

Lower Wolf River Bottomlands
Natural Resources Area



Feasibility Study
and
Environmental Impact Statement

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Guidance Team

Paul DeLong, Director, Division of Forestry
Tom Hauge, Director, Bureau of Wildlife Management
Signe Holtz, Director, Bureau of Endangered Resources
Bob Roden, Director, Bureau of Facilities and Lands
Mike Staggs, Director, Bureau of Fisheries Management
Curt Wilson, Regional Land and Forestry Leader, Northeast Region (NER)

Core Team

Tom Bahti, NER Wildlife Specialist
Dan Helf, Water Leader, Wolf River Basin
Jill Mrotek, NER Property Planner (team leader)
Dave O'Malley, Rivers Specialist
Jean Romback-Bartels, Land and Forestry Leader, Wolf River Basin
Art Techlow, Winnebago System Biologist

Expanded Team

Mark Beilfuss, Warden
Kay Brockman-Medegas, Wildlife Biologist
Andy Galvin, Endangered Resources Inventory Coordinator
Ron Jones, Forester
Kendall Kamke, Fisheries Biologist
James Robaidek, Wildlife Technician
Eric Roers, Wildlife Technician
Paul Samerdyke, Wildlife Technician
Mike Young, Warden

DNR and Other Staff Specialists

Ellen Barth, Land and Forestry Leader, Upper Fox Basin
Kyle Burton, GIS Analyst
Eric Epstein, Community Ecologist
Terry Gardon, Land and Forestry Leader, Upper Green Bay
Dick Nikolai, Wildlife Biologist
Mary Hamel, Public Involvement Specialist
Mike Lutz, Attorney
Catherine Neisweinder, UWEX-Basin Educator
Mike Penning, Real Estate Specialist
Jeff Schimpff, EIS Coordinator
Joanne Tooley, GIS Coordinator
Tom Watkins, Land Resource Specialist
John Young, Non-Point Source Coordinator

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INTRODUCTION

This document is the Feasibility Study and Environmental Impact Statement (EIS) for the Lower Wolf River Bottomlands Natural Resources Area. The proposed project boundary includes 214,000 acres of lands in portions of Shawano, Outagamie, Waupaca, and Winnebago counties. Scattered within this boundary are 14 existing state properties. The proposed project would rely on partnerships between the Department of Natural Resources (Department), local governments, conservation groups, and others to protect the important natural resources inside the proposed boundary and would also use traditional Department land acquisition and easement programs. In order to achieve this, the Department would establish a land acquisition goal of 45,000 additional acres outside of the existing state properties to focus on opportunities for land protection of the Lower Wolf River and Embarrass River corridor and their important floodplain forests and marshes; and the potential to connect existing state properties. This EIS has been prepared to meet the requirements of the Wisconsin Environmental Policy Act (WEPA) and Chapter NR 150 of the Wisconsin Administrative Code.

Although a major feature of this proposed project is its extensive reliance on partnership efforts, the Department would still need authority to acquire additional land to meet the proposed project goals. A Feasibility Study is the mechanism for seeking this authority, which requires the approval of the Natural Resources Board and the Governor. A Feasibility Study is used to determine whether it is feasible for the Department of Natural Resources to establish and acquire a new property or to make a significant change to the boundary of an existing property. The evaluation of feasibility takes into account the physical and biological environment, the opinions of the public, including area landowners, and the availability of funding and staff to adequately accomplish the project goals. Further, a feasibility study analyzes boundary alternatives and makes a boundary recommendation, describes general land management concepts, and ensures ecosystem management principles are considered in these decisions.

The purpose of an EIS is to disclose, explain, and evaluate the proposed action's effect on the environment. The EIS describes and evaluates alternatives to the proposed course of action. To provide for public participation in the study process, the EIS is circulated for public review and comment for a period of 45 days, and a public informational hearing is conducted. The public review period and a formal hearing give interested and/or affected persons a chance to discuss the study area, project alternatives, and potential impacts directly with the study team.

Following completion of the 45-day public review period, the study team will analyze comments and information received, and modify this document and the project concept accordingly, if warranted. You will be notified via a Record of Decision when the EIS/Feasibility Study process has been completed. The final proposal will be referred to the Natural Resources Board for approval and then the Governor. Upon approval of this Feasibility Study/EIS, the Department would be authorized to begin land protection and acquisition efforts in the project area. The agency would then develop a property Master Plan to guide future development and management of the project. Master Planning involves another series of meetings to receive public comment.

The planning team hosted several meetings (i.e. open houses and working meetings) and published nine newsletters, which have generated considerable support for the project from the public, local officials, and area organizations. Additional information received from interested and concerned citizens has contributed to the development of this project and possible future management of these resources (Appendix A: Vision, Goals and Criteria for Identifying Conservation and Recreation Lands within the Lower Wolf River Bottomlands).

If you have questions or need additional information please contact Jill Mrotek at 920/492-5830 or email mrotej@dnr.state.wi.us.

The Lower Wolf River Bottomlands Natural Resources Area

SCOPE OF THIS REPORT

This report presents a description of the project area and evaluates the potential for additional protection and restoration of an ecologically unique and important area known as the Lower Wolf River Bottomlands. The proposed boundary described in this report includes 14 scattered properties already owned, eased and/or managed by the Department of Natural Resources. The Department, with public input, has explored the concept of establishing a 214,000 acre project boundary to provide opportunities for land protection of the Lower Wolf River and Embarrass River corridor and their important floodplain forests and marshes; and connect existing state properties. Within this boundary area, the Department would pursue partnerships with local governments, conservation organizations, and others along with traditional Department land acquisition and easements. The Department would focus its land acquisition/easement efforts in key areas of this corridor and look at opportunities to connect existing properties. In order to achieve this the Department would establish a land acquisition goal of 45,000 acres in addition to its current land purchasing authorities within existing property boundaries.

This project was initiated as the Lower Wolf River Bottomlands; this is synonymous with Lower Wolf River Bottomlands Natural Resources Area. The title of "Natural Resources Area" has been added to clarify the project name, just as the Department has "State Wildlife Areas or State Fishery Areas" there are "Natural Resources Areas" that allow for a broad range of vegetation and recreation management. Specific vegetation and recreation management practices will be determined through the master planning, and if appropriate the name could be revised.

The concept of the Lower Wolf River Bottomlands Natural Resources Area is the protection of the natural resources through a variety of methods including: 1) development of land management partnerships with citizens, local, state, county and federal governments, and various non-profit organizations and the Department; and 2) acquisition of land or easements by the Department. This project describes protecting the rich natural resources of this corridor for the future by evaluating potential opportunities to connect strategic state properties along the Lower Wolf River through ecosystem management. These state properties include designated wildlife areas, natural areas, and remnant fishery areas. The focus of this project is to provide further protection of critical habitat for a variety of benefits including; threatened and endangered species protection, fisheries spawning areas protection, protection of the water quality of the Wolf River and its tributaries, providing corridor connections for wildlife and recreation, and management of larger blocks of land for ecological restoration and increased recreational opportunities.

The area within the proposed project boundary is intended to identify where the Department has an interest in either working cooperatively with others for protection of the Wolf River system or in acquiring additional lands. The Department intends to buy land from willing sellers only as our practice is not to use condemnation. The Department would make payments in lieu of taxes on lands acquired, which has an effect similar to payment of property taxes by other landowners. This is addressed in more detail later in this document. This report does not require or recommend zoning changes for land within this boundary nor does it add any restrictions on management of private lands. The planning team felt it was important to address these issues as they have been raised as concerns by some landowners and discussed throughout this planning effort.

PROJECT NEED/OPPORTUNITY

The Lower Wolf River Bottomlands is an ecologically important landscape tucked away between the urban areas and agricultural communities of eastcentral Wisconsin and the extensive forests of northern Wisconsin. The proposed project area is predominately open and rural with large wetlands and agriculture dominating the landscape. It is within the ecological landscapes called "northeast plains" and "southeast glacial plains". The "northeast plains" landscape is described as an area having wetlands that are extensive but heavily drained for agriculture and has ecological management opportunities to benefit floodplain forest and the lake sturgeon population. The "southeast glacial plains" is described as a landscape having the highest wetland and river productivity for plants, insects, and invertebrates; specifically this project includes portions of the Lake Winnebago Pool system, which is important to many aquatic species, especially the lake sturgeon. In addition, this area has many highly productive wetlands that are dominated by native vegetation. (Ecological Landscapes of Wisconsin, WDNR 1999).

Land uses in this area are changing as there are increased demands for housing development due to the nearby population centers in the Fox Valley area such as Appleton, Neenah-Menasha, and Green Bay. The location of the Lower Wolf River Bottomlands, combined with the expansive range of habitats it offers, makes it very popular for a multitude of recreational pursuits, especially fishing and hunting. Changing land uses and increased development eventually would fragment the unique habitat contained in this system, potentially causing declines in important wildlife and fish populations and a decrease in recreational opportunities for the public.

The Lower Wolf River Bottomlands Natural Resources Area provides an opportunity to collectively protect and manage regionally significant natural communities. This project area provides necessary habitat for various wildlife and aquatic communities. The area harbors some of the state's largest contiguous tracts of bottomland hardwood forest and numerous wetlands. These floodplain forests and wetlands are the most important and extensive example of these community types in eastern Wisconsin. Protection of this area contributes to the Lower Wolf and Embarrass River corridors overall biological health and diversity in addition to providing important downstream water quality benefits. The globally rare lake sturgeon uses these river corridors for annual spawning.

Natural communities found within this project area with high significance because of their extent, quality or condition include several types of aquatic communities, floodplain forest, sedge meadows, and hardwood swamps (Table 1). Within these communities in the Lower Wolf River Bottomlands, over 43% of all the state's native plant species are found. Approximately 60% of the state's breeding bird species nest in the project area. The rivers, backwaters, oxbows, and lakes harbor numerous fish species both game and non-game alike, as well as a diverse concentration of reptiles, amphibians, and insects.

Table 1. Proposed Lower Wolf River Bottomlands Acres by Land Category

Land Category	Proposed Project Boundary Area	
	Acres	Percent
Total Area	214,215	
Agricultural land	82,765	39%
Wetlands	54,786	26%
Forested Wetland	39,407	19%
Forestland	20,313	10%
Open Water	9,011	5%
Grassland	6,378	3%
Bare Soil/Sand/Rock	1,154	<1%
Urban	393	<1%

Landscapes with diverse and high quality habitat support diverse numbers of plant and animal species. Common species are found here in abundance, as well as regionally and globally rare species (Appendix B: Rare Plant Species and Appendix C: Rare Animal Species). The Lower Wolf River Bottomlands study area provides habitat for 22 rare plant species (including 2 state endangered and 6 state threatened) and 105 rare animals (including 5 state endangered and 14 state threatened). These include the federally listed prairie white-fringed orchid (threatened) and the Karner blue butterfly (endangered). The river corridor and associated communities provide excellent habitat for many important non-game species, including cerulean warbler, prothonotary warbler, red-shouldered hawk, Forster's and black terns, least and American bitterns, Blanding's and wood turtles and the state threatened pugnose shiner, greater redhorse and river redhorse, as well as the southern most population of the threatened pygmy snaketail dragonfly.

In summary, the proposed Lower Wolf River Bottomlands is important ecologically because it contains:

- ❖ Northeast Wisconsin's last, large, continuous, and relatively intact floodplain forest and wetland communities.
- ❖ Over 43% of all the state's native plant species.
- ❖ Habitat for approximately 60% of the state's breeding bird species.
- ❖ Many threatened, endangered, or special concern plant and animal species including the globally rare lake sturgeon.

The Lower Wolf River Bottomlands Natural Resources Area also includes 100 miles of the Wolf River, 37 miles of the Embarrass River, portions of 4 tributary streams, and several minimally developed lakes and 14 various state wildlife, fishery, and natural areas along with scattered remnant fishery areas.

RELATIONSHIP TO OTHER PLANS

Although many areas within the Lower Wolf River Bottomlands area may receive a minimum degree of protection through existing floodplain and shoreland zoning, experiences demonstrate that regulations, or their administration, can change over time and other opportunities to protect these resources should be considered. This proposal will look at several alternatives for protecting the natural resources of the Lower Wolf River Bottomlands. It will also recommend a preferred alternative that identifies areas for natural resource protection.

This proposal has also examined other local, regional, and state long-range resource and outdoor recreation plans; implementation of this Lower Wolf River Bottomlands Natural Resources Area would complement those plans and recommendations.

Department's Biodiversity Report

The WDNR's Biodiversity Report (1995) specifically addresses the need to focus attention on riverine-floodplain wetlands along large rivers in the state. "*These lowland and bottomland hardwood forest areas have diminished significantly in the state and the remaining acreage of these types should receive additional protection.*" The report further discusses applying the principles of ecosystem management to the many kinds of aquatic communities and their associated species and suggests "*Put less emphasis on single species management and more on communities and ecosystems.*" Lastly, the report notes that there is a need to emphasize critical aquatic habitat protection and restoration priorities in land acquisition and easement programs. "*Undeveloped shoreline areas deserve special consideration because these opportunities are rapidly declining.*"

Wisconsin's Land Legacy: A Study Of Public Land Needs For Conservation And Recreation In Our State

The goal of this study is to assess the state's conservation and recreation needs over the next fifty years to both adequately protect Wisconsin's natural resources and to provide satisfying outdoor recreation opportunities. The study will not be completed until early 2002, but an interim report has been prepared that presents draft criteria for use in evaluating the state's natural resources and landscape. These criteria, which have been reviewed and accepted by the public, have been grouped into seven major themes or goals. This study has also identified the Lower Wolf River Bottomlands as an area of significance. It meets many of the study criteria listed below:

- ❖ Protect the Pearls - High-quality and unique natural areas
- ❖ Protect Functioning Ecosystems – Keep common species common
- ❖ Maintain Accessibility and Usability of Public Lands and Waters
- ❖ Think Big
- ❖ Connect the Dots – Create a Network of Corridors
- ❖ Protect Water Resources

Wolf River Basin Water Quality Management Plan: A Five-Year Plan to Protect and Enhance our Water Resources

The 1996 Water Quality Plan recommends that a "*feasibility study for long-term active and passive acquisition and management of properties that include riverine communities of the Wolf River and its tributaries, from Shawano Lake to Lake Poygan*" be conducted. The plan also recommends that water-related resource protection areas should have priority for acquisition.

Other important considerations for the Lower Wolf River and Embarrass River System include the restoration and monitoring of natural wetland communities, the protection of properties adjacent to state-owned properties and collaboration with other Fox-Wolf Basin stakeholders, public and private, for the protection of these natural resources.

The plan also identifies some key portions of the Wolf River that are very important for sturgeon spawning and other game fish, areas to be selected for exceptional resource waters classification, and protection of the large contiguous tracts of bottomland hardwood forest - a unique wetland community.

Statewide Comprehensive Outdoor Recreation Plan (SCORP)

The 2000-2005 SCORP lists several high priority policy recommendations that are supported by this proposal. Two of these are "acquiring lands threatened by development that meet environmental protection and recreational needs" and "evaluation of the concept of anticipating new activities and provide use areas for participants before conflict occurs." The Lower Wolf River Bottomlands Natural Resources Area could implement these kinds of recommendations in future planning efforts.

Outagamie County Plans

The 1994 Outagamie County Greenway Plan encourages protection of environmentally sensitive areas like wetlands, stream corridors, and highly aesthetic areas (Outagamie 1995). Several important ecological resources within the county are also within the Lower Wolf River Bottomlands Natural Resources Area: the Wolf River, Embarrass River, Shioc River, and Shaky Lake; Wildlife Areas - Maine, Deer Creek, Wolf River Bottoms, Outagamie, and Mack; other miscellaneous natural resources - wetland tracts including Black Slough, Rat River Marsh, and the Wolf River Marshes. Additionally, other locally significant areas included tracts of mature forest, small wetland pockets, remnant prairies and similar environmental pockets (Outagamie 1995).

