

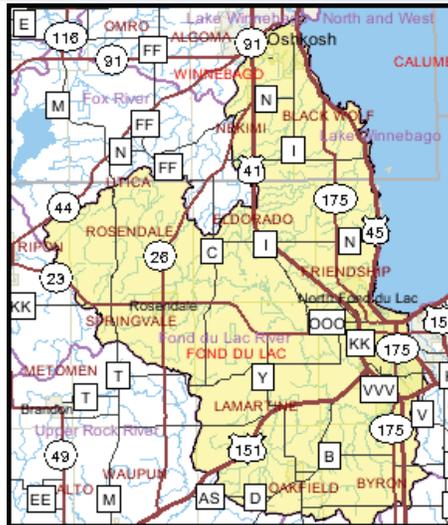
## 2010 Water Quality Management Plan Update

Upper Fox River Basin , Wisconsin

August, 2010

The Fond du Lac River Watershed is located primarily in Fond du Lac County, but extends north into the southeast portion of Winnebago County along the western shore of Lake Winnebago (Map 1). While part of the Upper Fox River Basin, the waters in the Fond du Lac River watershed flow into either the East or West Branches of the Fond du Lac River or directly into Lake Winnebago.

The watershed encompasses approximately 245 square miles (156,642 acres) and contains 461 miles of streams and rivers, 775 acres of lakes and 22,373 acres of wetlands. The watershed includes a mixture of land uses. Agriculture and wetlands are the most dominant features of the landscape.



Map 1: Fond du Lac Watershed



### Plan Contents

- Watershed Detail . . . . . 1**
- Population and Land Use . . . . . 1
- Hydrology . . . . . 2
- Ecological Landscapes . . . . . 2
- History Note . . . . . 2
- Water Condition . . . . . 3**
- Priority Issues . . . . . 3
- Water Quality Goals. . . . . 3
- River and Stream Condition . . . . . 3
- Lake Health . . . . . 7
- Wetlands . . . . . 7
- Groundwater. . . . . 7
- Waters of Note . . . . . 7
- Watershed Actions. . . . . 9**
- Projects and Grants . . . . . 9
- Recommendations . . . . . 9
- References . . . . . 10
- Appendices . . . . . 11**
- Watershed Map. . . . . 12
- Eldorado Marsh Map . . . . . 13
- CAFOs in the Watershed . . . . . 14
- Dams and Outfalls . . . . . 15
- ORW/Impaired Waters . . . . . 16
- Land Use . . . . . 17
- Potentially Restorable Wetlands. 18

### Watershed Details

#### Population and Land Use

The watershed is dominated by agriculture (68%), wetlands (14%) and is ranked high for nonpoint source issues affecting streams and groundwater (Table 1).

Municipalities in the watershed include Fond du Lac, North Fond du Lac, Oakfield, Rosendale, and portions of Oshkosh. The Rosendale and Oakfield wastewater treatment facilities discharge into the watershed. Additionally, a number of industrial facilities also discharge into the watershed.

There are large and growing urban areas in the watershed; however these currently only make up 3% of the watershed. Major urban areas in the watershed include large parts of the Cities of Fond du Lac and Oshkosh and a corridor along the lakeshore and U.S. Highway 41 between Oshkosh and Fond du

Land Use	Total Acreage	Percentage
Agriculture	106,383	67.9
Urban	4,578	2.9
Suburban	8,813	5.6
Wetland	22,373	14.3
Barren	233	0.2
Grassland	1,302	0.8
Forest	7,319	4.7
Open Water	775	0.5
Open Space	4,866	3.1
<b>Total</b>	<b>156,642</b>	

Table 1: Land Use Fond du Lac Watershed

Lac. Other urban areas in the watershed include North Fond du Lac, Oakfield, and Rosendale.

## Hydrology

The dominant rivers and streams in the watershed include the West Branch of the Fond du Lac River and the East Branch of the Fond du Lac River. A number of small streams populate the watershed with most of them flowing directly into Lake Winnebago's west shore. There are no named lakes in the watershed, only a number of unnamed ponds and millponds. The major wetland feature is the Eldorado Marsh State Wildlife area, a 36 square mile wetland complex managed by the Wisconsin Department of Natural Resources (Appendix).



