Dane County State of the Waters Report

DANE COUNTY OFFICE OF LAKES & WATERSHEDS

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This report is available for download at www.danewaters.com/stateofthewaters
All information and web links are current as of the date of publication: December 29, 2008

PREFACE

There is no shortage of information about Dane County's waters. But, for lake and river users, local friends' groups, residents of waterfront property and surrounding areas, researchers, the news media and others interested in water resources, there has not been — until now — a convenient single reference for those seeking in-depth information about the water bodies and watersheds throughout Dane County.

The State of the Waters report is intended to help fill that gap. The document begins with an overview of issues facing county water resources and a summary of the steps being taken to improve watershed management and water quality. (A watershed is an area of land that catches rainwater and snowmelt and drains into a body of water.)

Next, the report explores each of the four major river basins (groups of watersheds that ultimately drain to a major river or lake) in the county, providing information about their characteristics as well as exploring the issues confronting each basin. In addition, sections on individual basins contain detailed information about each watershed within that basin, including contacts for local resource protection groups active in that watershed. A glossary beginning on page 97 explains terms and acronyms that are used in this document.

A project of this size and complexity is only possible if a number of individuals are willing to provide their expertise and advice and to give of their time. We are very grateful to all those who did. We are also hopeful that the State of the Waters report provides both information and inspiration as we continue to seek to understand, preserve and protect the waters that are so much a part of what makes Dane County special.

Susan Jones
Editor

Dane County State of the Waters Report

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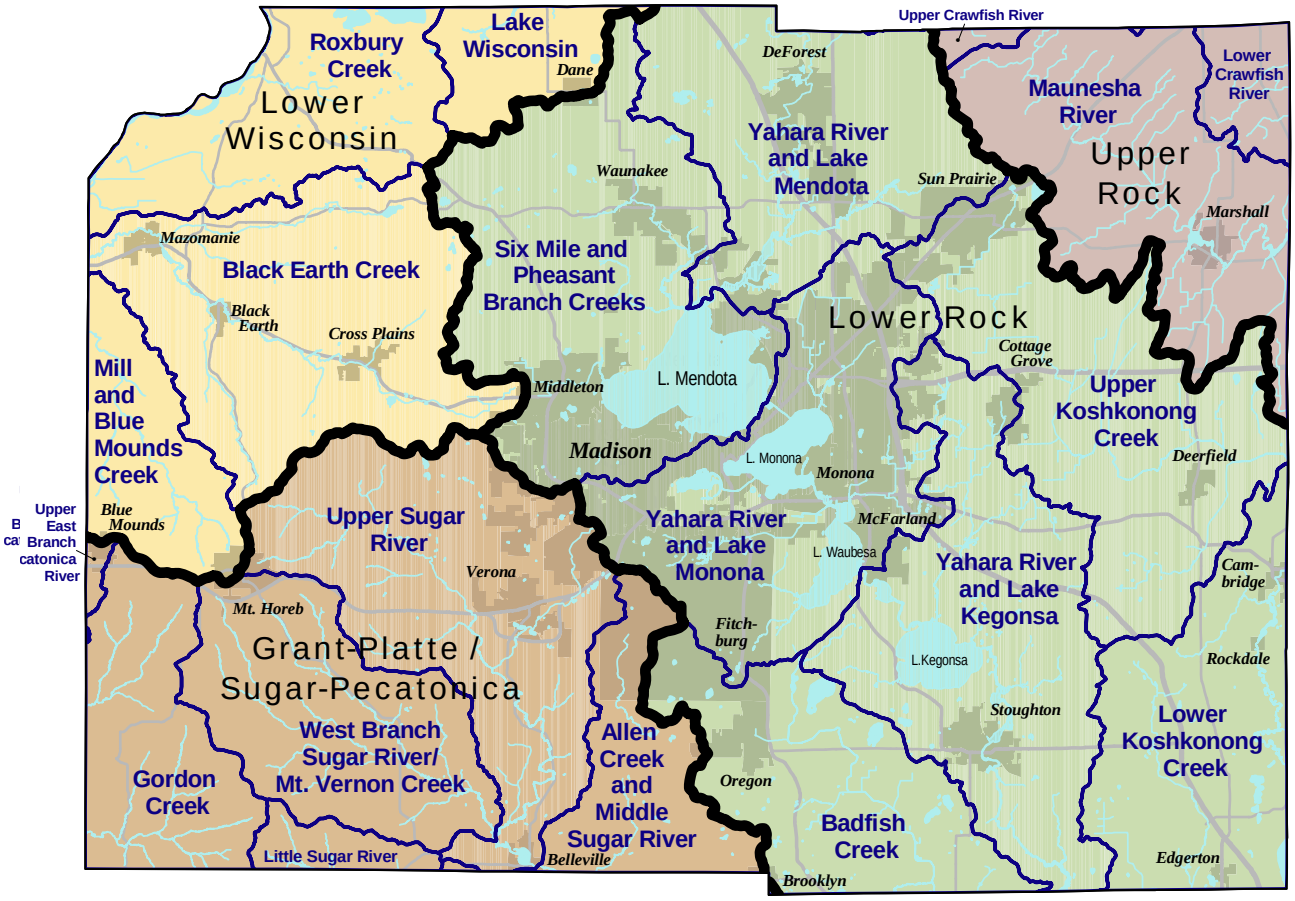

Upper Crawfish River
Roxbury Creek
Lake Wisconsin
Dane
DeForest
Lower Crawfish River
Maunesha River
Lower Wisconsin
Yahara River and Lake Mendota
Waunakee
Sun Prairie
Upper Rock
Marshall
Mazomanie
Six Mile and Pheasant Branch Creeks
Black Earth Creek
Black Earth
Cross Plains
Lower Rock
Cottage Grove
Mill and Blue Mounds Creek
Middleton
L. Mendota
Upper Koshkonong Creek
Madison
L. Monona
Deerfield
Monona
Upper East Branch catonica River
Blue Mounds
Upper Sugar River
Yahara River and Lake Monona
McFarland
L. Waubesa
Yahara River and Lake Kegonsa
Cam-bridge
Verona
Mt. Horeb
Fitch-burg
L.Kegonsa
Rockdale
Grant-Platte / Sugar-Pecatonica
Stoughton
Lower Koshkonong Creek
West Branch Sugar River/ Mt. Vernon Creek
Allen Creek and Middle Sugar River
Gordon Creek
Oregon
Badfish Creek
Little Sugar River
Belleville
Brooklyn
Edgerton

INTRODUCTION - Dane County Waters

The total surface water acreage in Dane County is over 23,000 acres or 36 square miles. The 69 named lakes and ponds in the county make up the bulk of that, covering 21,735 acres, and the rest is made up by the 52 named rivers, streams, and creeks, which run well over 400 miles and cover just over 2,000 acres. That includes the 14 miles portion of the Wisconsin River that flows through Dane County. Today, the county also contains 52,000 acres of wetlands. Incidentally, that is less than half of the area that existed prior to European settlement and draining and filling practices that helped enable agricultural and urban development.

Dane County's groundwater resources are also of great importance, both to the county's human occupants—who drink it—and to the flow and quality of many of the surface waters detailed above. Groundwater is estimated to be equivalent in volume to a reservoir 1000 feet thick covering the county.

Table 1 summarizes the miles and acres of Dane County's surface waters and other countywide characteristics (see also Figure 3 for more on waters identified as impaired, outstanding, and exceptional).

Table 1 Dane County Resource Characteristics

Resource Characteristics	Size
Hydric Soils – acres	119,135
Non-hydric soils (likely to contain hydric inclusions) – acres	71,291
Open water - acres	23,863
Impaired waters (303(d)) - acres	13,363
Impaired waters (303(d)) - miles	119
Outstanding resource waters - miles	8
Exceptional resource waters - miles	108
Average T - tons/acre/year	4
Highly erodible land – acres	263,742

In Dane County, groundwater supplies all public and private drinking water. Wetlands filter pollutants, provide habitat for plants and animals both rare and abundant, and provide protection from floods. Surface waters and wetlands both provide critical habitat for both aquatic and land-based wildlife.

Madison, Wisconsin's capital city, is defined by its position on an isthmus. Surrounded on two sides by Lakes Mendota and Monona, Madison's urban waters are among the most studied lakes in the nation.

Dane County residents are as likely as citizens anywhere to feel our waters are "priceless" while, paradoxically, behaving as if they have little value. However, over the past decades, blessed with a combination of extensive water resources, university and government scientists attracted to the study of those waters, engaged area residents, and enlightened political leadership, Dane County has focused attention and invested financially in preserving and protecting our waters.

The State of the Waters Report you hold in your hands brings together a wealth of information that describes the waters of this county, the challenges they face and the effects of those challenges. Happily, we are also able to describe solutions to those challenges and—even better—we are able to describe how some of those solutions are already being implemented.

By many measures, and we chronicle them in the pages that follow, the quality of our water resources in Dane County has improved and continues on that path, especially due to past efforts to remove or reduce point sources of pollution from wastewater. Of course, not all waters are sufficiently protected and restored. Pollution and neglect have already damaged some of the most important lakes, streams and wetlands in the county. Continuing concerns such as growth and sprawl, agricultural and urban runoff (otherwise known as nonpoint sources of pollution) are well understood but not necessarily well under control. Add to all that some of the emerging concerns we face—invasive species, climate change; the movement of hormones, antibiotics and other pharmaceuticals through our waters—and it is clear that there is much work to be done if we are to pass on these waters and their sustaining natural legacy of beauty and value to our children and grandchildren.

Understanding Dane County's Waters

Dane County contains two very different areas where the form and features of the landscape are distinctly different. Each of these landscapes has different effects on water patterns and resources. The eastern half of Dane County was covered by glaciers, while the western half, part of what is known as Wisconsin's "driftless area," was not. The dividing line is roughly the watershed boundary between the Lower Rock River basin and the Lower Wisconsin and Sugar-Pecatonica basins. Figure 1 below is a shaded relief map showing these two distinct landscapes.

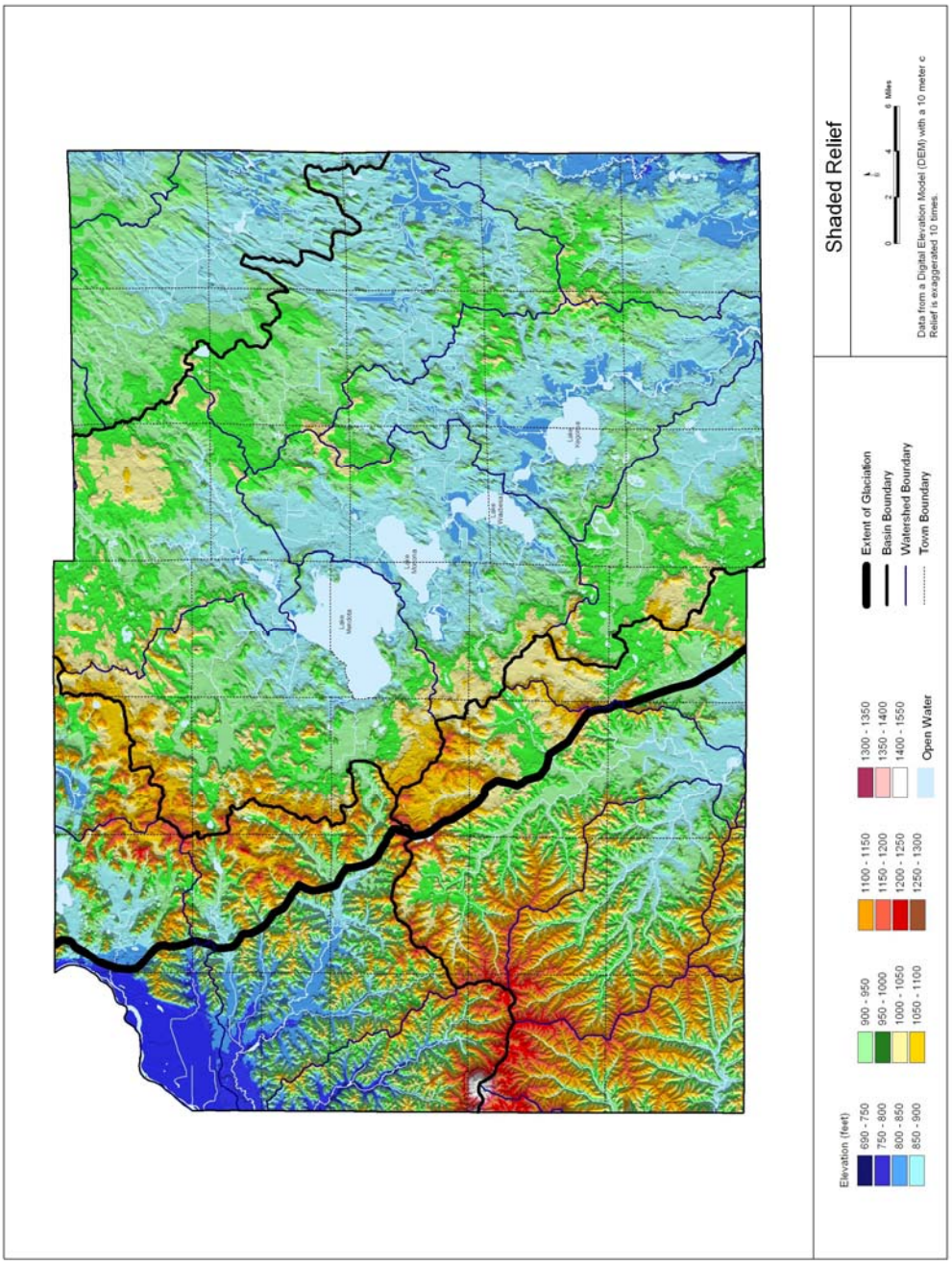

Shaded Relief
Data from a Digital Elevation Model (DEM) with a 10 meter c
Relief is exaggerated 10 times.
Extent of Glaciation
Basin Boundary
Watershed Boundary
Town Boundary
Open Water
1300 - 1350
1350 - 1400
1400 - 1550
1100 - 1150
1150 - 1200
1200 - 1250
1250 - 1300
900 - 950
950 - 1000
1000 - 1050
1050 - 1100
Elevation (feet)
690 - 750
750 - 800
800 - 850
850 - 900

Figure 1.

In the eastern, glaciated portion of the county, streams are less steeply sloped, more sluggish and usually adjoined by wetlands. Few streams are spring fed, and drainage is not well defined. Sediments of sand, silt and muck underlie streams. In the Yahara River valley area (in the Rock River basin), deep glacial sand and gravel deposits dammed up large valleys forming a chain of lakes and adjoining wetlands, all of which are connected by the Yahara River. Those lakes are now known as Mendota, Monona, Waubesa and Kegonsa.

In the western, unglaciated portion of the county, many streams have a gravel or rubble bottom. The steeper topography in the western portion of the county means that generally the rate of streamflow here is higher than in the eastern part of the county. Most streams here are nourished by upwelling groundwater discharge, and by springs and seeps flowing from water-bearing layers of bedrock exposed on hillsides. Steep gradients contribute to cool water and high levels of dissolved oxygen in the water. Due in large part to these factors, trout streams are abundant in this half of the county. The area is generally without natural or human-made lakes. Figure 2 indicates the general location of trout streams and other coldwater resources designated by Wisconsin's Department of Natural Resources (WDNR), most of them located in the unglaciated area of the county. A thermally sensitive stream locator is available on the Dane County web site, at this address: www.countyofdane.com/landconservation/cws.

The Wisconsin River Valley in the northwestern part of the county contains deep sand and gravel deposits and extensive marshes in the river floodplains. Fish and Crystal Lakes are located here.

Figure 3 shows the location of these waters also noted in the table of resource characteristics below. According to WDNR, an officially designated *Outstanding Resource Water* has excellent water quality, high recreational and aesthetic value, high quality fishing and is free from treated wastewater discharges or runoff pollution. Point-source pollution will not be allowed to these waters in the future unless the quality of such discharges meets or exceeds the quality of the receiving water. An E*xceptional Resource Water* is a stream exhibiting the same high quality resource values as outstanding waters, but may be impacted by point-source pollution (those that can be traced to a definite point of origin) or may receive future discharges. *Impaired waters*, those that fail to meet one or more established legal criteria for beneficial uses of the water (drinking water quality, recreation, aquatic habitat, and industrial use, for example), are kept on a list maintained by WDNR, according to Section 303(d) of the federal Clean Water Act. Certain state and federal programs make the improvement of these water bodies a top priority.

Figure 4 shows land use patterns across the county.

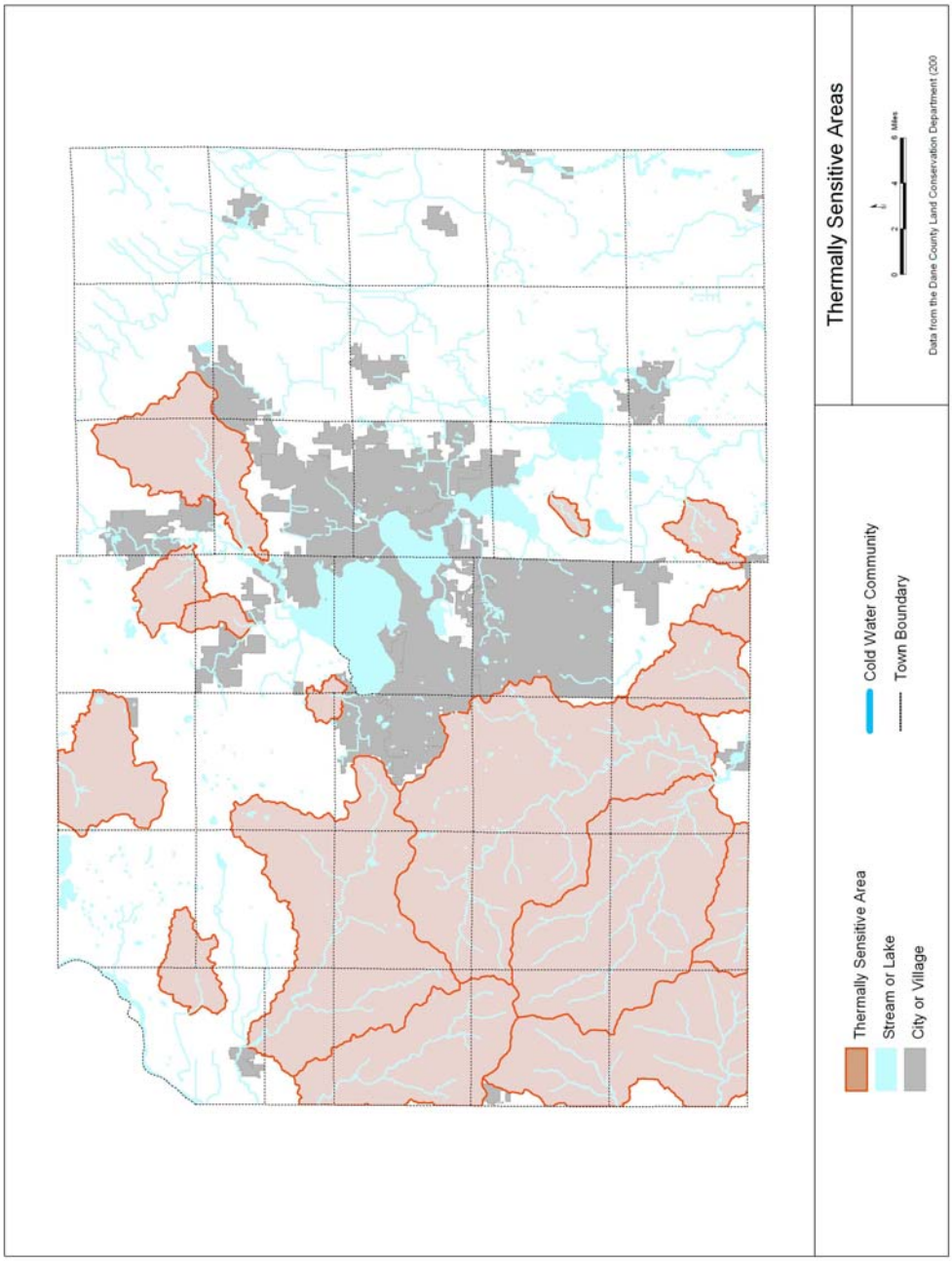

Thermally Sensitive Areas
Data from the Dane County Land Conservation Department (200
Cold Water Community
Town Boundary
Thermally Sensitive Area
Stream or Lake
City or Village

Figure 2.

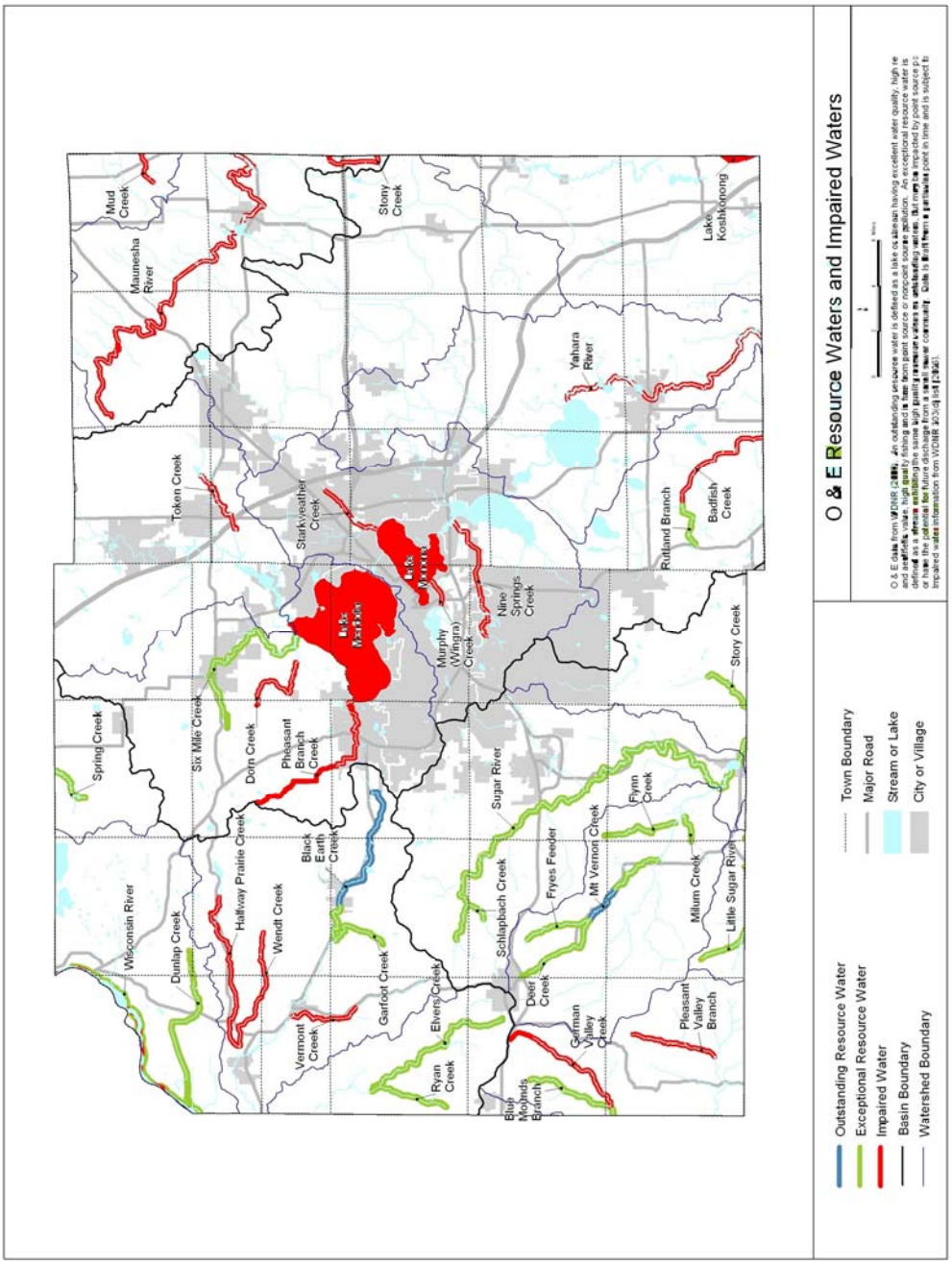

O & E Resource Waters and Impaired Waters
Outstanding Resource Water
Exceptional Resource Water
Impaired Water
Basin Boundary
Watershed Boundary
Town Boundary
Major Road
Stream or Lake
City or Village
Mud Creek
Maunesha River
Stony Creek
Lake Koshkonong
Yahara River
Token Creek
Starkweather Creek
Lake Monona
Badfish Creek
Rutland Branch
Nine Springs Creek
Murphy (Wingra) Creek
Story Creek
Spring Creek
Six Mile Creek
Dorn Creek
Pheasant Branch Creek
Sugar River
Flynn Creek
Wisconsin River
Dunlap Creek
Halfway Prairie Creek
Wendt Creek
Black Earth Creek
Schlapbach Creek
Fryes Feeder
Mt Vernon Creek
Milum Creek
Little Sugar River
Garfoot Creek
Elvers Creek
Deer Creek
German Valley Creek
Pleasant Valley Branch
Vermont Creek
Ryan Creek
Blue Mounds Branch

Figure 3.

