

Watchable Wildlife Sites with public access. The Audubon Society has created a series of trails that the public can use to view the diverse species of wildlife. Large populations of waterfowl use this area during the fall and spring migrations. It is not unusual to see 200-250 tundra swans, thousands of Canada geese and a wide variety of duck species during these periods.

The main concern of this subwatershed is to continue to enhance and maintain this valuable shallow lake and wetland system. A cooperative effort is planned among the Audubon Society, Del Monte, Dane and Columbia County LCDs, WWA and the DNR to create a 4.5-acre wetland restoration site as a part of the watershed project.

Nonpoint Source Pollutants

- The Goose Lake Subwatershed contains 12 animal lots which generate 321 pounds of phosphorus annually. All 12 of these lots are internally drained.
- The upland sediment delivery in the Goose Lake Subwatershed is 519 tons, annually, but since it is internally drained, it does not effect the total watershed loading to Lake Mendota.

Water Resource Objectives

The following objectives are recommended for the surface water resources of the Goose Lake Subwatershed:

1. Protect and enhance wildlife and aquatic habitat by:
 - Reducing sediment loading by a **medium** level to Goose Lake and the wetlands that surround it.
 - Reducing phosphorus and nutrient loading by a **medium** level to Goose Lake and the adjacent wetlands.
 - Enhancing existing wetlands and creating new wetland areas to help filter runoff and to provide habitat for wildlife.
 - Reducing soil loss from wind erosion and runoff events by using conservation tillage practices.
2. Protect and maintain grassed waterways and upland grasslands by:
 - Reseeding waterways to aid in the reduction of sediment-nutrient transport.
 - Stabilizing upland areas by restoring with prairie plant species, which would reduce soil loss and provide excellent wildlife habitat, such as Tall Grass Prairie.

Yahara River & Cherokee Marsh Subwatersheds (YR & CM)

Description

The Yahara River originates in south central Columbia County and flows southward toward the village of DeForest where it continues through the village of Windsor and then enters the

Cherokee wetland complex before discharging into Lake Mendota. A tributary to the Rock River, the Yahara River is 127 miles long (20 miles of which is within the Lake Mendota Watershed including the headwaters of the Cherokee Marsh.). The Yahara River Subwatershed drains an area of 56.5 square miles, or 24.3% of the total Lake Mendota watershed area. The river's total drainage area of 466 square miles or about one third of Dane County. Most of this is agricultural land, followed by residential, transportation and wetlands. This river connects the county's four largest lakes, often called the "Yahara lakes:" Mendota, Monona, Waubesa and Kegonsa.

Cherokee Marsh is also a subwatershed. It is 16.1 square miles or 6.9% of the total Lake Mendota watershed. The DNR, Dane County, and the City of Madison own parcels of land surrounding Cherokee Lake and its wetlands that offer public access for recreational activities. The problems affecting the Yahara River are many and include destruction of valuable wetlands, sediment and phosphorus loading from farm runoff, construction site and streambank erosion, urban storm water runoff, straightening and channelizing headwater areas for agriculture, discharge from impoundments, areas of heavy aquatic plant growth, high water temperatures and periods of low dissolved oxygen. Historically, treated wastewater effluent from the Madison area was discharged into the Yahara River until this practice ended in the 1950s. Wastewater effluent is now diverted around the chain of lakes, and discharged into Badfish Creek. Map 2-3 shows both of these subwatersheds.

Water Quality Conditions

The Yahara River was divided into three different reaches for the purposes of the watershed project: the first reach is the segment from the headwaters downstream to county Highway V; the second is from Highway V downstream to Windsor Road; and the third reach is from Windsor Road downstream to the Cherokee Marsh. In all three reaches, the river experiences sediment and nutrient loading from agricultural fields and barnyards, hydrologic manipulation, turbidity and bank erosion.

In the first reach, the problems affecting water quality are related to a landscape dominated by agriculture, both cash cropping and dairy farming, followed by residential development. In addition to the other water quality problems, this reach experiences channelizing of the headwater areas, low flows, lack of suitable habitat for aquatic organisms, unstable and narrow stream corridors, wetland destruction and heavy in-stream sedimentation. Storm water runoff from the urban area is also a concern due to the increasing growth of the village of DeForest. The current biological use of the fishery in this reach is warmwater sportfishery. However, it is probably more reflective of a warmwater *forage* fishery due to its low flows, elevated water temperatures, low dissolved oxygen levels, and the lack of diverse habitat. Macroinvertebrate samples indicate "fair" water quality. This reach has very poor available habitat for aquatic organisms, because most of the desirable substrate is embedded in fine sediments. Increasing buffered corridors adjacent to the stream would reduce the amount of sediment entering this reach of the Yahara River.