Eldorado Marsh State Wildlife Area, WDNR Photo

Rivers and streams in the southern part of the watershed are impacted by the Niagara Escarpment, a prominent dolomite bedrock formation that supports numerous cold water springs. Streams which originate in this area, such as Campground Creek and Parsons Creek, are capable of supporting trout populations. The northern part of the watershed is generally flatter and streams there are dependent on runoff and seepage sources. These creeks, including Van Dyne Creek, Anderson Creek, and Mosher Creek, are often intermittent in nature.

## 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.



Map 2: Fond du Lac Watershed

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 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.

## History Note

The Fond du Lac River watershed drains the western portion of the City of Fond du Lac, at the southern tip of Lake Winnebago. The historical Octagon House can be found here. The site of the house was part of a Native American

village in the early 1800s. It was originally on the banks of the Fond du Lac River, but the river has been rerouted since then and so no longer flows past the building. In 1956, Isaac Brown, a carpenter and trader with the Native Americans, grew concerned about his safety, so he built an Orson Fowler-designed eight-sided house which was designed for hiding. The house was a wedding gift to Isaac's son, Edwin Brown and his bride, Ruth Pier. It was their home until his death in the battle of Antietam in 1862.

The house contained secret passageways, and a tunnel was built between the house and a woodshed. This tunnel and woodshed were later used to hide slaves as they made their way north to safety on the Underground Railway. Although the house was placed on the National Register of historic places in 1972, it was just days away from demolition when a private buyer placed a bid on the house and saved it from being destroyed. Marlene Hansen and her family have restored the house, and it is open for private tours.



Octagon House. Photo credit: <http://commons.wikimedia.org/wiki/User:Dspradau>

## Watershed Condition

### Priority Issues

Issues of concern in the watershed include:

- Sediment and nutrient (nitrogen and phosphorus) delivery to waterbodies.
- Impacts of aquatic invasive species.
- Continued urbanization of the watershed. Erosion from road construction and commercial and residential construction sites delivers significant amounts of sediment to surface waters.
- Water quality and habitat problems from specific agricultural practices.
  - Barnyards adjacent to streams
  - grazing and trampling of stream banks
  - fall tillage practices appear to be the main problems
  - A number of concentrated animal feeding operations (CAFOs) are located in the watershed (Appendix).
- Ditched and drained wetlands: wetland areas have been ditched and drained to accommodate farming, which can impact their quality. Many of the streams have been also been ditched to facilitate field drainage.

### Water Quality Goals

- Monitor highest priority waters to develop a clear understanding of overall water conditions, pollutant loads, and reduction goals.
- Prevent the spread of aquatic invasive species in the watershed.
- Identify and reduce sediment and nutrient loads from agricultural and urban sources.
- Identify opportunities for wetland restoration and reestablishment.

### River and Stream Condition

#### Fond du Lac River, East Branch

The East Branch of the Fond du Lac River (WBIC 135900) begins in south central Fond du Lac County and flows northeasterly to its junction with the West Branch in the City of Fond du Lac. There is intense agriculture throughout much of the watershed. Runoff from plowed fields and barnyards and erosion of heavily grazed and exposed stream banks along the East Branch and its tributaries are adding tons of sediment and nutrients to the river and to Lake Winnebago. Critical soil erosion rate from agricultural lands has been estimated as being 6 tons per acre per year. The East Branch is the largest single sediment contributor to Lake Winnebago (Bruch, 1988).

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## Recommendations

- Additional water quality monitoring data should be collected to develop a clearer picture of the overall water quality of the river. In particular, total phosphorus, suspended solids, and macroinvertebrate data should be collected so that effective management strategies can be developed.
- The East Branch of the Fond du Lac River does not have much data for total phosphorus, suspended solids, or macroinvertebrates. Having a good set of data is important so that effective management strategies can be developed.

### Fond du Lac River, West Branch

The West Branch of the Fond du Lac River (WBIC 134000) begins in northwest Fond du Lac County and flows generally southeast to its confluence with the East Branch. The West Branch has four distinct segments. The first segment is the upper headwater segment, including all its tributaries upstream from Eldorado Marsh. The second segment is contained within Eldorado Marsh. The third segment is downstream from Eldorado Marsh to the City of Fond du Lac, while the fourth segment is in the City of Fond du Lac.

