

2011 Water Quality Management Plan Update

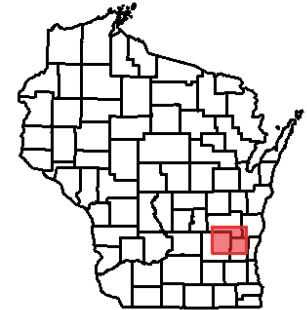
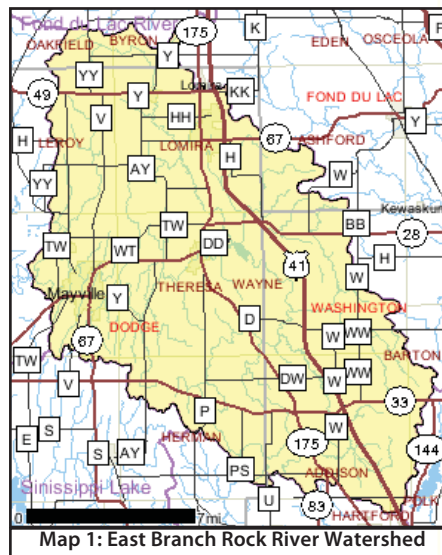
Upper Rock Basin, Wisconsin

December 2011

The East Branch Rock River Watershed lies directly to the east of Horicon Marsh, with the western portion of the watershed in Dodge County and the eastern portion in Washington County. The primary land use in the watershed is agriculture (74%). Theresa Marsh Wildlife Area and Allenton Wildlife Area are large wetland complexes in the watershed.

The East Branch of the Rock River meanders through almost the entire width of the watershed, approximately 45 miles. The East Branch of the Rock River is the primary source of water for part of Horicon Marsh and is also the main source of nutrient and sediment loading to the marsh.

Municipal wastewater facilities discharging in the watershed include: Brownsville, Lomira, Mayville and Theresa. The Allenton Sanitary District and one industrial facility also discharge in the watershed.



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Watershed Details

Population and Land Use

Nearly three-quarters of the area of the East Branch Rock River Watershed is devoted to agricultural use. Wetlands and forests also make up sizeable proportions of the watershed with nine and eight percent of the total area, respectively. Suburban environments equal about four percent of the watershed's area and open water and open space account for another three percent. Scarcer still, Grasslands and urban landscapes each amount to a little less than one percent of the total area.

Land Use	Acres	Percent of Area
Agriculture	94,715.52	74.37%
Wetland	11,139.98	8.75%
Forest	10,133.20	7.96%
Suburban	4,654.95	3.65%
Open Water & Open Space	4,321.58	3.39%
Grassland	1,113.09	0.87%
Urban	1,038.36	0.82%
Barren	242.19	0.19%
Total Acres in Watershed	127,358.86	

Hydrology

The East Branch Rock River Watershed drains directly into the south end of Horicon Marsh. The dominant water feature is the main stem of the Rock River. There are numerous small tributaries that drain into the main stem. A recent USGS/WDNR stream flow model based on temperature and instream flow has characterized the resources in the basin. The map below shows the results of a stream model based on natural communities in the watershed. The streams are differentiated by model results depicting flow and temperature resulting in the placement of waters into one of 11 distinct natural communities.

Rivers Natural Communities in the West Branch of the Rock River Watershed

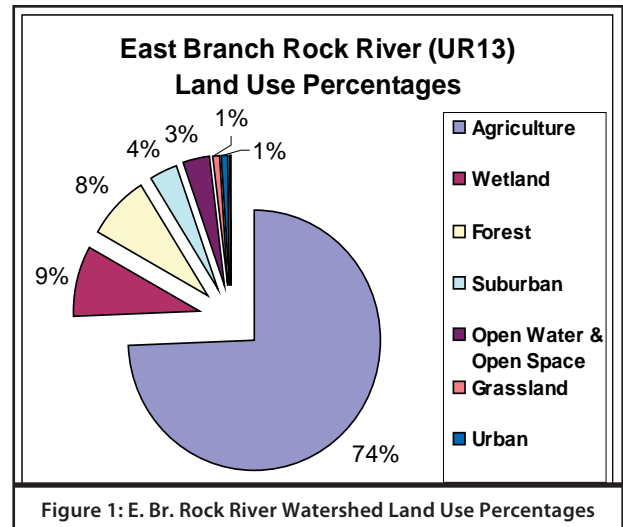
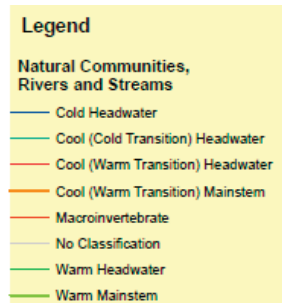


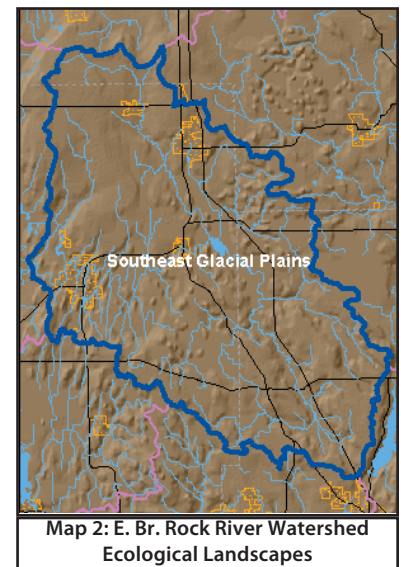
Figure 1: E. Br. Rock River Watershed Land Use Percentages



Ecological Landscapes

The Southeast Glacial Plains Ecological Landscape makes up the bulk of the non-coastal land area in southeast Wisconsin. This ecological landscape is made up of glacial till plains and moraines. Most of this ecological landscape is composed of glacial materials deposited during the Wisconsin Ice Age, but the southwest portion consists of older, pre-Wisconsin till with a more dissected topography. Soils are lime-rich tills overlain in most areas by a silt-loam loess cap. Agricultural and residential interests throughout the landscape have significantly altered the historical vegetation. Most of the rare natural communities that remain are associated with large moraines or in areas where the Niagara Escarpment occurs close to the surface.

Historically, vegetation in the Southeast Glacial Plains consisted of a mix of prairie, oak forests and savanna, and maple-basswood forests. Wet-mesic prairies, southern sedge meadows, emergent marshes, and calcareous fens were found in lower portions of the landscape. End moraines and drumlins supported savannas and forests. Agricultural and urban land use practices have drastically changed the land cover of



Map 2: E. Br. Rock River Watershed Ecological Landscapes

the Southeast Glacial Plains since Euro-American settlement. The current vegetation is primarily agricultural cropland. Remaining forests occupy only about 10% of the land area and consist of maple-basswood, lowland hardwoods, and oak. No large mesic forests exist today, except on the Kettle Interlobate Moraine, which has topography too rugged for agriculture. Some existing forest patches that were formerly savannas have succeeded to hardwood forest due to fire suppression.

Historical Note

The Village of Theresa is located in the rolling hills of northeast Dodge County in the East Branch of the Rock River Watershed. The small community was founded by a French trader named Solomon Juneau. His original home now stands on a hill overlooking the village. Juneau was named an authorized agent when the American Fur Company established a Trading Post in Milwaukee in 1818. He soon saw a future in Milwaukee and purchased the land between the Milwaukee River and Lake Michigan, platted it, and named it Juneau Town. He became the first postmaster and the first president of the Village of Milwaukee and in 1846 was elected the first mayor of the City of Milwaukee.