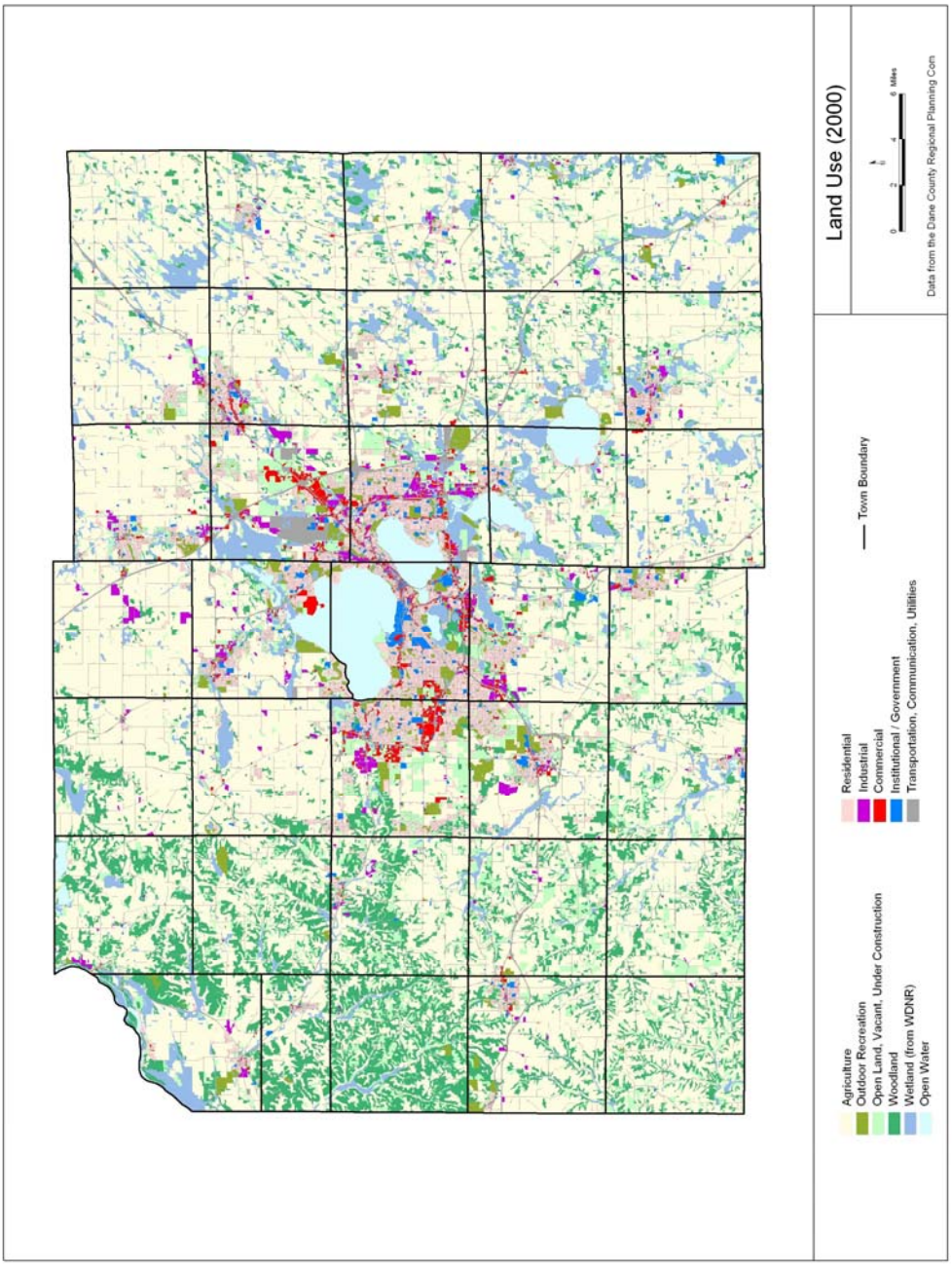
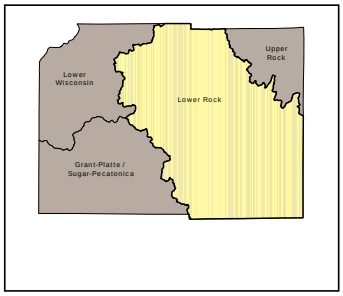

Land Use (2000)
Data from the Dane County Regional Planning Com
Residential
Industrial
Commercial
Institutional / Government
Transportation, Communication, Utilities
Town Boundary
Agriculture
Outdoor Recreation
Open Land, Vacant, Under Construction
Woodland
Wetland (from WDNR)
Open Water

Figure 4.

LOWER WISCONSIN RIVER BASIN



WATERSHEDS

Mill and Blue Mounds Creek
Black Earth Creek
Roxbury Creek
Lake Wisconsin

BASIN OVERVIEW

The Lower Wisconsin River Basin encompasses 12 counties and 137,695 acres, of which Dane County is but one part (with 14,244 acres). Most of the Lower Wisconsin River Basin is in the driftless (unglaciated) part of the state. The Wisconsin River is the Basin's main water attribute. The Wisconsin River is a tributary to the Mississippi, which drains into the Gulf of Mexico. The large valley of the Wisconsin River consists of deep sand and gravel deposits and extensive marshes on the river's floodplain.

General Basin-Wide Concerns

- Nitrate/bacteriological contamination of wells: high nitrate concentrations in shallow private wells are the result of agricultural fertilizer use, septic systems, etc. Earlier studies have shown that 25-35% of private domestic wells tested in Dane County exceed the ten mg/l nitrate drinking water standard.
- Nutrients to surface water.
- Pesticides/herbicides including atrazine: Detected in many places, atrazine's use is largely prohibited now. Refer to http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/atrazine/county-maps/dane/index.jsp which identifies the atrazine prohibition area for Dane County. Improperly abandoned or unabandoned wells and poorly located wells.
- Municipal discharges.
- Agricultural and nonpoint runoff (primarily soil erosion from cropland, but also some organic pollution from barnyard runoff).

SPECIFIC CONCERNS

- Groundwater contamination from the closed Refuse Hideaway Landfill in the Black Earth Creek Watershed.
- Future source to other county waters of exotic pest species such as zebra mussel and Asian Carp.

MILL AND BLUE MOUNDS CREEKS WATERSHED

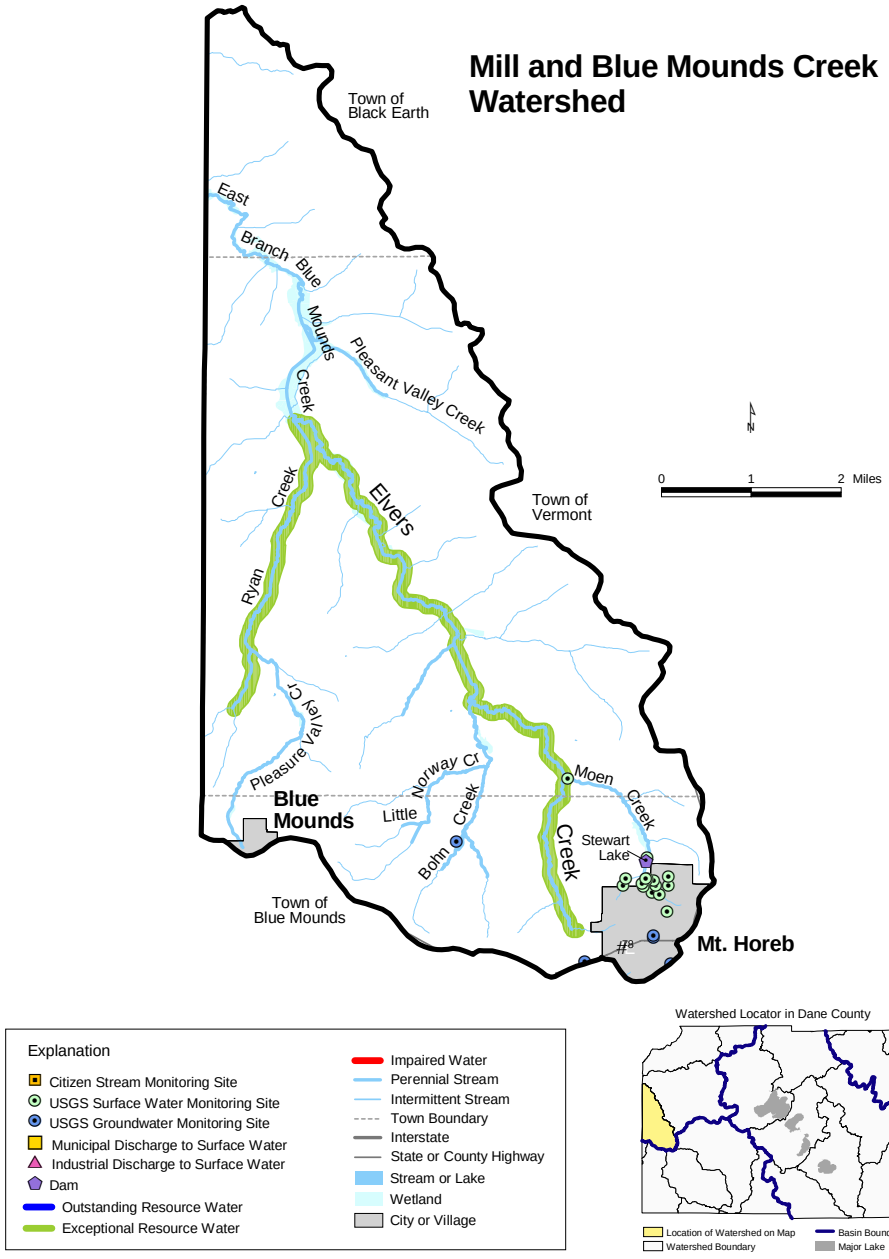
Resource Characteristics	in acres
Hydric Soils	829
Wetlands	507
Agricultural	7,145
Commercial	31
Institutional/Governmental	21
Industrial	43
Open water	8
Other*	3,309
Outdoor recreation	481
Residential	512
Transitional**	665
Woodland	10,594
Size of watershed	119,615
Portion in Dane County	22,851

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Mill and Blue Mounds Creek Watershed consists of 119,615 acres in northeast Iowa and western Dane Counties. It contains 176 stream miles with 56 trout miles and 27 sport fishery miles. Most of the watershed is in Iowa County. The Dane County portion comprises 22,851 acres. Predominately rural, the watershed consists largely of broad-leaf deciduous forest (49%) with some agriculture (24%). The topography is rolling hills characteristic of unglaciated regions. Grasslands are also common here. Municipalities partially located in the watershed are the Villages of Blue Mounds and Mount Horeb, and the towns of Vermont, Blue Mounds and Black Earth.

One of the main water quality challenges is the growth of local communities. For example, the Villages of Blue Mounds and Mount Horeb, the only two municipalities located in the Dane County portion of the watershed, grew by 59% (708 people up from 446) and 40% (5,860 people up from 4,182), respectively, between 1990 and 2000. Specific rural nonpoint sources in the Dane County portion of the watershed include:

- Overtopping manure storage pits near streams.
- General agricultural non-point pollution.



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village

SURFACE WATERS WITHIN DANE COUNTY

- Moen Creek flows two miles northwest from Mount Horeb and leads to Elvers Creek. It is a Class II trout stream with potential to be Class I. It has good riffles and runs in some stretches but not in others. This may be attributed to the moderate non-point pollution coming in from the watershed. The creek receives stormwater runoff from Mount Horeb. Unstable banks in some areas result in erosion. The headwaters of Moen Creek were impounded to form Stewart Lake. The creek just below the impoundment (dam) contains filamentous algae, a sign of a high nutrient (especially phosphorus) load. Monitoring in 2001 found that Moen Creek just below the lake had lower dissolved oxygen and higher temperatures in the early morning than other locations in the creek. Stewart Lake County Park has public access. Baseline monitoring and new stream classification survey are recommended.

- Elvers Creek is a small trout stream. It is a Class II trout stream in its lower three miles and Class III in its upper five miles. Overall water quality is thought to be negatively affected by non-point pollution, especially stream bank erosion. Parts of the stream have been ditched in the past. With proper management, Class II sections could be Class I, and Class III could be Class II. The stream is ranked as a high priority for non-point source pollution reduction. Baseline monitoring and a new stream classification survey are recommended.

- Bohn Creek is a spring-fed three-mile-long tributary to Elvers Creek. Its lower two miles are Class II trout and designated an exceptional resource water by the WDNR. It has good water quality and suitable in-stream habitat supports trout. In 2001, a cursory evaluation identified the biggest problem as non-point pollution and a lack of suitable stream bottom as a result of sedimentation. The WDNR has recommended that Bohn Creek be put back into its original channel. Baseline monitoring, vegetation management and new stream classification survey are recommended.

- Little Norway Creek is a cool, spring-fed, 1.3-mile long tributary to Bohn Creek that flows through a steep valley. It has good water quality and seems to have fairly good trout habitat. WDNR indicates its fishery is not currently managed.

- Ryan Creek is a six-mile long (SWRDC) Class II trout stream and designated an ERW by the WDNR. This stream meets up with Elvers Creek in Dane County to form the East Branch of Blue Mounds Creek. This creek is affected by hydrologic modification, including ditching to drain a nearby wetland. Cattle access has created significant erosion problems and affected in-stream habitat. The stream has been ranked as a high priority for non-point source reduction project. Stream habitat improvements that included structures that duplicate under bank refuge and cover were installed in 1999 and part of the stream was also riprapped.

- Stewart Lake, (7 acres, 13 foot maximum depth) for many years plagued by algae blooms and excessive plant growth, receives runoff from the Village of Mount Horeb, and is now being restored in a cooperative county and local project. The Dane County Land and Water Resources Department, in cooperation with the Village of Mount Horeb using funding from the WDNR Lake Protection Grant program, has installed 13 stormwater detention basins to control sediment run-off. Dredging and lake restoration work will be complete in 2010.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost share programs include: grass waterways, contour strip cropping, streambank protection, barnyard runoff systems, water and sediment control basins, and wetland restoration. The Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, and Conservation Reserve Program were used to implement best management practices and other resource protection methods.

BLACK EARTH CREEK WATERSHED

Resource Characteristics	in acres
Hydric Soils	4,865
Wetlands	1,511
Agricultural	30,959
Commercial	101
Institutional/Governmental	170
Industrial	492
Open water	280
Other*	7,523
Outdoor recreation	773
Residential	2,614
Transitional**	2,537
Woodland	20,876
Size of watershed	67,383
Portion in Dane County	66,326

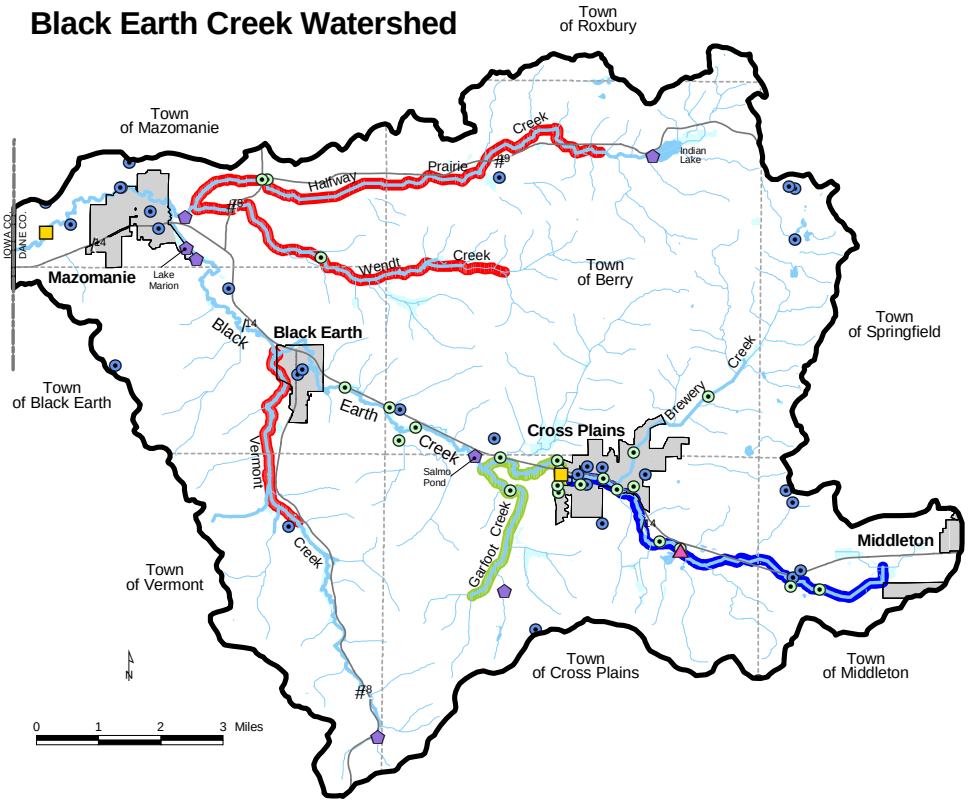
*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Black Earth Creek Watershed consists of 103 square miles (67,383 acres) in northwestern Dane County. Most of the watershed, 66,326 acres, is in Dane County. It contains 75 steam miles with 22 trout miles and 12 fishery miles.

Municipalities located in the watershed are the Villages of Cross Plains, Black Earth and Mazomanie, a portion of the City of Middleton, and parts of the towns of Berry, Cross Plains, Vermont, Black Earth, Mazomanie, Roxbury, Springfield and Middleton.

Much of this region was not glaciated, but its hydrology was shaped by glaciation. While the majority of the watershed is in the driftless (unglaciated) area, the headwaters of Black Earth Creek and its tributary, Halfway Prairie Creek, are in the smoother rolling landscape of glaciated land. That landscape encompasses the major spring areas that feed Black Earth Creek. The forested slopes are one reason why there is excellent rainwater infiltration and subsequent groundwater discharge to Black Earth Creek.

There are over 300 acres of mitigated or restored wetlands in the watershed. Most are on private lands. Three wetland restorations are being done in cooperation with the Federal Wetlands Reserve Program administered by Dane County. There are 1,300 acres of public land in the watershed.



Explanation

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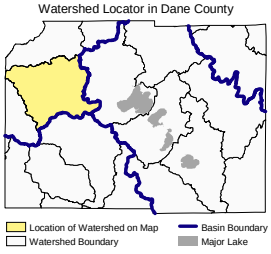


Increasing development threatens water quality in the watershed. From 1990 to 2000 the Village of Black Earth grew 6.0% (1,320 people up from 1,248); the Village of Cross Plains grew 31% (3,084 up from 2,362); and the Village of Mazomanie 7.8 % (1,485 up from 1,377). This growth has contributed to urban non-point source pollution concerns including:

Comment [MK1]:
Note, Cross Plains is way off. I have provided RPC population tables for Urban Service Areas throughout Dane County, as well as DOA numbers for communities in the Central Urban Area, which we don't separate out.

- more development increasing impervious surfaces and surface water runoff;
- Black Earth's, Cross Plains' and Mazomanie's stormwater runs into Black Earth Creek although Cross Plains has installed some infiltration basins near parking lots and streets;
- Rapid urban development in the Black Earth Creek headwater areas, coupled with westward expansion of the City of Middleton, may result in reduced groundwater flow and increased surface water runoff. These factors could lead to poorer water quality, increased stream temperature and habitat destruction.

Rural nonpoint pollution concerns include:

- eroding agricultural lands;
- eroding stream banks;
- animal lots;
- improper manure spreading; and
- atrazine pollution of groundwater and drinking water.

Best Management Practices (BMPs), such as crop rotations, cover crops, minimum tillage, contour strip cropping, grassed waterways and enrollment in CRP or CREP programs, which pay farmers to leave marginal land in conservation easements, have been used in this watershed.

SURFACE WATERS WITHIN DANE COUNTY

- Black Earth Creek is a 27-mile tributary to Blue Mounds Creek. Trout Unlimited has rated Black Earth Creek one of the 100 best trout streams in the nation. Its headwaters are influenced by channelization, and support only warm-water forage fish. The rest of the creek has a high fisheries value. The lower 11.5 miles support a warm-water sport fishery that includes smallmouth bass. However the stretch between the Villages of Black Earth and Mazomanie may be able to be reclassified to cold-water fishery. Upstream from there to Cross Plains the stream is a cold-water trout fishery, fed by a series of spring complexes. One of these includes a large cold-water spring (Festge Springs) just upstream from Cross Plains and numerous smaller springs and is classified as an outstanding resource water by WDNR. Many naturally reproducing brown trout and a few native brook trout live there. The downstream portion of the stream is stocked with rainbow trout. The entire stream portion from Festge Springs to Lake Marion is designated a WDNR Fishery Area.
- Brewery Creek is a 2.7-mile tributary to Black Earth Creek at the Village of Cross Plains, and is important habitat for forage fish and small brown trout. However, eroding stream banks are increasing sediment loading to the creek. These problems add to Black Earth Creek's problems. The creek is subject to flooding and low summer flows.
- Garfoot Creek is a 3.8-mile tributary that flows into Black Earth Creek a few miles west of Cross Plains. There have been streambed changes and non-point source pollution; however the creek supports cold-water species and is listed as an ERW. The creek supports brown trout, and wild brook trout have been stocked recently to see if they would reproduce.

- Halfway Prairie Creek is an 11-mile tributary that originates at Indian Lake and flows to Black Earth Creek which it enters on the west side of Mazomanie. Ditching and sedimentation have caused habitat problems. Halfway Prairie Creek is currently on the 303d list of impaired waters. The creek could be improved if natural stream courses are restored.

- Vermont Creek is six miles long and joins Black Earth Creek just west of the Village of Black Earth. Vermont Creek is a cold-water resource and supports natural reproduction of brown trout. The creek was added to the 303(d) list of impaired waters in 2004. Habitat restoration, sediment control, and reduction of non-point pollution would help this stream.

- Wendt Creek, is six miles long and located just south of Halfway Prairie Creek which it intersects just east of Mazomanie. Wendt Creek is on the 303d list and is impacted by nutrients and pH concerns.

- Indian Lake, 66 acres in size, is located in Indian Lake County Park. Indian Lake has no inlet or outlet, is about five feet deep and is adjacent to ten acres of wetlands and wet meadows. The lake is hypereutrophic with nuisance level summer algae blooms and aquatic plant growth. An aeration system was installed and runs in winter, so winter fish kills, once common, are now rare. Indian Lake has been stocked with bluegill and largemouth bass that reproduce naturally. Non-point pollution affects lake water quality. The Dane County Parks and Open Space Plan recommends that land be acquired around the park to buffer the lake. This includes wetlands that contain springs forming the headwater of the lake.

- Marion Lake is located on the southeast edge of Mazomanie between the railroad and County Highway KP. Marion Lake is 16.7 acres in size with a ten-foot maximum depth.

- Salmo Pond is located on the south side of Highway 14, west of Cross Plains. This deep abandoned gravel pit of six acres has a maximum depth of 15 feet. Salmo Pond is stocked with rainbow trout and contains naturally reproducing populations of black bass, bluegill, and pumpkinseed.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

The Black Earth Creek Watershed was a Priority Watershed Project from 1989 thru 2001. Water quality goals targeted a 50% reduction in phosphorus, upland sediment delivery, streambank erosion and gully erosion. Pollution reduction goals were exceeded by an average of 60% through the state and county contribution of $1.5 million in cost sharing and through landowner contributions of over $750,000. Federal cost-share programs are continuing, including the Conservation Reserve, Wetland Reserve, Conservation Reserve Enhancement Program, and nutrient management.

A Black Earth Creek Resource Area Plan was adopted in 2003 by the Dane County Board of Supervisors. The plan promotes cooperative partnerships among public and private agencies and landowners to protect, restore and enhance the significant natural resources and outdoor recreational opportunities along Black Earth Creek.

Refuse Hideaway Landfill located adjacent to STH 14 between Cross Plains and Middleton was a U.S. EPA listed Superfund Site. Alternatives to deal with groundwater contamination have been implemented and will continue until the cleanup goals have been met. Specific information about this site can be found at the EPA website: http://www.epa.gov/R5Super/npl/wisconsin

Black Earth Creek, Garfoot Creek, and Brewery Creek have all had stream segments restored and protected through bank stabilization and habitat improvement.

Groups/Associations

Black Earth Creek Watershed Association (BECWA)
9580 Union Valley Rd, Black Earth WI 53515, 608-767-3325
website: www.becwa.org or www.madison.com/communities/becwa
email: becwa_coordinator@yahoo.com

The Black Earth Creek Watershed Association seeks to:

- protect, conserve, support, and advocate the wise, long-term management of the physical, biological, environmental, cultural and historical resources that constitute the heritage and future assets of the Black Earth Creek Watershed;
- foster and encourage resident- and locally-based stewardship among the many members of the watershed community; and
- provide a forum for civil and informed discussion of issues and problems in the watershed.

Current issues:

- As the population of the area increases, pressure on the watershed intensifies from changing land uses. Loss of permeable surfaces and an increase in stormwater runoff impact the quality and temperature of the creek. Pollutants from agricultural uses and urban runoff impact the entire ecosystem.
- Expansion of Highway 14 will have a major impact on the watershed.

Primary accomplishments:

- BECWA has existed as a volunteer organization for over 20 years and continues to be a major player in the watershed. BECWA was first formed in 1987 as the area was facing a major threat from hazardous contamination from Refuse Hideaway landfill at the headwaters of the creek.
- Other critical events over the years, including a major fish kill in the summer of 2001, affected the watershed and prompted BECWA action.
- BECWA sponsors a spring creek cleanup on the Saturday nearest Earth Day (in April), partnering with school and non-profit groups to clear trash from the watershed.
- BECWA hosts an annual “Passport to Your Watershed” event to link with the Cross Plains Trout Days activities to demonstrate the value of the creek to all who live or visit the area. The event emphasizes environmental education regarding the creek's ecosystems for a primary audience of school children and their parents.

Black Earth Creek Conservation Organization (BECCO)
Louise Klopp, President, 4283 Hwy P, Cross Plains, WI 53528, 608-798-4249
email: louklopp@chorus.net

Black Earth Creek Conservation Organization, founded in 1994, is a non-profit volunteer group established to protect, enhance, restore and celebrate the unique geological features of the Black Earth Creek Watershed.

Its primary goals and projects are advocacy, education, monitoring and work on Cross Plains Nature Park.

Roxbury Creek Watershed

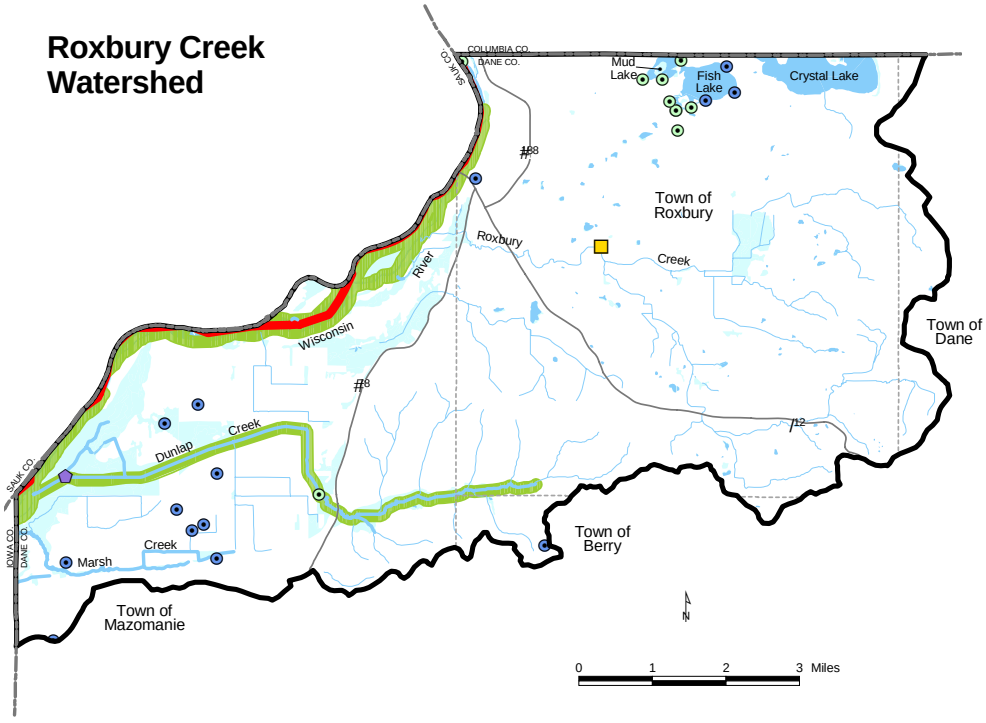
Resource Characteristics	in acres
Hydric Soils	7,197
Wetlands	3,717
Agricultural	18,816
Commercial	16
Institutional/Governmental	12
Industrial	164
Open water	1,729
Other*	4259
Outdoor recreation	339
Residential	842
Transitional**	1,090
Woodland	10,929
Size of watershed	45,553
Portion in Dane County	38,199

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Roxbury Creek Watershed consists of 45,553 acres in northwestern Dane County and in Columbia County. The vast majority of the watershed (38,199 acres) is in Dane County. The watershed contains 35 stream miles, 3.5 trout miles and five sport fishery miles.

