

Site Conservation Planning for Wisconsin's Land Trust Community

A manual created by:

Sara DeKok
Master's Candidate, University of Wisconsin – Madison
Gaylord Nelson Institute of Environmental Studies

2006
Gathering Waters Conservancy
www.gatheringwaters.org

Site Conservation Planning Manual: An Overview

Objectives:

- To provide an understanding of the importance of site conservation planning to land trust regional or local conservation goals.
- To provide land trusts with a working knowledge of the site conservation planning process for their use.
- To provide the necessary tools to develop a functional site conservation plan, adaptable to various sites and situations.

Structure:

The structure of this document is meant to act as a manual for site conservation planning for Wisconsin's land trust community. The manual is broken down into five distinct sections, each of which are designed to help guide the reader through the process of creating a site conservation plan. The sections are as follows:

I. Introduction to Site Conservation Planning

This section is designed to acquaint the reader with the idea of site conservation planning. The “basics” presented here will build the individual's understanding of the meaning and importance of conservation planning. It is presented in three segments:

- a. What is site conservation planning?
- b. The importance of site conservation planning
- c. The framework of site conservation planning

II. The site conservation planning process

This section is designed in a “how-to” format. It breaks the planning process down into distinct steps and provides guideline as to how to complete each step.

III. Site conservation plan components

This section tackles the how-to of each individual component of the conservation plan itself. A working site conservation plan typically comprises 8 to 12 sections, and this piece of the manual teaches the reader how to develop each section. This is done by explaining the purpose of the section, providing questions to be answered within the section, offering resources to help find answers to those questions, and giving an example of a completed section.

IV. Site Conservation Plan Executive Summary

The final section offers guidelines to create an effective executive summary of a completed site conservation plan, for use in fundraising and outreach efforts.

V. Sample site conservation plans

In this section you will find three completed sample plans. These plans cover three distinct geographic areas focused on different resources and were completed by separate organizations. All are valid, working plans and display the variety of formats in which a conservation plan can be presented. The plans included here are for:

- a. Gilson Creek-Red Banks in Brown County
- b. Upper Des Plaines River Watershed in Kenosha and Racine Counties
- c. Upper Sugar River Watershed in Dane County

Introduction to Site Conservation Planning

What is site conservation planning?

Site conservation planning is a process that identifies the most important strategic actions needed to achieve specified conservation goals and defines the land area where the strategic actions are implemented. The process integrates more traditional preserve design and land acquisition activities with newer conservation biology and ecosystem management concepts into a single dynamic framework. Site conservation planning is used by organizations across the country to guide their protection and stewardship activities.

The importance of SCP

As land trusts continue to grow and become more sophisticated in their land protection strategies, it becomes increasingly important for the allocation of their limited resources to be put to their most effective use. As such, a system of strategic and proactive land protection should begin to take precedence over reactive conservation practices. Site conservation planning is an important tool to guide protection and stewardship activities for valuable conservation sites. It has been a successful instrument for conservation organizations because it.

1. Focuses conservation work
2. Maximizes successes
3. Provides an explicit process
4. Builds funding capacity
5. Builds and strengthens partnerships

The framework of site conservation planning

The most appropriate and effective format of a site conservation plan is one that works best for you and your partners and conveys your priorities to your particular audience. However, you should keep in mind that the recommended length for a plan is no more than 15 pages, which can be difficult to do. Succinctness and efficiency in your writing to convey main points will make the document much more user-friendly. The use of tables, maps, and figures is also encouraged.

When site conservation planning was developed by The Nature Conservancy, they based the framework on the Five-S approach. The Five-S framework represents a set of guiding principles for making strategic conservation decisions and measuring conservation successes at sites. The five S's include:

- **Systems:** the conservation targets, species and communities, occurring at a site, and the natural processes that maintain them, that will be the focus of site-based planning.
- **Stresses:** the types of degradation and impairment afflicting the species and system(s) at a site.
- **Sources:** the agents generating the stresses.
- **Strategies:** the types of conservation activities employed to abate sources of stress and persistent stresses.
- **Success:** measures of biodiversity health and threat abatement at a site.

The application of the Five-S Framework throughout the site conservation planning process is an effective way to strategically look at what is threatening your conservation targets and plan to mitigate those threats.

The site conservation planning process

The development of a site conservation plan is a collaborative effort. The planning process is done over a period of days to weeks to months by a team of partners.

Two types of information are fundamental to the planning process – ecological information and human context information. Information about the ecological context of the conservation targets is essential to the assessment of relevant natural systems, stresses and biodiversity health. Information about land use and economic factors, laws and policies, and cultural attitudes and stakeholders is essential for the assessment of stress sources and the development of effective conservation strategies.

Creating the plan: step-by-step

Although the planning process for creating a site conservation plan is not always linear, there are generally eight steps involved in the creation of a plan. Each step has one or more planning questions associated with it. In essence, site conservation planning is the process of going through these steps, answering the associated questions, and answering them with the specificity needed and allowed by available information. In the outline of the process below, the S's from the Five-S framework are italicized.

I. Define Direction

What are the conservation targets? Defined as *systems* in the Five-S framework, conservation targets should be focused (e.g. a flower species instead of an entire watershed) to allow for more attainable success, and can include things like:

- a. **Species**, including imperiled, declining, or keystone species and locations where species aggregate, such as nesting, feeding and resting areas.
- b. **Communities**, groupings of co-occurring species in both terrestrial and aquatic systems.
- c. **Landscapes**, both natural and human-influenced landscapes, in a spatially identified area linked by ecological processes, environmental features (e.g. topography, soils, geology), environmental gradients, or land use patterns (e.g. agriculture, etc.)
- d. **Sustainable Uses of Natural Resources**, such as sustainable grazing, forestry, agriculture and recreation.

What are the long-term conservation goals of the project and short-term objectives for the target?

- a. Conservation goals outline the conditions that conservation action is attempting to obtain over a set period of time. An identified goal:

1. provides a vision of future conditions that can be communicated to staff, colleagues, stakeholders and the public,
 2. guides conservation and management action, integrating action across conservation targets,
 3. provides a framework for identifying short-term conservation and land management objectives and benchmarks,
 4. provides spatial and temporal priorities for conservation and land management, and
 5. provides the basis for the evaluation of conservation and land management actions.
- b. Objectives for the target are short-term, measurable benchmarks leading to the goal.

II. Engage Partners

Which staff or practitioners should be included in planning or implementation?

- a. Small teams are typically more effective than large teams.
- b. The local planning team assembled should have an understanding of the natural environment as well as the human context of the site. Thus, sufficient teams often include:
 1. One or more scientists or local field representatives who are knowledgeable about the site, conservation targets, and supporting natural processes.
 2. The local project director or other staff member who will be assuming responsibility for conserving the site and have knowledge of the local “situation” for conservation.
 3. A local government representative or agency employee familiar with local politics and current events.
 4. A conservation practitioner who has experience with conservation planning.

- c. A planning team may have different members at different stages of the planning process. For instance, neighboring landowners may be invited to the vision-setting meeting. Elected officials may be asked to attend the presentation of the final plan.

How and when should they be included?

- a. For planning meetings, small groups work better. But, teams can (and should) include people who do not attend meetings and just provide information, feedback or particular expertise.

III. Assemble Information

What ecological conditions threaten the healthy and viability of conservation targets?

- a. These ***stresses*** are the direct impairment of the condition of a conservation target and results in reduced viability. Examples include: habitat destruction, alteration of natural fire regimes, sedimentation, etc.
- b. ***Stresses*** are the *type* of damage or harm.

What are the characteristics of human institutions, local communities, and land uses that affect the ecological system?

IV. Analyze Information

What current and potential human-mediated activities or ecological processes (e.g. groundwater reduction) interfere with maintaining the functional ecosystem?

- a. These ***sources*** of stress are an extraneous factor that causes stress. For example: policies, land uses, introduction of non-native species, etc.
- b. ***Sources*** of stress are the *cause* of the damage or harm.

Which stakeholders are likely to affect or be affected by attempts to achieve conservation goals? Stakeholders are individuals, groups, or institutions who:

- a. Would benefit if the conservation goals are achieved,
- b. Would be hurt if the conservation goals are not achieved,
- c. Could shape public opinion about the conservation goals,
- d. Have the authority to make decisions about activities that affect the conservation goals

V. Develop Strategies

What are some appropriate conservation *strategies* to prevent or mitigate the sources of stress?

- a. The ultimate goal of conservation *strategies* is to reduce the *stresses* that can degrade and impair the conservation targets. There are two major paths for accomplishing this:
 1. **threat abatement strategies** – actions that abate the critical threats, assuming that reducing the threat will improve the condition of the conservation target
 2. **restoration strategies** – actions that actively restore the desired condition of the conservation target and are needed in situations when removing stresses does not result in the recovery of the conservation target

How can stakeholders be accommodated, satisfied, or engaged?

Where are the areas on the ground in which specific strategies apply? Some *strategies* can be applied in a localized approach, others will be more widely broadcast. *Strategies* include:

- a. policy change
- b. land acquisition
- c. Purchase of Development Rights program
- d. educational outreach

VI. Identify Actions

What actions are necessary to implement the conservation *strategies*?

Will/should some actions take priority due to interest, timing, funding or capacity?

Who will do them?

When will they occur?

How long will they take?

How much will they cost?

VII. Assess Feasibility

Can the conservation *strategies* be implemented and the goals realized, given the situation for conservation, the program capacity to accomplish actions, and other programmatic commitments?

What partners are available to provide resources toward implementing strategies?

VIII. Measure Progress

Is progress being made towards the site conservation goals?

- a. In order to determine if the actions are having their intended effect and are a *success*, monitoring of the condition of the conservation targets is necessary. The best evaluation is made with the following points:
 1. Be able to summarize the success of your project in simple, easy to understand terms.
 2. Support the easy to understand format with objective qualitative or quantitative data.
 3. Measure both the means (the conservation strategies) and the ends (the conservation targets).
 4. Measure conservation targets as directly as needed.

Site Conservation Plan Components

- 1: Cover Page
- 2: Introduction
- 3: History of the Region
- 4: Description of the Site
- 5: Conservation Targets
- 6: Threats to Targets
- 7: Strategies to Mitigate Threats
- 8: Partners
- 9: Sources of Funding
- 10: Action Matrix
- 11: Site Maps

Cover Page

Purpose:

A site conservation plan is a professional document, and thus, should be presented in a professional manner. A descriptive, clean and eye-catching cover page is an important part of this presentation. The cover page should include several components:

- a clear and descriptive title of the plan
- a list of parties involved in the preparation of the document
- the dates in which the plan was prepared
- information regarding any funding source for the project

A photo or map of a highlighted land feature or species in the plan could also make a good addition. For example, the cover page below shows a photo of the Dwarf Lake Iris and a map of the Niagara Escarpment – both major features of the Red Banks-Gilson Creek plan.

Example:

gil son creek watershed - red banks al var

site conservation plan

Prepared by:
Gathering Waters Conservancy
Northeast Wisconsin Land Trust
Wisconsin Department of Natural Resources – Bureau of Endangered Resources
Brown County Planning
U.S. Fish & Wildlife Service
The Nature Conservancy – Wisconsin Chapter
Bay-Lake Regional Planning Commission
UW-Extension

February, 2004 – July, 2005


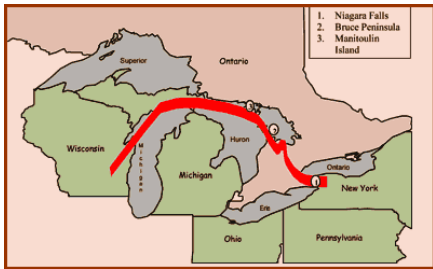



Photo by Joel Trick



Funding provided by the Wisconsin Coastal Management Program and the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant #NA03NOS4190106; and by the Environmental Protection Agency's Great Lakes National Program, Grant # 2004-0005-005.



**WISCONSIN COASTAL
MANAGEMENT PROGRAM**

Introduction

Purpose:

The purpose of the introduction is to briefly introduce the identified site and convey basic details of the plan.

Questions to Answer:

When writing this section, answer the following questions:

- Where is the site?
- Why is the protection of the site important?
- By what is it threatened?
- What is the goal of the plan?

Example:

The Red Banks and Gilson Creek area is located in the Towns of Scott and Green Bay in Brown County. Red Banks-Gilson Creek was identified as a regionally significant site for the health of the Lake Michigan watershed in Landscapes of Opportunity, a report on conservation needs of Wisconsin's Lake Michigan basin prepared by the Lake Michigan Shorelands Alliance. This area is biologically and geologically very rich, but it is under threat from development from the Green Bay metropolitan area. This plan was developed using a collaborative approach to conservation planning and involved several partners. The goal of this site conservation plan is to identify threats to the Red Banks-Gilson Creek area and propose strategies to protect its important natural resources.

History of the region

Purpose:

Before proposing a conservation plan for a given site it is important to understand the historical context of the region in which the site exists. The purpose of this section is to give the reader a historical overview of the ecological and human processes which have created the current status of the site.

Depending on the specific, unique features of the site it may be appropriate to break this section into subsections. Appropriate subsections may include:

- Geology
- Human settlement
- Land Use & Development

Questions to Answer:

When writing this section, answer the following questions:

- Does the region in which the site lies have any unique geological, aquatic, or other natural features that have come to define its landscape?
- How has this region's native features contributed to its settlement?
- What, if any, industries has this region supported?
- How has the population of this region grown over the years?
- How has the land been used or developed over the years?
- What is the attitude among local residents regarding local natural resources and past conservation efforts?
- What local politics may effect conservation efforts?

Resources:

U.S. Census Bureau: <http://www.census.gov/>

Wikipedia, the free encyclopedia: <http://www.wikipedia.org/> (search for your local municipality or unique land feature)

Great Lakes Environmental Directory: <http://www.greatlakesdirectory.org/>

Economic profiles for Southeastern Wisconsin:

<http://www.sewrpc.org/economicprofiles/default.shtm>

Pre-settlement vegetation: <http://www.dnr.state.wi.us/landscapes/maps/state/finleys.htm>

1990 population density: <http://www.dnr.state.wi.us/landscapes/maps/state/population90.htm>

2000 population density: <http://www.dnr.state.wi.us/landscapes/maps/state/population-2000.htm>

2000 per capita income: <http://www.dnr.state.wi.us/landscapes/maps/state/PCIncome-2000.htm>

2000 % of houses that are seasonal:

<http://www.dnr.state.wi.us/landscapes/maps/state/seasonalhouse.htm>

2000 % unemployment: <http://www.dnr.state.wi.us/landscapes/maps/state/unemployment.htm>

Local Chamber of Commerce website

Local city website
Local county website
Local newspaper archives

Example:

Geology

The Red Banks-Gilson Creek area lies within the once-glaciated portion of Wisconsin and contains highly unique geologic features. Dolomites and shales underlie the glacial deposits that blanket virtually the entire landscape in Brown County.

The dolomite Niagara Escarpment is the major bedrock feature – approximately 69% of Brown County lies within the Niagara Escarpment, which runs from the northeast to the southwest part of the county. The Niagara Escarpment is the steep face of a 650-mile sickle-shaped cuesta (bedrock ridge) that runs from New York to southeastern Wisconsin. A series of dolomite cliffs in Brown County provide critical habitat for rare terrestrial snails, bats and specialized plants.

The Red Banks site in particular is perched on top and at the edge of the Niagara Escarpment and is characterized by areas of exposed bedrock and very thin soils. The primary glacial landform is lakeplain.

