descriptions.

The Village of Stratford used to have a number of wells dug that produced bacteriologically unsafe drinking water. These wells have since been properly abandoned. Well 5, which was the best producing

well, was converted into a screened, gravel-packed well in the hope that the total coliform positive samples were related to the well construction and could be eliminated by sealing the top portion of this well. Unfortunately, the total coliform positive samples continue on an intermittent basis. A number of improperly abandoned wells have been discovered around this well and as each one gets properly sealed it is hoped that the coliform problems will cease.

The remaining wells are located in the south central portion of the village and have numerous potential sources of contamination surrounding them. So far the village has been lucky and these wells remain free of contaminants. Nitrate concentrations vary from 0.37 ppm at Well 8 to 7.14 ppm at Well 4, which is located across the street from the local Ag. Coop.

The water in Stratford is also corrosive, causing problems with elevated lead levels leaching from some of the homes plumbing. The village initiated pH adjustments with sodium hydroxide to reduce the corrosive nature of the water. Chlorine is added at all wells for disinfection purposes and a polyphosphate is added at Well 8 to sequester the slightly elevated concentration of manganese. The village does not have a Well Head Protection Program but they have been aggressive in getting unused private wells within the village properly abandoned.

The Central Wisconsin Groundwater Center of the University of Wisconsin-Stevens Point conducted 45 well water samples for nitrates in the Lower Big Eau Pleine River Watershed. Of all the wells tested 13.3 percent of them were over 10 parts per million in nitrate concentrations. The Department of Health sets the safe drinking water standards for the State of Wisconsin, and any nitrate water sample over 10 parts per million is consider unsafe to drink. Of the 13.3 percent that is over 10 parts per million, none of the wells had nitrate concentration of 20 parts per million or greater.

Of the 216 wells tested for triazine in the Lower Big Eau Pleine River Watershed, 7.0 percent of the wells tested had concentrations at 1.1 parts per billion or greater of triazine. One half of a percent of the wells sampled were over 3.0 parts per billion. Since triazine can not be used to set standards for drinking water limitations, it is strongly recommended that if a test result comes back above 1 part per billion of triazine, the well should be tested further for total concentrations of atrazine.

This watershed has some very poorly constructed existing wells in several areas. Short-cased drilled and improperly constructed or unused dug wells do contribute to the bacteriologically unsafe water quality in some properly constructed wells. Several significant VOC contamination cases exist within this watershed.

Many farms in this watershed have numerous non-complying wells that need to be properly sealed to protect groundwater.

WATERSHED RECOMMENDATIONS

1. Fish and Aquatic Habitat Staff should conduct baseline monitoring on watershed streams.

2. WVIC should be encouraged to continue water quality monitoring, especially in winter, to assess the effects of altered draw down on water quality, specifically dissolved oxygen in the Big Eau Pleine Reservoir

3. Watershed Staff should conduct sediment core sampling in the Big Eau Pleine Reservoir.

4. Watershed Staff should conduct a water quality standards review on Fenwood Creek and Unnamed Creek (T27N, R4E, S20, SE ¼, SE ¼) receiving the Village of Fenwood WWTP discharge.

5. Watershed Staff should conduct a water quality standards study on the unnamed creek receiving the Village of Stratford's WWTP discharge.

6. Lower Big Eau Pleine Watershed should remain a high priority for future grant eligibility under the State Nonpoint Source Pollution Abatement Program.

7. Watershed Staff should evaluate the severity of dissolved oxygen and bacteria problems in the Lower Big Eau Pleine River, as identified on the 303 (d) List.

Table UW17-1 Lower Big Eau Pleine River Watershed Marathon County Square Miles: 139 Stream Miles: 94 NPS Stream Rank: High