During his many trips between Milwaukee and Green Bay as a buyer for the American Fur Company, he was attracted to an Indian camping ground located on the East Branch of the Rock River which was to become Theresa. Juneau established a Trading Post here in 1833, naming it Theresa in honor of his mother.

In 1847 he built a home and later moved his family there from Milwaukee. Juneau had platted the village south of the Rock River in 1848, and was engaged in many business pursuits here. He had purchased the water rights and built a dam earlier to provide water power for his saw and grist mills. He also operated a general merchandise store and kept trading furs with the Indians.

The last home of Solomon Juneau was saved as a historical shrine by Joseph Gottwald, a Theresa resident, who purchased it in 1932 when it was to be torn down, and later sold it to the village who moved it to the present site. The house stands some 200 feet from its original location and has the original clapboard siding. The windows have not been altered and the hand-carved spindles in the railing in the upstairs hall are as they were when the house was built in 1847. There are a few of the original furnishings such as the black stove in the parlor which was used to heat the house. The large double doors of his Trading Post which was located at what is now 105 South Milwaukee Street, stand in the upstairs display room, along with an ingenious mouse trap bearing the inscription "S.J. 1814". The home is open to the public on Memorial Day and every last Sunday of the month from Memorial Day through September.



Figure 2: Solomon Juneau's Home in Theresa, WI (Photo courtesy of <http://www.lomira.k12.wi.us/library/solomon/house.html>)

Watershed Condition

Priority Issues

Priority issues for the East Branch Rock River Watershed include the quantity and quality of agricultural runoff reaching surface waters and groundwater and its impact on drinking water and surface water quality. Water quality in the East Branch of the Rock River has been impaired by both point source and nonpoint source pollution. A basin-wide Total Maximum Daily Limit (TMDL) report is in development, which sets specific limits for phosphorous and suspended solids. To see improvement in water quality these limits must be met. Other issues in the watershed include invasive species, loss of wetlands, runoff from urban areas, and the need for more water quality and biological assessment data.

Water Quality Goals

- Minimize agricultural runoff through best management implementation
- Minimize urban stormwater runoff
- Protection of groundwater resource
- Restoration of wetlands for water quality improvement and protection
- Monitor and control invasive species
- Obtain water quality and quantity information
- Conduct biological monitoring to assess water resource conditions
- Increase citizen watershed awareness, understanding and stewardship activities

Overall Condition

There are over 14 miles of Class II trout streams in the East Branch Rock River Watershed spread amongst segments of Irish Creek, Gill Creek, Allenton Creek, and East Branch Rock River. There are several wadable warm water small mouth bass fisheries documented along the East Branch Rock River. Impaired waters total over 52 miles, including sections of the East Branch of Rock River, Gill Creek, Irish Creek, and Kiefer Creek, which suffer from low dissolved oxygen due to elevated total phosphorus levels. In addition, total suspended solids are degrading the habitats of segments of Kohlsville River, Limestone Creek, and Wayne Creek. There are no Exceptional or Outstanding Resource Waters listed for the East Branch Rock River Watershed.

River and Stream Condition

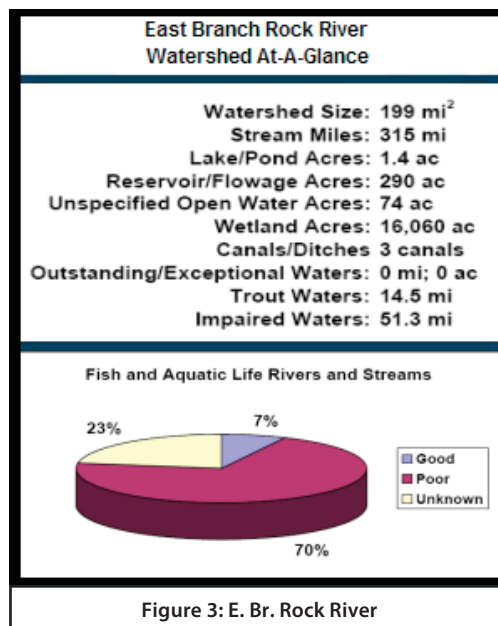
According to the WDNR’s Register of Waterbodies (ROW) database, there are over 315 miles of rivers and streams in the East Branch Rock River Watershed; 82 miles of which have been entered into the WDNR’s assessment database. Of these 82 miles, only about six are meeting Fish and Aquatic Life uses and are specified as in “good” condition; over 70% are not meeting Fish and Aquatic Life uses and are specified as in “poor” condition. The condition of the remaining stream miles is not known or documented.

Additional uses for which the waters are evaluated include Fish Consumption, General Uses, Public Health and Welfare, and Recreation. As Table 2 shows, these uses have not been directly assessed for the watershed. However, a general fish advisory for potential presence of mercury is in place for all waters of the state.

Use	Supporting	Not Supporting	Not Assessed	Total Size
Fish Consumption			81.68	81.68
Fish and Aquatic Life	5.93	57.34	18.41	81.68
General			81.68	81.68
Public Health and Welfare			81.68	81.68
Recreation			81.68	81.68

Allenton Creek

Allenton Creek is one of the headwater streams forming the East Branch of the Rock River. Located in Washington County, the creek is about 3.5 miles long and is classified as a Class II trout fishery (WDNR 1980). Macroinvertebrates were collected on Allenton Creek upstream of Deer Road indicating that the condition of water is “good” by its macroinvertebrate index of biological integrity value, which was collected during the last 10 years.



East Branch Rock River

The East Branch of the Rock River is classified as a Warm Water Sport Fishery (WWSF) for its entire 45 miles. Due to polluted runoff, the East Branch Rock River is only partially meeting its designated use in many areas. Only a portion of the river, from the City of Mayville to where it joins with the West Branch in Horicon Marsh, is on the 303(d) list of impaired waters. It is likely other parts could be listed but these areas have yet to be evaluated. The chart below shows two macroinvertebrate IBI values. The first value (from November 2007) is on the East Branch impaired stretch, which is not meeting water quality standards due to excess phosphorus and suspended solids. The second value, which is considered “fair” is located upstream and was collected in October, 2002. The TMDL for the Rock River Basin has been approved by the USEPA (2011).

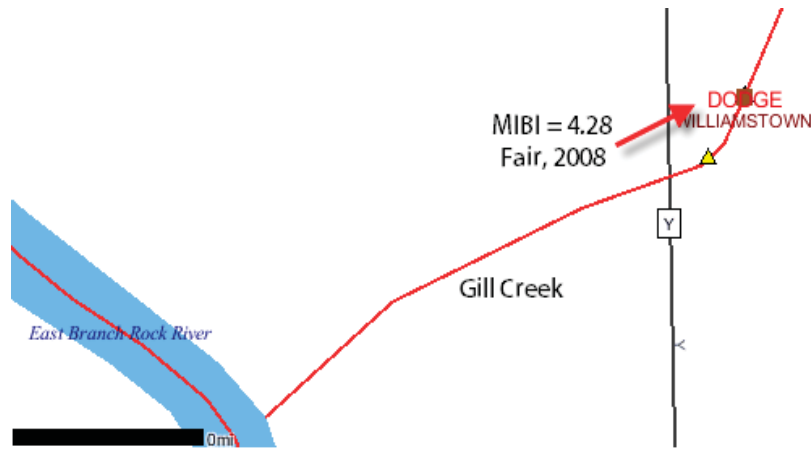


Station ID	Name	# Results	Median	Min	Max	Condition
143261	Rock River, East Branch At Dohman Rd	1	5.696	5.696	5.696	Good
143037	East Branch Rock River - Near Mayville, WI	1	3.512	3.512	3.512	Fair

There are numerous dams located along the river. The dams in Mayville and Kekoskee in the lower portion of the river are creating conditions to prevent the river from meeting its full potential. The millponds created by the dams impede fish migration, encourage rough fish breeding, and create low oxygen conditions. Upper reaches have some good water quality and instream habitat, but additional monitoring is needed. The City of Mayville is the largest municipal discharger on the river.