Human settlement

The Gilson Creek and Red Banks area is in the Towns of Scott and Green Bay, located just east of the City of Green Bay, in the northeast corner of Brown County. Since the time of the glaciers, which receded roughly 10,000 years ago, the Green Bay region has supported several Native American cultures with its rich fisheries, waterfowl, wild rice, forests and water. Archeological evidence shows these early people inhabited the Red Banks area on Green Bay's east shore as far back as 7000 BC.

In the 1700s and early 1800s the Green Bay area, with its ideal location, became a center for the fur trade. Logging was also a big industry in the 1800s until the land was cleared, marking the beginning of the region's agricultural business – an industry that is still an important economic factor in the area today.

Inland from Green Bay, along the Fox River (which feeds into Green Bay), the Fox River Valley experienced great success with paper production. However, by 1927 the Wisconsin State Board of Health reported that raw sewage, oil slicks, wastes from canning factories and paper mills, and dead fish floated along the Fox River's surface and lower Green Bay.

At one time, Green Bay supported the largest commercial fishery in Wisconsin, but due to overfishing, competition from exotics, and the dumping of toxic PCBs (polychlorinated biphenyls) into the Lower Fox River, emptying into Green Bay, the fishing industry in the area was ruined.

Today, the Fox River Valley is still the largest paper production industry in the world, but before 1979 when they were banned, PCBs were still being used by paper mills as a vehicle for holding and delivering ink in carbonless copy paper. Much of this copy paper was recycled and reprocessed, releasing an estimated 50,000 kilograms of PCBs to the Fox River and Green Bay via the mills' wastewater discharges. The widespread effects of PCBs on fish and wildlife in the region include walleyes with tumors, frogs with deformed spines and the decline of bald eagles.

PCBs also harm humans – they are thought to cause cancer and a variety of other health problems.

A comprehensive cleanup plan for the Fox River and Green Bay is currently being developed by the Wisconsin Department of Natural Resources and the U.S. Environmental Protection Agency. The proposed plan, if implemented, will result in the cleanup of sediments that will lead directly to the protection of human health and the environment. However, the final project could take more than 10 years to complete.

Land Use & Development

A high concentration of urban development can be found in and around the City of Green Bay, with the majority of shoreline in Brown County also developed. Brown County, according to 2003 estimates, has a population of 233,888, with a population density of 429 people per square mile – over four times the average density of the state. It is also an area of high growth, experiencing a 16.5% increase in population in the 1990s, compared to a 9.6% increase in the state. The Green Bay Metropolitan area has consistently grown faster than both the Wisconsin and national averages and had the fastest rate of population growth among Wisconsin's Metropolitan areas between 1990 and 2000.

Red Banks, with its close proximity to the City of Green Bay, is feeling the pressure from excessive residential development. As agriculture becomes less economically viable, there is concern that the open farmland in eastern Brown County could be purchased and developed.

Other areas of Brown County contain small forest patches, agricultural lands, low density housing and quarry operations of differing sizes.

Description of site

Purpose:

The purpose of this section is to delve into greater detail regarding the present context, composition and condition of the site.

It may be helpful to break this section into subsections, such as:

- Regional Context
- Species, Natural Communities, Scenic/Recreational Value
- Current Conditions
- Other Protected Areas

Questions to Answer:

When writing this section, answer the following questions:

- In what watershed does your site lie?
- What is the ecological landscape of the site?
- What are the climate conditions of the site?
- What is the topography of the site?
- Does the site contain any noteworthy or rare biota, such as endangered or threatened species?
- What are the native plant and animal communities of the site?
- Does the site contain any valuable recreational or scenic features?
- Are there any unique or important geological, aquatic or other natural features found at the site?
- What is the current condition of the site (e.g. degraded, pristine)?
- Are there other agencies or groups doing conservation work in the area?
- Are there other similar or related sites protected in the area?
- What land uses are present on lands adjoining or near the site (e.g. residential, agricultural, commercial)?

Resources:

DNR Ecological Landscapes link: <http://www.dnr.state.wi.us/landscapes/>

Ecological Landscapes Maps: <http://www.dnr.state.wi.us/landscapes/maps/>

Opportunities for Sustaining Natural Communities table:

<http://www.dnr.state.wi.us/landscapes/opportunity/>

Natural Communities of Wisconsin: <http://www.dnr.state.wi.us/landscapes/community/>

WDNR's Hydrologic Areas: <http://www.dnr.state.wi.us/org/gmu/sidebar/whatis.htm#wmus>

Data Compilation and Assessment of Wisconsin's Coastal Wetlands:

<http://www.dnr.state.wi.us/org/land/er/publications/cw/>

Natural Community Descriptions:

<http://www.dnr.state.wi.us/org/land/er/communities/descriptions.htm>

State Natural Areas: <http://www.dnr.state.wi.us/org/land/er/sna/>

U.S. Fish & Wildlife Service, Great Lakes-Big Rivers Region: <http://www.fws.gov/midwest/>

Current land cover (1992): <http://www.dnr.state.wi.us/landscapes/maps/state/wiscland.htm>

Public land ownership and private land enrolled in forest tax programs:

<http://www.dnr.state.wi.us/landscapes/maps/state/publicland.htm>

% of change in acreage assessed agricultural:

<http://www.dnr.state.wi.us/landscapes/maps/state/percentacre.htm>

Average monthly max. temperature for August:

<http://www.dnr.state.wi.us/landscapes/maps/state/augtemp.htm>

Average monthly min. temperature for January:

<http://www.dnr.state.wi.us/landscapes/maps/state/jantemp.htm>

Imperiled or significant species by worldwide status:

<http://www.dnr.state.wi.us/landscapes/maps/state/imperiled.htm>

Outstanding and exceptional resource waters:

<http://www.dnr.state.wi.us/landscapes/maps/state/outstandwaters.htm>

Degraded lakes and rivers: <http://www.dnr.state.wi.us/landscapes/maps/state/303degraded.htm>

Susceptibility to groundwater contamination:

<http://www.dnr.state.wi.us/landscapes/maps/state/susceptibility.htm>

Bedrock types: <http://www.dnr.state.wi.us/landscapes/maps/state/bedrocktype.htm>

Example:

Gilson Creek Watershed

Regional Context

The Gilson Creek Watershed is located in the Northeast corner of Brown County along the shore of Green Bay. This region falls within the Central Lake Michigan Coastal (CLMC) Ecological Landscape – one of 16 Ecological Landscapes in Wisconsin that are based on a system of land classification developed by the Department of Natural Resources. This system divides the state into ecological units based on combinations of biotic and environmental factors, which include climate, geology, soils, hydrology, and vegetation.

The climate of the CLMC Landscape is highly influenced by its proximity to Lake Michigan, giving the area cooler summers, warmer winters and precipitation levels greater than at locations farther inland. Its generally flat topography consists of clay and silt loam soils. Historically, most of this landscape was vegetated with mesic hardwood forest, but due to the heavy development pressure in the Green Bay area much of the land cover is now primarily urban and agricultural. There are some remnants of northern hardwood forest with maple, beech, and some hemlock, plus conifer swamps, hardwood swamps, and riverine marshes.

The biota in this region is especially noteworthy for the rare regional endemic plants associated with Lake Michigan shoreline habitats and the highly specialized animals inhabiting the Niagara Escarpment. The coastal areas annually host significant concentrations of migratory birds and provide seasonally critical habitat for numerous animals. However, the CLMC

Landscape has the worst relative pollution ratings for watershed and streams according to the rankings by the Wisconsin DNR.

An area loosely referred to as Red Banks is found in the Gilson Creek Watershed and contains an unusual and unique array of natural communities. Red Banks supports Wisconsin's best example of an alvar community and unusual variants of the prairie-savanna and cedar forest communities. Invertebrate diversity is high in both the insect and land snail groups, with many rare taxa represented. The Gilson Creek Watershed is also home to the rare and threatened dwarf lake iris (*Iris lacustris*).

Red Banks

Species, Natural Communities, Scenic/Recreational Value

The Red Banks Alvar was designated a State Natural Area in 2001. Alvar communities are extremely rare and are distinguished by naturally open areas of very shallow soils over essentially flat limestone or dolomitic bedrock. An unusual blend of boreal, southern and prairie species, -- relicts of the post-glacial environment and the warmer, dryer period that followed -- characterizes alvar ecosystems. Alvars are important sites for (1) the protection of biodiversity including threatened plant communities and rare and threatened species of flora and fauna; (2) biological research and environmental monitoring; and (3) ecotourism.

Red Banks Alvar contains one of the most diverse snail communities known in the Midwest and is one of the most important areas in Wisconsin for land snails -- colonies of 25 different groups of highly specialized and rare glacial relict snails can be found from the base to the top of the escarpment. A few rare plants found at the alvar include cream gentian (*Gentiana alba*), Craze's sedge (*Carex crawei*), and Richardson's sedge (*C. Richardsonii*). There have also been at least 20 species of butterflies documented within the community and there is an old-growth mesic forest on the slope below the dolomite escarpment.

A unique white cedar woodland community also occurs at Red Banks, bordering Gilson Creek. This community is dominated by white cedar, native sedges and the common juniper. The rare Great Lakes endemic, dwarf lake iris, is a local dominant in the groundlayer.

The dwarf lake iris is listed both by the State of Wisconsin and by the United States government as a threatened species. Its rarity is due both to a limited amount of habitat and to increasing disturbance by shoreline development. The dwarf lake iris must have just the right combination of light, humidity, soil, moisture and temperature to live -- it thrives on the cool air that flows off the lakes, and the thin, moist, sandy or rocky soils that can be found in a few sites near the shores of the northern Great Lakes. The iris is appreciated for its deep blue to purple blossoms and its great genetic potential.

Current conditions (e.g. degraded, pristine)

Some of the major disturbance factors affecting the Red Banks site include hydrologic disruption, invasive plants, quarrying, heavy grazing, encroachment by residential development, and fragmentation by roads and power line corridors. These factors, together with a long history of fire suppression, have altered the composition and structure of the alvar community by increasing the dominance of woody species. The vegetation has formed an almost closed canopy dry forest, with small scattered openings supporting plants characteristic of savanna or prairie communities -- exotics, such as Kentucky bluegrass and smooth brome, are common and sometimes dominant in these openings.

In terms of the specific habitat of the dwarf lake iris -- its lakeshore habitat has been greatly reduced by shoreline development. Residential and vacation homes, as well as associated road-widening, chemical spraying and salting, and off-road vehicle use have caused disturbance and destruction of habitat.

Although threats remain very high to this region and it is considered a priority for immediate conservation attention by the DNR, there are portions of this site that are relatively intact or restorable.

Niagara Escarpment

Geology

The Niagara Escarpment is the steep face of a 650-mile sickle-shaped cuesta that runs from the northeastern United States south of Rochester, New York, across portions of southeastern Canada, and the southward north and west of Lake Michigan to southeastern Wisconsin. In geological terms, a cuesta or escarpment is a ridge composed of gently tipped rock strata with a long, gradual slope on one side and a relatively steep scarp or cliff on the other. In Wisconsin, the Escarpment extends over 230 miles, from Rock Island, off the northern tip of the Door Peninsula, south to northern Waukesha and Milwaukee counties.

The primary bedrock type is dolomite, formed from accumulated sediments of an ancient sea 405-425 million years ago during the Silurian Period of the Paleozoic Era. The Escarpment was formed over millions of years through the differential erosion of rocks of different hardnesses – a cap of erosion-resistant dolomite overlays weaker, more easily eroded weather shale rocks, that when gradually eroded left a series of cliffs. This series of bluffs can be found along the shoreline of Red Banks in the Gilson Creek Watershed.

Species, Natural Communities, Scenic/Recreational Values

The geology of the Escarpment greatly influences its ecological attributes. Cold air and sometimes water move through the fractured rock creating unique microhabitats in which many highly specialized species, such as rare terrestrial land snails and bats, can be found.

The Niagara Escarpment is as much a hydrological as a geological feature. The headwaters of several rivers rise in the Escarpment and the area is important for groundwater recharge. The uncontaminated water of many Escarpment aquifers is in heavy demand from the bottled water industry.

The area of the Escarpment in the Gilson Creek Watershed is home to the rare dwarf lake iris and Red Banks Alvar. There are also trees growing on the forested portion of the Niagara Escarpment that include some of the oldest red and white cedars in Wisconsin.

Current conditions (e.g. degraded, pristine)

Shoreline near the Escarpment has been extensively developed near the City of Green Bay and the Town of Scott, in the vicinity of Red Banks – mostly for residential uses. As you move away from large cities a mix of agricultural land, woodlands, and locally concentrated developments can also be found.

Another form of development that is a concern is the number of county operated or privately owned quarries that supply crushed stone from the Escarpment primarily for road base or concrete aggregate. Areas along the Niagara Escarpment, such as Red Banks, have thin soil deposits due to glacier scouring and relatively post glacial deposition. These conditions of

shallow soils lying directly over fractured bedrock make the area susceptible to groundwater contamination.

Other protected areas

The portion of the Niagara Escarpment occurring in Ontario, Canada has been designated as a World Biosphere Reserve by the United Nations Education, Scientific and Cultural Organization.

The work being done at Red-Banks Gilson Creek is also ongoing at several other sites within the Lake Michigan basin by the Lake Michigan Shorelands Alliance.

Conservation Targets

Purpose:

The purpose of this section is to identify the targets for conservation in your site and briefly describe the necessary protection goals for each. These targets should be the few key elements – species, natural communities, cultural or recreational resources - whose protection will serve to ensure the preservation of the overall resources of the site.

Questions to Answer:

When writing this section, answer the following questions:

- What specific biota, natural feature or natural communities are most ecologically significant or unique to your site?
- What historic, cultural or recreational values does the site provide or could provide?
- Will the protection of these specific elements provide subsequent protection to the site overall?
- What measures must be taken to ensure the protection of these elements?

Resources:

Wisconsin State Threatened and Endangered Species:

http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/TandE.asp

Wisconsin's Federally Listed Species:

http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/fed_listed.asp

Endangered and Threatened Species Fact Sheets:

<http://www.dnr.state.wi.us/org/land/er/factsheets/>

Natural Heritage Inventory Program: <http://www.dnr.state.wi.us/org/land/er/nhi/>

NHI Working List: http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/

Wisconsin's Animals, Plants and Natural Communities:

<http://www.dnr.state.wi.us/org/land/er/biodiversity.htm>

Example:

While the Red Banks area is rich in biological, ecological, geological & historic diversity, the partners on this plan are focused on a few key elements. It is hoped that protection of these features will serve to ensure preservation of the whole ecological landscape.

Conservation Goals

Dwarf lake iris

- ♦ protection of all known occurrences
- ♦ restoration of intact, functioning habitat with full spectrum of species & communities
- ♦ genetic study of population to compare with Door County population

Escarpment

- ♦ intact, continuous ecological/habitat gradient from top to bottom
 - intact hydrology
- ♦ protection of all intact examples of escarpment communities
- ♦ sufficient area of plateau protected to conserve recharge areas critical to health of watershed

Trout stream

- ♦ self-sustaining population of brook trout
- ♦ creek hydrology delineated

Groundwater recharge areas

- ♦ protection of all recharge areas which impact other conservation targets

Threats to Targets

Purpose:

The purpose of this section is to identify and describe the direct threats to the health and viability of the stated conservation targets. It may also be helpful to identify which conservation targets are impacted by which threats for a different perspective.