Stream Name	Length (miles)	Codified Use	Biolgical Use (Existing)	Biological Use Potential	SUPPORTING USE FULLY-PART-NOT-THR/MILES	303(d) Listed Water	Assess. Categ. M E U	Trend	Integ Indic	Integ Status	Data Level	PROBLEMS SOURCE//IMPACT	COM N R	REF.
Big Eau Pleine Riv. T26NR06ES14 WBIC: 1427200	21.0	DEF	WWSF/0-21.0[e]	Same	PART/21.0	D.O. BAC	E	U			B,H,C,P	NPS/NUT,SED PSB,PWL/BOD,DO	R	8,142,95,94,135,35,199,200,19882,13
Burns Creek T27NR05ES24 WBIC: 1428100	5.0	DEF	WWFF/0-5.0[e]	Same	UNK/5.0	No	E	U			B		R	8,44
Fenwood Creek T27NR04ES25 WBIC: 1428700	17.0	DEF	WWFF/0-17.0[e]	Same	PART/17	No	E	U		F	B,P,H	NPS/NUT,SED PSM/NMM	R	8,63,161,201
Freeman Creek T27NR05ES35 WBIC: 1427700	7.0	DEF Cold Cold	WWSF/0-1.4[e] Cold III/1.4-2.4[e] Cold II/2.4-7[e]	Same Cold/4.6(I)	PART/1.4 PART/1.0 NOT/4.6	No	E	U		F	B,H,P	NMM/SED,TU RB PSB/SED,HAB	R	8,44,152,156,175,161,201
Rock Creek T27NR4ES18 WBIC: 1429600	5.0	DEF	UNK/0-5.0[e]	UNK/5.0	UNK/5.0	No	E	U					R	8
Rocky Run T27NR04ES24 WBIC: 1428800	6.0	DEF	UNK/0-6.0[e]	UNK/6.0	UNK/6.0	No	E	U					R	8
Unnamed Creek T27NR04ES20 WBIC: 1429400	4.0	LAL	LAL/0-4.0[a]	Same	FULLY/4.0	No	E	U			B	NPS/ PSM/	R	147,173
Unnamed Creek T27NR05ES26 WBIC: 1427800	3.0	Cold	Cold II/0-3.0[b]	Same	UNK/3.0	No	U	U						153
14 Unnamed Creek	26													

Table UW17-2. Lower Big Eau Pleine River Watershed. Marathon County. NPS Lake Rank: High

Lake Name	Fishery Use	Access	Area (acres)	Max/Mean Depth (Feet)	Lake Type	Watershed Drainage	Phos. Class	TSI Range	Fish Advis.	LMO	Impair Source/Impact	Aquatic Plant Data	Exotics	Self-Help Monitoring	Recommends.
Big Eau Pleine Reservoir T26NR06ES14 1427400		BR	6,830.0	46/16	DG	329.6			MEC	Organization	NPS,DEV,HM/SED NUTS,HAB,DO				

Table UW17-3. Lower Big Eau Pleine River Watershed Marathon County; Wisconsin Pollution Discharge Elimination System (WPDES) Program

Facility	Permit No./ Expires	Industrial Or Municipal	Receiving Stream/ Classification G = groundwater	Q710 of Receiving Stream	Design Flow (MGD)	Variances	Phosphorus Limit	Facility Plan Candidate? Y/N	Waste Load Allocation	Recommendations
Fenwood	0031411 31 March 2003	M	Fenwood Creek WWSF	Zero?	0.015	None	NA	Yes	No	Investigate possible leaking to groundwater, QA on flow measurement
Stratford	0025569 31 March 2004	M	Creek 20-12A LAL	Zero	0.235	None	1.0 mg/l	No	No	None

Table UW17-4.Lower Big Eau Pleine Watershed. Marathon County. NPS Groundwater Rank: High

Municipal Water Supply Data														
Stratford		Sanitary Survey Date 1997			Population 1602		PWSID 73701683				Ave. Day Use 100,000 Gallons			
Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screen/Bore Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
4	4	BG322	No	?	77'	20'	?	70	7.14	Cl, pH	No	<1200'	No	No
5	5	DV931	Yes	Granite	73'	68'	68'-73' (S)	80	4.24	Cl	No	<1200'	No	No
6	6	BG324	No	?	44.5'	26'	26'-44.5'	100	2.46	Cl, pH	No	<1200'	No	No
7	7	BG325	No	?	44.5'	27'	27'-44.5'	47	1.85	Cl, pH	No	<1200'	No	No
8	8	KY282	Yes	Granite	62'	35'	35'-62' (B)	40	0.37	Cl, pH	No	<1200'	No	No

UPPER BIG EAU PLEINE RIVER WATERSHED (UW18)

WATERSHED SUMMARY

The Upper Big Eau Pleine River Watershed (Map UW18) is located in Marathon, Clark and Taylor Counties. The streams in this watershed are all classified as warm water game fish, warm water forage and marginal variance streams. Because the watershed is "flashy," nutrients, sedimentation, bacteria and turbidity affect the majority of the streams, resulting in fish habitat destruction, algae blooms and diurnal shifts in dissolved oxygen levels. The major concern with this watershed and the surrounding watersheds is the nonpoint pollution that is occurring from poor agriculture and development practices.