PROPOSED PROJECT DESIGNATION AND ACQUISITION AUTHORITY

The proposed legal designation for the Lower Wolf River Bottomlands Natural Resources Area is "habitat area" as found in s. 23.092, Wis. Stats. This designation provides for both resource protection and recreation opportunities. Master planning would determine the specific resource management activities and recreational uses on the proposed property, and a final determination of the appropriate designation would occur upon completion of the master plan.

The Department would also need additional land acquisition authority for the areas it proposes to focus on that are outside existing state properties. This authority is found in s. 23.09(2)(d), Wis. Stats., and is granted through approval by the Natural Resources Board and the Governor. That statute authorizes land purchases by the Department for fisheries, wildlife, forestry, parks, natural areas, recreation, and habitat areas.

The Department would continue to use its approved acquisition authority within the existing designated state wildlife, fishery, and natural areas boundaries. Other statewide acquisition programs such as the State Natural Areas, Remnant Fishery Areas, and Statewide Habitat Areas would be continued and complement the land management goals within this proposed project area.

PROJECT OVERVIEW

Regional Analysis

The Lower Wolf River Bottomlands Natural Resources Area offers a unique opportunity to protect associated riverine communities that are of regional significance. This is an area that contains one of the last large, continuous and intact floodplain communities in the state. The location of this project is within a one-hour drive of 500,000 people in the Fox Valley and Green Bay communities (Map 1 Regional View) and an unlimited number of other Wisconsin citizens and visitors to the state.

The Lower Wolf River Bottomlands Natural Resources Area is centered on the lower reaches of the Wolf and Embarrass Rivers, from the city of Shawano downstream to Lake Poygan. The project area encompasses portions of 22 townships within Shawano, Outagamie, Waupaca, and Winnebago counties (Map 1).

- Portions of the townships of Belle Plaine, Waukechon, Hartland, Navarino, and Lessor in Shawano County.
- Portions of the townships of Deer Creek, Maine, Maple Creek, Bovina, Liberty, Ellington, Hortonia, and Dale in Outagamie County.
- Portions of the townships of Matteson, Mukwa, Royalton, Weyauwega, Fremont, and Caledonia in Waupaca County.
- Portions of the townships of Wolf River, Winchester, and Clayton in Winnebago County.

Public Land

There are approximately 31,000 acres of existing state-owned lands within the proposed project boundary (Map 2). These areas are managed to provide important breeding and nesting cover, as well as other habitat values to a wide variety of plant and animal species. In addition, there are private game farms and conservancy areas that provide similar habitat values.

These existing state-owned lands also provide recreation and limited outdoor education opportunities. There are a few private and county organizations, within or nearby the proposed

project area, that also offer outdoor experiences (such as Mosquito Hill Nature Center, Fallen Timbers Environmental Center, and Navarino Nature Center).

Table 2. State-owned Land in the Proposed Project Area

Property	Acres Owned/Eased	Acreage Goal	Remainder
<i>Wildlife Areas</i>			
Deer Creek Wildlife Area	1,490	1,490	0
Mack Wildlife Area	1,369	1,357	+12*
Maine Wildlife Area	720	760	40
Mukwa Wildlife Area	1,290	1,320	30
Navarino Wildlife Area	14,662	16,500	1,838
Outagamie Wildlife Area	725	690	35*
Rat River Wildlife Area	4,414	5,136	722
Wolf River Wildlife Area	1,709	2,209	500
Wolf River Bottoms Wildlife Area - K&S and LaSage Units	2,982	3,128	146
<i>Fishery Areas</i>			
Wolf River Fishery Area	193	206	13
Remnant Fishery Areas and Statewide Habitat Areas	791	2,991** 1,302***	
<i>State Natural Areas</i>			
Hortonville Bog State Natural Area	680	1,192	512
Shaky Lake State Natural Area	220	290	70
Total Existing Projects	31,210	34,278	
<p>* Acreage goals have been exceeded with approval understanding that the property is awaiting an updated master plan and/or land was received through donation. ** Remnant acreage goals are based on statewide authority and distributed on a County need basis for scattered cold water habitats in need of protection or restoration as defined in NR codes, manual codes, and criteria in program handbooks (2,991 represents county wide acreage goal for Winnebago, Waupaca, Outagamie, and Shawano Counties). *** Statewide habitat goals are based on statewide authority and distributed on a Regional need basis for scattered warm water habitats in need of protection or restoration as defined in NR codes, manual codes, and criteria in program handbooks (1,302 represents an acreage goal for the Northeast Region).</p>			

Social-economic Conditions

The proposed project area is located close to the Fox Valley, one of the busiest economic areas of the state. Both business and residential development are quickly moving out to the rural areas along the Wolf and Embarrass Rivers. This development helps to create a strong economy but also could impair the uses of the Wolf River corridor, including recreation, fisheries reproduction, wildlife habitat and the forestry resource.

As an example of the recreational values the Wolf, Embarrass and Shioc Rivers bring to the communities here, area cities in conjunction with the Outagamie County UW-EX formed the Tri-River Nature Area. This group promotes recreational pursuits such as wildlife viewing, canoeing, and hiking. There is also a great deal of enthusiasm for the opportunities to provide birding trails between current Department properties and other state and county lands. If lands were acquired and habitat restored or enhanced, it is anticipated that nature-based recreation would increase in the area. This kind of recreation would complement local and agricultural economies in the area.

Fishing on the Wolf, Embarrass, and other tributary rivers has been a long-standing tradition. The annual white bass and walleye runs and sturgeon migration along the river bring visitors from around the state. This high quality fishery brings in revenue for the local communities. To prove the impact this fishery and surrounding natural resources have on the area, several local organizations such as Shadows on the Wolf, Sturgeon for Tomorrow, and Walleyes for Tomorrow have been formed that work on protecting these amenities.

Sustainable forest management plays an important role in managing the forested lands within the proposed project boundary. Forest management plans on state and private lands are integrated management plans designed to maintain or enhance certain forest cover types for a variety of purposes such as benefits to wildlife, aesthetics, and recreation. In addition, timber harvests also provide an income and a raw timber resource to support the local and state economy.

Although the proposed project area remains primarily open with agriculture and wetlands, changing land uses and ownerships can be seen. Higher density developments are occurring in towns in the southeast portion of the project area - a short commute to the Appleton - Fox City area. In addition, plans to improve U.S. Highway 10 will likely increase the pressure to sell farmland and the adjacent uplands for residential and commercial development. Some developments have also occurred within the floodplain, which impair the function of those ecosystems.

The populations of the four counties involved have increased, in some areas at a more rapid pace. Urban and rural residential, and second or cottage home development is expected to continue and expand. As this happens, opportunities to preserve open space and wildlife habitat, and to preserve or restore wetlands and critical wildlife habitat will decrease. Area citizens recognize the need to maintain and enhance these areas and are interested in having a variety of land management or selling options available to them.

The Wolf River, the tributaries and connected lakes afford many miles of scenic natural shoreline for boating enthusiasts. As such, many people boat and enjoy their day on the river. The Wolf River is the 6th most popular water body in the state for recreational boating. Intensive boating activity can have an impact not only on the quality of boating but on the shoreline and water quality. Increases in shoreline erosion and water turbidity have been documented along the Wolf River.

Cultural Resources

There are 412 archaeological sites recorded in the Lower Wolf River Bottomlands. This number represents 1.4% of all archaeological sites recorded in Wisconsin. A high density of sites are located in the southern end of the proposed project area in Winnebago County. It is certain that the remaining area of the proposed project is also rich in cultural and archeological sites.

The most common type of archaeological site in this area is the campsite/village. Garden bed sites, areas where Native Americans grew crops in ridged fields or rows of corn hills, are notable. There are several sites within the Lower Wolf River Bottomlands, near some state-owned lands. It is important to note that most garden bed sites have been destroyed. The few that remain are considered very significant for future research. In addition, there are 43 sites recorded as having burial mounds.

Pre European settlement, this area was mainly the land of the Menominee people. Beginning in the 1830s and 1840s Euro-American settlement occurred in this area. There are 18 sites that are listed as Euro-American, these are mostly cabins or homesteads. Others include schools, a church, a limekiln, a brickyard, and dumps. Some may have archeological research potential,

but most cabin or homestead sites are not as archeologically significant. Together these sites and buildings are important to the local community, linking the present generation with the past generations that settled here and established farms and communities.

Project/Property's Analyses

Landscape

The surface topography and drainage of the study area is controlled by the bedrock surface but has been significantly modified by Pleistocene glacial erosion and deposition. In general, the underlying bedrock consists of Precambrian crystalline igneous rock in the northern and western part of the study area and Paleozoic age dolomite and sandstone overlying the Precambrian rocks in the south and east.

Nearly all the topography, soils and drainage of the area are a result of the Wisconsinian glacial advance, which moved southward from Hudson Bay approximately 11,000 years ago. These glacial deposits cover the entire area and generally are 100 to 200 feet deep, resulting in only limited bedrock exposure. The deposits vary widely and include glacial till (a mixture of clay, sand, and gravel) in the northern area, and lake deposits (clay and sand) generally in the south. Pockets of gravelly stream deposits occur throughout the region.

The resulting topography from the glacial deposits includes rolling hills, sand ridges along the glacial lake margins, and flat areas in the former lakebeds. Kettle lakes are concentrated in the southern part of the area near Waupaca.

Natural Communities

There are several natural community types within the proposed project area that have local or regional significance. Natural community types of especially high significance because of their extent, quality or condition include:

Emergent Aquatic (cattail-bulrush-bur-reed-arrowhead), these are open, marsh, lake, riverine and estuarine communities with permanent standing water dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures.

Emergent Aquatic - Wild rice, this open community is an emergent macrophyte type with wild rice as the dominant species. The substrate usually consists of poorly consolidated, semi-organic sediments. Water fertility is low to moderate, and a slow current is present. Wild rice beds have great cultural significance to native peoples, and are important wildlife habitats.

Submergent Aquatic (pondweeds-wild celery-waterweed-water milfoil), is a herbaceous community of aquatic macrophytes that occur in lakes, ponds, and rivers. Submergent macrophytes often occur in deeper water than emergents, but there is considerable overlap.

Southern Sedge Meadow (tussock sedge-Canada bluejoint grass), an open wetland community that is widespread in southern Wisconsin can be found within the Lower Wolf River Bottomlands. If not managed invasive reed canary grass may be dominant in grazed and/or ditched stands. Ditched stands can also succeed quickly to Shrub-Carr (dogwood-meadow sweet-willow).

Floodplain Forest (silver maple-green ash-swamp white oak), this is a lowland hardwood forest community that occurs along large rivers, usually stream order 3 or higher, that flood periodically. The best-development of these communities generally occurs along large rivers in southern Wisconsin, but this community is also found in the north. The Lower Wolf River Bottomlands is an exceptional example of this kind of community that is found in northeastern Wisconsin. Common species include silver maple, green ash, swamp white oak, and

cottonwood. There is an unusually high number of vines and low number of shrubs present -- the characteristics that give way to the back bayous and the Wolf's signature cardinal flower. If not managed properly invasive reed canary grass may begin to dominate.

Southern Hardwood Swamp (red maple-elms-ashes), is a deciduous forested wetland community type found in areas with seasonally high water tables. There is a more developed shrub layer with seedlings of the dominant tree species, dogwoods, and alder. Groundlayer plants include ferns, sedges, grasses and forbs similar to wet meadows, and characteristic plants like skunk cabbage and marsh marigold.

Natural community types which are not extensive in the proposed project area but are significant because of their rarity statewide, their quality and condition, and/or because they provide habitat for locally or regionally rare species include: Southern Mesic Forest (maple-basswood terraces just above the floodplain of the Wolf River); Northern Dry-Mesic Forest (white pine-red oak-red maple); Northern Wet-Mesic Forest (white cedar); Northern Sedge Meadow (*Carex* spp.-Canada bluejoint grass); Tamarack Swamp (tamarack-Labrador tea-sedges-mosses); Open Bog (sphagnum mosses-leatherleaf); Muskeg (sphagnum mosses-ericaceous shrubs-black spruce-tamarack); Wet Prairie (prairie cordgrass-Canada bluejoint grass); and Wet-Mesic Prairie (big bluestem-prairie dock).

It is the large blocks of lowland forests interconnected by corridors of similar natural communities that cover the Lower Wolf River Bottomlands. The river corridors of the Wolf and Embarrass form a contiguous forest block that provides habitat for neo-tropical migratory songbirds and endangered/threatened bird species such as the red-shouldered hawk, cerulean warbler, prothonotary warbler, and Forster's tern. Common associated birds include wood ducks, mallards, rails, turkeys, ruffed grouse, eagles, ospreys, and great blue and green herons. It is also the diversity of wetland communities intermingled or dominant in stretches of the proposed project area that increases the types of plants and animals found here.

A relatively open canopy and variety of moisture regimes make lowland forests an extremely diverse habitat for reptiles and amphibians. Amphibians such as American toads, spring peepers, wood frogs, and redbacked salamanders benefit from annual flooding. These floods create temporary breeding ponds and woody debris for both cover and prey. Reptiles that are commonly found in lowland forests include eastern garter, northern water, northern ringneck, and brown and red-bellied snakes. Common turtle species include painted and snapping turtles as well as the state threatened Blanding's turtle.

Most mammals found here are common to other parts of the state that have riverine and wetland areas. Aquatic animals such as muskrat, mink, and raccoons move through the stream and river corridors. White-tailed deer make extensive use of these floodplain forest areas during fall and winter.

Aquatic Communities

Wolf River

The Wolf River is the basin's largest watercourse. It originates in Pine Lake in Forest County and flows south for 203 miles until it reaches Lake Poygan where it becomes part of the Winnebago chain of lakes. The Lower Wolf River Bottomlands area includes the lower 100 miles of the Wolf River downstream to Lake Poygan.

Major tributaries of the Wolf include the Shioc, Pigeon, Embarrass, Waupaca, and Little Wolf Rivers. There are also numerous small tributary streams and bayous. Sand is the dominant

bottom material; silt is also present in most areas. Instream cover, especially fallen trees, is common.

The proposed project area contains the sections below the Shawano Dam. Here the river is relatively narrow with steep sides. This section of the river contains habitat for small mouth bass and catfish as well as panfish. At about the Highway 156 crossing, the river again changes to a large river system with numerous floodplain and marshes. This portion of the river and adjacent wetlands provide excellent spawning habitat and feeding areas for many species of warm water game fish including northern pike, walleye, perch, smallmouth bass, largemouth bass, bluegill, black crappie, rock bass, pumpkinseed, white bass, channel catfish, flathead catfish, bullheads, and lake sturgeon. These wetlands also provide excellent habitat for many species of wildlife and terrestrial vegetation.

Wolf River - Spring Fish Spawning

During the spring months, various species of fish from Lake Winnebago make their way up into the Wolf River for the reproduction phase of their lifecycle. This annual migration is different for each species. During this annual "run" thousands of anglers are attracted to the area for some of the season's best fishing. Fishing during this time provides anglers an opportunity to catch their daily limit and also provides for an impressive boost to the local economy. The following is a short chronology of the spring fish run:

Northern Pike

Northern Pike are the first to spawn. They migrate from the river into small creeks and streams, warmed by the sun to spawn on marshes in the river's flood plain. The fish spawn on flooded vegetation and quickly return to the main river. When eggs mature into fry they are washed back into the main stream or out of the marshes. Eventually, these fish find their way back to Lake Winnebago or the "pool" lakes.

