

MILL AND INDIAN CREEKS WATERSHED (LW10)

This watershed is located in the unglaciated, or driftless, area of the state. Most of the streams in the watershed are tributary to Mill Creek, which flows into the Wisconsin River by Muscoda. Many of these tributaries, particularly above Boaz, are trout streams. As with other watersheds in the basin, land use is predominately agricultural. Away from the Wisconsin River, wetlands are few and many of them have been grazed or cultivated.

Population projections for the Mill and Indian Creeks Watershed predicted the watershed to have a total population of approximately 2,200 people in 2000. The only municipality in the watershed is the village of Boaz. Boaz had a 1990 population of 131 and a 2000 population of 137, which is a 4.6% overall increase in population.

Table 1: Land Cover in the Watershed

<i>Land Cover</i>	<i>Percent of Watershed</i>
Agriculture	46.0%
Forest (Total)	38.6%
<i>Broad-Leaf Deciduous</i>	38.3%
<i>Coniferous</i>	0.3%
Grassland	11.9%
Wetland (Total)	2.3%
<i>Emergent/Wet Meadow</i>	1.5%
<i>Forested</i>	0.6%
<i>Lowland Shrub</i>	0.2%
Open Water	0.7%
Barren	0.5%
Development	0.03%

There are two industrial permitted point source discharges in the watershed. These point sources discharge to groundwater. There are no municipal wastewater discharges in this watershed. The main issue of concern to surface water quality in the watershed is from nonpoint source pollution. As a result of its historical and current problems with nonpoint source pollution, the watershed has been given a high priority ranking for nonpoint source pollution reduction projects. In addition, a portion of the watershed on the Lower Wisconsin River Valley is in an atrazine prohibition area. These areas indicate that elevated levels of atrazine, an herbicide used on corn, have been found in some tested private water wells. Soils are permeable which has allowed atrazine to reach groundwater in some locations. See Appendix B.

Watershed At A Glance

Drainage Area (m²): 129.0

Total Stream Miles: 100.5

Trout Stream Miles: 56.1

Sport Fishery Miles: 12.6

Lakes: Balmoral Pond

Exceptional/Outstanding

Resource Waters: Babb Hollow, Coulter Hollow, E. Branch Mill, Fox Hollow, Higgins, Hood Hollow, Kepler, Mill, Miller, Pine Valley, Ryan Hollow, W. Branch Mill

Municipalities: Boaz

Major Public Lands: None

Concerns and Issues:

- ◆ Nonpoint source pollution
- ◆ Stream channelization and diversion
- ◆ Atrazine

Initiatives and Projects:

- ◆ Wild trout reintroduction

The Mill and Indian Creeks 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. These communities include:

- ◆ Dry cliff
- ◆ Dry prairie
- ◆ Pine relict
- ◆ Moist cliff
- ◆ Sand barrens
- ◆ Southern dry-mesic forest
- ◆ Southern mesic forest
- ◆ Emergent aquatic
- ◆ Ephemeral pond
- ◆ Floodplain forest
- ◆ Oxbow lake
- ◆ Southern sedge meadow

In addition to these special communities, the watershed is also home for a variety of rare plant and animal species including; 1 species of beetle, 4 species of dragonflies, 12 species of fish, 2 species of mayflies, 12 species of mussels, 10 plant species, and 1 mammal species. These plants and animals are listed on the state's Natural Heritage Inventory (NHI).

STREAMS AND RIVERS IN THE WATERSHED

Babb Hollow Creek

Babb Hollow Creek is listed as a Class I trout stream and has some natural reproduction of brook trout. Parts of this stream have been channelized, reducing available in-stream habitat. Two headwater streams have been impounded to create Sabin Pond. Overall, water quality is considered good although temperature and sediment are suspected problems.

Byrds Creek

Byrds Creek, a tributary to the Wisconsin River, is considered a Class II trout stream. Water quality and in-stream habitat are affected by barnyard runoff and intense grazing adjacent the stream. The creek has been ranked as a high priority for nonpoint source pollution reduction. Water resources staff believe this stream has the potential to produce a good population of trout if these nonpoint sources of pollution were corrected. The creek was assessed as a part of 2000 baseline monitoring. A cursory habitat evaluation conducted in the summer of 2001 found good habitat in the lower reaches of the stream and fair habitat in the middle and upper portions of the stream. The creek is threatened by sources of nonpoint pollution including streambank erosion. Overall, there is some sediment deposition that can cover good quality stream bottom.