Questions to Answer:

When writing this section, answer the following questions:

- What are the most prominent threats to the viability and health of the identified conservation targets?
- What are the sources of those threats?
- What are the impacts of those threats on the conservation targets?
- Which threats impact each target?

Resources:

Invasive Species Information:

Plants: <http://www.dnr.state.wi.us/invasives/plants.htm>

Animals: <http://www.dnr.state.wi.us/invasives/animals.htm>

Example:

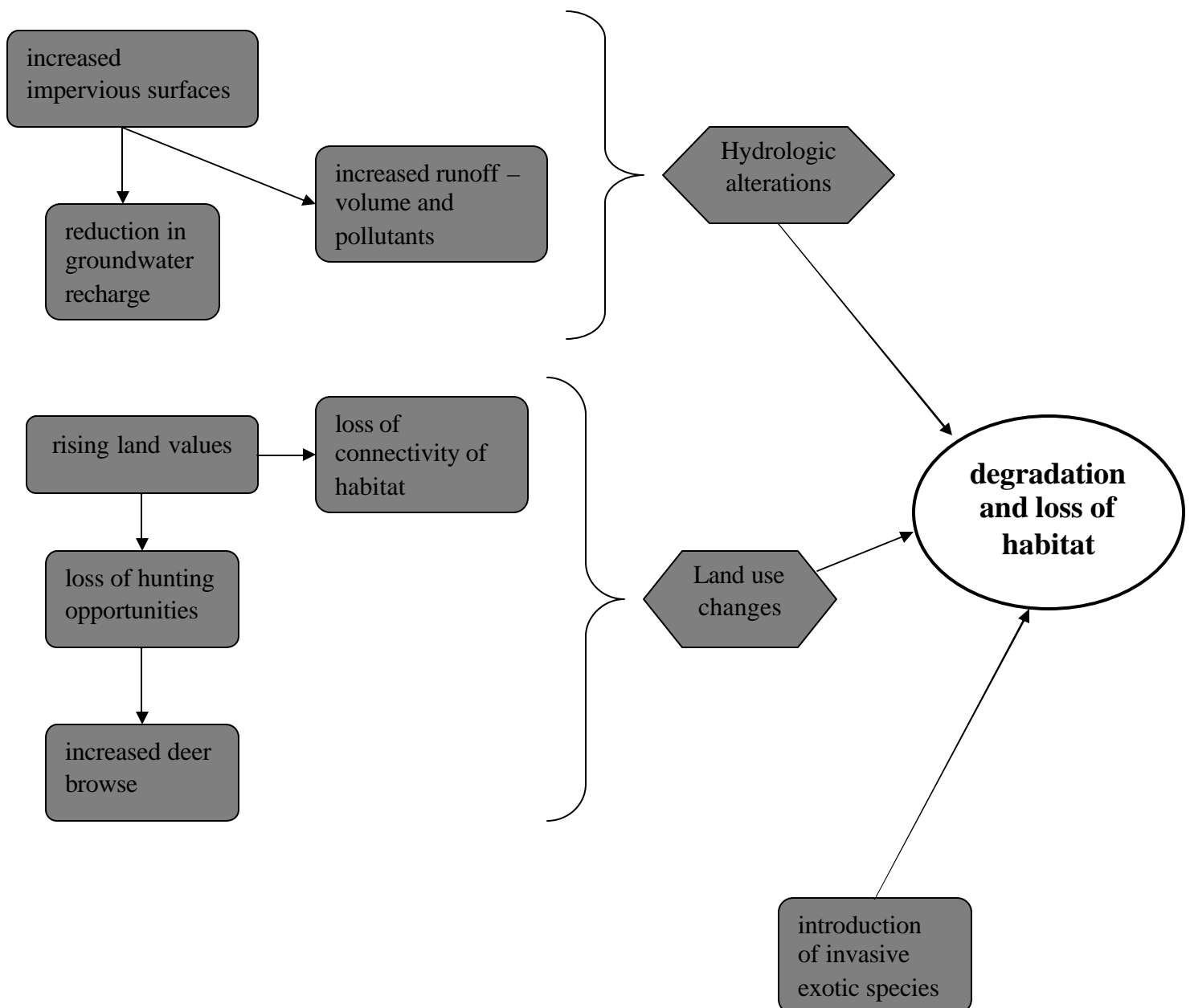
The most prominent threats to the viability and health of the conservation targets for the site are those arising from **residential development** of the area. As the Green Bay metropolitan area grows, and as agricultural production becomes less economically viable, the open acres of farmland in eastern Brown County are more attractive to developers and homebuyers. The resulting patchwork of development has multiple cascading effects on the species and natural communities of the site.

- ♦ *Increased impervious surfaces* – driveways, roads, roofs, parking lots – reduce infiltration of precipitation and runoff into the ground. This alters the hydrology of a watershed, changing stream flows, water temperature and flood cycles. Stormwater runoff moves across the landscape more quickly, and brings with it more toxins accumulated from the paved surfaces. The impact of a single home and driveway is minimal, but the combined impact of a subdivision or strip mall development can radically alter many facets of stream ecology.
- ♦ *Habitat loss and fragmentation* – Developed land has a direct impact on species habitat through the loss of acreage. In addition, the scattered nature of development breaks up formerly contiguous habitats, resulting in smaller, isolated parcels. This has two negative results; first, it decreases or eliminates the ability of individuals of a

population from moving across their full habitat, and second, many species which are area-sensitive can no longer survive on the smaller parcels, even when they contain appropriate habitat.

- ♦ *Septic systems and wells* – Increased development requires more water withdrawals via wells, reducing groundwater resources which in turn affects stream flows. Development also requires more septic fields. Poorly maintained or inadequately abandoned wells and septic systems can reduce groundwater quality.
- ♦ *In-stream development* – Channelization, streambank riprap, and culverts are often associated with both residential development and agricultural operations. These modifications destroy and degrade stream habitats, and fragment remaining habitat.

Negative Impact of Development:



Other threats were also identified. In some cases, these are associated with development but not directly.

- ♦ *Invasive exotic species* – Invasive species include plants and animals which are non-native to the region and which outcompete native species for resources. Left alone, these species can take over entire habitats, resulting in a monotypic environment unsuited for other wildlife. In this region, invasives of concern are:
 - *purple loosestrife*
 - *garlic mustard*
 - *buckthorn*
- ♦ *Deer browse* – High populations of whitetail deer in the area, combined with shrinking habitat for those deer, has resulted in overbrowsing of native vegetation. Deer browse can dramatically curtail regeneration of certain plant species, and reduces the biodiversity of an area.
- ♦ *Lack of information about species and natural communities* – Many of the conservation targets identified for this site are lacking adequate inventories and location mapping. Without knowledge about the current population size, geographic location and health of these targets, it is difficult to target conservation strategies designed to preserve or restore their status.
- ♦ *Lack of awareness of conservation targets/low priority for conservation* – The general public are not informed about the ecological significance of the area, the threats facing the region's biodiversity and the need for conservation efforts. As a result, conservation and restoration are given low priority in local land use plans, and inadequately funded at the county level.

A list of threats by targets impacted (key threats in ***bold italics***):

Niagara escarpment:

- ♦ ***development***
 - quarrying
 - wind farms
 - logging
 - septic systems
- ♦ invasive species
- ♦ lack of management/lack of fire
- ♦ fragmentation of habitat
- ♦ inappropriate agricultural practices

groundwater recharge areas:

- ♦ ***residential/commercial development***
 - increased impervious surfaces
 - groundwater withdrawals via wells
 - older septic systems and improperly abandoned wells contaminating groundwater
- ♦ lack of best management practices in agriculture
- ♦ lack of locational information about recharge areas
- ♦ land use changes

trout stream:

- ♦ *development*
 - agricultural
 - nonpoint runoff
 - channelizing and diverting flows
 - residential/commercial
 - increased impervious surfaces – changes in flow patterns
 - culvert placements
 - bank riprapping
- ♦ thermal changes from quarry overflows and loss of vegetative cover
- ♦ lack of management of in-stream debris

Point Comfort Woods:

- ♦ logging
- ♦ development – inadequate buffer between woods and residential areas
- ♦ invasive species
- ♦ deer browse

dwarf lake iris:

- ♦ development – loss of habitat
- ♦ lack of appropriate management of existing habitat
- ♦ deer browse
- ♦ invasive species – future concern, not present in iris habitat yet

Conservation Strategies to Mitigate Threats

Purpose:

The purpose of this section is to suggest specific conservation strategies to mitigate the threats to your site. It may be helpful to organize these strategies by their associated threat.

Questions to Answer:

When writing this section, answer the following questions:

- What specific strategies can be used to mitigate the identified threats?
- What strategies can be exercised to restore or enhance the conservation targets?

Resources:

Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need:
<http://dnr.wi.gov/org/land/er/WWAP/index.htm>

Example:

Many of the strategies developed during partner meetings, when implemented, will have impacts on several of the conservation targets simultaneously. Specific actions to be taken toward implementation are outlined in the accompanying Action Matrices (Appendix A).

To mitigate negative impacts of development:

- 1) Enact a stormwater runoff fee.
- 2) *Directing development away from critical areas via comprehensive plans.*
 - * need to define and map these critical areas
- 3) Encourage conservation design development.
- 4) *Acquire land or easements on highest priority parcels.*
 - * iris habitat & alvar community within SNA
- 5) Work with Brown County on ecologically sensitive areas definition in their sewer plan.
- 6) Let local towns know about conservation priorities so they can consider conservation needs in comprehensive plans.

To mitigate impacts of invasive exotic species:

- 1) Develop management plan for Red Banks State Natural Area.
- 2) Form a Friends of Red Banks organization to implement management activities and fundraise for management needs.

To increase public awareness and appreciation of natural resources:

- 1) Lead field trips to Red Banks State Natural Area, other sites along escarpment.
- 2) Form a Friends of Red Banks organization to build community support for protection through education and outreach.

Partners

Purpose:

The purpose of this section is to identify all of the partners (agencies, organizations and institutions) involved in the planning and preparation of this plan.

Questions to Answer:

When writing this section, answer the following questions:

- Who attended meetings, provided expertise, or participated in the development or implementation of this plan?
-

Example:

This plan was developed using a collaborative approach to conservation planning. The partners involved in this planning include:

- The Nature Conservancy – Wisconsin Chapter
- Wisconsin Department of Natural Resources – Bureau of Endangered Resources
- Bay-Lake Regional Planning Commission
- U.S. Fish & Wildlife Service – Private Lands
- Brown County Planning Commission
- Northeast Wisconsin Land Trust
- UW-Extension Basin Educators
- Gathering Waters Conservancy

Sources of Funding

Purpose:

The purpose of this section is to identify the sources of funding for implementation of the plan.

Questions to Answer:

When writing this section, answer the following questions:

- What sources of funding are available to implement specific strategies developed in this plan?
- What in-kind support (e.g. maps, printing, staff resources) might be available from partner organizations?

Examples:

- Natural Resources Damage Assessment – related to Fox River PCB loading
- Knowles-Nelson Stewardship Fund
- Wisconsin Coastal Management Program Grant (NOAA Funding)
- GIS development and mapping by UW staff and students

Action Matrix

Purpose:

The purpose of the action matrix is to present the specific actions to be taken to conserve the site, and to create a timeline for implementation of those actions. Actions should be organized by the conservation goals established during the planning process.

Questions to Answer:

When writing this section, answer the following questions:

- What actions must be taken to fulfill the strategies identified to mitigate the threats for the site?
- Do priorities need to be established between particular action steps?
- Who the lead on each action item?
- What resources are needed or available to complete each action item?
- After each identified action item is completed, what is the next step, who is in charge of seeing it through, and what is the deadline?

Example:

<u>THREAT: DEVELOPMENT</u>	
<u>Strategy:</u> Directing development away from critical habitat; acquisition of land or easements on priority parcels	
Action	Mapping target locations, threat impact areas, systems supporting target health
Lead Organization	Bay-Lake RPC GIS program can generate maps; can develop recharge area data <i>Contact:</i> Angela Pierce
Other Resources	Brown Co. LCD has agricultural field data, subwatersheds of the Red River priority watershed data <i>Contact:</i> Jon Bechle
	DNR has dwarf lake iris habitat data, alvar community location data <i>Contact:</i> Darcy Kind
	DOT has karst features location data from Hwy 57 expansion project <i>Contact:</i> Joel Trick
	Coordinate with UW-GB to use students for on the ground mapping & inventory <i>Contact:</i> Mike Grimm, Bob Howe
	Next Steps Ground truth subwatershed maps

		Who/When	
		survey and map Gilson Creek watershed	
		Who/When	
		List of map needs to BLRPC	
		Who/When	GWC
Action	Secure funding for inventory & mapping work		
Lead Organization	Bay-Lake RPC; WI-DNR Bureau of Endangered Resources		
	Next Steps	Karen talk with Mark W. of BLRPC re: costs for mapping	
		Investigate possibility of WCMP grant for recharge area mapping – Nov 4 th deadline	
		Research Ducks Unlimited and NAWCA funding opportunities for inventory of area, possibly including Duvall Swamp	
Action	Northeast Wisconsin Land Trust identification of priority parcels for protection via acquisition or easement – iris & alvar properties outside current SNA boundaries		
Lead Organization	NEWLT, with advice from DNR		
Strategy: Coordination with local town comprehensive planning efforts			
Action	Contact local officials to introduce to Lake Michigan Shoreland Alliance, conservation planning, conservation priorities for the site		
Lead Organization	Brown Co. Planning		
	Next Steps	Share information about local town planning status	
		Who/When	Joel Dietl
		Coordinate outreach, planning meeting attendance among area NGO's – NE WI Audubon, Brown County Cons. Alliance, local TU chapter, Great Lakes Sportsfishermen, Niagara Escarpment Resource Network	
		Who/When	Northeast Wisconsin Land Trust
		Develop outreach materials to use in working with local towns	
		Who/When	UW-GB graduate student/Summer 2005

Site Maps

Purpose:

The purpose of site maps are to depict the key features of the site, delineate its geographic extent, identify key parcels or areas within the site, and map the conservation targets for the site.

Questions to Answer:

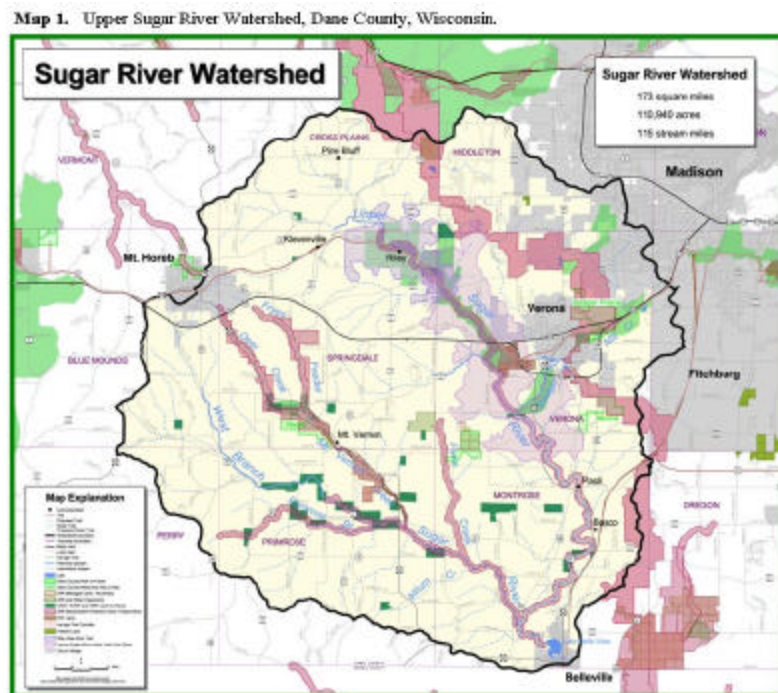
When creating site maps, consider the following questions :

- How can maps best depict the conservation targets/resources of the site?
- What maps of the site or area are already available?
- If someone not familiar with the site reviewed the maps, would they gain information not otherwise presented by the site plan?