Gill (Farmersville) Creek

Gill Creek, a tributary to the East Branch of the Rock River just below the Kekoskee Millpond, is considered a Class II trout stream. It is one of the few trout streams in the entire Rock River basin. It is also listed on the 303(d) list of impaired waters due to excessive phosphorus and suspended solids (or turbidity). The stream was monitored several times in the past 15 years, most recently in 2008, when macroinvertebrates were collected and the MIBI value was found to be “fair”. The water quality of this stream continues to be degraded by various sources of nonpoint/agricultural pollution. Despite these conditions, however, the stream is stocked annually with trout and some reproduction does occur.



Irish (Leroy) Creek

Irish Creek was at one time the best trout stream in Dodge County (Kernen, et al., 1965). However, nonpoint/agricultural pollution, pond construction at the headwaters, and bank erosion have adversely affected water quality and instream habitat. The stream is listed on the 303(d) list of impaired waters. The stream is get stocked every year when fish are available. There has been some work done to improve conditions, and a streambank easement was purchased to protect the stream on the lower reaches. The MIBI value at CTH Z went from fair (3.0) in 2003 to excellent in 2008.

Station ID	Name	# Results	Median	Min	Max	Condition
143353	Irish Creek at Cth Z	1	10.100	10.100	10.100	Excellent
10011244	Irish (Leroy) Creek at Farmersville Road	1	2.448	2.448	2.448	Poor

Kummel (Kiefer) Creek

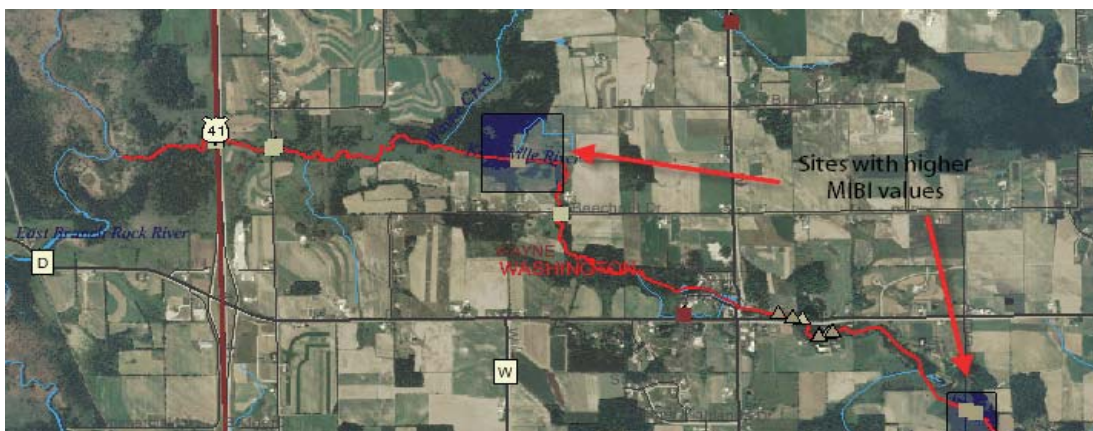
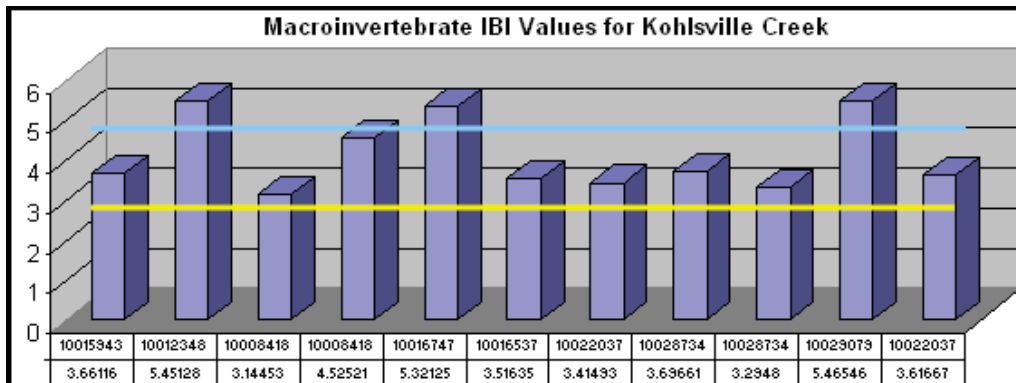
Kummel Creek begins just above the Village of Brownsville and joins the East Branch of the Rock River 16 miles downstream, just below the Theresa Marsh dam. Sediment and silt deposition is severe throughout most of the length of the stream. Portions of the creek have been channelized. The creek has been added to the list of 303(d) impaired waters. Kummel Creek may be used by northern pike for spawning. The Village of Brownsville and Grande Cheese discharge wastewater effluent to this creek just downstream of County Highway 49.

Kohlsville River

The Kohlsville River is a tributary to the East Branch of the Rock River in Washington county. The river is currently classified as WWSF for its nine (9) miles. The river has the potential to support trout on a 3.5-mile portion (WDNR 1994). The entire river is considered impaired and has been monitored to verify condition prior to the creation and subsequent approval of the 2010 TMDL for the Rock River Basin.

Station ID	Station Name	Value	Date
10008418	Kohlsville R.: Midland Rd. Bridge	3.14453	13-Nov-95
10008418	Kohlsville R.: Midland Rd. Bridge	4.52521	07-Nov-01
10012348	Kohlsville River At Aurora Road North	5.45128	13-Nov-95
10015943	Kohlsville River - Downstream Of Townline Rd ~ 45 Feet	3.66116	13-Nov-95
10016537	Kohlsville River - Upstream Of Beechnut Dr.	3.51635	08-Oct-02
10016747	Kohlsville River - Downstream Of Beechnut Dr.	5.32125	08-Oct-02
10022037	Kohlsville River - Upstream of Midland Drive	3.41493	21-Oct-07
10022037	Kohlsville River - Upstream of Midland Drive	3.61667	20-Oct-10
10028734	Kohlsville River At Hwy 41	3.69661	08-Oct-08
10028734	Kohlsville River At Hwy 41	3.2948	08-Oct-08
10029079	Kohlsville River - Upstream of Aurora Drive	5.46546	27-Oct-08

The table and graph below show macroinvertebrate values for the river over time at multiple stations. Multiple sites show fair values at many years over time. The three “good” values are connected to the stream near Aurora Road and Beechnut Road. A map of these locations is displayed below.



Map of MIBI values on Kohlsville River, Rock River Basin.