The second reach shows more effects of adjacent residential development. This reach flows through the village of DeForest and the town of Windsor, both of which are expanding their developed areas. In addition to the other water quality problems, this reach experiences large

Map 2-3. Yahara River and Cherokee Marsh Subwatersheds

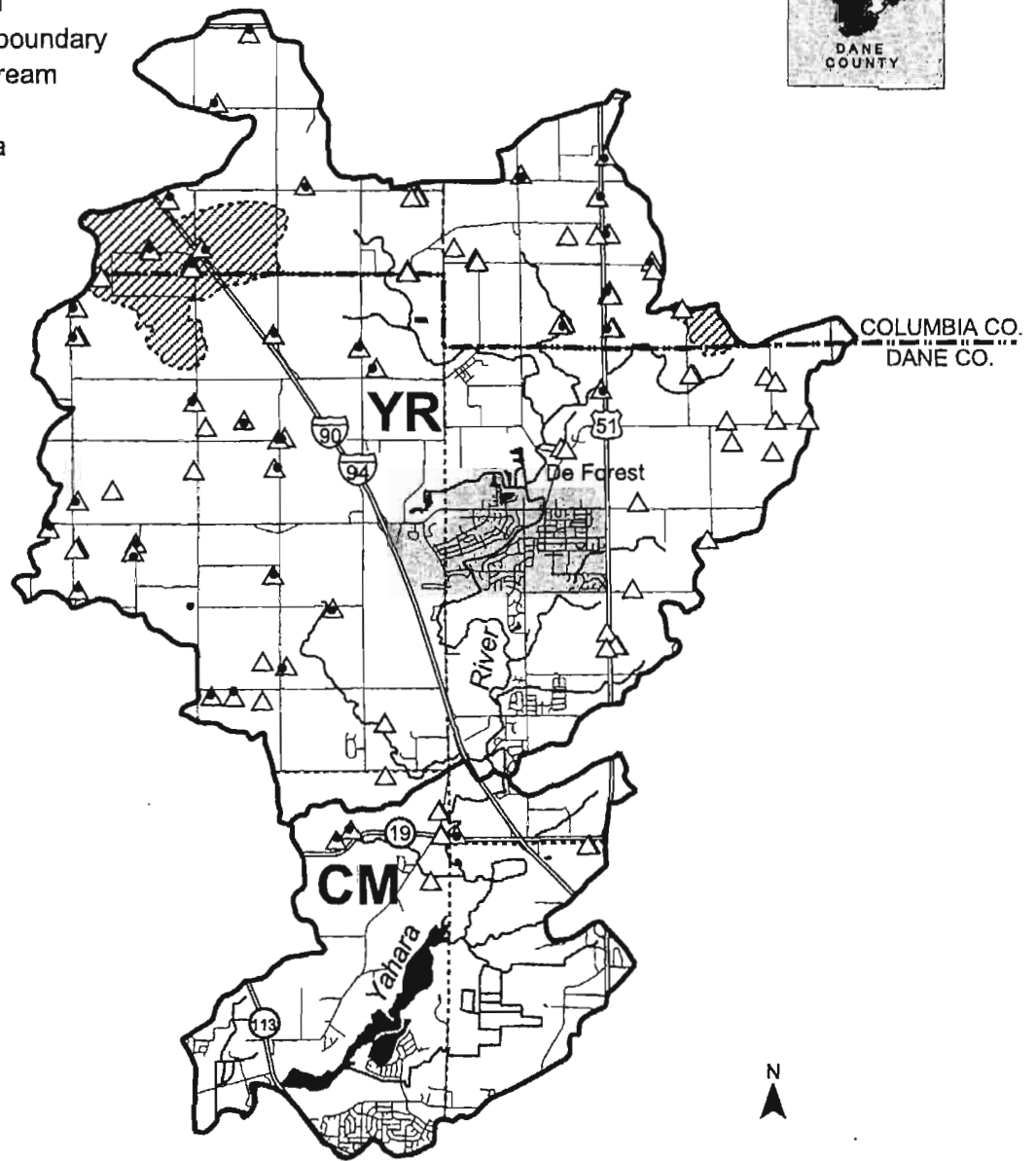
Explanation

- Well
- △ Barnyard
- Subwatershed boundary
- Road
- == Major road
- Township boundary
- River or stream
- Lake
- Urban area
- ▨ Internally drained