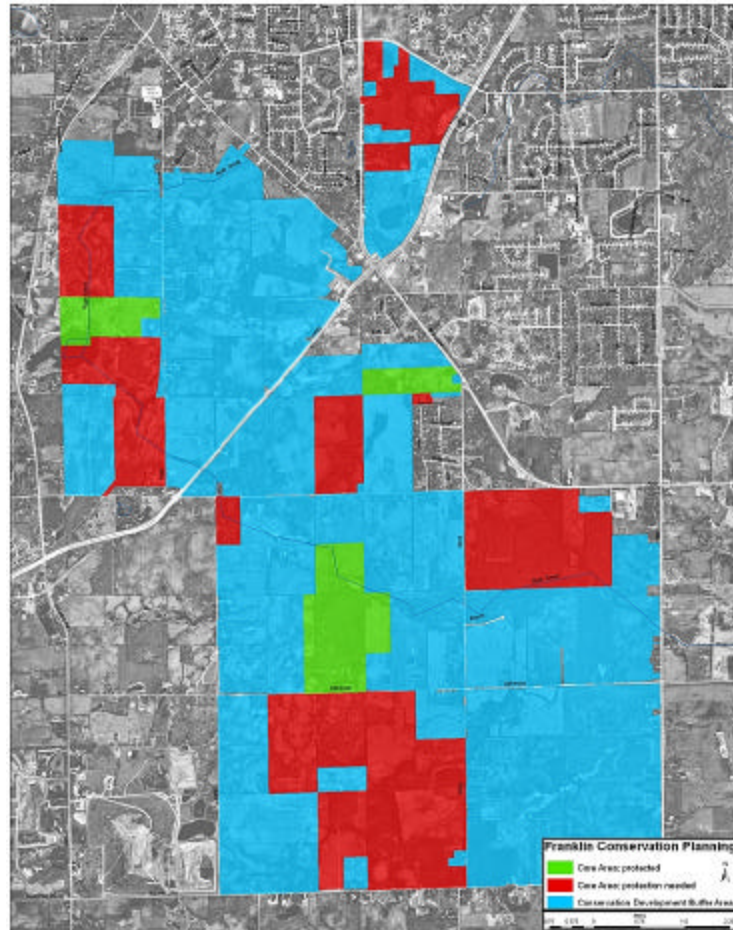
Examples:

- Topographic maps – U.S. Geographic Services
- GIS based maps – including land use data, political boundaries, roads and other developed areas, waterways, etc.
- Plat maps indicating parcel ownerships
- Conservation strategy maps – where on the landscape will strategies be implemented

EX: Project Area
Boundary with
protective land
ownership



EX: Parcel data
with level of
protection priority



Site Conservation Planning Resources

Demographics Data

1990 Population Density: <http://www.dnr.state.wi.us/landscapes/maps/state/population90.htm>

2000 Population Density:

<http://www.dnr.state.wi.us/landscapes/maps/state/population-2000.htm>

2000 % of houses that are seasonal:

<http://www.dnr.state.wi.us/landscapes/maps/state/seasonalhouse.htm>

2000 % unemployment: <http://www.dnr.state.wi.us/landscapes/maps/state/unemployment.htm>

2000 per capita income: <http://www.dnr.state.wi.us/landscapes/maps/state/PCIncome-2000.htm>

Economic profiles for Southeastern Wisconsin:

<http://www.sewrpc.org/economicprofiles/default.shtm>

U.S. Census Bureau: <http://www.census.gov/>

Land and Water Data

% of change in acreage assessed agricultural:

<http://www.dnr.state.wi.us/landscapes/maps/state/percentacre.htm>

Bedrock types: <http://www.dnr.state.wi.us/landscapes/maps/state/bedrocktype.htm>

Current land cover (1992): <http://www.dnr.state.wi.us/landscapes/maps/state/wiscland.htm>

Data Compilation and Assessment of Wisconsin's Coastal Wetlands:

<http://www.dnr.state.wi.us/org/land/er/publications/cw/>

Degraded lakes and rivers: <http://www.dnr.state.wi.us/landscapes/maps/state/303degraded.htm>

DNR Ecological Landscapes link: <http://www.dnr.state.wi.us/landscapes/>

Ecological Landscapes Maps: <http://www.dnr.state.wi.us/landscapes/maps/>

Natural Communities of Wisconsin: <http://www.dnr.state.wi.us/landscapes/community/>

Natural Community Descriptions:

<http://www.dnr.state.wi.us/org/land/er/communities/descriptions.htm>

Opportunities for Sustaining Natural Communities table:

<http://www.dnr.state.wi.us/landscapes/opportunity/>

Outstanding and exceptional resource waters:

<http://www.dnr.state.wi.us/landscapes/maps/state/outstandwaters.htm>

Presettlement vegetation: <http://www.dnr.state.wi.us/landscapes/maps/state/finleys.htm>

Primary Environmental Corridors in Southeastern Wisconsin:

http://www.sewrpc.org/publications/brochure/plan_on_it_environmental_corridors.pdf

Public land ownership and private land enrolled in forest tax programs:

<http://www.dnr.state.wi.us/landscapes/maps/state/publicland.htm>

State Natural Areas: <http://www.dnr.state.wi.us/org/land/er/sna/>

Susceptibility to groundwater contamination:

<http://www.dnr.state.wi.us/landscapes/maps/state/susceptibility.htm>

WDNR's Hydrologic Areas: <http://www.dnr.state.wi.us/org/gmu/sidebar/whatis.htm#wmus>

Species Data

Endangered and Threatened Species Fact Sheets:

<http://www.dnr.state.wi.us/org/land/er/factsheets/>

Imperiled or significant species by worldwide status:

<http://www.dnr.state.wi.us/landscapes/maps/state/imperiled.htm>

Invasive Species Information:

Plants: <http://www.dnr.state.wi.us/invasives/plants.htm>

Animals: <http://www.dnr.state.wi.us/invasives/animals.htm>

Natural Heritage Inventory Program: <http://www.dnr.state.wi.us/org/land/er/nhi/>

NHI Working List: http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/

Wisconsin's Animals, Plants and Natural Communities:

<http://www.dnr.state.wi.us/org/land/er/biodiversity.htm>

Wisconsin's Federally Listed Species:

http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/fed_listed.asp

Wisconsin State Threatened and Endangered Species:

http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/TandE.asp

Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need:

<http://dnr.wi.gov/org/land/er/WWAP/index.htm>

Community Data

Local Chamber of Commerce website

Local city website

Local county website

Local newspaper archives

Southeastern Wisconsin Transportation Planning: <http://www.sewrpc.org/transportation/>

Other

Average monthly max. temperature for August:

<http://www.dnr.state.wi.us/landscapes/maps/state/augtemp.htm>

Average monthly min. temperature for January:

<http://www.dnr.state.wi.us/landscapes/maps/state/jantemp.htm>

Great Lakes Environmental Directory: <http://www.greatlakesdirectory.org/>

U.S. Fish & Wildlife Service, Great Lakes-Big Rivers Region: <http://www.fws.gov/midwest/>

Wikipedia, the free, open-source encyclopedia: <http://www.wikipedia.org/> (search for your local municipality or unique land feature)

Executive Summary How-To

The goal and purpose of the executive summary

The purpose of the summary is to have a piece of literature available to prospective funders, local decision makers and other interested parties that provides a comprehensive yet concise introduction to the site and the conservation plan. The plan in its entirety is usually too detailed and lengthy for the interests of these parties, thus an executive summary is an easy-to-distribute and understandable resource that conveys the necessary details of the plan.

The format of the executive summary

There is no specific format that is appropriate for the layout of the executive summary. The example included in this resource manual is formatted as a tri-fold pamphlet. Another potential format is a two page fact sheet.

Many of the details in the summary can be expressed in bullet points to make them easy to scan and process. Photos and diagrams are also encouraged.

Details to include in the summary

As is stated above, the goal of the executive summary is to create a literature piece that conveys the most relevant and important details of your site conservation plan in a concise and easy to read manner. Despite the importance of brevity, certain details are central to the plan and should be included.

Details that you want be sure are included in the summary include:

Regarding the site

- location of the site
- unique or rare ecological features of species found at the site
- the current state of the natural communities and features at the site

Regarding the conservation plan

- threats to the ecological integrity of the site
- conservation strategies identified to mitigate the threats
- ecological benefits to implementing the plan

Administration

- information on who to contact for more information about the plan
- photos of the site and its unique features
- map of site location

Site Conservation Plan for the Upper Sugar River Watershed 2004



Introduction

The Natural Heritage Land Trust is a non-profit organization dedicated to the conservation of natural areas, agricultural lands, and open spaces in Dane County and surrounding areas. In 2002, the Land Trust identified the Upper Sugar River Watershed as one of its priority areas where the organization will focus land protection efforts. In order to set goals for land protection in the area and to form strong working relationships with other groups, we decided to undertake Site Conservation Planning. This process was designed by the Nature Conservancy to identify shared goals and strategies to protect important natural resources.

Upper Sugar River Watershed

The Upper Sugar River Watershed (Map 1) is a 173-square mile watershed in Southwestern Dane County, and is part of the larger Sugar-Pecatonica River Basin. The watershed includes all or large portions of the Towns of Cross Plains, Montrose, Primrose, Springdale, and Verona, the Villages of Belleville and Mount Horeb, and the City of Verona. The watershed includes several Dane County parks: Badger Prairie Park, Donald Park, and Prairie Moraine

Park, as well as other land owned by the county, the federal government, and the Department of Natural Resources. Natural and recreational resources important to many people are found in the watershed, such as the Military Ridge State Trail, the Ice Age National Scenic Trail, the Madison School Forest, Sugar River Wetlands State Natural Area, many trout streams, challenging bicycling routes, and several county resource sites identified in the Dane County Park and Open Space Plan.

Goals of Upper Sugar River Watershed Site Conservation Planning: Develop shared goals and strategies for the conservation of important natural resources in the Upper Sugar River Watershed, and to communicate what partners do and establish better working relationships.

Conservation targets and goals

The first task of Site Conservation Planning was to identify conservation targets within the Upper Sugar River Watershed. The group identified four targets and articulated goals for each target. Some of these targets are depicted on Maps 1 and 2.

1) Native Natural Communities/Native Species Habitat

(includes: fisheries, grasslands, prairie/oak savanna remnants, rare/threatened species, wetlands, and woodlots)

Goals: Native natural communities and native species habitat in the Upper Sugar River Watershed will be fully inventoried, and restored and protected to the greatest extent possible. The public will be familiar with these natural resources and support the conservation of them.

2) Cultural Identity/Landscape

(includes archaeological features, cultural features, distinction between urban & rural, geologic landscape, open space, sustainable agriculture, and viewsheds)

Goals: The Upper Sugar River Watershed landscape will have a distinct identity as a scenic rural landscape with well-managed agricultural lands and healthy streams, wetlands, and other natural areas. Rural lands will not be fragmented by development. More rural landowners will employ conservation strategies. Archaeological, historical, and other cultural resources will be protected. Important viewsheds and the geologic landscape that created them will be maintained. Communities with their own identities will be separated and limit sprawl. Comprehensive plans will reflect these goals and preserve prime farmland and existing farms.

3) Water Quality/Quantity

(includes groundwater recharge areas, headwaters, springs/seeps, steep slopes, and wetlands)

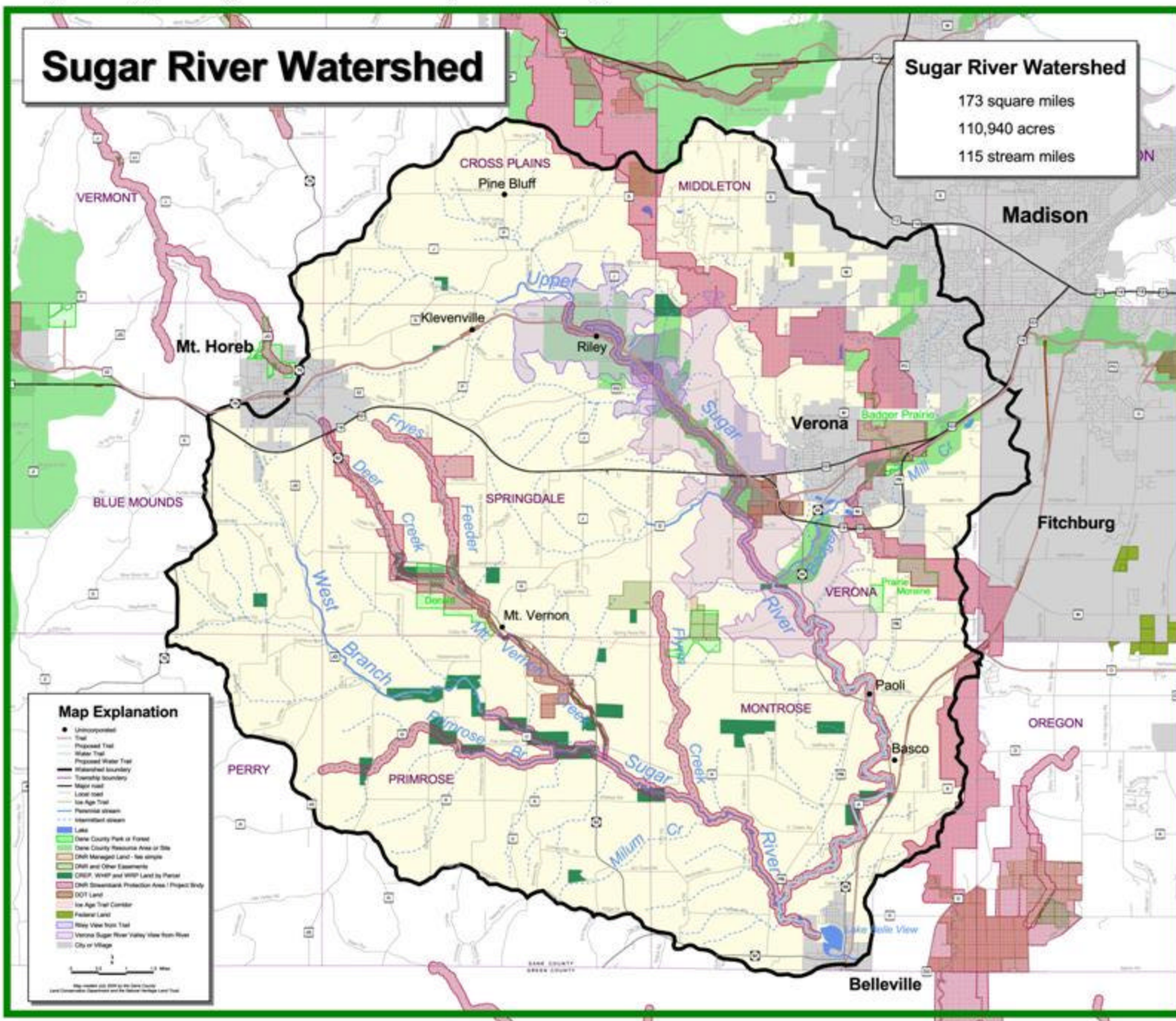
Goals: The water quality within the Upper Sugar River Watershed will improve—no streams will be listed on the state’s list of impaired waters (waters that do not meet state water quality standards). High quality wetlands will be identified and classified. Recharge areas, headwaters, springs, seeps, and steep slopes will be maintained. Monitoring of the Upper Sugar River will be coordinated and will alert proper officials when there are problems. Watershed residents’ water use will be efficient.

