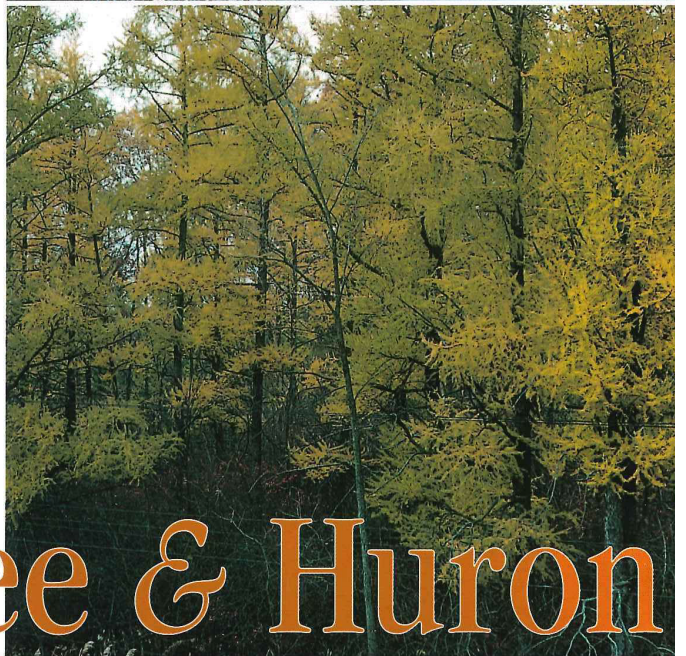


A UNIQUE SETTING WORTH

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# Shiawassee & Huron

*Headwaters Resource Preservation Project*



PREPARED MARCH 2000

## ***ACKNOWLEDGEMENTS***

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Milford Village  
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Springfield Township  
White Lake Township

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U.S. Environmental Protection Agency  
Community Foundation for Southeastern Michigan  
County of Oakland, L. Brooks Patterson, County Executive

## EXECUTIVE SUMMARY

The Shiawassee and Huron Headwaters Resource Preservation Project (S&H Project) involves six communities in western Oakland County, Michigan and covers approximately 180 square miles. The communities involved are Highland, Milford, Rose, Springfield, and White Lake Townships, and the Village of Milford. This area is unique in Oakland County because the topography of uplands and lowlands, along with the headwaters of the Shiawassee and the Huron Rivers, combine to form an area with unique natural landscapes. As development in Oakland County extends farther northward and westward, this natural landscape is becoming increasingly more in demand for residential and recreational uses. Therefore, local officials in the six communities came together in the fall of 1997 to identify and then determine how best to preserve and conserve these sensitive natural areas.

A Steering Committee composed of local officials, developers, property owners, and land conservancy members was the policy group that directed the S&H project. Funding came from a \$75,000 grant from the U.S. Environmental Protection Agency (U.S.EPA), a \$40,000 grant from the Community Foundation for Southeastern Michigan, and \$25,000 plus in-kind staff support from Oakland County.

The Steering Committee contracted with the Michigan Natural Features Inventory (MNFI) to conduct an inventory of the project area to identify potentially significant natural areas. One hundred and fourteen (114) sites were identified. These sites were ranked for ecological significance according to environmental criteria. The Steering Committee further ranked the sites to determine which would be visited and inventoried by MNFI ecologists, botanists, and zoologists. Eight (8) sites received detailed field inventory. Highlights of the Ecological Site Reports prepared by the MNFI are included which identify the ecological significance of each site, detail the types of natural communities, animals, and plants found within the sites, outline threats to those communities, and suggest stewardship actions to maintain the integrity of each site. The field studies revealed that some pristine, pre-settlement natural communities still exist within the study area. Ecologically significant unique and rare wetlands called prairie fens were found at the Long Lake and I-75 Woods sites in Springfield Township and Buckhorn Lake Complex in Rose Township.

A Natural Areas Opportunities Plan was prepared to identify opportunities to establish an open space system of linked natural areas throughout the six-community project area. The Plan has three key elements: the 114 sites identified by the MNFI, the river and stream corridors, and the remaining landscape fabric. By analyzing these three elements, the plan suggests locations where implementation strategies can begin to maintain, improve, or restore water quality and natural habitat. The Opportunities Plan provides a framework for the next step of local conservation planning.

