



STRATEGIC PLAN

FOR THE

BIG EAU PLEINE RIVER
WATERSHED AND RESERVOIR



BIG EAU PLEINE TASK FORCE

December 2011

MARATHON COUNTY
BOARD OF SUPERVISORS

ENVIRONMENTAL
RESOURCES COMMITTEE

BIG EAU PLEINE TASK FORCE

BIG EAU PLEINE TASK FORCE

- | | |
|---|--|
| John Small, Task Force Chair | Marathon County Supervisor |
| Jim Burgener, Director | Conservation, Planning & Zoning |
| Andy Johnson, Environmental Resources Coordinator | Conservation, Planning & Zoning |
| William Duncanson, Director | Parks, Recreation and Forestry |
| James Vanden Brook, Chief, Water Quality Section | Wisconsin Dept. of Agriculture, Trade
and Consumer Protection |
| Scott Watson, Basin Supervisor | Wisconsin Dept. Natural Resources |
| David Coon, Director Environmental Affairs | Wisconsin Valley Improvement Company |
| Matt Zoschke, County Conservationist | Clark County |
| Amy Niegum, District Conservationist | Natural Resources Conservation Service |
| Steve Oberle, County Conservationist | Taylor County |
| Dave Ruesch | Farm Producer |
| Ken Hein, Maple Ridge Dairy | Farm Producer |
| Michael R. Paul, President | Big Eau Pleine Citizen Organization |
| Ken Dorshorst, Member | |

Conservation, Planning and Zoning Support Staff

- | | |
|-----------------|----------------------------------|
| Diane Wessel | Comprehensive Planner |
| Gary Hetzer | Geographical Information Systems |
| Loretta Schultz | Secretary |
| Paul Daigle | Conservation Division Manager |

TABLE OF CONTENTS

List of Acronyms..... i

INTRODUCTION..... 1

FRAMING THE PARTNERSHIP PROCESS..... 2

THE ECONOMIC AND LANDSCAPE CONTEXT OF THE BIG EAU PLEINE..... 2

MAKING THE CASE FOR ACTION IN THE BIG EAU PLEINE RIVER WATERSHED... 3

CONCLUSION..... 5

POLICY RECOMMENDATIONS 6

STRATEGIC PLAN
FOR THE
BIG EAU PLEINE RIVER
WATERSHED AND RESERVOIR

List of Acronyms

BEPCO	Big Eau Pleine Citizens Organization
BMP	Best Management Practices
DATCP	Wisconsin Department of Agriculture, Trade and Consumer Protection
DO	Dissolved Oxygen
DNR	Wisconsin Department of Natural Resources
FERC	Federal Energy Regulatory Commission
LWRM	Land and Water Resource Management
MOA	Memorandum of Agreement
NRCS	USDA-Natural Resources Conservation Service
POWTS	Private On-site Waste Treatment Systems
PPM	Part per million
TMDL	Total Maximum Daily Load
WVIC	Wisconsin Valley Improvement Company

INTRODUCTION

As ice melting and spring runoff events began on the Big Eau Pleine Reservoir in the spring of 2009, residents, sportsman and officials saw the first evidence of a significant fish die-off. In January, the dissolved oxygen (DO) levels throughout the reservoir had dropped below 1 part per million (ppm). Without areas of safe harbor for the fish within the reservoir or adequate aeration capacity to provide a limited refuge for fish, the fishery collapsed. Unfortunately, fish kills are not new to this river and reservoir system. Low dissolved oxygen levels during the mid to late winter have been a reality with the reservoir since its construction in 1937.

In response to the fish kill, Marathon County convened a meeting between Wisconsin Department of Natural Resources (DNR), Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), Big Eau Pleine Citizens Organization (BEPCO) and Wisconsin Valley Improvement Company (WVIC) to develop a short term plan to assess the impact on the fishery, adequacy of the aeration system, and water quality conditions. In November 2009, the Big Eau Pleine Task Force completed the short term strategic plan which included the following:

- a. Historic Case Study of the Big Eau Pleine Watershed and Reservoir. The case study summarizes nearly 70 years of water quality studies, management plans, conservation projects, and regulatory initiatives aimed at reducing the sediment and nutrient runoff.
- b. Action Plan to Upgrade the 1981 Aerator System. The plan described the purpose, condition and performance of the aeration equipment as of 2009. The plan outlined improvements to the aeration equipment to improve performance, as well as a Memorandum of Agreement (MOA) to clarify the roles and contributions of the partners in the aeration equipment's on-going operations and maintenance.
- c. Long Range "Plan of Work" to Address the Water Quality and Quantity of the Big Eau Pleine River System. The "plan of work" identified the partners and actions needed to assess best management practice needs.

