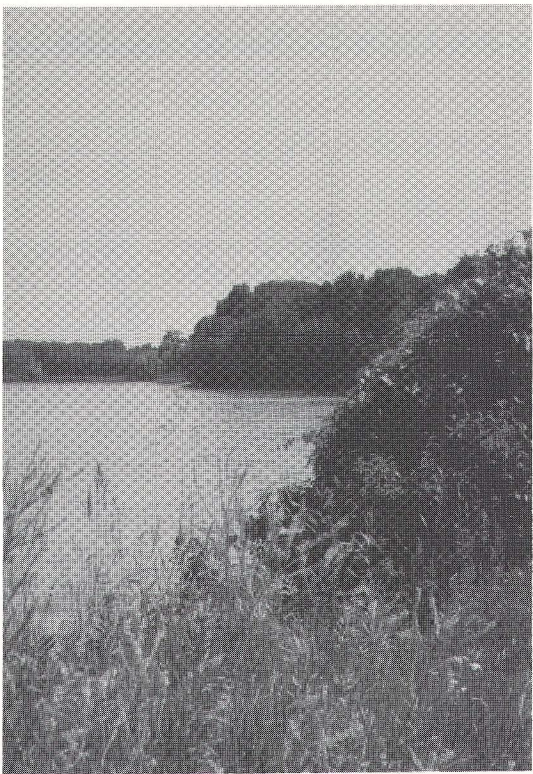


What Is The Yahara-Monona Watershed?

The Yahara-Monona Watershed is a beautiful and vibrant area in central Dane County encompassing 85 square miles of land surrounding Lakes Monona, Waubesa, and Wingra. You'll find everything in the watershed: from golden cropland to bustling streets; from the University of Wisconsin-Madison to the seat of local and state government; from thriving businesses to well-tended yards. Central to all this activity and beauty are our lakes, streams and wetlands, such as Lake Monona, Nine Springs Creek and Dunn's Marsh. These resources bring more to our community than recreation and water supplies. Their shorelines and stream banks define our environment and provide a focus for a special sense of place and community.



What Is A Priority Watershed?

A priority watershed is an area selected to participate in the Wisconsin Nonpoint Source Water Pollution Abatement Program. This voluntary program, administered by the Wisconsin Department of Natural Resources and the Department of Agriculture, Trade and Consumer Protection, provides funds and technical assistance to local municipalities and landowners to help them reduce pollution from runoff and snowmelt, known as "nonpoint source water pollution."

Watersheds are chosen for the program if they have serious nonpoint pollution problems and there is a serious commitment from local officials to address these problems. The Yahara-Monona Watershed was designated a priority watershed in 1988, joining 40 other priority watersheds in Wisconsin, covering more than 3 million acres.

What Should Be Done?

It will take the combined efforts of rural and urban landowners, private citizens, educators and public officials to protect our water resources in the Yahara-Monona Watershed. Important pollution control objectives are listed below.

Some Specific Objectives:

- Focus on control of sediment, heavy metals and phosphorus to lakes and streams.
- Reduce sediment loadings by over 30 percent through soil erosion control efforts.
- Reduce heavy metal discharges to the maximum extent practicable so as not to exceed aquatic life toxicity standards.
- Reduce future phosphorus loadings to Lakes Monona and Waubesa by 10-30 percent.
- Control nitrate-nitrogen, pesticides and road salt to protect groundwater quality.

Most of the urban land in the watershed requires some type of management practice to protect our water resources. About 17,000 acres of urban land are considered critical and need

management measures to reduce metal concentrations in runoff below toxicity levels for aquatic life. To cut existing loadings of phosphorus and sediment by 30 to 50 percent and to reduce loadings of heavy metals as much as possible, communities should plan and construct stormwater management practices to protect water quality in new and existing development.

Targets for Community Action:

- ✓ vigorous enforcement of construction site erosion and runoff control ordinances
- ✓ construction of wet detention basins and other structural water quality management practices
- ✓ increasing infiltration in new development, by limiting impervious surfaces and directing roof drainage to grassed areas
- ✓ accelerated street sweeping, meaning weekly sweeps of commercial and industrial areas and sweeping of residential areas once every 2 weeks using vacuum-type sweepers
- ✓ reduced use of road deicers to the extent possible
- ✓ protection and enhancement of wetlands and stream corridors through regulation and acquisition.

