ROXBURY CREEK WATERSHED (LW18)

The Roxbury Creek Watershed lies mostly in northwest Dane County although a small portion of it extends into Columbia County. Land use in the watershed is predominantly agricultural, although a good percentage of the watershed is covered by broad-leaf deciduous forest. In some areas, the main agricultural activity is dairying. There are no incorporated municipalities in the watershed. Overall population in the watershed in 2000 was estimated to be around 5,500 people. Residential development in the watershed is increasing as a result of the watershed's proximity to Madison.

Table 1: Land Cover in the Watershed

Land Cover	*Percent of Watershed*
Forest (Total)	42.4%
Broad-Leaf Deciduous	*30.0%*
Grassland	*11.3%*
Coniferous	*1.1%*
Agriculture	42.9%
Wetland (Total)	9.7%
Emergent/Wet Meadow	*4.6%*
Forested	*3.7%*
Lowland Shrub	*1.4%*
Open Water	3.9%
Barren	1.2%

The major known water quality problems in the watershed are from nonpoint source pollution. The Roxbury Creek watershed is ranked as a high priority for nonpoint source pollution reduction. The Dunlap Creek sub-watershed was chosen as a small-scale nonpoint source pollution abatement project. Streams in the watershed are also impacted by stream channelization and portions of Dunlap Creek have been extensively channeled. Development pressure in the watershed could pose a threat to water quality in the watershed.

In addition, a portion of the watershed is in an atrazine prohibition area. These areas indicate that elevated levels of atrazine, an herbicide used on corn, has been found in some tested private water wells. Soils are permeable which has allowed atrazine to reach groundwater in some locations. See Appendix B.

Watershed At A Glance

Drainage Area (m^2): 67.0

Total Stream Miles: 35.0

Trout Stream Miles: 3.5

Sport Fishery Miles: 5.0

Lakes: Fish, Crystal and Mud Lakes

Exceptional/Outstanding Resource Waters: Dunlap Creek

Municipalities: None

Major Public Lands:
- Mazomanie Unit of LWSR
- Black Hawk Unit of LWSR

Concerns and Issues:
- Nonpoint source pollution
- Stream channelization
- Development pressure
- Atrazine
- Changing water levels in Fish and Crystal Lakes

Initiatives and Projects:
- Fish Lake Project for study and protection
- Dunlap Creek priority nonpoint source pollution abatement project to reduce upland sediment delivery
- Crystal and Fish Lakes have a Lake Planing Grant for hydrologic studies and groundwater modeling
- Fish Lake master plan
- Long Term Trends Monitoring on Fish Lake
- Shoreline habitat improvement

The Crystal Lake Campground discharges to groundwater in the watershed and the Roxbury Sewerage District discharges to Roxbury Creek.

The Honey Creek Watershed has a variety of good quality habitats and rare plant communities that are listed on the state's Natural Heritage Inventory, (NHI), kept by the Bureau of Endangered Resources. These communities include:

- Dry cliff
- Dry prairie
- Moist cliff
- Oak barrens
- Calcareous fen
- Southern dry forest
- Southern dry-mesic forest
- Southern mesic forest
- Alder thicket
- Emergent aquatic
- Ephemeral pond
- Floodplain forest
- Deep, hard, seepage lake
- Shrub-carr
- Springs and spring runs, hard
- Stream, slow, hard, warm
- Wet prairie
- Southern sedge meadow

In addition to these special communities, the watershed is also home for a variety of rare plant and animal species including; 1 species of beetle, 3 species of birds, 3 species of butterflies, 3 species of dragonflies, 13 species of fish, 1 species of grasshopper, 3 species of moths, 8 species of mussels, 30 plant species, 3 species of snakes, 2 species of mammals and 1 species of lizard. These plants and animals are also listed on the state's Natural Heritage Inventory (NHI).

The Mazomanie and Black Hawk units of the Lower Wisconsin State Riverway lie in this watershed. The Mazomanie unit is 4,261 acres (only 3,518 are owned, the rest are leased). This unit has areas of marsh, potholes, forest, lake and stream and offers a variety of recreational opportunities from a dog training ground, Class I field trial grounds, fishing, canoeing, birdwatching, berry picking and hiking. The Black Hawk Unit is 800 acres of state owned land and has a historical site as well as opportunities to cross country ski, and birdwatch.

Note: The Dane County portion of this watershed is also discussed in the Dane County Regional Planning Commission (DCRPC) Dane County Water Quality Plan. The DCRPC plan should also be consulted for additional information, priorities and recommendations.

STREAMS IN THE ROXBURY CREEK WATERSHED

Dunlap Creek

Dunlap Creek is a small tributary to the Wisconsin River. Approximately 3.5 miles of it are classified as Class II trout waters. The creek has been extensively ditched from the end of the trout water to the Wisconsin River. Despite this, the creek still serves as a nursery stream for several warm water fish from the Wisconsin River including northern pike. A rare aquatic species has been found in the creek in past surveys.

