NEMIA

NORTHEAST MICHIGAN INTEGRATED ASSESSMENT

Final Report

Sea Grant Michigan

MICHU-09-207

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The following Michigan Sea Grant staff members deserve recognition for their contributions to this integrated assessment: Brandon Schroeder coordinated stakeholder engagement; Jen Read managed the technical assessments; Keely Dinse led the peer review process and compiled the final document; and Todd Marsee designed the cover and chapter title pages.

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EXECUTIVE SUMMARY

The Northeast Michigan Integrated Assessment (NEMIA) was conducted for the three-county region of Presque Isle, Alpena, and Alcona Counties in Northeast Michigan. The goal of this integrated assessment was to address the following question, as selected by NEMIA stakeholders:

> How can coastal access be designed, in a regional context for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

To address this question, assessment teams were assembled to conduct value-independent descriptions of the status and trends of environmental, social, and economic conditions related to the question, as well as consider the causes and consequences of those conditions. This report documents the work of the assessment teams, as well as an introductory chapter outlining the project process, and a concluding chapter that provides guidance for implementing the actions identified through the process.

The introductory chapter (Chapter 1) provides a history of the project, detailed background on the method and process, the Northeast Michigan region, the stakeholder meetings, and the policy context surrounding the topic of this assessment. The socioeconomic assessment (Chapter 2) uses demographic, economic, recreation, and travel data to create Geographic Information System (GIS) layers, a traffic flow model, and a tourism economic input model that estimates total visitor spending in the area and associated economic effects. The ecological inventory (Chapter 3) compiled existing digital spatial data layers and developed maps to highlight the ecologically valuable features throughout the region. The goal was to illustrate the ecological features that policy makers should focus on protecting and promoting for their ecological value as well as their value in developing regional ecotourism.

Similarly the cultural assessment team used data from existing documents, databases, and initiatives to inventory, describe, and chart (e.g. underwater shipwrecks) coastal cultural assets of the region, both on coastal lands and in Lake Huron waters (Chapter 4). Assets are organized by county (Alcona, Alpena, and Presque Isle) and by themes (lighthouses, shipwrecks, etc.). The goal of this assessment was to organize existing data into formats that can be used to support and inform coastal access-related actions.

The planning and zoning assessment team conducted content analyses of local comprehensive plans and zoning ordinances, interviewed local elected officials and decision-makers to examine the extent to which local governments appear to be taking steps to advance sustainability goals through their current planning and development management efforts. They also analyzed potential build-out scenarios illustrating the various land development patterns the region might experience in the foreseeable future based on current zoning.

The findings from the planning and zoning assessment (Chapter 5) set the stage for the analysis and recommendations made by the Sustainable Design Assessment Team (SDAT) report (Chapter 6). Northeast Michigan was chosen by the American Institute of Architects to receive a Sustainability Design Assessment Team grant. The program included an intensive 3-day site visit

by a multidisciplinary team of professionals with experience in sustainability principles. This chapter emphasizes the need to think regionally about Northeast Michigan's future. The team provided input on five issues relevant to the future of northeast Michigan: sustainable vision, economic prosperity, sense of place, environmental resources, and land use.

The final chapter is Policy Actions and Implementation Guidance (Chapter 7), which concludes the integrated assessment by providing approaches and activities for implementing preferred policy options as selected by the NEMIA stakeholders

The Ecological and Planning and Zoning Assessments and Implementation Guidance were peer-reviewed by at least two experts with extensive experience and knowledge about the subject matter. The Sociological Assessment was reviewed by one expert. The authors took the reviewers' comments into consideration when preparing their final reports. Peer review comments and authors' responses are available upon request.

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

Erica Powell, School of Natural Resources and Environment, University of Michigan

1.1 WHAT IS AN INTEGRATED ASSESSMENT?

An integrated assessment (IA) brings together policy makers, scientists, and key stakeholders to address a common issue of concern through collaboration and a formal analysis process. An IA is an approach to synthesizing and delivering relevant, independent scientific input to decision making through a comprehensive analysis of existing natural and social scientific information in the context of a policy or management question (Michigan Sea Grant [MSG], 2005a). The goal of an IA is to link existing natural and social scientific knowledge about a problem with policy options in order to help decision makers evaluate possible actions.