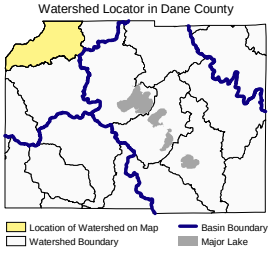
Dominant land use is agriculture with one-third of the area covered by broadleaf deciduous forest. No incorporated municipalities are present in the watershed, and the population includes land outside Dane County was approximately 5500 people in 2000. The Dane County areas of the watershed include portions of the towns of Roxbury, Mazomanie and Dane.

Major water issues are non-point source pollution, stream channelization, development pressure, atrazine (soils are permeable) and changing water levels in Fish and Crystal Lakes.



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village



SURFACE WATERS WITHIN DANE COUNTY

- Dunlap Creek, a tributary to the Wisconsin River, is 9.5 miles long and has 3.5 miles of Class II trout waters. Despite extensive ditching, the creek remains a nursery for several warm-water fish including northern pike. Sedimentation from cultivated fields and grazing are affecting in-stream habitat and impairing the stream's use. The stream was selected as a small-scale priority watershed project in 1991 with projects implemented to control the formation of gullies or to prevent further deterioration of existing gullies.

- Marsh Creek is a 3.5-mile long seepage tributary to the Wisconsin River, and currently supports forage fish but some sport fish may move in from the Wisconsin River. Low gradient/portions have been ditched. Non-point source pollution is a problem. Migrating waterfowl are known to use the stream.

- Roxbury Creek (also called Blums Creek) is eight miles long according to Surface Water Resources of Dane County (SWRDC) and a tributary to the Wisconsin River. The creek has been extensively ditched, and severely damaged by cattle grazing and associated bank erosion in some areas. Only forage fish live there.

- Fish Lake is a 251-acre seepage pothole with no inlet or outlet streams. The lake's water level has risen about nine feet between 1966 and 2002, causing flooding of roads and residences. The surface area has increased with increasing lake levels; approximately 20 acres more in 1991 than 1979. Water level increases have occurred in other Wisconsin seepage lakes since the 1970s, and are caused by changes in regional climate. The Fish Lake fishery is dominated by northern pike, largemouth bass and panfish and also supports a high population of cisco, a cold-water species related to salmon. Fish Lake had some of the best water quality among Dane County lakes in the early 1980s, but declining water quality caused by increased surface runoff pushed it toward eutrophic status. Dissolved oxygen content levels have been reduced resulting in occasional fish kills of cisco, which require a high dissolved oxygen content in the deep, cold water. Surrounding land use is 60% agricultural. The Crystal, Fish, and Mud Lake District was formed in 2003. The primary goal is to use pumping to draw down lake levels when they are excessively high.

- Crystal Lake is a 594-acre, shallow, eutrophic, seepage lake. Like Fish Lake, its water level has risen over the years; approximately five feet between 1974 and 1999. Crystal Lake's area also increased with increasing lake levels; approximately 72 acres more in 1999 than 1974. Until the mid-1980s, it was a marsh. Hydrologic changes caused the lake to change from one with bullheads and winterkill to a lake with good populations of largemouth bass and panfish. The majority of the lake is in Dane County with a small portion in the north being in Columbia County.

- Mud Lake (Marx Pond), 76 acres in size, is actually a marshy bay of Fish Lake, connected by at least three culverts. The level and area of Mud Lake, like Fish and Crystal Lakes, has also increased over the years. The lake provides an excellent spawning area for northern pike and largemouth bass. Habitat for waterfowl is excellent. The lake still supports a healthy fishery, even though occasional fish kills occur in winter.

- Wisconsin River is an ERW with a diverse warm-water sport fishery. Fourteen miles of the Wisconsin River are within Dane County (SWRDC). The Wisconsin River from Prairie du Sac to the Mississippi River is included on the 303(d) list due to contaminated sediments. Of the nearly 95 native fish species in the river, 19 are listed by the State as threatened or endangered, including paddlefish and sturgeon. Native freshwater mussels live there, as do certain unusual and rare insects (including rare dragonfly species) and threatened or endangered amphibians and reptiles. In addition to being an Exceptional Resource Water, it has also been nominated for inclusion in the National Wild and Scenic Rivers Program. In 1989, the Wisconsin State Legislature created the Lower Wisconsin State River Exceptional Resource Waterway Board. The Blackhawk Unit and the Mazomanie Wildlife Area Unit of the Lower Wisconsin State River Exceptional Resource Waterway are located in Dane County. The Wisconsin River is on the 303(d) list from the Prairie du Sac Dam downstream to the Mississippi River. There are fish advisories in effect in the river for mercury (walleye) and PCBs (sturgeon).

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

The Dunlap Creek Priority Watershed project ended in December 2004. The primary focus of this small-scale project was to control active gully erosion on the steep slopes. Land use has changed from

traditional agriculture to established upland grass and wetland vegetative cover. The remaining portion of the watershed has received the more traditional conservation practice applications, which include grass waterways, diversions and nutrient management.

LAKE WISCONSIN WATERSHED

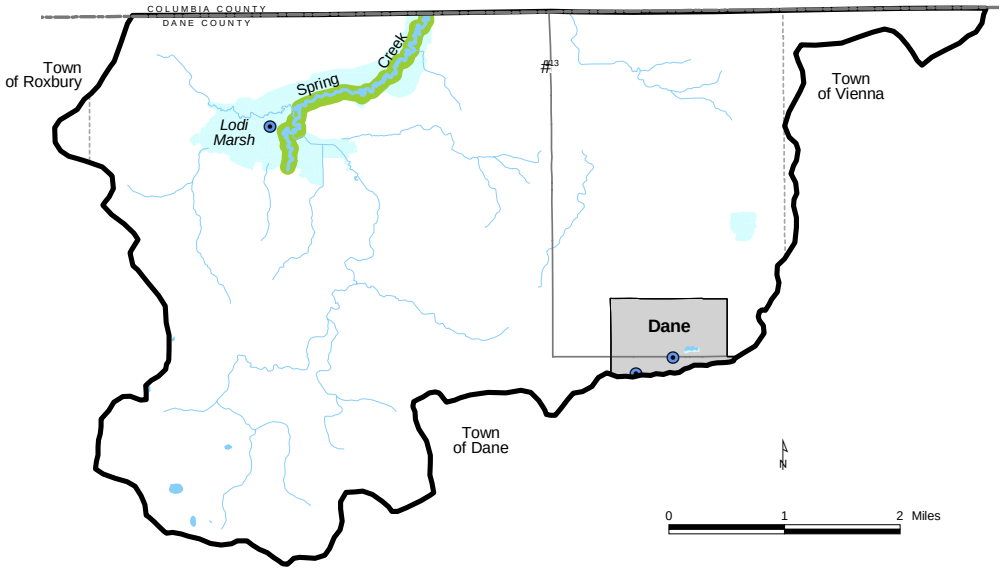
Resource Characteristics	in acres
Hydric Soils	876
Wetlands	698
Agricultural	9,541
Commercial	6
Institutional/Governmental	11
Industrial	23
Open water	41
Other*	1,118
Outdoor recreation	9
Residential	321
Transitional**	461
Woodland	2,712
Size of watershed	137,695
Portion in Dane County	14,244

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Lake Wisconsin Watershed consists of 137,695 acres in Sauk, Columbia and Dane Counties. Only the southern tip of the watershed (14,244 acres) is located in Dane County. Dominant land use is agriculture. Municipalities in the Dane County portion of the watershed are portions of the village and town of Dane, and very small segments of the towns of Roxbury and Vienna. The watershed's most dominant feature is Lake Wisconsin, an impoundment of Wisconsin River which is located outside of, and upstream from, Dane County.

Development is a water quality concern. Between 1990 and 2000, the Village of Dane grew 29% 799 people up from 621), the nearby City of Lodi in Columbia County, grew by 38%. Non-point pollution; stream channelization, atrazine, nutrient loading, and numerous point source discharges also threaten the watershed.

Lake Wisconsin Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
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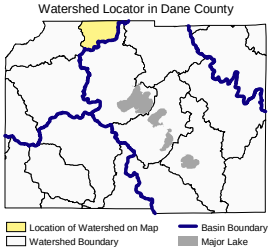
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village

Watershed Locator in Dane County



SURFACE WATERS WITHIN DANE COUNTY

- Spring Creek begins in Dane County and flows north into Columbia County and Lake Wisconsin. Spring Creek is a Class II trout stream; the four-mile stretch in Dane County is designated an exceptional resource water.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

The Dane County Public Works, Highway and Transportation Department has created a wetland mitigation bank in this watershed. This process involves purchasing wetlands or restoring wetlands when a particular construction activity cannot be avoided and impacts an existing wetland. There has been no targeted Dane County program effort placed on this watershed. A few grass waterways have been constructed with federal cost sharing.

Groups/Associations

Friends of the Lower Wisconsin River (FLOW)

Timm Zumm, Co-Chair, E5392 Jones Rd, Spring Green, WI 53588, 608-575-0325
web Site: www.geocities.com/wisriverfriends email: wisriverfriends@yahoo.com;

The Friends of the Lower Wisconsin River mission is to support events, policies and regulations that promote good river stewardship. They formed the original organization in 1987 and reorganized in 2001.

Current issues:

- personal watercraft use
- DNR river maintenance
- Mazomanie boat landing reconstruction support

Primary accomplishments:

- Annual participation in National Clean Rivers Week
- Sponsor of annual DOT highway cleanup project
- Successful Mazomanie boat landing construction project

Who are we?

We are a group of people who use and enjoy the beautiful Lower Wisconsin Riverway. Everyone is welcome to participate.

What do we do?

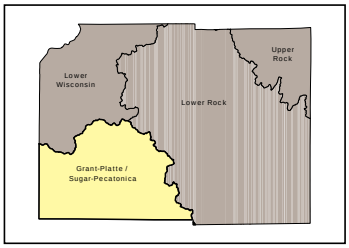
Focus public concern on the river's magnificent resources.
Clean-up the Riverway corridor throughout the year.
React to the concerns of our members.
Study Riverway issues and present positions to decision-makers.
ENJOY the river through various FLOW social activities!

When do we meet?

No regular meetings are held at this time. However, learning about issues, river clean-up events and tours to educate members about the river's resources are typically monthly from April through October.

GRANT-PLATTE-SUGAR-PECATONICA RIVER BASIN

WATERSHEDS



Gordon Creek
Upper East Branch Pecatonica River
Allen Creek/Middle Sugar River
Little Sugar River
Upper Sugar River
West Branch Sugar/Mount Vernon Creek
.

BASIN OVERVIEW

The Sugar and Pecatonica Rivers drain 1,832 square miles primarily in the driftless area of Wisconsin, which eventually flows into the Rock River in Illinois. The driftless (unglaciated) area is a region that was not covered by the continental ice sheet during the most recent glacial age, which ended 10-12,000 years ago. This produced a landscape unlike the rest of glaciated Wisconsin. The terrain varies from gently to moderately rolling hills, with small streams that have moderate to steep gradients. The Dane County portion of the basin is 171,589 acres in size.

The Grant-Platte-Sugar-Pecatonica Basin has more than 1,720 miles of streams. About 261 miles of those streams provide a cold-water fishery (trout). Another 518 miles are warm-water fishery while 215 miles are considered valuable forage fishery streams. The few lakes in the basin are primarily impoundments.

General Basin-wide Concerns:

- Rapid growth: According to studies by the WDNR, streams begin to be adversely affected when urbanization reaches 10% of contributing watershed area and, at 30%, streams are severely affected. In this basin, urbanization has been rapid. For example, from 1990 to 2000, the nearby City of Fitchburg grew by 31% (20,501 up from 15,648); the City of Verona by 31% (7,052 up from 5,374) and the Village of Mount Horeb by 40% (5,860 up from 4,182). That urbanization leads to greater runoff, which carries pollutants to surface waters.

- The City of Verona, found in the Grant-Platte-Sugar-Pecatonica River Basin, is part of a regional wastewater system. This regional system is run by, and known as, the Madison Metropolitan Sewage District (MMSD). Communities served by this system send their untreated wastewater, via sewage pipes, to the MMSD facility where it is treated and discharged to Badfish Creek. Most of the water comprising wastewater primarily begins as groundwater used by residential and industrial customers. The result of Verona sending its wastewater to MMSD is a transfer of water from the Grant-Platte-Sugar-Pecatonica River Basin to the Lower Rock River Basin. While groundwater is still considered to be plentiful for drinking water, the possibility exists for this water transfer to impact surface water flow. This might occur under a drought condition or if groundwater levels drop, resulting in impact to surface waters or wetlands. Discharge to surface waters is an important source of continuous flow to lakes and streams when weather is dry, and when too much is used or diverted away from where it came from, the water table falls low enough to reduce the flow to lakes and streams (known as baseflow), which negatively impacts the habitat for animals and plants in those places. A program to return a portion of the highly treated wastewater effluent flow back to the Sugar River Basin was implemented. This was done to try and minimize any potential for reduced flows in Badger Mill Creek and the Sugar River resulting from the loss due to wastewater treatment. To accomplish this strategy treated wastewater was returned via a large pipe, aerated in a cascade type structure and discharged to Badger Mill Creek, a tributary to the Sugar River. The goal is to try and minimize any hydrologic imbalance created by transferring water from one basin into another basin.

- From a groundwater quality standpoint, private wells in this region are usually only a few hundred feet deep and generally draw water from the shallow aquifer. Shallow private wells are typically more susceptible to contamination from surface activities. High capacity municipal wells, on the other hand, may be as much as one thousand feet deep drawing water from the deeper Mt. Simon sandstone aquifer. There is considerably less risk of contamination for public sources of water.

SPECIFIC CONCERNS:

- Bacteriological contamination of wells.
- Nutrients in water and pesticides. Pesticides—mostly atrazine—have been detected in all of 639 wells sampled.
- Nitrates in groundwater, mostly in shallow private wells. High concentrations are probably from high background levels of nitrate/nitrogen, which may result from agricultural over-fertilization, or by discharges from on-site sewage systems, manure or silage systems.
- Wells can be a direct source of contamination if they were improperly abandoned or poorly built.

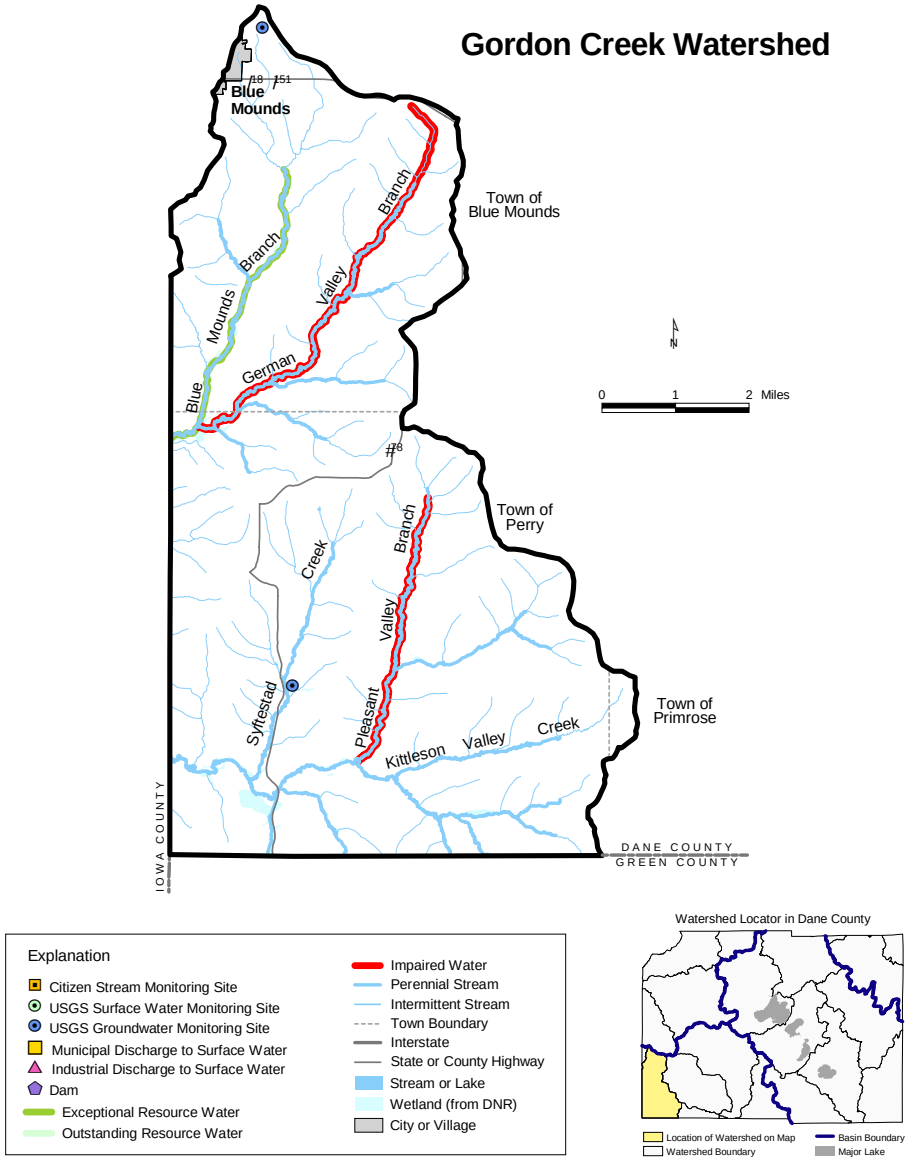
GORDON CREEK WATERSHED

Resource Characteristics	in acres
Hydric Soils	1,293
Wetlands	394
Agricultural	20,534
Commercial	1
Institutional/Governmental	10
Industrial	46
Open water	1
Other*	3,092
Outdoor recreation	81
Residential	270
Transitional**	906
Woodland	5,831
Size of watershed	49,260
Portion in Dane County	30,792

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Gordon Creek Watershed lies in southwestern Dane County, northwestern Green, and Southeastern Iowa counties. The watershed covers 77 square miles, 49,260 acres, of which 30,792 acres are in Dane County.

Agriculture is the dominant land use in 48% of the watershed. Municipalities in the Dane County part of the watershed are portions of the Towns of Perry and Blue Mounds and the southeast corner of the Village of Blue Mounds. The watershed contains no municipalities and is encompassed by the Conservation Reserve Enhancement Program Grassland Project that hopes to restore 10,000 acres of grassland in south central Wisconsin. In addition, the Nature Conservancy is involved in a grassland restoration project in the upper watershed, which should help maintain bird habitat and increase rain infiltration.


Gordon Creek Watershed
Blue Mounds
18
151
Town of Blue Mounds
Branch
Valley
Mounds
Branch
German
Blue
N
0
1
2 Miles
18
Town of Perry
Creek
Branch
Valley
Syftestad
Pleasant
Kittleson
Valley
Creek
Town of Primrose
IOWA COUNTY
DANE COUNTY
GREEN COUNTY

Explanation
Citizen Stream Monitoring Site
USGS Surface Water Monitoring Site
USGS Groundwater Monitoring Site
Municipal Discharge to Surface Water
Industrial Discharge to Surface Water
Dam
Exceptional Resource Water
Outstanding Resource Water
Impaired Water
Perennial Stream
Intermittent Stream
Town Boundary
Interstate
State or County Highway
Stream or Lake
Wetland (from DNR)
City or Village

Watershed Locator in Dane County
Location of Watershed on Map
Watershed Boundary
Basin Boundary
Major Lake

SURFACE WATERS WITHIN DANE COUNTY

- Gordon Creek, also known as Blue Mounds Branch and Big Spring Creek, originates near the Village of Blue Mounds and flows 5.5 miles in Dane County south to Iowa County and ultimately the East Branch Pecatonica River near Blanchardville. Gordon Creek is a Class II trout stream for 11 miles of its length. The primary water quality and habitat problems for Gordon Creek are polluted runoff from intense grazing, exposed and eroding banks, cultivated fields, and barnyards. The reach of Gordon Creek in Dane County is considered as exceptional resource water.

- German Valley Branch is a five mile long tributary to Gordon Creek in southwestern Dane County. The stream is a forage fishery stream and is assumed to generally have good water quality. Polluted runoff is the major water quality and habitat problem. Some ditching has occurred; pools, particularly in the lower half, have been degraded by sedimentation. The stream might be able to support trout if intensive habitat and watershed management were implemented. Initial restoration work was done by Dane County Land Conservation Division beginning in 2004 and restoration continued through 2008. German Valley is on the 303(d) list due to habitat impairment by sedimentation.

- Kittleson Valley Creek flows eight miles in Dane County, and is a tributary to Gordon Creek in southeast Iowa County. Seven miles are considered Class II trout waters while an additional two miles are Class III. Recreational use of this stream is impaired by polluted runoff. Heavy sedimentation in the stream bottom probably results from bank erosion and runoff from farm fields. This stream has received funding for restoration work in 2008 through the U.S. Fish and Wildlife Service (USFWS).

- Pleasant Valley Branch is a three-mile-long tributary to Kittleson Valley Creek in southwest Dane County. Pleasant Valley Branch is considered a warm-water forage fishery stream, but does have the potential for trout. Sediment and degraded habitat are concerns. The primary water quality and habitat problem appears to be grazing along the stream. This stream is on the Wisconsin 303(d) list due to sedimentation resulting in a loss of habitat. Pleasant Valley Branch is a Targeted Runoff Management project and has received USFWS funding for stream enhancement and protection.

- Syftestad Creek is a five-mile-long tributary to Kittleson Valley Creek, and is a warm-water forage fishery stream that may have potential for trout. Excess sedimentation has resulted in degraded habitat, and the creek was on Wisconsin's 303(d) list. After watershed practices were installed to reduce pollution, the stream is now in the process of being removed from the 303(d) list. Redside dace, a fish on the state's threatened and endangered species list, has been found here.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

A Targeted Resource Management grant was received to stabilize streambanks and implement fish habitat restoration in 2004. Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip-cropping, barnyard runoff systems, streambank fencing and wetland restoration. The Agricultural Conservation Program, county cost-share program, Environmental Quality Incentive Program, Wildlife Habitat Incentive Program, and the Conservation Reserve Enhancement Program were used to implement best management practices.

UPPER EAST BRANCH PECATONICA RIVER

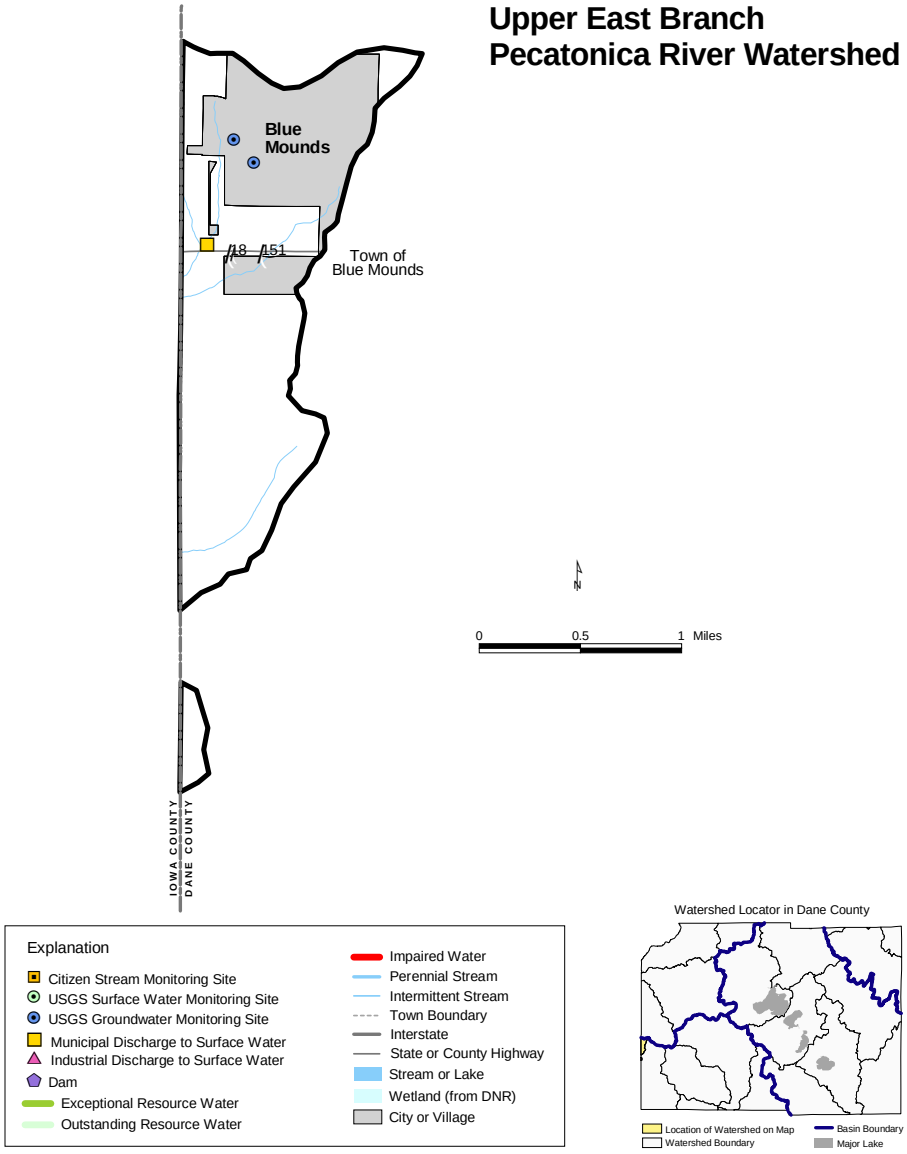
Resource Characteristics	in acres
Hydric Soils	0
Wetlands	0
Agricultural	832
Commercial	2
Institutional/Governmental	5
Industrial	11
Open water	0
Other*	45
Outdoor recreation	38
Residential	103
Transitional**	101
Woodland	23
Size of watershed	89,791
Portion in Dane County	1,172

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Upper East Branch of the Pecatonica River is located in Eastern Iowa County and a small portion (1,172 acres) of western Dane County. Municipalities in the Dane County part of the watershed are most of the Village of Blue Mounds and portions of the town of Blue Mounds. The dominant land use is agricultural. Five municipal wastewater permittees discharge to surface water in the watershed, but only the Village of Blue Mounds discharges within Dane County. Previous survey work activities indicated sedimentation and habitat destruction to the majority of the basin streams. Little monitoring data exists to assess the extent and severity of the problem.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by federal cost share programs include grass waterways and contour strip cropping. The primary cost sharing programs have been the Agricultural Conservation Program and the Conservation Reserve Program. A significant portion of the area within Dane County has been restored to native prairie.