Walleye

Walleye migrate into old river bayous along the river's floodplain. The Winnebago strain of walleye prefers to use grass as their spawning substrate. Fertilized eggs stick to the blades marsh grass and mature, oxygenated by the flowing water. Once the small eggs hatch, the water flowing through the marshes into the river carries the small fish. Once in the river, they travel to the upriver lakes and Lake Winnebago.

Lake Sturgeon

Lake sturgeon spawn when the water temperature reaches about 55 degrees Fahrenheit. The majority of these large fish migrate up the river during the previous fall. They stay in the deep pools during the winter months, waiting for spring. Once the water reaches the proper temperature, rocky shoreline explodes with activity. Rock riprap, installed as bank protection by landowners and conservation groups, is a favorite site for spawning. Over the years, many shoreland owners have created many additional sturgeon spawning sites. The dam at Shawano stops the sturgeon migration. Prior to the dams being constructed, the fish were stopped by Keshena Falls, the first natural barrier. As such, Shawano is a very popular site to watch these giant fish.

White Bass

These fish run up the river and spawn in the brushy cover fringes of the main channel. Upon conclusion of their spawning activities, these fish have a voracious appetite. White Bass are a favorite of anglers as they are easily caught and provide all anglers with plenty of action as well as some good eating.

It is important to note that there are a variety of other fish species that reside year round in the Wolf River. These species are important to the local fishery and river ecology as well as providing a recreational resource. These species include smallmouth bass, walleye and channel and flathead catfish.

Other Important Lower Wolf River Waters

Shioc River

The Shioc River is a 33 mile long tributary of the Wolf River. It is a hard water stream having slightly alkaline, light brown water. Fish inhabiting this river include northern pike, suckers and minnows. It has some value to nesting and migrating waterfowl. The river has 2.8 miles of frontage in the Navarino Wildlife Area. About 60 percent of the watershed area is agricultural with the balance being wooded and wild.

Embarrass River

The proposed project area includes 37 miles of the Embarrass which is a large tributary of the Wolf River, joining the Wolf at the City of New London. It contains light brown, slightly alkaline hard water, with a predominantly sandy bottom. The fishery includes northern pike, smallmouth bass, walleye, lake sturgeon, white bass, channel catfish, white suckers, carp, and panfish. Lake sturgeon spawn at several sites on the river up to the Pella dam. The river, particularly the lower stretch, supports nesting mallards, blue-winged teal, and wood ducks. Good populations of muskrats are also present.

Waupaca River

The Waupaca River is a large tributary of the Wolf River, joining the Wolf at Gills Landing. Its length is 24.7 miles up to the Portage County line where it is known as the Tomorrow River (Waupaca is an Indian term meaning "tomorrow"). Waupaca Millpond and Weyauwega Lake are impoundments located on the river. That portion of the river above Highway 10 is rated as class II trout water, with brown trout present. The remainder of the river contains smallmouth bass, northern pike, catfish, panfish, and various rough fish. While fishing is important, one of the major uses of this river is canoeing.

Little Wolf River

The Little Wolf River is a tributary of the Wolf River formed by two large tributaries known as the North Branch and the South Branch. It is a low gradient river flowing through a heavily farmed area. The fishery is similar to that of the Wolf River with sturgeon and walleye spawning in the lower reaches of the Little Wolf River. Furbearers, deer, and waterfowl are common in and near wetlands at the lower end of the river. The North and South Branches contain brook and brown trout. Canoeing is popular on these branches.

Partridge Lake

Partridge Lake is connected to the Wolf River near the Village of Fremont. It contains 1,124 surface acres and has a maximum depth of 6 feet. All but a small portion of the shoreline is composed of open marsh, shrub swamp, and hardwood swamp creating ideal conditions for muskrats, mink, deer, and waterfowl. Aquatic vegetation is dense in the shallow water areas. Sport fish present include northern pike, walleye, perch, largemouth bass, smallmouth bass, bluegills, black crappie, channel catfish, and bullheads. Gar, carp, drum, burbot, white sucker, redhorse and various forage species are also present. The lake is popular for angling and boating.

Partridge Crop Lake

Partridge Crop Lake is connected to the Wolf River just north of Guth's Landing. It contains 243 surface acres and has a maximum depth of 8 feet. Most of the shoreline is marsh. The fishery includes northern pike, walleye, largemouth bass, bluegill, black crappie, pumpkinseed,

perch, white bass, channel catfish, bullhead, suckers, redhorse, gar, burbot, carp, and bowfin. The lake is popular for ice fishing.

Cincoe Lake

Cincoe Lake is actually a bayou off the Wolf River. It contains 169 surface acres and has a maximum depth of 4 feet. A shrub-hardwood swamp surrounds the entire lake. The lake’s dense aquatic vegetation and shallow water attract a fair number of migrating waterfowl, making it popular among duck hunters. During summer months northern pike, largemouth bass, bluegills, bullheads, and carp are present. Ice and a lack of oxygen usually prevent a winter fishery.

White Lake

White Lake is landlocked except for small marsh drainage channels and an intermittent outlet. It contains 1,026 surface acres and has a maximum depth of 11 feet. Large expanses of very shallow water and dense aquatic vegetation attract a fair number of migrating waterfowl. These same conditions, combined with a slow rate of water exchange are factors that often result in winter fish kills. The fishery includes northern pike, largemouth bass, perch, bluegill, black crappie, white sucker, and bullhead. During the waterfowl hunting season a portion of this lake is posted as a waterfowl refuge.

Forest Resources

Existing state properties in the Lower Wolf River Bottomlands, over 31,000 acres, are nearly 50% forested. The remaining land cover is marsh, lowland brush, open water, upland grass, or actively farmed (Chart 1 Vegetation).

A forest type is an association of trees with similar growth characteristics that require the same soil, nutrient and moisture conditions to sustain growth. The largest forest type represented on the existing state properties is aspen, with nearly twice the acreage of the other forest types found on the properties. Swamp hardwoods and bottomland hardwoods follow as the next most common forest type. Although only comprising about 4% of the forest cover type; oak serves a vitally important role in supporting deer, ruffed grouse, turkeys, squirrels, etc (Chart 2 Forest Cover Type).

Aspen represents 44% of the forest cover types on the Lower Wolf River properties. Growing mostly on upland sites, aspen provides ideal habitat for deer and ruffed grouse, as well as a number of other animals and birds. Aspen is a relatively short-lived tree maturing in 40 to 50 years. Aspen is quite easy to regenerate by clearcutting all trees. Aspen is often found growing in association with oak and white pine, in which case scattered trees are left in the clearcut to enhance wildlife and aesthetic values.

Chart 1 Vegetative Cover Types on Existing State Properties

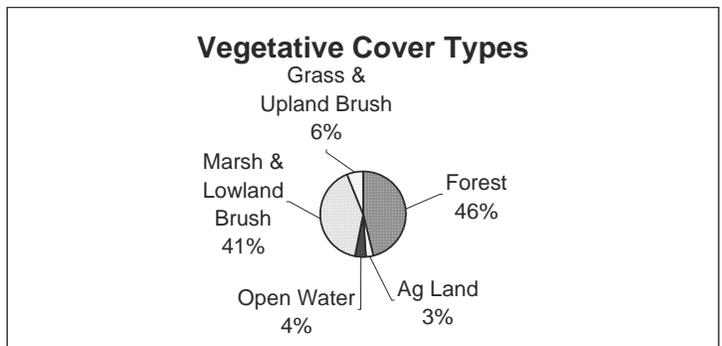
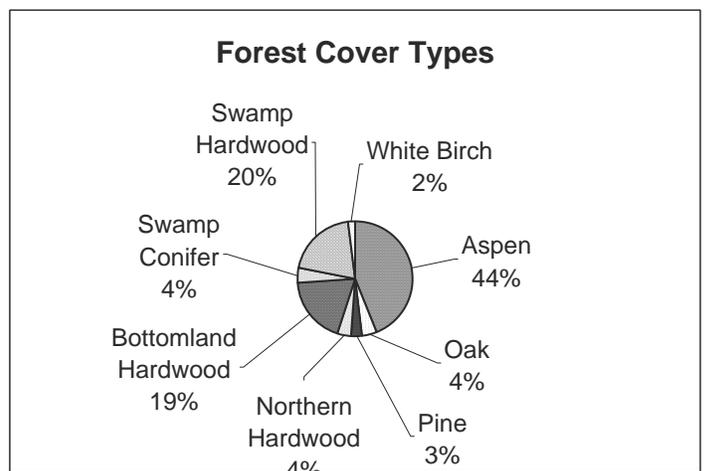


Chart 2 Forest Cover Types on Existing State Properties



Bottomland hardwoods represent 19% of the forest cover types. Common trees of this type are silver maple, green ash, swamp white oak, elm, cottonwood, and hackberry. The bottomland hardwood type is found immediately adjacent to the river and is well adapted to the annual spring flooding. Selective harvesting practices are used to encourage growth of swamp white oak, and sites to improve walleye spawning habitat, as well as produce timber products.

Swamp hardwoods represent 20% of the forest cover type. Common trees of this type are black ash, red maple, and elm. The swamp hardwood type is found on wet soils with somewhat poor drainage. Selective harvesting practices are used to maintain a healthy forest.

Oak represents 4% of the timber type in solid stands, it is also an important part of the aspen component, and is found in bottomland hardwoods. The oak type includes red oak, black oak, white oak, and bur oak. The oak represents much more than 4% of the trees, since it is associated with almost all cover types. Every effort is being made to increase the oak component in the Wolf River Bottomlands. Selective harvesting practices are used to encourage development of oak as well as partial clearcuts to encourage regeneration. Acorns of oaks are a prime food source for a wide variety of animals and birds, including deer, squirrel, turkey, and ruffed grouse.

These plant communities and the valuable forestry resource of the Lower Wolf River Bottomlands serve a vital role in supporting a healthy environment that provides habitat for a wide variety of wildlife and fish, recreational opportunities, clean water, and timber to help support the local economy.

Nearly 60,000 acres of the project area is comprised of forests. Much of this acreage is enrolled in the Managed Forest Law (MFL) program. Landowners with ten or more contiguous wooded acres (including new plantations) may be eligible to enroll in this program. This program provides incentives in the form of tax relief to landowners to encourage sound land use practices.

Agricultural Communities

The agricultural communities in the project area consists of beef, dairy, and produce farms, with crops grown for both livestock feed and cash crops. There continues to be significant numbers of family farms, but there has been an increase in the last decade of corporate farming. Horses, sheep, bison, and pigs are also raised in the project area.

Crops include alfalfa, corn, soybeans, and oats. Sweet corn, peas, and sod are also produced on various sites. Produce crops are primarily cabbage, although there are organic farming sites, where a variety of produce is grown for market. Approximately 81,000 acres of agricultural land occurs within the project area. An additional 6,200 acres are in grasslands. Many landowners are enrolled in the Conservation Reserve Program (CRP). Nearly 94,000 acres of the project area is identified as wetland and an additional 9,000 acres is open water. CRP practices include filter strips, riparian buffers (trees or grass), establishment of native grasses and legumes, permanent wildlife habitat, tree planting, and wildlife food plots.

PROPOSED VISION AND GOALS¹

It is proposed that "The Lower Wolf River Bottomlands will be managed recognizing the interconnectedness of air, water, and land in sustaining ecosystems in balance with local cultural and economic values. In partnership with citizens as stewards of the natural resources, we work to protect, restore, maintain, and enhance healthy, diverse ecosystems and the natural, scenic beauty of the corridor, while providing compatible recreational pursuits and educational opportunities for current and future generations."

The Department's proposed goals for this project are that:

- The land along the Lower Wolf River Bottomlands is protected through ecologically sound management decisions that reflect long-term considerations for healthy ecosystems.
- The Lower Wolf River Bottomlands protects the quality and quantity of surface and groundwater resources.
- All citizens share the responsibility for the stewardship of the natural resources in the Lower Wolf River Bottomlands for the benefit of current and future generations.
- The public has opportunities to experience a diverse range of compatible outdoor recreational and educational activities that enhance the quality of life and economy within the Lower Wolf River Bottomlands.
- The Lower Wolf River Bottomlands provides opportunities to preserve agricultural land through creative land management options.

CONCEPTUAL MANAGEMENT

The Department's master plan process would address activities compatible with the proposed purpose of the Lower Wolf River Bottomlands Natural Resources Area, as well as the management necessary for developing and managing its resources. The Department, with continued public involvement, would develop the master plan. If the feasibility study were approved, the Department would immediately begin master planning.

It is important to note that the Department initially began the Lower Wolf River Bottomlands project as a master planning effort. Due to an effective and responsive public involvement process this project evolved into an exploration of potential boundary expansions and acquisition goals. Under the guidance of the Department's administration and the Natural Resources Board, the planning team prepared this feasibility study and all parties (Department and public) have full expectations to continue in preparing a master plan upon approval of this feasibility study.

Lands acquired prior to the completion of the master plan would be managed consistently with wildlife, fishery, and/or state natural area program goals. Land management practices would focus on different aspects of protection or enhancement such as floodplain forest, wetland, rare species, unique or rare natural communities, and buffer land management. The management techniques used could include brush cutting, mowing, prescribed burning, timber stand improvement, invasive species control, planting of native grass and wetland restorations. Outlined in the Estimated Land Management Costs section of this report are further descriptions of property development and maintenance.

¹ The vision and goals have been developed as part of the planning process for the Lower Wolf River Bottomlands with planning participants (Appendix A).

LAND PROTECTION TOOLS

Many parcels of land within the project area would meet the established criteria (See pg. 16). A detailed inspection or inventory by a biologist, ecologist, forester, and archeologist would help determine how the qualities of that land would meet the overall project goals. If a parcel contains qualities needed for conservation and/or recreational lands and the landowner is willing to protect the land, then numerous land protection options would be available to the landowner. There are some governmental programs that give greater emphasis to landowners through credits and rankings if the lands fall within an established Department boundary.

Suitable land protection methods could include fee title acquisition, various conservation easements, and other state and/or federal programs (i.e. Conservation Reserve Program, North American Wetlands Conservation Act (NAWCA), Environmental Quality Incentives Program (EQIP), Wetland Reserve Program, Managed Forest Law, stamp programs). These protection methods could be accomplished by the Department, other governmental agencies, non-profit conservation organizations, private landowners, or land trusts. The Lower Wolf River Bottomlands Natural Resources Area is a partnering project for land protection and management. Options and strategies will be explored for involvement of others in helping to protect natural and rare resources and ecosystems that occur in the Lower Wolf River Bottomlands.

Land purchased in fee title by the Department would continue to provide tax revenue to local towns and counties. The Department would make an annual payment-in-lieu-of-taxes, as required by State Statute 70.114, on lands acquired. The payment is calculated in the same manner that property taxes are determined for any private landowner - the mill rate is multiplied by the assessed value of the land, except that the assessed value is considered the fair market value of the land. The initial assessed value is set at the price the Department paid for the land, which is based on the appraised market value. The value is adjusted to reflect changes in the assessed value of land in the taxation district.

The Lower Wolf River Bottomlands acquisition of agricultural lands would remain consistent with Department policies with regard to these lands. It is the Department's intent to avoid the purchase of Class 1, or other highly productive, agricultural land if possible. Class 1 lands may be purchased in situations where they occur as small inclusions within larger parcels of less productive land. In addition, if highly productive agricultural land were purchased, the Department would seek to either:

- sell this land with easement restrictions sufficient to protect adjacent land with significant natural resource features from incompatible land use changes;
- lease the land for agricultural production for an appropriate time period before converting it to other conservation or outdoor recreational uses; or
- continue the land in long-term agriculture if that would serve a conservation purpose, such as providing a buffer from incompatible land uses for other state-owned lands inside the proposed boundary.