Core Hollow Creek

This is a spring and seepage fed tributary to Mill Creek. The creek is currently classified as a Class II trout stream but has potential support a Class I fishery. Some natural reproduction of brook trout has been found in the creek. Core Hollow Creek was monitored as a part of 2000 baseline monitoring. A cursory habitat evaluation completed in the summer of 2001 found fair habitat in the lower portion of the stream and good habitat closer to the headwaters of the creek. Overall, the creek is affected by nonpoint sources of pollution from the watershed including streambank instability and erosion. Core Hollow Creek has also been impacted by hydrologic modifications.

Coulter Hollow Creek

This is a Class II trout stream that is tributary to Mill Creek. The stream is listed as exceptional resource water (ERW) and has been ranked as a high priority for nonpoint source pollution reduction. Some limited grazing along the stream may result in nonpoint source pollution problems. A large pig breeding facility operates in the upper reaches of the stream and has caused problems as a result of discharges reaching the stream.

Dieter Hollow Creek

Dieter Hollow Creek is a small, good quality Class II trout stream tributary to Mill Creek. The creek's watershed is estimated to have a high potential for soil erosion and has historically experienced water quality problems due to livestock. Dieter Hollow Creek produced abundant numbers of trout in the early 1970s. The fishery has declined since then, probably as a result of this nonpoint source pollution. The stream is ranked as a high priority nonpoint pollution reduction.

East Branch Mill Creek

This is another Class II trout stream which is also an exceptional resource water (ERW). The stream has some natural reproduction of brook and brown trout. The stream has been ranked high for nonpoint source pollution reduction. There are some barnyards near the stream and grazing occurs adjacent to the stream, which can cause bank erosion and contribute to habitat and water quality problems. Past channelization has affected stream habitat and water quality with stream sediment and suspected temperature problems but the extent of the damage has not been assessed.

Fox Hollow Creek

This is a small spring-fed tributary to Mill Creek. It is a Class I trout stream and is also classified as exceptional resource water (ERW). The stream is ranked as a high priority for nonpoint source pollution reduction. There are areas of intensive grazing along Fox Hollow Creek. This may be having an adverse impact on water quality and in-stream habitat. Past channelization has affected stream habitat and water quality. Stream access is limited to the stream due to excessive posting.

Gault Hollow Creek

This creek is a small seepage and spring fed tributary to Dieter Hollow Creek. The creek supports a Class II trout stream.

Higgins Creek

Higgins Creek is a high gradient spring fed tributary to Mill Creek. The creek supports a Class II trout fishery and is considered an exceptional resource water (ERW). The stream has problems as a result of hydrologic modification. The State owns easements on the creek where it joins with Mill Creek.

Hood Hollow Creek

Hood Hollow Creek is a small spring fed tributary to Mill Creek. The creek supports a Class II trout fishery and is considered an exceptional resource water (ERW). The creek has been hydrologically modified.

Hoosier Hollow Creek

Hoosier Hollow is a Class II trout stream, but has the potential to support a Class I trout fishery. A cursory habitat evaluation conducted in the summer of 2001 found fair habitat throughout most of the stream. Habitat did appear to be slightly better at the mouth of Hoosier Hollow Creek and Mill Creek. The survey identified nonpoint sources of pollution, bank instability and erosion as the main factors affecting habitat in the stream.

The fishery potential is limited by inadequate habitat that results from heavy grazing along the stream, and sedimentation of the streambed. Other factors that may be affecting the health of Hoosier Hollow Creek include an industrial junkyard near the stream and a dam in its headwaters. A number of barnyards in the sub-watershed may be affecting water quality. Manure handling may also be a problem in the sub-watershed. Portions of the stream were channelized in the past. Overall, this stream has been ranked as a high priority for nonpoint source pollution reduction and would benefit from a nonpoint source pollution project.

Indian Creek

Indian Creek is a direct tributary to the Wisconsin River. The creek has not been surveyed recently, although a cursory habitat evaluation was conducted in the summer of 2001. The stream is thought to contain cold water forage fish. A rare aquatic element has been found in the stream

John Hill Creek

No information available for this stream.