Limestone Creek

Limestone Creek is a tributary to the East Branch of the Rock River in the Allenton Wildlife area. The stream is classified as a WWSF from its mouth to four miles upstream, where the classification changes to Limited Forage Fishery (LFF). The stream could support a warm water fishery, but more assessment is needed. The lower reach of the stream is listed as a 303(d) impaired water. Monitoring conducted in ... found the stream condition to be fair based on macroinvertebrate index of biological integrity.



Lomira Creek

Lomira Creek is a tributary to the East Branch of the Rock River and enters the river in the Theresa Marsh Wildlife Area. The creek has been channelized in areas and does have sediment deposits that restrict the stream from meeting its potential. The upper two miles is classified as a LFF but the lower four miles is WWSF. The stream was monitored in 2006 and 2007 at the juncture of Crooked Creek and the MIBI values reflected fair conditions with a slight improvement during the second testing (3.1 versus 4.0). The Village of Lomira does discharge wastewater effluent to this creek.



Noname Creek

Noname Creek is a tributary to the East Branch of the Rock River. The Creek enters the river just upstream of Theresa Marsh. The creek supports cold water species, such as sculpin. In 2009, a manure spill severely affected the stream. There was a significant fish kill from the spill. No follow up monitoring has been done since the spill.

Wayne Creek

Wayne Creek is a tributary to the Kohlsville River in Washington County. It is classified as a WWSF for its entire 4.5 miles and has the potential to support trout on 1.4 miles, as indicated by the presence of mottled sculpin (Fago, 1982). Extensive channelization has occurred in portions of the creek, which may be affecting its ability to support a cold water fish community. However two surveys conducted in 1995 and 2002 showed improving conditions based on macroinvertebrate IBI values.



Lake Health

The WDNR's ROW database shows that two small unnamed lakes totaling 1.4 acres can be found in the East Branch Rock River Watershed. There are also 290 acres of reservoirs and flowages spread among Theresa Marsh Flowage, Lomira Pond, Crystal Spring, Kohlsville Millpond, Kekoskee Millpond, and Upper and Lower Mayville Pond. Another 74 acres of unspecified open water can be found in the watershed.

Kekoskee Millpond

Kekoskee Millpond is a shallow silt bottomed impoundment of the East Branch Rock River created by a 12-foot dam at Kekoskee. Extensive growths of marsh vegetation which provided habitat for muskrats and waterfowl have long since disappeared. The fishery is limited to carp, bullheads and an occasional northern pike. Although navigable access via the river is possible, no public access facilities exist on the pond itself. Pollution from municipal and industrial sources in Mayville is largely responsible for the severe winterkill which occurs annually, and with the arrival of anaerobic conditions it is common for local residents to complain of the putrid odors given off by the water spilling over the dam. Erosion within the watershed has resulted in an increased rate of siltation, and nowhere is the problem more evident than on the slopes adjacent to the pond itself. These badly overgrazed hills reveal poor land-use practices all too common to Dodge County. At the time of this writing, the Kekoskee Millpond is without a doubt the most mistreated body of water in the county (Source: 1965, Surface Water Resources of Dodge County Kekoskee Millpond T12N, R16E, S10, Surface Acres = 52, S.D.F. = 2.17, Maximum Depth = 5 feet).

Kohlsville Millpond

Kohlsville Millpond is an impoundment of the Kohlsville River at the Village of Kohlsville. The stream has a high gradient at this point and the impounding structure consists of a dike and two dams. Managed for largemouth bass and panfish with carp common in the fish population. Access is afforded by a village park and from a road bordering the pond. Hunting is not permitted because of the residential nature of the immediate area. There are no immediately adjoining wetlands, however, the stream above and below the pond is bordered by meadow (Source: 1963, Surface Water Resources of Washington County Kohlsville Millpond - T12N, R18E, Sec. 27, Surface Acres = 6, S.D.F. 1.1, Maximum Depth = 7 feet).

Lomira Pond

Lomira Pond is a small, artificial pond located within the 11.8-acre Lomira City Park. Overflow from a nearby swimming pool provides a source of water, and levels are maintained by a dike which includes a small dam. The outlet drains eventually to Lomira Creek. The pond is managed as a childrens’ fishing pond and is regularly stocked with adult panfish by the Wisconsin Conservation Department (Source: 1965, Surface Water Resources of Dodge County Lomira Pond T13N, R17E, S15, Surface Acres = 2, S.D.F. = 1.02, Maximum Depth = 6 feet).

Mayville Millpond, Lower

Mayville Millpond is a small impoundment of the East Branch Rock River inhabited by carp, bullheads, northern pike and crappies. The bottom is mainly silt, with some gravelly areas along the shore. Despite occasional pollution, the aeration of water falling over the upper dam maintains adequate oxygen levels and winterkills are few. Five dwellings are located on the shoreline and no public access is provided for.

Mayville Millpond, Upper

This damsite was regarded as the finest for water power production on the Rock River above Rock Island, Illinois, and the original dam and sawmill were constructed in 1845-46. Bullheads, northern pike and crappies provide fishing although carp are the most abundant species present. Winterkills have occurred, caused by both municipal and industrial sources of pollution. Bottom materials vary from silt to sand and gravel. A boat launching ramp provides access along with a four-acre city park which affords over 700 feet of frontage along the east shore.

Theresa Marsh Flowage

Theresa Marsh Flowage is an impoundment lake along the East Branch of Rock River created by the Theresea Marsh dam in Dodge County. Several streams including Kummel (Kiefer) Creek, Lomira Creek, and a few unnamed streams discharge their water into the flowage. Theresea Marsh Flowage was last monitored in 2009, but its general condition remains unknown.

Wetland Health

There are extensive wetlands in this watershed. Many of which have been lost to drainage for agriculture. There are numerous drumlins in the area with potentially restorable wetlands between them.

Wetland Status

The East Branch Rock River Watershed lies directly to the east of Horicon Marsh, with the western portion of the watershed in Dodge County and the eastern portion in Washington County. Currently, only 49% of the original wetlands in the watershed are estimated to exist. Of these wetlands, the majority include forested wetlands (42%) and emergent wetlands (39%).



Figure 4: Forested Wetlands (Photo courtesy of WDNR)

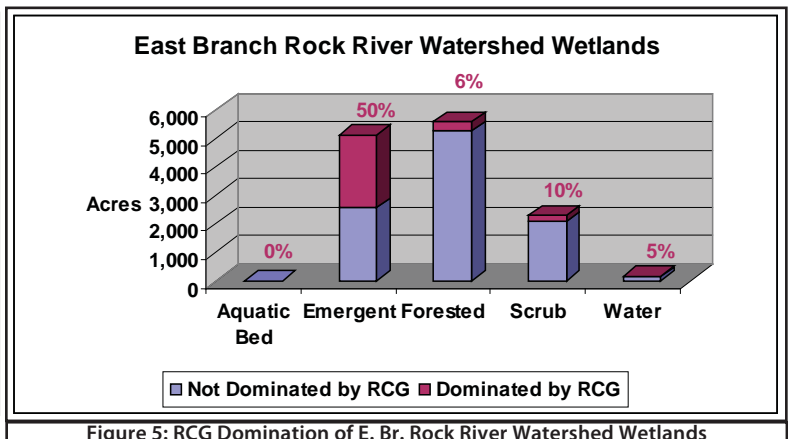


Figure 5: RCG Domination of E. Br. Rock River Watershed Wetlands

Wetland Condition

Little is known about the condition of the remaining wetlands but estimates of reed canary grass (RCG) infestations, an opportunistic aquatic invasive wetland plant, into different wetland types has been estimated based on satellite imagery. This information shows that reed canary grass dominates six percent of the existing forested wetlands and just over half of the remaining emergent wetlands (See Figure 5). Reed canary grass domination inhibits successful establishment of native wetland species.