Integrated assessment is formally defined as an interdisciplinary process of combining, interpreting and communicating knowledge from diverse scientific disciplines, in such a way that the whole set of cause-effect interactions of a problem can be evaluated from a synoptic perspective with two characteristics: (1) it should have added value compared to single disciplinary assessment; and (2) it should provide useful information to decision makers (Rotmans & Dowlatabadi, 1997).

Integrated assessments are useful for ensuring that both economic and environmental interests are represented in management decisions by including representatives of both the natural and social sciences. Additionally, by not recommending one specific option, policy makers can select the best option of many. Independent peer review of scientific information also adds credibility to the process. This process has been used to evaluate long-term and complex issues such as global climate change and hypoxia.

1.2 INTEGRATED ASSESSMENT EXAMPLES

The U.S. National Assessment of the Potential Consequences of Climate Variability and Change, conducted from 1997 to 2000, was based on IA methodology. The goal of the assessment was to analyze and evaluate what was known about the potential consequences of climate variability and change for the United States in the context of other pressures on the public, the environment, and the nation's resources. The assessment was mandated by the *Global Change Research Act of 1990* (P.L. 101-606) and was directed by the Committee on Environment and Natural Resources (CENR) in the National Science and Technology Council (NSTC) of the US Federal government. The process involved a broad spectrum of stakeholders from state, local, tribal, and Federal governments, business, labor, academia, non-profit organizations, and the general public. Analysis of climate variability and change was based on existing scientific literature. These analyses were linked to coping strategies to be implemented by planners, managers, and other decision makers at the local, state, and federal levels. The assessment process was founded on the principles of scientific excellence and openness and was designed to be comprehensive, integrative, and iterative. It culminated in a report delivered to the President and Congress,

documenting climate issues of regional and national importance and climate change implications for the nation over the next 25 and 100 years (National Assessment Synthesis Team, 2001).

Similarly, an integrated assessment process was used to evaluate the causes and consequences of the dead zone in the Northern Gulf of Mexico in accordance with the *Harmful Algal Bloom and Hypoxia Research and Control Act of 1998* (P.L. 105-383). This IA was also directed by the CENR and was conducted from 1998 through 2000. The assessment was led by the National Oceanic and Atmospheric Administration (NOAA) and included teams of academic, federal, and state scientists, engineers, and economists that analyzed existing data and documented the state of knowledge of the causes and effects of hypoxia in the Gulf of Mexico. Six interrelated, peer-reviewed reports were produced that examine various natural and social scientific aspects of the hypoxia issue (Committee on Environment and Natural Resources, 2000). The IA drew from the results in these reports and provided the basis for the development of an action plan that identifies management strategies for reducing, mitigating, and controlling the hypoxic zone (Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, 2001). The final *Integrated Assessment of Hypoxia in the Northern Gulf of Mexico* was released in 2000 and the *Action Plan* was released in 2001.

1.3 NORTHEAST MICHIGAN INTEGRATED ASSESSMENT

Michigan Sea Grant (MSG), part of the NOAA-National Sea Grant network of 30 university-based programs, uses the IA process to fulfill its mission to enhance sustainable use of the Great Lakes and Michigan's coastal resources. Michigan Sea Grant initiated a pilot IA project in 2005 that began MSG's new research program focusing on improving environmental decision-making through IA.

The assessment process used by MSG follows a series of five steps. After working with stakeholders to identify a policy or management question to be addressed by the IA, a value-independent description of the status and trends of environmental, social, and economic conditions related to the question is documented. Second, the causes and consequences of the environmental, social, and economic conditions are described using model simulations, statistical analyses, or other tools. Next, after a stakeholder process identifies desired future states, forecasts of conditions under various policy options are provided to identify potential scenarios that achieve those future states. Fourth, guidance for implementing each option is given, often through cost-effectiveness or cost-benefit analysis. Finally, an assessment of the level of certainty associated with the information produced is provided (MSG, 2005a).