Upper East Branch
Pecatonica River Watershed
Blue
Mounds
18
151
Town of
Blue Mounds
IOWA COUNTY
DANE COUNTY
N
0
0.5
1 Miles
Explanation
Citizen Stream Monitoring Site
USGS Surface Water Monitoring Site
USGS Groundwater Monitoring Site
Municipal Discharge to Surface Water
Industrial Discharge to Surface Water
Dam
Exceptional Resource Water
Outstanding Resource Water
Impaired Water
Perennial Stream
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Town Boundary
Interstate
State or County Highway
Stream or Lake
Wetland (from DNR)
City or Village
Watershed Locator in Dane County
Location of Watershed on Map
Watershed Boundary
Basin Boundary
Major Lake

ALLEN CREEK AND MIDDLE SUGAR RIVER WATERSHED

Resource Characteristics	in acres
Hydric Soils	2,637
Wetlands	1,131
Agricultural	16,726
Commercial	13
Institutional/Governmental	36
Industrial	46
Open water	109
Other*	3,485
Outdoor recreation	50
Residential	1,107
Transitional**	833
Woodland	2,136
Size of watershed	98,565
Portion in Dane County	24,554

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Allen Creek and Middle Sugar River Watershed is located in northeastern Green County, northwestern Rock County and south central Dane County. Total size is 98,565 acres, with 24,554 acres in Dane County. The dominant land use is agriculture, though some low intensity urban development exists in the upper reaches of the watershed. Municipalities in the Dane County portions of the watershed are portions of the City of Fitchburg, Village of Oregon, Belleville and Brooklyn, and parts of the towns of Oregon, Montrose and Verona. Municipal wastewater treatment plants in the Villages of Belleville and Brooklyn discharge to surface waters.

SURFACE WATERS

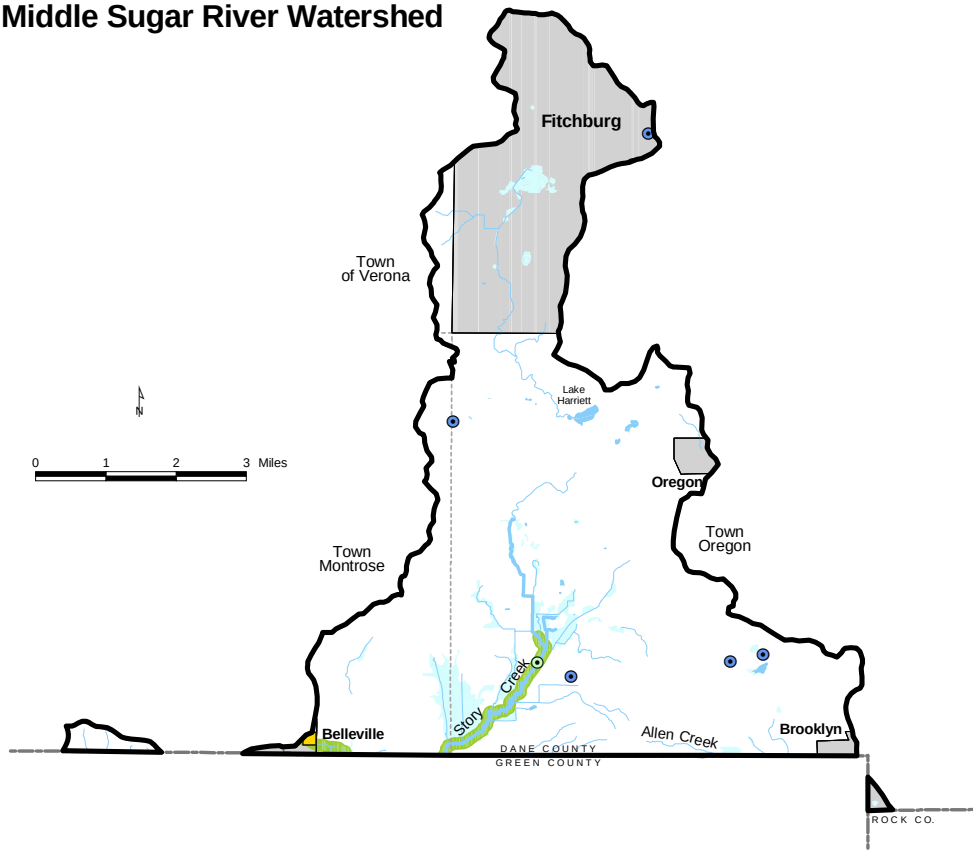
- Story Creek (also called Tipperary Creek) originates in southern Dane County and flows for three miles before it enters northeastern Green County and empties into the Sugar River. Story Creek is an exceptional resource water.

- Allen Creek originates in southern Dane County, flows through northwest Rock County and northeast Green County before emptying into the Sugar River.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

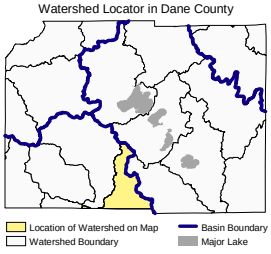
Traditional conservation practices installed and funded by federal cost share programs include grass waterways and contour strip cropping. Primary cost share program has been the Agricultural Conservation Program and EQIP is funding limited nutrient management.

Allen Creek and Middle Sugar River Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village



LITTLE SUGAR RIVER WATERSHED

Resource Characteristics	in acres
Hydric Soils	582
Wetlands	86
Agricultural	3,223
Commercial	0
Institutional/Governmental	2
Industrial	8
Open water	3
Other*	1,187
Outdoor recreation	0
Residential	52
Transitional**	204
Woodland	1,304
Size of watershed	85,2018
Portion in Dane County	6,011

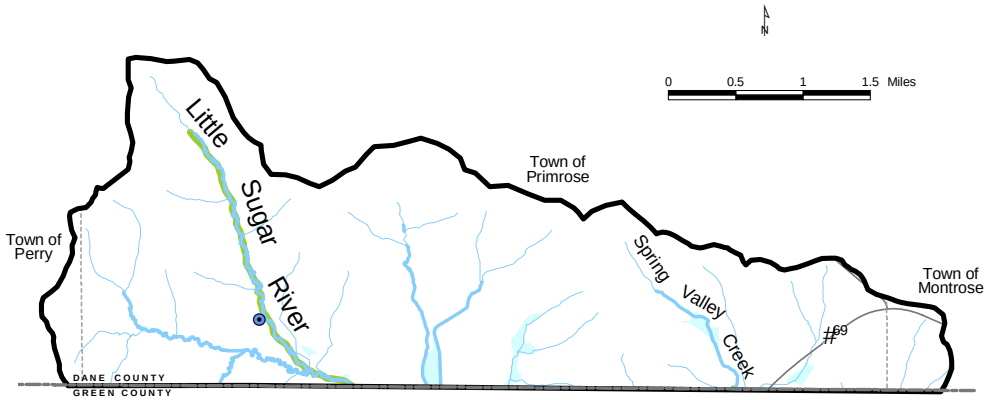
*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

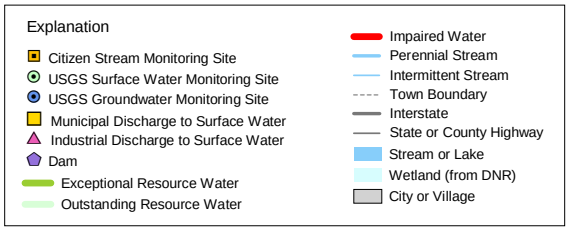
The Little Sugar River watershed lies in north central Green County with a small portion in southern Dane County. Total size is 85,208 acres, with 6,011 acres in Dane County. Agricultural land uses dominate, especially dairying, cash crops, and feeder operations. Municipalities within the Dane County portion of the watershed are portions of the town of Primrose and small parts of the towns of Montrose and Perry. The only municipal wastewater treatment plants that discharge to surface water in the watershed are outside Dane County.

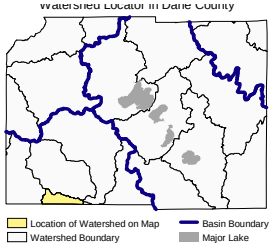
SURFACE WATERS WITHIN DANE COUNTY

- The Little Sugar River originates in southwest Dane County and flows southeast for two miles before entering the Sugar River at the Albany millpond in Green County. The river reaches in Dane County and all the way to New Glarus in Green County is a Class II trout stream and is considered an exceptional resource water. Some larger wetland complexes exist adjacent to the stream, which buffer the stream and provide important functional values such as sediment retention, nutrient capture, minimizing impacts of flooding and bird and animal habitat. Other wetland areas have been drained and put into agricultural production. There are potential sources of polluted runoff, but their impacts on the stream are unevaluated.

Little Sugar River Watershed







EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, streambank protection, wetland restoration, grass buffer strips, and barnyard runoff system. The Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Conservation Reserve Program were used to implement best management practices.

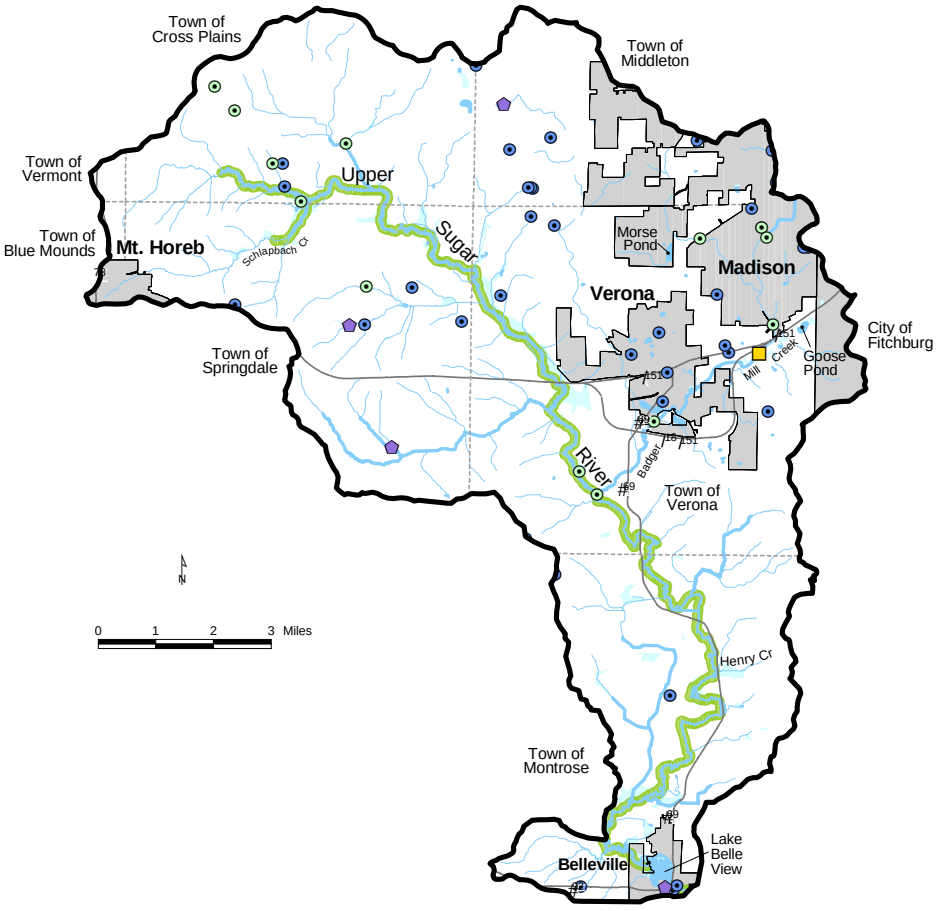
UPPER SUGAR RIVER WATERSHED

Resource Characteristics	in acres
Hydric Soils	4,507
Wetlands	2,270
Agricultural	37,328
Commercial	400
Institutional/Governmental	359
Industrial	509
Open water	446
Other*	9,155
Outdoor recreation	1,695
Residential	5,253
Transitional**	3,955
Woodland	7,209
Size of watershed	66,351
Portion in Dane County	66,310

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

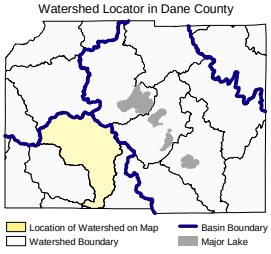
The Upper Sugar River Watershed is primarily in the driftless (unglaciated), southwestern corner of Dane County (66,310 acres out of a total of 66,351 acres) and has over 115 stream miles. Dominant land use is agricultural. Municipalities partially located in the watershed include the Cities of Fitchburg, Madison, and Verona; Towns of Blue Mounds, Cross Plains, Middleton, Montrose, Springdale, Vermont and Verona; and the Villages of Belleville and Mount Horeb. The region is characterized by steep ridges and valleys drained by fast-flowing streams, and generally lacks natural lakes or impoundments. Many cold-water trout streams are in this area, which feature cool water and high dissolved oxygen. Springs and seeps flowing from water-bearing layers of bedrock exposed on hillsides feed most streams. The City of Verona's population increased by 31% from 1990 to 2000 (7052 people up from 5374). The City of Verona transports its raw wastewater flow via a pipeline to the Madison Metropolitan Sewerage District (MMSD) sewage treatment plant. Flows are around 3 million gallons per day (mgd). Highly treated wastewater, at generally the same rate of 3 mgd, is returned via a separate pipeline and discharged into Badger Mill Creek. The General Basin-wide concern section at the beginning of the Upper Sugar River Basin portion of this document describes in more detail this relationship, but basically it is done to return water from the Sugar River Basin, back into that basin. As growth continues in the Verona area, these numbers may increase. MMSD will be looking at the possibility of a regional treatment system for the Grant-Platte-Sugar-Pecatonica Basins. This effort is still in the early stages and if it moves forward, would likely be done under contract with a consultant firm to better define the issues and costs.

Upper Sugar River Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village



Rapid urban development in the watershed, along with the associated increase in stormwater and construction site runoff, threatens water quality, wetlands, and in-stream aquatic habitat. This could lead to increased water quality problems unless appropriate and proper land-use planning measures and ordinances are enacted and enforced. Urban growth has already increased peak stormwater runoff and flows from impervious surfaces. Stormwater planning for this area is critical and should include addressing a reduction in peak runoff rates from existing developed areas as well as keeping runoff rates from future developments at the pre-development runoff rate.

SURFACE WATERS WITHIN DANE COUNTY

- Badger Mill Creek is a five-mile-long tributary to the Sugar River near the City of Verona. The stream begins in a wetland west of Goose Pond between the Cities of Madison and Verona. At one time, water quality in the creek was rated poor due to inadequately treated municipal and industrial wastewater discharged to it. Since 1978, these discharges have been eliminated or diverted. As a result, water quality and in-stream habitat have improved. The stream has been reclassified from supporting a limited forage fishery to supporting a warm-water forage fishery. Trout have been found in the stream below the City of Verona. The creek's drainage area includes much of the southwest side of Madison as well as most of Verona. Increasing urban runoff poses a significant and growing threat to Badger Mill Creek. In the early 1990s, the Verona wastewater treatment plant (WWTP) was at capacity. A facilities planning effort was conducted and the recommended alternative was that the Verona WWTP should be abandoned and the flow diverted to Madison Metropolitan Sewerage District's Nine Springs WWTP for treatment. This would result in the inter-basin transfer of water. There was concern that Badger Mill Creek (and the Sugar River to a lesser extent) would be negatively impacted by this inter-basin transfer—the primary concern was water quantity. Therefore, MMSD agreed to return a volume of highly treated effluent to the basin that was equal to the volume of wastewater removed from the basin. Effluent quality produced at MMSD is actually much better than the quality that had been achieved by the former Verona WWTP. Currently, approximately three million gallons per day of effluent is returned to Badger Mill Creek.

- Henry Creek is a small spring-fed tributary to the Sugar River. Henry Creek flows for one mile before entering the Sugar River near Basco (unincorporated), between Verona and Belleville. The creek likely has good water quality and fair in-stream habitat with the potential to support trout although siltation and low stream flow are problems. The stream runs through a small wetland that is part of the larger Sugar River wetland complex. These wetlands serve as a buffer for the Sugar River, and provide wildlife, fisheries and aesthetic values. Henry Creek was on the 303(d) list due to sedimentation and habitat loss and is now in the process of being removed from the list due to implementing measures which addressed the problems.

- Schlapbach Creek originates near the northeast corner of the Village of Mount Horeb and flows 3.5 miles easterly to the Sugar River. The stream is spring fed and has good water quality based on biotic index ratings. In-stream habitat rates only fair due to sedimentation from intense grazing of stream banks and runoff from croplands and urban areas. These sources of polluted runoff are being controlled, and Schlapbach Creek is classified as an ERW.

Comment [MSOffice2]: status?

- Upper Sugar River runs 30 miles from headwaters of the river northeast of the Village of Mount Horeb to the dam at the Village of Belleville. Water quality in this reach of the river has gradually improved. The stream's classification was recently upgraded to a cold-water community from the headwaters to the Frenchtown Road Bridge above Lake Belle View. Water quality in the river is considered generally good. High fecal coliform levels in the stream are a concern. Urban and agricultural sources of polluted runoff are likely sources of water quality problems. Large wetland complexes exist adjacent to the Sugar River. The Belleville dam and one at Paoli impede fish migration. The entire stretch of the Sugar River within this watershed is classified as exceptional resource water. Runoff from farm fields, streets, and parking lots, construction sites, and barnyards, as well as intense grazing adjacent to the stream and stream bank erosion add sediments and pollutants to the stream and degrade habitat and water quality.

- Lake Belle View is a shallow 100 acre impoundment of the Sugar River with a maximum depth of seven feet. It is found adjacent to the village of Belleville in southern Dane County. The lake suffers from the water quality problems usually associated with impoundments, including sedimentation, turbidity, excessive rooted aquatic plants and attached algae, free floating blue-green algae, water level fluctuations, fish winterkills and rough fish

(carp, etc.). The Village of Belleville has worked with state and federal agencies for several years on a complex lake restoration project that would separate the lake from the Sugar River. The Village has recently hired a consultant to assist the Village's Lake Committee in developing an alternative lake restoration plan.

- Morse Pond is a small, 10 acre, maximum depth of 6 feet shallow pothole pond on the edge of the driftless region west of the City of Madison. The pond is unique in that it has a large bed of American lotus (*Nelumbo lutea*) not found on many other waterbodies in the Grant-Platte-Sugar-Pecatonica basin. Sediment, herbicides and excess nutrients washing into the pond from the nearby University of Wisconsin Golf Course threaten the lotus and water quality of the pond.

- Goose Pond is a 11 acre, 10 foot deep seepage pond system, found just outside of the City of Verona along STH 151. There has been a DNR – Self Help water quality monitoring volunteer taking water clarity measurements since 1986. Summer water clarity measurements, using the Secchi disc, in 1986 and 1987 were in the 4.5 foot to 7 foot deep range. Since that time there has been a continued downward trend in water clarity. Summer readings for 2004 and 2005 ranged from .5 feet to 1.75 feet. This would indicate that the pond has significant algal blooms likely associated with higher phosphorus levels.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Part of the Sugar River Watershed along with the West Branch Sugar River/Mt Vernon Creek, was a PL-566 Watershed Project, sponsored by Dane County and funded by the Soil Conservation Service. Implementation began in 1979, and funding ended in 1989. In the first complete land treatment program funded by PL-566, emphasis was placed on erosion control of cropland, barnyard runoff, and streambank fencing. As a demonstration, the county and WDNR with funding from the Madison Fishing Expo and other conservation organizations, installed fish habitat structures, cattle crossings and streambank fencing along the main stem below Paoli. The area also received statewide priority from the Environmental Quality Incentive Program, to cost share high priority conservation practices such as nutrient management, grassed waterways, clean water diversions for feedlots, and streambank protection. Other programs involved include the Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, Conservation Reserve Program and Wetland Reserve Program.

Groups/Associations

The Upper Sugar River Watershed Association
PO Box 314, Mt Horeb, WI 53572, 608-437-7707
website: www.usrwa.org email: usrwa@usrwa.org

The Upper Sugar River Watershed Association, formed in 2000, serves as a forum for the preservation and enhancement of the watershed resources through an impartial partnership among diverse community interests.

Current issues:

- Habitat Restoration and Maintenance
- Stream Monitoring & Data Collection
- Cooperative River Conservation Planning
- Municipal Stormwater Management Planning
- Household Stormwater Education
- Contractor Education and Construction Site Monitoring
- Ecologically-minded Recreation Planning

Primary accomplishments:

- Remain neutral on land use decisions, while focusing on overall water quality data and best management practices during land use transitions.
- Comprehensive watershed assessment reports with recommendations for watershed protection and river enhancement activities. (Currently available: Upper Sugar River Headwaters and Schlapbach Creek sub-watersheds).
- Coordination of the construction and delivery of fish habitat structures (LUNKERS) with Dane County Land Conservation Division, Deer Creek Sports Club volunteers and Trout Unlimited volunteers, for stream enhancement projects inside and outside of the Upper Sugar River Watershed.
- Stream bank maintenance, such as removal of log jams, invasive species control, and general "brush cutting."
- Volunteer monitoring including the use of "Tidbit" temperature recording technology. This data continues to be shared with local and state agencies and is always available by request.
- Delivery of general watershed awareness and stormwater education materials to individuals, community organizations and classrooms.
- Partnering and support for local governments on stormwater planning. Participation in a statewide stormwater regulation assessment workgroup.
- Assembly and delivery of rain barrels.
- Represent water quality interests at various public hearings and other forums.
- Provide assistance to new watershed groups in Southern Wisconsin.
- Host two education events each year: Annual Meeting & Open House (February) and Family Friendly Member Event (July).

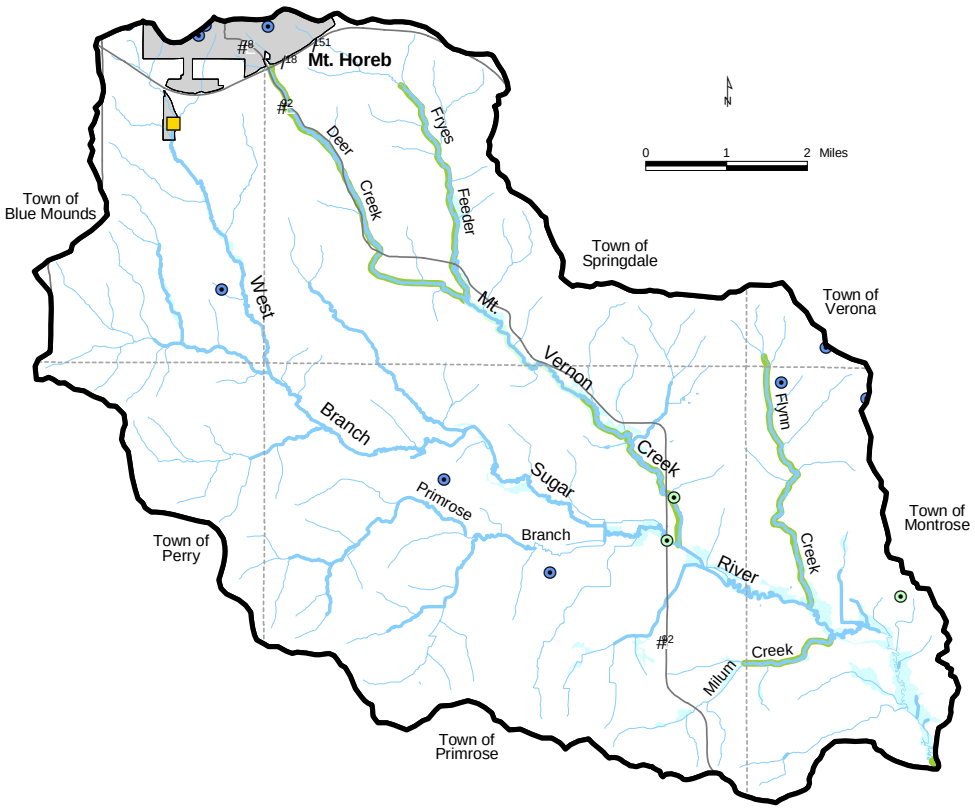
WEST BRANCH SUGAR RIVER AND MOUNT VERNON CREEK WATERSHED

Resource Characteristics	in acres
Hydric Soils	3,462
Wetlands	1,124
Agricultural	26,692
Commercial	25
Institutional/Governmental	61
Industrial	66
Open water	42
Other*	6,425
Outdoor recreation	94
Residential	599
Transitional**	1,607
Woodland	7,140
Size of watershed	42,750
Portion in Dane County	42,750

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The West Branch Sugar River and Mount Vernon Creek Watershed consists of 42,750 acres—all of which are in Dane County. Agriculture is the dominant land use. Part of the Village of Mount Horeb and all of the unincorporated community of Mount Vernon are located in this watershed as are parts of the towns of Blue Mounds, Springdale, Verona, Montrose, Primrose and Perry. This watershed has many trout streams which are described in more detail within this section's individual stream write-ups. Mount Vernon is an unsewered residential area, and failing septic systems may be degrading water quality there. The Village of Mount Horeb wastewater treatment plant is the only permitted facility discharging effluent to surface waters in the watershed.

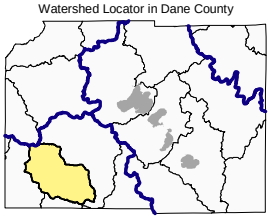
West Branch Sugar River / Mt. Vernon Creek Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Exceptional Resource Water
- Outstanding Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland (from DNR)
- City or Village

Watershed Locator in Dane County



SURFACE WATERS WITHIN DANE COUNTY

- Deer Creek originates on the southwest side of the Village of Mt. Horeb, flows southeast and joins with Frye Feeder to become Mt. Vernon Creek. Although WDNR's 1992 stream classification indicated that it supported a warm water forage fishery, both brook and brown trout were found in the stream. A Targeted Runoff Management (TRM) project was completed in 1999. This TRM project narrowed and stabilized the stream banks. These modifications when coupled with fish habitat structures improved conditions to allow the support of a cold water fishery and classification as an Exceptional Resource Water (ERW) under the state's anti-degradation rules.

- Flynn Creek is a three-mile long tributary to the West Branch Sugar River. Approximately 2.5 miles is classified as Class II trout waters. Water quality ranged from very good to fairly poor based on biotic indices in 1986 and 1987. Stream habitat is rated fair. Runoff from croplands and pastures causes siltation in the stream. Redside dace, a fish on the state's threatened and endangered species list, occur in the stream. Flynn Creek is an ERW stream.

- Fryes Feeder is four miles long and joins with Deer Creek to become Mt. Vernon Creek. Habitat protection and improvement work similar to that done on Deer Creek was also done under the TRM program for Fryes Feeder. The project also included fencing to restrict cattle access in order to protect stream banks. Fryes Feeder is also an ERW stream and about 1.5 miles of its length are now classified as Type II trout water.

- Milum Creek is a two mile long tributary to the West Branch Sugar River. The Creek's current use classification indicates that it supports a warm-water forage fishery but could potentially support a cold-water community. Data from 1986 and 1987 indicate poor in-stream habitat, but water quality ranged from good to very good. Siltation from cropland erosion seems to be the primary problem limiting water quality. Redside dace, a fish on the state's threatened and endangered species list, is found in the stream. Milum Creek is an ERW stream.

- Mount Vernon Creek is classified as a trout stream for its entire seven-mile length. About four of its almost eight miles are Class I trout waters, and the remainder are rated Class II. The Class I portion of the stream has been elevated to outstanding resource water, status. The remainder of the stream is classified as exceptional resource water. Sources of polluted runoff threaten parts of this stream, but the total extent of the threat has not been evaluated. Increased nitrate concentrations have been documented, apparently directly related to agricultural changes in the watershed. The unincorporated community of Mount Vernon is located on the Class I portion of the creek. The community uses individual septic systems to handle its wastewater. Many of these systems are suspected of failing and may be degrading water quality in Mount Vernon Creek.