The creek flows through several publicly owned and leased lands including the Mazomanie and Blackhawk Units of the Lower Wisconsin Riverway. In addition, there is a large, high-

quality wetland complex adjacent to the stream. This wetland, however, has been significantly degraded by the presence of purple loosestrife. This exotic, invasive species has dominated the area and continues to spread.

Sedimentation from cultivated fields and grazing are affecting in-stream habitat and impairing the stream's full use. This sub-watershed was selected as a small-scale nonpoint source priority watershed project in 1991. An appraisal monitoring report and a project plan detailing what needs to be done to improve water quality was completed in 1992 or early 1993. The main focus of this project is to reduce soil erosion from upland areas in the Dunlap Creek watershed. Many of the cost-share practices are focused on controlling the formation of gullies or the worsening of existing gullies.

Table 2: Dunlap Creek Watershed Project Evaluation (1993 - 2004)

Pollutant Source	Barnyard (Phosphorus)	Upland Sediment	Gully	Streambank
Inventoried Load	738 lbs.	373 tons	486 tons	181 tons
Goals (Reduce By)	266 lbs. (36%)	112 tons (30%)	292 tons (60%)	76 tons (42%)
***Reduction**	181 lbs.	1,425 tons	486 tons	0
% Reduction of Goal	68%	1,272%	166%	0
% Reduction of Total Load	25%	382%	100%	0

**Represents local, county, state, and federal funding sources. Table from Dane County Land Conservation Department.*

Marsh Creek
Marsh Creek is a short seepage fed tributary to the Wisconsin River. Marsh Creek supports forage fish although some sport fish may move into the stream from the Wisconsin River. The stream has a low gradient and portions of the stream in the headwaters have been ditched. The stream is affected by hydrologic modification and nonpoint source pollution. Migrating waterfowl have been known to use the stream. A rare aquatic species has been found in the creek in past surveys.

Roxbury Creek (Blums Creek)
Roxbury Creek is a tributary to the Wisconsin River. The stream and its tributaries have been extensively ditched. The stream has a low baseflow and the stream supports only a forage fishery, although some sport fish may move into the stream from the Wisconsin River. The creek is severely impacted by the cattle grazing in some areas of the stream. This grazing has led to streambank erosion in sections of the stream.

Wisconsin River
A portion of the Wisconsin River flows through this watershed. For more information on the Wisconsin River, see page 90.

LAKES IN THE ROXBURY CREEK WATERSHED

Fish Lake

Fish Lake is a 216-acre pothole lake on the edge of the unglaciated driftless area of Wisconsin. The lake is fairly deep, with a maximum depth of 62 feet. The lake is a seepage lake with no inlet or outlet streams. Northern pike, largemouth bass and panfish dominate the fishery. It has been considered a mesotrophic lake, but declining water quality and habitat are pushing it toward eutrophic status. Fish Lake had some of the best water quality among Dane County lakes in the early 1980s. Since then, the lake has experienced a decline in water clarity, and lower dissolved oxygen readings as a result of increased surface water runoff. DCRPC has ranked Fish Lake high for possible selection as a nonpoint source priority lake watershed project. The lake has a high population of cisco, a cold water fish related to salmon, which need cold water and high dissolved oxygen. The declining quality of the water in the lake has led to occasional fishkills.

The surrounding landuse is over 60% agriculture. Factors contributing to the decline of the lake are believed to be the lack of adequate buffer zones, poor animal waste management and farm management practices, organic loading and sedimentation of the southwest bay, and excessive Eurasian water milfoil growth in the lake. An Environmental Protection Agency (EPA) Clean Lakes research project was conducted on the lake and a lake management plan was completed in 1996. The lake is also a long-term trends monitoring lake through the WDNR's lakes management program. WDNR and Dane County Parks have been conducting shoreline habitat and riparian area improvement work on Fish Lake. As a part of this work, several trees have selectively been knocked into the lake to create shoreline habitat. In addition, black locust trees, an invasive exotic species, has been removed and there have been efforts to re-establish American locust. These efforts, as well as the successful acquisition of Lussier Park on the eastern shoreline should have a positive impact on the lake.

Another factor affecting the management of the lake is that over the past 25 years, the lake's water level has risen. A study, funded by a Lake Planning Grant and conducted by USGS and the Dane County Lakes and Watershed Management, was being done over the last year and a half. The study was examining options to help reduce the problems being caused by Fish Lake's high stage condition, such as flooding of roads and residences. The study will help evaluate options of how to manage the problem, whether it be pumping water out of the lake or diverting surface water from the lake. Another study is being conducted simultaneously to determine how these options would or could affect Crystal Lake. The lake has a lake association that was organized in 1998.

Crystal Lake

Crystal Lake is a 527-acre shallow, eutrophic, seepage lake, which up until the mid 1980s, was a marsh. Hydrologic changes of the ground water has caused the lake level to increase dramatically, thereby allowing its fishery to change from a winterkill plagued bullhead and minnow lake to one of the best bass and panfish producing waters in the state. Dense, aquatic plants grow in some nearshore areas and a mid to late summer algal bloom occurs. Dead timber lines the shoreline as a result of the recent rise in water level. The lake has received a Lake Planning Grant from the Department of Natural Resources which has been used to

contract with the USGS to conduct groundwater modeling. Public access on the lake is inadequate. A fishery survey was conducted on the lake in 2000.