CRITERIA FOR IDENTIFYING CONSERVATION AND RECREATION LANDS WITHIN THE LOWER WOLF RIVER BOTTOMLANDS

Criteria were developed with public participation to first identify and evaluate several possible boundary alternatives. The criteria have been used to further refine the priority sites within the proposed project boundary. Below are descriptions of these criteria within the landscape of the Lower Wolf River Bottomlands project area. (* denotes one of the 5 Priority Criteria see page 20)

***Protect the Lower Wolf River and it's tributaries river shoreline.**

If one were to step back from the study area, you would find a narrow green corridor along the Wolf River surrounded by a landscape of agriculture and urban areas. The sites along the corridor have historically been impacted by these surrounding land uses. This narrow corridor represents the remnant of what once was an extensive array of diverse community types harboring the many species commonly associated with this part of Wisconsin. Buffers could be created to protect the core of the main rivers and streams and their tributaries. Many lands would still remain in private ownership and landowners could take advantage of the governmental land management opportunities (see Land Protection Tools). These corridors would benefit from increased water quality and protection from nonpoint runoff.

***Provide an opportunity for a corridor connection for wildlife habitat and recreational opportunities.**

The wildlife properties within the proposed project boundary serve as large islands of quality wildlife habitat. However, wildlife need to travel through intact habitat during spring and fall migrations, and during their daily movements between food, water, and shelter. River corridors are especially important in spring and fall to migrating species for a food source. In early spring insect productivity is higher than in the uplands and in fall the trees and shrubs are rich in fruit. Protecting habitat connections between neighboring state lands and the riparian corridor will maintain the health of wildlife in the future, and reduce habitat fragmentation. An example of this is Deer Creek Wildlife Area, which can be connected to the Wolf and Embarrass Rivers, Navarino WA, and Wolf River Bottoms-K&S Unit. Maintaining these critical connections between state lands and the river corridor will strengthen the health and resiliency of the entire bottomland forest ecosystem, by allowing wildlife to freely move through multiple travel routes to large blocks of critical habitat. If this is not done, future development throughout the basin may slowly fragment these travel routes until only those isolated "islands" of habitat remain.

Provide opportunities for habitat restoration.

Providing habitat restoration opportunities is an important way to increase habitat areas for wildlife and the biota of the landscape. Where remnants exist there would be opportunities to expand populations of the entire biota there. These areas would ensure endangered, threatened, and rare species are not lost. Further, they would create opportunities for expansion and infusion of genetic diversity to guarantee the viability of the endangered, threatened, and rare species without genetic stagnation. Restorations could provide corridors to link one site to another. For instance, restored wetlands and forest opportunities may ensure and prevent isolation of spring peepers from one small woodlot to a large forested wetland. In the case of the Karner blue butterfly this may involve linking restored grassland habitat containing lupine to an isolated habitat of existing Karners. Restoration opportunities may cover the whole realm of methods (see Land Protection Tools section).

***Protect areas with endangered and threatened resources, and critical habitats.**

The natural communities (southern sedge meadow, shrub-carr, and southern hardwood swamp) within this area support a number of rare species found in few other locations within the region (Table 1). The Wolf River supports a diverse assemblage of rare fish, including one of the

best-known populations of the globally rare lake sturgeon. The Wolf River and its major tributaries have exceptionally high species diversity of aquatic invertebrates, distinguishing this area within the state (Appendix D: Biotic Inventory & Analysis of the Wolf River Basin: Interim Report). These include mussels, mayflies, dragonflies and beetles, plus many other aquatic animals, which find suitable habitat within the main stem of the Wolf River, and its tributaries, especially the Little Wolf River and the Embarrass River. Vast marshes, sedge meadows, and disjunct northern wetlands support an array of colonial marshland birds and other grasslands.

As a result of the two years of extensive biotic inventory of the Lower Wolf River Bottomlands study area, Bureau of Endangered Resources has identified 9 sites for inclusion within future. Most of the areas listed below have been included within the proposed project boundary, and the others are located adjacent or nearby.

- Wolf River Corridor: Navarino WA – Shiocton
- Wolf River Corridor: Shiocton – New London
- Wolf River Corridor: Mukwa SWA – Fremont
- Wolf River Corridor: Fremont – Boom Bay
- Little Wolf River
- Upper Embarrass River
- Lower Embarrass River
- Winneconne – Winchester Wetlands
- Clark’s Point Wetlands

These sites represent a range of community types and include, or provide the potential for, the important habitats and species found within this region. Large portions of the Wolf River main stem are included in these sites because of the habitat, corridor connections and habitat protection and restoration potential. Portions of the Embarrass and Little Wolf Rivers have been identified for similar reasons. In addition, two extensive wetland complexes away from the Wolf River corridor are included because of the high quality and size of the occurrences and the rare species they support.

Lastly, the Lower Wolf River Bottomlands Natural Resources Area has great potential for large-scale restoration. The large tracts of agricultural lands, especially the fallow lands in the south, could be beneficial as large grassland areas for a host of at-risk species. Sites identified thus far include only a few patches of upland forests whose viability is enhanced because of their proximity to the river corridor. Most upland forest exists as isolated patches today. Taking a broader approach to ecosystem restoration within the larger Lower Wolf River Bottomlands study area would provide for many ecological opportunities not currently afforded by the existing state properties and land protection efforts.

Table 3. Rare species within the Lower Wolf River Bottomlands Natural Resources Area

Feature Type	Globally Rare	Endangered/Threatened	Aquatic or Wetland
Communities	8	NA	21
Plants	3	9	14
Mussels	2	4	6
Fish	4	5	12
Birds	0	7	9
Herps	0	2	3
Snails	1	0	0
Aquatic Insects	4	1	17
Terrestrial Insects	4	0	NA
Total	26	54	82

Protect lakes with minimal development.

Loss of habitat has a direct effect on fish communities, affecting their success of spawning, growth, and survival. Habitat changes can be natural, such as gradual filling in of shallow bays. However, it is most often accelerated, or made more severe, by human activities. Loss of habitat can occur in many forms. The filling in of marsh areas bordering lakes and streams destroys critical spawning habitat and diminishes the filtering capacity of the wetland, resulting in poorer water quality for the entire system. Increasing shoreline development, seawall construction, and in-lake modifications, such as sand blankets and the removal of aquatic vegetation greatly change or destroy the near-shore areas of our lakes and streams. These shallow areas, known as littoral zones, are important for egg deposition, nursery and hiding areas for newly hatched fish, and as food production areas for juvenile fish and their prey items. While the addition of one cottage or development on a lake may seem inconsequential, the cumulative total of lost habitat areas can have a substantial effect on many waters. Various recreational activities can have a direct negative effect on habitat quality, particularly on water clarity and on aquatic plants in near-shore areas that provide habitat for young fish. Finally, one of the most difficult problems affecting fish populations, directly and indirectly, is the problem of non-point source pollution. The variety of factors affecting habitat loss can act synergistically to negatively impact wetland and aquatic communities.

Several small lakes exist within the larger project boundary that at present have only minimal development on their shores. These lakes are an integral component of the aquatic communities that comprise the Lower Wolf River Bottomlands, and offer an excellent opportunity to preserve their natural shorelines for future generations.

***Include spawning areas for protection and habitat management.**

Walleye migrate out of Lake Winnebago and travel upstream on the Wolf as far as 97 miles to historic “spawning marshes” where they lay their eggs and then return to the lakes downstream. These spawning marshes are distinctive areas with characteristics unique to walleye in the Winnebago system. Well-defined inlets and outlets provide oxygenated flowing water while grasses and sedges provide a silt-free spawning substrate – both essential for successful egg incubation and hatching. The flows also carry the newly hatched fry to the river before the marshes begin to dry up as the river retreats to within its banks as spring floods subside.

Over time, the effectiveness of these marshes has diminished from both natural succession and man-made changes in these bottomlands. Over the years, DNR fisheries management has purchased several of the marshes along the Wolf River to manage them for walleye spawning and protect them from development. However, many more areas exist that are in private ownership. Recent changes in laws and court decisions have made the possibility of development in these areas a greater threat. Purchase or easement of these areas as they become available will ensure their continued existence in a natural state, and maintain their critical functional role in the Wolf River ecosystem.

Wisconsin's Lake Winnebago system lake sturgeon population, one of the largest self-sustaining ones in the world, is also dependent on critical spawning areas along the Wolf River. Traditional spawning areas were natural in-stream riffles and rocky areas along the banks. Natural changes in the rivers path along with increased development, both along the shore and within the watershed, caused more and more sediment to be transported downstream, covering some of these areas with silt. In addition, owners of shoreline property changed the waterfront to suit their desires. The addition of rock riprap to protect shorelines from erosion has had the unanticipated benefit of providing additional spawning areas for these prehistoric fish.

Improve the potential for fish and wildlife and other recreational/educational opportunities.

As we have gone through many public input sessions on the master plan, the public has stated that "bigger is better", for it offers more opportunities for recreation. These may be the traditional uses of fishing and hunting or other recreational pursuits such as snowmobiling, hiking, bird watching, dog training, horseback riding, ATV trails, and roadless/trailess tracts for quality recreational solitude. Most of these sites would be located on uplands where high volume traffic, whether by foot, bike, or horse traffic is less likely to affect the landscape. Wetlands communities can not support these types of additional recreational pursuits, which would be the case if the boundary were only kept within the narrow corridor along the Wolf River and its tributaries. Upland sites that may be available to these types of recreation are currently in forest or agricultural lands. Camping, shoreland fishing opportunities, hiking, off-road biking trails, and general picnic areas are few and far between in the project area. Educational opportunities lend themselves to parks and trail friendly areas. There are some opportunities here to provide for protection of the open farmland and forests, a variety of educational programming, and watchable wildlife opportunities. Migration stopovers are important for waterfowl and other birds in this area. Approximately ten percent of world's tundra swans migrate through the project area in the spring along with other waterfowl numbering in the tens of thousands.

***Include larger tracts of land that promote ecological and/or recreational opportunities.**

The protection of large tracts of land is very attractive especially if there are multiple tracts adjacent to each other. Some of these large tracts along the Wolf and Embarrass Rivers are privately owned and managed intensively for waterfowl. Others are large farms, wetlands or wooded tracts. The majority of tracts are over 120 acres in size and are in clusters with other large landowners. Large tracts of land increase opportunities for farmland preservation, grassland and wetland restorations, and recreation.

Large blocks of bottomland hardwoods are critical for many species of wildlife, including a variety of endangered and threatened species. Red-shouldered hawks, cerulean and prothonotary warblers, wood turtles, herons and egrets especially need this habitat. Bald eagles and osprey fish on the Wolf and Embarrass Rivers. Two "Important Bird Areas" identified by The Nature Conservancy occur within the boundary. The area between New London and Fremont is one of these areas. This is a large block of forest with numerous oxbows and very few roads. Cerulean warblers occur here and are highly area-sensitive species, with tracts 10,000 acres or more being best for viable populations. They prefer intact, closed-canopy forests with super-canopy trees (within which they nest), often near streams and rivers. The second location is the "Shiocton Bottoms" where thousands of tundra swans, Canada geese, other waterfowl, Sandhill cranes, and shorebirds congregate during spring migration. It is an important stop-over site and is located at the confluence of the Wolf, Shioc, and Embarrass River systems.

Improve boundary definition for better land management and public access.

Moving project boundaries to established roads would greatly increase both public and DNR access to properties, make habitat management activities and public use easier and safer, and reduce both the cost and difficulty of important maintenance projects such as boundary posting and parking lot upkeep. A trend that is occurring is the development of private land around state properties. The effects of these kinds of developments reduce the quality of the surrounding wildlife habitat, restrict public access, and may create conflicts with adjacent landowners. Not having public ownership out to roadways greatly increases management costs of state lands. It is much easier to post along a recognized boundary such as a roadway. It is more difficult to post boundaries "cross country" where survey markers and other landmarks are often non-existent. Overall adjacent property developments increase the complexity and risk of many management activities such as prescribed burns, timber harvests, herbicide applications, and at the same time increase the risk of damage to state lands by wildfire.

PROPOSED PROJECT DESCRIPTION

Preferred Alternative (Lower Wolf River and Embarrass River Corridor)

This project boundary alternative is actually a combination of two early alternatives. Planning participants commented that they wanted an alternative that includes the Embarrass River Corridor and tributaries of the Lower Wolf (e.g. Shioc River) but early draft alternatives were too big and ambitious. This project boundary alternative is most supported by the public.

The preferred alternative offers the best array of opportunities to achieve the broad land management goals on a long-term basis: to protect and/or maintain the character of natural and rural communities within the Lower Wolf River Bottomlands project area. These land management goals will be further refined through the master planning process. This proposed project area encompasses 214,000 of which 31,000 acres are existing state properties. The existing state properties included within the entire Lower Wolf River Bottomlands Natural Resources Area are: Navarino, Deer Creek, Maine, Mack, Wolf River Bottoms - K&S Unit and LaSage Unit, Outagamie, Mukwa, Wolf River, and Rat River Wildlife Areas; Hortonville Bog and Shaky Lake State Natural Areas; the Wolf River Fishery Area and fishery remnants (Map 2 Proposed Project Area Map). The Department currently has approved acquisition authority within these existing designated properties up to 34,000 acres. As part of implementing the Lower Wolf River Bottomlands Natural Resources Area, the Department would establish a goal of acquiring up to 45,000 additional acres outside of the existing state properties.

The Lower Wolf River Bottomlands Natural Resources Area would use an ecosystem management approach to identify, protect, and manage the natural resources, and endangered and threatened species habitat. Emphasis would be centered on two aspects of landscape management: protecting water resources and the river corridors, and protecting the buffer areas of these riverine resources, within a functional agricultural landscape. The ecosystem management approach would also require consideration of social, economic, institutional, as well as biological aspects to the management efforts.

The proposed project area represents the areas that are known to meet or have a high potential to meet the Criteria for Identifying Conservation and Recreation Lands within the Lower Wolf River Bottomlands. These criteria are described in the previous section of this report. Focus areas within the Lower Wolf River Bottomlands Natural Resources Area have been further identified based on their importance to helping achieve the overall vision for this project. Five priority criteria were identified by staff and discussed with the public and consensus was reached that these five criteria were appropriate to use to identify potential focus areas (Map 3 Areas Meeting the 5 Priority Criteria). The five criteria selected are:

- ❖ Protect the Lower Wolf River and its tributaries river shoreline.
- ❖ Provide an opportunity for a corridor connection for wildlife habitat and recreational opportunities.
- ❖ Protect areas with endangered and threatened resources, and critical habitats.
- ❖ Include spawning areas for protection and habitat management.
- ❖ Include larger tracts of land that promote ecological and/or recreational opportunities.

Map 3 represents areas that are important for special management and protection using the five criteria above. These areas also support what planning participants told us during public meetings: that the Wolf and Embarrass Rivers system is a natural resources treasure that should be protected and maintained for future generations.

In order to focus the Department's land protection and management efforts, staff evaluated the above criteria and determined that a long-term acquisition goal of 45,000 acres is feasible. The 45,000 acreage goal is arrived at by the overlap of any 3 of the five priority criteria. The areas represented in Map 4 shows those focus areas that may be important for further study and/or possible land protection efforts. Acquisition of land or easements by the Department would focus on these areas while areas beyond this would more likely be candidates for land management partnership efforts with landowners, nonprofit organizations, and other agencies. Even within these focus areas the Department would investigate potential land conservation opportunities with partners. Landowners with all or a portion of their land lying in the shaded area on Map 4 could expect a contact from the Department in regard to the project. The extent of this contact would depend on the landowner's interest and willingness to discuss the natural resource values of their property. Landowners choosing not to participate in this project would not be subjected to any new or additional regulations or restrictions on land use by this proposal.