Farmers can work with Dane County to develop and put into practice conservation plans to reduce soil erosion and the amount of sediment reaching our lakes and streams. These plans should control polluted runoff from animal lots and promote the sound use of fertilizers and pesticides. About 5,000 acres of cropland and 11 livestock operations need additional practices to meet water resource management objectives.

The watershed map on the reverse side displays priority areas for these practices.

What's Happening in The Watershed?

Water resources in the Yahara-Monona Watershed are in danger. Our lakes are plagued by excessive weeds and algae. Our streams have low flow and many are choked with eroded soil. Low dissolved oxygen levels endanger fish and other aquatic life. Toxic materials are found in stormwater runoff and stream and lake bottom sediments. Pregnant women and children are restricted in eating walleye pike from Lakes Monona and Waubesa, due to mercury contamination. Levels of salt and nitrates have increased in surface and ground water. Table 1 summarizes the various water resource problems in the watershed.

For the most part, there are no smoking sewage pipes or industrial culprits to blame for our water quality problems. The major threat to our lakes and streams comes from our daily activities. When rain falls or snow melts, it runs into our lakes and streams through storm sewers or drainageways. As stormwater flows it runs across streets, parking lots, gardens, yards, and farm fields, picking up whatever lies on these surfaces and washing it into the nearest water body. This is commonly referred to as "non-point source pollution." Gardeners' fertilizer, worn-off and torn-off pieces of cars, barnyard runoff, soil from new construction sites and cropland, agricultural and household pesticides, autumn leaves and pet waste--these seemingly innocent things are the major threats to our water resources.

Since we all contribute to the problem, we must all be a part of the solution. Unless we all take action, water quality will continue to decline. Predicted population growth and urbanization will increase pressures on our water resources. Urbanization threatens our lakes and streams through increased water runoff. When more and more of the land surface is paved over with streets and parking lots, this keeps precipitation from replenishing groundwater, stream baseflow and wetlands. Instead, water flows more quickly across the land, picking up and carrying a variety of pollutants.

What Is The Plan?

The Yahara-Monona Priority Watershed Plan is a detailed guide to water quality protection and improvement, full of facts and figures, research and recommendations. Developed during the first stage of the priority watershed project, the plan is the basis for distribution of state grants to those responsible for following through on the plan's recommendations during the project's 8-year implementation period.

The plan is based on water quality data, wetland surveys and analyses, livestock and land use inventories and shoreline erosion assessments. Present and predicted land use information was gathered and used in computer models for urban and rural areas within the watershed. Land use data were used to figure out how much precipitation runs into storm sewers or drainageways and, eventually, our lakes and streams. This information indicates the kinds of pollutants, such as metals, sediment and phosphorus, the water may pick up as it travels across the land surface.

The computer models were used to determine major sources of water pollution, pollutant quantities and the effects different management practices will have on reducing pollution from runoff. Recommendations to improve and protect water quality are based on analyses of computer modeling results and data gathered throughout the planning process.

The plan was developed through the cooperative efforts of county, state and local units of government. The Dane County Regional Planning Commission prepared the plan, in cooperation with the Dane County Lakes and Watershed Commission, the Dane County Land Conservation Department, Dane County Extension, the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection and local units of government. The Yahara-Monona Steering Committee, with representatives from watershed municipalities (e.g., Cities of Madison, Monona and Fitchburg and Village of McFarland) and concerned citizens, was instrumental in reviewing and evaluating the plan.

What Are The Goals?

To protect and improve the quality of water resources in the Yahara-Monona Watershed by:

- Controlling nonpoint source pollution with management structures and improved housekeeping.
- Increasing public awareness of non-point pollution.
- Increasing public involvement in pollution prevention.
- Protecting soil productivity
- Protecting and improving sensitive environmental areas, such as wetlands, stream corridors and lake shores.
- Improving recreational use.
- Preventing flooding and drainage problems.

What's Causing The Problem?

Phosphorus is of major concern in runoff water because the more of this nutrient which runs into our lakes and streams, the more weeds and algae will grow there. In one year, roughly 15,000 pounds of phosphorus wash into water bodies in the Yahara-Monona Watershed from urban areas alone (see Table 2).

That's the equivalent of about 7500, 20-lb. bags of lawn fertilizer being dumped into our lakes and streams each year. Major sources for this

phosphorus are eroded soil, leaves, livestock waste, grass clippings, and fertilizer from croplands and urban lawns.