- West Branch Sugar River: The West Branch of the Sugar River originates near the southwest limits of the Village of Mount Horeb and flows for 18 miles in Dane County. The stream was significantly impacted by stream bank erosion, overgrazed pastures, cattle access, barnyard runoff, poor in-stream habitat, cropland runoff, hydrologic modification, gully erosion and upland sediment delivery. Problems on the stream were addressed for many years and in the 2000-2004 time period more intensive activities were done using TRM projects. The identified sources of the problems were mitigated by fencing, streambank restoration and protection, in-stream habitat improvement and streambank easements for access and protection. Over 1,000 oak habitat structures that duplicate undercut banks were installed on the West Branch of the Sugar River. Most of these structures were built by volunteers. In 2004, the protection and restoration efforts on the West Branch resulted in it being the first river in Wisconsin to be removed from the 303(d) impaired water list.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Part of the Sugar River Watershed along with the Upper Sugar River, was a PL-566 Watershed Project, sponsored by Dane County and funded by the Soil Conservation Service. Implementation began in 1979, and funding ended in 1989. The first complete land treatment program funded by PL-566, emphasis was placed on erosion control of cropland, barnyard runoff and streambank fencing. The Dane County Conservation League, WDNR and the Young Adult Conservation Corps fenced more than seven miles of

streams in the watershed. Previous streambank fencing was done in conjunction with the Madison Public School Summer program. Other programs involved include: Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, Conservation Reserve Program and Wetland Reserve Program.

The former Dane County Land Conservation Department (now part of the Dane County Department of Land and Water Resources) received several Targeted Resource Management Grants from WDNR for projects in this watershed beginning in 1999. Another grant was awarded in 2004 for the Primrose Branch. The projects addressed streambank restoration and habitat enhancement projects on Deer Creek, Fryes Feeder, and 12 contiguous miles of the West Branch Sugar River. Total management practices installed to date include almost 22,000 feet of riprap and edging, nearly 70,000 feet of shaping and seeding, over 1,200 fish habitat structures, almost 70 acres of critical area seeding, and 3,000 feet of fencing. Public access easements exist on all projects. The WDNR has monitored the site since 1999. Based on fish shocking results the trout fishery is recovering and fish are naturally reproducing. Overall, monitoring data show that the stream is cleaning itself naturally and stream temperatures are declining. Habitat for aquatic invertebrates and fish is good. The WDNR is seeing more sensitive fish species, those indicating improving stream water quality and habitat conditions, and fewer species tolerant of poor water quality and warm temperatures. The total project cost to date is about $843,000 and was mostly from state grants. Deer Creek Sport and Conservation Club, Upper Sugar River Watershed Association, Dane County Conservation League and others all provided volunteer help to make these projects a reality.

Groups/Associations
Deer Creek Sport and Conservation Club
8475 Miller Rd, Verona WI, 608-832-6377
website: www.madison.com/communities/deercreeksportsmen
email: Julie Bigler at jlbigler@netzero.net. Please enter DEERCREEK as subject

Deer Creek Sport and Conservation Club is a registered not-for-profit organization with a mission of community service and promotion of hunting, fishing, wildlife preservation and conservation. The club has a very active membership. It is an open membership, and all memberships are "family memberships". We believe that this automatic inclusion of all ages and genders is something unique and important for a club in our area of interest.

Club activities include: Hunter safety courses, Adopt-A-Kid archery leagues, Archery tournaments and trap shoots, local trout stream maintenance, and we have constructed a handicap fishing ramp.

Throughout the winter months we support a weekly senior resident lunch and card playing. Once again this event is open to the general public. This event is held every Tuesday afternoon with no charge to the group.

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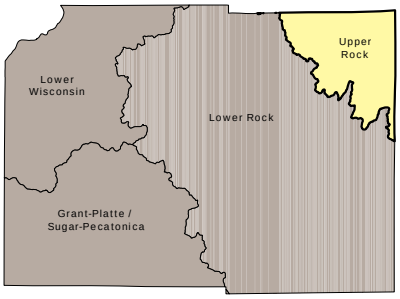
- Assembly and delivery of rain barrels.
- Represent water quality interests at various public hearings and other forums.
- Provide assistance to new watershed groups in Southern Wisconsin.
- Host two education events each year: Annual Meeting & Open House (February) and Family Friendly Member Event (July) .

UPPER ROCK RIVER BASIN

Including:
Lower Crawfish River
Maunesha River
Upper Crawfish River



LOWER ROCK BASIN

Including:
Yahara River and Lake Kegonsa
Badfish Creek
Yahara River and Lake Monona
Yahara River and Lake Mendota
Six Mile and Pheasant Branch Creeks
Lower Koshkonong Creek

The Upper and Lower Rock River Basins encompass 2.4 million acres in ten counties. Dane County occupies 67,181 acres in the Upper Rock River Basin, and 410,042 acres in the Lower Rock River Basin. Glaciers once covered this area, and produced rolling hills, plains, rivers, lakes, marshes, moraines, and drumlins on a relatively flat, spongy terrain.

Early explorers reported that many streams flowed through the area and described them more as long seeping wetlands rather than rivers in a defined channel. This was a result of the deep prairie soils and dense vegetation absorbing rainfall and slowly releasing it to rivers. While most of the basin's large streams and rivers still meander as they have for thousands of years, many smaller streams have been ditched and straightened, changing the hydrology of the basin's rivers substantially.

Over time, many of the streams and rivers were dammed for gristmills or power mills. As settlements and transportation grew, acres of pavement, buildings and other impervious areas increased. Prairies and forests were converted to farmland. Water began running off the land faster, and less soaked in, leading to more flooding, warmer rivers, and decreased groundwater infiltration.

Many waters in the basin are impaired, but all waters have reduced water quality from non-point or point source pollution. Many waterbodies are eutrophic (highly enriched) with high levels of nutrients. This leads to excessive algal growth and poor water clarity. It also leads to beach closings and endangers mollusks, aquatic plants, and waterfowl.

Most private wells in the region draw water from sand and gravel, 20 to several hundred feet beneath the land surface. Most public wells draw water from deeper limestone or sandstone, from wells that are often over 1000 ft deep. Water contamination risk is greater for the shallower wells or wells located in areas of high bedrock or permeable soils.

MMSD provides wastewater treatment to an approximately 170 square mile service area, most of which is located in the Lower Rock River Basin. A small portion of the District's service area is located in the Sugar River Basin. MMSD treats about 41 million gallons per day (MGD) of wastewater. Treated effluent is discharged to two receiving streams. About 38 million gallons of treated effluent is currently diverted

around the Madison Lakes and discharged to Badfish Creek, which is located in the Lower Rock Basin. Diversion of effluent around the Madison Lakes can have significant impacts on water quantity in portions of the Yahara River during low flow conditions. As water quantity concerns within the basin increase, there may be opportunities to beneficially reuse effluent to address these concerns. About three MGD is returned to the Sugar River Basin via discharge to Badger Mill Creek. The decision to return effluent to Badger Mill Creek was made primarily to address water quantity concerns.

Stormwater volumes are increasing in the basin due to urbanization and increasing impervious watershed areas. The increased stormwater volumes contributed to the lakes are increasing the frequency and magnitude of flooding resulting public and private property damage, shoreline erosion, habitat degradation, loss of floating bogs and diminished recreational use of the lakes. One estimate of the property damage from floods in 1993, 1996 and 2000 tallied over $40 million in losses. Studies have begun and mitigation plans prepared to attempt to develop strategies for reducing flooding in the Yahara Lakes.

GENERAL BASIN-WIDE CONCERNS

- Well testing shows various sorts of groundwater contamination are fairly widespread in certain areas. In Dane County, where intensive testing occurs, about 45% of wells test positive for pollution from surface contaminants.

- Of all basin counties, known atrazine contamination is greatest in Dane County, where two-thirds of the county is in atrazine prohibition areas. Refer to http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/atrazine/county-maps/dane/index.jsp which identifies the atrazine prohibition area for Dane County. Other herbicides are increasingly used now.

- In Dane County, about 35% of wells have high nitrate levels, compared to only 13% basin-wide.

- Contamination also can come from leaking underground storage tanks and some on-site spills. Many LUST sites have been cleaned up, but many are still under investigation or remediation.

- Improperly abandoned wells are conduits for contamination to reach groundwater.

- The groundwater table is dropping in some basin areas as groundwater is being extracted faster than it is being recharged. Growth of cities and suburbs means higher water consumption, less infiltration because of pavement and, consequently, less recharge. A Dane County Regional Hydrologic Study was begun in 1992 and completed in 1997. The purpose of the study was to estimate the impact of development on county groundwater. One result of that effort showed that water table levels have declined by as much as 60 feet in some areas beneath the Madison metropolitan area. Lowered groundwater levels have produced declines of groundwater discharge to the Yahara Lakes and tributary streams. This model also showed that the source for Dane County groundwater is infiltration within county boundaries, and that some streams already have been affected and show lower baseflows (minimum amount in dry weather that is supplied by ground water) due to paving, greater pumping, and possibly from more of the rain falling in intense events. Groundwater recharge loss from impervious development has compounded the problem by as much as 20%. As the county's population continues to grow, the impacts to surface water resources are expected to increase due to increased growth and development and additional water withdrawals.

Groups/Associations
Rock River Coalition, Inc.
PO Box 141, Watertown, WI 53094, 920-674-7443
website: www.rockrivercoalition.org email: rriver@excel.net

Mission:
The mission of the Rock River Coalition is to educate and provide opportunities for people of diverse interests to come together to protect and improve the economic, environmental, recreational and cultural resources of the Rock River Basin. The group formed in 1994 and incorporated as a non-profit in 1996.

Top issues include membership development, fundraising, volunteer recruitment, and obtaining resources to implement action plans for several issues, including stormwater, water quality, and recreation.

Accomplishments:
- **Citizen Stream Monitoring Program** trains more than 180 people who measure water quality at 56 locations in the basin.
- **Wetland Monitoring Program**, initiated in 2004, is already a model for citizen-based monitoring in Wisconsin.
- **Rain Garden in Every Community** is a partnership between schools, communities and the RRC resulting in 300 students from eight schools helping design and build 12,050 square feet of rain gardens which infiltrate 1,982,786 gallons of rain water each year.
- **RRC Rural Development Guidelines and Policies Manual** helps many municipalities develop plans to preserve open space and farmland and utilize low impact design for new development.
- **Storm Water Round Tables** are held to help municipalities deal with the complex problem of controlling storm water.
- **Environmental Action Guide** published, providing detailed information on ten projects groups or schools could do to improve the Rock River Basin.

Yahara Lakes Association
PO Box 44578, Madison WI, 53744-4578, 608-848-1450
email: yla@mailbag.com

Yahara Lakes Association, Ltd., formed in the early 1970s, is a non-profit organization of over 700 members dedicated to protecting and representing lake property owners and improving the environment of Lakes Mendota, Monona, Waubesa, Kegonsa and the Yahara watershed.

Current Issues:
- The increasing and sometimes conflicting use of our lakes.
- The need for continual lake maintenance in the face of increased budget constraints.
- Balancing individual member concerns with what is beneficial for all lake property owners.

Accomplishments:
- Purchased a sound level meter for the Dane County Lakes Patrol and provided training for the officers.
- Actively supported the fight against constructing a landfill near the shores of Lake Waubesa.
- Supported research for environmentally safe alternatives for lake weed control.

Lower Crawfish River Watershed

Resource Characteristics	in acres
Hydric Soils	1,861
Wetlands	492
Agricultural	7,111
Commercial	1
Institutional/Governmental	3
Industrial	1
Open water	12
Other*	649
Outdoor recreation	0
Residential	54
Transitional**	230
Woodland	437
Size of watershed	113,778
Portion in Dane County	8,519

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Lower Crawfish River Watershed covers 172 square miles in total. However, most of this watershed is not in Dane County: of the 113,778 total acres, 8,519 are in Dane County. Dominant land use in the watershed is agriculture (70%) with a number of feedlots. Municipalities in the Dane County portion of the watershed are a very small part of the City of Sun Prairie; all of the Village of Marshall; portions of the Towns of Bristol, York, Medina and Sun Prairie; and a very small portion of the Town of Windsor.

SURFACE WATERS WITHIN DANE COUNTY

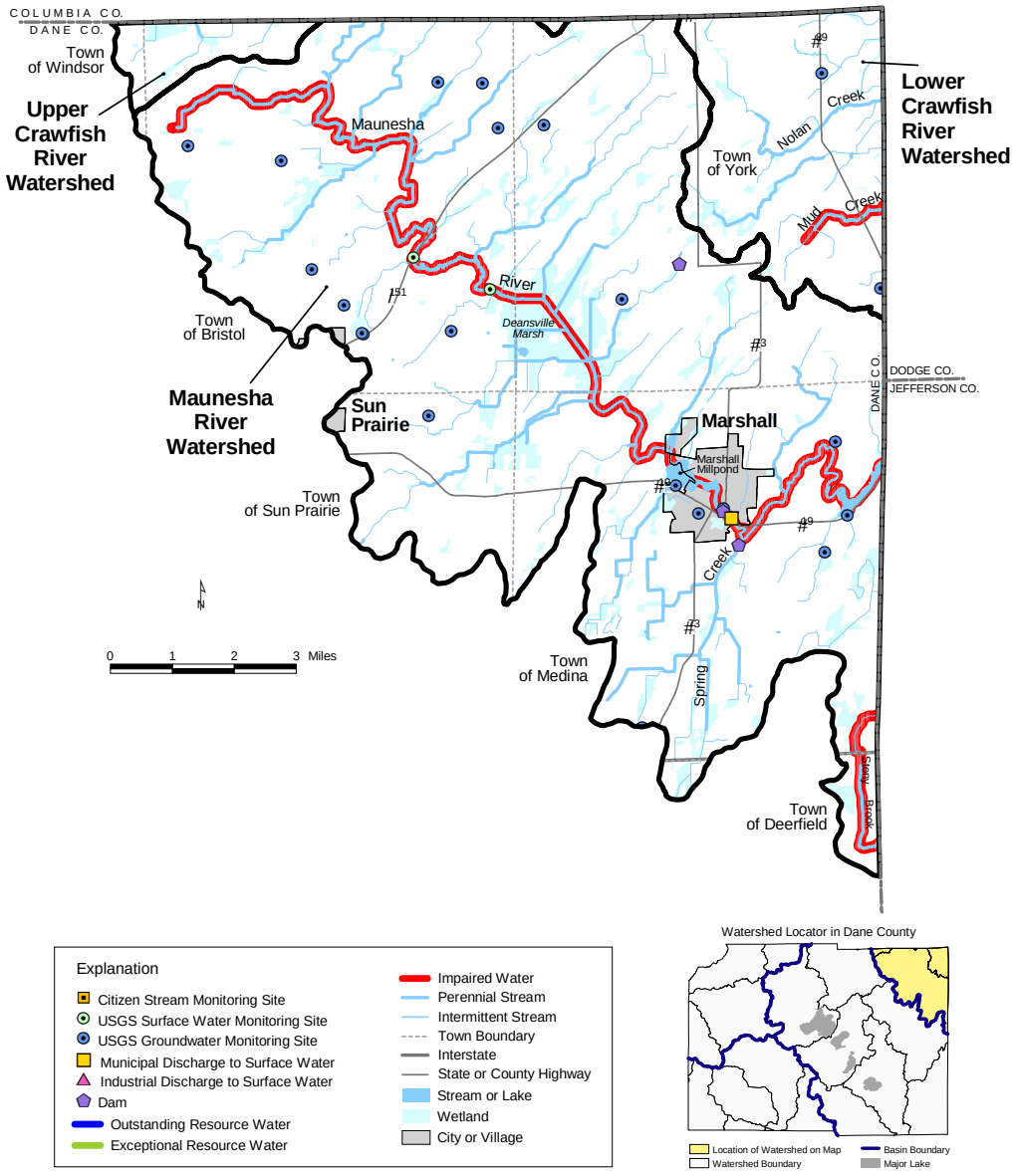
- Mud Creek originates in Dane County, flows northeast into Dodge County, and enters the Crawfish River. Three of Mud Creek's ten miles are in Dane County. The stream is classified as a warm-water forage fishery, but non-point pollution and associated habitat and sedimentation issues keep it from being classified as a warm-water sport fishery.

- Nolan Creek is a 5 mile long stream supporting a forage fish population.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include grass waterways, contour strip cropping, barnyard runoff systems, terraces, diversions, and wetland restoration. The Agricultural Conservation Program, county cost-share program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Wetland Restoration Program were used to implement best management practices.

Lower Crawfish River, Maunesha River, and Upper Crawfish River Watersheds



MAUNESHA RIVER WATERSHED

Resource Characteristics	in acres
Hydric Soils	15,773
Wetlands	5,767
Agricultural	43,046
Corn	19,452
Soybeans	8,834
Commercial	56
Institutional/Governmental	137
Industrial	125
Open water	249
Other*	6,038
Outdoor recreation	69
Residential	1,442
Transitional**	2,270
Woodland	2,673
CREP Acres	153
Perpetual WRP	462
30 year WRP	0
10-year WRP	12
All WRP	474
10-year WHIP	0
5-year WHIP	0
All WHIP	0
Size	80,710
Acres in Dane County	56,126

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Maunesha River Watershed covers 80,710 acres with 56,126 acres in Dane County. Dominant land use is agricultural (70%). Dane County municipalities within the watershed include the Village of Marshall and the Towns of York, Medina, Windsor, Bristol and Sun Prairie. The land is quite level because glaciers flattened the eastern part of Dane County and left many wetlands and low-gradient (sluggish) streams. Most wetlands have been drained for cultivation. Most streams have been ditched and straightened. Of the three dams in the watershed, only one of them is in Dane County, forming Marshall Millpond. Deansville Marsh State Wildlife Area in Dane County is one of two state wildlife areas in the watershed.

The main water quality issues facing this watershed are polluted agricultural runoff and heavy silt loads from farm field erosion.

See page 56 for a map of this watershed, along with the Upper Crawfish River and Lower Crawfish River.

SURFACE WATERS WITHIN DANE COUNTY

- Maunesha River flows 32 miles through three counties (Dane, Dodge, Jefferson), and is classified as a warm-water sport fishery. The river is shallow with a low gradient; ditching has occurred within Deansville marsh, east of Sun Prairie. The river had 'fairly good' water quality based on 1990 data, even though nitrate levels increased between 1976 and 1990, probably from agricultural fertilizers. The river is not meeting its potential use in some places. About 19.5 miles of the river in Dane County is on the impaired list of 303d waters (fishery called very

poor in places). Problems are hydrological modifications (dams, ditching, wetlands drainage), non-point pollution, and cropland erosion. This results in habitat impairment, sedimentation, and nutrient enrichment. Polluted agricultural runoff is the primary concern. The Village of Marshall operates a mechanical wastewater treatment plant that has been upgraded and no longer bypasses treatment before discharge to the Maunesha River.

- Marshall Millpond. This impoundment is 185 acres in size, five feet deep, and experiences problems of high turbidity, sedimentation, and heavy aquatic plant growth.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, barnyard runoff systems, terraces, diversions, and wetland restoration. The Agricultural Conservation Program, county cost-share program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Wetland Restoration Program were used to implement best management practices. A significant wetland restored by the Wetland Reserve Program is adjacent to the Maunesha Creek and the Deansville Marsh. This restored wetland is a result of collaborative efforts by the USDA NRCS, WDOT and Wings Over Wisconsin. The WDOT has established part of the restored wetland as a mitigation bank.

Groups/Associations

Friends of the Maunesha Watershed

Lee Hellenbrand, President, PO Box 94, Marshall, WI 53559, 608-655-4474
email: lhellenbrand@marshall-wi.com

Mission Statement:

To preserve and protect the Maunesha River and its surroundings. To enhance the water quality, fishery, boating safety, education and aesthetic values of the Maunesha River, as a public recreational facility for today and for future generations.

UPPER CRAWFISH RIVER WATERSHED

Resource Characteristics	in acres
Hydric Soils	332
Wetlands	190
Agricultural	1,427
Commercial	0
Institutional/Governmental	0
Industrial	5
Open water	0
Other*	151
Outdoor recreation	0
Residential	29
Transitional**	46
Woodland	24
Size of watershed	103,235
Portion in Dane County	1,686

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Upper Crawfish River Watershed covers 164-square miles or 103,235 acres, of which 1,686 acres are in Dane County. The Crawfish River begins as a small stream in Dane County and flows north out of Dane County toward Columbus. The dominant land use is agriculture (73%) and 18% of the watershed is wetlands.

See page 56 for a map of this watershed, along with the Upper Crawfish River and Lower Crawfish River.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, barnyard runoff systems and terraces. The Agricultural Conservation Program and county cost-share program were used to implement best management practices.

YAHARA RIVER AND LAKE KEGONSA WATERSHED

Resource Characteristics	in acres
Hydric Soils	11,240
Wetlands	6,372
Agricultural	37,449
Commercial	241
Institutional/Governmental	329
Industrial	422
Open water	4,175
Other*	10,356
Outdoor recreation	1,309
Residential	4,927
Transitional**	4,066
Woodland	3,620
Size of watershed	80,917
Portion in Dane County	66,894

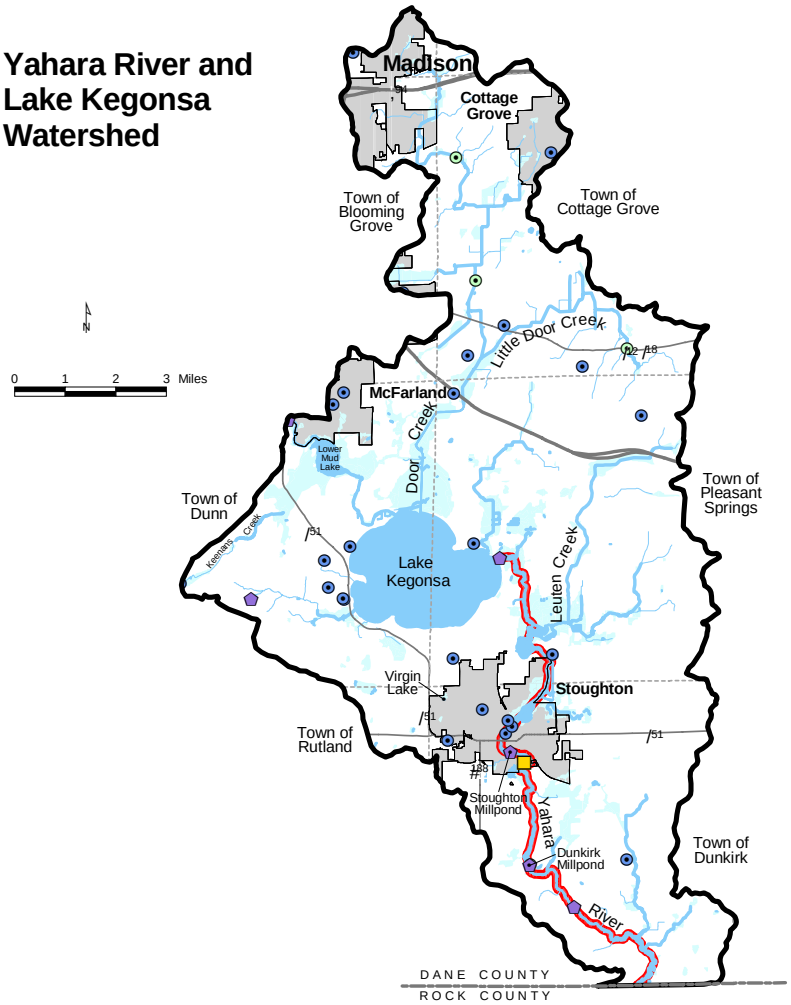
*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Yahara River and Lake Kegonsa Watershed is located from just east of the City of Madison south to where the Yahara River meets the Rock River below the unincorporated community of Indianford in Rock County. This watershed covers 126 square miles, or 80,917 acres, with 66,894 acres in Dane County. The dominant land use is agricultural (81%). Municipalities located within the Dane County portion of watershed are parts of the City of Madison, almost all of the City of Stoughton, parts of the Village of and Town of Cottage Grove; parts of the Towns of Pleasant Springs, Dunn, Dunkirk, Rutland, Blooming Grove, Sun Prairie and Burke along with part of the Village of McFarland.

The Yahara River supports a diverse warm-water sport fishery with about 48 species. Some areas provide rocky gravel substrate and good flow, which creates good spawning area for white bass and walleye. Other common species include northern pike, central stoneroller, common carp, golden, emerald, common and spottail shiner, bluntnose and fathead minnow, creek chub, buffalo, white sucker, black, yellow and brown bullheads, brook silverside, brook stickleback, white bass, pumpkinseed, bluegill, largemouth bass, white/black crappie, Johnny darter; yellow perch, walleye and mottled sculpin.

The 74 miles of stream in the entire watershed include six named and nine unnamed streams, as well as eight lakes (two unnamed) that have a combined surface area of 3,595 sq miles. Extensive wetland systems occur at Door Creek and Lower Mud Lake.

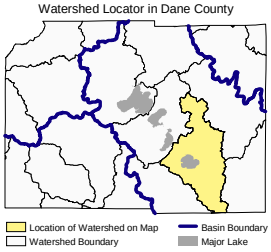
Yahara River and Lake Kegonsa Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village

Watershed Locator in Dane County



Main surface water quality concerns include point and non-point pollution. The area is developing rapidly. For example, the population of Cottage Grove increased by 259% ((4059 up from 1131) from 1990 to 2000. Extensive wetlands losses, largely the result of ditching and draining for farmland, have occurred, resulting in loss of wildlife and fish habitat and degradation of lake and stream water quality.

Population growth in the watershed has resulted in construction of large municipal wells. Pumping groundwater lowers the groundwater table in the area surrounding the well. This lower groundwater table often is more pronounced in areas immediately adjacent to the well, lessening with distance. The impact on the groundwater is referred to as the cone of depression. Dependent on the situation (depth of well and rate of removal, soil type, proximity to surface waters), there may be impact to surface waters if the cone of depression results in reduced groundwater flow into streams or lakes. In addition, urbanization results in more impervious surface, reducing the rate of recharge to groundwater. As an example, predevelopment flow of Door Creek was 7.25 cubic feet per second (cfs) and is now about 5.2 cfs and expected to decline further to 4.3 cfs by 2020.

For non-point pollution, efforts are underway to 1) evaluate and prioritize municipal and industrial sludge and septage land spreading programs for potential impacts to receiving waters of phosphorus and nitrogen; 2) develop priorities and procedures for implementing urban stormwater programs; and 3) identify, assess, and prioritize best management practices to reduce nutrient and sediment loads.

SURFACE WATERS WITHIN DANE COUNTY

- Yahara River is 40 miles long with 23 miles found in the Yahara/Kegonsa watershed. The Yahara River drains over one-third of Dane County. The stretch in Dane County flows from the outlet dam at Lake Waubesa and into Rock County, where it ends at its confluence with the Rock River. The river is slow, moving at a gradient of 3.6 feet/mile. The section of the Yahara south of Lake Kegonsa is on the 303(d) list of impaired waters. Runoff is the main concern. Stormwater runoff carries construction site sediment from areas of development, which is intense in Dane County. Much development is on waterfront property, which is highly susceptible to erosion. Rural runoff contains soil from cropland erosion, pesticides and barnyard/cattle exercise yard runoff. Point sources of pollution in the watershed include railroad yard runoff (oil, sulfur, chloride), non-contact industrial cooling waters, and city swimming pool outflow. Stoughton has the only wastewater treatment plant discharging into the Yahara.