The segment upstream from Eldorado Marsh has a relatively low gradient. There are numerous small wetland complexes and areas of drained wetlands. Many of the unnamed tributaries and drainageways have been ditched or straightened. There are areas of very intensive farming, including the state's largest concentrated animal feeding operation (CAFO), but there are also large areas of farmland which have been set aside as part of the Conservation Reserve Program (CRP). The seemingly large CRP lands in the sub-watershed of this segment act as buffers to the stream in many areas. Water quality is good enough to allow wild rice to be present in the stream channel at least one location upstream from Eldorado Marsh (WDNR SCR-Files, 1996). All the CRP land also reduces the amount of sediment and nutrients that would otherwise find their way into Eldorado Marsh. There is a dam on the river at the Community of Eldorado. Ownership of the dam is unclear according to DNR records. As a result, it is unknown how the dam is being managed or ought to be managed.

The Eldorado Marsh segment of the river is within the boundaries of the Eldorado State Wildlife Area. There is a water control structure that is used to manipulate water levels and control flow out of the marsh. The marsh acts as a sediment and nutrient sink, where much of the incoming sediment is deposited.

The segment of the river from State Highway 23 at the south edge of the wildlife area downstream to U.S. Highway 41 has a steeper gradient and possesses a series of runs and riffles. In stream habitat looks very good and perhaps may be capable of supporting a smallmouth bass fishery (WDNR SCR-Files, 1996). There is not as much intensive agriculture in this segment and there is rural, low-density residential development along portions of the river that may be offering even more buffer from agricultural nonpoint source impacts. Macroinvertebrate monitoring indicates fair to good water quality conditions (Sorge, 1996).

The segment from U.S. Highway 41 downstream to its confluence with the East Branch is an urban stream. There are urban nonpoint sources of pollution, which affect the water quality of the stream.

## Recommendations

- Additional water quality monitoring data should be collected to develop a clearer picture of the overall water quality of the river. In particular, total phosphorus, suspended solids, and macroinvertebrate data should be collected so that effective management strategies can be developed.
- The dam on the West Branch of the Fond du Lac River in the hamlet of Eldorado should be inspected and ownership issues should be resolved.

### Fond du Lac River

The Fond du Lac River (WBIC 133700) is formed by the juncture of the East and West Branches of the Fond du Lac River in the City of Fond du Lac. It flows approximately two miles to Lake Winnebago. It is a completely urban waterway whose pollutant load includes the urban and rural loading of the East and West Branches. There are a number of industries either along the river or nearby which contribute stormwater runoff. Fond du Lac River water was used as background control water during bioassay monitoring done at the Galloway West Company (currently Saputo Cheese USA, Inc.) facility in Fond du Lac. Organisms in the control water failed the chronic toxicity test indicated there may be some problem with water quality in the river. Additional monitoring will be done to try to determine if this "failure" of

the chronic toxicity test was an anomaly or if nonpoint sources of pollution are causing the problem (WDNR SCR-Files, 1996).

### **Campground (Byron) Creek**

Campground Creek (WBIC 137400) rises from several springs at the base of the Niagara escarpment in southeast Fond du Lac County (Weber et al., 1969). It is considered a Class II trout stream from Fond du Lac County Highway Y to a point near its headwaters, approximately 3.3 miles upstream (WDNR, 1980). The stream has a good gradient through this reach. The stream flattens from about mile 0.6 through a main wetland complex just downstream from its origin area (Reif, 2010). The Creek can be considered cold water to that 0.6 mile point and has potential to sustain a brook trout population. The man-made ponds in the large wetland as well as man-made diversions in the wetland degrade it to the point that it warms to near 30 Deg. C in the summer and also results in periodic anoxic conditions that cause fish kills. Much work needs to be done on this wetland problem to restore the trout migration capabilities (Reif, 2010).

