CROSSMAN CREEK & LITTLE BARABOO RIVER WATERSHED (LW23)

The Crossman Creek and Little Baraboo River Watershed lies in northwestern Sauk County, southern Juneau County, northeastern Richland County, and the southeast corner of Vernon County. It is also in the driftless, or unglaciated region of Wisconsin. The watershed includes the main stem of the Baraboo River from Wonewoc to Reedsburg. Overall population in the watershed for 2000 was estimated to be around 7,400 people.

Table 1: Growth in Municipalities in the Watershed

Municipality	*1990*	*2000*	*% Change*
Cazenovia	288	326	13.2%
Ironton	200	250	25.0%
La Valle	446	326	-26.9%
Wonewoc	793	834	5.2%

The dominant land use in the watershed is agriculture. Forest and grassland also cover a large portion of the watershed.

Table 2: Land Cover in the Watershed

Land Cover	*Percent of Watershed*
Agriculture	46.7%
Forest (Total)	29.6%
Broad-Leaf Deciduous	*29.4%*
Coniferous	*0.2%*
Grassland	17.5%
Wetland (Total)	4.7%
Emergent/Wet Meadow	*2.0%*
Lowland Shrub	*1.4%*
Forested	*1.3%*
Open Water	0.6%
Barren	0.5%
Development	0.3%

Nonpoint sources of pollution are problematic in the watershed. In response, the watershed was the focus of a nonpoint source priority watershed project. The project was jointly sponsored by the Department of Natural Resources, the Department of Agriculture, Trade and Consumer

Watershed At A Glance

Drainage Area (m^2): 218.0

Total Stream Miles: 217.4

Trout Stream Miles: 23.3

Sport Fishery Miles: 27.4

Lakes: Redstone, hemlock Slough, Dutch Hollow, Lee

Exceptional/Outstanding Resource Waters: none

Municipalities: La Valle, Ironton, Cazenovia, Wonewoc

Major Public Lands: none

Concerns and Issues:
- Nonpoint source pollution
- Atrazine
- Hydrologic modification
- High phosphorus levels in lakes leading to eutrophication and algae blooms

Initiatives and Projects:
- Crossman Creek and Little Baraboo River Watershed Former Nonpoint Source Priority Watershed Project
- Baraboo River Restoration Project: LaValle dam removal
- Grant to assist the Lake Redstone protection district with a sediment delivery model
- Grant to study bottom withdrawal on Lake Redstone
- Wild trout restoration
- Lake Redstone Protection and Restoration District

Protection, and the Sauk, Richland and Juneau County Land Conservation Departments. The project was selected in 1983 and was completed in the mid 1990's. Goals of the project were to protect and improve water quality and fisheries habitat by controlling erosion from farm fields, reducing streambank erosion, reducing or controlling barnyard runoff, and better management of manure spreading in the watershed.

When the priority watershed project was completed, 60% of eligible landowners had signed up, but only 65% of the signed projects were actually completed. The project did achieve its goal of 70% phosphorus reduction and 50% sediment reduction.

There is one small area of atrazine prohibition in the watershed. This area is located in the town of Woodland in the area around Plum Creek. The Village of Cazenovia is closely monitoring one well to ensure that drinking water does not exceed the drinking water standard for nitrates. See Appendix B.

A few smaller municipal and industrial point source discharges operate in the watershed. Lakeside Foods, Saputo Cheese and the La Valle wastewater treatment plant discharge to the Baraboo River. Carr Valley discharges to groundwater and the Cazenovia wastewater treatment plant discharges to the Little Baraboo River. The nearby community of Ironton is sewered to correct groundwater problems and has connected with the Cazenovia system for treatment, as has Germantown.

The Crossman Creek and Little Baraboo River Watershed has a variety of good quality habitats and rare plant communities that are listed on the state's Natural Heritage Inventory, (NHI), kept by the Bureau of Endangered Resources. The communities found in the watershed include:

- Dry cliff
- Hemlock relict
- Moist cliff
- Northern mesic forest
- Pine relict
- Southern dry-mesic forest
- Southern mesic forest
- Alder thicket
- Floodplain forest
- Northern wet forest
- Springs and spring runs, hard
- Springs and spring runs, soft
- Stream--fast, hard, cold

In addition to these special communities, the watershed is also home for a variety of rare plant and animal species including; 3 species of birds, 3 species of fish, and 6 plant species. These plants and animals are also listed on the state's Natural Heritage Inventory.