A nationwide literature search was conducted to identify potential planning tools and techniques for natural resource protection. From that search, thirty-two relevant tools are presented that can be used by local governments, developers, and other private parties. In addition, model policies and guidelines are developed for innovative techniques, such as Resource Protection Overlay District Standards, Private Road Ordinance, Stormwater Management/Impervious Surface Mitigation Standards, and Transfer and Purchase of Development Rights.

The report concludes with Recommendations, Action Checklists, and Lessons Learned. Recommendations are both project-wide and site specific. General recommendations have been prepared that identify next steps for principal participants responsible for implementation. There is a strong emphasis in the recommendations on public information and education, focusing on local officials, developers and property owners who have a vested interest in preservation. Specific recommendations refer to three application areas that embody typical resource conditions found throughout the study area. Within these three specific areas, the Opportunities Plan, tools and techniques, model policies and ordinance language, and the MNFI findings are further illustrated to aid the developers, property owners, land conservancies, and local officials who will use the results of this two and a half-year study.

# CONTENTS

|   |     |     |
|---|-----|-----|
| <b>Acknowledgements</b> .....   | i   |     |
| <b>Executive Summary</b> .....  | ii  |     |
| <b>Contents</b> .....   | iv  |     |
| <b>Chapter I – Introduction</b>   |     |     |
| Project Overview, Purpose, Goals and Principles.....                          | 1   |     |
| Why take an Ecosystem Approach? .....   | 5   |     |
| Organization of this Report.....  | 6   |     |
| Project Goals Reference Sheet....   | 9   |     |
| <b>Chapter II - River Basin Descriptions</b>                                  |     |     |
| Natural Resource Context ...  | 11  |     |
| Huron River Watershed .....   | 15  |     |
| Shiawassee River Watershed .....  | 18  |     |
| Clinton River Watershed ....  | 21  |     |
| Summary of Typical Land Form Cross Section .....                              | 23  |     |
| <b>Chapter III – Delineation and Ranking of Natural Areas</b>                 |     |     |
| Analysis of MNFI Sites .....  | 27  |     |
| Analysis of MNFI Sites by Community ...                                       | 29  |     |
| Field Inventory .....   | 33  |     |
| Permission Required.....  | 33  |     |
| Site Summaries.....   | 35  |     |
| <b>Chapter IV - Opportunities Plan</b>  |     |     |
| Natural Areas Opportunities Plan.....   | 61  |     |
| Local Conservation Planning & Management.....                                 | 75  |     |
| Conservation Approaches.....  | 77  |     |
| <b>Chapter V - Tools and Techniques</b>                                       |     |     |
| Introduction.....   | 79  |     |
| Planning Support.....   | 80  |     |
| Regulatory Measures and Site Design Techniques.....                           | 84  |     |
| Open Space Acquisition and Preservation.....                                  | 99  |     |
| Summary.....  | 107 |     |
| <b>Chapter VI – Model Policies and Ordinances</b>                             |     |     |
| Introduction.....   | 109 |     |
| Planning Support.....   | 110 |     |
| Regulatory Measures and Site Design Techniques.....                           | 120 |     |
| Open Space Acquisition and Preservation.....                                  | 168 |     |
| <b>Chapter VII – Recommendations, Applications, and Lessons Learned</b> ..... |     | 179 |
| Recommendations and Action Checklist.....                                     | 179 |     |
| Project Recommendations .....   | 179 |     |
| Application Areas .....   | 186 |     |
| Project Area Policies.....  | 188 |     |
| Application Area ‘A’ .....  | 188 |     |
| Application Area ‘B’ .....  | 199 |     |