The gradient flattens and the stream is dominated by a warm water forage fishery downstream of County Highway Y. The municipal wastewater treatment facility and Seneca Foods discharge to it below County Highway Y. Nonpoint sources of pollution, particularly bank erosion due to cattle grazing, are the main water quality problem in the trout waters reach. Sedimentation from farm tillage practices is also a problem in the downstream reach. Runoff due to excessive spray irrigation by a canning company near Oakfield has occasionally reached the stream and caused water quality problems. There are also some unnamed tributaries to the creek which have intensive agricultural operations on land adjacent to them. Some of these operations may be affecting water quality in Campground Creek (WDNR SCR-Files, 1996). There is one cold water spring-fed tributary (WBIC 137600) that feeds into Campground Creek below the main wetland and is potentially capable of sustaining a trout population (Reif, 2010). Trout have been documented in this tributary in the past (Hacker, 1956).

### **Recommendations**

- The main wetland complex in the Campground Creek sub-watershed needs to be studied and restored to a natural stream channel. Many useful cold springs enter the wetland but are warmed extensively in the summer. Much of this does not appear to be a natural condition and has been the result of man-made modifications such as mining peat in the wetland.
- Groundwater use appears to be a serious concern. High capacity wells, such as those of the City of Fond du Lac and several area Concentrated Animal Feeding Operations (CAFOs) may be having a significant impact on the flows of springs feeding streams. This needs to be extensively studied to develop water use determinations.
- Groundwater protection areas need to be formally identified for the springs that feed Campground Creek.
- The origin spring area of Campground Cr. is a major source of cold water for that area of the Creek and is important in that it has potential to meet cold trout water conditions. This needs to be protected and restored.

### **Parsons Creek**

Parsons Creek (WBIC 136000) is a small cold to coolwater tributary to the East Branch of the Fond du Lac River. The stream, originating along the Niagara escarpment, is designated as Class I trout water for 1.9 miles of its length and is an Exceptional Resource Water. An additional 2.4 miles of the stream is classified as Class II trout waters (DNR, 1980). The segment upstream from Hickory Road flows from some main springs down through a wetland complex and a small county park (Hobbs Woods) and appears to have good water quality though heavily impacted by habitat modifications (Reif, 2009). Downstream from Hickory Road, Parsons Creek was, at one time, heavily impacted by agricultural practices, particularly barnyard runoff and excessive grazing along the streams banks. These impacts were addressed as part of a Priority Watershed project of the late 1990s and early 2000s.

There is an unnamed tributary (WBIC 135200) from the east that



Parsons Creek, Photo by Chad Cook UW Extension

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joins Parsons Creek in Hobbs Woods County Park. This tributary had good water quality at one time (Weber et al., 1965). Recent macroinvertebrate monitoring indicating poor water quality conditions (Sorge, 1996). This tributary was found to vary a lot in quality though appears to be heavily impacted by habitat modifications, agricultural runoff, water loss and quarry discharges (Reif, 2009). In the spring of 2010 while macroinvertebrate sampling the east tributary upstream from the confluence an excellent population of the stonefly *Clioperla clio* was found. A visual survey found significant spring inputs to the tributary near the railroad tracks to the east of Hobbs Woods County Park (Reif, 2010b).

### Recommendations

- The Parsons Creek watershed has a TMDL developed to address the sources of impairments. A thorough watershed inventory should be completed to determine with more specificity the sources of pollution.
- In stream habitat in Parsons Creek, specifically Hobbs Woods County Park, should be restored and improved to support trout populations.
- An implementation plan for Parsons Creek should be developed and implemented to remove the Creek from the 303(d) impaired waters list.
- Parsons Creek is classified as a Class I to Class II trout stream. At present it does not sufficiently support a significant and/or reproducing brook trout population due to extensive habitat modifications and wetland degradation. Habitat improvements and wetland restoration projects should be undertaken to improve conditions.
- Groundwater Protection Areas need to be formally identified for the springs that feed Parsons Creek and the unnamed tributary.
- The unnamed tributary that enters Parsons Creek and the upper part of Hobbs Woods contains a dense population of the stonefly *Clioperla clio*. The cold water of the tributary and the uniqueness of this biota are important to protect. This tributary subwatershed contains quarries that have the potential to reduce flow and negatively modify temperatures. It is necessary that temperature limits be established for these quarries.