STREAMS AND RIVERS IN THE WATERSHED

Babb Creek

Babb Creek is a 6-mile tributary to the Baraboo River. The creek supports a warm water forage fishery. Sampling conducted in the summer of 2000 found the water to be of fair quality. The stream is considered impaired as a result of nonpoint sources of pollution and is listed on the EPA's list of impaired waters. This nonpoint pollution comes from general

erosion as well as streambank pasturing. Babb Creek was a baseline monitored stream in 2000. A rare aquatic species has been found in the creek in past surveys.

A cursory habitat evaluation was conducted during the summer of 2001. The evaluation found the creek to have good in-stream habitat at the mouth and fair to poor habitat upstream. In the upper reaches of the creek, there is evidence of heavy watershed erosion and nonpoint sources of pollution. In addition, unstable banks were noted. These nonpoint sources of pollution have contributed sediment to the system and increased the amount of sediment found on the bottom of the stream.

Baraboo River
The Baraboo River from Wonewoc to Reedsburg is considered a warm water sport fishery. The former dam at LaValle impounded water on the Baraboo River to form the LaValle Millpond. This dam was removed in 2000. Currently, a restoration plan is being developed for the old mill pond area of the river near LaValle. Despite the efforts of the nonpoint source priority watershed project, the river continues to be threatened by sources of nonpoint pollution. A rare aquatic species has been found in the river in past surveys.

Bauer Valley Creek
Bauer Valley Creek is a 3.5-mile tributary to Cazenovia Branch in Richland County. The creek is a Class II trout stream. The stream experiences habitat problems due to nutrient loading and nonpoint sources of pollution. The creek has not recently been surveyed.

Big Creek
Big Creek is a half of a mile and located just below Lake Redstone where it enters the Baraboo River. Big Creek is considered to have a warm water sport fishery. A survey conducted in 1999 found 23 different species in Big Creek and determined the water to be of fair quality as evidenced by the fish species present. There was a good species diversity found and 23 different species were noted. See Lake Redstone.

Bundy Hollow
This small stream is a tributary to the Little Baraboo River. The stream is very shallow and has problems due to nonpoint sources of pollution. The stream is only able to support a small warm water forage fishery. The creek has not recently been surveyed.

Carr Valley Creek
Carr Valley Creek is a seepage and spring fed tributary to Cazenovia Branch. The creek is currently considered a warm water forage fishery, but there is potential for the stream to support a Class II trout fishery. The stream has problems with nonpoint sources of pollution and a survey conducted in 1999 found the water quality to be borderline fair as evidenced by the fish species present.

A cursory habitat evaluation was conducted during the summer of 2001. The evaluation found the creek to have mostly fair quality habitat. The major problems in the creek can be attributed to erosion and other nonpoint sources of pollution from the surrounding watershed and unstable streambanks.

Cazenovia Branch
Cazenovia Branch is a spring and seepage fed tributary to the Little Baraboo River. The stream has been impounded to form Lee Lake in the village of Cazenovia. The lower 2.5 miles of the creek are considered a warm water forage fishery. Another 4.6 miles are considered a Class II trout stream. The stream has some potential to be a Class I trout stream, however, it has some problems with nonpoint sources of pollution. In addition, portions of the creek have been straightened in an attempt to reduce streambank erosion. Monitoring conducted in 1999 found good water quality as evidenced by the fish species found.

A cursory habitat evaluation was conducted during the summer of 2001. The evaluation found the creek to have mostly good quality habitat below Lee Lake, but poor quality above the lake. The main habitat problem above the lake can be attributed to heavy sedimentation and a lack of exposed stream bottom. The habitat further upstream from the lake, however, appeared to be of better quality than that directly above the lake. The most prominent problem is from nonpoint sources of pollution from the surrounding watershed and bank failure and erosion. See Lee Lake.