Subwatershed Codes

- CM= Cherokee Marsh
- YR = Yahara River

Subwatershed Location



Produced by:
Dane County Land Conservation Department
April 2000

0 1 2 3 Miles

volumes of storm water runoff from urban areas, construction site disturbance, loss of infiltration areas, discharge from impoundments and the loss of valuable wetlands. The current biological use of the fishery for this reach of river is warmwater sport fishery. This reach of river has the greatest potential for sustaining valuable populations of sport fish. The amount of available aquatic habitat in this reach is very good. Macroinvertebrate samples indicate "good" to "fair" water quality. The gradient and flow in this reach are also very good. There are a couple of large areas of eroding, raw streambanks north of Windsor Road that contribute sediment to this reach of river.

The third reach (from Windsor Road downstream to the Cherokee Marsh) of the Yahara River is dominated by agriculture, residential development, wetland and grassland. In addition to the other water quality problems described above, this reach experiences debris jams, discharge from impoundments, elevated water temperatures, periods of low dissolved oxygen, loadings associated with storm water runoff from urban areas, heavy in-stream aquatic plant growth, large populations of common carp, and sediment loading from construction site erosion. There are several areas downstream of Windsor Road where streambank erosion is a problem. In some cases sediment loading is so great that it has caused the channel to become braided. The current biological use of the fishery in this reach is a warmwater sport fishery. This reach plays an important role in providing spawning habitat for a wide variety of sport fish. Species such as northern pike, walleye and white bass use the lower reaches of the Yahara River and Cherokee Marsh yearly. A wide range of wildlife species also use the lower reaches of the river along with the Cherokee Marsh. Macroinvertebrate samples were not collected in this reach, due to the lack of suitable substrate and overall depth.

Cherokee Lake is 57 acres and 20 feet deep. The lake was formed when part of Cherokee Marsh was dredged in the 1960s. The lake functions as a deep-water sedimentation basin for the Yahara River and is a popular recreation area. Cherokee Marsh is the major estuarine wetland of the Mendota watershed and includes at least 4 major springs and high quality fens designated as a State Natural Area. Some of the marsh has been altered considerably by ditching, filling, golf course development and farming.

Nonpoint Source Pollutants

- The Columbia County portion of the Yahara River subwatershed contains 37 animal lots which contribute 1,088 pounds of phosphorus, annually. This represents an estimated 6% of the phosphorus for the entire watershed. This portion delivers 369 tons of sediment to Lake Mendota annually, or 6.5% of the total load. The Dane County portion of the Yahara River subwatershed contains 50 animal lots (8 are internally drained) which contribute 2,340 pounds of phosphorus, annually. This represents an estimated 12% of the phosphorus for the entire watershed.
- The upland sediment delivery in the Dane County portion of the Yahara River subwatershed is 710 tons, annually, or 12% of the entire watershed load. The Cherokee Marsh subwatershed contains 9 barnyards (1 is internally drained) which contribute 580 pounds of phosphorus annually. This represents an estimated 3% of

the phosphorus for the entire watershed. About 424 tons of sediment are delivered to the lake each year from this subwatershed, or 7.5% of the total load.

Water Resource Objectives

The following objectives are recommended for the surface water resources of the Yahara River and Cherokee Marsh subwatersheds:

1. Reduce sediment and nutrient loading from agricultural and barnyard runoff by a **high** level to enhance the overall water quality.
2. Maintain proper native grassland buffers along river corridors, grassed waterways, and other buffer areas to aid in streambank stabilization and nutrient and sediment retention.
3. Maintain proper construction site erosion control practices on any areas where the soil has been disturbed (residential, commercial or highways).
4. Emphasize proper soil conservation tillage practices to reduce soil and nutrient loss.
5. Continue to address storm water runoff and its associated problems through proper planning for future growth areas, educational workshops and installing control structures.
6. Protect, enhance and create new wetlands to improve spawning areas for sport fish and provide additional wildlife habitat.
7. Stabilize streambanks where banks are eroding due to bank failures, especially the reach from Windsor Road to Interstate 90-94.
8. Further recommendations about the Cherokee Marsh subwatershed are found in the wetland section at the end of this chapter.

Token Creek Subwatershed (TC)

Description

Token Creek is a tributary to the Yahara River that originates in north central Dane County (Map 2-4). It originates in Windsor Township (T9N, R10E, Section 24). Token Creek is 10 miles long with a drainage area of 25.3 square miles, or 10.9% of the total watershed area. The primary land use for this subwatershed is agricultural.