# Chapter I Introduction

*Project Overview, Purpose, Goals, and Principles* .....1

*Why take an Ecosystem Approach?* .....5

*Organization of this Report* .....6

*Project Goals Reference Sheet* .....9





## **Chapter I. INTRODUCTION**

### **Project Overview, Purpose, Goals, and Principles**

#### **Project Overview**

The Shiawassee and Huron Headwaters Resource Preservation Project (S&H Project) involves six communities in northern and western Oakland County, Michigan. The communities are Highland, Milford, Rose, Springfield, and White Lake Townships, and the Village of Milford. The map on the next page shows the extent of the study area, which covers approximately 180 square miles. This area is unique in Oakland County. Rolling topography is concentrated in the western and northern portion of the county. The headwaters of two rivers, the Shiawassee and the Huron are within the project area and the headwaters of a third river, the Clinton, also is located within a small portion of the project area. This topography of uplands and lowlands, along with the headwaters, combine to form a natural landscape that is abundant with unique marshes, fens, streams, prairie lands, and forested tracts. These fragile land and water areas serve as irreplaceable natural environments for a wealth of plants and animals. As development in Oakland County extends farther northward and westward, the natural landscape is becoming increasingly more in demand for residential and recreational uses. Therefore, local officials in the six communities came together in the fall of 1997 to determine how best to preserve and conserve these sensitive natural areas.

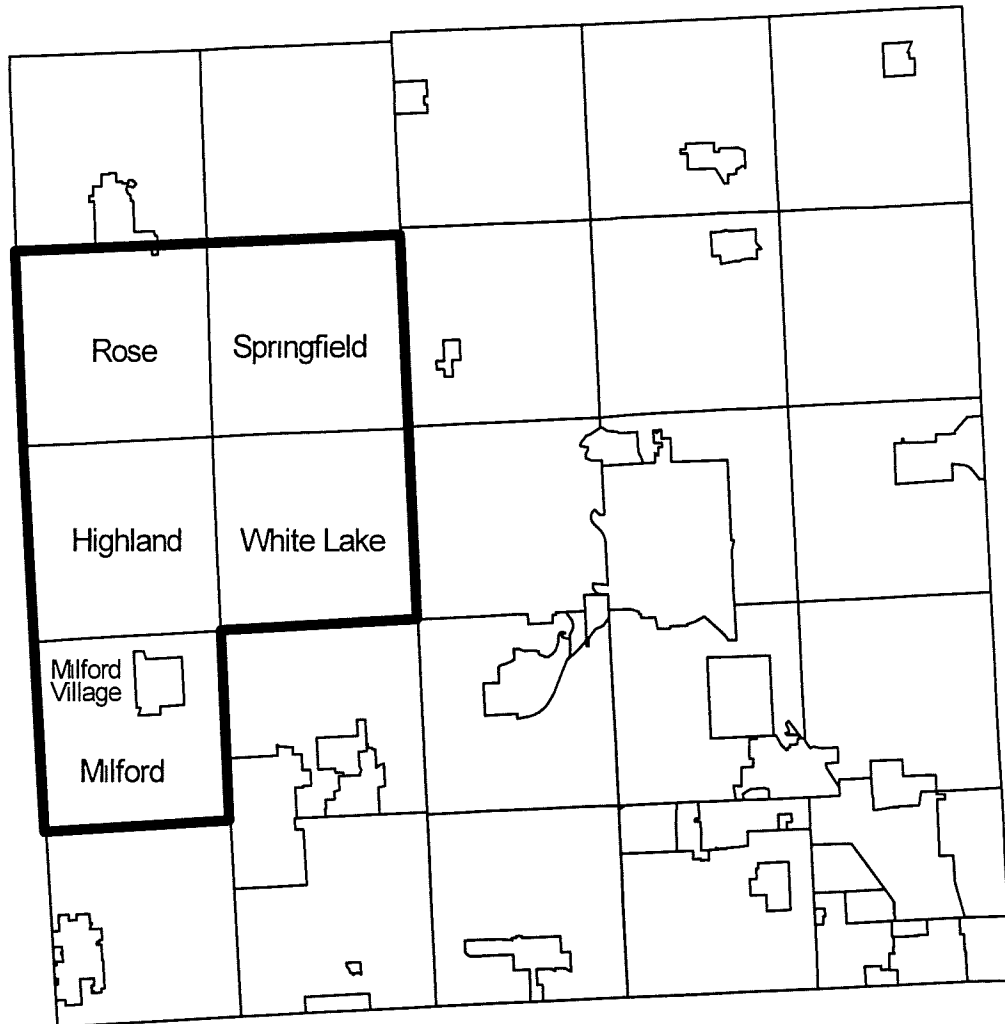
A Steering Committee composed of local officials, developers, property owners, and land conservancy members was the policy group that directed the S&H Project. Meetings were held monthly and were open to the public. Funding for the project came from a \$75,000 grant from the U.S. Environmental Protection Agency (U.S.EPA), a \$40,000 grant from the Community Foundation for Southeastern Michigan, and \$25,000 plus in-kind staff support from Oakland County. The Oakland County Planning & Economic Development Services Division, Carlisle Wortman & Associates, the Land Information Access Association (LIAA), and the Michigan Natural Features Inventory (MNFI) worked with the communities on the study. This report contains the significant findings of the two and a half-year project.