Wetland Restorability

Of the 13,833 acres of estimated lost wetlands in the watershed, approximately 92% are considered potentially restorable based on modeled data, including soil types, land use, and land cover (Chris Smith, DNR, 2009).

Groundwater

Groundwater continues to be a concern in parts of the East Branch Rock River Watershed. The Niagara Escarpment does go through parts of the watershed and there are areas where there is little soil above the fractured rock to filter groundwater. There have been problems with significant pollution in wells in these areas since the fractured limestone bedrock is highly susceptible to surface contamination from nitrite and bacteria.

The following groundwater information is for Dodge and Washington Counties (from Protecting Wisconsin's Groundwater through Comprehensive Planning website, <http://wi.water.usgs.gov/gwcomp/>), which roughly approximates to the East Branch Rock River Watershed.

No municipal water systems within the East Branch Rock River Watershed have a wellhead protection plan in place.

Dodge and Washington counties do have animal waste management ordinances in effect, however.

From 1979 to 2005, total water use in Dodge County has fluctuated from about 11.0 million gallons per day to about 14.3 million gallons per day. The fluctuation in total water use over this period is due to fluctuations all usage categories, except domestic use, which only increased. The proportion of county water use supplied by groundwater was generally about 98% during the period 1979 to 2005.

During this same time period, total water use in Washington County has increased from about 9.4 million gallons per day to about 13.4 million gallons per day. The increase in total water use over this period is due to increases in all use categories through 2000; with subsequent increases in domestic, irrigation, and livestock uses, and decreases in public use and losses, industrial, and commercial uses. The proportion of county water use supplied by groundwater has been consistently at or greater than 99% during the period 1979 to 2005.

Private Wells

Eighty-nine percent of 670 private well samples collected in Dodge County and 97% of 210 private well samples collected in Washington County from 1990 through 2006 met the health-based drinking water limit for nitrate-nitrogen. Land use affects nitrate concentrations in groundwater. An analysis of over 35,000 Wisconsin drinking water samples found that drinking water from private wells was three times more likely to be unsafe to drink due to high nitrate in agricultural areas than in forested areas. High nitrate levels were also more common in sandy areas where the soil is more permeable. In Wisconsin's groundwater, 80% of nitrate inputs originate from manure spreading, agricultural fertilizers, and legume cropping systems.

A 2002 study estimated that 62% of private drinking water wells in the region of Wisconsin that includes Dodge County contained a detectable level of an herbicide or herbicide metabolite. Only 21% of private drinking water wells in the region of Wisconsin that includes Washington County contained a detectable level of an herbicide or herbicide metabolite in the same study. Pesticides occur in groundwater more commonly in agricultural regions, but can occur anywhere pesticides are stored or applied. A total of 18,492 acres of land in Dodge County are in atrazine prohibition areas. Ninety percent of 39 private well samples collected in Dodge County and 76% of 49 private well samples collected in Washington County met the health standard for arsenic.

Potential Sources of Contamination

WDNR's Remediation and Redevelopment (RR) Program oversees the investigation and cleanup of environmental con-

tamination and the redevelopment of contaminated properties. The RR Program provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin through its Bureau for Remediation and Redevelopment Tracking System (BRRTS) database (WDNR 2010e).

The database shows that there are 16 sites in the East Branch Rock River Watershed that are specified as “open”, meaning “contamination has affected soil, groundwater, or more and the environmental investigation and cleanup need to begin or are underway.” These sites include five Leaking Underground Storage Tank (LUST) sites and 11 Environmental Repair (ERP) sites. A summary of these sites is included in the table below.

Table 3: Open-status Bureau for Remediation and Redevelopment Tracking System (BRRTS) Sites in the East Branch Rock River Watershed

Site Name, Location	Start Date	Activity Type	Remediation Activities	Waste Activities	Substance
United (Dodge County) Coop, Mayville	12/08/2010	ERP	2	2	Unspecified (Transferred to DATCP)
Hahn Sky Ranch, Township of Wayne	08/18/2010	ERP	2	0	Fuel Oil (Petroleum); Pesticides, Herbicides and Insecticides (Agricultural Chemicals)
Helena Chemical Co. (Former Gundrum Farm Supply, Inc., Mix/Load Building), West Bend	07/20/2010	ERP	2	0	Fertilizer; Pesticides, Herbicides and Insecticides (Agricultural Chemicals) (Transferred to DATCP)
Olde Tyme Cleaners, Mayville	07/21/2008	ERP	1	2	Perchloroethylene (VOC)
Jacobson Farmers Supply, Brownsville	10/24/2006	ERP	1	0	Unspecified (Transferred to DATCP)
Wisconsin DOT Right-Of-Way, Allenton	06/24/2005	LUST	1	0	Gasoline & Diesel Fuel (Petroleum)
Allcast, Allenton	03/27/2001	ERP	1	0	Metals
Highview Farms, Allenton	06/12/1998	LUST	1	0	Gasoline (Petroleum)
JK Rentals, Theresa	11/14/1995	LUST	2	0	Unspecified groundwater and soil contamination within 100 ft. of private well and within 1000 ft. of public well
Dodge County Highway Department Garage, Mayville	09/21/1993	LUST	1	1	Gasoline & Diesel Fuel (Petroleum)
R. E. Phelon Company, Inc. Wi Div., Lomira	09/02/1993	ERP	1	2	Chlorinated Solvents (VOC)
Mayville Products Corporation, Mayville	12/23/1992	ERP	1	3	Resource Conservation and Recovery Act Subtitle C Wastes (RCRA); Chlorinated Solvents (VOC)
Coles Amoco, Lomira	04/28/1992	LUST	2	0	Jet Fuel (Petroleum)
Country Side Hide & Fur, Lomira	02/06/1992	ERP	1	0	Unspecified Private Well and Groundwater Contamination
Lomira Bulk Plant, Lomira	06/18/1990	ERP	1	0	Unspecified Soil Contamination within 100 ft. of Private Well
Hechimovich Landfill, Township Of Williamstown	12/01/1984	ERP	1	5	Unspecified (Previously tracked as Superfund activity number 05-14-111757)

The Petroleum Environmental Cleanup Fund Award (PECFA) program was created in response to enactment of federal regulations requiring release prevention from underground storage tanks and cleanup of existing contamination from those tanks. PECFA is a reimbursement program returning a portion of incurred remedial cleanup costs to owners of eligible petroleum product systems, including home heating oil systems. As of May 31, 2007, \$29,383,263 have been reimbursed by the PECFA fund to clean up 216 petroleum-contaminated sites in Dodge County. This equates to \$330 per county resident, which is greater than the statewide average of \$264 per resident. In Washington County, over \$33 million has been spent on petroleum cleanup from leaking underground storage tanks, which equates to \$263 per county resident.

Point and Nonpoint Pollution

The watershed is predominately agriculture; however, there are at least seven small communities that have nonpoint pollution from street and parking lot runoff. These communities are also point source contributors. In addition, runoff from agriculture is adversely affecting water quality in the rivers and streams. The Rock River Basin TMDL report shows that the East Branch Rock River Watershed has the highest sediment and phosphorus loads per acre of any watershed in the basin.