The Big Eau Pleine Task Force submits this document to identify the role of governmental agencies, sportsman and citizen groups, educational institutions, agricultural groups, and the WVIC to improve the health of the river system while balancing the needs of community and economic interests. It will also provide a foundation of understanding for the policies that may be proposed by local leaders.

FRAMING THE PARTNERSHIP PROCESS

The strategic plan process is designed to build upon the existing capacities and resources of agencies to efficiently leverage financial and technical assets. The task force was established by Marathon County to assure that all interested parties were represented and County policy is based upon recommendations consistent with community and economic development goals.

The task force consisted of representatives of USDA-Natural Resources Conservation Service (NRCS), DNR, WVIC, DATCP, Clark County, Marathon County, Taylor County, BEPCO, and local dairy producers. It was important for farm producers to be part of the task force to assure that members understand farming challenges and the effectiveness of conservation initiatives.

THE ECONOMIC AND LANDSCAPE CONTEXT OF THE BIG EAU PLEINE

Policy recommendations and program activities for the Big Eau Pleine River Watershed and Reservoir need to be established with an understanding of the region's unique natural resources and economic contributions. Recommendations must realistically capture the scope of financial and technical resources required to improve the water quality and the time required for best management practices to influence change in water quality. The financial limitations of landowners, industries and public agencies require that local partnerships coordinate and leverage multiple-sourced resources to be effective.

The Big Eau Pleine is part of the Upper Wisconsin River basin which comprises nearly 20% of the State's landscape. The reservoir acts as the major source of water that is used to help regulate the flow of the Wisconsin River during low flow seasons. DNR has identified four (4) municipalities and eight (8) industries within Marathon County along the Upper Wisconsin River with Wisconsin Pollutant Discharge Elimination System permits that base respective discharge limits upon water flow in the river. The operation of the Wisconsin River System, including the Big Eau Pleine reservoir is the responsibility of WVIC with regulatory authority provided by the Federal Energy Regulatory Commission (FERC).

The Big Eau Pleine agricultural producers represent nearly 850 farms. These farms create \$100 million annually of direct farm receipts from dairy and commodity crops. Fifteen percent of Marathon County's jobs are created by the agricultural industry. Profitable farmers with reasonable and achievable performance criteria and incentives are critical to the success of any

proposed policy initiatives. Success is achieved when soil and water resources are protected while assuring that landowners meet the challenge of producing food.

The Big Eau Pleine Reservoir is a regional recreation destination. The Marathon County Parks, Recreation and Forestry Department provides recreational opportunities within 3 parks in the Big Eau Pleine watershed. The most notable is the Big Eau Pleine Park which consists of 2,050 acres located on the north shore of the 7,000 acre Big Eau Pleine Flowage. Poor water quality and fish kills significantly impact the economic and recreational opportunities associated with the reservoir such as boating, swimming, fishing and businesses that support these activities. The Big Eau Pleine Park represents a major public investment of land and recreational infrastructure along the reservoir. In 2010, camping in the BEP Park generated nearly \$300,000 of revenue for the local economy. According to BEPCO estimates, nearly \$2 million of economic activity is generated annually from fishing opportunities in the watershed.

MAKING THE CASE FOR ACTION IN THE BIG EAU PLEINE RIVER WATERSHED

The Big Eau Pleine watershed includes nearly 238,000 acres with 217,000 acres in Marathon County, 8,500 acres in Clark County, and 12,000 acres in Taylor County. It represents the most extensive agricultural area in Marathon County with nearly 60% of the land base under active cropping use and 17,000 cows. The fine textured soils, extensive man-made field drainage system, and loss of wetlands create a “flashy” hydrology where runoff from snowmelt and rain carry soil and manure loads to streams. The runoff contributes excessive loads of nutrients to the reservoir and Wisconsin River. The soil sediment, organic matter and nutrients compromise the water quality necessary to support a sustainable fishery and provide high quality recreational activities. Excessive nutrient loading contributes to algae blooms which occur several times annually. Decomposition of algae and organic matter sediment consumes available dissolved oxygen needed by the fishery in the winter.