- Door Creek is a 13 mile long tributary to Lake Kegonsa and originates near Cottage Grove. Door Creek is a sluggish stream, and at times suffers from low flows and high temperatures. Up until 1982 Cottage Grove discharged its wastewater into Door Creek. Untreated wastewater is now sent directly to MMSD. Extensive channelization and ditching has occurred on the creek resulting from a still active drainage district formed in 1919. Soil loss and cropland erosion is high resulting in heavy silt deposits on the stream bed. Aquatic habitat is then limited due to covering, turbidity and higher temperatures. Many of the adjacent wetlands have been drained. Estimated wetland loss is from a high of around 5,000 acres in 1919 to around 800 acres today. Low flows in Door Creek limit the fishery to forage species. The Basin Plan does indicate that “Water quality improvements have been documented and the stream should be upgraded to a warm water forage fishery or warm water sport fishery.”

- Keenan Creek is a 4.5 miles long and enters Lower Mud Lake on its southwest shore. The area drained is primarily agricultural in the northern portions, with a 400 acre wetland being found in the south. Forage fish species are present but the potential for a more valuable fishery is low.

- Leuten Creek is a three-mile long, spring-fed tributary to the Yahara below Lake Kegonsa. It is surrounded by agricultural lands, with residual wetlands. Some migrating waterfowl use the area. Leuten Creek has a limited forage fishery, but was managed for trout in the 1950s. The Creek’s water quality is below average for Dane County due to hydrologic modification and cropland erosion.

- Little Door Creek, five miles long, has a limited forage fishery due to low flow, high turbidity, and ditching. This small, ditched stream, begins in the town of Cottage Grove and joins Door Creek south of Highways 12 and 18. Agricultural lands dominate the watershed, with some small wet meadows. Water quality is below average due to non-point pollution and hydrologic modifications. Fish species include brassy minnow, creek chub, white sucker, brook stickleback and Johnny darter.

- Dunkirk Millpond, as of the preparation of this document, is in the Federal Energy Regulatory Commission process for dam licensing. Following completion of the process and approval will have an impoundment area of around 70 acres. The Dunkirk Dam, owned by the Dunkirk Dam Lake District, is found 2.9 miles downstream from the Stoughton Millpond.

- Lake Kegonsa covers 3,209 acres, with a maximum depth of 31 feet and a mean depth of 17 feet. The Yahara River flows into it. Lake Kegonsa is a highly eutrophic, moderately shallow drainage lake that was formed as glacial deposits dammed the Yahara River. It is surrounded primarily by agricultural land. Much of its shoreland is covered by homes, with only 1.5 miles of shoreline in public ownership. Excess sediment; nutrient and chloride loads affect the lake's water quality. Phosphorus levels have declined since the 1970s, but severe blue-green algae blooms still occur in summer and restrict beneficial aquatic plant growth. Modest improvements in water clarity would allow some plants to grow and benefit the fishery. Fish sampling has detected toxic contaminants, but at levels below health standards. High fecal coliform levels in 1987 likely were caused by poor septic systems, which sewer service has since helped reduce this contamination source. The lake has significant undesirable plant growth including Eurasian milfoil and curly leaf pondweed. Waterfowl hunting is good. The excellent and diverse warm-water sport fishery includes bass, bluegill, and yellow perch.

- Lower Mud Lake covers 195 acres and has a maximum depth of 15 feet. The Yahara River flows from Lake Waubesa to this lake. Other water sources include groundwater discharge from small springs and seepages in the surrounding marsh. Heavy nutrient loads from the Yahara River contribute to water quality problems from agricultural and urban runoff. Urbanization in the Village of McFarland is increasing. Aquatic plant growth is excessive. Migrating waterfowl use the lake extensively during the spring.

- Stoughton Millpond is an 82 acre impoundment with a maximum depth of 5 feet. The majority of the millpond falls within the City of Stoughton city limits. Non point pollution and stormwater runoff are major contributors to water quality problems. The water is turbid and alkaline with frequent nuisance algae growth.

- Virgin Lake is ten acres in area and surrounded by shallow marsh. Located in northwestern Stoughton, it was formerly known as Hull Pond. This lake, which DNR calls a natural, navigable lake, does not have a direct surface water connection to the Yahara River. Areas around the lake are being developed into residential housing.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

In the 1980s, emphasis by both Dane County and the former Soil Conservation Service was placed on promoting and cost-sharing no-till methods on cropland in this area of Dane County. This special emphasis area included parts of the Upper Koshkonong Creek Watershed. Traditional conservation practices installed and funded by both county and federal cost-share programs include grass waterways, diversions in cropland, terraces, and wetland restoration. The Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, Conservation Reserve Program, Wetland Reserve Program and Land and Water Resource Management Program were used to implement best management practices.

The restoration and protection of the Door Creek Wetlands is a priority in Dane County. In 2000, the County Board of Supervisors adopted the Door Creek Wetlands Resource Protection Plan. The wetlands lie at the mouth of Door Creek before it empties into Lake Kegonsa. The primary objectives are to restore

the wetlands to provide additional northern pike spawning habitat, improve water quality benefits to Lake Kegonsa, and also provide a trail connection between Fish Camp Launch and Kegonsa State Park on either side.

In 1994, the County Board of Supervisors adopted the Lower Mud Lake Resource Protection Plan. The primary objective is to create a preserve along this section of the Yahara River to protect wetland functions and water quality, provide natural habitat for fish and wildlife, and to preserve archeological and historic sites located there.

There are two EPA Superfund sites found within this watershed. Both of the sites are close to Stoughton, Wisconsin. They are known as the Stoughton City Landfill and Hagen Farm Landfill. Both sites have gone through the evaluation stage and protection measures have been, or are being, implemented. The intent at both sites is to clean-up groundwater contamination or prevent its movement further off-site. Specific information about these sites can be found on the EPA website at:
www.epa.gov/R5Super/npl/wisconsin

Groups/Associations
Friends of Lake Kegonsa Society
Friends of Lake Kegonsa, Inc., Ray Potempa, PO Box 173, Stoughton, WI 53589
website: http://www.kegonsa.org email: rjp3411@aol.com

Friends of Lake Kegonsa Society (FOLKS) was established in 1987 as a non-profit organization whose purpose is to protect, maintain and enhance the environmental and recreational values at Lake Kegonsa and its surroundings; and to represent the collective interests of the members. In other words, **FOLKS** is a volunteer organization interested in preserving our neighborhood.

Overall, we would like to have a positive influence in the development and maintenance of a healthy lake environment, while also protecting the interest of the homeowners from over regulation by the various administrative agencies.

BADFISH CREEK WATERSHED

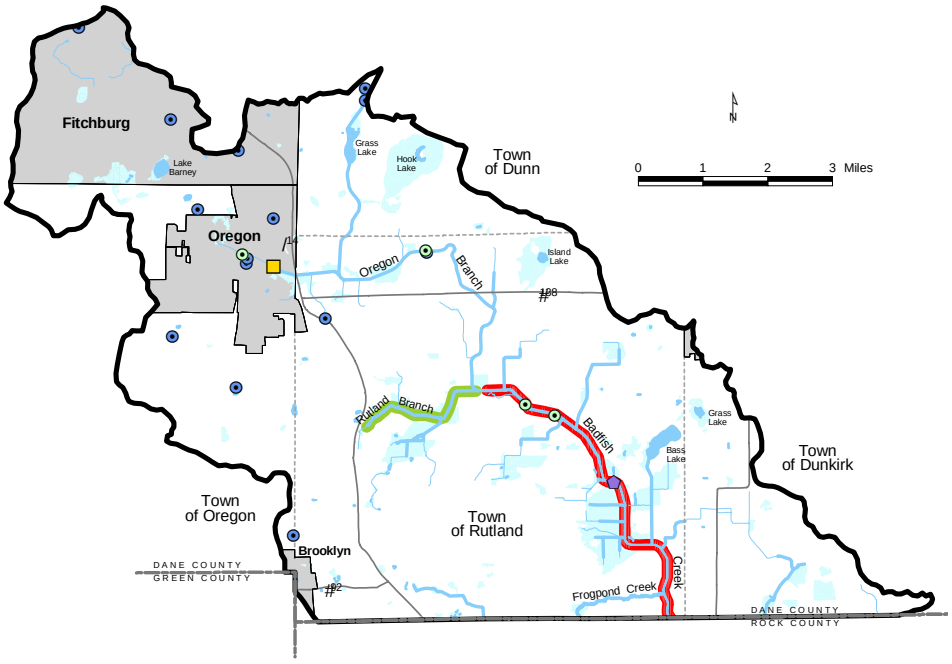
Resource Characteristics	in acres
Hydric Soils	7,351
Wetlands	3,327
Agricultural	29,716
Commercial	118
Institutional/Governmental	170
Industrial	167
Open water	767
Other*	4279
Outdoor recreation	271
Residential	2,424
Transitional**	1,817
Woodland	2,096
Size of watershed	53,933
Portion in Dane County	41,849

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

Located in south central Dane County and northwestern Rock County, the Badfish Creek Watershed is 85.5 square miles or 53,933 acres in size, with 41,849 acres in Dane County. Population growth is changing this area from rural to suburban. Municipalities at least partially in the Dane County portion of the watershed include the City of Fitchburg (20,501 up from 15,648) grew 31% between 1990 and 2000), Village of Oregon grew 66% from 1990 to 2000 (7,514 up from 4,519), Town of Oregon grew 30% from 1990 to 2000 (3,148 up from 2,428), and the Town of Rutland grew 19% from 1990 to 2000 (1,887 up from 1,589), Village of Brooklyn's Dane County portion grew by 24% (502 up from 406), Town of Dunn had virtually no change during the 10 year period (5270 down from 5274) and the Town of Dunkirk was down 3% (2,053 down from 2,121).

The main water quality issues in this watershed are construction site erosion and stormwater management. Wastewater from Madison Metropolitan Sewage District is discharged through an effluent ditch that joins the Oregon Branch of Badfish Creek. MMSD has 130 acres of sludge lagoons in the watershed. These contain low levels of PCBs that are considered not to be moving off site.

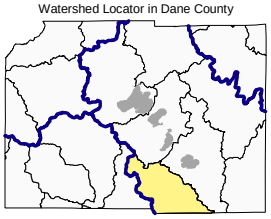
Badfish Creek Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village

Watershed Locator in Dane County



SURFACE WATERS WITHIN DANE COUNTY

- Badfish Creek is formed by the confluence of its Oregon and Rutland branches. Nearly 100% of its six-mile length in Dane County has been ditched, straightened and widened. Improvements in effluent quality coming from MMSD have benefited Badfish Creek. Since 1983 more than 42 fish species have been observed. Brown trout were seen in the stream by 1995. White sucker remains dominant, constituting 40-70% of the samples. In 1995, three new species were recorded: emerald shiner, northern hog sucker and white crappie. Lack of habitat, not water quality, is the limiting factor for increased species richness. The stream has been extensively channelized, and its habitat simplified. Badfish Creek has a PCB advisory for all sizes of Brown trout (no more than one meal a week), and a PCB advisory for all sizes of carp (no more than one meal a month).

- Frog Pond Creek is a small, seven-mile-long, spring-fed creek that flows east along the southern edge of Dane County, dips into Rock County, re-enters Dane and empties into Badfish Creek. Water quality problems are from polluted runoff, ditching and tiling in its headwaters area. The stream is buffered by wetlands in its headwaters. Some rarely seen species of waterfowl nest here. The U.S. Fish and Wildlife Service manages this area for waterfowl production.

- Oregon Branch originates in the Village of Oregon and flows ten miles southeast to its confluence with the Rutland Branch to form Badfish Creek. Prior to the 1920s it was considered marginal trout water but was ditched and straightened. The Oregon waste water treatment plant, which was upgraded in the mid-1990s, discharges to the creek. The village is growing, which will increase stormwater and flood flows into the creek. Oregon Branch is classified as a limited forage fishery.

- Rutland Branch is a two-mile long spring-fed stream that joins with the Oregon Branch to form Badfish Creek. Rutland Branch supports trout, and is considered an exceptional resource water. The stream has a sand bottom with muck in its lower reaches and gravel in the upper reaches. Some channelization has occurred, but the stream seems to be restoring itself. The DNR has acquired some property near the stream in order to protect some large springs found in the streams headwaters.

- Lake Barney and wetlands, located about one quarter mile south of Dane County Highway M, is 27 acres in size, with a maximum depth of six feet. A popular migratory waterfowl and songbird stopover, it once supported whistling swans. However, polluted runoff, grazing and cultivation have degraded the water quality. Development remains the biggest water quality threat. The U.S. Department of Interior owns wetlands west of Lake Barney.

- Bass Lake covers 69 acres with a maximum depth of nine feet. This eutrophic seepage lake has experienced winter fishkill.

- Grass Lake (within Town of Dunn) is 48 acres in size with a maximum depth of nine feet. It is a eutrophic seepage lake, which has experienced winter fishkills.

- Grass Lake (within the Town of Dunkirk) covers ten acres with a maximum depth of five feet. A seepage lake, it has experienced winter fishkills.

- Hook Lake is one of the most important wetlands in Dane County. This northern forest-type bog is unique in southern Wisconsin and is a fairly undisturbed seepage lake. However, development is a threat. The lake has experienced winter fishkills. DNR's Lake Book lists Hook Lake as being 125 acres in size with a maximum depth of 4 feet. The actual size of the area inundated by water varies seasonally, and from year to year based on weather conditions.

- Island Lake covers more than ten acres with a maximum depth of five feet, and is found in a Federal Wildlife Area.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include grass waterways, wetland restoration and grass buffers. The Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Conservation Reserve Program were used to implement best management practices.

City Disposal Corporation Landfill located on about 38 acres of land in the town of Dunn is a EPA Superfund site. This site if found in between Sand Hill Road and Badfish Creek east of Oregon, Wisconsin. The site has gone through the remediation process and has had several corrective measures implemented which are currently being monitored to gauge effectiveness. Specific information about this site can be found at the EPA website: www.epa.gov/R5Super/npl/wisconsin .

Groups/Associations

Friends of Badfish Creek Watershed

website: www.geocities.com/badfish_creek/ email: badfish_creek@yahoo.com

Our mission is to educate ourselves and others about Badfish Creek and its watershed, to work in partnership to improve riparian habitat and water quality, and to encourage land use policies that protect the creek.

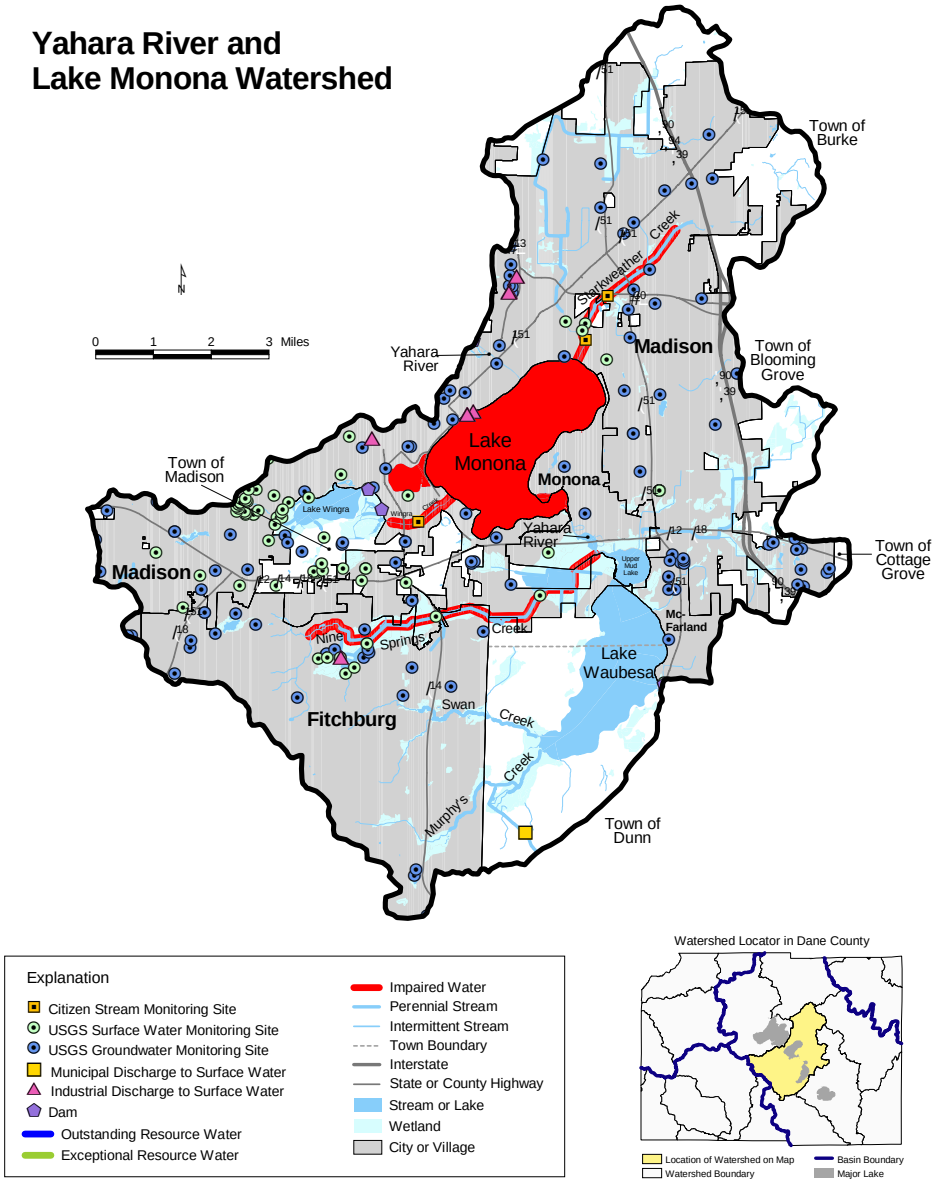
YAHARA RIVER AND LAKE MONONA WATERSHED

Resource Characteristics	in acres
Hydric Soils	11,507
Wetlands	5,636
Agricultural	10,240
Commercial	3,106
Institutional/Governmental	1,687
Industrial	2,456
Open water	6,261
Other*	10,662
Outdoor recreation	3,179
Residential	11,049
Transitional**	10,522
Woodland	2,479
Size of watershed	61,643
Portion in Dane County	61,643

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Yahara River and Lake Monona Watershed is 85 square miles or 61,643 acres in area, all of which is in Dane County. The dominant land use is urban (70%). Municipalities within the watershed are the Cities of Fitchburg, Madison, and Monona; Village of McFarland; and Towns of Blooming Grove, Burke, and Dunn.

The main water quality issue for this watershed is urban runoff of nutrients, solids, organic contaminants, heavy metals, oil, and grease. The watershed has been subjected to heavy development, with the City of Fitchburg and Village of McFarland experiencing rapid growth. Point source discharges in the watershed include the Dane County Regional Airport (to Starkweather Creek); Madison Gas & Electric Company (to Lake Monona); UW-Madison at Charter Street (to Lake Monona via storm sewers); WDNR Nevin Fish Hatchery (to Nine Springs Creek), and Kraft-Oscar Mayer (to the Yahara River).


Yahara River and
Lake Monona Watershed
Town of Burke
Town of Blooming Grove
Town of Cottage Grove
Town of Madison
Town of Dunn
Madison
Monona
Fitchburg
Lake Monona
Lake Waubesa
Lake Wingra
Upper Mud Lake
McFarland
Yahara River
Starkweather Creek
Nine Springs Creek
Swan Creek
Murphy's Creek
0 1 2 3 Miles
N
Explanation
Citizen Stream Monitoring Site
USGS Surface Water Monitoring Site
USGS Groundwater Monitoring Site
Municipal Discharge to Surface Water
Industrial Discharge to Surface Water
Dam
Outstanding Resource Water
Exceptional Resource Water
Impaired Water
Perennial Stream
Intermittent Stream
Town Boundary
Interstate
State or County Highway
Stream or Lake
Wetland
City or Village
Watershed Locator in Dane County
Location of Watershed on Map
Watershed Boundary
Basin Boundary
Major Lake

Groundwater levels have decreased due to urban pumping and an increase in the number of impervious surfaces that limit surface water infiltration. There are also elevated chloride and sodium levels in the surface waters due to road salting.

SURFACE WATERS

- Wingra Creek is a two mile long channelized creek that connects Lake Wingra and Lake Monona. Channelization of the stream began in 1905 and the stream has a flat gradient (2 feet/mile) resulting in stagnant conditions, heavy plant and algae growth and turbid water. Urban runoff, aquatic plant growth and sedimentation affect the creek which does experience fish kills. Road salt increases chloride levels and heavy metals, DDT metabolites and PCBs have been found in stream sediment samples. Wingra Creek is on the 303(d) list for aquatic toxicity. The City of Madison implemented a streambank stabilization project between Fish Hatchery Road and Park Street.

- Murphy's Creek is a three-mile long, spring-fed creek that flows into the southwest area of Lake Waubesa. A large percentage of the area near Murphy's Creek is wetland, much of which are managed by the Nature Conservancy and WDNR. A 1990 appraisal monitoring indicated good water quality and habitat in the lower section of the stream. The potential exists to have good northern pike spawning, but vegetation removal limit this option. Northern pike need flooded mats of grass and sedges to deposit their eggs. The fishery is restricted to forage species.

- Nine Springs Creek is a six-mile-long, warm-water sport fishery that picks up its flow from the springs for which it is named. The creek empties into the Yahara River just above Upper Mud Lake. Portions are ditched and straightened. Nine Springs Creek runs through urban areas and is channeled in places, and subject to non-point runoff. This, plus urban runoff from the Cities of Fitchburg and Madison, have had a devastating effect on water quality and habitat. Detectable levels of mercury were found in low concentrations in Nine Springs Creek sediments near Moorland Road. Residents raised concerns that the possible source of contamination was MMSD sludge lagoons found adjacent to the stream. These lagoons are listed as a Superfund site for PCBs. Further survey work conducted during the Superfund Remedial Investigation phase concluded no sludge related contaminants were migrating to the stream or groundwater.

- Starkweather Creek east and west branch and mainstem is a tributary to Lake Monona at its northern end and drains urban land on the east side of Madison. The creek is a limited forage fishery and on the 303d list. Most of its wetlands have been filled for development. The two-mile-long West Branch of the Creek has been extensively channelized and has very poor water quality. Most point source discharges are now managed, but some former industrial sites still are problems. Contaminated runoff from Dane County Regional Airport includes oil, grease, lead, cadmium, ethylene glycol (a runway deicer), PAHs from parking lots and roofs, zinc, lead, PCBs and DDT metabolites. The airport now has an ethylene glycol collection system. The three-mile-long East Branch of the Creek drains the east side of Madison south of East Washington Avenue, and rural land east of Interstate 90-94. The East Branch is best described as an urban stormwater ditch choked with sediment and aquatic vegetation. Toxins, PCBs, mercury, lead and zinc have been detected in the main stem of the Creek. The mainstem of Starkweather Creek was dredged in 1992/93 removing 15,000 cubic yards of contaminated sediments. These contaminated sediments contribute to the fish consumption advisory for Lake Monona walleye (PCBs and Mercury). Ongoing monitoring continues and includes water quality sampling and fish shocking evaluation.

- Swan Creek is two-miles long with a warm-water forage fishery.

- Yahara River (the two miles that connect lakes Monona and Mendota) has a warm-water sport fishery. Adverse effects are from sediments, debris and nutrients from Madison streets, lots, and yards. Boating pressure is high with boaters going between the lakes via a lock and dam found on Lake Mendota.

- Lake Monona covers 3,274 acres with a maximum depth of 64 feet and a mean depth of 27 feet. This eutrophic drainage lake is subject to urban runoff, nutrient loading and intense boating pressure. The fishery is diverse, with panfish, largemouth bass, northern pike, walleye and muskie. A fish consumption advisory exists for walleye. Eurasian water milfoil and curly leaf pondweed, both non-native species, have invaded the lake in the

past 50 years. Lake monitoring by the University of Wisconsin and DNR have shown that chloride levels have increased slowly since the 1960's and are higher in Lake Monona than Lake Mendota due to salting and runoff from city streets. Lake Monona is on the 303(d) list due to fish consumption advisories related to PCBs and Mercury. Starkweather Creek has been identified as a source for both mercury and PCBs to Lake Monona. In 1987, the highest concentration of PCBs was in sediments at the north shore area of Monona Bay. Mercury was also highest there, and arsenic and copper have also been found. One possible source is a large storm sewer outfall near the sampling site. Monitoring by DNR for PCBs and Mercury will continue indefinitely.

- Lake Waubesa is a drainage lake that covers an area of 2,080 acres and has a 34 foot maximum depth and a 16 foot mean depth. Lake Waubesa is on the 303(d) list due to a fish consumption advisory for mercury. Municipal wastewater was discharged to the lake in the 1940's and 1950's. This direct discharge was changed to Badfish Creek and lake water quality improved, but still is adversely impacted by large nutrient loads from the watershed. The exotic aquatic plant Eurasian water milfoil has invaded Lake Waubesa, as well as all of the other Yahara Lakes. Although the lake has a mercury fish consumption advisory for walleye, sediment sampling has shown a decreasing trend in concentration. Lake Waubesa supports a warmwater fishery comprising muskie, northern pike, walleye, bass and panfish. A cooperative effort to restore 8 acres of wetlands in the south end of the lake was initiated in 1995 in order to improve this kind of habitat.

- Lake Wingra covers 345 acres, has a maximum depth of 21 feet, and is a eutrophic, impounded drainage lake. Its shoreline, fed by seeps and springs, is diverse, offering wet forests, wetlands, including spring fed tamarack stands, deepwater cattails, fen, wet meadow, oak savanna and second growth maples. The lake has been infested by Eurasian water milfoil. Sodium and chloride levels from road salt have increased steadily in recent decades. Chloride levels are almost twice as high as in Lake Monona. Sodium levels are about 75% higher. The adjacent Gardner Marsh was separated some years ago from the creek, and now the marsh is overrun by an invasive cattail hybrid. Intrusion of red osier dogwood into wetland areas and the presence of the exotic plant purple loosestrife are also problems. Lake Wingra's fishery is dominated by a stunted panfish population and an overabundance of carp. Musky have been stocked in an effort to help control panfish populations. The number of musky found in the lake is among the highest in the state. Although the lake is shallow, turbid and fertile numerous groups and individuals have supported efforts to try and improve lake water quality and adjacent habitat. Some of the efforts proposed, or include, rerouting a major storm sewer outfall through HoNeeUm pond, removal of carp, reintroduction of wild rice and reconnecting Gardner Marsh to the lake. Several sedimentation ponds designed to remove sediments transported by storm sewer pipes were constructed within the lakes watershed. Lake Wingra will continue to be the object of many different kinds of activities geared towards improving water quality, protecting or enhancing shore land areas, reducing input of nutrients and sediments and fish management improvement.