Water Quality Conditions

The problems affecting the water quality of Token Creek include destruction of valuable wetlands, sediment and phosphorus loading from agricultural fields and barnyards, sediment

Map 2-4. Lake Windsor and Token Creek Subwatersheds

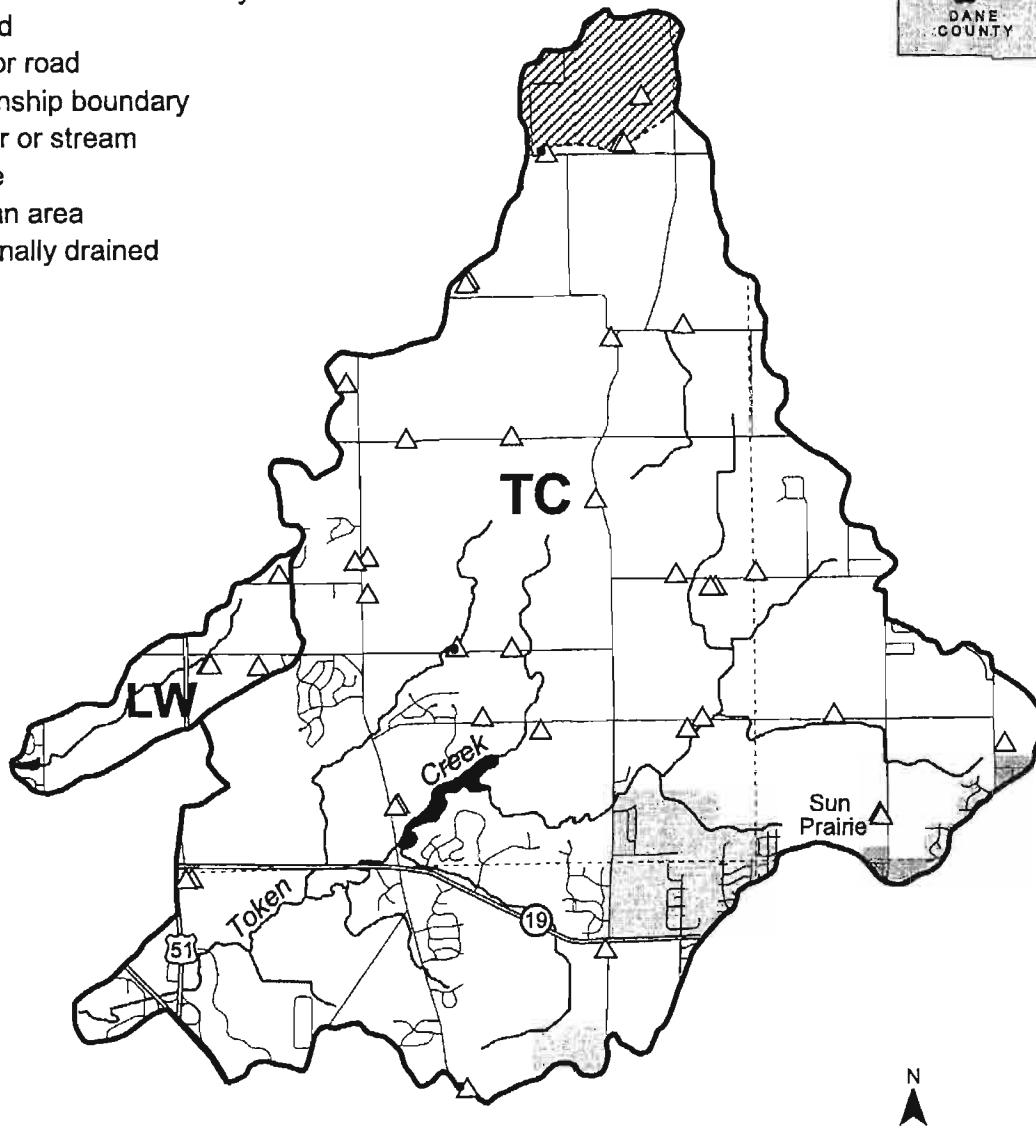
Explanation

- Well
- △ Barnyard
- Subwatershed boundary
- Road
- == Major road
- Township boundary
- River or stream
- Lake
- Urban area
- ▨ Internally drained

Subwatershed Codes

LW = Lake Windsor
 TC = Token Creek

Subwatershed Location



Produced by:
 Dane County Land Conservation Department
 April 2000



loading from construction site and streambank erosion, storm water runoff from urban areas, discharge from several impoundments, areas of heavy in-stream plant growth, periods of low dissolved oxygen and a lack of habitat for aquatic organisms due to heavy sedimentation. Large populations of common carp along with high turbidity also impair water quality. Token Creek has a diverse fishery, containing warmwater, coldwater, and rough fish species. The first two miles of stream upstream from its confluence with the Yahara River is currently classified as warmwater sport fishery consisting of bluegill, largemouth bass, walleye, green sunfish, and some rough fish species (common carp and freshwater drum). This section of stream is characterized by low gradient, high turbidity, heavy sedimentation and overall channel widening. Urban development along with hydrologic modification have all had impacts on Token Creek.