4) Recreational/Educational Opportunities

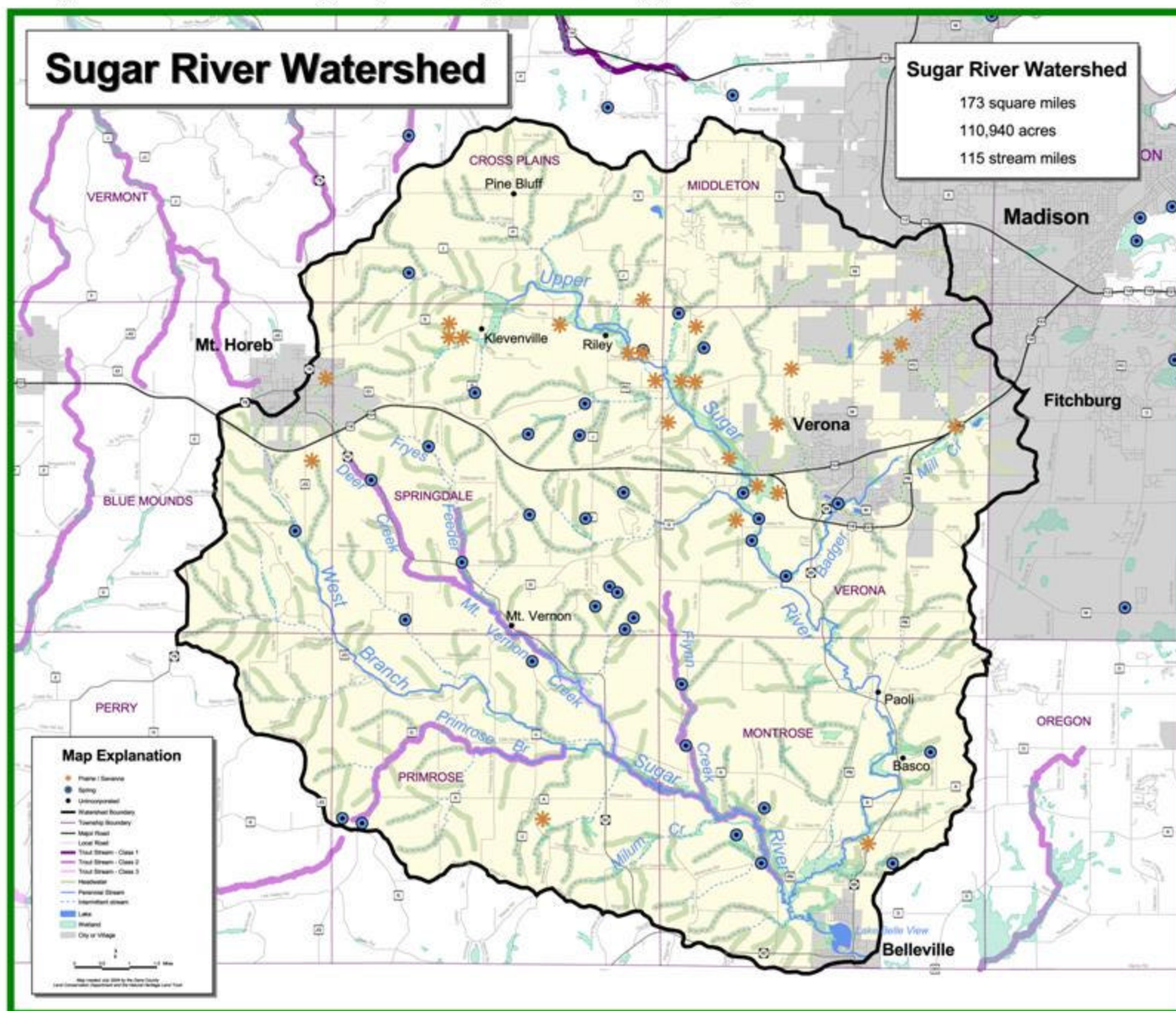
(includes environmental education, education about conservation practices, and land & water trails for hiking, biking, and canoeing)

Goals: The Upper Sugar River Watershed will provide abundant opportunities for canoeing, hiking, biking, hunting, fishing, and scenic driving. Many of the recreational corridors will be connected. The public will be aware of individual and community impacts to the watershed and will be involved in conservation decisions. Watershed residents will develop a land stewardship ethic and more rural landowners will employ conservation strategies. More citizens will be volunteers engaged in monitoring, management, and other activities. Schools within the watershed will integrate a local, environmental education curriculum.

Map 1. Upper Sugar River Watershed, Dane County, Wisconsin.



Map 2. Conservation Targets (partial list) within the Upper Sugar River Watershed.



Strategies & Actions to Implement the Upper Sugar River Watershed Site Conservation Plan

Strategies to reach goals for conservation targets

After assessing the current threats to the four conservation targets, we developed strategies to diminish the threats and reach the goals set for each target. The strategies presented here are organized under the headings of the three threats with the most impact: development, problematic land uses, and lack of funding.

Actions or strategies in bold are those that participants ranked highly in terms of priority and ability to participate.

Objective: Decrease impacts of development (includes development pressure, infrastructure, and roads)		
Strategy a) Action	Convener	Team members
1) Protect land with Conservation Easements in the watershed		
a) Finalize land protection project boundaries		
b) Establish priorities for land protection	NHLT	BMAP, CAPD, DCP, DNR, SNA, TV OSPC, USRWA
c) Negotiate with landowners and complete conservation easements	NHLT	DCP, DNR, SNA
2) Educate local municipalities about natural resources		
a) Obtain science-based data (complete needed inventories) & share with local units of government	USRWA	BMAP, CAPD, DNR, SNA, TV OSPC, UW-EX
b) Collate info on impacts of development, alternatives, etc. & share with local units of government	TV OSPC	BMAP, CAPD, DNR, NHLT, USRWA, UW-EX
c) Find willing townships to partner on cost of community services analysis		
d) Complete citizen/constituent survey		
3) Provide incentives for developers to integrate conservation practices into plans		
a) Educational forum on low-impact development		
b) Pursue “green certification” for area developers		
c) Encourage increased demand for green development		
d) Advocate for Wisconsin to develop proposal for accelerated permitting		
e) Research impact fees		
4) Provide landowners with alternatives to development		
a) Research PDR (purchase of development rights) and other funding options (township-wide, watershed-wide) and provide information to landowners	NHLT & TV OSPC	BMAP, CAPD, DCLCD, DCP,

		MRPHA, SNA, UW-EX
b) Begin conversations with County Executive's office about USRW as pilot for County agricultural preservation project		
5) Provide homeowner and landowner incentives for conservation practices		
a) With resource map, landowner outreach partners work to focus efforts on critical resources	none	BMAP, DCLCD, DCP, MRPHA, NHLT, SNA, TV OSPC
b) Create "welcome wagon" info packet on conservation practices	BMAP	SNA, TV OSPC, USRWA, UW-EX
c) Recognize landowners practicing good land stewardship	UW-EX	BMAP, DCLCD, DNR, SNA, TV OSPC, USRWA
d) Create matrix of resources of interest & tools available	done	done
6) Advise Dept. of Transportation, County about bridge modifications to minimize hydrological disruptions		
a) Identify specific locations of concern		
b) Establish contact with Dept. of Transportation		

Objective: Decrease problematic land use (includes lack of BMP (Best Management Practice) implementation and non-point run-off)		
Strategy	Convener	Team members
a) Action		
7) Increase implementation of Best Management Practices (BMPs)		
a) Investigate alternative staffing structure to assist Dane Co. Land Dept.'s outreach about BMPs (talk to Resource Conservation & Development group about funding)		
b) Show County that the USRW is important by presenting to Environment, Agriculture, and Natural Resources Committee & Land Conservation Committee on USRW project-goals and partners		
c) Identify landowners who are not maximizing practice of BMPs		
d) Work with farmers who are not implementing best management practices and/or who are contributing to water quality problems	DCLCD	USRWA
e) Form "bad cop" group		
8) Recognize landowners practicing good land stewardship		
9) Restore degraded wetlands		
a) Finish wetland inventory		
b) Explore funding sources-Trout Unlimited, Ducks Unlimited, WI Wetlands, WI Waterfowl		
c) Complete the restoration of degraded wetlands		

10) Promote the local farming community and products (to keep farming viable)		
a) Find models of value-added agricultural programs		
b) Prepare summary of Black Earth Creek watershed sustainable agriculture project		
Objective: Increase funding options for conservation projects		
Strategy	Convener	Team members
a) Action		
11) Explore obtaining funding from development		
a) Explore options of imposing development surcharge/impact fees, stormwater utility fees, or allocating % of money from conservation development		
12) Complete Dane County Parks resource area plan for areas identified in Dane County Parks and Open Space Plan	NHLT & TV OSPC	DCP
a) Set timeline for meetings, identify partners, roles		
b) Complete resource area plan for areas within USRW		
c) Get plans adopted by Dane Co. Bd.		
13) Promote local stewardship volunteers		
14) Partner with major landowners and business leaders in the watershed		
a) Form team to work on issues		
b) Approach landowner and business leaders	USRWA	BMAP, DCLCD, DNR, NHLT, TV OSPC, UW-EX
15) Collaborate with partners on grant proposals when appropriate	none	ad hoc
16) Ear-mark a tax increase for conservation programs within the watershed		

Legend:

BMAP	Blue Mounds Area Project
CAPD	Community Analysis & Planning Division of Dane County Department of Planning and Development (formerly Dane County RPC)
DCLCD	Dane County Land Conservation Department
DCP	Dane County Parks
DNR	Department of Natural Resources
MRPHA	Military Ridge Prairie Heritage Area, a specified boundary that includes a portion of the Upper Sugar River Watershed
NHLT	Natural Heritage Land Trust
SNA	State Natural Areas, a program of the DNR, that works only within specified Natural Area Boundaries
TV OSPC	Town of Verona Open Space and Parks Commission
USRWA	Upper Sugar River Watershed Association
UW-EX	UW-Extension

Appendix

Planning Session Notes

Steps in the Site Conservation Planning process:

We brainstormed conservation targets (natural resources/values) that we want to protect. These targets were grouped under four headings (natural communities/native species habitat, cultural identity/landscape, water quality/quantity, & recreation/education opportunities), and we stated goals for these four targets. Then we identified stresses of the targets and ranked the severity and scope of each stress. For the highest-ranked stresses, we identified the sources of the stresses, and then ranked the impact of each source on each stress. Finally, we discussed strategies that will be effective at diminishing the sources of stress and prioritized these strategies.

Data summary from Day 1:

Target: Native Natural Communities/Native Species Habitat

Target includes: fisheries, wetlands, grasslands, prairie/oak savanna remnant, rare/threatened species, woodlots, hedgerows

Goals: restore, protect, build public awareness, complete further inventory

Stresses: fragmentation, siltation, habitat loss, nutrient loading, degradation, altered hydrology

Sources: development, row crops, trees, infrastructure, hydrological modifications (culverts, ditching, etc.), invasive species, lack of BMP implementation, fire suppression, non-point run-off, over-browsing

Target: Cultural Identity/Landscape

Target includes: open space-distinction between urban & rural, viewshed (entrance to Verona), sustainable agriculture, archaeological features, cultural features, geologic landscape

Goals: maintain community separation, minimize sprawl, avoid fragmentation, inventory and preserve archaeological/historical resources, identify and protect key viewsheds, participate in and support comprehensive plans, support ag. preservation programs (no loss of prime farmland or existing farms), establish criteria for prioritizing protection, increase number of landowner employing conservation strategies, build community identity

Stresses: fragmentation, loss of natural communities, lack of inter-organizational communication, low commodity prices, loss of special places and views, trophy homes, lack of comprehensive land use plans and lack of plan implementation, undervaluation of viewsheds, lack of awareness/appreciation, rising land values, lack of definition of viewshed

Sources: parochialism, too few people doing work, lack of funding, lack of central data repository, increasing population, inconsistent programs, bureaucracy, insufficient farm support system, development pressure

Target: Water Quality/Quantity

Target includes: groundwater recharge, springs/seeps, fisheries, wetlands, headwaters, steep slopes

Goals: protect, enhance and restore (no streams on 303d list), review stream designations, coordinate comprehensive monitoring, sustain baseflow, identify and classify high quality wetlands, recognize highly treated effluent as a resource, maximize water use efficiency

Stresses: lack of infiltration, temperature changes, flashiness, depletion of groundwater, erosion, siltation, nutrient loading, toxins, increased turbidity

Sources: development, roads, row crops, hydrological modifications (culverts, ditching, etc.), carp, lack of BMP implementation, non-point runoff, groundwater pumping, stormwater run-off

Target: Recreational/Educational Opportunities

Target includes: blocks of tree cover (woodlots or forests), public footpath and other recreational opportunities (land and water trails for hiking, biking, canoeing, etc.), education about conservation practices, environmental education

Goals: increase connectivity, make area known as driving destination, maintain/increase hunting and fishing opportunities, build land stewardship ethic, involve citizens in monitoring and management, increase volunteerism, involve public in conservation decision-making, increase awareness of individual and community impacts, increase funding, integrate environmental education curriculum in local schools

Stresses: lack of funding, lack of access for land-based activities, lack of awareness of environmental ed (curricula and training), lack of educators, habitat destruction and degradation, lack of inter-organizational coordination, lack of interpretive materials

Sources: lack of political support for conservation, political instability/inconsistency, development, roads, row crops, lack of public support/awareness, undervaluing of resources, lack of funding

Summary from Day 2:

We identified strategies for the 3 highest-ranked sources of stress—development, incompatible land use/ag issues, and lack of funding—and created the chart seen above.

General outcomes:

Develop map of natural resources and targets within the Upper Sugar River Watershed. DC, DNR, NHLT, RPC, USRWA, UW. Kate-NHLT is lead.

We will meet quarterly for around 2 hours to give progress reports, etc. At the first meeting, we will review the map to determine the location of focus areas.

Planning dates: October 8, 2003 and October 29, 2003

Participants:

Bruce Allison, Chair, Town of Verona Open Space and Parks
Commission

Jim Amrhein, Watershed Specialist, DNR

Karen Bassler, Program Director, Gathering Waters (our facilitator)

Peggy Compton, Basin Educator, UW-Extension

Steve Falter, Vice-President, Capitol Water Trails

Frank Fetter, Executive Director, Upper Sugar River Watershed Association

Steve Fix, Environmental Review Specialist, Dept. of Ag., Trade, &
Consumer Protection

Andrea Good, Development Director, Upper Sugar River Watershed
Association

Mindy Habecker, Natural Resources/Community Development Educator,
UW-Extension

Drew Hanson, Geographer, Ice Age Park and Trail Foundation

Chris James, Planner, Dane County Parks

Derek Johnson, Director of Habitat Protection, The Nature Conservancy

Mike Kakuska, Environmental Resources Planner, Dane Co. Regional
Planning Commission

Kathleen McCormick, Commission Member, Town of Verona Open Space
and Parks Commission

Meg Nelson, Development Director, Natural Heritage Land Trust

Ken Potter, Professor, UW-Madison Dept. Civil Engineering

Gene Roark, Board Member, Natural Heritage Land Trust

Carroll Schaal, President, Blue Mounds Area Project

Janet Silbernagel (and class), Associate Professor, UW-Madison Dept.
Landscape Architecture

Pat Sutter, Soil and Water Conservationist, Dane Co. Land Conservation
Dept.