Kepler Branch

Kepler Branch is a small, Class I trout stream and an exceptional water resource (ERW). The stream has some natural reproduction of both brook and brown trout. Despite its classification and designation as an ERW, there are water quality problems due to barnyards and cattle access to the stream and the stream has been ranked high for nonpoint source pollution reduction. Trout numbers in this stream have been declining, probably as a result of barnyard runoff in the watershed. A 1993 survey found limited trout habitat in parts of Kepler Branch as a result of siltation and an increased growth of periphyton. The state owns a small bit of land along Kepler Branch and has some land in easements.

Mill Creek

The lower 12.6 miles are classified as a warm water sport fishery. Above Highway 171, the stream becomes a Class II trout stream. Mill Creek above Boaz is considered an exceptional resource water (ERW). A rare aquatic species has been found in the creek. An outstanding wetland complex exists along Mill Creek from near the community of Basswood to Balmoral Pond. This wetland complex is very important for migratory waterfowl and other wildlife in the area. Water quality and stream habitat in the vicinity of Boaz is considered good, and the water in this area seems to be getting colder. Fish management staff have been catching brook trout in these cooler tributaries above Boaz. The stream is ranked as a high priority for nonpoint source pollution reduction. Some stream reaches were channelized which has affected stream habitat. Sediment in the stream is also a problem in some areas. Cattle

trampling the banks and bank erosion have been noted in some reaches of the stream. In the early 1990's, there seemed to be an increase in feeder cattle and feedlots and barnyards adjacent the stream which could have had an adverse impact on habitat and fisheries in Mill Creek. Manure handling and storage has also been a problem along some reaches of Mill Creek. In addition, the dam creating Balmoral Pond is an impediment to fish migration from the Wisconsin River. The state manages several easements along Mill Creek. Many of these easements can be found in the headwaters of the creek, although there are also some easements where Mill Creek joins the Wisconsin River.

Miller Branch Creek

Miller Branch is a small, spring-fed tributary to Mill Creek. It has a high gradient and is thought to have good water quality. The stream is a Class II trout stream and an exceptional water resource (ERW). There is limited information available for this stream.

Miller Hollow Creek

Miller Hollow Creek is a small seepage fed tributary to Mill Creek. The creek is thought to potentially support cold water forage fish. Problems in the stream that have been noted include barnyard runoff and an abundance of aquatic vegetation in the upper reaches. The stream has not been recently surveyed.

Pine Valley Creek

Pine Valley Creek is another small, Class II trout stream and exceptional resource water (ERW). Runoff from barnyards and cattle trampling banks may be causing habitat and water quality problems. The stream has been ranked as a high priority for nonpoint source pollution reduction. The stream has never been surveyed.

Ryan Hollow Creek

Ryan Hollow Creek is a small, spring-fed tributary to West Branch Mill Creek that supports a Class II trout fishery. The stream is considered an exceptional resource water (ERW). A rare aquatic species has been found in the creek. Ryan Hollow Creek has been channelized and in-stream habitat and pools are limited.

West Branch Mill Creek

The West Branch of Mill Creek is a Class I trout stream and exceptional resource water (ERW). Fish surveys on the stream have found naturally reproducing brook trout and a 1996 survey found a healthy population of brook trout. Water quality is considered to be excellent in the upstream portion of the creek. Past stream channelization has caused some habitat problems. There are also beaver dams on the stream that may cause migration problems for the fish.

Wisconsin River

This watershed is adjacent to a portion of the Wisconsin River. For more information on the Wisconsin River, see page 90.

LAKES IN THE WATERSHED

Balmoral Pond

Balmoral Pond is a drainage fed lake created by placing a dam on Mill Creek. The 41.8-acre pond was originally built for hydroelectric purposes but is currently only maintained for recreational purposes. The lake has been affected by nonpoint sources of pollution and the depth is only 5 feet at its deepest point as a result of siltation. In addition to siltation problems, the lake experiences winterkill and an increase in aquatic plant growth as a result of eutrophication.