Crossman Creek
Crossman Creek is a low gradient spring and seepage fed tributary to the Baraboo River that begins in Juneau County. Baseline surveys conducted in the summer of 2000 determined the creek to be in poor condition. Currently, the lower 4.5 miles are supporting a warm water forage fishery, although this section of the creek could be a warm water sport fishery. The upper 5 miles are currently a limited forage fishery, although it has potential to be a higher quality forage fishery. The lower 4.5 miles of the creek are listed on the EPA's list of impaired waters as a result of nonpoint sources of pollution. This pollution causes problems with habitat and with turbidity in the stream.

A cursory habitat evaluation was conducted during the summer of 2001. The evaluation found the creek to have mostly good quality habitat, although at the mouth and at the uppermost reaches seem to be a little more degraded than the middle portion. The main habitat problem can be attributed to nonpoint sources of pollution from the surrounding watershed and bank failure and erosion. This nonpoint pollution leads to sedimentation of the stream bottom.

Dutch Hollow Creek
Dutch Hollow Creek is a spring and seepage fed stream that was impounded in the 1970's to create Dutch Hollow Lake. Today the stream supports a limited forage fishery. The impoundment has impacted the flow and quality of the stream. The creek has not recently been surveyed. See Dutch Hollow Lake.

East Branch Big Creek
East Branch Big Creek begins in Juneau County and flows south into Lake Redstone in Sauk County. The creek is considered a limited forage fishery and it is not anticipated that the creek could support anything more. The creek experiences problems due to nutrient loading and nonpoint sources of pollution. The creek has not recently been surveyed.

Furnace Creek
Furnace Creek is a spring and seepage fed tributary to the Little Baraboo River in Sauk County. The stream has potential to support a Class II trout fishery, but currently, the stream is only considered a warm water forage fishery. The creek experiences problems due to nonpoint sources of pollution, especially from streambank erosion and streambank pasturing. Baseline monitoring was conducted on the stream in 2000. Surveys in 1999 and 2000 determined the water quality to be fair for warm water fish and poor for cold water species.

Gardner Creek
Gardner Creek is a seepage fed tributary that begins in Juneau County and joins the Baraboo River in Sauk County. The creek is considered a warm water forage fishery and has habitat problems due to nutrient loading as a result of nonpoint sources of pollution. The stream could use some more spring flow to support more fish. The creek has not recently been surveyed.

Hay Creek
Hay Creek is a spring and seepage fed stream that flows to the Reedsburg Millpond. The creek is considered a Class II trout stream for the lower 5.7 miles. The upstream portion is too small to support a trout fishery. The stream is impacted by nonpoint sources of pollution. Surveys conducted in 1998 found water quality to be poor for warm water species and fair for cold water species.

Jones Valley Creek
Jones Valley Creek is a small, spring fed, high gradient, tributary to the Little Baraboo River. The creek's water is cold, but it is too small to support a trout fishery, although some trout may enter the creek from the Little Baraboo River. The creek has not recently been surveyed.

Little Baraboo River
The Little Baraboo River begins from springs in Vernon County. The river then flows east through Sauk County to the Baraboo River at LaValle. In the upper 7 miles, 4.5 are considered to be a Class II trout stream. These upper 4.5 miles support native brook trout, though habitat and water quality are thought to be fair. The rest of the river is considered to be a warm water forage fishery. The stream is affected by nonpoint sources of pollution, particularly those associated with agriculture. Surveys conducted in 1999 found water quality in the trout area of the river to be of fair quality for cold water species. Other surveys found the river to be of fair quality for warm water species as well. Instream habitat work on the Little Baraboo had little positive effect on the overall health of the stream. In addition, despite the priority watershed efforts, the overall health of the aquatic resource is at a low level.

McGlynn Creek
McGlynn was originally a spring and seepage fed tributary to Cazenovia Branch in Richland County, however, it was impounded to form Lee Lake. The bottom three miles of the creek are considered a Class II trout stream. The upper portion of the creek is a cold water stream with smaller forage fish species present. The stream experiences habitat and nutrient problems due to nonpoint sources of pollution. The creek has not recently been surveyed.

Mortimer Valley Creek
Mortimer Valley Creek is a small, high gradient, spring fed tributary to the Little Baraboo River just east of Valton. The creek is currently supporting a Class II trout stream. The creek has not recently been surveyed.