Water quantity management and operational activities for the reservoir are a complicated balancing act. The WVIC must strive to meet the water flow needs of the Wisconsin River for municipal discharges, power and paper industries, as well as sustain the natural resources and recreational expectations of the local communities. The waters of the Big Eau Pleine Reservoir are necessary to help sustain the river flows during low flow periods, commonly in summer and winter.

The “60% Solution” is a water quantity management concept proposed by BEPCO to reduce the probability of fish kills. BEPCO has assessed that there is a very strong statistical correlation between fish kills and prescribed water levels over winter. The concept is supported by 40 years of operational data, but the application of the data to reservoir operations is not endorsed by all parties. The DNR recommends a winter storage goal of 60%, using operation criteria from July through November to continue protection of the Wisconsin River target flows and maximize the potential to reach the 60% winter storage goal. WVIC wants to maximize operational flexibility, but recognizes the value of winter storage goals.

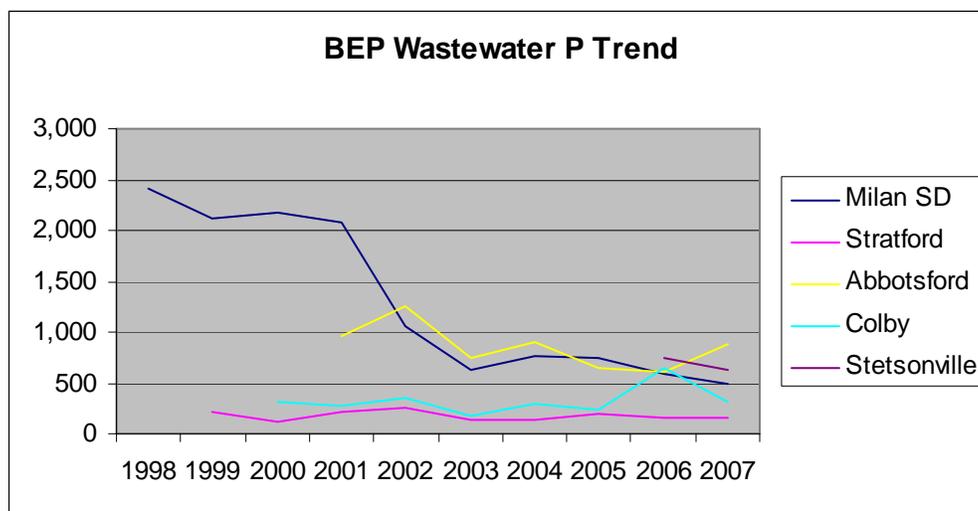
Through modeling conducted at BEPCO’s request, the WVIC determined that it is possible to change the summer and winter operating procedures and realize a significant increase in water levels over winter during drought conditions. This can be done while still protecting minimum Wisconsin River flows and without impacting flows or reservoir operations upstream of the Big Eau Pleine. However, WVIC believes that a change in reservoir operations every year is not required to help protect the fishery. Moreover, modifying the operating plan according to the modeling would result in an estimated hydropower generation loss averaging 1.7 million KWh per year whether drought conditions existed or not. Instead, the WVIC believes that its enhanced drought contingency plan is the methodology that should be used to address severe drought conditions and thereby help protect the fishery during these extreme events, not a permanent change in reservoir operations.

Agricultural producers have a long history of implementing conservation in the watershed. Although most farmers are in compliance with state agricultural performance standards and local ordinances, the sediment and nutrient loads remain too high to protect the water quality. In cases where performance standards are not being met or chronic runoff events occur that threaten the water quality and fishery, Marathon County may need to provide an increased regulatory presence. In order to require farmers to reach beyond current performance criteria, additional education, technical and financial assistance will need to be offered. Marathon County with its partners must provide producers with better strategies to minimize runoff through soil saving Best Management Practices (BMPs), nutrient management plans, and manure treatment and distribution technologies such as anaerobic digestion and manure injection equipment.