### Rosendale Creek

Rosendale Creek (local name) is an unnamed tributary (WBIC 134900) to the West Branch of the Fond du Lac River that originates to the Southwest of the Village of Rosendale and flows 5.2 miles, through Rosendale, to its confluence with the West Branch of the Fond du Lac River. The lower approx. 1 mile is spring fed and can be classified as coolwater according to the fish biota found there as well as continuous summer temperature data collected. These springs are potentially subject to degradation due to urban construction since they are within the Village limits (Reif, 2006).

### Recommendations

- Proposed targeted monitoring is recommended to address elevated temperatures and degraded habitat. Water quality conditions should be compared to state standards to determine whether the creek should be included on Wisconsin's impaired waters list.
- The Village of Rosendale Wastewater Treatment Facility discharge should remain downstream from the high quality area that is near the Mascoutin Valley State Trail.
- The wooded area near the Mascoutin Valley State Trail should be maintained as a green corridor to protect the high water quality conditions of this part of Rosendale Creek.
- The poor habitat downstream from Rose Eld Road should be restored. It was heavily ditched in the past, which has had a negative impact on the biota. Also, there was a small dam upstream from the Mascoutin Valley State Trail that could be a boundary for fish migration. There is also an impoundment downstream from State Highway 23 in Rosendale that is a clear boundary to fish migration. The removal of this dam could allow seasonal migration of gamefish like northern pike to move all the way to the wetland upstream from the Village Park for spawning.
- The groundwater pressure that supplies the springs in the high quality area near the Mascoutin Valley State trail should be maintained and the confining layer that creates this pressure should not be punctured by things like construction.
- The high quality portion of Rosendale Creek near the Mascoutin Valley State Trail has the potential to be classified as an Exceptional Resource Water. Monitoring and evaluation should continue to determine if the segment should be nominated for this designation.

## Lake Health

There are no named lakes in the Fond du Lac River watershed and only about 775 lake surface acres, according to the National Land Cover Dataset. Most of the lakes are small, shallow, man-made ponds or small impoundments of the numerous streams in the watershed.

## Wetlands

The Fond du Lac River watershed contains 22,373 wetland acres. The largest contiguous tract of wetland in the watershed is contained in the Eldorado State Wildlife Area. This 6,381-acre property located in central Fond du Lac County. The wildlife area is 5 miles west of the City of Fond du Lac. The wildlife area consists of a rich mosaic of wetland types, small oak openings, shrubland, grasslands and agricultural land. The West Branch of the Fond du Lac River flows through the wildlife area. The original species rich sedge meadow wetlands have converted to reed canary grass and cattail vegetation because of human disturbance.

Eldorado Marsh was created by glacial activity from the Wisconsin glacial period, about 10,000 years ago. Native Americans utilized this area for hunting and gathering as evidenced by artifacts found on the property. In 1912, an unsuccessful attempt was made to drain the marsh for agriculture. By the 1920's, farmers realized that they could only cut marsh hay. In 1932, a severe fire burned over much of the area creating numerous deep holes in the peat. Hunters and conservation minded citizens quickly recognized the value of the marsh for wildlife and initiated its protection. The area was established as a project by the Wisconsin Conservation Commission in 1951. Land acquisition began in 1952 and continues today.

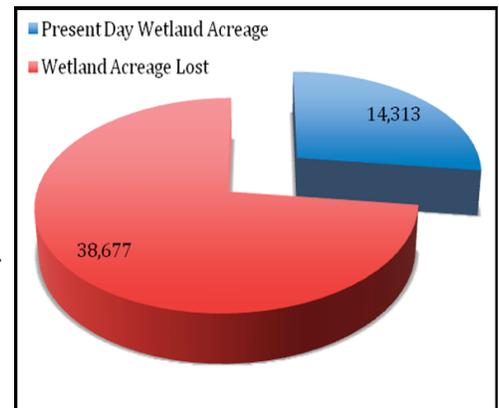


Figure 1: Fond du Lac Watershed Wetlands Lost

Despite the watershed being 14% wetland today, a significant acreage has been lost due to conversion to agricultural land. (Figure 1). Recent analysis of soil conditions suggest that historically, the watershed contained 51,190 acres of wetland which was about 33% of the entire watershed. This translates to a loss of 76% of the historic wetland acreage. Analysis also suggests that 68% of these "lost" wetlands are potentially restorable (Figure 2). The remaining wetland acres are often impacted due to excessive sediment and nutrient inputs.