Ox Creek
Ox Creek is a spring fed tributary to the Baraboo River. The creek currently supports a warm water forage fishery. The creek has not recently been surveyed.

Plum Creek
Plum Creek is a low gradient, spring and seepage fed tributary to the Baraboo River. The stream currently supports a warm water fishery. Overall, the stream is affected by nonpoint sources of pollution and hydrologic modification. Heavy runoff during storm events leads to severe erosion in the creek. In an attempt to slow the erosion, many portions of the stream and its tributaries have been straightened. There have been no recent surveys on this creek.

Silver Creek
Silver Creek is a spring fed tributary to the Baraboo River. The stream does not have good habitat and is able to support only a warm water forage fishery. The stream has been listed on the EPA's list of impaired waters as a result of nonpoint source pollution. Overall, a survey conducted in 1998 found the water to be fair for warm water species.

A cursory habitat evaluation was conducted during the summer of 2001. The evaluation found the creek to have fair quality habitat at the mouth and better habitat in the headwaters area. The main problem in the creek can be attributed to the deposition of sediments. Overall, although the potential for nonpoint source pollution from the watershed was noted, the overall quality of the in-stream habitat appeared to be good.

Twin Creek
Twin Creek is a tributary to the Baraboo River. The stream has problems due to nonpoint sources of pollution, specifically streambank erosion. As a result, the stream has some dissolved oxygen and nutrient problems. The stream is only able to support a warm water forage fishery. Baseline monitoring was conducted on the stream in the summer of 2000. This monitoring found fair water for warm water species in the middle portion of the stream and good water quality further upstream.

West Branch Big Creek
West Branch Big Creek begins in Juneau County and flows south into Lake Redstone in Sauk County. The creek is considered a limited forage fishery and it is not anticipated that the creek could support anything more. The creek experiences problems with nutrient loading and nonpoint sources of pollution. The creek has not recently been surveyed.

LAKES IN THE WATERSHED

Dutch Hollow Lake

The 210-acre Dutch Hollow Lake, located in Sauk County, was created by impounding Dutch Hollow Creek in the early 1970's for real estate interests. The lake has a maximum depth of 40 feet, although the lake's basin leaks and the community relies on groundwater pumping to maintain the water level in the lake. The lake used to be a long term trends monitoring lake and was monitored every five years. With the cessation of that program, the lake became a baseline trends monitored lake. Now the lake's

The fishery is comprised of largemouth bass, northern pike, stocked walleye, with bluegill, black crappie, pumpkinseed and yellow perch representing panfish species. White suckers and black bullhead are also present. The lake is noted for especially large size bluegill and crappie. State records of both species were caught during 1994. A mercury consumption advisory exists on walleye and bass. Eurasian water milfoil can be found in the lake.

Lake Redstone

This 612-acre impoundment on Big Creek was created in the early 1970's for real estate interests. Lake Redstone supports a good fishery, dominated by largemouth bass, stocked walleye, stocked musky, abundant white crappie and lesser numbers of bluegill, pumpkinseed and yellow perch. Some channel catfish are present, likely from a 1982 stocking and sparse reproduction occurs. Smallmouth bass have been introduced by a local Bass Club and appear to be doing well. Carp are border-line abundant, and comprised almost totally of large fish (>25"). Aquatic vegetation is sparse due to poor light penetration and few shallow areas. Carp are notorious for up-rooting aquatic vegetation, but there is little vegetation to impact. Nevertheless, a carp removal project would benefit the lake by eliminating competition with other species and turbidity in the shallows during their spawning period. It should be successful as there is no evidence of carp recruitment occurring. Eurasian water milfoil can be found in the lake.

The lake reflects the extensive agricultural watershed it drains with heavy, late summer algal blooms. Organic decomposition depletes the oxygen below 12 feet during the summer. A very active lake district exists on the lake and they have been studying and conducting water quality improvement projects with noticeable results. One of the district's projects is the development of a sediment delivery model for the lake. This project is funded by a Lake Planning Grant from the WDNR. Another Lake Planning Grant was used to fund monitoring on the lake in 2000. The monitoring examined the potential to reduce phosphorus concentrations at the bottom of the lake. One of the options proposed was the installation of a bottom draw on the lake to discharge the phosphorus laden water from the lake. A feasibility study was conducted by WDNR to evaluate this option. The study found that overall, a bottom withdrawal would provide only modest water quality benefit to the lake. In addition, due to the high levels of hydrogen sulfide and ammonia concentrations in the hypolimnetic water, effluent limits and potential wastewater treatment of the discharge would be needed to prevent nuisance odors and to protect the downstream fishery in Big Creek.