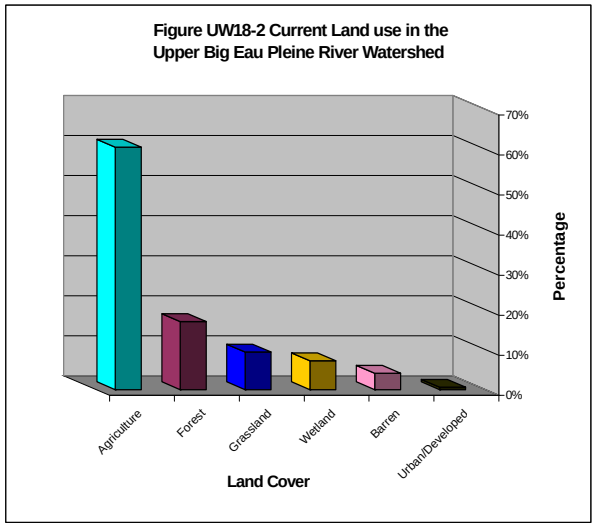
The Upper Big Eau Pleine River Watershed was ranked per the Nonpoint Source Priority Watershed Selection Criteria. Based on surface and ground water data, the overall ranking was high. In 1987, a nonpoint source control plan was approved for the Upper Big Eau Pleine River Watershed. It was completed in December 1997 (Lewis and Jaeger, 1987).

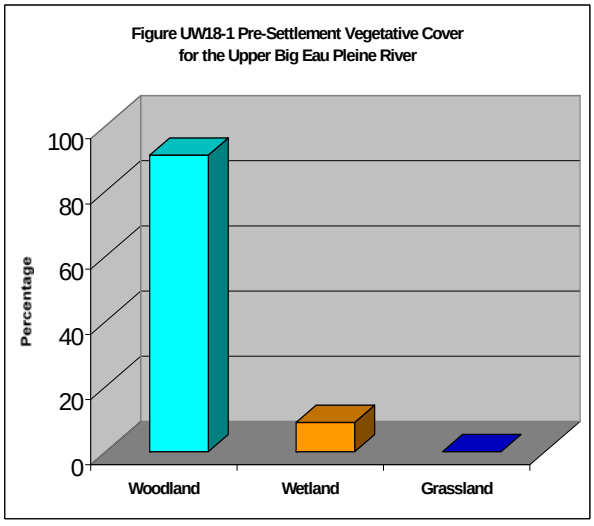
Land use is primarily dairy agriculture (Figure UW18-2). Tight soils, shallow bedrock and steep surface gradients create the "flashy" stream flow pattern with destructively high flows during wet periods and stagnation when the weather is dry. During wet periods, large amounts of sediment, and phosphorus from animal waste run-off enter the streams. This phosphorus ultimately ends up in the Big Eau Pleine Reservoir that has a history of massive algae blooms and fish kills. Reduction of phosphorus to the streams in the Upper Eau Pleine Reservoir is the main goal of the priority watershed project.

POPULATION DEMOGRAPHICS

The Upper Big Eau Pleine River is the third largest watershed in the basin with an overall watershed population of 8,742 making up three percent of the basins population (North Central Wisconsin Regional Planning Commission, 2000, Wisconsin Department of Administration, 2000).

According to land survey records form the mid-1800s, original vegetation consisted primarily of woodlands (Figure UW18-2). The current land use is comprised of over half agriculture with forests, wetlands, and grasslands (Figure UW18-1). Wetlands have remained the same over time but the forests were cut to destroyed to create agriculture (Enterprise Information, 1998).