The portion of stream from mileage marker 2 to 4 is currently classified as coldwater fishery. This includes the section of stream from the Token Creek County Park upstream to the Token Creek millpond dam. The summer electrofishing surveys showed low numbers of brown trout and brook trout, which are probably escapees from DNR rearing ponds. Other fish species were dominated primarily by tolerant forage species (white sucker, creek chub, johnny darter and bluntnose minnow). Two sport fish and large numbers of common carp (both young of the year and adults) were also found. Carp are visible at road crossings throughout the year. This segment of stream is characterized by moderate velocities, high turbidity, heavy sedimentation, naturally occurring log jams, overall channel widening and heavy in-stream aquatic plant growth.

An unnamed tributary to Token Creek flows southward before entering this section. The current fish classification for "Creek 4-1" is coldwater, and includes brown trout, mottled sculpin and white sucker. This portion of creek has the highest water quality within the subwatershed. Creek 4-1 is characterized by good spring activity, healthy macroinvertebrate communities, well buffered streambanks, stable substrate and good in-stream cover. There are large areas of watercress here indicating groundwater upwelling or spring activity and good water quality.

The last six miles of Token Creek upstream from the millpond dam to its headwaters was classified in 1996 as limited forage fishery. Summer electrofishing found bluntnose minnow, fathead minnow, brook stickleback, common carp, green sunfish and white sucker. This portion of stream is characterized by low flows, increased rates of sedimentation, high turbidity, elevated temperatures and lack of habitat.

In 1998, the DNR purchased the dam and the land upstream of the dam which had long ago formed the 50-acre Token Creek Millpond. In 1993, the dam had failed and significant springs were uncovered. The DNR has made it a priority to remove the dam and to restore the stream to its original condition prior to having had a dam in place. This will be a multi-year effort involving finding and rehabilitating the original stream corridor, improving the fisheries habitat and protecting the springs. The springs flow at a rate of 4,000 gallons per minute, at 50° and provide 50% of the base flow to Lake Mendota. The ultimate goal is to restore the stream to a naturally reproducing brook trout fishery.

Nonpoint Source Pollutants

- The Token Creek Subwatershed contains 33 animal lots (5 are internally drained) which contribute 2,383 pounds of phosphorus annually. This represents an estimated 12% of the phosphorus for the entire watershed.
- The upland sediment delivery in the Token Creek Subwatershed is 752 tons, annually, or 13.4 percent of the entire watershed load.

Water Resource Objectives

The following objectives are recommended for improving the surface water resources of Token Creek Subwatershed:

1. Reduce sediment and nutrient loading from agricultural and barnyard runoff by a **high** level to enhance overall water quality.
2. Remove the dam that creates the millpond. This would allow the stream to find its original natural channel, improve the coldwater fishery and provide a valuable wetland complex.
3. Maintain proper native grassland buffers, grassed waterways and other buffer areas to aid nutrient and sediment retention.
4. Maintain proper construction site erosion control practices on any areas where the soil has been disturbed (residential, commercial or highways), through proper planning, educational workshops and proper control structure installation.
5. Maintain and enhance the overall integrity of water quality for the coldwater unnamed tributary located in Windsor Township (T9N, R10E, Section 34). This could be accomplished through the above objectives plus habitat improvement for coldwater fish and providing well-vegetated buffers along the stream corridor.
6. Emphasize proper soil conservation tillage practices to reduce soil and nutrient loss.
7. Continue to address storm water runoff and its associated problems through proper planning for future growth areas and installation of control structures.

Lake Windsor Subwatershed (LW)

Description

Lake Windsor is located in the township of Windsor (T9N, R10E, Sections 31 and 32) Dane County. This lake is a drainage lake created by building a dam on an intermittent tributary to the Yahara River. The resulting Windsor impoundment is 9 acres in size and has a maximum depth of 6 feet, and a drainage area of 1.2 square miles. The ratio of the drainage basin to