Farming is not the only contributor to pathogens, nutrients, and sediment to the Big Eau Pleine River system. Sediment from non-metallic mining, once a significant contributor of sediment to the river system, is now regulated and minimized through state codes and local ordinances. Continued support of administrative and technical efforts by local and state agencies in regulation of these mining activities is necessary. Similarly, private sanitary treatment systems contribute less than 1% of the nutrient load to the river but pose serious public health concerns when left to directly discharge into ditches and waterways. Current regulatory oversight has been effective in controlling design and operations of new Private On-site Waste Treatment Systems (POWTS), but more needs to be done to address discharges from old systems and the education of holding tank owners to reduce discharges of human wastes.

Soil erosion from non-agriculture activities has been significantly reduced since storm water permits have established erosion control standards for construction sites, road work, and industrial storage. The mass of phosphorous discharged to the Big Eau Pleine River from point sources has been reduced with the inclusion of phosphorous limits in waste water permits since 1997 (see Table 1).

Table 1. Pounds of Phosphorus Delivered/Year.



CONCLUSION

The Big Eau Pleine River Watershed and Reservoir represent tremendous natural and cultural resource assets to our community. The watershed is home to an agricultural industry producing

and processing a variety of dairy and commodity products. The rural character of the region is defined by its land use, beauty and the local businesses. However, runoff from fields and farmsteads threatens the health of its people, soil and water resources, and community. The time to act is now.

For nearly 80 years, conservation agencies have worked with private landowners and shared in their investments to improve the management of the soil and water resources in order to sustain its inherent productivity and to help them prosper. Even though the landowners have done much to meet the expectations of state and local resource management goals, the Big Eau Pleine River and Reservoir remains a polluted water body due to runoff of nutrient, soil sediment, and organic matter. Aeration alone is not enough to protect the fishery through low oxygen periods.

Marathon County needs to lead an effort with many identified partners to efficiently leverage existing and new resources to continue improvements of water quality. Education, technical assistance and financial incentives are needed to help landowners, cities, villages, and towns better manage and protect the resources in ways that are profitable and sustainable.

The recommendations forwarded by the Big Eau Pleine River Task Force represent policies and activities that Marathon County should develop, coordinate and implement to lead a local effort to improve community and economic development opportunities, as well as minimize public health concerns associated with the watershed's water quality.

The fish kill of 2009 is symptomatic of a serious water quality problem caused by excessive soil sediments, nutrients and organic matter that flow into the Big Eau Pleine Reservoir. Conditions are made worse by low flows during drought periods. Until poor water quality is abated in the Big Eau Pleine Reservoir watershed, the potential for fish kills will remain.

POLICY RECOMMENDATIONS

1. **Aeration System Operation and Maintenance.** The aeration system will be an ongoing and necessary management tool to the well-being of the reservoir and fishery. It opens 30-60 acres of water surface for aeration during the late winter and early spring. Operations and maintenance and capital expenditures for the system will be administered through a Memorandum of Agreement established for 5 year periods.

WVIC, the FERC licensed operator of the reservoir, and DNR, the owner of the land and aeration equipment, will serve as the primary agents to determine the start-up criteria, safety and operations of the system. These organizations will also serve as the primary water quality monitoring agents for the tributary and reservoir waters.

Participating partners should contribute funds to annual electrical costs and the repair or replacement of capital improvements such as items associated with motors, blowers, and buildings.

2. **Resource Management Initiatives.** The local, state and federal agencies serve as the primary vehicle of delivery of local conservation programming to landowners and residents. Local conservation programs include education, resource assessments and planning, technical assistance, grant funding, and administration of regulations. Marathon County will provide leadership through policy, and partnership coordination through the Marathon County Comprehensive Plan. Specifically,

a. **Marathon County will:**

- i. Adopt and implement state agricultural performance standards in local ordinance to address chronic and significant discharges.
- ii. Minimize or eliminate winter land surface spreading activities of wastes.
- iii. Promote technologies to treat and distribute livestock waste.
- iv. Provide Best Management Practice education and training to landowners.
- v. Administer the Non-metallic Mining Ordinance.
- vi. Eliminate direct surface discharges of sanitary wastes.
- vii. Develop a reservoir recreation management plan.
- viii. Provide financial support of annual operational costs of the aerator.
- ix. Develop and implement a Fenwood Creek pilot project (see description below).

b. **WI Department of Natural Resources (DNR) will:**

- i. Develop a reservoir management plan to protect the natural resources (land, water and fish) of the Big Eau Pleine reservoir and tributary waters. The plan will set goals for the fishery and supporting food system.
- ii. Provide lake management grants to local partners.