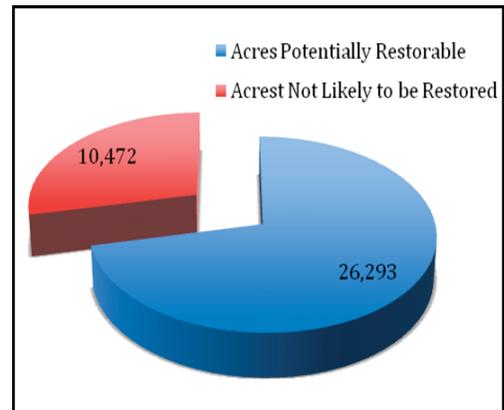


Figure 2: Potentially Restorable Wetlands

## Groundwater

Groundwater use appears to be a serious concern in specific areas of the watershed, such as near Campground Creek. High capacity wells, such as those of the City of Fond du Lac and several area Concentrated Animal Feeding Operations (CAFOs) may be having a significant impact on the flows of springs feeding streams. This needs to be extensively studied to develop water use determinations.

Groundwater protection areas need to be formally identified for the springs that feed Campground Creek. The origin spring area of Campground Cr. is a major source of cold water for that area of the Creek and is important in that it has potential to meet cold trout water conditions. This needs to be protected and restored.

## Waters of Note:

Exceptional Resource Waters, Trout Waters

Parsons Creek is identified as an Exceptional Resource Water (ERW). In addition two segments of Parsons Creek are listed as Class II trout waters and an unnamed tributary is listed as a Class I trout water. A portion of Campground Creek is also designated as a Class II trout water (Table 2).

Table 2. Exceptional Resource and Classified Trout Waters

Water Name	Exceptional Resource Water	Trout Class	Start Mile	End Mile
Parsons Creek		Class II	2.58	3.49
Parsons Creek	ERW	Class II	3.49	5.68
Campground Creek		Class II	1.67	7.26
Unnamed East Tributary to Parsons Creek		Class I	0.01	1.89

### Impaired Waters

A number of rivers and streams in the watershed are currently on Wisconsin's impaired waters list as required by section 303(d) of the federal Clean Water Act (Table 3). A majority of these suffer from low dissolved oxygen and degraded habitat due to nonpoint source pollution impairment. The Fond du Lac River has elevated levels of polychlorinated biphenols (PCBs) which results in contaminated fish tissue and chronic aquatic toxicity. A Total Maximum Daily Load (TMDL) has been developed for Parsons Creek and its unnamed east tributary. This TMDL was approved by EPA in 2007 but some additional refinements need to be done with regards to waste load allocations. A full listing of impaired waters is provided in Table 3.

Table 3: Impaired Waters, UF03

Name/Details	Local Name/Map	Start Mile	End Mile	Impairment	Pollutant
Anderson Creek	Anderson Creek	0	7.26	Degraded Habitat	Sediment/Total Suspended Solids
Campground Creek	Byron Creek	0	1.66	Degraded Habitat	Sediment/Total Suspended Solids
Campground Creek	Byron Creek	1.67	7.26	Low DO, Elevated Water Temperature, Degraded Habitat	Sediment/Total Suspended Solids
Fond Du Lac River	Fond Du Lac River	0	1.56	Contaminated Fish Tissue, Chronic Aquatic Toxicity	PCBs, Unspecified Metals
Lake Winnebago	Lake Winnebago			Contaminated Fish Tissue, Low DO, Eutrophication, Turbidity	PCBs, Total Phosphorus, Sediment/Total Suspended Solids, Mercury
Mosher Creek	Mosher Creek	0	3	Degraded Habitat	Sediment/Total Suspended Solids
Parsons Creek	Parsons Creek	0	2.58	Degraded Habitat	Total Phosphorus, Sediment/Total Suspended Solids
Sevenmile Creek	Sevenmile Creek	0	11	Degraded Habitat	Sediment/Total Suspended Solids
Unnamed	East Trib. to Parsons Cr	0.01	1.89	Low DO, Degraded Habitat	Elevated Water Temperature, Sediment/Total Suspended Solids
Van Dyne Creek	Van Dyne Creek	1	9.11	Degraded Habitat	Sediment/Total Suspended Solids

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## Watershed Actions

### Projects and Grants

The following Nonpoint Source Grants have been secured over the years to fund projects within the watershed.