Soil, and the chemicals attached to it, are major pollutants in the Yahara-Monona Watershed. The plan estimates that over 100,000 tons of soil erode annually from agricultural fields alone. About one-tenth of this reaches water bodies (see Table 3), often carrying with it chemical fertilizers, herbicides, insecticides and animal wastes.

Soil is also lost from urban and urbanizing areas. Erosion from construction sites can equal

(continued on panel below)

TABLE 2 ANNUAL URBAN POLLUTANT LOADINGS BY SUBWATERSHED BASED ON 1990 LAND USE CONDITIONS							
Subwatershed	Acreage	Average Suspended Solids Loading (Tons/Acre)	Average Phosphorus Loading (Lbs./Acre)	Average Zinc Loading (Lbs./Acre)	Total Suspended Solids Loading (Tons)	Total Phosphorus Loading (Lbs.)	Total Zinc Loading (Lbs.)
Lake Monona	5,541	.17	.71	.46	930	3,939	2,563
Starkweather Creek	11,061	.14	.49	.42	1,502	5,373	4,628
Lake Wingra	4,928	.09	.39	.22	440	1,936	1,099
Nine Springs Creek	6,724	.09	.34	.24	621	2,264	1,628
Upper Mud Lake	3,888	.08	.33	.23	328	1,266	879
Lake Waubesa	1,752	.08	.32	.20	137	566	359
Total	33,894	.12	.45	.33	3,958	15,344	11,156

or exceed 30 tons per acre per year. With an average of 163 acres of urban development a year in the watershed, this results in a loss of about 5,000 tons of soil per year--about 1,000 tons more than the soil running off existing urban areas.

Metals, such as zinc and copper, pose water quality problems. Concentrations of zinc and other heavy metals in storm sewer runoff often exceed toxicity standards for aquatic life. It is estimated that each year more than 11,000 pounds of zinc drain into our water resources from urban areas. This zinc comes from automobiles, chipping paint and downspouts, among other sources.

Four contaminants are of primary concern regarding groundwater quality: nitrate-nitrogen, salt (sodium chloride), volatile organic chemicals and pesticides. Approximately 50 percent of the private, rural wells tested in the Yahara-Monona Watershed for nitrate-nitrogen exceed the recommended public drinking water standard for infants. High nitrate-nitrogen levels probably result from fertilizer use and septic tanks.

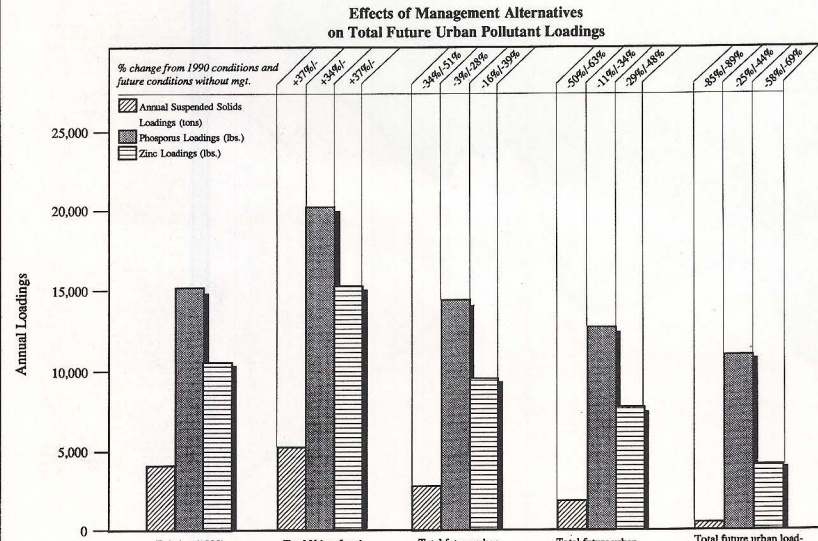
Sodium and chloride concentrations have increased substantially in some downtown City of Madison wells. Three wells, which are no longer used, exceed the advisory level for people on low-sodium diets. Sodium and chloride can be traced to the use of road salt, which leaches into groundwater.

VOCs (volatile organic chemicals) have been detected in private and municipal wells near Madison, Fitchburg and McFarland. Landfill leaks, underground tanks and chemical spills are the likely sources of these chemicals. The pesticide atrazine also has been found in some tested private wells as a result of agricultural practices.

Simply using groundwater can cause problems. Large water withdrawals in the watershed have lowered groundwater levels. This has had serious effects on stream baseflow and wetlands.

Urban development reduces the replenishment of groundwater, as buildings, streets, parking lots and other impervious surfaces cover up land that once absorbed the rain.