WATERSHED STREAMS

A summary of watershed streams is listed in Table UW18-1. Figure UW18-3 indicates the total number of stream miles in the Upper Big Eau Pleine Watershed.

Figure UW18-3. Total number of stream miles in the Upper Big Eau Pleine Watershed.

Exceptional Resource Waters = 0.0
(ERW or Cold I)

Outstanding Resource Waters = 0.0
(ORW or Cold II)

Cold III = 0.0

Warm Water Sport Fishery = 29.0
(WWSF)

Warm Water Forge Fishery = 51.7
(WWFF)

Limited Forage Fishery = 36.8
(LFF)

Limited Aquatic Life = 5.5
(LAL)

Unknown Classification = 39.0
Total of Stream Miles = 162.0
Number of Streams / Ditches= 40

Big Eau Pleine River

The Big Eau Pleine River is classified as a warm water game fishery. The stream suffers from sedimentation and turbidity problems due to excessive run-off in the watershed. High bacteria counts at two county parks have forced swimming beaches to close. We have not determined the sources of the high bacteria, but potential sources include swimmers, septic systems, or animal waste. The Big Eau Pleine River is listed on the EPA 303 (d) list as an impaired waterbody for low dissolved oxygen and high levels of bacteria.

Dill Creek

Dill Creek is both a warm water game and limited forage fishery. Like the majority of the Big Eau Pleine Watershed, Dill Creek is characterized by the large amount of run-off it receives and little base flow. Water quality problems associated with the stream include excessive nutrient concentrations, which causes excess algae growth, in-stream sediment, water warming, diurnal oxygen changes, and low flow conditions. The animal waste caused nutrients entering Dill Creek must be reduced to improve the warm water game fishery. The city of Colby WWTP discharges effluent to Dill Creek and is also a significant source of nutrients. A recent discharge permit was issued and includes a total phosphorus limit, which may reduce the total phosphorus loading into Dill Creek.

Elm Brook

Elm Brook is classified as a limited forage fishery and limited aquatic life stream. Biotic index results indicated "very poor" water quality at a site a mile above the junction with Dill Creek. The Abbotsford WWTP, Stormwater run-off, may be responsible for degradation of water quality. The source of BOD-demanding materials is depleting oxygen in the stream.

Hamann Creek

Hamann Creek is classified as a warm water forage fishery. Water chemistry samples taken in the mid- to late '70s during run-off had suspended solids concentration up to 1,000 parts per million (ppm), phosphorous values up to 1.0 ppm and organic concentrations increased about four-fold. Thick growths of filamentous algae are common, indicating a nutrient problem. Run-off and streambank pasturing are sources of nutrients entering the stream. The forage fishery could improve if nutrient sources were reduced or eliminated.

Randall Creek

The sanitary district of Milan discharges its effluent to a wetland draining to Randall Creek. In the spring of 2001, Foremost Farms has shown extremely high phosphorus concentrations in the Milan effluent.

West Branch of the Big Eau Pleine River

The village of Stetsonville WWTP discharges its effluent to the West Branch of the Big Eau Pleine River.

Winding Creek
The DNR owns and operates a walleye-rearing pond discharging to Winding Creek. More data and research needs to be collected to analyze and determine sound management practices on Winding Creek.

WISCONSIN POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM (WPDES)

Table UW18-3 summarizes the WPDES in the Big Eau Pleine River Watershed.

City of Abbotsford
Abbotsford operates trickling filters and rotating biological contactors (RBC) for wastewater treatment. There is a significant industrial loading to the plant: cheese and whey plant, slaughter house and egg breaking plant. The design life is until the year 2006, major improvements occurred in 1986 and the average daily flow is 439,700 gallons a day with a BOD load of 1,506 (#/day).
Treatment types: Trickling filters, RBC

City of Colby
Colby completely reconstructed their WWTP in 1995, the new treatment plant is a two channel oxidation ditch preceded by three anoxic/anaerobic tanks designed for biological phosphorus removal. Two circular clarifiers follow the ditches. Sludge is aerobically digested and is followed by 180 days sludge storage. The design life is until the year 2015, new plant was built in 1995 and the average daily flow is 179,000 gallons a day with a BOD load of 835 (#/day).
Treatment types: two-channel oxidation ditch and bio-P removal