The East Branch of the Rock River watershed is ranked as a high priority overall for nonpoint source (NPS) pollution and is similarly ranked for stream NPS pollution. The East Branch Rock River NPS rank is listed as high stream.

- Within the watershed there are currently two Concentrated Animal Feeding Operation (CAFO) permits, with one application pending.
- There was a significant fish kill on Noname Creek in 2009.

Waters of Note

Trout Waters

There are over 14 miles of Class II trout streams in the East Branch Rock River Watershed spread amongst segments of Irish Creek, Gill Creek, Allenton Creek, and East Branch Rock River. Class II trout streams may have some natural reproduction, but not enough to utilize available food and space. Therefore, stocking is required to maintain a desirable sport fishery. These streams have good survival and carryover of adult trout, often producing some fish larger than average size (<http://dnr.wi.gov/fish/species/trout/streamclassification.html>). The table below indicates where these trout waters are located along the streams, starting from the mouth at mile zero.

WADRS ID	Official Waterbody Name	Local Waterbody Name	WBIC	Start Mile	End Mile	Trout Class	Trout ID	Counties
11606	Allenton Creek	Allenton Creek	867100	0	3.97	CLASS II	1833	Washington
904247	East Branch Rock River	East Branch Rock River	861400	42.62	43.05	CLASS II	1830	Washington
11570	Gill Creek	Gill Creek	861700	0	6.32	CLASS II	1832	Dodge
11569	Irish Creek	Irish Creek	861600	0	3.79	CLASS II	1831	Dodge

Outstanding and Exceptional Resource Waters

No Exceptional or Outstanding Resource Waters are listed for this watershed.

Impaired Waters

Sections of the East Branch of Rock River, Gill Creek, Irish Creek, and Kiefer Creek suffer from low dissolved oxygen due to elevated total phosphorus levels. In addition, total suspended solids are degrading the habitats of segments of Kohlsville River, Limestone Creek, and Wayne Creek.

Waterbody Name	Local Name	Start Mile	End Mile	WBIC	Pollutant	Impairment	303 Status	Priority
East Branch Rock River	East Branch Rock River	0	11.61	861400	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
East Branch Rock River	East Branch Rock River	0	11.61	861400	Total Phosphorus	Low DO	TMDL Development	High
Gill Creek	Gill Creek	0	6.32	861700	Ammonia (Unionized) - Toxin	Acute Aquatic Toxicity	303(d) Listed	High

Gill Creek	Gill Creek	0	6.32	861700	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Gill Creek	Gill Creek	0	6.32	861700	Total Phosphorus	Degraded Habitat	TMDL Development	High
Irish Creek	Irish Creek	0	3.79	861600	Ammonia (Unionized) - Toxin	Acute Aquatic Toxicity	303(d) Listed	Medium
Irish Creek	Irish Creek	0	3.79	861600	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Irish Creek	Irish Creek	0	3.79	861600	Total Phosphorus	Degraded Habitat	TMDL Development	High
Kohlsville River	Kohlsville River	0	8.27	865400	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Kiefer Creek	Kummel Creek	0	10.38	863500	Ammonia (Unionized) - Toxin	Acute Aquatic Toxicity	303(d) Listed	Medium
Kiefer Creek	Kummel Creek	0	10.38	863500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Kiefer Creek	Kummel Creek	0	10.38	863500	Total Phosphorus	Low DO	TMDL Development	High
Kiefer Creek	Kummel Creek	10.38	11.54	863500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Kiefer Creek	Kummel Creek	10.38	11.54	863500	Total Phosphorus	Low DO	TMDL Development	High
Kiefer Creek	Kummel Creek	11.54	14	863500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Kiefer Creek	Kummel Creek	11.54	14	863500	Total Phosphorus	Low DO	TMDL Development	High
Kiefer Creek	Kummel Creek	14	17.96	863500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Kiefer Creek	Kummel Creek	14	17.96	863500	Total Phosphorus	Low DO	TMDL Development	High
Limestone Creek	Limestone Creek	0	1.67	866800	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Wayne Creek	North Branch Wayne Creek	4.14	4.8	865500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High
Wayne Creek	Wayne Creek	3.08	4.8	865500	Sediment/Total Suspended Solids	Degraded Habitat	TMDL Development	High

Fish Consumption

There are currently no specific fish consumption advisories in effect for waterbodies within the East Branch Rock River Watershed. However, a general fish consumption advisory for potential presence of mercury is in place for all waters of the state.

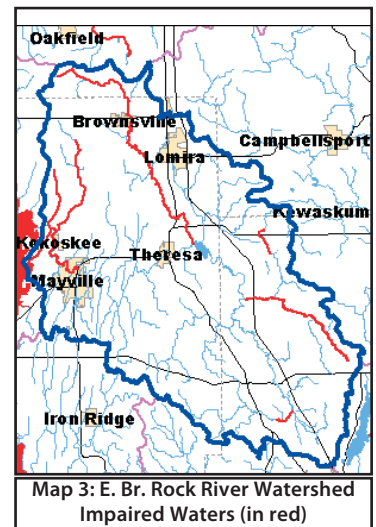
Aquatic Invasive Species

No specific Aquatic Invasive Species (AIS) advisories are listed for any waterbodies within the East Branch Rock River Watershed.

Species of Special Concern

Whooping cranes, trumpeter swans, and other bird species can be observed in the East Branch Rock River Watershed.

On June 26, 2001, a non-essential experimental population of the whooping crane was designated in a 20-state area of the eastern United States. The first release



of birds occurred in Wisconsin in 2001, and the counties listed, including Dodge and Washington, are those where the species has been observed to date. It is unknown at this time which counties the species will occupy in the future, as the birds mature and begin to exhibit territorial behavior. For purposes of section 7 consultation, this species is considered as a proposed species, except where it occurs within the National Wildlife Refuge System or the National Park System, where it is treated as a threatened species (<http://www.fws.gov/midwest/endangered/lists/wisc-spp.html>).

State Natural and Wildlife Areas

Allenton Marsh Wildlife Area

Allenton Marsh Wildlife Area is a 1,160-acre property located in Washington County. Find it forty minutes north of Milwaukee and west of Highway 41. The property is comprised mostly of wooded bottomland surrounded by grassland and crop fields, two 10-acre impoundments, several dozen smaller ponds and other wetlands, fence lines, feeder streams, and small woodlots.

Allenton Marsh was the site of a glacial lake which, through the process of succession, turned into a wooded bottomland producing the area as it exists today. An abundant water supply from the many springs and creeks made this a good habitat area. With the advance of agriculture into the region, the marsh was subjected to timber cutting and cattle grazing. With the development of new agricultural methods, dairy and beef cattle grazing became important, altering the marsh's vegetation complex. Rising costs in fencing material and labor caused a decline in interest in these lands by farmers and eventually provided an opportunity for public ownership and preservation of the area. In 1953, Mr. Walter Brinkman, one of the key landowners on Allenton Creek, offered his property for sale to the state.

Pheasants are stocked for hunting once or twice each week during the first month of the pheasant season. Pheasant hunting is prohibited after two in the afternoon beginning the third day of the season through November 3rd. Upland fields are managed as nest cover or as cropland to provide wildlife food and cover. These areas, along with numerous man-made potholes, should provide good dove hunting opportunities. Wooded and wetland areas are managed to provide habitat for deer, turkeys, waterfowl, and other game and non-game species.