#### **Purpose**

Quite simply, the Shiawassee and Huron Headwaters Resource Preservation Project was initiated with a threefold purpose:

- To comprehensively identify and prioritize natural resources and ecosystems;
- To provide mechanisms to protect and sustain the critical resources;
- To provide public information and education regarding the natural resource ecosystems within the study area.

The Shiawassee and Huron headwaters is a diverse area with a variety of economic, social, physical, and natural characteristics. Due to the abundance of natural resources, the study area has attracted significant residential development over the past twenty-five years. The proximity to major transportation routes such as I-75, I-96, M-59, and Dixie Highway has placed the headwaters area within easy commuting distance of major employment centers. The increased base of population has given rise to an increase of residential, commercial, office, industrial, and other forms of development. The result has been that many of the natural features and resources that had initially attracted people to the area have been significantly degraded. It is clear that past land use planning approaches have been largely unsuccessful at adequately protecting these important natural characteristics of the headwaters area.



Oakland County Michigan

## Location Map

### LEGEND

 Community Boundary

 Study Area

Shiawassee & Huron  
Headwaters Resource Preservation Project



Communities have for years been involved in the protection of public health, safety, and welfare by regulating various aspects of economic activity and by providing residents with needed services such as utilities, schools, and roads. Increasingly, communities are recognizing that natural resource preservation is not only crucial to economic health, but that the natural systems often found within open space areas can provide vital natural functions to a community's overall health. Protected natural resource areas can serve many functions, including increasing property values in adjacent neighborhoods, providing scenic vistas and viewsheds for residents and tourists, serving various natural functions such as wildlife habitat and water filtration, and providing recreation opportunities

Throughout the course of the headwaters project, strong emphasis has been placed on public information and education, focusing on developers and property owners who have a vested interest in preservation. This report is a discussion of the specific tools and techniques available not only to local governments, but to developers and other private parties for natural resource protection. It will provide the basis for developing appropriate strategies for the Shiawassee and Huron Headwaters Resource Preservation Project.

### **Project Goals**

In the initial stages of the project, the Steering Committee identified the following goals for the project, based on critical issues they identified within the headwaters study area:

1. Identify and conserve critical natural resources, ecosystems, and habitat environments in the Shiawassee and Huron Headwaters Resource Preservation Project Area.
  - A. Inventory high ranked or priority sites to identify significant flora, fauna, and ecosystems.
  - B. Create a model and demonstration of how to comprehensively identify, prioritize, and rank existing natural features, critical ecosystems, and areas of resource/habitat restoration
  - C. Prepare a comprehensive conservation plan that provides for the identification, protection, and sustainability of critical natural resource sites, systems, and habitats.
2. Identify and develop implementation tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development.
  - A. Investigate current land use policies, master plans, and zoning ordinances.
  - B. Identify methods of acquiring and conserving natural resources, including land conservancies, easements, and homeowner associations.
  - C. Identify new and existing successful tools and techniques, and share this information with participating communities.
  - D. Develop model ordinance language.
  - E. Explore the advantages of resource preservation for the benefit of property owners, developers, and the communities

- F. Provide models and case studies for more effective land use that optimize resource preservation
3. Provide the findings of the study to community officials, property owners, developers, and conservancies so that they are encouraged to work together to preserve and protect areas with significant resources.
- A. Create an ongoing public information program that communicates land-based data and the findings of the study to citizens, local decision makers, developers, and others.
  - B. Create an easily accessible document/product that will aid land use decision-making and encourage the preservation of natural resources in participating local units of government.
  - C. Create methods to encourage the on-going use of the land based information by public officials, staff, planning commissioners, developers, educators, and citizens.
  - D. Update the existing community information systems in Highland and Milford Townships and the Village of Milford with the information created during this project
  - E. Enhance relationships between communities, property owners, and developers so a public-private partnership can be strengthened.