The non-shaded areas in Map 4 within the remainder of the proposed project area represent important areas for land protection and management because of the multiple benefits they provide to the Wolf River system. The Department would expect to pursue land protection efforts through a variety of land protection tools (see Land Protection Tools section) such as partnerships and landowner incentives. The character of these areas is mostly upland, forested area, and agricultural land. The areas have an important role within the ecosystem of the Lower Wolf River where the focus could be on potential restoration of wetlands, grasslands, and forest areas or agricultural lands that remain undeveloped. Since much of the land within current state ownership is wetlands, the upland areas beyond the river corridor are important to provide for a variety of future recreational and ecological opportunities and buffers to improve water quality. Most landowners in the non-shaded areas should not anticipate a Department contact regarding natural resource values of their land. Landowner contacts would be on a case-by-case basis and focus on sites that potentially contain other unique or rare species habitat not found within previously identified Department focus areas, and/or possibly contain upland or agricultural land that would help achieve project goals as described. Some landowners have expressed an interest in participating programs (e.g. CRP, MFL) or selling land to the Department. Land managers will evaluate these parcels and work with owners to determine the best land management options available. Landowners who choose not to participate in this project would not be subjected to any new or additional regulations or restrictions on land use by this proposal.

During master planning, it is possible that the need for adjustments in the approved boundaries of one or more of the 14 existing Department properties within the proposed overall 214,000 acre boundary may be identified. Each of those properties, while part of the larger proposed project, will retain their distinct legal designations and identities. Existing boundaries might need modification to address concerns about public access to the property, confusion over location of the boundary and resulting trespass concerns, or additional resource protection or public recreation needs specific to the individual property. Any significant change in an approved boundary requires Natural Resources Board approval, this proposal is the feasibility study and has incorporated public participation.

Agricultural Lands

It is the Department's intent to avoid the purchase of Class 1, or other highly productive, agricultural land if possible. Class 1 lands may be purchased in situations where they occur as small inclusions within larger parcels of less productive land. In addition, if highly productive agricultural land were purchased, the Department would seek to either:

- sell this land with easement restrictions sufficient to protect adjacent land with significant natural resource features from incompatible land use changes;

- lease the land for agricultural production for an appropriate time period before converting it to other conservation or outdoor recreational uses; or
- continue the land in long-term agriculture if that would serve a conservation purpose, such as providing a buffer from incompatible land uses for other state-owned lands inside the proposed boundary.

Role of Partners

The proposed Lower Wolf River Bottomlands Natural Resources Area is a project that depends on partners for assistance in land acquisition and management. This proposal emphasizes strategies and options for involvement of others in helping to protect the resources and ecosystems that occur in the lower Wolf River corridor. Other government agencies and private groups have recognized the need to preserve the natural resources in this area of the state. Organizations like The Nature Conservancy, Northeast Wisconsin Land Trust, Walleyes for Tomorrow, Sturgeon for Tomorrow, Lake Poygan's Sportsmen's Group, and Shadows on the Wolf are just a few of the organizations that have been active in protecting the natural resources of the Wolf River. There are a variety of other local, regional, and state long-range resource and outdoor recreation plans that identify the proposed project area as important for protection and to be held in public trust for future generations. Establishing cooperative ventures with various partners and private landowners would be critical to the success of this project.

COST ESTIMATES

Estimated Land Acquisition Costs

The land in the proposed project boundary ranges from rural agricultural to rural residential land uses. For purposes of determining estimated acquisition costs the land was divided into three **general** categories: agricultural, wetlands (swamp) and forest. The acquisition cost estimates are based on information obtained from the Department of Revenue for sales of land in these categories during 2000. Average land values can be expected to increase during the acquisition phase of the project due to inflation and market conditions. Department policy calls for avoiding the acquisition of high-value improvements, where possible. The improvements included in the acquisition of large key parcels would be carved out on lots that comply with local zoning regulations and resold. Estimated improvement acquisition costs are not reflected in any of the estimated acquisition costs.

Estimated per acre values for:

Agricultural lands	\$1,650
Forest land	\$1,550
Wetlands	<u>\$700</u>
Total Average land value	\$1,300

Total estimated acquisition costs of 45,000 acres: \$58,500,000

Again, it should be noted that these estimates were derived using "2000" land sale figures. It can be expected that average land values will increase over time due to inflation and market conditions.

Tax Base Replacement

The Department makes an annual payment-in-lieu-of-taxes, as required by State Statute 70.114, on lands acquired. The payment is calculated in the same manner that property taxes are derived at for any private landowner - the mill rate is multiplied by the assessed value of the land, except that the assessed value is considered the fair market value of the land. The initial assessed value is set at the price the Department paid for the land, which is based on the

appraised market value. The value is adjusted annually to reflect changes in the assessed value of land in the taxation district. If the price of land goes up, the payment by the Department is adjusted accordingly.

In general, assessed values for land traditionally lag behind fair market land values. Therefore, Department land purchases should have no net impact or minimal positive impacts on revenue collected by local governments. This is based on a historic trend in increased land prices over time.

Estimated Land Management Costs

Following approval of the proposed project outlined in the feasibility study, a master plan would be prepared to address development, operations and maintenance, and staffing in detail. Therefore, the following topics are discussed here in broader, generalized terms.

The costs involved with operation and maintenance of floodplain forests, wetlands, grasslands, and public use facilities would be dependent on the type of property, its size and the practices needed to meet the land management objectives. Volunteer agreements with landowners and non-profit conservation organizations could also affect responsibilities of property management. Therefore, the cost estimates here are generalized.

Development

Development of newly acquired or eased properties would primarily consist of boundary identification. Buffer land or connecting corridors between rare species habitat would be restored to prairie, savanna, forest, or wetlands as opportunities arise. Fencing would be limited to what is needed to comply with boundary fence laws, and to protect the land from public abuses such as off-road vehicles. Lands owned in fee by the Department would be posted accordingly.

Estimated costs for development if the Department would purchase or take easements on the entire 45,000 acres are:

Signing	\$ 35,000
Public use facilities (i.e. parking lots, gates)	\$ <u>95,000</u>
Estimated Total:	\$ 130,000

Maintenance

“Passive” or non-management in some self-sustaining community types such as lowland forest and tamarack swamps would achieve the property maintenance of natural communities. An exception would be where exotic species control is needed to control invasive plants such as purple loosestrife, garlic mustard, European buckthorn, and honeysuckle. For other community types, management is needed that mimics and maintains the natural processes such as burning a prairie or harvesting timber.

In those areas where an open aspect would be maintained, such as prairies and savannas, several management methods would be used -- prescribed burning, mechanical brush cutting, herbicide treatments, and agreements with farmers for sharecropping or grazing. To improve forest habitat for interior bird species, small areas surrounded by woodland could be planted with trees or left idle to grow into woodlands through succession. New grass plantings would normally be done with "warm season" native grasses and forbs. The use of delayed hay cutting and grazing would be explored.

Recommended planting and maintenance items and their respective costs are:

Prescribed burning - 150 acres/yr. @ \$5.00/acre	\$ 750
Mowing/herbicide - 200 acres/yr. @ \$5.00/acre	\$ 1,000
Tree planting - 25 acres/yr. @ \$350.00/acre	\$ 8,750
Grassland seeding – 100 acres/yr. @ \$200.00/acre	\$ 2,000
Public use facilities inspection and maintenance	\$ 800 (Miles, meals, gravel)
Site and easement inspection and maintenance	\$ 200 (Miles)
Fencing/posting inspection and maintenance	\$ 500 (Miles, meals, misc.)
Estimated Total:	\$ 14,000

Several wetlands in the study area have been tiled, ditched, filled or otherwise altered. Management and restoration of purchased or eased wetlands would include plugging ditches, disabling tile systems, scraping out silt-filled basins, and fencing over-grazed wetlands. Once restored, these wetlands would have a higher value for wildlife habitat and improving water quality. Waterfowl stamp projects will be submitted for the restoration and management of these systems, in accordance with the workplanning efforts of the Department. In addition, partners such as Ducks Unlimited, Shadows on the Wolf, and Whitetails Unlimited may be interested in offsetting some of these restoration costs.

Ponds, lakes, rivers, and streams would be managed to improve water quality and wildlife habitat through the use of vegetative buffer strips, "best management" forestry practices, and "conservation" farming practices. These programs would be administered by the Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS), and land conservation departments under existing or new programs.

Of the existing forested areas within the project boundary, approximately 23,700 acres are enrolled in forest tax incentive programs. There are approximately 23,100 acres in the Managed Forest Law (MFL) program and 600 acres in the Forest Crop Law (FCL) program. Some of the cover types associated with the forestry tax law programs include northern hardwoods, central hardwoods, bottomland hardwoods, swamp hardwoods, oak, white ash, aspen, red pine, fir/spruce, white spruce, herbaceous vegetation, grass, upland brush, minor lake, keg, emergent vegetation, lowland brush, dogwood, and willow.

Staffing

As proposed, the Lower Wolf River Bottomlands Natural Resources Area is an example of integrated ecosystem management and the utilization of partnerships. Both of these principles are goals of the Department. The assessment of the staffing need of this proposed project encompasses five of the different disciplines within the Department of Natural Resources, Forestry, Wildlife, Fisheries, Law Enforcement, and Facilities and Lands. Current staffing levels within the twenty-two townships within this project area are as follows:

- Forestry – Four foresters, one in each county. Two technicians are also currently employed in Waupaca County.
- Wildlife – Two Wildlife Biologists, one in Shawano and one in Waupaca. Two technicians are currently located at Shawano.
- Fisheries – Three Fisheries Biologists, one in Shawano and two in Oshkosh. Two technicians are in Oshkosh, and one in Shawano.
- Law Enforcement – Six wardens currently work within the project area. One in Shawano, two in Waupaca, one in Outagamie, and two in Winnebago.
- Facilities and Lands – No current positions within the project area.
- Endangered Resources - No current positions within the project area.

The additional lands held in fee title or easements would increase the workload on the current staff. Increases within these disciplines would make management of the land possible, as well as increasing our ability to serve the public within those townships. The suggested additional human resources are as follows:

Discipline	Position	Salary & fringe	Supplies/services	Total cost (annual)
Forestry	One technician	\$50,000	\$7,500	\$57,500
Wildlife	One technician	\$50,000	\$21,500*	\$71,500
Fisheries				No request
Law Enforcement	One warden	\$75,000	\$10,000	\$85,000
Facilities/Lands	One technician	\$50,000	\$27,500**	\$77,500
Endangered Resources	One technician	\$50,000		\$50,000

*\$14,000 of this relates to the prior amount listed for management practices on the project lands.

**\$ 20,000 of this relates to the signing and fencing costs related with this project.

Partnering is an essential part of the proposed project and there would be opportunities to work with an increasing number of partners to help accomplish the project goals. We anticipate that developed partnerships would continue and possibly expand and become a major contributor to meeting project goals. In addition, several local private conservation organizations exist that have an interest in fisheries and wildlife habitat management and providing recreational opportunities. These groups have a potential for providing volunteer hours to assist the Department with its management efforts.

The proposed project would involve numerous other partnerships. Partnering with landowners and providing guidance and training to cooperators requires a great deal of effort. This type of approach requires more initial work, but long-term costs and benefits are worthwhile. Coordinating partnership development and activities requires recruiting, training, and supervising volunteer crews who could provide substantial assistance with habitat management. Cultivating such partnerships would take time and effort that existing biologists and technicians might not be able to provide. However, in the long run these partnerships could provide large benefits to the Department and the biological resources it is charged with protecting. A partnership limited term employee will be hired to coordinate this effort. Funding for this position would be placed in the Basin Leader's budget. A budget addition of \$10,500 for salary and \$2,500 for supplies and services is requested.

Estimated annual costs for increased permanent personnel would be approximately \$225,000 (including salary and benefits), and \$10,500 for the LTE position. The total supplies and services annual cost is \$67,500.

Current staffing levels can potentially manage an addition of about 10,000 acres dependent on the amount of development associated with these parcels. Developments can include dikes, water control structures, parking areas, miles of boundaries, and interior roads. Further acquisition above this level would require more staff resources for land management.

Funding

Funding for the acquisition of land and the development of facilities would come from the Department of Natural Resources Stewardship 2000 Program, U.S. Fish and Wildlife Service (NAWCA, EQIP grant) programs, cost-share programs, priority watershed program easement funds, funds from non-profit conservation organizations, and grants from individuals, corporations, and foundations. To the extent possible, the Department would use partners to achieve project objectives. Establishing the Lower Wolf River Bottomlands Natural Resources

Area should enhance the ability of the Department and partners to compete for grants which could help fund acquisition, habitat restorations and maintenance.

Using funds from the existing Department's Fish and Wildlife account (fishing and hunting license sales and sales from pheasant, turkey, and waterfowl stamp accounts) would be used to develop, restore, and enhance wildlife habitat. Additional funds would be sought from federal grants (e.g. NAWCA), and from non-profit conservation organizations such as Ducks Unlimited, Wisconsin Waterfowl Association, and fishing conservation organizations.

ALTERNATIVES TO THE PROPOSED PROJECT

No Action Alternative

Under this alternative existing project boundaries of the 14 Department properties within the study area would remain the same. Most of these properties have not acquired all of the land within their boundaries so some land acquisition would likely occur in the future. These property boundaries were established many years ago and did not take into consideration the potential for connection between properties, or connections of important habitat areas along the Wolf River corridor.

Maintaining existing property boundaries would result in a substantial decrease in land acquisition costs as well as a decrease in related property management costs when contrasted with a larger scale land acquisition effort. Although cost savings could be realized, this would not allow for expansion to improve boundary definition or property management efficiency. This alternative would not provide additional resource protection for important habitats or provide additional recreational access. This could result in continued loss of critical habitat and eventual fragmentation of these areas as land use changes continue in the future.

This approach would rely largely on other efforts to protect the Wolf River system such as land trusts, conservation organizations, or voluntary efforts by landowners. While these are very important on a large scale, it would be very difficult to make a substantial impact without a coordinated effort that also includes a strong component of state land acquisition and easements.

Some people favored no increase in Department acquisition. They are not in favor of the state buying more land and they feel the Department owns more land than they can adequately manage. Others also felt threatened that an expanded boundary line would impose restrictions on how they manage their land.

Project Boundaries Rounded Off Boundary Alternative

This alternative boundary expands existing project boundaries to increase management efficiency and improve access from public roads. This alternative includes 29,352 acres for protection beyond current project boundaries. The "rounding off" of properties would emphasize an improved boundary definition. An improved boundary definition would be done by expanding boundaries out to the nearest road. This could alleviate trespass problems and user confusion on where the property begins or ends. This may also assist in land management practices such as use of roads as firebreaks and access for timber stand improvements. A smaller boundary would mean lower costs for acquisition and management.

Although this boundary includes some critical habitat areas, it would exclude lands between Department properties, the river shoreline, spawning habitat, and areas with many rare species or natural communities. It also would not provide for increased protection or potential for wildlife or recreational corridors, habitat restoration opportunities, the protection of minimally developed lakes, or preservation of agricultural lands.

Cooperators are accomplishing complementary management actions on private lands within project boundaries, and this would continue with this proposed expansion. However, there are no efforts to focus and coordinate activities, or potentially connect Department properties within the study area for further natural resource protection or recreational expansion.

Some favored this approach as it improves access and management efficiencies without creating a larger project. Others were concerned this is too piecemeal of an approach and does not protect much additional habitat or provide connections between properties.

Lower Wolf River Corridor Boundary Alternative

This alternative includes additional lands (61,765 acres in addition to Project Boundaries Rounded Off Alternative) along the entire Lower Wolf River Corridor. Opportunities increase for providing wildlife and endangered/threatened species habitat (e.g. red-shouldered hawk), fishery resources and water quality management; and linear corridor connections for wildlife, recreation, and educational pursuits. An expanded area would also increase opportunities to develop partnerships, provide incentives, and utilize acquisitions or easements for assistance in the management of the Lower Wolf River resources.