Milan Sanitary District
Milan SD operates a three cell aerated lagoon system. A majority of the influent is from Foremost Farms cheese plant. A pretreatment process is going in at Foremost to reduce the influent loadings of phosphorus, BOD and solids. Foremost is also going through the process of reducing the chloride loadings to the WWTP. The design life is until the year 1998, major improvements occurred in 1978 and the average daily flow is 46,100 gallons a day with a BOD load of 796 (#/day)
Treatment types: aerated lagoons

Stetsonville
Stetsonville is currently constructing a new wastewater treatment facility which will consist of a primary lagoon which is aerated and covered for partial treatment, a covered settling zone, emergency storage equalization basin, and an 8-zone recirculating sand filter. Construction is scheduled for completion in October 2000.

Anamax
The operations at Anamax Corp consist of transferring animal parts and materials from the local route trucks into semi-trucks for shipment to the rendering facility in Green Bay. Transferred materials include animal carcasses, bones, scraps, viscera, hides, etc. from butcher shops, grocery stores and local meat processing facilities. Wastewater originates from the washroom in the facility and occasional general washdown. Normal operation time is 5 days per week, 52 weeks per year and intermittently through the day from about 6:00 am to 6:00 pm. The discharge also includes wastewater generated from the manager's home, which consists of typical residential sewage.

Welcome Dairy
Process wastewater is collected in a 10,000 gallon holding tank at Welcome Dairy. Wastewater is pumped from the holding tank into trucks for landspreading.

GROUNDWATER

Abbotsford has struggled to find enough water to meet its needs since the very beginning and this struggle continues today. The majority of Abbotsford's wells are very low yielding wells constructed into a very tight sandstone formation and often terminating into the granite. Municipal Water Supply summary is found in Table UW18-4; it includes the NPS ground water ranking and well description.

Three of their wells are dug wells, two constructed by the railroad in 1903 and one constructed by the Milk Plant in 1937. These wells are 12 or more feet in diameter and 50 or more feet in depth. They are generally self filling ground storage reservoirs that provide a good capacity of water for short periods of time and then must be given time to recharge. The other six bedrock wells average about 20 gpm each and all discharge to a central raw water storage structure. Eight of these wells are routed through a central treatment plant, which provides for 3-log inactivation of Giardia cysts through ozone contact. This treatment plant was required due to the periodic coliform positive samples coming from the three dug wells.

In addition to the ozone treatment, the water is also chlorinated, fluoridated and injected with a polyphosphate to inhibit corrosion. Some volatile organic compounds related to gasoline and degreasing chemicals are also found in some of the wells. By blending all the wells together and with some destruction by the ozone process, the concentrations are reduced below the maximum contaminant levels (mcl's). At least 6 different sites have been identified that may have contributed to the gasoline contamination near Well 5 and it is suspected that additional sources may also be present. A number of groundwater investigations are currently underway in this area.

Well 3 is a sandstone well that pumps directly into the system; this well is provided with chlorine only.

Three very shallow sand and gravel wells were located east of the City and together produce about a 130 gpm. Due to their very shallow nature, they are also treated for 3-log inactivation of Giardia with ozone contact and are also provided with chlorine, fluoride and polyphosphate addition.

Attempts to construct a 4th well in this area were thwarted by the discovery of a plume of tetrachloroethylene. At this time the source has not been identified and the city has had to put development of another well in this area on hold.

Nitrate concentrations are moderately low, ranging from 1.28 ppm to 3.62 ppm and iron and manganese are, fortunately, not a problem. With STH 29 and 13 bisecting this community, the expected potential growth may become limited by the amount of water the city can supply. The city does not have a Wellhead Protection Program.

The City of Colby has five low yielding wells all located in this watershed. Three of the wells are very shallow sand and gravel wells and the remaining two are developed into the granite bedrock.

Wells 2 and 4 pump water from shallow sand and gravel formations to a pressure iron filter and zeolite-softening unit to remove iron and manganese and reduce the hardness of the water. Chlorine and fluoride are also fed at this plant. Well 6 is another sand and gravel well, which pumps directly to the system with chlorine the only additive. Well 8 is a granite well that has it's own small iron filtration system with a chlorine feed point. Well 9 is the other granite well where chlorine and fluoride are both fed. Nitrate concentrations range from 0 ppm to 4.5 ppm.