Mayville Ledge Beech-Maple Woods

Mayville Ledge is a one-half mile exposure of Niagara dolomite escarpment, ranging from 40 to 60 feet in height. The escarpment slope supports an ungrazed forest of sugar maple, basswood, red oak, and American elm. The understory is quite rich in ferns and other deep shade vegetation, including walking and bulblet ferns. The level plain above the escarpment supports woods of various ages of ironwood, American beech, sugar maple, and yellowbud hickory. American beech is rare in this location and represents its westernmost range extension in southern Wisconsin. Mayville Ledge Beech-Maple Woods is owned by the University of Wisconsin-Milwaukee and was designated a State Natural Area in 1987.

Theresa Marsh Wildlife Area

Theresa Marsh Wildlife Area is a 5,990-acre property located in northern Washington County and eastern Dodge County. Grassland, cattail and brush marsh, woodland, agricultural land, seasonally flooded wetlands, and permanent wetlands are all important in the proper management of the property.

At one time, a vast tamarack river bottom provided an excellent hunting and trapping area for the Pottawatomie Indians, some of whom returned each fall to trap long after the white man had settled and was actively engaged in agriculture. Some of the old-time residents can still recall these trapping expeditions. Most of the tamarack was rapidly logged off during early settlement to provide building materials and firewood. Many of the logs were also used to build a corduroy road across the marsh. This same road is still being used today, having been modernized with gravel and blacktop and designated as State Highway 28.

In 1852, Solomon Juneau came to this area and founded the Village of Theresa, which he named after his mother. Here he established



Figure 6: Theresa Marsh Wildlife Area, WDNR photo

and operated a trading post and built a grain mill and a saw mill together with a dam to provide water power. The flowage resulting from the construction of this dam created ideal fish and wildlife habitat, and resulted in fabulous hunting and fishing for the early settlers.

At about the turn of the century, the grain mill dam was removed by a land development group who promised quick profits from the improved fertile muck lands. Early agricultural ventures included cattle ranching, canary grass seed production, truck farming, and mint farming. Flooding risks and short growing seasons caused all these ventures to ultimately fail, and in 1964, the Department of Natural Resources was able to complete much of the land acquisition which had begun in 1948.

In 1968, a mile-long dike and a dam were constructed on the west side of the marsh, creating a 1,500-acre flowage. About three miles of additional dikes and 18 water control structures have been installed since then, allowing water levels to be raised and lowered to provide ideal waterfowl habitat. Two 1,000-acre waterfowl refuges have been established, one on each end of the marsh, to provide food and resting areas for long distance migrants.

The marsh is primarily managed for waterfowl production and as a migration stopover for shorebirds, ducks, and geese. Water levels on the 1,500-acre main pool and several small sub-impoundments are managed seasonally to improve wetland habitat. Pheasants are stocked for hunting once or twice each week during the first month of the pheasant season. Natural fields and dike edges provide good opportunity for mourning doves, as do sharecropped fields of corn, hay, and soybean.

Watershed Actions

Grants/Projects

A number of projects and grants have been issued in this watershed due to the heavy emphasis on controlling runoff pollution in key watersheds in the Rock River Basin. Several grants have been issued to help install best management practices where known problems existed, including:

Notice of Intent (NOI) issued prior to Notice of Discharge (NOD) – Dodge County: Schultz 03/20/2009 – In progress.

- To control direct runoff from feedlot to waters of the state

NPS Grant (Targeted Runoff Rural Construction Grant) – Dodge County: Wondra NOI 02/19/2008 – In progress

- To install practices to control barnyard runoff and milkhouse waste

NPS Grant (Targeted Runoff Rural Construction Grant) - Dodge County: Reible NOI 08/10/2005 – Complete

- Installed practices designed to remediate NR151 performance standard violations voluntarily for direct runoff to waters of the state.

NPS Grant (Targeted Runoff Rural Construction Grant) - Washington County LCD: 4-Way Farms Resource Management Project 01/01/2004 – Complete

- State cost-shared landowner installations at 70%.

Lake Planning Grant – Mayville School District: Mayville Sense of Place Project 04/01/2003 – Complete

- Mayville School District implemented the Mayville Sense of Place Project in order to create and enhance awareness of water quality issues focused on the Mayville Millponds and other area waterbodies. A full description of the project scope and deliverables is available in the grant application, which is part of this agreement. The DNR was provided with both a paper copy and an electronic copy of the final report. Information was disseminated to the public as described in the grant application.

Lake Protection Grant – Dodge County Waterway Classification Project 08/01/2002 - Complete

- Dodge County Planning & Development Department revised the Dodge County Shoreland Zoning Regulations and adopted a “waterway” classification system to better regulate and manage the county’s water resources. A full description of the project scope and project deliverables is available in the grant application, which is a part of this agreement. The DNR was provided with both a paper copy and an electronic copy of the final report. Information

was disseminated to the public as described in the grant application.

Lake Planning Grant - Dodge County Lakes Survey 10/01/2001 – Complete

- Dodge County collected information utilizing a public survey questionnaire in order to determine public opinion about the waters in the county and to see if there is need to conduct a Waterway (Lake & Stream) Classification Project in the future. A full description of project scope and deliverables is available in the grant application, which is part of this agreement. The DNR was provided with both a paper copy and an electronic copy of the final report. Information was disseminated to the public as described in the grant application.

Lake Protection Grant – Lake Classification Project-Washington County 09/01/2001 –Complete

- Through this project Washington County developed a waterbody classification system; reviewed and revised shoreland-wetland and floodplain ordinances; and refined the ordinance provisions governing shorelands, wetlands and floodlands, incorporating the waterbody classification into them.

Lake Protection Grant - Ordinance/Lake Classification Project 07/01/1998 – Complete

- Phase 3 of Lake Classification Project. Public Hearing and Ordinance revision adoption for the lakes in Washington County. Dissemination of proposed ordinance changes to the other local units of government. Enforcement of revised zoning provisions related to shorelands, wetlands, and floodlands through current channels. Information to public of changes in Washington County codes by meetings, publicity, pamphlets, and brochures. The DNR was provided with both a paper copy and an electronic copy of the final report.

Monitoring

Lakes Baseline and Trends Monitoring

River Monitoring to comply with Clean Water Act implementation - water quality standards: use designations, criterion, permit issuance and compliance, assessments and impaired waters management. Fisheries projects include a wide variety of “baseline” monitoring and targeted fieldwork to gain specific knowledge related to Wisconsin’s fish communities. In close cooperation with UW Extension and Wisconsin Sea Grant, education efforts focus on working with resource professionals and citizens statewide to teach boaters, anglers, and other water users how to prevent transporting aquatic invasive species when moving their boats. Additional initiatives include monitoring and control programs.

Volunteer Monitoring

The Citizen Lake Monitoring Network, the core of the Wisconsin Lakes Partnership, involves over 1,000 citizen volunteers statewide. The goals are to collect high quality data, to educate and empower volunteers, and to share this data and knowledge. Volunteers measure water clarity, using the Secchi disk method, as an indicator of water quality. This information is then used to determine the lakes trophic state. Volunteers may also collect chemistry, temperature, and dissolved oxygen data, as well as identify and map plants, watch for the first appearance of Eurasian water-milfoil near boat landings, or alert officials about zebra mussel invasions on Wisconsin lakes. Monitoring work in this watershed consists of lake monitoring and surveys for water quality, aquatic plants, aquatic invasive species, and ice observations.

