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**Name of Organization:** Wisconsin Department of Natural Resources

**Type of Organization:** State

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**Project Title:** Breakwall Bioengineering Pilot

**Project Category:** Habitat (Ecological) Protection and Rest

**Rank by Organization (if applicable):** 2

**Total Funding Requested (\$):** 50,000 **Project Duration:** 2 Years

**Abstract:**

Shallow lakes in the Winnebago pool system(Lakes Butte des Morts, Poygan, Winneconne) have experienced dramatic declines in riparian wetland areas due to wave erosion and ice heaving/expansion. For several decades, the installation of rock rip rap (offshore and onshore) has been used to protect soft wetland edges. This quarried stone rip-rap has great value for protection of the wetland edge effectively reducing shoreline erosion and improving localized water clarity. This initiative seeks to improve the design with bioengineered applications resulting in improved aesthetics and higher quality habitat upon and around the breakwall structure. Improved structure designs will support greater biodiversity and increase the acceptability of this rip-rap approach thereby facilitating large scale application. Subsequent improvements in wetland protection , habitat and water quality will benefit the entire system, including Lake Winnebago. The water quality of Lake Winnebago has a great influence upon the lower Fox river which enters Lake Michigan at Green Bay. The biodiversity of the Winnebago system is also a factor for healthy Great Lake ecosystems. A review of existing breakwater structures used to stop wave and ice forces will be completed. A feasibility analysis will follow that identifies feasible approaches. A number of pilot structures will be constructed and evaluated for effectiveness. These may involve plantings, structural diversity, sinuosity, structural height,width, length, materials, organic enhancements or other bioengineered applications.

**Geographic Areas Affected by the Project**

**States:**

- |                                    |                                     |              |
|------------------------------------|-------------------------------------|--------------|
| <input type="checkbox"/> Illinois  | <input type="checkbox"/>            | New York     |
| <input type="checkbox"/> Indiana   | <input type="checkbox"/>            | Pennsylvania |
| <input type="checkbox"/> Michigan  | <input checked="" type="checkbox"/> | Wisconsin    |
| <input type="checkbox"/> Minnesota | <input type="checkbox"/>            | Ohio         |

**Lakes:**

- |  |                          |           |
|--|--------------------------|-----------|
| <input type="checkbox"/> Superior            | <input type="checkbox"/> | Erie      |
| <input type="checkbox"/> Huron               | <input type="checkbox"/> | Ontario   |
| <input checked="" type="checkbox"/> Michigan | <input type="checkbox"/> | All Lakes |

**Geographic Initiatives:**

- |  |                                  |                                     |                                      |   |
|--|----------------------------------|-------------------------------------|--------------------------------------|---|
| <input type="checkbox"/> Greater Chicago | <input type="checkbox"/> NE Ohio | <input type="checkbox"/> NW Indiana | <input type="checkbox"/> SE Michigan | <input type="checkbox"/> Lake St. Clair |
|--|----------------------------------|-------------------------------------|--------------------------------------|---|

**Primary Affected Area of Concern:** Fox River/Green Bay, WI

**Other Affected Areas of Concern:**

***For Habitat Projects Only:***

**Primary Affected Biodiversity Investment Area:** Green Bay Western Shore

**Other Affected Biodiversity Investment Areas:**

**Problem Statement:**

Wetland losses on the Winnebago system pool lakes ( 27,000 acres), are unacceptable for the maintenance of biodiversity and water quality. Wave forces and ice related shore erosion is reducing the system value. Large stable breakwater structures are needed to protect the wetlands and upland shores. Presently, it has become more difficult to obtain regulatory approval for the structures due to concerns about aesthetic and biological integrity. The "problem" is really a "challenge"; to improve the aesthetic and biological integrity of the structures themselves, thereby supporting further improvements in pool lake water quality and biology.

Lake Michigan and Green Bay receive the outflow from the Winnebago system. Over 50% of the non-point source pollution entering the lower Fox river is estimated to originate within the tributaries discharging into Lake Winnebago. Any improvements to the system will help water clarity and biodiversity in downstream receiving waters, including the lower Fox river.

**Proposed Work Outcome:**

Develop and evaluate new/innovative construction approaches for breakwalls, utilizing various bioengineering methods that improves biodiversity and aesthetics while continuing to protect shore areas; i.e. maximize the structural value.

Pilot structures will be constructed.

A feasibility analysis will be completed.

**Outcomes:**

- \* lower phosphorous loads from Lake Winnebago to Green Bay and L Michigan
- \* lower sediment loads from Lake Winnebago to Green Bay and L Michigan
- \* lower organic loadings from Lake Winnebago to Green Bay and L Michigan
- \* improved biodiversity in basin, including the great lakes
- \* development of bioengineering methodology with universal value
- \* strengthened partnerships in Fox/Wolf river basin
- \* improved local economy from fisheries/waterfowl use improvements

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<b>Project Milestones:</b>	<b>Dates:</b>
Project Start	10/2000
Feasibility Analysis	01/2001
Complete Pilot Designs	01/2001
Complete Pilot Construction	06/2001
Complete phase 1 evaluation	12/2001
Complete phase 2 evaluation	10/2002
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Project End	10/2002

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Project Addresses Environmental Justice

**If So, Description of How:**

Project Addresses Education/Outreach

**If So, Description of How:**

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**Project Budget:**

	<b>Federal Share Requested (\$)</b>	<b>Applicant's Share (\$)</b>
<b>Personnel:</b>	15,000	5,000
<b>Fringe:</b>	2,000	500
<b>Travel:</b>	1,000	500
<b>Equipment:</b>	500	0
<b>Supplies:</b>	0	0
<b>Contracts:</b>	6,500	0
<b>Construction:</b>	25,000	0
<b>Other:</b>	0	0
<b>Total Direct Costs:</b>	50,000	6,000
<b>Indirect Costs:</b>	0	0
<b>Total:</b>	50,000	6,000
<b>Projected Income:</b>	0	0

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**Funding by Other Organizations (Names, Amounts, Description of Commitments):**

Poygan Sportsmens Club  
Butte des Morts Conservation Club  
Winnebago County LCD  
WI DNR Shallow Lakes Initiative

We expect that the above named partners will show monetary and community support for the project. At this time we would not be able to provide credible values for that support. Past actions from these partner groups demonstrates a committment to the resource and we feel it is reasonable to assume that will continue.

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**Description of Collaboration/Community Based Support:**

We expect to partner with University of Wisconsin- Oshkosh for evaluation actions, the clubs mentioned in sect 8 for support, Winnebago County Land Conservation Department for design and construction assistance. The University of Wisconsin - Extension Resource Agent may also support educational actions regarding the pilot project.