This alternative does not provide for the level of habitat restoration opportunities, the protection of minimally developed lakes, or preservation of agricultural lands that is needed to protect the Wolf River system and provide future recreational opportunities. Important Wolf River tributaries (e.g. Embarrass River, Shioc River, Little Wolf River, and Waupaca River) are excluded which contribute to health and diversity of this ecosystem.

Many commented this alternative would accomplish some of the goals of the project but did not go far enough in preserving and improving adjacent habitat and Wolf River tributaries. They expressed strong interest in including the Embarrass River and tributaries of the Lower Wolf River.

Larger than Proposed Project Boundary Alternative

This alternative includes a larger area (>214,000) to encompass more of the watershed and tributary areas. This would provide more opportunities for protection, management, and recreation beyond the area outlined in the proposed boundary alternative. Inclusion of this expanded area would potentially provide a greater benefit but at a greater cost for acquisition and management. This could also reduce management efficiency by stretching resources over a broader area than is desirable. It was generally felt the area within this boundary alternative was larger than what would be practical.

The proposed project acquisition goal of 45,000 acres was established by evaluating which lands best met the highest priority criteria for identifying conservation and recreation lands. This will enable the Department to focus acquisition/easement efforts within this key area while working with others to protect lands that are outside of the focus area but still important for protecting the integrity of the Wolf River system. Expanding the boundary beyond 214,000 acres could make it very difficult for the Department to practically manage or focus efforts scattered over an area this large. It may be possible to better accomplish project goals over the larger area by working in cooperation with landowners and partnership groups to preserve or improve the Wolf River system.

Some favored this alternative and commented the Department should protect as much land as possible, since the Wolf River system is a unique resource and should receive protection.

PUBLIC INVOLVEMENT

Public input was sought from the very beginning using a variety of types, methods, and means in order to create opportunities for participation. Since September 1999, Department staff has prepared written materials on the planning process, the state-owned properties, newsletters/updates, and replies to people's letters of support or concerns. To date, approximately 700 planning participants have been involved in the planning process. The planning staff has also hosted several open houses and working group meetings along with attending club meetings (e.g. Lake Poygan Sportsmen Club, Oshkosh Bird Club, etc.). Efforts have also been made to meet with local, county and state elected officials: town board meetings, Wisconsin Farm Bureau representatives of Outagamie, Shawano, Waupaca (contacts made via phone with Winnebago county). Additionally, nine newsletters have been sent out to planning participants over the past year providing background information, meeting announcements and summaries, and materials for discussion and comment. Overall, comments and support of the Lower Wolf River Bottomlands project have been overwhelming positive. Opportunities for individuals to become involved continue through direct mailings, public notices, and the webpage. The webpage www.dnr.state.wi.us/master_planning/wolf is an archive for planning information and will continue to be updated throughout the master planning process.

During the planning process, local residents and conservation organizations expressed interest in expanding the scope of the planning beyond existing property boundaries. Many people favored a comprehensive approach to look at potentially expanded state ownership and creation of partnerships to protect and improve this ecosystem. Since the initiation of this planning project, formal public involvement has included 10 public meetings and distribution of a series of 9 newsletters to keep the public informed and involved in the process. Department staff has also met with numerous organizations such as the Farm Bureau, sportsmen clubs and other conservation organizations. These groups have been very interested in the project and support the larger project boundary. In addition a number of press releases and feature stories in local newspapers have been written to publicize this project.

The following is a chronology of significant events that lead up to the current proposal for the Wolf River Bottomlands project boundary.

- September 1999 – Held public meetings in 4 locations (Shawano, Shiocton, New London, and Winchester) spaced throughout the planning area to identify key issues in the planning process.
- March & April, 2000 – Department staff attended town board meetings with each of the 22 townships to discuss the potential for a larger project.
- May, 2000 - Developed Vision & Goals based on public input- The Department planning team and a few interested members of the public met to develop draft vision & goals statements based on public input already received, and professional judgment of those most familiar with the study area.
- June 19, 2000 – Public meeting in Stephenville to discuss vision & goals and project boundary criteria. Over 50 people attended and most felt the vision, goals, and boundary criteria were on target.
- August 28, 2000 - Meeting with town chairs to share information on draft boundary alternatives and receive feedback prior to September public meeting.

- Sept. 26th, 27th 2000 - Two public meetings (in Shiocton and Winchester) were held to review 5 potential boundary options. A mailing was sent to over 6,500 landowners and interested citizens to gain input on the different boundary options (290 people attended the meetings). Based on feedback received at these meetings, the planning team refined the 5 boundary options to 3 potential boundary options.
- Nov. 28th, 29th 2000 – Public work group meetings (in Navarino and Dale) to evaluate the revised 3 potential boundary options using the boundary criteria and the vision and goals. Approximately 70 people attended. Participants worked in small-facilitated groups and then reconvened as a large group to share discussions. Most seemed to favor the larger expansions.
- June 6, 2001 - Meeting with town chairs to share information on draft boundary alternative analysis and receive feedback prior to June public meeting.
- June 12 & 14, 2001 - Public meetings (in Winchester and Town of Maine) to discuss draft boundary alternative analysis that planning staff prepared.
- August and September, 2001 - Department staff attended town board meetings with each of the 22 townships to update on project and inform them that draft feasibility to be available in fall. Also, met with Farm Bureau Service representatives.

ENVIRONMENTAL EFFECTS

The proposed Lower Wolf River Bottomlands Natural Resources Area would provide significant positive, long-term benefits to the terrestrial and aquatic resources within the study area. It would also provide protection of the natural resource features and associated habitats of the Lower Wolf River and Embarrass River systems, thereby contributing to the quality of life in the surrounding rural and urban environments.

Lands acquired by the Department, as well as some parcels protected under easements or volunteer agreements would be actively managed to maintain, enhance, or restore wetland and upland habitats. This could include the restoration of previously converted wetlands, and the planting of upland woodland and grassland species on some agricultural lands. Degraded wetland areas would be restored to the extent possible by plugging drainage ditches, disabling drain tile systems, excavating scrapes, and building berms. Engineering feasibility studies would be completed to determine the full possibility of wetland restorations, and to ensure that the proposed restorations would be done in such a way as not to cause hydrologic change on privately owned land. The actual size and location of proposed restorations would be addressed in the property master plan.

The restoration of wetlands and the conversion of marginal agricultural lands to permanent grassland and upland cover would result in significant benefits to surface and groundwater resources in the project area. We would expect to experience a decrease in soil erosion and nutrient runoff in the Lower Wolf and Embarrass River and tributary streams. Water quality improvements would benefit the associated fishery and aquatic ecosystems. Some portions of tributary streams within the proposed Lower Wolf River Bottomlands Natural Resources Area are designated as priority watershed projects.

An attribute of Department ownership is that marginal agricultural lands taken out of production could be restored to agricultural use if such a conversion were required in the future. Agency policy also provides for emergency hay cutting on state-owned lands when farmers experience shortages caused by severe drought conditions.

The Department would make a payment-in-lieu-of-taxes in accordance with Section 70.114 of the State Statutes on all lands purchased in fee title. Therefore, the potential impact on property taxes from Department ownership within the project area should be negligible. A June 2000 study by the Department of Revenue states that public land in a community has little effects on property taxes in that community. It is possible that the values of some private properties located adjacent to larger parcels of public land could be affected. In some circumstances, the value of properties adjacent to a block of public land may increase due to the perception that the recreational opportunities and solitude provided by the public lands are positive amenities, although, it is difficult to predict where and to what extent these scenarios could occur. In addition, the use and effect of perpetual conservation easements on the tax base is difficult to predict. State law requires that local assessors consider the effect of conservation easements on the value of property. The existence of a perpetual conservation easement could reduce the value of a given property to some degree. However, based on past experience and uses of conservation easements, there are no known cases where assessed property values have actually changed as a result of Department easement acquisition.

Cumulative Effects

No adverse cumulative effects are anticipated. The proposed project area would contribute to the protection and management of green space, fish and wildlife habitat, water quality of the lower Wolf River watershed, educational and recreational opportunities, and overall high quality of life.

The cumulative effect of the removal of some cropland from production, coupled with losses experienced elsewhere in the state, may cause concern. However, it is anticipated that the rate of residential and cottage home development will increase in the project area, regardless of the status of the proposed project. Also, data from the Wisconsin Agricultural Statistics Reporting Service shows that cropland acquired by the Department is responsible for less than three percent of all croplands diverted to other uses in Wisconsin (1989-1998). Since sharecropping is practiced on some Department owned lands and existing lands within the proposed project area, state ownership could actually allow agriculture to continue on some state-owned lands. The sale of non-cropland acreage may reduce the debt-load of some farmers, thereby maintaining their ability to farm other lands.

The potential exists for the public to inadvertently trespass on private lands as hunting and recreational uses increase. To prevent such trespass problems, measures such as properly posting lands and/or enforcement will be addressed in the property master plan. The proposed project boundary identifies an area where the Department and its partners can use fee title or easement acquisition, or other types of agreements with landowners to help preserve and protect natural resources and provide for outdoor recreation and education opportunities. Existence of the project boundary does not limit a landowner's use or the sale or other disposition of his/her property, based on Department regulatory responsibilities. The landowner maintains the right to use and develop his/her property in accordance with existing regulations.

Risks

There is little or no risk associated with the proposed purchase of lands by the Department. There is a distinct risk that if the Department did not acquire the lands or enter into partnerships for land protection, future development of the upland areas for residential or commercial uses could impair the natural features and rural character of these lands.

Critical habitat for wildlife would likely degrade, and in some cases, be entirely lost. Plant and animal communities identified for their significance to the Lower Wolf and Embarrass Rivers ecosystem could also be jeopardized. Access to high quality natural resources for recreational

activities might also be reduced, while the demand for these opportunities would increase in the area.

Precedent

The creation of a 214,000 project area would not set a precedent, as other state-owned and managed projects have been established in the past. These include the Lower Chippewa River State Natural Area and the Western Prairie Habitat Restoration Area which are also landscape scale projects. These projects also have established acreage goals smaller than the project boundary; they have generally used habitat models of target species for identifying lands for protection. The Lower Wolf River Bottomlands is different in that instead of using habitat models for target species, the project has developed a set of criteria for identifying priority conservation and recreation lands within the project area. These criteria are more encompassing in that they look to protect, maintain, or enhance the entire river ecosystem, not just specific species. While this project includes "traditional" Department land acquisition, it also relies extensively on innovative approaches to land protection that could involve a variety of partners and interested landowners for the overall project success. In this way the Lower Wolf River Bottomlands does set a precedent in establishing and implementing ecosystem management. This approach could become a template for other landscape-scale projects in the future.

Controversy Over the Environmental Effects

There has been considerable emphasis on gathering public input during this planning process. The Department held 11 public input session (i.e. open houses and meetings) from September, 1999 to June 2001; met with elected officials and made presentations to each of the representative townships and town boards; contacted state elected officials whose districts lie within the project area; met with Land Conservation Committees; met with Farm Bureau representatives in Winnebago, Waupaca, Outagamie, and Shawano counties; made presentations to various local sportsmen clubs and other conservation organizations; sent out newsletters to more than 700 interested participants; and maintain webpages with current information.

There is considerable support for the Department to continue exploring the potential for developing a project in this area. Sharing information and keeping people informed of this project continues to be an ongoing process that will carry into master planning. Some are philosophically opposed to increased public ownership and others have expressed concerns over whether the Department will be able to properly manage more lands in this area. Other concerns over condemnation of lands, specific property management issues, and zoning changes were expressed and these have been addressed during the planning process.

It is the policy of the Natural Resources Board to acquire land within a project boundary from willing sellers or through donations. The use of conservation easements are important additions to fee simple acquisitions. Lands acquired using fee simple would be removed from the tax roll and the Department would make a payment in lieu of taxes. The payment in lieu of taxes is equal to property taxes normally paid on that land and is distributed to the various taxing jurisdictions. There would be no noticeable loss of revenue to the local school district, city or county, nor would any land acquisition have a negative impact on regional land values. Lands with conservation easements remain the property of the landowner, who is responsible for the payment of taxes in the future.

PROJECT FEASIBILITY

Based on the information presented above, Department staff believe that the Lower Wolf River Bottomlands Natural Resources Area is feasible, from the standpoint of legal authority, ecological soundness, public support, and availability of initial staffing and funding. The

project could proceed with existing permanent and limited term staff, but will eventually require additional staff and funds to fully implement.

This project was initiated as a master planning effort and through the public involvement process, the focus was changed to explore opportunities for expanding existing Department project boundaries, to provide additional natural resource protection and provide connection for wildlife and recreation corridors. This proposal presents the past 2 year's investigations and recommends a project boundary for the future of the Lower Wolf River Bottomlands. Given the overwhelming public support and enthusiasm for this project to date, Department staff recommend that the project proceed. It is anticipated that long-term acquisition funding will be available as a result of the stewardship program reauthorization.

If the recommended project boundary were established, the master planning process would resume and this process would identify in greater detail how the project would be implemented. The public participation in this effort has been instrumental and would continue with the master planning process.

The Lower Wolf River Bottomlands project has generated considerable interest, suggestions, and support from a variety of individuals, groups, organizations, and other agencies. Without their involvement this project would not be possible.

APPENDIX A

Lower Wolf River Bottomlands Planning Effort

Draft Vision

The Lower Wolf River Bottomlands will be managed recognizing the interconnectedness of air, water, and land in sustaining ecosystems in balance with local cultural and economic values. In partnership with citizens as stewards of the natural resources, we work to protect, restore, maintain, and enhance healthy, diverse ecosystems and the natural, scenic beauty of the corridor, while providing compatible recreational pursuits and educational opportunities for current and future generations.

Draft Goals

The land along the Lower Wolf River Bottomlands is protected through ecologically sound management decisions that reflect long-term considerations for healthy ecosystems.

The Lower Wolf River Bottomlands protects the quality and quantity of surface and groundwater resources.

All citizens share the responsibility for the stewardship of the natural resources in the Lower Wolf River Bottomlands for the benefit of current and future generations.

The public has opportunities to experience a diverse range of compatible outdoor recreational and educational activities that enhance the quality of life and economy within the Lower Wolf River Bottomlands.

The Lower Wolf River Bottomlands provides opportunities to preserve agricultural land through creative land management options.

Draft Criteria for Identifying Conservation and Recreation Lands within the Lower Wolf River Bottomlands

Protect the Lower Wolf River and its tributaries river shoreline. The area is seeing increasing pressures for development; citizens feel there is a need to protect the natural resources and scenic qualities within the Lower Wolf River Bottomlands.

Provide an opportunity for a corridor connection for wildlife habitat and recreational opportunities. Connection between open spaces are important for the biological diversity of many wildlife species and plant and animal communities. Recreational activities can also be provided by providing linear trails and increasing the size of properties to allow for more diverse activities.

Provide opportunities for habitat restoration. Maintaining, protecting, and improving the Lower Wolf River Bottomlands wetlands will provide for improved and enhanced water quality, shoreline protection, and wildlife habitat.

Protect areas with endangered and threatened resources, and critical habitats. For example, the Lower Wolf River Bottomlands corridor has been identified as the best bottomland hardwoods in WI. This area has a high potential for sensitive bottomland forest and wildlife species as well as many other significant natural features.

Protect lakes with minimal development. There are relatively few undeveloped lakes within the Lower Wolf River Bottomlands. Protecting these rare resources will help preserve them for the future.

Include spawning areas for protection and habitat management. The Lower Wolf River provides spawning habitat for walleye and sturgeon. To enhance these habitats additional lands to buffer and connect existing areas should be considered for a variety of fish species.

Improve the potential for fish and wildlife and other recreational/educational opportunities. For example, expand the boundary along the Lower Wolf River corridor to include other lands because most of the existing wildlife areas are wetland, which limits access. Also, provide for additional shoreland access (i.e. shore fishing opportunities).