On page nine (9) is a reference guide that identifies where these goals are addressed in the report.

### **Project Principles**

While preservation and management of the S&H Project area involves complex relationships which include economic, social, physical, and natural factors, there are a number of guiding principles that provide a focus to preservation efforts.

Key Principles include:

- 1. Encourage the implementation of strategies to maintain, improve, or restore water quality and natural habitat.**
- 2. Encourage the creation of an open space system that minimizes fragmentation of habitat and provides for a continuous system of linked natural areas and open spaces.**
- 3. Encourage and implement regulations to enable innovative development to take place in areas that are environmentally suitable.**
- 4. Recognize economic interests so that the need for growth is balanced against the benefits of preservation.**
- 5. Recognize land owners' rights to reasonable use of their property.**

The S&H Project was approached with the philosophy that the whole ecosystem needs to be considered. The key principles recognize the integrated nature of ecosystems.

## **Why take an Ecosystem Approach?**

In the early years of conservation, fragile and unique lands were acquired and set aside as preserves by private individuals, organizations, and governments to protect these sites from direct habitat destruction. Once acquired, these preserves were typically “fenced off” and left to the forces of nature. Despite strong efforts to protect fragile natural areas, the character of many of these lands changed over time. Plant diversity diminished, rare birds stopped nesting in the area, diverse prairies became brushland, wetlands became choked with monocultures of invasive weeds, the rich groundlayer of oak forests became barren, and in our rivers and streams large beds of mussels became covered with sediment and disappeared.

Organizations such as nature and land conservancies and natural resource and land planning agencies soon realized that successful conservation required more than simply putting a “fence” around a small preserve and walking away. Plants, animals, and insects interact with each other in complex ways to form a diverse web of life. They are also affected by weather patterns, soil, topography, and the hydrology found around them. In addition, human activities such as fire suppression, road construction, chemical applications, and residential development can have a profound impact on populations of plants, animals, and insects and the natural communities in which they live.

Taking all of these factors into consideration, many conservation organizations and land planning agencies now take a more holistic approach to conservation by looking beyond the borders of our most fragile natural areas. What happens on the adjacent farmland, in the nearby town, or upstream is just as important as what happens within a preserve. A holistic or ecosystem-based approach to conservation tries to consider the integrity or health of the ecosystem, rather than focus on a single species or stand of trees. Ecosystem integrity is the degree to which all ecosystem elements, including native plants, animals, insects, natural communities, and processes are intact and functioning in ways that ensure long-term viability and adaptation to changing environmental conditions.

Many factors need to be considered to develop a more holistic approach to conservation. Important factors include: 1) key components of natural systems (water quality, plant diversity, size of area, landscape patterns, and population size); 2) key ecological processes (fire, wind throw, flooding, dispersal, and pollination); and 3) major threats (habitat destruction, fragmentation, pollutants, sedimentation, nest predation, and invasive exotic species).

One method ecologists use to help determine some of these factors is to look back in time. According to the original land surveys conducted in the mid 1800s, the majority of Oakland County was dominated by a mosaic of fire dependent natural communities such as oak barrens, savanna, and mixed oak and oak-hickory forests. Interspersed throughout these upland communities were a broad variety of wetlands including conifer swamps, marshes, southern shrub-carrs, wet meadow, and prairie fen, many of which were found along streams and rivers.

As European settlers moved into the area, many of the open grassland communities, such as barrens, prairies, and wet meadows were converted to farmland, primarily because there were few or no trees to clear. Over time, cities were established and roads and railroads were built to facilitate trade. In recent years, many of the farmlands in Oakland County have been converted to

residential housing and subdivisions. According to 1998 projections by the Southeast Michigan Council of Governments, Oakland County's population is expected to grow 21.9% over the next 25 years. Today, much of the original landscape has disappeared, and what natural vegetation remains occurs in small isolated patches. Instead of islands of human settlement surrounded by wilderness, we have islands of natural areas surrounded by human development: roads, residential houses, farmsteads, row crops, old fields, parking lots, utility corridors, and businesses. In addition, any remnants of the original grasslands or open woodlands quickly converted to old field, pasture, brushland, and closed canopy forest due to fire suppression policies. Therefore, in order to preserve the integrity of the remaining natural areas, it is important to consider not only what is within the natural area but what is beyond as well.