RECOMMENDATIONS (LW10)

- ◆ Heavy willow brush that exists along **Babb Hollow Creek** should be removed.
- ◆ Stream monitoring should be conducted on **Pine Valley Creek, Mill Creek, Miller Branch Creek** and other named streams in the Mill and Indian Creek Watershed.
- ◆ The **East Branch Mill Creek** should be monitored to determine the extent of stream bank erosion and loss of in-stream habitat as a result of nonpoint source pollution.
- ◆ In-stream habitat improvements should be conducted on **Ryan Hollow Creek** and on **Kepler Branch** to improve the trout population and the overall in-stream health of the system.
- ◆ The pond located on **Byrd's Creek** should be removed.
- ◆ **Byrds Creek, Coulter Hollow Creek, Dieter Hollow Creek, E. Branch Mill Creek, Fox Hollow Creek, Hooiser Hollow Creek, Kepler Branch, Mill Creek and Pine Valley Creek** should be considered for nonpoint source pollution reduction projects such as the Targeted Runoff Management grant (TRM).
- ◆ **Indian Creek, Mill Creek and Ryan Hollow Creek** should be surveyed to determine if rare aquatic elements previously found in the streams are still present.
- ◆ Public access to streams throughout the Mill and Indian Creek Watershed should be increased.

WATERSHED MAP

Streams in the Mill and Indian Creeks Watershed (LW10) **Richland County** **Area: 129 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 Hollow Cr.	1218400	1.5	COLD I	same	Full	COLD III/ERW	COLD I	N	N	HM	HAB	M	M (1996)	B2	I	6, 16, 19
Byrds Creek	1215500	0-5.4	COLD II	COLD I	Part	COLD II	same	N	N	NPS, HM	HAB	H	M (2000 & 2001)	B4, H3	U	1, 2, 3, 6, 12, 19
		5.4-7	U	U	U	DEF	same	N	N						U	
Core Hollow Cr.	1217000	0-3.3	COLD II	COLD I	Part	COLD II	same	N	N	HM	HAB, TEMP	NR	M (2000 & 2001)	B4, H3	U	2, 3, 6, 7, 10, 16, 19
		3.3-4	U	U	U	DEF	same	N	N						U	
Coulter Hollow Cr.	1218800	1.5	COLD II	same	Full-thr	COLD III/ERW	same	N	N	NPS	HAB, TEMP	H	E		U	3, 6, 19
Dieter Hollow Cr.	1216500	0-2.5	COLD II	same	Part	COLD II	same	N	N	NPS, HM	HAB	H	E		U	3, 6, 11, 19
		2.5-4	U	U	U	DEF	same	N	N							
E.Br. Mill Creek	1217200	4.8	COLD II	same	Full-thr	COLD III/ERW	same	N	N	HM,NPS	HAB, TEMP	H	E		U	3, 6, 19
Fox Hollow Cr.	1216700	2.5	COLD I	same	Full	COLD I/ERW	same	N	N	HM,NPS,ACC	HAB	H	E		U	3, 6, 11, 19
Gault Hollow Cr.	1216600	1	COLD II	same	Part	DEF	COLD II	N	N	NPS	HAB	NR	E (1995)	B2, H1	U	12, 16
Higgins Creek	1219000	1.8	COLD II	same	Full	COLD III/ERW	same	N	N	HM	HAB,TEMP	L	U	B2	U	6, 19
Hood Hollow Cr.	1218300	1	COLD II	same	Full	COLD III/ERW	same	N	N	HM	HAB,TEMP	M	E		U	3, 6, 19
Hoosier Hollow Cr.	1215700	0-5	COLD II	COLD I	Part	COLD II	same	N	N	NPS, HM, BY, BDAM, IND, JUNK, PSB	HAB	H	M (2001)	H2	U	2, 3, 6, 12, 19
		5-6	U	U	U	DEF	same	N	N							
Indian Creek	1219700	3	COLD	U	U	DEF	same	N	Y	HM	HAB	NR	M (2001)	H2	U	2, 12
John Hill Cr.	1216400	1.9	COLD II	same	Part	COLD II	same	N	N			NR	E		U	19
Kepler Branch	1218900	1.5	COLD I	same	Part	COLD II/ERW	COLD I	N	N	NPS, HM, BY, BDAM, IND, JUNK, PSB	HAB	H	E (1993)	B2, H1	I	1, 3, 4, 6, 7, 16, 19
		0-12.6	WWSF	same	Part	WWSF	same	N	Y	NPS, HM	HAB, MIG	M	E (1993)	B2, H1	U	3, 6, 7, 10, 12, 13, 16, 19
Miller Branch	1218000	0.7	COLD II	same	Full	COLD III/ERW	same	N	N			M	E (1976)		U	3, 6, 19
		12.6-22.6	COLD II	same	Full-thr	Full-thr	same	N	N			H			U	
Miller Hollow Cr.	1216200	2	COLD	same	Part	DEF	same	N	N			NR	U		U	12
Pine Valley Cr.	1218200	1.5	COLD II	COLD I	Part	COLD III/ERW	same	N	N	NPS, HM, PSB	HAB	H	U		U	3, 6, 7, 19
Ryan Hollow Cr.	1217900	1.5	COLD II	same	Part	DEF/ERW	COLD II	N	Y	HM	HAB, DO, NUT, TEMP	M	E		U	3, 6, 12, 16, 19
West Branch Mill Cr.	1217700	7.4	COLD I	same	Full	COLD III/ERW	COLD I	N	N	HM	HAB	M	M(1996)	B2	U	3, 6, 12, 16, 19
Unnamed Trib to Hoosier Hollow Cr. (T9NR1W, 12-11)	1215900	1.3	COLD II	same	Part	COLD III	same	N	N			NR			U	19
Unnamed streams		13.6				DEF										
Total Stream Miles		100.5	COLD II	43.2												
COLD		5	WWSF	12.6												
COLD I		12.9	U	26.8												