Dave Taylor, Director of Special Projects, Madison Metropolitan Sewerage
District

Jim Welsh, Executive Director, Natural Heritage Land Trust

Bob Wernerehl, Ecologist, Blue Mounds Area Project

Kristin Westad, Project Coordinator, Military Ridge Prairie Heritage Area

Kate Wipperman, Conservation Specialist, Natural Heritage Land Trust

Matt Zine, State Natural Areas Manager, DNR

gilson creek watershed - red banks alvar site conservation plan

Prepared by:

Gathering Waters Conservancy

Northeast Wisconsin Land Trust

Wisconsin Department of Natural Resources – Bureau of Endangered Resources

Brown County Planning

U.S. Fish & Wildlife Service

The Nature Conservancy – Wisconsin Chapter

Bay-Lake Regional Planning Commission

UW-Extension

February, 2004 – July, 2005



Photo by Joel Trick



Photo by WI-DNR

Funding provided by the Wisconsin Coastal Management Program and the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant #NA03NOS4190106; and by the Environmental Protection Agency's Great Lakes National Program, Grant # 2004-0005-005.



**WISCONSIN COASTAL
MANAGEMENT PROGRAM**

At one time, Green Bay supported the largest commercial fishery in Wisconsin, but due to overfishing, competition from exotics, and the dumping of toxic PCBs (polychlorinated biphenyls) into the Lower Fox River, emptying into Green Bay, the fishing industry in the area was ruined.

Today, the Fox River Valley is still the largest paper production industry in the world, but before 1979 when they were banned, PCBs were still being used by paper mills as a vehicle for holding and delivering ink in carbonless copy paper. Much of this copy paper was recycled and reprocessed, releasing an estimated 50,000 kilograms of PCBs to the Fox River and Green Bay via the mills' wastewater discharges. The widespread effects of PCBs on fish and wildlife in the region include walleyes with tumors, frogs with deformed spines and the decline of bald eagles. PCBs also harm humans – they are thought to cause cancer and a variety of other health problems.

A comprehensive cleanup plan for the Fox River and Green Bay is currently being developed by the Wisconsin Department of Natural Resources and the U.S. Environmental Protection Agency. The proposed plan, if implemented, will result in the cleanup of sediments that will lead directly to the protection of human health and the environment. However, the final project could take more than 10 years to complete.

Land Use & Development

A high concentration of urban development can be found in and around the City of Green Bay, with the majority of shoreline in Brown County also developed. Brown County, according to 2003 estimates, has a population of 233,888, with a population density of 429 people per square mile – over four times the average density of the state. It is also an area of high growth, experiencing a 16.5% increase in population in the 1990s, compared to a 9.6% increase in the state. The Green Bay Metropolitan area has consistently grown faster than both the Wisconsin and national averages and had the fastest rate of population growth among Wisconsin's Metropolitan areas between 1990 and 2000.

Red Banks, with its close proximity to the City of Green Bay, is feeling the pressure from excessive residential development. As agriculture becomes less economically viable, there is concern that the open farmland in eastern Brown County could be purchased and developed.

Other areas of Brown County contain small forest patches, agricultural lands, low density housing and quarry operations of differing sizes.

Description of Site

Gilson Creek Watershed

Regional Context

The Gilson Creek Watershed is located in the Northeast corner of Brown County along the shore of Green Bay. This region falls within the Central Lake Michigan Coastal (CLMC) Ecological Landscape – one of 16 Ecological Landscapes in Wisconsin that are based on a system of land classification developed by the Department of Natural Resources. This system divides the state into ecological units based on combinations of biotic and environmental factors, which include climate, geology, soils, hydrology, and vegetation.

The climate of the CLMC Landscape is highly influenced by its proximity to Lake Michigan, giving the area cooler summers, warmer winters and precipitation levels greater than

at locations farther inland. Its generally flat topography consists of clay and silt loam soils. Historically, most of this landscape was vegetated with mesic hardwood forest, but due to the heavy development pressure in the Green Bay area much of the land cover is now primarily urban and agricultural. There are some remnants of northern hardwood forest with maple, beech, and some hemlock, plus conifer swamps, hardwood swamps, and riverine marshes.

The biota in this region is especially noteworthy for the rare regional endemic plants associated with Lake Michigan shoreline habitats and the highly specialized animals inhabiting the Niagara Escarpment. The coastal areas annually host significant concentrations of migratory birds and provide seasonally critical habitat for numerous animals. However, the CLMC Landscape has the worst relative pollution ratings for watershed and streams according to the rankings by the Wisconsin DNR.

An area loosely referred to as Red Banks is found in the Gilson Creek Watershed and contains an unusual and unique array of natural communities. Red Banks supports Wisconsin's best example of an alvar community and unusual variants of the prairie-savanna and cedar forest communities. Invertebrate diversity is high in both the insect and land snail groups, with many rare taxa represented. The Gilson Creek Watershed is also home to the rare and threatened dwarf lake iris (*Iris lacustris*).

Red Banks

Species, Natural Communities, Scenic/Recreational Value

The Red Banks Alvar was designated a State Natural Area in 2001. Alvar communities are extremely rare and are distinguished by naturally open areas of very shallow soils over essentially flat limestone or dolomitic bedrock. An unusual blend of boreal, southern and prairie species, -- relicts of the post-glacial environment and the warmer, dryer period that followed -- characterizes alvar ecosystems. Alvars are important sites for (1) the protection of biodiversity including threatened plant communities and rare and threatened species of flora and fauna; (2) biological research and environmental monitoring; and (3) ecotourism.

Red Banks Alvar contains one of the most diverse snail communities known in the Midwest and is one of the most important areas in Wisconsin for land snails -- colonies of 25 different groups of highly specialized and rare glacial relict snails can be found from the base to the top of the escarpment. A few rare plants found at the alvar include cream gentian (*Gentiana alba*), Crawe's sedge (*Carex crawei*), and Richardson's sedge (*C. Richardsonii*). There have also been at least 20 species of butterflies documented within the community and there is an old-growth mesic forest on the slope below the dolomite escarpment.

A unique white cedar woodland community also occurs at Red Banks, bordering Gilson Creek. This community is dominated by white cedar, native sedges and the common juniper. The rare Great Lakes endemic, dwarf lake iris, is a local dominant in the groundlayer.

The dwarf lake iris is listed both by the State of Wisconsin and by the United States government as a threatened species. Its rarity is due both to a limited amount of habitat and to increasing disturbance by shoreline development. The dwarf lake iris must have just the right combination of light, humidity, soil, moisture and temperature to live -- it thrives on the cool air that flows off the lakes, and the thin, moist, sandy or rocky soils that can be found in a few sites near the shores of the northern Great Lakes. The iris is appreciated for its deep blue to purple blossoms and its great genetic potential.

Current conditions (e.g. degraded, pristine)

Some of the major disturbance factors affecting the Red Banks site include hydrologic disruption, invasive plants, quarrying, heavy grazing, encroachment by residential development, and fragmentation by roads and power line corridors. These factors, together with a long history of fire suppression, have altered the composition and structure of the alvar community by increasing the dominance of woody species. The vegetation has formed an almost closed canopy dry forest, with small scattered openings supporting plants characteristic of savanna or prairie communities – exotics, such as Kentucky bluegrass and smooth brome, are common and sometimes dominant in these openings.

In terms of the specific habitat of the dwarf lake iris -- its lakeshore habitat has been greatly reduced by shoreline development. Residential and vacation homes, as well as associated road-widening, chemical spraying and salting, and off-road vehicle use have caused disturbance and destruction of habitat.

Although threats remain very high to this region and it is considered a priority for immediate conservation attention by the DNR, there are portions of this site that are relatively intact or restorable.

Niagara Escarpment

Geology

The Niagara Escarpment is the steep face of a 650-mile sickle-shaped cuesta that runs from the northeastern United States south of Rochester, New York, across portions of southeastern Canada, and the southward north and west of Lake Michigan to southeastern Wisconsin. In geological terms, a cuesta or escarpment is a ridge composed of gently tipped rock strata with a long, gradual slope on one side and a relatively steep scarp or cliff on the other. In Wisconsin, the Escarpment extends over 230 miles, from Rock Island, off the northern tip of the Door Peninsula, south to northern Waukesha and Milwaukee counties.

The primary bedrock type is dolomite, formed from accumulated sediments of an ancient sea 405-425 million years ago during the Silurian Period of the Paleozoic Era. The Escarpment was formed over millions of years through the differential erosion of rocks of different hardnesses – a cap of erosion-resistant dolomite overlays weaker, more easily eroded weather shale rocks, that when gradually eroded left a series of cliffs. This series of bluffs can be found along the shoreline of Red Banks in the Gilson Creek Watershed.

Species, Natural Communities, Scenic/Recreational Values

The geology of the Escarpment greatly influences its ecological attributes. Cold air and sometimes water move through the fractured rock creating unique microhabitats in which many highly specialized species, such as rare terrestrial land snails and bats, can be found.

The Niagara Escarpment is as much a hydrological as a geological feature. The headwaters of several rivers rise in the Escarpment and the area is important for groundwater recharge. The uncontaminated water of many Escarpment aquifers is in heavy demand from the bottled water industry.

The area of the Escarpment in the Gilson Creek Watershed is home to the rare dwarf lake iris and Red Banks Alvar. There are also trees growing on the forested portion of the Niagara Escarpment that include some of the oldest red and white cedars in Wisconsin.

Current conditions (e.g. degraded, pristine)

Shoreline near the Escarpment has been extensively developed near the City of Green Bay and the Town of Scott, in the vicinity of Red Banks – mostly for residential uses. As you move away from large cities a mix of agricultural land, woodlands, and locally concentrated developments can also be found.

Another form of development that is a concern is the number of county operated or privately owned quarries that supply crushed stone from the Escarpment primarily for road base or concrete aggregate. Areas along the Niagara Escarpment, such as Red Banks, have thin soil deposits due to glacier scouring and relatively post glacial deposition. These conditions of shallow soils lying directly over fractured bedrock make the area susceptible to groundwater contamination.

Other protected areas

The portion of the Niagara Escarpment occurring in Ontario, Canada has been designated as a World Biosphere Reserve by the United Nations Education, Scientific and Cultural Organization.

The work being done at Red-Banks Gilson Creek is also ongoing at several other sites within the Lake Michigan basin by the Lake Michigan Shorelands Alliance.

Conservation Targets

While the Red Banks area is rich in biological, ecological, geological & historic diversity, the partners on this plan are focused on a few key elements. It is hoped that protection of these features will serve to ensure preservation of the whole ecological landscape.

Conservation Goals

Dwarf lake iris

- ♦ protection of all known occurrences
- ♦ restoration of intact, functioning habitat with full spectrum of species & communities
- ♦ genetic study of population to compare with Door County population

Escarpment

- ♦ intact, continuous ecological/habitat gradient from top to bottom
 - intact hydrology
- ♦ protection of all intact examples of escarpment communities
- ♦ sufficient area of plateau protected to conserve recharge areas critical to health of watershed

Trout stream

- ♦ self-sustaining population of brook trout
- ♦ creek hydrology delineated

Groundwater recharge areas

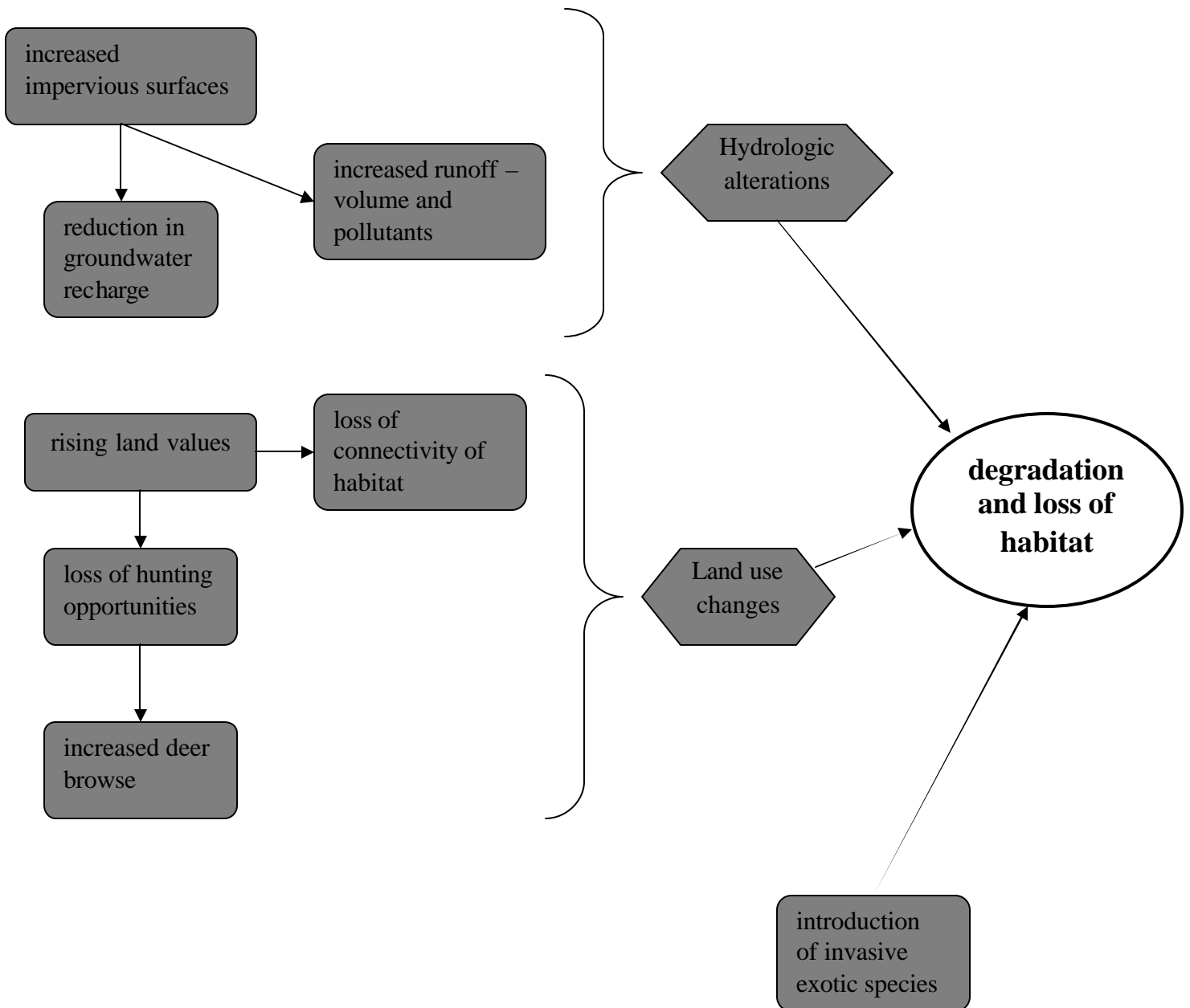
- ♦ protection of all recharge areas which impact other conservation targets

Threats to Targets

The most prominent threats to the viability and health of the conservation targets for the site are those arising from **residential development** of the area. As the Green Bay metropolitan area grows, and as agricultural production becomes less economically viable, the open acres of farmland in eastern Brown County are more attractive to developers and homebuyers. The resulting patchwork of development has multiple cascading effects on the species and natural communities of the site.