Include larger tracts of land that promote ecological and/or recreational opportunities. As demands for land increases for development, recreational pursuits, and wildlife habitat the affordability and availability of larger acreage's decreases. Larger, continuous parcels of land provide for better land management, recreational pursuits, and hunting and trapping opportunities.

Improve boundary definition for better land management and public access. Avoid trespass problems and user confusion about the location of boundary by expanding property boundaries to nearby roads, and establishing a more linear boundary where necessary.

APPENDIX B

Rare Plants of the Lower Wolf River Bottomlands Natural Resources Inventory Area

Common name	Scientific name	Observation date	WI State status	Federal status
prairie white-fringed orchid	<i>Platanthera leucophaea</i>	1993	END	Lt
squarestem spikerush	<i>Eleocharis quadrangulata</i>	1930	END	
brittle prickly-pear	<i>Opuntia fragilis</i>	1986	THR	
handsome sedge	<i>Carex formosa</i>	1999	THR	
marsh valerian	<i>Valeriana sitchensis ssp uliginosa</i>	1928	THR	
pale green orchid	<i>Platanthera flava var herbiola</i>	1970	THR	
ram's-head lady's-slipper	<i>Cypripedium arietinum</i>	1928	THR	
small white lady's-slipper	<i>Cypripedium candidum</i>	1987	THR	
American shore-grass	<i>Littorella americana</i>	1931	SC	
cuckooflower	<i>Cardamine pratensis</i>	1999	SC	
Deam's rockcress	<i>Arabis missouriensis var deamii</i>	1965	SC	
Hooker orchis	<i>Platanthera hookeri</i>	1916	SC	
indian cucumber-root	<i>Medeola virginiana</i>	1999	SC	
large roundleaf orchid	<i>Platanthera orbiculata</i>	1931	SC	
leafy white orchis	<i>Platanthera dilatata</i>	1931	SC	
northern bog sedge	<i>Carex gynocrates</i>	1931	SC	
rock stitchwort	<i>Minuartia dawsonensis</i>	1965	SC	
showy lady's-slipper	<i>Cypripedium reginae</i>	1916	SC	
small yellow lady's-slipper	<i>Cypripedium parviflorum</i>	1890	SC	
Vasey rush	<i>Juncus vaseyi</i>	1916	SC	
waxleaf meadowrue	<i>Thalictrum revolutum</i>	1971	SC	
yellow screwstem	<i>Bartonia virginica</i>	1916	SC	

WI Status: Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened; LELT = listed endangered in part of its range, threatened in another part; PE = proposed endangered; PT = proposed threatened; PEPT = proposed endangered in part of its range threatened in another.

APPENDIX C

Rare Animals of the Lower Wolf River Bottomlands Natural Resources Inventory Area

Common Name	Scientific Name	Observation Date	WI State Status	Federal Status	Group Name
blanchard's cricket frog	<i>Acris crepitans blanchardi</i>	1983	END		frog^
snuffbox	<i>Epioblasma triquetra</i>	1995	END		mussel^
forster's tern	<i>Sterna forsteri</i>	1984	END		bird^
barn owl	<i>Tyto alba</i>	1979	END		bird
slippershell mussel	<i>Alasmidonta viridis</i>	1991	THR		mussel^
red-shouldered hawk	<i>Buteo lineatus</i>	1984	THR		bird^
wood turtle	<i>Clemmys insculpta</i>	1989	THR		turtle^
cerulean warbler	<i>Dendroica cerulea</i>	1984	THR		bird
blanding's turtle	<i>Emydoidea blandingii</i>	1999	THR		turtle^
longear sunfish	<i>Lepomis megalotis</i>	1926	THR		fish^
redfin shiner	<i>Lythrurus umbratilis</i>	1926	THR		fish^
river redhorse	<i>Moxostoma carinatum</i>	1982	THR		fish^
greater redhorse	<i>Moxostoma valenciennesi</i>	1994	THR		fish^
pugnose shiner	<i>Notropis anogenus</i>	1971	THR		fish^
yellow-crowned night-heron	<i>Nyctanassa violacea</i>	1984	THR		bird^
pygmy snaketail	<i>Ophiogomphus howei</i>	1999	THR		dragonfly^
salamander mussel	<i>Simpsonia ambigua</i>	1991	THR		mussel^
buckhorn	<i>Tritogonia verrucosa</i>	1995	THR		mussel^
lake sturgeon	<i>Acipenser fulvescens</i>	1996	SC/H		fish^
elktoe	<i>Alasmidonta marginata</i>	1995	SC/H		mussel^
american bittern	<i>Botaurus lentiginosus</i>	1984	SC/M		bird^
henry's elfin	<i>Callophrys henrici</i>	1990	SC/N		butterfly
a land snail	<i>Catinella gelida</i>	1997	SC/N		snail
black tern	<i>Chlidonias niger</i>	1984	SC/M		bird^
gorgone checker spot	<i>Chlosyne gorgone</i>	1991	SC/N		butterfly
a tiger beetle	<i>Cicindela patruela patruela</i>	1999	SC/N		beetle
yellow-billed cuckoo	<i>Coccyzus americanus</i>	1984	SC/M		bird
lake chubsucker	<i>Erimyzon sucetta</i>	1981	SC/N		fish^
columbine dusky wing	<i>Erynnis lucilius</i>	1991	SC/N		butterfly
western sand darter	<i>Etheostoma clarum</i>	1994	SC/N		fish^
least darter	<i>Etheostoma microperca</i>	1979	SC/N		fish^
two-spotted skipper	<i>Euphyes bimacula</i>	1989	SC/N		butterfly^
dion skipper	<i>Euphyes dion</i>	1999	SC/N		butterfly^
banded killifish	<i>Fundulus diaphanus</i>	1995	SC/N		fish^
sculpted glyph	<i>Glyphyalinia rhoadsi</i>	1997	SC/N		snail
plains clubtail	<i>Gomphurus externus</i>	1999	SC/N		dragonfly^
splendid clubtail	<i>Gomphurus lineatifrons</i>	1991	SC/N		dragonfly^
skillet clubtail	<i>Gomphurus ventricosus</i>	1999	SC/N		dragonfly^
green-faced clubtail	<i>Gomphus viridifrons</i>	1999	SC/N		dragonfly^
bald eagle	<i>Haliaeetus leucocephalus</i>	1992	SC/FL	(PS)	bird^
dark rubyspot	<i>Hetaerina titia</i>	1999	SC/N		dragonfly^
karner blue butterfly	<i>Lycaeides melissa samuelis</i>	1996	SC/N	LE	butterfly
red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	1984	SC/M		bird
stygian shadowfly	<i>Neurocordulia yamaskanensis</i>	1999	SC/N		dragonfly^
weed shiner	<i>Notropis texanus</i>	1995	SC/N		fish^
pugnose minnow	<i>Opsopoeodus emiliae</i>	1981	SC/N		fish^
a small minnow mayfly	<i>Paracloeodes minutus</i>	1992	SC/N		mayfly^
a primitive minnow mayfly	<i>Parametetus chelifer</i>	1993	SC/N		mayfly^

Common Name	Scientific Name	Observation Date	WI State Status	Federal Status	Group Name
an ephemerid mayfly	<i>Pentagenia vittigera</i>	1992	SC/N		mayfly^
tawny crescent spot	<i>Phyciodes batesii</i>	1991	SC/N		butterfly
round pigtoe	<i>Pleurobema sintoxia</i>	1995	SC/H		mussel^
mulberry wing	<i>Poanes massasoit</i>	1991	SC/N		butterfly^
broad-winged skipper	<i>Poanes viator</i>	1991	SC/N		butterfly
little glassy wing	<i>Pompeius verna</i>	1991	SC/N		butterfly^
prothonotary warbler	<i>Protonotaria citrea</i>	1985	SC/M		bird
a heptageniid mayfly	<i>Pseudiron centralis</i>	1999	SC/N		mayfly^
arctic shrew	<i>Sorex arcticus</i>	1999	SC/N		mammal^
northern marbled locust	<i>Spharagemon marmorata</i>	1999	SC/N		grasshopper
a riffle beetle	<i>Stenelmis antennalis</i>	1999	SC/N		beetle^
elusive clubtail	<i>Stylurus notatus</i>	1999	SC/N		dragonfly^
ash-brown grasshopper	<i>Trachyrhachys kiowa</i>	1999	SC/N		grasshopper
appalachian pillar	<i>Cionella morseana</i>	1997			snail

WI Status: Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened; LELT = listed endangered in part of its range, threatened in another part; PE = proposed endangered; PT = proposed threatened; PEPT = proposed endangered in part of its range threatened in another. **Group Name:** ^ = aquatic species.

APPENDIX D

(an excerpt from the Biotic Inventory & Analysis of the Wolf River Basin: An Interim Report, WDNR, 2000)

Key issues for Master Planning

The following are ecological issues that have emerged after review of NHI's preliminary results following one field season in the Lower Wolf River Bottomlands Master Plan inventory area. These issues were developed for the Department's master planning team who will use these issues, along with other information, to help develop overall recommendations for the DNR properties and surrounding areas. This inventory and analysis are only a part of a broader assessment that will be completed to prepare for master planning, which will consolidate a variety of information to develop the overall recommendations.

Although the NHI information presented in this report is preliminary, it should prove to be very useful for planning. More thorough analysis and management considerations will be developed at the conclusion of the biotic inventory for the entire Wolf River Basin expected in the spring of 2002. Site specific management issues and considerations are provided in the individual site descriptions in Appendix B.

Fragmentation

Since European settlement of the lower Wolf River Basin, both pattern and extent of native vegetation have been changed dramatically. Clearing for agricultural, residential, and industrial developments has reduced the forests, and in the southernmost part of the basin oak savanna, to small isolated remnants. These are typically within a matrix of agricultural land. Riverine systems have been fragmented by the construction of dams, which can effectively isolate populations and habitats of aquatic organisms, and reduce habitat suitability of sensitive species.

The largest, most intact native ecosystems persisting in the lower Wolf River Basin are wetland complexes within the floodplains of the Wolf River and its major tributaries. There are also several large wetland complexes within insular depressions in glacial till, outwash, or lakeplain.

Ecosystem Simplification

The structure, composition, and function of ecosystems native to the region have been significantly modified, often in ways that have led to the loss of characteristic species or other attributes. Large carnivores, several large ungulates, and certain habitat specialists are now absent from areas they formerly occupied. Monocultures of agricultural crops have replaced diverse native ecosystems. Suppression of fire has diminished or eliminated prairie and savanna species due to encroachment of open habitats by woody species. Grazing pressure has altered ecosystems by suppressing reproduction of trees and subjecting some herbs and shrubs to pressures they cannot withstand. Logging has reduced the extent of older forest successional stages. Invasive species now dominate some ecosystems, crowding out the natives.

Extensive wetlands found along the lower portion of the Wolf River have been severely altered by drainage, impoundments, and a phenomenon called marsh recession. Upland shorelines have been almost completely developed in some areas for residential and recreational purposes. Dominant faunal communities have been substantially altered in the large lakes on the lower Wolf River by the replacement of mayflies and native fish as dominants, to midges and non-native fish. Some of the fixes attempted for these problems, such as rough fish control or rip-rapping of eroding shorelines, may actually further simplify native ecosystems.

Invasive/Exotic Species

These are non-native, or in some cases Eurasian strains of native, species which have the capability of colonizing native ecosystems and displacing native species. Invasive and exotic species that are well established in the wetlands of the lower Wolf River Basin include reed canary grass, purple loosestrife, giant reed, Eurasian water-milfoil, moneywort, and flowering rush. Carp and rusty crayfish are prevalent in some of the region's aquatic systems. Zebra mussels are a significant, but yet unrealized, threat to any warmwater firm-bottomed aquatic habitat in the lower Wolf River Basin.

Hydrological Manipulation

There are over 50 dams on 30 streams in the Lower Wolf River Bottomlands Master Plan inventory area creating almost 3,800 acres of impoundments. By far the majority of these are on the streams west of the Wolf River. Dam heights range from one to 38 feet. Some of these dams are operated such that spring flood levels are minimized, or to maximize production of electricity. The net result is that natural fluctuations in the flow regime have been changed. Drainage of wetlands has been extensive. In some counties in the lower Wolf River Basin over 30 percent loss of wetlands has been documented since 1961.

Water Quality

Water quality in the lower Wolf River Basin has declined markedly since the advent of intensive farming and industrialization. Many point sources of organic and chemical pollutants have been identified and subsequently addressed. However, nonpoint source pollutants remain a significant threat to aquatic diversity in the lower Wolf River Basin.

Multiple Ownership (private and multiple ownership)

Ownership within the Wolf River Basin is predominantly private. Within the southeast portion of the basin, scattered DNR-owned properties exist, but only represent a modest percentage of the overall land base and the area's representative natural communities. The Wolf River corridor is the biologically richest portion of the area, but DNR-owned properties are scattered along its length and have few connecting corridors. The high percentage of private ownership represents both a challenge and an opportunity for managing landscapes and strategizing for a long term conservation plan. Opportunities may exist for a variety of conservation and protection alternatives.

Management Needs of Rare Species

The ongoing biotic inventory project will provide information on the locations and habitat affinities of rare plants and animals. With a few exceptions (e.g. lake sturgeon, bald eagle), basic information on the needs and sensitivities of rare species has not been available to managers in the basin.

Importance of the Wolf River to Ecoregional Planning

The Nature Conservancy (TNC) is currently developing ecoregional plans for each of the major ecoregions in the United States. In Wisconsin, TNC has nearly completed the plan for the Great Lakes Ecoregion, which includes the Wolf River Basin. TNC's ecoregional planning designs a portfolio of sites that collectively conserve viable natural community types, globally rare native species, and other selected features. Within each site, TNC anticipates working with their partners to conserve, or where necessary restore, the ecosystem patterns and processes that sustain the elements for which that site was selected (TNC 1997).

Map 7 shows the preliminary aquatic portfolio sites that were identified within the Wolf River Basin. Portions of the Wolf River mainstem, the lower Embarrass River, and the Crystal/Waupaca River fall within the master plan inventory area. These sites have been identified because of their ecoregional significance and, as priorities, are in need of conservation activities to ensure protection of the diversity of the aquatic species found here.

Miscellaneous

In this interim report, each of the public lands within the lower basin is treated as a “site”. Pending document review and subsequent to the collection of additional data during the 2000 field season, it is expected that most, if not all, of the natural community boundaries within the public properties will be revised to reflect ecological attributes.

APPENDIX E

Glossary

Biological Diversity - The variety and abundance of species, their genetic composition and the communities, ecosystems and landscapes in which they occur. "Biological Diversity" also refers to the variety of ecological structures, functions, and processes at any of these levels. [Wis. Stats., Section 28.04 (1)].

Class 1 Agricultural Land - Class 1 lands are defined by the Natural Resource Conservation Service (NRCS) as having soils with few limitations that restrict their use. They are soils that do not require special conservation practices, do not reduce the choice of plants that can be grown on them, do not limit their use largely to pasture, woodland or wildlife, and are not unsuited to cultivation or for the development of commercial plants.

Coniferous Swamp - White cedar or tamarack wetlands that may be inundated in spring and saturated for most of the growing season. Soils are organic peat or muck with tamarack more common in acidic soils and white cedar where soils are alkaline. While coniferous swamps are common in northern Wisconsin, they are rare in the southern half of the state and home to many rare plants such as lady-slipper orchids.

Conservation Easement - The purchase of partial rights to a property. Common rights purchased include wetland easements, which prohibit some or all building construction on the property. Other examples are habitat, hunting, fishing, scenic, and streambank easements.