- iii. Complete a water quality assessment of the Upper Wisconsin River Basin and develop a Total Maximum Daily Load (TMDL) plan for the Big Eau Pleine Watershed and Wisconsin River.
 - iv. Support Taylor, Marathon, and Clark Counties with investigation and enforcement of agricultural performance standards and prohibitions.
 - v. Provide Best Management Practices cost-share grants to landowners.
 - vi. Provide water quality monitoring of algae concentrations that threaten public health.
 - vii. Primary responsibility role (with WVIC) for the aeration system in an operation and maintenance plan.
 - viii. Coordinate aeration system operations (with WVIC).
- c. WI Department of Agriculture, Trade and Consumer Protection will:**
- i. Provide BMP grants to landowners for state agricultural performance standard(s) compliance.
 - ii. Provide administrative support for the Farmland Preservation Program.
 - iii. Coordinate education with agriculture industry associations to producers on nutrient management and non-point runoff controls.
- d. Wisconsin Valley Improvement Company will:**
- i. Provide water quantity and quality monitoring.
 - ii. Coordinate aeration system operations with DNR.
 - iii. Lead reservoir operation activities.
 - iv. Update reservoir modeling tool(s) and drought management plan at 5-year intervals (next update due 2016).
- e. USDA – Natural Resources Conservation Service will:**
- i. Provide technical assistance, conservation planning, and engineering support to landowners.
 - ii. Provide cost-share assistance to landowners.
 - iii. Develop and implement manure winter spreading evaluation and planning strategies to minimize runoff risks.
- f. Big Eau Pleine Citizens Organization will:**
- i. Provide a citizen's voice to community needs relative to property, resource management, and public waters.

- ii. Coordinate input from community-based organizations such as recreational and lake groups to provide feedback about program outcomes and outreach needs.
 - iii. Pursue grant opportunities.
 - g. **Farm industry representatives will:**
 - i. Provide landowner education.
 - ii. Provide feedback on incentives and program initiatives.
 - h. **Taylor County Land Conservation Department will:**
 - i. Implement conservation programs focusing upon conservation compliance, nutrient management, and animal waste management through the Land and Water Resource Management (LWRM) plan.
 - ii. Provide education on groundwater protection and Best Management Practices.
 - i. **Clark County Land Conservation Department will:**
 - i. Implement conservation programs focusing upon conservation compliance, nutrient management, and animal waste management through the LWRM plan.
 - ii. Implement Heart of America's Dairyland Agricultural Enterprise Area.
3. **Fenwood Creek Watershed Project.** Because the water quality assessment activities and the Big Eau Pleine River and Reservoir Total Maximum Daily Load plan will not be completed until 2015-16, the task force recommends that the agencies initiate a small scale watershed project. The purpose of the project is to develop the strategies relative to Best Management Practices, waste treatment and distribution technology implementation, conservation planning, financial incentives, technical assistance, and education needed to achieve water quality outcomes for the watershed. The project would include the following elements:
- Water quality monitoring. Assess the management and environmental performance of BMPs, quantify the pollutant contributions of major event runoff discharges vs. chronic low-level discharges, and document changes in water quality over time.
 - Education. Communicate performance expectations and regulatory requirements to landowners, towns, cities and villages.
 - Nutrient management planning. Provide technical and financial assistance to landowners to assure all producers have and follow nutrient management plans.
 - Manure winter spreading assessments. Develop and implement criteria to assess winter spreading runoff risks and provide planning assistance to landowners to manage risks.

- “Edge of Field” Best Management Practices. Implement BMPs down slope of cropland to treat and reduce sediment and nutrient loading from runoff. In cases where runoff contributions are chronic and cannot be minimized to acceptable levels, permanent land use conversion strategies will be developed.
- Financial and management incentives. Develop financial and management incentives to promote BMP implementation, including long-term maintenance and performance of BMP.
- Waste treatment and distribution technology. Increase understanding and implementation of waste treatment and distribution technologies that reduce runoff risks and maximize nutrient utilization. Provide cost-benefit analysis of new technologies and develop adoption strategies.