- Upper Mud Lake covers 256 acres with an eight-foot maximum depth and four-foot mean depth. This eutrophic drainage lake is surrounded by 1,000 acres of wetlands. The lake was formed by a railroad grade crossing a marsh at the inlet of the Yahara River to Lake Waubesa. Good spawning grounds for northern pike exist, and the lake is a good stopover for migrating waterfowl. Penitto Creek, a perennial stream, contains an aquatic insect called *Gammarus*, indicating groundwater seepage and good water quality.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

The Yahara River and Lake Monona Watershed was selected by the WDNR as a Priority Watershed Project in 1988 ending 10 years later in 1998. A rapidly urbanizing watershed, plan implementation began in 1992 and focused on urban information and education activities. Agricultural sources of sediment were reduced by 48%. Phosphorus contributions from feedlots were reduced purposely by 208 pounds during the watershed project. Because the watershed was changing rapidly, many feedlots were also abandoned.

Two sludge lagoons contaminated with PCBs are found adjacent to the Madison Metropolitan Sewage District (MMSD). These lagoons were included on the EPA Superfund Site list. A soil and fabric cover was constructed, as a part of the site remediation plan to reduce exposure to highly contaminated wastes.

Specific information about this site can be found at the EPA website:
www.epa.gov/R5Super/npl/wisconsin

Groups/Associations

Lake Waubesa Conservation Association
website: www.lakewaubesa.org/
email: jnewob@aol.com or imjude1109@aol.com

With its Autumn 2008 newsletter, the Lake Waubesa Conservation Association (LWCA) assumed a dormant status. LWCA's mission was to provide information and education that encourages preservation and enhancement of resources in and around Lake Waubesa, ensuring a quality environment.

Formed in late 1989, this non-profit organization led a grassroots movement to protect the northwest shore of the lake from a proposed landfill, forming a powerful coalition of governmental agencies, non-profits, community groups and private individuals. In 1994, the Wisconsin Supreme Court defeated the landfill proposal and the property was acquired as part of the new Capital Springs Centennial State Park.

LWCA provided financial support, and its members volunteered in several wetland restorations, benefiting water quality in Lake Waubesa. The association was also actively involved in Dane County's "Take a Stake in the Lakes" activities, and the creation of the Yahara Water Trail Guide.

Friends of Lake Wingra
c/o Edgewood College, 1000 Edgewood College Dr., Madison, WI 53711, 608-663-6921
website: http://lakewingra.org email: info@lakewingra.org,

The Friends of Lake Wingra, formed in 1998, promote a healthy Lake Wingra through an active watershed community.

Current issues:

- Excess nutrients, sediments, and associated pollutants from surface runoff and storm sewers.
- Reduced spring flows and groundwater levels.
- Degraded wetland and aquatic habitats.
- Invasions of non-native plant and animal species.
- Murky, unpleasant water, especially during summer algal blooms.
- Swimming beach closings due to high bacterial counts.

Primary accomplishments:

- Annual Wingra Watershed Community Fair, Windows on Wingra, a series of smaller seasonal events.
- Designed and facilitated Partner Meetings to coordinate the activities of multiple agencies and groups with direct or indirect influence over the lake.
- Completed management plans for stormwater, invasive plants and animals, and resident stewardship.

- Produced The Wingra Water Trail, a guide to the natural features along the shores of Madison's Lake Wingra.
- Hosted or co-hosted rain garden workshops and supported demonstration rain gardens at Edgewood College.
- Partnered with City of Madison Department of Public Health in support of EMPACT project aimed at improving swimming safety and public beaches.
- Established and maintain four kiosks in are parks to inform the public about watershed issues.
- In partnership with Dane County and the City of Madison, acquired DNR Lake Management Protection grand funding for a rain garden street and shoreline habitat restoration.

Friends of Monona Bay
Jeffrey Swiggum, 833 W. Lakeside St., Madison, WI 53715, 608-257-0049
website: http://www.mononabay.org email: info@mononabay.org

Friends of Monona Bay is a resident watershed group working to improve the health and enjoyment of Monona Bay through monitoring, education, stewardship and advocacy.

Friends of Monona Bay:

- organizes shoreline cleanups
- monitors water quality through the DNR's Self-Help Citizen Lake Monitoring program
- hosts informational meetings and panel discussions
- sponsors Bay Days, a community-building event
- supports legislation to promote healthy lakes
- promotes lake-friendly practices for residential, commercial, and public properties throughout the watershed.

Mostly located in downtown Madison and on the UW campus, the majority of the 1260-acre watershed is impervious surface. Polluted runoff from streets, parking lots, buildings, and construction sites drain into Monona Bay, degrading water quality and adding sediment to an already shallow body of water. In addition to runoff, the Bay also has problems with invasive lake weeds, algae, floating trash (mostly carried in from storm sewers) and occasionally commercial spills.

Friends of Starkweather Creek Watershed
P.O. Box 8442, Madison, WI 53708-8442
website: www.madison.com/communities/starkweather/library/index.php
email: admin@starkweatherfriends.org

The Friends of Starkweather Creek, formed in 2002, work for a healthy urban stream to benefit the community through stewardship, education and advocacy.

Current issues: development pressures, infill development goals, large neighborhood outreach to disparate groups within watershed, water quality testing, green space/trails linkages - Starkweather

Resolution, lack of infiltration, promoting rain gardens, infiltration principles build into design element as major component, trying to identify areas of peak infiltration and areas of peak potential for wetlands restoration / open space preservation within watershed.

Primary accomplishments:

- Helped defeat Sam's Club proposal for seven acres of parking lot surrounding one of remaining springs on creek.
- Established winter and summer solstice festivals.
- Starkweather Resolution, which requested the City of Madison to support a number of initiatives aimed at restoring the biological integrity of Starkweather Creek and promoting recreational opportunities on surrounding lands, passed through City Council.
- Outreach and working relationship begun to neighborhoods within watershed (Worthington Park Community Gardens Initiative, Ridgewood Neighborhood Planning and evaluation assistance/cooperation).

Friends of the Yahara River Parkway
Margaret Bergamini, 454 N Few St., Madison WI 53703-1736

website: http://www.madison.com/communities/foyrp/about.php email: margamini@tds.net

The Yahara River Parkway, connecting Lake Monona to Tenney Park and Lake Mendota, was originally purchased by the community with small individual donations to provide a pleasant natural escape for all. The Parkway, originally designed by landscape architect O.C. Simonds, has been designated a National Historic Place.

Mission Statement:

We are dedicated to long-term stewardship and advocacy for the Yahara River Parkway between Lake Monona and Lake Mendota.

Our Vision

The Parkway will be:

- a stunningly beautiful landscape that is an asset to the community.
- restored in the spirit of O.C. Simonds' historic landscape plan.
- a healthy watershed and wetlands environment supporting a variety of native plants and wildlife.
- designed to encourage interaction of members of the community with nature and each other, through the use of walkways, bikeways, boatways and links to other key urban open spaces.
- actively used as an educational resource for all in the community, especially by the neighborhood schools.
- used as a setting for visual art and cultural events which enhance the landscape and the vitality of the neighborhood.

Yahara River and Lake Mendota Watershed

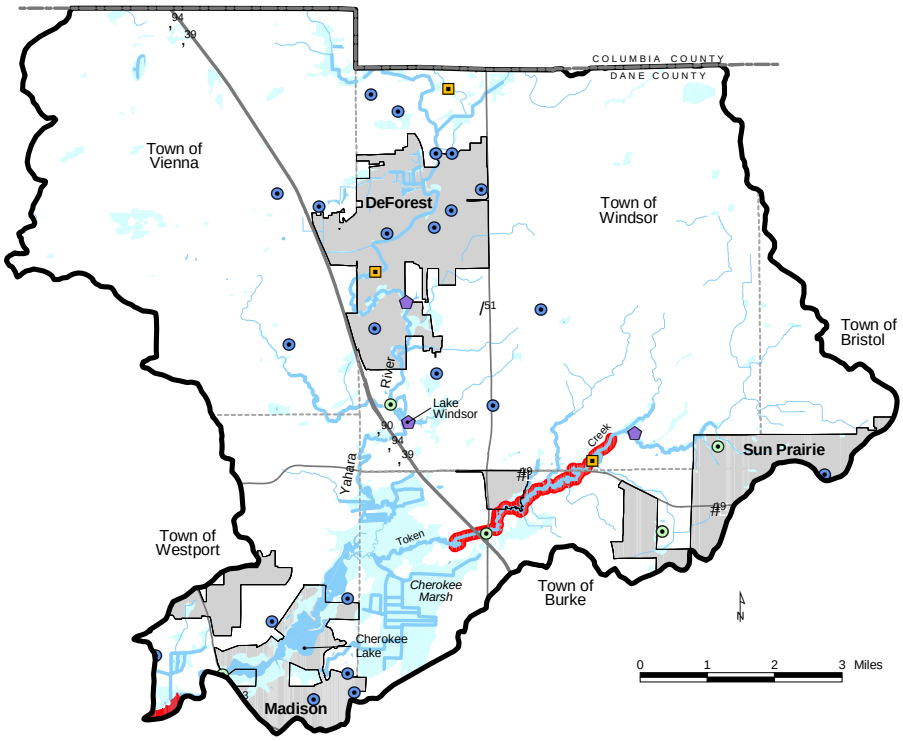
Resource Characteristics	in acres
Hydric Soils	8,012
Wetlands	4,884
Agricultural	35,066
Commercial	338
Institutional/Governmental	312
Industrial	979
Open water	688
Other*	6,533
Outdoor recreation	1,306
Residential	4,260
Transitional**	3,456
Woodland	1,457
Size of watershed	72,094
Portion in Dane County	54,415

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Yahara River and Lake Mendota Watershed covers 115 square miles or 72,094 acres in total with 54,415 acres in Dane County. Agricultural land uses dominate the watershed (72%), with the rest a mix of suburban and urban. The Village of DeForest is entirely within the watershed. Other municipalities partially in the watershed are the Towns of Windsor, Vienna, Westport and Burke, the north side of the City of Madison and a portion of the City of Sun Prairie. Large portions of the watershed's wetlands have been filled or drained for development since settlement.

The major water quality issue for this watershed is increased urban development.

Yahara River and Lake Mendota Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
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- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
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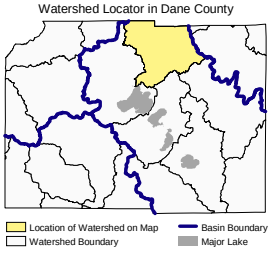


SURFACE WATERS WITHIN DANE COUNTY

- Token Creek, a spring-fed, 10-mile-long, Class III trout stream, is a primary tributary to the Yahara River. The land through which it passes is 73% agricultural, which contributes sediments and nutrients. A major dam once created a 44-acre millpond here. When the dam failed in 1992, the pond became a shallow to deep-water marsh. Two significant springs and many seeps have since been found. Biologists believe that preserving them is essential to maintaining the existing brown trout fishery and establishing a brook trout fishery. In partnership with the Town of Windsor, Dane County, local conservation groups, and residents, WDNR purchased 69 acres of the Token Creek millpond area. The dam was breached shortly after purchase and finally removed in 1995. The management goal is to incorporate stream improvement modifications which will create improved habitat for trout.

- Yahara River originates in marshy areas of Columbia County and meanders for 20 miles through extensively farmed land to its outlet to the more than 2,000 acre Cherokee Marsh. Wetlands along this stretch have been extensively drained and small feeder streams have been straightened. This has resulted in large sediment and nutrient loads and loss of valuable fish habitat. Heavy fertilizer use, poor animal waste management practices, and silage holding problems have adversely affected water quality. A report by the Dane County Regional Plan Commission identifies the Yahara River as carrying the largest total mass of sediments to Lake Mendota of all five of its tributaries.

- Cherokee Lake is a 57-acre eutrophic drainage lake, with a maximum depth of 20 feet.

- Cherokee Marsh is the last major wetland in the watershed and it is more than 2,000 acres in size.

- Lake Windsor is a 10-acre eutrophic lake with a maximum depth of six feet. The lake was created for residential recreational development by the construction of an earthen dam in 1969, which was repaired in 1989.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Selected by the WDNR as Priority Watershed project in 1993, plan implementation began in 1998 and is ending in December 2008. The watershed plan includes management objectives for both rural and urban areas. Emphasis is on erosion control and resulting sediment delivery from both agriculture and urban sources along with a high emphasis on nutrient management of animal waste.

Groups/Associations

Token Creek Watershed Association
Scott Woody, PO Box 366, Windsor WI 53598, 608-516-2337
website: http://www.tokencreek.org email: swoody@facstaff.wisc.edu

Token Creek Watershed Association (TCWA) is a resident-driven effort formed in March 1997 to seek collaborative ways of preserving and/or improving watershed conditions so that involved residents can proudly pass on the stewardship of the area to their children and grandchildren.

The TCWA recognizes that the Token Creek Watershed is a special place to live. The watershed comprises a 27 square mile area of Dane County landscape whose waters drain into Token Creek. The watershed basin lies between Sun Prairie and DeForest and drains snowmelt and rainfall into Cherokee Marsh and eventually Lake Mendota. Although situated just north of the most rapidly growing metropolitan area in Wisconsin, the watershed is still dominated by the rolling green hills of local farms and flows into the largest wetland in Dane County, Cherokee Marsh. Token Creek itself originates from

some of the most productive springs in Southern Wisconsin and provides more base flow to Lake Mendota than any of the lake's other tributaries.

Issues, Accomplishments and Goals

- To address concerns regarding potential changes to the creek and surrounding land due to tremendous growth to the watershed.
- Forum created in 1997 to agree upon strategies for care and protection of the scenic, recreational and environmental qualities of the area.
- To Recognize past trends and a share an understanding of present trends.
- To envision a watershed that will benefit future generations.

The Friends of Cherokee Marsh and Upper Yahara Watershed
website: www.cherokeemarsh.org email: info@cherokeemarsh.org

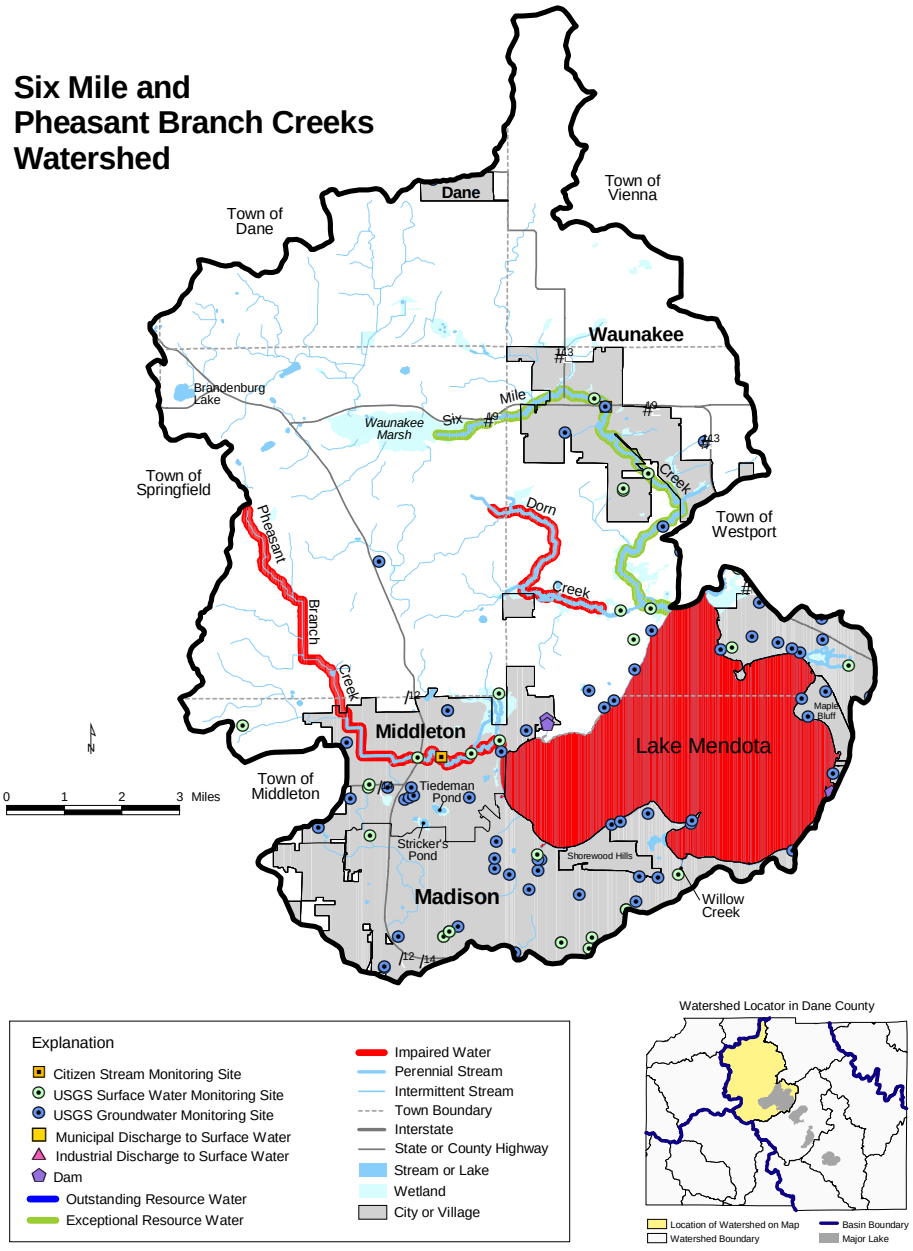
The Friends of Cherokee Marsh and Upper Yahara Watershed formed in 2006 to appreciate, protect, and help restore the special natural features of this unique ecological treasure.

Six Mile and Pheasant Branch Creeks Watershed

Resource Characteristics	in acres
Hydric Soils	6,613
Wetlands	2,936
Agricultural	38,635
Commercial	1784
Institutional/Governmental	1,248
Industrial	916
Open water	10,128
Other*	6,252
Outdoor recreation	2,422
Residential	8,414
Transitional**	5,030
Woodland	1,680
Size of watershed	76,513
Portion in Dane County	76,513

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Six Mile and Pheasant Branch Creek Watershed covers 85 square miles, or over 54,000 acres, all of which are in Dane County. Land use is 52% agricultural and 13% urban. Municipalities located at least partially within the watershed include: the cities of Madison and Middleton; towns of Springfield, Dane, Middleton, Vienna and Westport and the Villages of Dane, Shorewood Hills, Waunakee and Maple Bluff. This watershed was one of the first projects selected in the DNR Priority Watershed Projects (1981-1990). It was again selected as a priority as a part of the Lake Mendota Priority Watershed Project from 1993 through 2008. Focus of the current priority watershed project is to control polluted run-off, restore and protect wetlands and minimize the impact from urban and agricultural run-off of sediments and nutrients. These sources of pollutants continue to impact water quality in Lake Mendota, which in turn impacts the other Yahara chain of lakes.


Six Mile and
Pheasant Branch Creeks
Watershed
Dane
Town of
Dane
Town of
Vienna
Waunakee
Brandenburg
Lake
Waunakee
Marsh
Six
Mile
Creek
Town of
Springfield
Pheasant
Branch
Creek
Dorn
Creek
Town of
Westport
Middleton
Lake Mendota
Maple
Bluff
Town of
Middleton
Tiedeman
Pond
Stricker's
Pond
Shorewood Hills
Madison
Willow
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0 1 2 3 Miles
Explanation
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Town Boundary
Interstate
State or County Highway
Stream or Lake
Wetland
City or Village
Watershed Locator in Dane County
Location of Watershed on Map
Watershed Boundary
Basin Boundary
Major Lake

SURFACE WATERS

- Lake Mendota, the largest of the Yahara Lakes at 9,842 acres, is three times larger than Lake Monona. Maximum depth is 82 feet and mean depth is 42 feet. Fifty percent of its original wetlands have been filled. Agricultural runoff is a larger source of phosphorus to this lake because its drainage area is so large. Lake Mendota is on the 303(d) impaired waters list due to a fish consumption advisory for PCBs. There have been a number of structural and nonstructural nutrient and sediment. reduction/retention projects. Lake Mendota provides a warm-water sports fishery with walleye, perch, panfish, bass, northern pike and muskellunge. The lake is used heavily for recreation. There is an existing facility on the UW campus (Charter Street heating and cooling facility) which withdraws water from Lake Mendota for use in cooling towers, boiler make-up, non-contact cooling water and chilled water make up. A new West Campus Cogeneration Facility (owned jointly by MG&E and the University) which will reach final build out by 2012 also uses Lake Mendota water. Overall there will be a net loss of water to the basin, even though options are being employed to minimize this impact. Impacts are not anticipated to be adversely negative.

- Six Mile Creek, which is 12 miles long, has good water quality and supports a limited forage fishery west of Highway 113, a diverse forage and sport fishery from Highway 113 to Lake Mendota, and abundant spawning areas. Six Mile Creek is an exceptional resource water. This watershed includes the rapidly urbanizing Village of Waunakee. Pollutants from agricultural land and construction site erosion, as well as habitat loss are problems. In 1991, the Stokely Canning Company had an accident with its land spreading of canning waste that caused a fish kill in Six Mile Creek. This made for three fish kills in a two-year period. There was also a fish kill in 2001, thought to be related to high chlorine levels from the flushing of a new water main.

- Pheasant Branch Creek is seven miles long and drains 23 square miles of west central Dane County, including the west side of the Cities of Madison and Middleton. There are two forks. The South Fork is an intermittent stream flowing north from its headwaters found near Mineral Point Road. The North Fork drainage area is predominantly agricultural and has been extensively channelized and straightened. The North Fork meets the South Fork at the western edge of the city of Middleton near Highway 12. In large storm events, downstream of the confluence, the stream carries high flow and sediment volume. Growth in the watershed is resulting in the need for many stream related protection measures including, detention ponds, sedimentation basins, nutrient filters all of which have been constructed since 1995. As development continues in the watershed, measures to protect the creek and reduce sediment/nutrient flow will increase in importance. Pheasant Creek does flow into a large wetland complex referred to as the Pheasant Branch Creek Resource Protection Area. Dane County purchased 160 acres in 1994 to help protect the creek and wetlands. Pheasant Branch Creek upstream of the marsh consists of tolerant fish species and below the marsh supports a diverse warm water fishery.

- Dorn Creek is six miles long. The creek starts in the Town of Springfield and flows southeast through agricultural lands and Governor Nelson State Park. It drains lands that are 78% agricultural and 16% wetland. Wetlands provide wildlife habitat and spawning for northern pike. The stream supports a warm-water forage fishery. Two intolerant fish species have been found in the stream: northern redbelly dace and pearl dace.

- Willow Creek is a local name for a stormwater ditch emptying into Lake Mendota at University Bay. A large portion of the near west side of Madison, much of Shorewood Hills and a part of the west side of the University of Wisconsin campus drain into Willow Creek. Materials and contaminants from streets and parking lots, lawns and construction site runoff has deposited in University Bay, resulting in a delta of sediments found at the mouth of Willow Creek. Methods to deal with this sediment deposit are being coordinated between agencies and the University. In addition, measures such as daily cleanup and diverting animal waste to the sanitary sewer system are being used to prevent future manure runoff to Willow Creek.

- Tiedeman's Pond (15 acres in size), Stricker's Pond (15 acres), Esser's Pond (15 acres) and Graber's Pond (13 acres). All four of these ponds are found in rapidly developing areas of Madison and Middleton. Water quality in each is affected by polluted runoff. All experience nuisance algae and plant growth in the summer. All freeze over in winter except Graber's, which receives industrial non-contact cooling water.

- Brandenburg Lake is a 38-acre seepage lake, with a mean depth of six feet and maximum depth of nine feet. The surrounding area is 60% agricultural, 14% grassland, 8% wetland and 4% residential. In the early 1980s, this lake was used for walleye rearing, but agricultural pesticide runoff resulted in poor walleye survival.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Originally a Priority Watershed project designated by the WDNR in 1981 and completed in 1990, emphasis was placed on erosion control in agricultural areas and stormwater management in urban communities. Again, from 1993 to 2008 the entire watershed was included in the Yahara Mendota Priority Watershed Project. Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, streambank protection, barnyard runoff systems, nutrient management and wetland restoration. The Agricultural Conservation Program, county cost-share program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Conservation Reserve Program were used to implement best management practices.

Groups/Associations

Friends of Kettle Ponds

Gurdip Brar, 608-831-4075, email: gurdipbrar@hotmail.com

The Friends of Kettle Ponds is a non-profit (501-(c)-3) group, formed in 2002 with the goal of preserving and improving the quality of the kettle ponds and surrounding wetlands in Middleton and western Madison. We work closely with the DNR. As a non-profit partner to the City we can obtain environmental grants and provide volunteer labor to enable the City to implement improvements it could not otherwise afford.

Some of the FOKP opportunities include:

- The City's Arbor Day activities
- Presentations at area schools
- Neighborhood birding hikes
- Preservation of indigenous plant and animal life through planting and maintaining flowers, shrubs and trees trash

Friends of Pheasant Branch

PO Box 628242, Middleton WI 53562-8242, 608-831-8823
website: www.pheasantbranch.org email: office@pheasantbranch.org

The Friends of Pheasant Branch organized in June 1995 to "restore, preserve and promote the value of conservancy lands and other habitats in the Pheasant Branch watershed for today and tomorrow."

They face the challenge of preserving and restoring wetlands, prairie and savanna in a 540-acre conservancy in an urban area. They are working to reduce the amount of polluted runoff flowing to Pheasant Branch Creek, and to protect the recharge area for a major spring complex in the Pheasant Branch Conservancy. They seek to educate local residents of all ages about the ecology of the Pheasant Branch Conservancy and promote an understanding of its value to the community.

Primary accomplishments:

- organizing thousands of hours of volunteer effort to restore Pheasant Branch Conservancy lands.

- leading efforts to cause the City of Middleton to route a sewer interceptor around, rather than through, the Conservancy.
- obtaining grants and donations to purchase more than 50 acres of land to add to the Conservancy.
- developing ecological education programs for the community including “Kids for the Earth” for area school children.
- successfully promoting the purchase, by the City of Middleton, of Morey Airport and adjacent farmland to protect the Conservancy’s springs’ recharge area.

Friends of Stricker’s Pond

Jean Nordlund, 1030 Middleton St, Madison, WI 53717, 608-836-5898
email: jnordlund@tds.net

Friends of Stricker's Pond work to preserve the wetlands and wildlife area of Stricker's Pond, a conservancy located on the border of Madison and Middleton.