TABLE 3 ANNUAL RURAL SOIL EROSION AND SEDIMENT LOADS TO WATER BODIES BY SUBWATERSHED, 1990 LAND USE CONDITIONS			
Subwatershed	Total Cropland Acreage	Total Soil Erosion (Tons)	Total Sediment Load Reaching Water Bodies (Tons)
Starkweather Creek	3,655	32,505	2,411
Upper Mud Lake (Penitto Creek)	1,697	12,865	1,096
Nine Springs Creek	1,883	13,180	1,105
Lake Waubesa	1,885	19,560	1,014
Swan Creek	2,737	20,015	1,418
Murphy's Creek	1,489	20,760	1,708
Total	13,346	118,885	8,752



"Lakes and streams have an indefinable quality, the power of drawing attention without courting it and the ability of exciting interest by their very presence."

-Derived from Henry Van Dyke

What's It Going To Cost?

It's estimated that it will cost up to \$21 million to fully implement the Yahara-Monona Priority Watershed Plan over an 8-year period. The state will cover a significant portion of these expenses (up to \$11.5 million) through cost-sharing grants to local municipalities and rural landowners.

In existing development, state grants are available to pay for 70% of the construction costs for practices such as wet detention basins, grass drainage systems and infiltration basins, and 50% of the land acquisition and storm sewer rerouting costs associated with these practices. The municipality or landowner must come up with the rest. In planned development, funding is available for feasibility studies only.

The state will also help communities convert to vacuum-type street sweepers, which are more effective in removing pollutants than conventional broom-type sweepers. In addition, construction site erosion control enforcement can be 100% funded through the priority watershed program for a limited period of time.

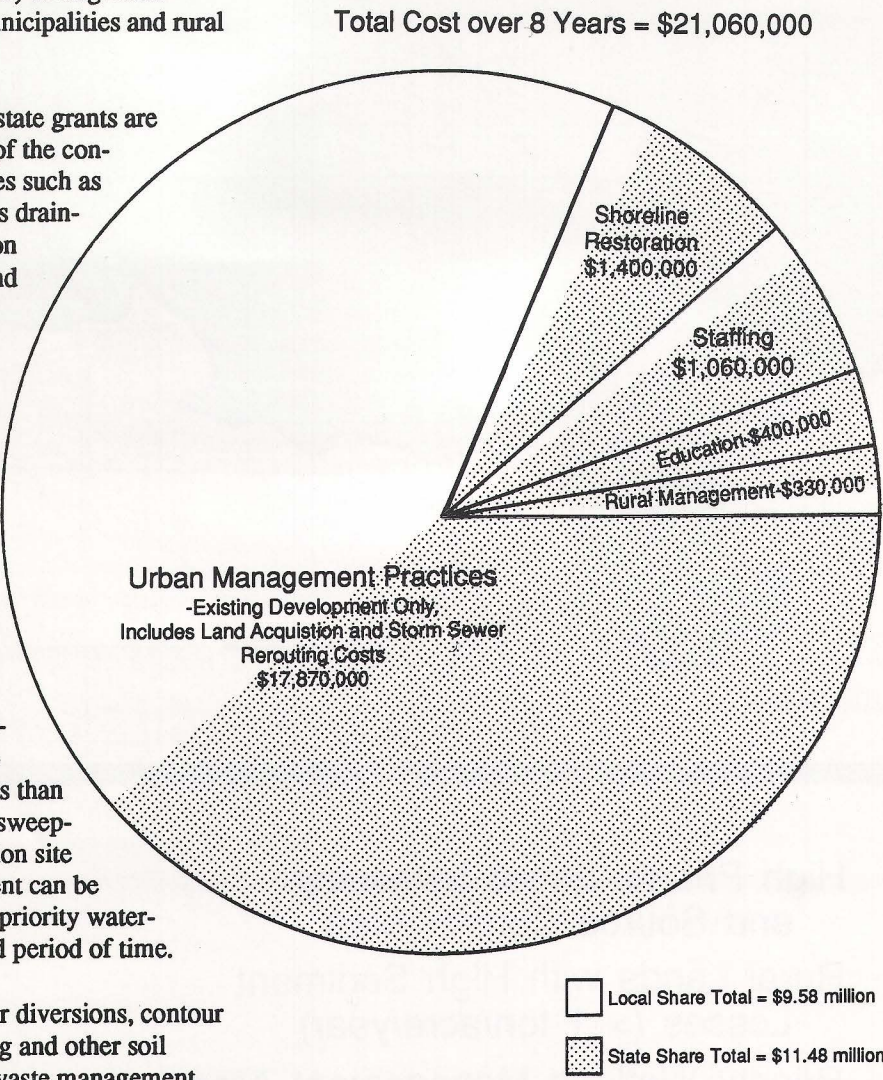
Conservation tillage, water diversions, contour cropping, livestock fencing and other soil conservation and animal waste management practices are eligible for 50% to 70% state cost-share funding in rural areas.