- ♦ *Increased impervious surfaces* – driveways, roads, roofs, parking lots – reduce infiltration of precipitation and runoff into the ground. This alters the hydrology of a watershed, changing stream flows, water temperature and flood cycles. Stormwater runoff moves across the landscape more quickly, and brings with it more toxins accumulated from the paved surfaces. The impact of a single home and driveway is minimal, but the combined impact of a subdivision or strip mall development can radically alter many facets of stream ecology.
- ♦ *Habitat loss and fragmentation* – Developed land has a direct impact on species habitat through the loss of acreage. In addition, the scattered nature of development breaks up formerly contiguous habitats, resulting in smaller, isolated parcels. This has two negative results; first, it decreases or eliminates the ability of individuals of a population from moving across their full habitat, and second, many species which are area-sensitive can no longer survive on the smaller parcels, even when they contain appropriate habitat.
- ♦ *Septic systems and wells* – Increased development requires more water withdrawals via wells, reducing groundwater resources which in turn affects stream flows. Development also requires more septic fields. Poorly maintained or inadequately abandoned wells and septic systems can reduce groundwater quality.
- ♦ *In-stream development* – Channelization, streambank riprap, and culverts are often associated with both residential development and agricultural operations. These modifications destroy and degrade stream habitats, and fragment remaining habitat.

Negative Impact of Development:



Other threats were also identified. In some cases, these are associated with development but not directly.

- ♦ *Invasive exotic species* – Invasive species include plants and animals which are non-native to the region and which outcompete native species for resources. Left alone, these species can take over entire habitats, resulting in a monotypic environment unsuited for other wildlife. In this region, invasives of concern are:
 - *purple loosestrife*
 - *garlic mustard*
 - *buckthorn*
- ♦ *Deer browse* – High populations of whitetail deer in the area, combined with shrinking habitat for those deer, has resulted in overbrowsing of native vegetation. Deer browse can dramatically curtail regeneration of certain plant species, and reduces the biodiversity of an area.
- ♦ *Lack of information about species and natural communities* – Many of the conservation targets identified for this site are lacking adequate inventories and location mapping. Without knowledge about the current population size, geographic location and health of these targets, it is difficult to target conservation strategies designed to preserve or restore their status.
- ♦ *Lack of awareness of conservation targets/low priority for conservation* – The general public are not informed about the ecological significance of the area, the threats facing the region's biodiversity and the need for conservation efforts. As a result, conservation and restoration are given low priority in local land use plans, and inadequately funded at the county level.

A list of threats by targets impacted (key threats in ***bold italics***):

Niagara escarpment:

- ♦ ***development***
 - quarrying
 - wind farms
 - logging
 - septic systems
- ♦ invasive species
- ♦ lack of management/lack of fire
- ♦ fragmentation of habitat
- ♦ inappropriate agricultural practices

groundwater recharge areas:

- ♦ ***residential/commercial development***
 - increased impervious surfaces
 - groundwater withdrawals via wells
 - older septic systems and improperly abandoned wells contaminating groundwater
- ♦ lack of best management practices in agriculture
- ♦ lack of locational information about recharge areas
- ♦ land use changes

trout stream:

- ♦ *development*
 - agricultural
 - nonpoint runoff
 - channelizing and diverting flows
 - residential/commercial
 - increased impervious surfaces – changes in flow patterns
 - culvert placements
 - bank riprapping
- ♦ thermal changes from quarry overflows and loss of vegetative cover
- ♦ lack of management of in-stream debris

Point Comfort Woods:

- ♦ logging
- ♦ development – inadequate buffer between woods and residential areas
- ♦ invasive species
- ♦ deer browse

dwarf lake iris:

- ♦ development – loss of habitat
- ♦ lack of appropriate management of existing habitat
- ♦ deer browse
- ♦ invasive species – future concern, not present in iris habitat yet

Conservation Strategies to Mitigate Threats

Many of the strategies developed during partner meetings, when implemented, will have impacts on several of the conservation targets simultaneously. Specific actions to be taken toward implementation are outlined in the accompanying Action Matrices (Appendix A).

To mitigate negative impacts of development:

- 1) Enact a stormwater runoff fee.
- 2) *Directing development away from critical areas via comprehensive plans.*
 - * need to define and map these critical areas
- 3) Encourage conservation design development.
- 4) *Acquire land or easements on highest priority parcels.*
 - * iris habitat & alvar community within SNA
- 5) Work with Brown County on ecologically sensitive areas definition in their sewer plan.
- 6) Let local towns know about conservation priorities so they can consider conservation needs in comprehensive plans.

To mitigate impacts of invasive exotic species:

- 1) Develop management plan for Red Banks State Natural Area.
- 2) Form a Friends of Red Banks organization to implement management activities and fundraise for management needs.

To increase public awareness and appreciation of natural resources:

- 1) Lead field trips to Red Banks State Natural Area, other sites along escarpment.
- 2) Form a Friends of Red Banks organization to build community support for protection through education and outreach.

Partners

This plan was developed using a collaborative approach to conservation planning. The partners involved in this planning include:

- ✦ The Nature Conservancy – Wisconsin Chapter
- ✦ Wisconsin Department of Natural Resources – Bureau of Endangered Resources
- ✦ Bay-Lake Regional Planning Commission
- ✦ U.S. Fish & Wildlife Service – Private Lands
- ✦ Brown County Planning Commission
- ✦ Northeast Wisconsin Land Trust
- ✦ UW-Extension Basin Educators
- ✦ Gathering Waters Conservancy

Sources of Funding/Partnerships

Natural Resources Damage Assessment – related to Fox River PCB loading

Knowles-Nelson Stewardship Fund

Wisconsin Coastal Management Program Grant (NOAA Funding)

<u>THREAT:</u> DEVELOPMENT		
<u>Strategy:</u> Directing development away from critical habitat; acquisition of land or easements on priority parcels		
Action	Mapping target locations, threat impact areas, systems supporting target health	
Lead Organization	Bay-Lake RPC GIS program can generate maps; can develop recharge area data <i>Contact:</i> Angela Pierce	
Other Resources	Brown Co. LCD has agricultural field data, subwatersheds of the Red River priority watershed data <i>Contact:</i> Jon Bechle	
	DNR has dwarf lake iris habitat data, alvar community location data <i>Contact:</i> Darcy Kind	
	DOT has karst features location data from Hwy 57 expansion project <i>Contact:</i> Joel Trick	
	Coordinate with UW-GB to use students for on the ground mapping & inventory <i>Contact:</i> Mike Grimm, Bob Howe	
	Next Steps	Ground truth subwatershed maps
	Who/When	
		survey and map Gilson Creek watershed
	Who/When	
		List of map needs to BLRPC
	Who/When	GWC
Action	Secure funding for inventory & mapping work	
Lead Organization	Bay-Lake RPC; WI-DNR Bureau of Endangered Resources	
	Next Steps	Karen talk with Mark W. of BLRPC re: costs for mapping
		Investigate possibility of WCMP grant for recharge area mapping – Nov 4 th deadline
		Research Ducks Unlimited and NAWCA funding opportunities for inventory of area, possibly including Duvall Swamp

Action	Northeast Wisconsin Land Trust identification of priority parcels for protection via acquisition or easement – iris & alvar properties outside current SNA boundaries	
Lead Organization	NEWLT, with advice from DNR	
<u>Strategy:</u> Coordination with local town comprehensive planning efforts		
Action	Contact local officials to introduce to Lake Michigan Shoreland Alliance, conservation planning, conservation priorities for the site	
Lead Organization	Brown Co. Planning	
	Next Steps	Share information about local town planning status
	Who/When	Joel Dietl
		Coordinate outreach, planning meeting attendance among area NGO's – NE WI Audubon, Brown County Cons. Alliance, local TU chapter, Great Lakes Sportsfishermen, Niagara Escarpment Resource Network
	Who/When	Northeast Wisconsin Land Trust
		Develop outreach materials to use in working with local towns
	Who/When	UW-GB graduate student/Summer 2005

Regional Conservation Plan for the Upper Des Plaines River Watershed



P.O. Box 085153
Racine, WI 53408-5153
www.krilt.org
info@krilt.org

Kenosha/Racine Land Trust, Inc.

Mission Statement

*To protect open space and natural areas
in Kenosha and Racine Counties
for the benefit of current and future generations.*

Table of Contents

	Page
Introduction	1
Why Watershed-Based Conservation Planning?	2
A Brief History of the Upper Des Plaines River Watershed	3
Targets for Conservation within the Upper Des Plaines River Watershed	5
Native Ecosystems and Critical Species Habitat	6
Functional Aquatic Ecosystems	6
Natural Hydrology	6
Viewshed	6
Archeological Sites	7
Recreation and Education Opportunities	7
Strategies to Achieve Conservation Targets	8
Follow the recommendations by the Southeastern Wisconsin Regional Planning Commission for natural areas and critical species habitat protection	8
Participate in comprehensive “Smart Growth” land use planning within the Watershed	8
Develop Outreach and Education Programs	9
First Conservation Project within the Watershed	11
 Table 1. Critical plant species known to occur within the Des Plaines River Watershed of Wisconsin	 13
 Table 2. Endangered or threatened animal species known to occur in the Des Plaines River Watershed	 14
 Table 3. Wisconsin animal species of special concern occurring in the Des Plaines River Watershed	 15

Introduction

In February and March of 2002, the Kenosha/Racine Land Trust, Inc., asked a group of people interested in the fate of the Upper Des Plaines River Watershed to help it develop a conservation plan. The Land Trust believed these individuals could help produce a solid and achievable regional conservation plan because of their diverse backgrounds and perspectives. Among the participants were representatives from the Southeastern Wisconsin Regional Planning Commission (SEWRPC), Wisconsin Department of Natural Resources (WDNR), Village of Pleasant Prairie, Lake County Stormwater Management Commission (SMC), United States Department of Agriculture Conservation Service (USDA-CS), Ducks Unlimited (DU), Applied Ecological Services, Inc. (AES), Des Plaines River Watershed Alliance, WE Energies, WISPARK, Upper Des Plaines River Ecosystem Partnership, and Pringle Nature Center. Gathering Waters Conservancy, an umbrella organization for Wisconsin Land Trusts, facilitated the process.

The Land Trust used a planning process that was developed by the Nature Conservancy to guide protection and stewardship activities. Regional conservation planning is an interactive process that requires input from all participants to be effective. The integration of ideas and visions was essential developing this multi-disciplinary regional conservation plan.

The participants began the planning process by selecting specific features within the watershed on which to focus conservation efforts. These conservation “targets” were endangered species, specific ecosystem types, ecological processes, or other features

deemed important by the participants. Next, the participants identified threats to the targets and the most important strategic actions that would protect the conservation targets in an effective, timely, and cost-efficient manner.

The Land Trust will use the strategic actions identified during this regional conservation planning session to develop appropriate watershed conservation programs and to define job responsibilities for future staff.

While this plan was developed for the Upper Des Plaines River watershed, the strategic actions identified in it can also be used for the conservation of other watersheds in Kenosha and Racine counties.

Why Watershed-Based Conservation Planning?

Watershed-based conservation planning makes sense because anything that degrades water quality and hydrology upstream will have an impact downstream. Watershed-based conservation can create healthier environments and economic communities. Federal, state and local governments are adopting watershed-based management of natural resources because it is a comprehensive approach to flood management and to stream water quality improvement. Land conservation practices, such as restoring wetlands along river corridors and in agricultural areas, will improve water quality, increase groundwater availability and reduce the severity of flooding. These practices also benefit biodiversity and can increase recreational opportunities such as hunting, fishing, and wildlife observation.

WDNR now uses a watershed-based approach to manage Wisconsin's natural resources. In its 2002 report *The State of The Southeast Fox River Basin*, which includes

the Des Plaines River watershed, WDNR identified increased nutrient and sediment loads, drain tile impacts, and historic ditching as sources of water quality impairment to the Des Plaines River.

As the Land Trust begins to preserve and restore areas along the Upper Des Plaines River, it will need to ensure upstream water quality to prevent the degradation of the conserved areas. Additionally, Land Trust conservation efforts along the Des Plaines River will include the restoration of wetlands and prairies and will lead to improved downstream water quality and reduced flood intensity. Therefore, the Land Trust has established strong support for a watershed-based conservation plan that crosses political boundaries.

A Brief History of the Upper Des Plaines River Watershed

The Upper Des Plaines River watershed is a remnant of the vast stream and wetland complex created by the last retreating glacier, which covered southeast Wisconsin over 14,000 years ago. Sedges and spruce sprang up as the glacier retreated north, providing forage for the woolly mammoths. Some of the earliest known human inhabitants of North America hunted woolly mammoths in what is now the the Upper Des Plaines. In fact, over hunting by these early humans may have contributed to the mammoth's extinction.

As the glacier retreated northward, the climate and vegetation in the region changed. Tall-grass prairie, oak savanna, wetland, and sedge meadow communities gradually developed. Humans helped maintain this landscape for thousands of years. Human-set and lightning-strike fires prevented the succession of the prairies and

savannas to hardwood forests; the fires also sustained food and medicinal resources for the early cultures inhabiting this area. This landscape held an incredible diversity of plants and animals. As the cycles of growth and burning continued, deep and rich soils were produced.

When new settlers began to arrive in this area from the North American Atlantic Coast, they were unaware of the richness of prairie soil and settled in the woodlands. Not until 1837, when John Deere developed and manufactured mechanical plows that could cut through the tough, deep roots of the prairie grasses, did these settlers begin to influence this landscape in a new way. They began to cultivate farm fields and ditch creeks and streams. These very productive farms began to feed the world, but they also changed how rainwater and snowmelt moved through the soil. Storm- and melt-waters could no longer soak deeply into the soil because the deep roots of the prairie grasses were gone. The region's once wide and shallow prairie streams were now required to follow straight and narrow courses. With the use of drain tiles, wetlands were converted to farmland and no longer filtered or held storm- and melt-water, or provided habitat for wildlife. Native plants and animals disappeared as their ecosystems were destroyed. Runoff from farm fields caused erosion and began silting the Upper Des Plaines River and its tributaries. Fertilizers, pesticides, salts, oils, and other pollutants soon became part of the runoff. The narrow banks of the streams could not accommodate the water from heavy rainfalls, and farm fields began to flood.

In only 150 years, the landscape of Kenosha County lost 99 percent of its prairies, 100 percent of its savannas, 50 percent of its wetlands, and 68 percent of its woodlands. Virtually all of the prairie and savanna was converted to farmland. Today the landscape

continues to change, as farmland is lost to urban sprawl. Urban sprawl covers the landscape with impervious surfaces such as roads, parking lots, and roofs. Turf grass, with very shallow roots, is the vegetation of choice. Storm- and melt-waters cannot infiltrate the soil, and humans now have to determine what to do with all of the runoff.