The City of Colby has enough source capacity to meet the needs of the community at this time, but have been looking for another well site to supplement the existing system and provide for future needs. At this time a suitable site has not yet been identified. The city is working towards putting together a comprehensive Wellhead Protection Program, but it has not yet been formalized. Many old, unused

private wells have been identified throughout the city, and these are being properly abandoned on a prioritized schedule.

The Central Wisconsin Groundwater Center of the University of Wisconsin-Stevens Point conducted 107 well water samples for nitrates in the Upper Big Eau Pleine River Watershed. Of all the wells tested 3.7 percent of them were over 10 parts per million in nitrate concentrations. The Department of Health sets the safe drinking water standards for the State of Wisconsin and if nitrate concentrations are 10 parts per million or greater that water is unfit for human consumption. Of the 3.7 percent of the wells that tested over 10 parts per million, none of the wells sampled have nitrate concentration of 20 parts per million or greater.

Of the 15 wells tested for triazine in the Upper Big Eau Pleine River Watershed, none had concentrations at 1.1 parts per billion or greater of triazine.

This watershed has some very poorly constructed existing wells in several areas. Short-cased drilled and improperly constructed or unused dug wells (often located in basements) do contribute to the bacteriologically unsafe water quality in some properly constructed wells utilizing the same formation. Several significant VOC contamination cases exist within this watershed.

As you travel west in this watershed the thickness of clay overlying bedrock tends to increase with some areas having 80 – 100' of clay overlying bedrock. In the extreme western portion of this watershed some intermittent thin seams of shale and sandstone occur with in the overlying clays. If not careful during drilling, these seams can easily be missed. The wells over much of the western portion of the watershed produce water with considerable hardness.

WATERSHED RECOMMENDATIONS

1. Watershed Staff should conduct water quality standards review on Randall Creek, the West Branch of the Big Eau Pleine River, Elm Brook and Dill Creek (Milan, Stetsonville, Abbotsford, and Colby (WWTP).

2. Fish and Aquatic Habitat Staff should conduct baseline monitoring on watershed streams.

3. Watershed and County Staff should continue efforts to reduce agricultural run-off in the watershed.

4. Upper Big Eau Pleine Watershed should remain a high priority for future grant eligibility under the State Nonpoint Source Pollution Abatement Program.

5. Watershed Staff should evaluate the severity of dissolved oxygen and bacteria problems in the Upper Big Eau Pleine, as identified on the 303 (d) List.

Table UW18-1 Upper Big Eau Pleine River Watershed Marathon, Taylor and Clark Counties Square Miles: 224 Stream Miles: 193 NPS Stream Rank: High