## **Organization of this Report**

The report consists of the following chapters.

### **II. River Basin Descriptions**

While the Shiawassee and Huron headwaters area operates as a system, the watersheds of the Shiawassee River and the Huron River, as well as a small part of the Clinton River watershed, are distinct units with their own unique characteristics. The watershed summaries provide a description of natural and physical features in each watershed. Typical landform units are also described, showing the distinct natural elements that are common to the river systems. The purpose of the watershed summaries is to achieve the goals identified by the Steering Committee, namely, to identify critical natural resources in the project area and identify and develop implementation tools and techniques that will conserve these areas.

### **III. Delineation and Ranking of Natural Areas**

The Michigan Natural Features Inventory (MNFI) staff was hired to identify potentially significant natural areas within the six-community study area. This chapter explains the criteria used by the MNFI to delineate and rank these areas or sites. One hundred and fourteen (114) sites were identified throughout the study area. Maps showing the location of the sites and charts indicating the ranking of the sites are included in this chapter.

Of the 114 sites identified, eight were chosen for detailed field inventory. This chapter also describes the process used to choose the eight sites and concludes with a summary of the findings of the field studies. The summaries identify the ecological significance of the sites and list threats and stewardship considerations. The MNFI sites are an important element in the Natural Areas Opportunities Plan, which is explained in *Chapter IV*, and are part of the Applications illustrated in *Chapter VII*.

### **IV. Opportunities Plan**

The Natural Areas Opportunities Plan identifies opportunities to establish an open space system of linked natural areas throughout the six-community study area. This system incorporates the MNFI identified and ranked natural areas and ecosystems and includes both lowland and upland areas. Special consideration is given to river and stream corridors and watershed management. The plan integrates a full range of open space conditions from pristine pre-settlement landscapes to more intensely developed and fragmented landscapes with some element(s) of the natural landscape still remaining. The plan suggests locations where implementation strategies to maintain, improve, or restore water quality and natural habitat can begin.

## V. Tools and Techniques

One of the goals of the S&H Project is to "identify and develop implementation tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development." *Chapter V* and *Chapter VI* address this goal.

Tools and Techniques were selected for their potential application to the study area. They are organized into four parts:

- 1) **Planning Support** - Efforts at preservation must be supported by the full range of community plans. This section describes the various types of plans that can be prepared and adopted locally and how they can be modified to support the S&H Project's Goals and Principles.
- 2) **Regulatory Measures and Site Design Techniques** - Options to foster open space protection through planning regulations, ordinances, and site design and development options are described in this section. While the emphasis on this study has not been on regulatory control, there are various tools that communities can adopt as part of their ordinances or codes to support the S&H Project goals. Additionally, promoting creative and enlightened site design will strongly support preservation efforts.
- 3) **Open Space Acquisition and Protection** - Methods of open space acquisition, protection, and incentives are a significant focus of the project. This section identifies the broad range of techniques available.
- 4) **Summary** - This section discusses tools and techniques that are most appropriate for conserving the unique natural resources found in the landform cross section.

## VI. Model Policies and Ordinances

This chapter provides model language for some of the tools and techniques found in *Chapter V*. Resource Protection Overlay District Standards, Private Road Ordinance, and Transfer of Development Rights are some of the policies and ordinances in this chapter. The model language provided is meant to be a starting point for communities. It is intended that each community will modify the language to reflect its own goals and procedures.

## VII. Recommendations, Applications, and Lessons Learned

This chapter is divided into three sections. The first section addresses general recommendations for the entire project area. Principal participants and an action checklist are identified for each recommendation. The second section is devoted to three application areas, which provide examples of how the general recommendations are met at the site-specific level. All six participating communities are included in at least one application area and cover the following areas:

### **Area A (Rattalee Lake/Long Lake/I-75 Woods Complex)**

**Municipalities:** Rose and Springfield Townships

**Characteristics:** Combined public and private ownership, large areas of very high resource intactness with some surrounding fragmentation, extensive upland/wetland complex, continuous major riparian corridor, and highly ranked MNFI sites.

**Area B (Haven Hill East and West/Mud Lake/Pettibone Lake/Waterbury Lake Complex)**

**Municipalities:** Highland and White Lake Townships

**Characteristics:** Majority of land in public ownership, large areas of high resource intactness with surrounding fragmentation, upland/wetland complex, highly ranked MNFI sites, and potential future sewer expansion outside the study area to the east.

