WATER QUALITY ISSUES IN THE WISCONSIN RIVER BASIN

Above: Blue-green algal bloom on the Petenwell Flowage, an impoundment on the Wisconsin River.

What causes the water to turn bright green? Excessive nutrients (particularly phosphorus) enter the water from runoff from agricultural fields, barnyards, and residential yards as well as wastewater from industrial and municipal systems (stormwater and treatment plants). These excessive nutrients "fertilize" the water causing algae to grow and spread in the waterway.

Photo at Left: Skin rash from wading in water containing bluegreen algae.

WHAT'S WRONG WITH THE WATER?

- **In 2004-05, Petenwell Flowage exceeded the World Health Organization (WHO) standard for high risk to public health of 100,000 blue-green (BG) algal cells per milliliter on several occasions. Algal toxins were present in some of the samples.**
- **In 2005, the Big Eau Pleine Reservoir had BG cell counts up to double the WHO standard.**
- **In 2009, the Petenwell Flowage had BG cell counts in excess of 3 million cells/mL.**
- **Signs were placed near swimming areas on the Petenwell Flowage warning people about risks associated with BG algae.**
- **In 2009, the Dept. of Health Services documented over 41 cases statewide of human health exposure related to BG algae blooms including: respiratory ailments (coughing), watery eyes and rashes.**

THE WISCONSIN RIVER IS AN IMPORTANT RECREATIONAL, ECONOMIC AND NATURAL RESOURCE WORTH RESTORING

The Wisconsin River drains approximately 20% of the State of Wisconsin to the Upper Mississippi River system, and has experienced a long history of poor water quality conditions due to excessive nutrients, especially phosphorus. Low levels of dissolved oxygen in the river and severe algal blooms in impoundments have decreased opportunities for recreational activities, raised concerns for human health, damaged fish and aquatic life, and overall, has lowered the aesthetics and quality of life benefits of living along the River.

Three major impoundments in the Wisconsin River Basin: the Big Eau Pleine, Petenwell, and Castle Rock have been identified by the Wisconsin Department of Natural Resources (WDNR) as polluted waterways and have been listed on the State's List of Impaired Waters that is reported to the U.S. Environmental Protection Agency every 2 years.

The Wisconsin River system is a valuable recreational, economic and natural resource to the State of Wisconsin. There is a pressing need to identify the sources of nutrients to the Wisconsin River Basin and assess the environmental conditions causing these impairments.

Below: In the winter of 2009, fish lie dead along the shores of the Big Eau Pleine Flowage due to low dissolved oxygen caused by excessive nutrient loading and low water levels.. Fish kills have often occurred in the Petenwell.

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The map above shows the extent of the Wisconsin River Basin. The Central Wisconsin portion from Merrill to Castle Rock is included in the 2009 appropriation and water quality study.

WHAT HAS BEEN DONE?

- Studies began in 1991 and resulted in the Petenwell and Castle Rock Flowage Comprehensive Management Plan (January 1996).
- This plan identified Petenwell and Castle Rock Flowages as Wisconsin's first inland *Area of Concern*, a designation previously provided only to the Great Lakes.
- This plan showed that more monitoring data and further research was needed to model the sources of pollutants (phosphorus loads) to the Wisconsin River. This goal remains a priority today.
- Preliminary analysis from 5 years of water quality data suggest non-point sources contribute 20-34% and point sources contribute 26%-52% of the total annual load.

A WATER QUALITY PARTNERSHIP

A partnership has formed to achieve water quality goals with: WDNR, US Army Corps Engineers, USGS, Wisconsin Valley Improvement Corporation, University of Wisconsin– Stevens Point, County Land Conservation Departments, Petenwell and Castle Rock Stewards and the Big Eau Pleine Citizens Organization. **Collectively the agencies, organizations and citizens must join together to find solutions to reduce phosphorus loads to restore the Wisconsin River Basin.**

WHAT ARE THE NEXT STEPS?

Beginning in 2009, the Wisconsin State Legislature appropriated $150,000 per year for the next 5 years to conduct a monitoring and modeling study in the Wisconsin River Basin from Castle Rock dam upstream to Merrill. While this appropriation is a great start, additional funding is needed. The WDNR is currently applying for a grant through the U.S. Army Corps of Engineers and seeking other federal support. The total cost of the project is estimated at $2 million. The project includes the following elements:

- Conduct 3 years of monitoring including 21 river sites and 23 reservoir sites.
- Establish at least 6 new USGS flow gauging stations.
- Develop water quality and land use models for the basin.
- Determine phosphorus loads from all sources: including point sources, nonpoint sources, and natural background.

WHAT IS A TMDL?

Completing a study, known as a Total Maximum Daily Load or TMDL, will determine the phosphorus reductions needed from each source to meet water quality restoration goals, focus pollution controls where they can be most effective, and in turn, reduce risks to human health by decreasing harmful algal blooms. TMDLs are required by the U.S. EPA for all waterbodies listed on Wisconsin's List of Impaired Waters, sometimes known as the 303(d) List.

WE MUST WORK TOGETHER TO RESTORE THE WISCONSIN RIVER WATERSHED