LOWER KOSHKONONG CREEK WATERSHED

Resource Characteristics	in acres
Hydric Soils	9,740
Wetlands	4,285
Agricultural	32,265
Commercial	96
Institutional/Governmental	191
Industrial	176
Open water	752
Other*	4,872
Outdoor recreation	552
Residential	1,023
Transitional**	1,983
Woodland	3,368
Size of watershed	170,111
Portion in Dane County	45,350

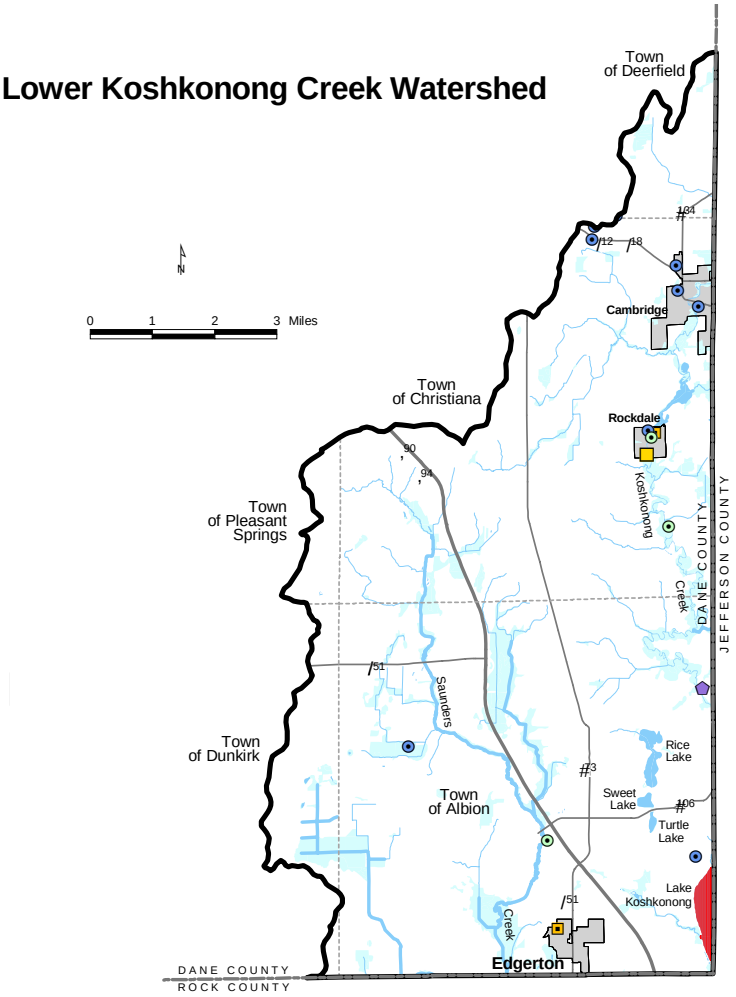
*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

The Lower Koshkonong Creek Watershed covers 220 square miles, or 140,800 acres in Dane County. Two-thirds of it is divided evenly between Rock and Dane Counties (over 45,000 acres), 26% is in Jefferson County and 5% in Walworth County. The watershed includes Lake Koshkonong and the Rock River from Fort Atkinson to the Indianford Dam. The dominant land use is agricultural. Dane County municipalities located in the watershed are the City of Edgerton, Village of Cambridge and Rockdale, and the Towns of Albion, Christiana, Deerfield, Dunkirk, and Pleasant Springs.

The majority of the watershed's wetlands have been drained for agriculture, but there are still significant wetland areas remaining. The Rockdale Dam was removed in 2001 eliminating the only impoundment on Koshkonong Creek. High soil loss rates, coupled with wetland drainage and stream channel straightening, are the likely main water quality problems for the Towns of Albion and Christiana. Currently, there is little stream information monitoring to prove this. The potential for urban pollution is high from rapidly growing areas. For example, the Village of Cambridge's population growth rate from 1990 to 2000 is 6.1% (Dane County portion increased from 883 people to 1,014).

No Class I or II trout streams or small-mouth bass exist in this watershed. Stream water quality is fair.

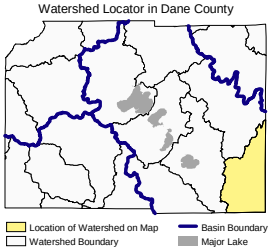
Lower Koshkonong Creek Watershed



Explanation

- Citizen Stream Monitoring Site
- USGS Surface Water Monitoring Site
- USGS Groundwater Monitoring Site
- Municipal Discharge to Surface Water
- Industrial Discharge to Surface Water
- Dam
- Outstanding Resource Water
- Exceptional Resource Water
- Impaired Water
- Perennial Stream
- Intermittent Stream
- Town Boundary
- Interstate
- State or County Highway
- Stream or Lake
- Wetland
- City or Village

Watershed Locator in Dane County



SURFACE WATERS WITHIN DANE COUNTY

- Lower Koshkonong Creek still flows in its natural channel most of its 32 mile length in Dane County. This low-gradient meandering stream forms a small delta at its mouth on Lake Koshkonong. The only impoundment on the creek (Rockdale Dam) was removed in June 2001. Restoration of stream banks and re-vegetation is in progress. Lower Koshkonong Creek is classified as warm-water sport fishery, but is impaired by agricultural runoff. There are highly intensive agricultural operations including a muck farm in its drainage area. Bullhead and rough fish dominate with some northern pike in the lower reaches.

- Saunders Creek originates in southeast Dane County and flows ten miles south to join the Rock River near Edgerton. The creek meanders, draining 36 miles of mostly agricultural lands. Parts are ditched with wetlands drained. Saunders Creek is affected by lots of non-point agricultural runoff. Some remnant wet meadows provide limited northern pike spawning grounds.

- Lake Koshkonong, a large shallow impoundment of the Rock River, exhibits the same water quality problems as other dammed rivers but on a larger scale. The lake was originally a shallow, deep-water marsh. The Indianford Dam in Rock County, built in 1850 and rebuilt in 1917, raised the lake two more feet. Lake Koshkonong is a major stop for migratory waterfowl. Lake Koshkonong is 10,460 acres, with a maximum depth of seven feet. Only approximately two miles of shoreline are within Dane County. The lake receives tremendous sediment from the Rock River, Koshkonong Creek and other tributaries in addition to urban sources. Shoreland erosion is also severe. There used to be trouble with failing septic systems, but a sanitary district in one area of the lake has mitigated this. There is a large commercial carp fishery, but carp are still a big problem, destroying habitat and increasing the lake's turbidity. This results in algae blooms that can result in fishkills. The shallow depth combined with the width of the lake's surface water space results in serious shoreline erosion in storms. All these things adversely affect fisheries. Lake Koshkonong is on the 303(d) list due to eutrophication, degraded habitat, sedimentation and periodic low dissolved oxygen levels. The Indianford Dam, located in Rock County has recently been repaired.

- Rice Lake is a 170 acre eutrophic lake with 8 foot maximum depth. Septic systems are, or may be, causing water quality problems with the lake.

- Sweet Lake is 12 acres in area, with a maximum depth of four feet. Similar to Rice Lake, septic systems may also be causing problems here. Existing water quality is poor to very poor, but the lake has low sensitivity to increased phosphorus loading.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, barnyard runoff systems, terraces, diversions and wetland restoration. Cost share programs included were Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, Conservation Reserve Program. With recent removal of the Rockdale Dam, future considerations may be made to explore opportunities in fish habitat improvement

Groups/Associations

Friends of Cam-Rock Park

Janice Redford, Secretary/Treasurer, 2062 Hillside Rd, Cambridge, WI 53523 Phone (day) 608-345-4944, (evening) 608-423-4438, email: JRedford@matcmadison.edu

Friends of Cam-Rock Park is a non-profit organization founded in 2000. It is membership based and works for the protection and preservation of the natural areas in and around the Mississippi River basin, the Rock River Watershed and Koshkonong Creek.

Mission
To provide public education, land stewardship, and protection and preservation of the cultural, historical, recreational, and natural resources of Cam-Rock Park and the surrounding area. To promote the sustainable protection and management of Koshkonong Creek watershed, Cam-Rock Park, and the human and natural communities in the vicinity of Cam-Rock Park.

Projects
- a very active water quality monitoring team, prairie restorations
- large rain garden along Koshkonong Creek at Rockdale.

UPPER KOSHKONONG CREEK WATERSHED

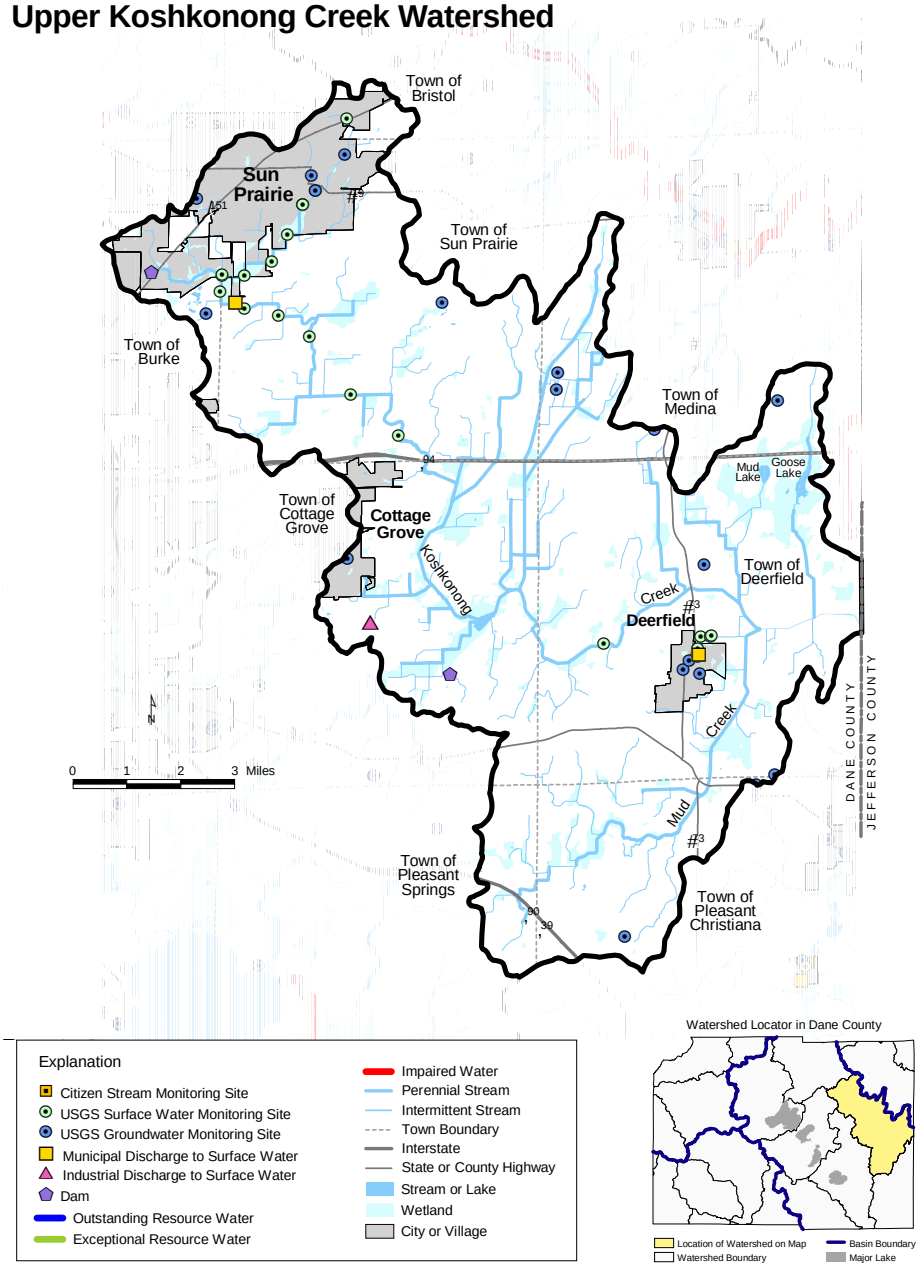
Resource Characteristics	in acres
Hydric Soils	20,449
Wetlands	6,190
Agricultural	44,243
Commercial	328
Institutional/Governmental	321
Industrial	709
Open water	294
Other*	7,902
Outdoor recreation	467
Residential	3,899
Transitional**	3,788
Woodland	4,408
Size of watershed	66,773
Portion in Dane County	66,362

*includes codes 97, 98, 999 (other open or vacant land; vacant, unused land; under construction)
**includes transportation, communication and utilities

This watershed drains 107 square miles, or 66,773 acres, of which 66,362 acres are in Dane County. The dominant land use is agricultural with large amounts of the original wetlands drained for this purpose. Dane County municipalities at least partially within the watershed include the City of Sun Prairie and the Villages of Cottage Grove and Deerfield, and the Towns of Sun Prairie, Deerfield, Medina, Christiana, Pleasant Springs, Burke, Bristol and Cottage Grove.

Main water quality issues are wetland losses, stream ditching and widespread use of field tiles. These allow high nutrient and sediment loads to reach surface waters in streams. Rapid growth in Sun Prairie and Deerfield, leading to high soil loss rates are also a problem. Drainage from the northwest portion of Sun Prairie roughly parallel to USH 151 flows west to Token Creek, a half-mile away. The remainder discharges to Koshkonong Creek. In the Village of Deerfield in 1992, a public well had to be replaced after Volatile Organic Compounds (VOCs) were found in it. Rapid growth is also potentially problematic. The City of Sun Prairie grew by 33% during the period from 1990 to 2000 (20,369 up from 15,352), the Town of Sun Prairie by 26% (2,308 up from 1,839), the Town of Deerfield by 24% (1,470 up from 1,184) the Village of Deerfield by 22% (1,971 up from 1,617) and the Village of Cottage Grove by 259% (4,059 up from 1,131).

Upper Koshkonong Creek Watershed



SURFACE WATERS WITHIN DANE COUNTY

- Upper Koshkonong Creek starts at the east end of Sun Prairie flows for 29 miles into Lake Koshkonong. Most of its headwaters are ditched and straightened. Non-point pollution is a significant issue. This stream has sluggish flows, debris-clogged stretches and poor water quality. Most of its tributaries are also ditched and clogged. Above Highway T, the stream supports a few forage fish species. From the headwaters to Highway T, it is classified as supporting limited aquatic life, affected by low stream flows and the Sun Prairie wastewater treatment plant which discharges here. Below Highway T it is classified as a warm-water sport fishery, though it is severely affected by non-point and former point source discharges.

- Mud Creek is a nine-mile-long ditched tributary to Koshkonong Creek. The creek historically wove through interconnected wetlands, most since drained for agriculture. Agricultural non-point runoff is the number one threat. There is lots of silt from fields. The stream is now classified as warm-water forage fishery.

- Mud Lake is a 34 acre seepage lake with an 8 foot maximum and 3 foot average depth. The lake is located within Goose Lake Wildlife Area. The lake has poor to very poor water quality with a low sensitivity to increased phosphorus loading.

- Goose Lake is a 61 acre seepage lake with a 2 foot maximum depth. The lake is located within Goose Lake Wildlife Area.

EXAMPLES OF WATERSHED PROTECTION ACTIVITIES

In the 1980s, emphasis by both Dane County and the former Soil Conservation Service was placed on promoting and cost-sharing no-till on cropland. This special emphasis area also included parts of the Yahara River and Lake Kegonsa Watershed. Traditional conservation practices installed and funded by both county and federal cost-share programs include: grass waterways, contour strip cropping, barnyard runoff systems, terraces, diversions and wetland restoration. The Agricultural Conservation Program, county cost-share program, Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program and Conservation Reserve Program were used to implement best management practices.

COUNTY-WIDE NATURAL RESOURCE GROUPS

Badger Fly Fishers
www.badgerflyfishers.org

Capitol Water Trails
3806 Atwood Avenue, Madison WI 53714-2805, 608-223-0995
website: www.capitolwatertrails.org email: cwt@capitolwatertrails.org

Dane County Conservation League
PO Box 44039, Madison WI 53744
website: www.dccl.org email: dccl@dccl.org

Four Lakes Group Sierra Club
Sierra Club, c/o Jennifer Persha, 347-5954
website: www.4lakes.org email: contactus@4lakes.org

Greater Madison Healthy Lawn Team

Greater Madison Healthy Lawn Team, PO Box 45606, Madison WI 53744-5606
website: www.healthylawnteam.org/home.htm email: GMHLT@healthylawnteam.org

Madison Fishing Expo
Chuck Rolfsmeyer, PO Box 14044, Madison WI 53708-0044, 608-245-1040
website: www.madfishexpo.com email: info@madfishexpo.com

Muskies, Inc.—Capital City Chapter
PO Box 8862, Madison WI 53708
website: www.capitalcitymuskiesinc.org email: info@capitalcitymuskiesinc.org

Natural Heritage Land Trust (NHLT)
303 S Paterson St, Ste 6, Madison, WI 53703, 608-258-9797, fax: 608-258-8184
website: www.nhlt.org email: jim@nhlt.org

Natural Heritage Land Trust is dedicated to the conservation of natural areas and open space in Dane and the surrounding counties. NHLT was formed in 1983 and works to promote land and water conservation in the community by protecting land through conservation easements or acquisition; educating and empowering residents in protecting their local natural area; working with willing landowners to protect significant elements of our landscape; and developing conservation partnerships and community networks.

NHLT has purchased 140 acres on the shores of Fish Lake in northern Dane County (now Lussier County Park); placed 25-acre conservation easement on Bolz Conservancy Park; purchased 238 acres for the Nine Springs E-way and Farmland Preservation;, collaborated with residents and other stakeholders in long-term Token Creek Watershed project (resulting in creation of the Token Creek Watershed Association);

and partnered with the Town of Dunn to protect over 1,000 acres of agricultural lands under conservation easements.

NHLT has prioritized and planned work in the Black Earth Creek Watershed, Token Creek Watershed and Upper Sugar River Watershed. They have a formed a partnership with the Town of Verona Open Space and Parks Commission to further their vision for an Upper Sugar River valley that includes protected lands and limited development and creating a scenic river corridor.

Mission: To connect people with local environmental issues/politics in order to increase our awareness of how to reduce our impact on the land.

Issues/Concerns: The ecological health of Madison and Dane County, and reducing pesticides in the City of Madison.

River Alliance of Wisconsin
306 E Wilson St, Ste 2W, Madison, WI 53703, 608-257-2424; fax: 608-260-9799
website: www.wisconsinrivers.org email: info@wisconsinrivers.org

Mission: To protect, enhance, and restore Wisconsin's rivers and watersheds for their ecological, recreational, aesthetic and cultural values.

Publications: Wisconsin Rivers newsletter, CANOE e-newsletter; Dam Removal, Polluted Runoff, and Watershed Advocate Toolkits; Using the Clean Water Act to Protect Wisconsin's Waters; and a loan library.

Projects: Programs include river restoration through selective small dam removal, providing training and technical support to local river and watershed organizations and advocating for river-friendly policies (e.g. nonpoint source pollution, groundwater, mining).

Southern Wisconsin Chapter of Trout Unlimited (SWTU)
Dave Sanders, President, 608-843-7125
website: www.swtu.org

Formed in the 60s, SWTU seeks to preserve, protect, and restore cold-water fisheries.

Current issues:
- polluted runoff
- thermal pollution
- changes in land use
- eroded stream channels

Primary accomplishments:
- working with partners to restore trout fisheries in streams like Deer Creek and Frye's Feeder
- providing access to streams through the use of easements and outright purchases
- protection of area streams from development that may threaten their long-term health

Yahara Fishing Club

PO Box 3271, Madison, WI 53704, 608-455-2067
website: www.yaharafishingclub.org

Dedicated to:

- **Fishing activities**: local and statewide fishing outings, all species, open water and ice fishing, kids fishing, fishing opportunities for people with disabilities, fishing contest, all levels of skill included.
- **Conservation:** habitat improvement and protection projects such as: shoreline or stream bank improvement, fish cribs, improving lake access, Take a Stake in the Lakes, creating and improving boat launches and fishing piers for the disabled and political action on issues that impact fishing.
- **Social activities:** monthly meetings, fish fries, kids fishing days, Madison Fishing Expo, angler fellowship.
- **Education:** monthly guest speakers, special fishing seminars, fishing reports, habitat and aquatic science reports, monthly newsletter, fishing videos, scholarships.

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- Wisconsin Trout Streams, DNR Publ. 6-3600[80])

GLOSSARY

303(d) list Section 303(d) of the federal Clean Water Act requires Wisconsin to prepare a list of all surface waters in the state for which beneficial uses of the water, such as for drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants. This 303(d) list is periodically updated to include additional waters recommended for inclusion, or those that can be removed from the list due to correction of the impairment. The complete Wisconsin list should be available at http://dnr.wi.gov/org/water/wm/wqs/303d/303d.html

Agricultural nonpoint pollution Runoff from improperly managed agricultural lands. This happens when water runs over land or through the ground, picks up pollutants and deposits them into surface waters or introduces them to groundwater.

Algae blooms Algae are microscopic, single-celled plants that live in lakes and rivers. Most species of algae or phytoplankton are not harmful and serve as the energy producers at the base of the food web, which supports other life. Occasionally, the algae grow very fast or *bloom* often because of an overabundance of phosphorous, and accumulate into dense, visible patches near the surface of the water. A small number of species produce potent neurotoxins that can be transferred when ingested by other organisms, including fish, birds, dogs and humans, with the potential to kill.

Basin A group of watersheds that ultimately drain to a major river or lake.

Biotic index data Used to help assess water quality based on the macroinvertebrates present in streams. Streams are rated as having poor, fair, good or excellent water quality with the biotic index. http://watermonitoring.uwex.edu/wav/monitoring/biotic.html

BMPs (Best Management Practices) Proven techniques and methods used to help conserve and protect soil and water resources.

Class I Class I streams are high-quality streams where populations are sustained by natural reproduction. (See *Wisconsin Trout Streams*, DNR Publ. 6-3600[80])

Class II Class II streams have some natural reproduction but need stocking to maintain a desirable fishery. (See *Wisconsin Trout Streams*, DNR Publ. 6-3600[80])

Class III Class III streams sustain no natural reproduction and require annual stocking of legal-size fish for sport fishing. (See *Wisconsin Trout Streams*, DNR Publ. 6-3600[80])

Cold-Water Community (CWC) Cold-water community includes surface waters capable of supporting a community of cold-water fish and other aquatic life or serving as a spawning area for cold-water fish species.

Enforcement Standard (ES) Enforcement Standard (see NR140 for specific groundwater quality standards for substances of public health concern).

Exceptional Resource Waters (ERW) Exceptional resource waters have excellent water quality and valued fisheries but may already receive wastewater discharges or may receive future discharges necessary to correct environmental or public health problems. ERWs exhibit the same high quality

resource values as outstanding waters, but may be impacted by point source pollution or have the potential for future discharge from a small sewer community.

Geomorphology The study of landforms, including their origin and evolution, and the processes that shape them.

Highly Erodible Land (HEL) Land that has the potential for an excessive annual rate of erosion in relation to the soil loss tolerance level as determined by the Secretary through application of factors from the USLE and WEQ. The HEL is an erodibility index (EI) of a particular soil. Only the 'RKLS' factors from the USLE are used to determine the EI. The result must exceed an erodibility index of '16', or greater. Generally for Dane county soils, any soil with a 'C' (>6%) slope, or greater meets the criteria. Soil loss and soil loss tolerance are not calculated. The HEL category only applies to USDA programs, where a producer must comply with a conservation plan to be eligible for USDA program benefits. The Food Security Act of 1985, as amended, requires that all persons that produce agriculture commodities must protect all cropland classified as being highly erodible from excessive erosion. The provisions have been amended in the 1990, 1996, and 2002 Farm Bills. The purpose of these provisions is to remove the incentive to produce annually tilled agricultural commodity crops on HEL unless the HEL cropland is protected from excessive soil erosion.

Hydric soil A soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic (without oxygen) conditions in the upper part.

Hydrologic modification Is the alteration of streamflow by human activities. Examples can include channel modifications and dams.

Hypereutrophic an extreme eutrophic condition, where algal scums dominate in summer, where there are few macrophytes, no oxygen in the hyperlimnion (lower cooler area of a lake during summer thermal stratification), and fishkills are possible in summer and under winter ice.

Impaired waters are those found on a list required of DNR to maintain by Section 303(d) of the federal Clean Water Act. This list includes all surface waters in the state for which beneficial uses of the water, such as for drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants.

Landforms Geomorphological units categorized by characteristics such as elevation, slope, orientation, stratification, rock exposure and soil type.

Limited Aquatic Life (LAL) Limited Aquatic Life (marginal surface waters) includes surface waters severely limited because of very low or intermittent flow and naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of aquatic life.

Limited Forage Fishery (LFF) Limited forage fishery (intermediate surface water) includes surface waters of limited capacity because of low flow, naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of tolerant forage fish and aquatic life.

LUNKERS Little Underwater Neighborhood Keepers Encompassing Rheotactic Salmonids, or fish habitat boxes.

LUST sites Leaking underground storage tank sites.

Outstanding Resource Waters (ORW) Outstanding resource waters have excellent water quality, high recreational and aesthetic value, high quality fishing and is free from point source or nonpoint source

pollution. They do not receive wastewater discharges. Point source discharges will not be allowed in the future unless the quality of such discharges meets or exceeds the quality of the receiving water. In Dane County, this classification includes the highest quality Class I trout streams.

Preventive Action Limit (PAL) See NR140 for specific groundwater quality standards for substances of public health concern.

Polycyclic Aromatic Hydrocarbons (PAHs) A standard product of combustion from automobiles and airplanes.

Sedimentation deposition of eroded soils at a site different from the one where the erosion occurred.

Surface Water Resources of Dane County (SWRDC) A publication by the Wisconsin Department of Natural Resources printed in 1985.

"T" The soil loss tolerance (T) value represents the average annual rate of soil erosion that could occur without causing a decline in long term productivity.

Total developed area Includes property having residential, commercial or industrial activities.

USDA NRCS United States Department of Agriculture Natural Resources Conservation Service.

VOCs Volatile Organic Compounds, typically gasoline and other organic solvents.

Warm-water Forage Fishery (WWFF) Warm-water forage fish communities include surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

Warm-Water Sport Fishery Warm-water sport fish communities include surface waters capable of supporting an abundant diverse community of warm-water sport and forage fish and other aquatic life or serving as a spawning area for warm-water fish.

Watershed The area of land that catches rain and snow and drains into a marsh, stream, river, lake and groundwater.

Winterkill Aquatic vegetation produces dissolved oxygen through the respiration process of photosynthesis, just as land-based plants release oxygen into the air. Fish then process oxygen with their gills. During some winters, the snow cover on a lake or river is sufficient enough to block sunlight long enough to kill aquatic vegetation. Without aquatic plants, the water no longer contains enough dissolved oxygen for fish to survive. Without oxygen, fish suffocate, just as they do when removed from the water.

WDNR Wisconsin Department of Natural Resources.

WDOT Wisconsin Department of Transportation.

PROGRAMS

Agricultural Conservation Program (ACP) A Farm Service Agency cost-sharing program for conservation practice application.

County cost-share program General fund dollars provided by Dane County to implement BMPs; primary focus on no-till, streambank protection and barnyard runoff.

Conservation Reserve Enhancement Program (CREP) An amendment to the CRP where producers remove land from agricultural production and plant native grasses, trees and other vegetation to improve water and soil quality and wildlife habitat.

Conservation Reserve Program (CRP) A provision of the federal Farm Bill that takes eligible cropland out of production and puts it into grass or tree cover for 10-15 years.

Environmental Quality Incentive Program (EQIP) Federal program to provide technical and cost-sharing assistance to landowners for water quality protection.

Wetland Restoration Program (WRP) A provision of the federal Farm Bill that compensates landowners for voluntarily restoring and protecting wetlands on their property.

Wildlife Habitat Incentive Program (WHIP) Federal program to help improve wildlife habitat on private lands.