What's A Wet Detention Basin?

A wet detention basin is a little like a wetland built by human hands. It looks like a pond. Its

ESTIMATED COSTS OF THE RECOMMENDED PLAN*

*Includes only initial capital costs (1990 dollars). Does not account for initiation or costs of management practices in areas undergoing development. Shaded areas indicate proportion of costs supported by state funds.



purpose is to collect, hold and gradually release stormwater runoff that may be chock full of fertilizer, sediment, pesticides, metals and other contaminants. The basin allows many pollutants to settle out before the water moves on to the nearest lake or stream. The average construction cost of a wet detention basin is \$70,000 per acre, which does not include land acquisition or storm sewer rerouting costs.

What Individuals Can Do:

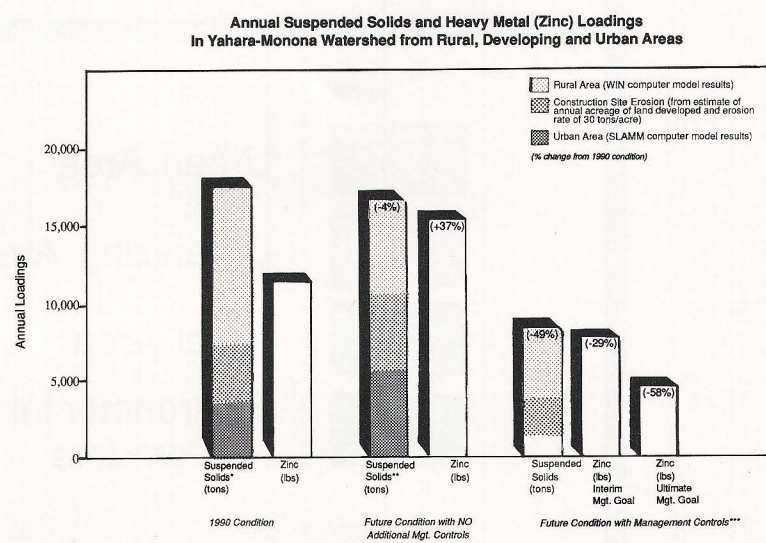
- ✎ keep leaves and grass clippings off the street and out of storm sewers
- ✎ direct your downspouts to grassed or unpaved areas
- ✎ reduce use of fertilizer and pesticides
- ✎ remove pet wastes from sidewalks, streets, and lawns
- ✎ keep engine oil, dirt, debris, and other pollutants out of streets and storm sewers
- ✎ reduce use of deicers
- ✎ don't wash cars on paved areas
- ✎ share these tips with friends
- ✎ volunteer for the "Take A Stake in the Lakes" shoreline cleanup program
- ✎ participate in "Clean Sweep"
- ✎ work with neighborhood associations, service clubs, schools or other groups in protecting water quality and being a part of the "Signs of Success"

For additional information, contact the Yahara-Monona Public Information Officer at the Dane County Lakes and Watershed Division.

What Will The Plan Accomplish?

The lakes in the Yahara-Monona Watershed will not clear up overnight. But implementation of the Yahara-Monona Plan can protect water bodies from further degradation. In the long run, and with lots of work, we will be able to reduce concentrations of nutrients and sediment loading. This will, in turn, reduce algae growth and provide us with clearer lakes. Through management practices and individual actions, stream and wetland areas can be improved in the short term, and certain problem pollutants, such as metals and pesticides, can be controlled so they do not harm aquatic life.

The figure below shows the shape of things to come. Based on computer models used in the planning process, this chart illustrates projected pollutant loadings with and without implementation of the Yahara-Monona Plan.



* Suspended Solids is the only pollutant that may be compiled from different land uses.
** Heavy metal loadings are associated primarily with urban land uses.
*** Suspended Solid reduction is from agricultural land being taken out of production.
**** Assumes 50% additional control of soil erosion from construction sites than in 1990 through stringent enforcement of ordinances.