La Valle Millpond
The La Valle Millpond was an impoundment created by a dam on the Baraboo River. The dam was removed in 2000 and a restoration plan for the old lake bed is being completed to enhance the wetland and riparian habitat adjacent the river corridor.

Lee Lake
Lee Lake, also known as the Cazenovia Millpond, is a 46-acre impoundment of Cazenovia Branch and McGlynn Creek in Richland County. The lake's fishery consists of largemouth bass and panfish, but carp are a major problem in the lake. The lake is heavily silted in and problems with nutrient loading can be seen by the thick vegetative growth in shallow areas of the lake and in recurring algal blooms. Eurasian water milfoil can be found in the lake.

Hemlock Slough
Hemlock Slough is a 12-acre oxbow of the Baraboo River in Sauk County. The slough experiences some problem with carp. The fishery of the slough consists of northern pike, largemouth bass and panfish. A Sauk County Park is adjacent to the slough.

RECOMMENDATIONS (LW23)

- An assessment should be made of the effort to control the nutrients entering **Lake Redstone.**

- **Babb Creek** and the **Baraboo River** should be monitored to determine the status of rare aquatic species that have been found in these streams.

- **Bauer Valley Creek, Bundy Hollow, Dutch Hollow Creek, East Branch Big Creek, Gardner Creek, Jones Valley Creek, McGlynn Creek, Mortimer Valley Creek, Ox Creek**, and **Plum Creek** should be monitored.

- **Carr Valley Creek, Crossman Creek**, and **Furnace Creek** should be considered for a nonpoint source pollution reduction project such as the Targeted Runoff Management Grant (TRM).

- **Carr Valley** should continue to conduct groundwater monitoring with their point source discharge permit.

- Conduct point source assessment monitoring on the **Little Baraboo River** in the vicinity of the Cazenovia-Ironton discharge to determine if there are any adverse water quality impacts on the stream from the discharge.

Watershed map

Streams in the Crossman Cr & Little Baraboo River (LW23) Sauk, Juneau, Richland & Vernon Counties Area: 218 sq miles