Conservation Reserve Program (CRP) - Established in 1985, is a federal program, administered by the Natural Resource Conservation Service (NRCS), that encourages landowners to voluntarily plant areas of grass and trees on land that needs protection from erosion, to act as windbreaks, or in places where vegetation can improve water quality or provide food and habitat for wildlife. Contracts are 10 to 15 years long. In return, the landowner receives an annual rental payment, incentive payments for certain activities and cost-share assistance to establish the protective vegetation. There is no public access. The landowner's permission is needed to access his/her land.

Conservation Reserve Enhancement Program (CREP) - CREP is a State-federal conservation partnership program targeted to address specific State and nationally significant water quality, soil erosion and wildlife habitat issues related to agricultural use. The program uses financial incentives to encourage farmers and ranchers to voluntarily enroll in contracts of 10 to 15 years in duration to remove lands from agricultural production. This community-based conservation program provides a flexible design of conservation practices and financial incentives to address environmental issues.

Endangered Species - State designated endangered species include any species native to the State of Wisconsin whose continued existence as a viable component of the State's wild animals or wild plants, is determined by the Wisconsin Department of Natural Resources, on the basis of scientific evidence, to be in jeopardy. [Wis. Stats., Section 29.604 (2)(a)].

Environmental Quality Incentives Program (EQIP) - This federal program provides technical help, cost-sharing and education for conservation on farmland. It focuses on locally-identified priority watersheds, although some funds are available statewide.

Feasibility Study - A study used to determine whether it is feasible for the Department of Natural Resources to establish, acquire, develop, and manage a new property. The study considers the physical and biological environment and its capability, the view of the landowners and general public, and the availability of funding and staff to adequately accomplish the project purpose.

Floodplain - Land which may be covered by floodwater during the regional flood. The flood frequency of the regional flood is once in every 100 years. This means that in any given year there is a 1% chance that the regional flood may occur or be exceeded.

Floodplain Forest - Wetlands dominated by deciduous hardwood trees that grow on mineral soil adjacent to streams. The soils are inundated during flood events but are usually well drained for much of the growing season. Common trees are silver maple, green ash, cottonwood, elm, black willow, and box elder. Floodplain forests are important for flood storage and have a high diversity of animal species since they are migration corridors. Animals commonly found are wood ducks, barred owls, herons, songbirds, and amphibians.

Forest Crop Law (FCL) - The FCL was available from 1928 to 1986. The last contracts expire December 31, 2035. These lands are open for public hunting (not trapping) and fishing. When the FCL contracts expire, the landowner can apply for the Managed Forest Law (MFL) program, if the land meets the minimum eligibility requirements.

Hardwood Swamps - Wetlands dominated by deciduous hardwood trees on organic or muck soils of old lake basins or oxbows. They have standing water in the spring and saturated soils or ponded water for much of the growing season. Black ash, red maple, silver maple, yellow birch, and elm are common in hardwood swamps. They also have a shrub layer and ground cover of species from the wet meadow plant community. Hardwood swamps retain floodwater and provide habitat for deer and furbearers, grouse, songbirds, and amphibians.

Managed Forest Law (MFL) - Established in 1986, MFL combined 2 earlier state forestry incentive programs - Forest Crop Law and Woodland Tax Law. Any landowner of 10 contiguous acres of forestland can apply for MFL. Contracts are 25 or 50 years long and the landowner must follow a forest management plan. At least 80% of the enrolled property must be forested and used for no other purpose except for growing trees. The landowner can choose to have the property opened or closed to the public. Tax payments made by the landowner are dependent upon whether the land is opened or closed to the public.

Marshes - Wetlands with aquatic plants like cattails, sedges, and arrowhead growing in permanent to seasonal shallow water. Marshes are the most productive wetlands for water birds and furbearers and they also provide spawning and nursery habitat for fish like walleye. Ducks, rails, herons, and songbirds use marshes for breeding and feeding. Upland wildlife like pheasant or rabbit use marshes as winter habitat. Marshes also store floodwater, protect shorelines from erosion and improve water quality.

Natural Areas - Tracts of land or water so little modified by human activity, or which have recovered from effects of such activity, that they contain intact native plant and animal communities believed to be representative of the pre-European settlement landscape.

Natural Heritage Inventory (NHI) - A Department of Natural Resources's program responsible for maintaining data on the locations and status of rare species, natural communities, and natural features in Wisconsin. The Wisconsin NHI is part of an international network of inventory programs that collect, process, and manage data on the occurrences of natural biological diversity using standard methodology.

North American Wetlands Conservation Act (NAWCA) - The NAWCA of 1989 provides matching grants to private or public organizations or to individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico.

Shrub Swamps - Wetlands dominated by woody vegetation like small willows, red osier and silky dogwoods. They occur on saturated or seasonally flooded muck soils and on the mineral soils of floodplains. Wet meadows may become shrub swamps after drainage and fire suppression. Shrub swamps provide habitat for many songbirds, grouse, woodcock, and small mammals as well as winter habitat for upland game.

Special Concern Species - Species for which some problem of abundance or distribution is suspected but not yet proven.

Sustainable Forestry - The practice of managing dynamic forest ecosystems to provide ecological, economic, social and cultural benefits for present and future generations [Wis. Stats., Section 28.04 (1)].

Threatened Species - State designated threatened species include any species of wild animals or plants native to the State of Wisconsin which appear likely, within the foreseeable future and on the basis of scientific evidence, to become endangered [Wis. Stats., Section 29.604 (2)(b)].

Wet Meadows - Wetlands vegetated with grass, sedge, and showy flowering plants like marsh milkweed, goldenrod, and aster. Woody plants are absent and standing water is present only after heavy rains. Wet meadows are especially important for water quality protection since they are generally the buffers between uplands and waterways where their dense vegetation traps sediments and takes up nutrients. They also retain floodwater and provide wildlife habitat for many species including cranes, pheasants, and many small mammals.

Wetlands - Areas where "water is at, near or above the land surface long enough to support aquatic or hydrophytic vegetation, and which has soils indicative of wet conditions" [Wis. Stats., Section 23.32 (1)].

Wetland Reserve Program (WRP) -This program restores wetlands that were previously drained or filled for crop production. Options are 10-year contracts, and 30-year or permanent easements.

November 30, 2001

BEFORE THE
DEPARTMENT OF NATURAL RESOURCES

RECORD OF DECISION
WISCONSIN ENVIRONMENTAL POLICY ACT COMPLIANCE FOR THE
PROPOSED LOWER WOLF RIVER BOTTOMLANDS NATURAL RESOURCES
AREA

In portions of Outagamie, Shawano, Waupaca, Winnebago Counties

The Wisconsin Environmental Policy Act (WEPA) requires state agencies to prepare an Environmental Impact Statement (EIS) for major state actions significantly affecting the quality of the environment. Department of Natural Resources (DNR) regulations for implementing WEPA (Ch. NR 150, Wis. Adm. Code) classify Department acquisition projects that involve over 1000 acres, and that involve a basic change in land use, as Type 1 actions that require the preparation of an EIS.

The proposed Lower Wolf River Bottomlands Natural Resources Area project boundary includes 214,000 acres of lands in portions of Shawano, Outagamie, Waupaca, and Winnebago counties. Scattered within this boundary are 14 existing state properties. The proposed project would rely on partnerships between the Department of Natural Resources (Department), local governments, conservation groups, and others to protect the important natural resources inside the proposed boundary and would also use traditional Department land acquisition and easement programs. In order to achieve this, the Department would establish a land acquisition goal of 45,000 additional acres outside of the existing state properties to focus on opportunities for land protection of the Lower Wolf River and Embarrass River corridor and their important floodplain forests and marshes; and the potential to connect existing state properties.

This proposal was the subject of an environmental review and feasibility study process that culminated in the release of an Environmental Impact Statement and Feasibility Study. The Department's authority to undertake the proposed project is found in s. 23.09(2)(d), Wis. Stats.. That statute authorizes land purchases by the Department for fisheries, wildlife, forestry, parks, natural areas, recreation, and habitat areas. The proposed legal designation for the Lower Wolf River Bottomlands Natural Resources Area is "habitat area" as found in s. 23.092, Wis. Stats.. In order to implement the proposed project, the Department must obtain approval of the Natural Resources Board (NRB), and ultimately the approval of the Governor. This proposal will be presented for approval at a meeting of the NRB in January, 2002.

FINDINGS OF FACT

The Department of Natural Resources finds that:

- 1.) The EIS and Feasibility Study document for the Lower Wolf River Bottomlands Natural Resources Area was released for a public review period commencing on October 8, 2001 and ending November 23, 2001. During the 45-day review period, 10 written comments were received from individuals, organizations, and agencies.
- 2.) An informational public hearing on the EIS and Feasibility Study was held on Thursday, November 8, 2001, in New London, Wisconsin. Hearing sessions were

- 3.) During the public hearing sessions 8 people gave oral testimony or asked questions for the hearing record. Four people provided written testimony on comment forms provided at the sessions.
- 4.) Issues to be discussed in the EIS and Feasibility Study were identified through a series of Department staff meetings, 10 public meetings, and numerous meetings with local governments, cooperating agencies, interested organizations, and individuals.
- 5.) A summary of the issues raised in public comments about the EIS and Feasibility Study, and Department responses to those issues, has been prepared and is being distributed with this Record of Decision.
- 6.) Consistent with social, economic, and other essential considerations, the Department, in developing this proposal, has adopted all practical means to avoid or minimize adverse environmental impacts.
- 7.) Department staff will include the EIS and Feasibility Study document, and the summary of public comments about the study, in their presentation of the proposal to the Natural Resources Board.

CONCLUSIONS OF LAW

The Department of Natural Resources concludes that:

- 1.) The Department, under Ch. NR 150, Wis. Adm. Code and S. 1.11 Stats., has the responsibility to comply with WEPA, and the authority to determine its compliance with that Act.
- 2.) The Department, under S. 23.27, Stats., has the authority to plan and implement State Natural Resources Areas.

DECISION

- 1.) The Department of Natural Resources has complied with the requirements of WEPA; S. 1.11, Stats.; and Ch. NR 150, Wis. Adm. Code in studying the feasibility of implementing the proposed Lower Wolf River Bottomlands Natural Resources Area project. This compliance applies to all subsequent individual actions consistent with the EIS.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to SS. 227.52 and 227.53, Stats., you have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Stats., you have 30 days after the decision is mailed or otherwise served by the Department to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request

for a contested case hearing is not a prerequisite for judicial review and does not extend the 30 day period for filing a petition for judicial review.

This notice is provided pursuant to S. 227.48(2), Wis. Stats.

Dated at Green Bay, Wisconsin, the 30th day of November, 2001.

STATE OF WISCONSIN
Department of Natural Resources
For the Secretary

By
Al Stranz, Supervisor
Environmental Analysis & Review Program
Northeast Region

Lower Wolf River Bottomlands Natural Resources Area
Feasibility Study and Environmental Impact Statement
Public Comment Summary and Response
November 30, 2001

The public comment period and public informational hearing for the Lower Wolf River Bottomlands Natural Resources Area Feasibility Study and Environmental Impact Statement (EIS) have been completed. The public comment period commenced with public distribution of the Feasibility Study and EIS on October 8, 2001, and concluded on November 23, 2001. The public informational hearing was held at the New London High School in New London on November 8, 2001.

During the 45 day comment period, a total of 10 comments were received from individuals, organizations, and agencies. These comments were written. Twenty-eight people attended the public hearing. Eight people chose to give formal testimony at the hearing. People in attendance were asked to fill out an appearance slip; 7 people checked in support of the project, 2 opposed, and 2 checked as interest may appear. The remaining 17 appearance were incomplete.

All written comments received were of a constructive and supportive nature. Several of these comments provided some editorial changes and additions to the regional analysis. Verbal comments from the public hearing were concerns about condemnation, future restrictions to private property, and people not wanting more government. Throughout this process the planning team has addressed these concerns. Below is a summary of the prevalent questions raised at the public hearing and the Department's responses to those questions and issues.

Can the Department give a written guarantee that they won't condemn land?

It is the policy of the Natural Resources Board (NRB) to purchase land only as it becomes available from willing sellers, as it is NRB policy not to use condemnation. The Department can only acquire land by condemnation if the Natural Resources Board, two standing committees of the Legislature and the Governor approve the action. It is important to note that the Department has not had an eminent domain procedure in over 25 years. Again, if a landowner is not interested in selling land that is their decision. If they are interested in selling land they have the right to decide to whom they will sell. They do not have to sell to the Department. Additionally, it should be noted that for condemnation, all units of government, state, county, town, city, school districts, lake districts, sanitary districts, etc., have the statutory authority of eminent domain.

Planning staff has prepared various materials to address this specific concern such as a Frequently Asked Questions sheet, articles in newsletters, and discussions at public meetings.

Concerns mentioned in regards to potential future restrictions on lands within the area.

The Department intends to work cooperatively with landowners on natural resource management issues. It is not the intention of this project to add any restrictions on the management of private lands. Current zoning laws in place by towns, or the county would not have to be changed because of this plan, nor would this proposed project have anything to do with enforcing zoning.

Would habitat projects with local organizations (i.e. Walleyes for Tomorrow) be able to occur?

The Department has a long history of working with various federal, state, and local organizations to create, maintain, and/or enhance habitat for wildlife and fish. The success of these projects is due to the collaborative efforts on many levels. There are current habitat projects on Department owned properties and it is the Department intention to continue such projects in the future.

Does the Department contact landowners when they are interested in purchasing land?

The Department does make landowner contacts; land managers generally contact landowners via a letter every 3 years. The extent of this contact would depend on the landowner's interest and willingness to discuss the natural resource values of their property. Some landowners contact the Department and express an interest in participating in programs (e.g. Conservation Reserve Program, Managed Forest Law) or selling land to the Department. Land managers evaluate these parcels and work with owners to determine the best land management options available.

Question over how we arrived at the average cost per acre of land.

The estimated per acre values for in the draft Lower Wolf River Bottomlands Natural Resources Area was arrived at by using information obtained from the Department of Revenue for sales, during the year 2000, of land in three general categories: agricultural, wetlands (swamp) and forest. Average land values can be expected to increase due to inflation and market conditions.

Some comments pointed out errors or incorrect information in the study document. Known errors or incorrect statements are acknowledged and corrected below:

Pg. 4 - Under Wisconsin's Land Legacy: A Study of Public Land Needs For Conservation and Recreation in Our State, clarify 'Protect the Pearls' as it is now it's too jargony.

Pg. 6 - Under Social-economic Conditions. Incorporated the idea that urban sprawl such as is occurring in the area will fragment natural areas, create pollution in air and water, and drive up land prices.

Pg. 7 - First paragraph talks about the Tri-Rivers Nature Area as a group that promotes recreational pursuits. This is revised to clarify that the Tri-River Nature Area is a group that promotes nature based tourism.

Pg. 7 - Fourth paragraph, 2nd sentence addition of 'and numerous scattered large lot homesites in or immediately east of the project area.'

Pg. 7 - Fifth paragraph, incorporate the idea of local and county officials promoting sound land use planning important to this area to maintain high quality natural area.

Pg. 20 - Second paragraph, 3rd sentence missing the word acres, corrected sentence should say 'This proposed project area encompasses 214,000 acres of which 31,000 acres are existing state properties.'

Pg. 21 - Third paragraph, last sentence as written stated implies that we would need to go through another feasibility study, which is what this process was. Sentence corrected to

read 'Any significant change in an approved boundary requires Natural Resources approval, this proposal is the feasibility study and has incorporated public participation.'

Pg. 29 - Under "Environmental Effects", 3rd paragraph, 3rd sentence, 'Water quality improvements would benefit the associated fishery and aquatic ecosystems.' This sentence should also include 'and Lake Winnebago, another nice fishery and a source of potable water to over 200,000 people and hundreds of businesses.'

Pg. 31 - Under "Precedent", first line, 'The creation of a 214,000 project area' should say 'The creation of a 214,000 acre project area'.