***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 Mill and Indian Creeks Watershed (LW10)

Richland County

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
Balmoral Pond	1216100	Richland	42	5	DG	Y	NW							2	

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

REFERENCES

1. Ball, Joseph R., Tom Smith and C.W. Threinen. Surface Water Resources of Richland County. Wisconsin Department of Natural Resources. 1970.
2. Derkowski, Neil. Summer 303(d) Monitoring Project for Stream in the Lower Wisconsin Basin. Wisconsin Department of Natural Resources. Unpublished. 2001.
3. Eagan, Lloyd Lewis et.al. Richland County Water Quality and Nonpoint Source Assessment Report. Wisconsin Department of Natural Resources. 1985.
4. Enterprise Information, Technology and Applications, Bureau of. Wisconsin DNR. The WISCLAND Land Cover Data. Data from 1991 to 1993. Published in 1998.
5. Enterprise Information, Technology and Applications, Bureau of. Wisconsin DNR. User's Guide to WISCLAND Land Cover Data. 1998.
6. Fix, Steve. Lower Wisconsin River Basin Water Quality Management Plan. Wisconsin Department of Natural Resources. PUBL-WR-001-94-REV. 1994.
7. Kerr, Roger. Personal Communications. Wisconsin Department of Natural Resources. 1991.
8. Marshall, Dave. Personal Communications. Wisconsin Department of Natural Resources. 2000.
9. North Central Wisconsin Regional Planning Commission. Watershed Population Estimates for the State of Wisconsin. May 2000.
10. Schlessor, Roger. Personal Communications. Wisconsin Department of Natural Resources. 1991, 2000.
11. Sorge, Patrick (Buzz). Personal Communications. Wisconsin Department of Natural Resources. 1991 – 1992.
12. Van Dyck, Eugene. Personal Communications. Wisconsin Department of Natural Resources. 2000.
13. Vollrath, Mike. Personal Communications. Wisconsin Department of Natural Resources. 2000.
14. Wisconsin Department of Administration. Population Projections and Census 2000 websites, Http://www.doa.state.wi.us/dhir/boir/demographic/pop_proj.asp. Last updated August 2000.
15. Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP). Atrazine Prohibition Web site, <http://datcp.state.wi.us/arm/agriculture/pest-fert/atrazine/> and ATCP 30, Wisconsin Administrative Code. 2001.
16. Wisconsin Department of Natural Resources. Fish Management Files in Dodgeville and Fitchburg. Southcentral Region. Through 2000.
17. Wisconsin Department of Natural Resources. Water Resources Management Files – South Central Region. 2001.
18. Wisconsin Department of Natural Resources. Wastewater Management Files – South Central Region.
19. Wisconsin Department of Natural Resources. Wisconsin Trout Streams. Bureau of Fisheries Management. 1980.