**Area C (Rowe Lake/Sherwood Creek Complex)**

**Municipalities:** Highland and Milford Townships and Milford Village

**Characteristics:** Private ownership, resource fragmentation but with potential for restoration, riparian corridor, upland/wetland complex, and lower ranked MNFI sites.

The chapter concludes with a section on the major lessons learned over this two and a half-year planning project.

**Glossary and Bibliography/References**

Definitions of natural resource terms used throughout the Shiawassee and Huron Headwaters Resource Preservation Project are provided in the glossary. A list of information sources that were used in the research of this project and other related reference material are provided in the bibliography.

**Appendix**

*Michigan Natural Features Inventory Site Ranking by Community* – A complete listing of all sites identified and ranked by the MNFI and grouped by community, with maps.

*Michigan Natural Features Inventory Site Ecological Reports* – The full ecological reports by the MNFI based on surveys or incidental observations in 1998 and 1999.

*Rattalee Lake Fens Site Ecological Summary* – Ecological site summary of Rattalee Lake Fens in Rose Township prepared by the Michigan Natural Features Inventory in 1987 and an overview of the Rattalee Lake Fens prepared by the Oakland Land Conservancy in 1996.

*Huron River System Study Results* – Results of a study by the Huron River Watershed Council on the quality of the Huron River Headwaters.

*Identifying Our Natural Heritage* - Summary report of the MNFI 1987 Natural Areas Inventory of Oakland County.

*Literature Search Report 5.0* –The results of a nationwide literature search on the various tools and techniques available not only to local governments, but to developers and other private parties for open space protection

*Literature Search Report 5.1*- A summary of the tools found in each community participating in the S&H Project.



## Project Goals Reference Sheet

| Project Goals  | Location in Report  |
|--|---|
| <b>1. Identify and conserve critical natural resources, ecosystems, and habitat environments in the Shiawassee &amp; Huron Headwaters Project Area.</b>  |   |
| A. Inventory high ranked or priority sites to identify significant flora, fauna, and ecosystems.   | Chapter III, Appendix   |
| B. Create a model and demonstration of how to comprehensively identify, prioritize and rank existing natural features, critical ecosystems and areas of resource/habitat restoration.                                | Chapters III and IV, Appendix   |
| C. Prepare a comprehensive conservation plan that provides for the identification, protection and sustainability of critical natural resource sites, systems, and habitats.  | Chapters IV, V, VI, and VII   |
| <b>2. Identify and develop implementation tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development.</b>                                |   |
| A. Investigate current land use policies, master plans, and zoning ordinances.   | Appendix (Literature Search 5.0)  |
| B. Identify methods of acquiring and conserving natural resources, including land conservancies, easements, and homeowner associations   | Chapters V, VI and VII  |
| C. Identify existing successful tools and techniques and share this information with participating communities.  | Chapter V, Appendix   |
| D. Develop model ordinance language.   | Chapter VI  |
| E. Explore the advantages of resource preservation for the benefit of property owners, developers, and the communities.  | Chapter VI<br>Chapter VII   |
| F. Provide models and case studies for more effective land use that optimize resource preservation.  |   |
| <b>3. Provide the findings of the study to community officials, property owners, developers, and conservancies so they are encouraged to work together to preserve and protect areas with significant resources.</b> |   |
| A. Create an ongoing public information program that communicates land-based data and the findings of the study to citizens, local decision makers, developers, and others.  | Chapter VII<br>Project Poster and CD  |
| B. Create an easily accessible document/product that will aid land use decision-making and encourage the preservation of natural resources in participating local units of government.                               | Project Slide Show<br>Full Report, Project Poster, MNFI<br>Site Inventory Boards, CD      |
| C. Create methods to encourage the on-going use of the land based information by public officials, staff, planning commissioners, developers, educators, and citizens.   | Chapter VII, Project Poster, CD<br>Project Workshops                                      |
| D. Update the existing community information systems in Highland and Milford Townships and the Village of Milford with the information created during this project.  | To be completed   |
| E. Enhance relationships between communities, property owners, and developers so a public-private partnership can be strengthened.   | Project Workshops, Follow up<br>news articles and interviews with<br>project participants |