Stream Name	Length (miles)	Codified Use	Biolgical Use (Existing)	Biological Use Potential	SUPPORTING USE FULLY-PART-NOT-THR/MILES	303(d) Listed Water	Assess. Categ. M E U	Trend	Integ Indic	Integ Status	Data Level[i]	PROBLEMS SOURCE//IMPACT	COM N R	REF.
Big Eau Pleine River T26NR06ES14 WBIC: 1427200	43.0	DEF	WWSF/0-21.[e]	Same[f]	PART/21.0	D.O. BAC.	E	U			B,H,P,C	NPS/NUT,SED TURB,BY/BAC	R	8,80
Brod Creek T28NR03ES11 WBIC: 130300	4.0	DEF	UNK/0-4.0	UNK/4.0	UNK/4.0		E	U			B	NPS/NUT PSB/NUT	R	8,80
Deer Creek T30NR02ES29 WBIC: 1433400	8.0	DEF	WWFF/0-8.0[e]	Same[f]			U	U						8,80,36
Dill Creek T28NR03ES32 WBIC: 1430700	20.0	DEF LFF	WWSF/0-8.0[e] LFF/8-20[c]	Same[f] Same	PART/8.0 FULLY/12.0		E	U			B	NPS/SED,TURB, NUT PSM/NUT	N,R	8,80,61,129 ,78, 147
E. Br. B. Eau Pleine R. T29NR02ES26 WBIC: 1432300	11.00	DEF	WWFF/0-11[e]	Same[e]	PART/11.0		E	U			B	NPS/TURB,SED	R	8,80,44
Elm Brook T28NR02ES19 WBIC: 1431500	5.0	LFF LAL	LFF/0-3.5[c] LAL/3.5-5[c]	Same Same	FULLY/3.5 FULLY/1.5		E	U			B	PSM/DO	R	8,80,14762
Hamann Creek T27NR03ES02 WBIC: 1429900	10.0	DEF	WWFF/0-10[e]	Same	PART/10.0		E	U			B,C,P	PSB/HAB,NUT NPS/NUT,SED, TURB	N	8,80
Marsh Creek T28NR03ES08 WBIC: 1431900	6.0	WWFF	WWFF/1-6.0[c]	Same	PART/6.0		U	U						8,80,14764
Noisy Creek T27NR03ES13 WBIC: 1429700	6.0	DEF	WWFF/0-6.0[e]	Same[e]	PART/6.0		U	U						8,80,44
Porky Creek T28NR02ES03 WBIC1432200:	6.0	DEF	WWFF/0-6.0[e]	Same	PART/6.0		E	U			B	NPS/NUT	R	8,80,65
Raeder Creek T28NR02ES35 WBIC: 1430800	3.0	DEF	WWFF/0-3.0[e]	Same	PART/3.0		E	U			B	NPS/TURB,SED	R	8,80,44
Randall Creek T28NR03ES19 WBIC: 1431800	10.0	LFF LAL	LFF/0-9[c] LAL/9-10[c]	Same Same	FULLY/9.0 FULLY/1.0		E	U			B,C	NPS/TURB,SED, NUT PSM/NUT	R	8,80,14767
W. Br. B. Eau Plein. R. T29NR02ES26 WBIC: 1432700	12.0	DEF LFF	WWFF/0-8.7[e] LFF/8.7-12[c]	Same	PART/8.7 FULLY/3.3		E	U			B	NPS/TURB,SED	R	1, 2, 7, 8
Winding Creek T28NR02ES33 WBIC: 1432700	5.0	DEF	WWFF/0-5.0[e]	Same	UNK/5.0		E	U			B,C		R	8,80,44
Unnamed Creek T29NR02ES02 WBIC: 1432500	5.0	DEF	UNK/0-5.0	UNK/5.0	UNK/5.0		U	U						
25 Unnamed Creeks	39													

Table UW18-2. Upper Big Eau Pleine River Watershed. Marathon , Taylor and Clark Counties. NPS Lake Rank: Low

Lake Name	Fishery Use	Access	Area (acres)	Max/Mean Depth (Feet)	Lake Type	Watershed Drainage	Phos. Class	TSI Range	Fish Advis.	LMO	Impair Source/Impact	Aquatic Plant Data	Exotics	Self-Help Monitoring	Recommends.
Unnamed Lake T28NR02ES28 1431100			38.0		DG		2C			No					
Abbotsford Pond T29NR02ES21 1432900	LM Bass	NW	4.0	5/NR	DG	35.4	2C		NT	No					
1 Unnamed Lake			1.0												

Table UW18-3. Upper Big Eau Pleine River Watershed. Marathon, Taylor and Clark Counties Wisconsin Pollution Discharge Elimination System (WPDES) Program

Facility	Permit No./ Expires	Industrial Or Municipal	Receiving Stream/ Classification G = groundwater	Q710 of Receiving Stream	Design Flow (MGD)	Variances	Phosphorus Limit	Facility Plan Candidate? Y/N	Waste Load Allocation	Recommendations
Abbotsford, City of	0023141 31 Dec 2002	M	Elm Brook LAL	<0.01 cfs	0.815	None	1.0 mg/l (effective 1 Jan 2001)	Yes	No	Finalize industrial agreements and determine if capacity of plant is sufficient for current industrial and residential users
Colby, City of	0023655 30 June 2002	M	Dill Creek LFF	0.1 cfs	0.4	None	1.0 mg/l starting 1 July 2000	No	No	
Milan SD	0031500 30 June 2005	M	Wetland to Randall Creek LAL	Zero	0.2	CBOD and TSS	NA if effluent P is less than 1800 lbs/yr after pretreatment at FFA	No	No	-Reduce influent chloride and phosphorus loadings -Justify cBOD & TSS limits
Stetsonville WWTP	0060216 30 Sept. 2002	M	Ditch tributary to Little Eau Pleine WWFF	Zero	0.085	None	1.0 mg/l starting 10-01-01	No currently under construction	No	Currently new facility constructed. Went on-line in Fall, 2000.
Anamax	0057070 31 Dec 2003	I	G	NA	500 gallons per day	None	NA	No	No	None
Welcome Dairy	0053660 31 March 2001	I	G	NA	1500 gallons per day	None	NA	No	No	None