- City of Fond du Lac for a water quality pond on Sullivan Drive. 2008.
- City of Fond du Lac for stormwater pollution prevention practices at municipal buildings. 2008.
- Village of North Fond du Lac for phase 2 of Mosher Creek rehabilitation. 2004.
- City of Fond du Lac for stormwater planning activities. 2004.
- Village of North Fond du Lac for Mosher Creek rehabilitation. 2003.

### Recommendations Summary

#### Fond du Lac East Branch

- Additional water quality monitoring data should be collected to develop a clearer picture of the overall water quality of the river. In particular, total phosphorus, suspended solids, and macroinvertebrate data should be collected so that effective management strategies can be developed.
- The East Branch of the Fond du Lac River does not have much data for total phosphorus, suspended solids, or macroinvertebrates. Having a good set of data is important so that effective management strategies can be developed.
- Fond du Lac West Branch: Additional water quality monitoring data should be collected to develop a clearer picture of the overall water quality of the river. In particular, total phosphorus, suspended solids, and macroinvertebrate data should be collected so that effective management strategies can be developed.

#### Fond du Lac West Branch

- The dam on the West Branch of the Fond du Lac River in the hamlet of Eldorado should be inspected and ownership issues should be resolved.
- The main wetland complex in the Campground Creek sub-watershed needs to be studied and restored to a natural stream channel. Many useful cold springs enter the wetland but are warmed extensively in the summer. Much of this does not appear to be a natural condition and has been the result of manmade modifications such as mining peat in the wetland.

#### Campground Creek:

- Groundwater use appears to be a serious concern. High capacity wells, such as those of the City of Fond du Lac and several area Concentrated Animal Feeding Operations (CAFOs) may be having a significant impact on the flows of springs feeding streams. This needs to be extensively studied to develop water use determinations.
- Groundwater protection areas need to be formally identified for the springs that feed Campground Creek.
- The origin spring area of Campground Cr. is a major source of cold water for that area of the Creek and is important in that it has potential to meet cold trout water conditions. This needs to be protected and restored.

#### Parsons Creek

- The Parsons Creek watershed has a TMDL developed to address the sources of impairments. A thorough watershed inventory should be completed to determine with more specificity the sources of pollution.
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temperatures. It is necessary that temperature limits be established for these quarries.

#### Rosendale Creek

- Proposed targeted monitoring is recommended to address elevated temperatures and degraded habitat. Water quality conditions should be compared to state standards to determine whether the creek should be included on Wisconsin's impaired waters list.
- The Village of Rosendale Wastewater Treatment Facility discharge should remain downstream from the high quality area that is near the Mascoutin Valley State Trail.
- The wooded area near the Mascoutin Valley State Trail should be maintained as a green corridor to protect the high water quality conditions of this part of Rosendale Creek.
- The poor habitat downstream from Rose Eld Road should be restored. It was heavily ditched in the past, which has had a negative impact on the biota. Also, there was a small dam upstream from the Mascoutin Valley State Trail that could be a boundary for fish migration. There is also an impoundment downstream from State Highway 23 in Rosendale that is a clear boundary to fish migration. The removal of this dam could allow seasonal migration of gamefish like northern pike to move all the way to the wetland upstream from the Village Park for spawning.
- The groundwater pressure that supplies the springs in the high quality area near the Mascoutin Valley State trail should be maintained and the confining layer that creates this pressure should not be punctured by things like construction.
- The high quality portion of Rosendale Creek near the Mascoutin Valley State Trail has the potential to be classified as an Exceptional Resource Water. Monitoring and evaluation should continue to determine if the segment should be nominated for this designation.

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Basin Education Initiative

Wisconsin DNR's mission involves preserving, protecting, and restoring natural resources. Watershed Planning provides a strategic review of water condition to enhance awareness, partnership outreach, and the quality of natural resource management.

# Fond du Lac River Watershed