Downstream in Illinois, urban sprawl surrounding the Des Plaines River has greatly increased the magnitude and financial cost of flood events as homes and businesses are damaged by floodwaters. In 1986 and 1987 flooding along the Des Plaines River in Illinois caused damage exceeding \$100 million. The 1986 floods caused damage to more than 10,000 homes and 263 business and industrial sites. More than 15,000 people were evacuated from the flooded areas. Since then, millions of dollars have been spent trying to prevent future flood events of that magnitude.

Urban sprawl cannot be easily prevented. Land values in the Wisconsin Upper Des Plaines River watershed are rising as urban sprawl pushes into this region. Farmers are selling their land to developers to supplement their incomes and fund their retirements.

The challenge now is whether we create a landscape that will best serve human needs for a thousand years or only fifty years. What kind of landscape will we create?

Targets for Conservation within the Upper Des Plaines River Watershed

The first objective for the participants of the regional conservation planning session was to assist the Land Trust in identifying conservation targets within the Upper Des Plaines River Watershed. The Land Trust believes conserving these targets will

maintain and enhance the health and the human appreciation of the Watershed. The following six conservation targets were selected:

- 1. Native Ecosystems and Critical Species Habitat** – Few native ecosystems and critical species habitat remain within the 133-square-mile Watershed. The best remaining examples have been catalogued by the Southeastern Wisconsin Regional Planning Commission (SEWRPC). They are described and ranked for ecological importance in Planning Report Number 42: *A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin*. Conservation efforts by the Land Trust will be guided by this SEWRPC report.
- 2. Functional Aquatic Ecosystems** – This target is closely related to Target 1 because many of the streams and tributaries within the Watershed provide critical species habitat. This target also focuses on the flow of water within the Watershed. Returning the Des Plaines River and its tributaries to a naturally functioning river ecosystem -- with meanders, pools, riffles and wetlands -- will decrease flooding, increase water quality, and improve habitat for native flora and fauna. River systems also provide the best opportunity for continuous environmental corridors within the Watershed.
- 3. Natural Hydrology** – Promoting the growth of appropriate native vegetation allows the infiltration of rainwater deep into the soils, which reduces stormwater runoff and enhances groundwater recharge. Reducing runoff can mitigate flood events and reduce streambed scouring and siltation. Groundwater recharge is critical for maintaining water table levels for river base flows and aquifer recharging.
- 4. Viewshed** – The aesthetic beauty of the landscape often influences human connection to an area. Farm fields ripening across the seasons and rolling hills provide a sense of nostalgia for many, while panoramas of wetlands,

marsh and prairie plant life undulating in the wind provide a glimpse of what this region once was. Where present, these landscapes should be seen from the road, not blocked by billboards, buildings and other man-made structures. The value of a viewshed may be difficult to quantify in monetary terms, but it becomes apparent in aesthetic terms and scenic recreation. Travelers through a region appreciate and welcome the simplicity of natural areas, farm fields, and beautiful vistas. This is what makes vacation destinations for many.

- 5. Archeological Sites** – Recent evidence suggests that humans have occupied the Upper Des Plaines River Watershed since the retreat of the last glacier more than 14,000 years ago. This finding has fueled controversy among archeologists as to whether the first human migration to North America came from Asia or Europe, making this region of critical importance for future archeological study. The integrity of existing archeological sites within the Watershed should be preserved for current and future study so that we may better understand the human history of North America and southeastern Wisconsin.
- 6. Recreation and Education Opportunities** – Regional conservation becomes possible when people believe they have something special to protect. The connection between people and place most often develops by experiencing the nature of the surrounding land and water first hand. People love to be part of nature; each year Wisconsin state forests, parks, trails and recreation areas receive millions of visitors. The remaining natural areas within the Upper Des Plaines River Watershed, however, are being lost to urbanization. Providing outdoor recreational and educational opportunities for the citizens and visitors of this area will promote a connection to place and help them realize that there is something of value to protect and restore here.

Strategies to Achieve Conservation Targets

After assessing the current threats to the six conservation targets, participants recognized strategies that would overcome or reduce the threats to the conservation targets. The Land Trust will use these strategies to develop programs that work towards achieving conservation of the target features. The three strategies listed below may be applicable to more than one conservation target.

- 1. Follow the recommendations by the Southeastern Wisconsin Regional Planning Commission for natural areas and critical species habitat protection** — SEWRPC was created in 1960 under Wisconsin Statutes to serve and to assist local, state, and other government agencies concerned with the development of the Southeastern Wisconsin Region. In 1997, SEWRPC completed Planning Report No. 42: *A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin*. This comprehensive report identifies the remaining natural areas and critical species habitat and ranks them by ecological importance. The Kenosha/Racine Land Trust will use SEWRPC recommendations to identify and prioritize the important ecological land areas within the Des Plaines River Watershed. This land can be conserved through vehicles such as USDA programs, conservation easements, and acquisition by the Land Trust or local or county government. The Land Trust will also work to extend, enhance and restore the primary and secondary environmental corridors along the Des Plaines River and its tributaries that have been identified by SEWRPC.
- 2. Participate in comprehensive “Smart Growth” land use planning within the Watershed** — By 2010, Wisconsin legislation requires all communities to base land use decisions on adopted comprehensive plans. SEWRPC has prepared several planning reports that cover areas within the Upper Des Plaines River Watershed and is currently developing a comprehensive plan for

the entire Wisconsin Des Plaines River Watershed. In its current draft of that plan, SEWRPC recommends the restoration of all potential wetlands within delineated floodplains in the watershed (about 3 square miles) and the restoration of about six square miles of prairies for the management of floodland and stormwater, enhancement of water quality, and the creation of habitat. The plan recommends encouraging the use of floodland areas for outdoor recreation and related open space activities. These recommendations, and others within the plan, support the Land Trust's conservation targets within the Upper Des Plaines River Watershed. SEWRPC recommends actions to be taken by government agencies for comprehensive land use planning, but it cannot enforce those recommendations. It is, therefore, up to local governmental units to adopt and carry out SEWRPC recommendations. "Smart Growth" planning legislation requires public hearings throughout the planning process. The Land Trust will participate and provide resources at these public meetings and will promote the adoption and incorporation of the SEWRPC Des Plaines River Watershed plan by local governments and communities during their "Smart Growth" planning.

- 3. Develop Outreach and Education Programs** — To achieve the conservation of our targets, support from individual landowners and communities within the Watershed is paramount. Outreach and education are the primary tools to accomplish this. The Land Trust will develop outreach and education programs that target specific audiences, such as the farming community, landowners, developers, private citizens, and local and county government. Existing materials for these programs will be gathered from agencies such as the United States Department of Agriculture, Fish and Wildlife Service, and Environmental Protection Agency, Wisconsin Department of Natural Resources, and University of Wisconsin Extension. The Land Trust will also develop its own materials. Examples of information that will be assembled and developed for specific audiences are as follows:

- **Farming Community:** Best management practices, purchase of development rights, conservation easements, Conservation Reserve Program, Conservation Reserve Enhancement Program, Wetlands Reserve Program, and conservation of archeological sites.
- **Landowners:** Conservation easements, invasive/weeds species control, use of native vegetation, endangered/threatened species awareness, backyard conservation, rain gardens, reduced herbicide and insecticide use, and conservation of archeological sites.
- **Developers:** Conservation subdivisions, use of native vegetation, conservation easements, conservation of archeological sites, and conservation stormwater management methods, such as swales instead of storm sewers and trails instead of sidewalks.
- **Private Citizens:** The “Smart Growth” planning process, past natural and human history of the area, local natural resources, and problems and costs associated with urban sprawl.
- **Local and County Government:** Model zoning and conservation subdivision ordinances, SEWRPC planning reports, regional trail systems, community conservation projects, restoration methods of existing open space areas.

Outreach to these audiences will be accomplished through a variety of methods such as mailings, personal visits, workshops, and newsletters. Each program will be monitored for effectiveness and revised, as needed.

First Conservation Project within the Watershed

The Kenosha/Racine Land Trust's first project in the Watershed is the acquisition, restoration and preservation of approximately 450 acres of Upper Des Plaines River floodplain in the Village of Pleasant Prairie. This land has been identified by SEWRPC as the Des Plaines River Lowlands, a natural area of significance that should be in protective ownership. Containing xeric oak woods, mesic and wet-mesic prairie, fresh (wet) meadow, and riverine forest, this extensive wetland and upland complex is significant because of its crucial role in reducing flooding downstream as well as creating open space and wildlife habitat communities.

The project land borders a 425-acre parcel of land once owned by WISPARK, which was donated to The Nature Conservancy in 1989, and then to the Village of Pleasant Prairie in 2001. WISPARK sponsored one of the Midwest's earliest wetland mitigation projects on that parcel in the early 1990s. The land contains emergent aquatic, wet prairie, wet-mesic prairie, and dry-mesic forest habitat, and is now part of Prairie Springs Park in the Village of Pleasant Prairie.

The Land Trust's 450-acre project will connect existing public and private conservation areas to create an environmental corridor of approximately 2,000 acres. In wetland areas with fluctuating water levels, this is an optimum size for preserving biodiversity. (Marion Farrior, "The Thousand Acre Difference," *Wisconsin Wetlands* June 2000.)

Rare, threatened or endangered species have been identified in this area, including the great egret (state threatened), red-shouldered hawk (state threatened), Blanding's turtle (state threatened, candidate for federal listing), purple milkweed (state endangered)

and prairie white-fringed orchid (state endangered, federal threatened). In spring and fall this area is a significant stopover site for waterfowl in the central migratory flyway. The Wisconsin Department of Natural Resources has identified a total of 216 bird species that use this landscape for migrating, wintering, foraging, and breeding. The land is highly visible from Interstate 94 and presents the first landscape to greet visitors entering Wisconsin from the south. It has significant economic value as the state's "front door" for the travel/tourism industry. The Land Trust is currently working with the Village of Pleasant Prairie and private landowners to make the conservation of this landscape a reality.

Table 1. Critical plant species known to occur within the Des Plaines River Watershed of Wisconsin

Endangered Species ^a
Purple milkweed (<i>Asclepias purpurascens</i>)
Prairie white-fringed orchid (<i>Platanthera leucophaea</i>) ^b
Threatened Species
Sullivant's milkweed (<i>Asclepias sullivantii</i>)
Prairie Indian plantain (<i>Cacalia tuberosa</i>)
Wild quinine (<i>Parthenium integrifolium</i>)
Special Concern Species
Swamp agrimony (<i>Agrimonia parviflora</i>)
Downy willow-herb (<i>Epilobium strictum</i>)
Marsh blazing-star (<i>Liatris spicata</i>)
Waxy meadow-rue (<i>Thalictrum revolutum</i>)
Red trillium (<i>Trillium recurvatum</i>)

^a State-designated status.

^b Also listed as "threatened in United States and "globally imperiled."

Source: Wisconsin Department of Natural Resources and SEWRPC.

Table 2. Endangered or threatened animal species known to occur in the Des Plaines River Watershed.

Endangered ^a
Fish: None
Amphibians
Blanchard's Cricket Frog (<i>Acris crepitans blanchardi</i>) ^b
Reptiles
Eastern Massasauga Rattlesnake (<i>Sistrurus catenatus</i>)
Birds
Piping Plover (<i>Charadrius melodus</i>) ^c
Common Tern (<i>Sterna hirundo</i>)
Forster's Tern (<i>Sterna forsteri</i>)
Loggerhead Shrike (<i>Lanius ludovicianus</i>) ^c
Yellow-Throated Warbler (<i>Dendroica dominica</i>) ^d
Mammals: None
Threatened ^e
Fish
Redfin Shiner (<i>Notropis umbratilis</i>)
Reptiles
Blanding's Turtle (<i>Emydonidae blandingi</i>)
Birds
Great Egret (<i>Casmerodius albus</i>)
Osprey (<i>Pandion haliaetus</i>) ^d
Bald Eagle (<i>Haliaeetus leucocephalus</i>) ^{d,f,g}
Acadian Flycatcher (<i>Empidonax virescens</i>)
Cerulean Warbler (<i>Dendroica cerulea</i>) ^d
Mammals: None

^a Wisconsin-designated endangered species.

^b May now be extirpated from the watershed.

^c Rare migrant through the watershed.

^d Migrant through the watershed.

^e Wisconsin-designated threatened species.

^f Wisconsin-designated special concern species.

^g Federally-designated special concern species.

Source: Wisconsin Department of Natural Resources, Milwaukee Public Museum, and SEWRPC.

Table 3. Wisconsin animal species of special concern occurring in the Des Plaines River Watershed.

Fish
Lake Chubsucker (<i>Erimyzon sucetta</i>)
Pirate Perch (<i>Aphredoderus sayanus</i>)
Least Darter (<i>Etheostoma microperca</i>)
Amphibians
Bullfrog (<i>Rana catesbeiana</i>)
Reptiles
Butler's Garter Snake (<i>Thamnophis butleri</i>)
Birds
American Bittern (<i>Botaurus lentiginosus</i>)
Least Bittern (<i>Ixobrychus exilis</i>)
Black-Crowned Night Heron (<i>Nycticorax nycticorax</i>)
American Black Duck (<i>Anas rubripes</i>)
Northern Pintail (<i>Anas acuta</i>)
Redhead (<i>Aythya americana</i>)
Lesser Scaup (<i>Aythya affinis</i>)
Common Goldeneye (<i>Bucephala clangula</i>)
Common Merganser (<i>Mergus merganser</i>)
Red-Breasted Merganser (<i>Mergus serrator</i>) ^a
Northern Goshawk (<i>Accipiter gentilis</i>)
Cooper's Hawk (<i>Accipiter cooperii</i>)
Northern Harrier (<i>Circus cyaneus</i>)
Merlin (<i>Falco columbarius</i>)
Common Moorhen (<i>Gallinula chloropus</i>)
Upland Sandpiper (<i>Bartramia longicauda</i>)
Wilson's Phalarope (<i>Phalaropus tricolor</i>)
Black Tern (<i>Chlidonias niger</i>)
Long-Eared Owl (<i>Asio otus</i>)
Short-Eared Owl (<i>Asio flammeus</i>)
Yellow-Bellied Flycatcher (<i>Empidonax flaviventris</i>) ^b
Sedge Wren (<i>Cistothorus platensis</i>)
Ruby-Crowned Kinglet (<i>Regulus calendula</i>) ^a
Swainson's Thrush (<i>Catharus ustulatus</i>) ^a
Tennessee Warbler (<i>Vermivora peregrina</i>) ^a
Blackburnian Warbler (<i>Dendroica fusca</i>) ^a
Prothonotary Warbler (<i>Protonotaria citrea</i>) ^a
Louisiana Waterthrush (<i>Seiurus motacilla</i>)
Dickcissel (<i>Spiza americana</i>)
Lark Sparrow (<i>Chondestes grammacus</i>)
Grasshopper Sparrow (<i>Ammodramus sanannarum</i>)
Henslow's Sparrow (<i>Ammodramus henslowii</i>) ^c
Boblink (<i>Dolichonyx oryzivorus</i>)
Orchard Oriole (<i>Icterus spurius</i>) ^a
Pine Siskin (<i>Carduelis pinus</i>)
Evening Grosbeak (<i>Coccothraustes vespertinus</i>) ^d
Mammals
Franklin's Ground Squirrel (<i>Citellus franklinii</i>)
Prairie Vole (<i>Microtus ochrogaster</i>)

^a Migrant through the watershed.

^b Rare forager in the watershed.

^c Rare breeder in the watershed.

^d Rare winter resident within the watershed.

Source: Wisconsin Department of Natural Resources and SEWRPC.