Stream Name	WBIC	Length (miles)	Existing Use	Potential Use	Supporting Potential Use	Codified Use and Trout Stream Classification	Proposed Codified Use	303(d) Status	Rare Aquatic Species	Use Impairment		NPS Rank	Monitored/ Evaluated/ Unassessed	Data Level	Trend	Ref.*
										Source	Impact					
Babb Creek	1279100	6	WWFF	same	Full	DEF	same	Y	Y	NPS, PSB	HAB, NUT	NA	M (2000, 2001)	B4, H2	U	1, 11, 19, 20
Baraboo River	1271100	62.4-89.3	WWSF	same	Part	WWSF	same	N	Y	NPS	HAB, TURB	NA	M (1999)	B2	U	1, 11, 19
Bauer Valley Cr.	1284100	3.5	COLD II	same	Full	COLD II	same	N	N	NPS	HAB, NUT	NA	E (1996)	H1	U	1, 19, 21, 24
Big Creek	1280200	0.5	WWSF	same	Part	DEF	same	N	N	HM	HAB, TEMP	NA	M (1999)	B2	U	11
Bundy Hollow	1284700	2	WWFF	same	Part	DEF	same	N	N	NPS	HAB	NA	U		U	11
Carr Valley Cr.	1283200	7	WWFF	COLD II	Not	WWFF	same	N	N	NPS, SB	HAB	NA	M (1999, 2001)	B2, H2	U	11, 14, 19, 21
Cazenovia Branch	1283100	0-2.5	WWFF	same	Part	DEF	same	N	N	NPS,HM	HAB,TEMP	NA	M (1999, 2001)	B2, H2	U	1, 11, 19, 21, 24
		2.5-7.1	COLD II	COLD I	Part	COLD II	same	N		HM	HAB				U	
		7.1-11	U	U	U	DEF	same	N							U	
Crossman Creek	1286700	0-4.5	WWFF	WWSF	Not	DEF	same	Y	N	NPS	HAB,TURB	NA	M (2000, 2001)	B4, H2	U	1, 8, 19
		4.5-9.5	LFF	WWFF	Not	DEF	same	N							U	
Dutch Hollow Cr.	1286300	5	LFF	same	Part	DEF	same	N	N	HM	FLOW	NA	U		U	11
E.Br. Big Creek	1280500	7	LFF	same	Full	DEF	same	N	N	NPS	NUT	NA	U		U	1, 11, 19
Furnace Creek	1282700	4	WWFF	COLD II	Not	DEF	same	N	N	NPS, PSB	HAB	NA	M (2000, 2001)	B4, H2	U	1, 11, 19, 20, 21
Gardner Creek	1287500	4	WWFF	same	Part	DEF	same	N	N	NPS	HAB, NUT	NA	E (1996)	H1	U	1, 8, 11, 21
Hay Creek	1279000	0-5.7	COLD II	same	Part	COLD II	same	N	N	NPS	HAB	NA	M (1998)	B2, H2	U	1, 11, 19, 20, 21, 24
		5.7-7	U	U	U	DEF	same	N							U	
Jones Valley Cr.	1285500	1	COLD	same	Part	DEF	same	N	N			NA	U		U	11
Little Baraboo River	1282500	0-13.5	WWFF	same	Part	DEF	same	N	N	NPS	HAB	NA	M (1999)	B2	U	1, 11, 19, 20, 21, 24
		13.5-18	COLD II	same	Part	COLD II	same	N		PSB	HAB				U	
		18-20	WWFF	same	Part	DEF	same	N							U	
McGlynn Creek	1283800	0-3	COLD II	same	Part	COLD II	same	N	N	NPS	HAB,NUT	NA	E		U	1, 18, 24
		3-4	COLD	same		DEF	same	N							U	
Mortimer Valley Cr.	1285200	2	COLD II	same	Part	DEF	COLD II	N	N	NPS	HAB	NA	E (1995)	H1, B2	U	1, 11, 20, 21
Ox Creek	1286600	2	WWFF	same	Part	DEF	same	N	N			NA	U		U	1, 11
Plum Creek	1287700	8	WWFF	same	Part	DEF	same	N	N	NPS, SB, HM	HAB	NA	M (1997)	B2, H1	U	1, 11, 19, 21
Silver Creek	1280000	4	WWFF	same	Part	DEF	same	Y	N	NPS	HAB	NA	M (1998, 2001)	B2, H2	U	1, 11, 19
Twin Creek	1279400	9	WWFF	same	Part	DEF	same	N	N	NPS	DO,NUT	NA	M (2000)	B4, H1	U	1, 11, 19, 20, 21
W.Br. Big Cr.	1281200	8	LFF	same	Part	DEF	same	N	N	NPS	NUT	NA	U		U	1, 11, 19
Unnamed streams		66				DEF										

Total Stream Miles	217.4
COLD	2
COLD II	23.3
WWSF	27.4
WWFF	68.5
LFF	25
U	71.2

The numbers in this column refer to the References found in the corresponding Watershed Narrative.
See Appendix J: "How to Read the Stream Tables," in Chapter 7 of the State of the Lower Wisconsin River Basin Report.

Lakes in the Crossman Creek and Little Baraboo River (LW23) **Sauk, Juneau, Richland and Vernon Counties**

Lake Name	WBIC	County	Surface Area (Acres)	Max Depth	Lake Type	Winterkill	Access	SH	Hg	MAC	LMO	TSI	Lake Plan or Prot	P Sens	Comments
Dutch Hollow Lake	1286500	Sauk	210	40	DG	N	BR, P		M	EWM	ASSC			1	lake leaks
Lee Lake (Cazenovia Millpond)	1283700	Richland	46	11	DG		BR		R	EWM				2	special proj.
Redstone Lake	1280400	Sauk	612	36	DG	Y	BR, F	X	M	EWM	DIST	57	PLAN	1	consider dam removal

See Appendix K: "How to Read the Lake Tables," in Chapter 7 of the Lower Wisconsin State of the Basin Report.

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