Stream Monitors (Water Action Volunteers)

Seven Volunteer Stream Monitoring stations have been established from 2002 through 2005 in UR13-East Branch Rock River Watershed and monitored by nine independent volunteers plus the Mayville Future Farmers student group. All stations are monitored using Level 1 procedures and are entered into the WAV database (<http://www.uwex.edu/erc/wavdb/>). On average, stations in the watershed were monitored monthly from May through October with a total of seventy-six field events entered for the watershed. All stations were monitored for biotic index, flow, dissolved oxygen, instantaneous temperature and transparency.

Volunteers collect macroinvertebrates twice a year (the first and last sampling event of the season) to determine a biotic index for each stream monitored. Streams are considered in poor quality if biotic index is between 1.0-2.0, fair quality if between 2.1-2.5, and in good quality if the index is between 2.6-3.5. Biotic index values in the watershed rated streams in poor to good quality throughout the seasons ranging from 1.3-3.1. Stream water flow varied between the seven streams. Flow in the smaller creeks was less, with an average of 5.5 cubic feet per second (cfs) and ranging from stagnant to 15.5 cfs. The larger rivers averaged 20.3cfs but ranged from 0.9-67.9 cfs.

Of the seventy-six field events from 2002-2005, 96% showed dissolved oxygen levels in the watershed were sufficient to sustain aquatic life. They ranged from 5-17mg/l. The remaining 4% from sites on the East Branch of the Rock River, Gill Creek, and Kummel Creek in August and September and ranged from 3.6-4.5mg/l.

Temperature measurements, used to classify streams as cold, cool or warm water habitats, and which are indicative of the ability of a habitat to sustain aquatic species were manually recorded at all seven stations. Of the stations monitored, five recorded maximum instantaneous temperatures below 25°C; suggesting they may be cold water streams. The other two (both E Branch of the Rock River) stations recorded maximum instantaneous temperatures between 25-28°C; suggesting they may be cool water streams. Stream transparency measurements primarily indicated good water quality with 68% of the 59 measuring less than 10 NTU. Of the remaining 32%, only one field event was over 240 NTU at Kummel Creek at Brownsville City Park on 5/20/2004.

TMDLs

A Rock River Basin Total Maximum Daily Load (TMDL) report has been developed, which includes the East Branch Rock River Watershed. A public hearing on the report was held in January of 2011. The TMDL report has received final approval from the EPA. An implementation plan needs to be developed to implement the water quality limits set in the TMDL. An implementation team has been assembled and work has begun on the plan. There is a two year timeline for a plan to be developed.

Basin/Watershed Partners

The Rock River Partnership has been established to provide a voice for the residents of the Rock River Basin in the evaluation, planning and restoration of the overall basin. These partners are very active and successful and currently working on the newly approved Rock River Basin TMDL implementation plan.

Recommendations

- DNR should conduct a post-relocation assessment of the unnamed tributary to Lomira Creek at the U.S. Highway 41 and State Highway 28 Interchange.
- Watershed management (WM) staff should evaluate the feasibility of removing the Kohlsville Millpond dam.
- DNR staff should conduct a stream classification of Fink Creek.
- DNR staff should conduct basin assessment monitoring to determine surface water quality impacts from the Allenton wastewater treatment plant on the East Branch of the Rock River.
- DNR should monitor sediments from the bottom of Kekoskee Millpond and the two Mayville impoundments for heavy metals.
- DNR staff should conduct basin assessment monitoring of streams in the East Branch Rock River Watershed to assess the effects of polluted runoff on streams and the extent to which nutrients and sediment runoff affects Horicon Marsh.
- Forest staff should work with local governments to provide educational materials that discourage the developments in woodlots, or protect the woodlands during construction, and help maintain woodlots and work to connect the woodlots in watersheds and the basin.
- FM staff should work with landowners and local governments to keep existing forests healthy by encouraging participation in government programs like the Managed Forest Land and WI Forest Landowner Grant programs.
- FM staff should encourage the planting of permanent cover (like trees, shrubs, and grasses) on erodible lands.
- FM staff should work with local partners to encourage the use of good forest stewardship to maintain healthy forests to help minimize the effects of high populations of insects.
- WM staff should encourage governments, non-profit conservation organizations and landowners to identify and protect the remaining high quality natural areas in the watershed.
- WM staff should work with local partners to discourage landowners from removing all shoreline vegetation, with the exception of viewing/access areas.
- WM staff should work with local partners to allow water levels in waterbodies to fluctuate naturally, allowing flooding of near shore marshes for fish spawning habitat.
- WM staff should encourage landowners to establish 100 foot or wider buffer zones along all waterways to retain their natural character. No structures or vegetation removal in the stream or buffer zone should be allowed other than to remove exotic plant species.

- WM staff should encourage the use of milfoil weevils and limited use of selective herbicides to control the propagation and spread of Eurasian water-milfoil.
- WM staff should work with public and private partnerships to install and restore wetlands in the watershed for water quality enhancement and to provide flood storage capacity in the watershed.
- WM staff should work with county LCD, lake organizations, and conservation organizations to promote and install conservation buffers along all intermittent and perennial streams, wetlands, ponds, and lakes through easements, land acquisitions, and voluntary land owner cooperation.
- WM staff should work with the villages and cities in the watershed with populations under ten thousand people to apply for funding through the Targeted Runoff Management (TRM) or Urban Nonpoint Pollution grant programs to develop stormwater management plans and install practices that control urban stormwater impacts.
- WM staff should encourage/inform communities to enroll in that state's Water Star program, which is designed to honor municipalities that do outstanding work to provide their communities with safe and abundant groundwater; lakes and streams protected from polluted runoff; maintain and enhance desirable aquatic habitats; and provide appropriate recreational opportunities for their citizenry.
- WM staff should develop a comprehensive management plan to protect the sensitive plant communities and water quality in the Theresa Marsh.
- WM staff should evaluate the possibility and feasibility of removing the Kohlsville dam.
- WM staff should evaluate the possibility and feasibility of removing the Kekoskee Millpond dam.
- WM staff should work with Dodge County and Washington County land conservation departments to discourage or prohibit future channelization of streams in the East Branch Rock River Watershed.
- WM staff should evaluate the possibility and feasibility of removing the Mayville dams.
- The City of Mayville should identify and implement measures to protect the East Branch of the Rock River, including enacting and enforcing a stormwater management ordinance, improving enforcement of construction site erosion control ordinances, and acquiring critical wetlands in the watershed.
- The DNR should consider the East Branch Rock River Watershed a high priority for Runoff grants.
- WM staff should evaluate the possibility and feasibility of removing the Theresa dam.
- WM staff should encourage Brownsville, Lomira, and Grande Cheese to consider regionalizing their wastewater treatment, to apply for funding through the TRM or Urban Nonpoint Pollution grant programs, to develop stormwater management plans, and to install practices that control urban stormwater impacts.
- Southeast Region WM staff should conduct a stream classification of Limestone Creek and Lomira Creek
- WM staff should conduct PI model of watershed to identify high load sources of agricultural phosphorus and total suspended solids to target BMPs to sites to obtain the greatest pollutant reduction per dollar invested.

Contributors

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East Branch Rock River Watershed