Mud Lake (Marx Pond)
The lake is actually a marshy bay of Fish Lake. Mud Lake is connected to Fish Lake by a culvert. The lake provides excellent spawning habitat for northern pike and largemouth bass. The lake also provided excellent habitat for waterfowl. Although winterkills occur occasionally, the lake is still able to support a healthy fishery. The lake is a part of the hydrologic studies currently being conducted on Fish and Crystal Lakes.

RECOMMENDATIONS (LW18)

- Long-term trend monitoring, littoral zone projects and monitoring on **Fish and Crystal Lakes** should be continued.

- **Fish Lake** should be considered a high priority candidate for Targeted Runoff Management grant, (TRM), or other nonpoint source pollution reduction project. Any project should include **Mud Lake** and its drainage area due to the lake's proximity to Fish Lake.

- Hydrogeologic studies and other research efforts on **Fish** and **Crystal Lakes** should be continued.

- **Roxbury Creek** should be reassessed and stream classification should be updated if necessary.

- Public funds should be sought to restore prairie potholes around **Fish and Crystal Lakes** to decrease surface water runoff to the lakes, improve water quality and increase biodiversity and waterfowl habitat.

- **Fish Lake** should be added to the 303(d) list of impaired waters due to excessive problems with Eurasian water milfoil and nonpoint source pollution.

- A management plan should be developed for **Crystal Lake**.

- Partners should work to protect **Dunlap Creek** due to the presence of listed species.

- Nonpoint source pollution priority rankings for streams in the watershed should be determined.

- The **Crystal Lake** fishery should continue to be monitored.

- **Dunlap Creek, and Marsh Creek** should be surveyed to determine if rare aquatic elements previously found in the streams are still present.

- The development of local lake management organizations on both **Fish Lake** and **Crystal Lake** should be encouraged.

- Dane County should seek to acquire additional public ownership on and adjacent to **Fish Lake**.

- Better shore and boat access to **Crystal Lake** should be established.

- The protection of shoreline from the development of **Fish and Crystal Lakes** should be sought through the purchase of fee titles or conservation easements.

- Pursue a purple loosestrife removal and wetland restoration project along **Dunlap Creek.**

Recommendations adapted from the Dane County Water Quality Plan (1995):

- Complete a wastewater facilities plan to increase plant capacity and change to surface water discharge (Roxbury Sanitary District).

- Evaluate and initiate efforts to reduce clearwater intrusion into the sanitary sewer system (Roxbury Sanitary District).

- The Town of Roxbury should consider the need to create an Inland Lake Protection and Rehabilitation District for **Fish Lake** to be responsible for ongoing lake management activities.

Watershed map

Roxbury Creek Watershed (LW18) — Dane and Columbia Counties — Area: 67 square miles

Stream Name	WBIC	Length (miles)	Existing Use	Potential Use	Supporting Potential Use	Codified Use and Trout Stream Classification	Proposed Codified Use	303(d) Status	Rare Aquatic Species	Use Impairment		NPS Rank	Monitored/ Evaluated/ Unassessed	Data Level	Trend	Ref.*
										Source	Impact					
Dunlap Creek	1253300	0-2.5	WWFF	same	Full	DEF/ERW	same	N	Y	CL,NPS, HM	HAB	NA	M	B2	U	5, 13, 18, 22
		2.5-6	COLD II	same	Full	COLD II/ERW	same	N							U	
Marsh Creek	1252900	0-1	WWSF	same	Part	DEF	same	N	Y	HM, NPS		NR	U		U	5, 13, 18
		1-4	WWFF	same	Part	DEF	same	N							U	
Roxbury Creek (Blums Creek)	1259900	0-4	WWSF	same	Part	DEF	same	N	N	HM		NR	E		U	5, 13, 18, 19
		4-8	LFF	same	Part	LAL	same	N							U	
Unnamed streams		17				DEF										

Total Stream Miles	35
COLD II	3.5
WWSF	5
WWFF	5.5
LFF	4
U	17

The numbers in this column refer to the References found in the corresponding Watershed Narrative.
See Appendix J: "How to Read the Stream Tables," in Chapter 7 of the State of the Lower Wisconsin River Basin Report.

Lakes in the Roxbury Creek Watershed (LW18) **Dane and Columbia Counties**

Lake Name	WBIC	County	Surface Area (Acres)	Max Depth	Lake Type	Winterkill	Access	SH	Hg	MAC	LMO	TSI	Lake Plan or Prot	P Sens	Comments
Crysal Lake	978900	Dane/Columbia	526	9	SE	Y	BF	X	M	EWM		65	PLAN	2	Barnyard & Septic probs.
Fish Lake	985100	Dane	216	62	SE	N	BR	C	M	EWM		55	PROT/ PLAN	1	lake projects ongoing
Mud Lake (Marx Pond)	1006500	Dane	54	5	SE	Y	R						PLAN	2	Part of clean lakes proj.

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

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