Table UW18-4. Upper Big Eau Pleine River Watershed. Marathon, Taylor and Clark Counties. Nonpoint Source Rank: High

Municipal Water Supply Data

Abbotsford			Sanitary Survey Date 1997				Population 1930			PWSID 73701485		Ave. Day Use 330,000 Gallons		
Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screen/Bore Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
1	200	BG273	No	Sandstone	47'	?	?	140	3.62	O, Cl, Fl, PO4	No	?	No	No
2	200	BG274	No	Sandstone	70'	?	?	250	3.62	O, Cl, Fl, PO4	No	?	No	No
3	3	BG275	No	Sandstone	41'	26'	26'-41' (B)	18	1.28	Cl	No	<1200'	No	No
4	200	BG276	No	Sandstone	80'	32'	32'-80' (B)	22	3.62	O, Cl, Fl, PO4	No	<1200'	No	No
5	200	BG277	No	Sandstone (SS)	63.5'	?	?	250	3.62	O, Cl, Fl, PO4	No	?	No	No
6	200	BG278	Yes	SS & Granite	92'	40.5'	40.5'-92' (B)	19	3.62	O, Cl, Fl, PO4	No	<1200'	No	No
7	200	BG279	Yes	SS & Granite	73'	48'	48'-73' (B)	20	3.62	O, Cl, Fl, PO4	No	<1200'	No	No
8	200	BG280	Yes	SS & Granite	98'	54'	54'-98' (B)	20	3.62	O, Cl, Fl, PO4	No	<1200'	No	No
9	200	BG281	Yes	SS & Granite	71'	53'	53'-71' (B)	22	3.62	O, Cl, Fl, PO4	No	<1200'	No	No
10	300	GS751	Yes	Sand & Gravel	41.5'	27.5'	27.5'-41.5' (S)	50	1.86	O, Cl, Fl, PO4	No	<1200'	No	No*
11	300	FJ751	Yes	Sand & Gravel	38'	33'	33'-38' (S)	38	1.86	O, Cl, Fl, PO4	No	<1200'	No	No*
12	300	GC559	Yes	Sand & Gravel	37.5'	29.5'	29.5'-37.5' (S)	42	1.86	O, Cl, Fl, PO4	No	<1200'	No	No*
Colby			Sanitary Survey Date 2000				Population 1600			PWSID 73701694		Ave. Day Use 125,000 Gallons		
Well	Entry Point	Unique Well No.	Well Const. Report	Geology	Well Depth	Casing Length	Screen/Bore Interval	Capacity (gpm)	Nitrate (ppm)	Treatment	Wellhead Protection	Calculated Fixed Radius	Flood Plain	Wetland
2	200	BF305	Yes	Sand & Gravel	49'	39'	39'-49' (S)	25	1.7	I, Cl, FL, Z	No	<1200'	No	No
4	200	BF307	Yes	Sand & Gravel	46'	38'	38'-46' (S)	55	1.7	I, Cl, FL, Z	No	<1200'	No*	No*
6	6	BF308	Yes	Sand & Gravel	50'	42'	42'-50' (S)	22	1.1	Cl	No	<1200'	No	No
8	8	BF310	Yes	Granite	100'	35'	35'-100' (B)	25	0	I, Cl	No	<1200'	No	No
9	9	BF354	Yes	Granite	302'	39'	39'-302' (B)	50	4.5	Cl, FL	No	<1200'	No	No

* Area around the wells may have been floodplain or wetland designation, but was filled during construction.