The first IA led by MSG was conducted for the three-county region of Presque Isle, Alpena, and Alcona Counties in Northeast Michigan. The local focus and comparatively small scale of the Northeast Michigan Integrated Assessment (NEMIA) make this process unique compared to previous IAs that address environmental issues at the global or national scale.

This coastal area in Northeast Michigan along Lake Huron includes rich natural and cultural resources. Historically, the region has depended on its natural resources and accessibility to the Great Lakes for economic development, including lumbering in the nineteenth century and mining, manufacturing, and some agriculture in the twentieth century. However, lost jobs in

mining and manufacturing, an Air Force base closure, and a decline in the agricultural sector have resulted in high unemployment in the area over the past few decades. According to the 2000 census, population increases in the region over the past ten years have been modest as the number of residents ages 45-54 increased while the number of residents ages 20-34 decreased (Northeast Michigan Council of Governments, 2007).

As a result of these changes in the region, community leaders have turned to tourism to boost the economy by promoting the natural and cultural resources unique to the area, especially those associated with the coast. Tourists who visit the rugged beauty of the Lake Huron coastline may enjoy the inland forests and wetland habitats, shoreline ecosystems, and the numerous lighthouses and shipwrecks that dot the coast. In fact, the Thunder Bay National Marine Sanctuary, the only such sanctuary in the Great Lakes, is located just off the coast of Alpena, in the center of the study area. Additionally, there are several state-owned public lands in the area which have remained undeveloped. The coast provides natural resources-related recreation such as fishing, birding, boating, swimming, camping, hiking, and kayaking.

Despite the great potential for economic development, the communities located here wish to proceed cautiously to avoid overdevelopment and destruction of the area's unique resources. There are also several barriers to growth in the region which are addressed in the IA. First, access to the region is limited to the US-23 corridor, a highway that originates in southeast Michigan and runs north-south along Lake Huron in the study area. Improving access to the region is necessary for continued tourism development. Secondly, tourism has traditionally focused on hunting and fishing but health issues in the deer herd and salmon fishery have depleted this base. More diverse, low impact uses of the area such as birding, kayaking, and maritime heritage interests could be developed. Third, tourism opportunities have traditionally been marketed independently without regional planning, coordination, or integration. Finally, the resources of the region represent not only a growth opportunity but also a quality of life for local citizens (Northeast Michigan Integrated Assessment [NEMIA], 2005). Again, a balance must be found between these two interests.

Therefore, the key policy question in this IA is:

> How can coastal access be designed, in a regional context for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

1.4 NEMIA PROCESS

1.4.1 Background

The NEMIA project was initiated in the summer of 2005 when MSG met with various local and state-wide partners to discuss the possibility of conducting an IA in Northeast Michigan. These initial discussions included representatives from Michigan State University Extension (MSUE), the Northeast Michigan Council of Governments (NEMCOG), Thunder Bay National Marine Sanctuary (Marine Sanctuary), and the Michigan Department of Natural Resources (MDNR). Representatives discussed what the central theme and focus of the IA might include, who should

be involved in the process, where funding could be obtained, and the most appropriate scale at which to address the suggested themes.

The overarching goal of MSG's IA program is to improve environmental decision-making. Additionally, as identified in the MSG 2005-2010 strategic plan, one of the statewide areas of work is sustainable coastal communities, focusing on addressing such issues as economic sustainability for coastal businesses, recreational access to the waterfront, coastal infrastructure safety and security, land use impacts on coastal systems, and preserving the historic and traditional uses of waterfronts (MSG, 2005b). This goal, in addition to the contribution of the Northeast Michigan coast to historical natural resource extraction, current cultural and natural resource-related tourism, and local quality of life, implied that an appropriate theme for the NEMIA would be a focus on coastal access and specifically, sustainable use of this resource to enhance local communities and economies.

Additionally, access to state-owned properties in the area, including Thompson's Harbor State Park, Rockport State Park, and Negwegon State Park has been debated over the years by state natural resource management agencies and local community leaders. The responsibility of the MDNR is to protect natural resources such as threatened species and rare habitats within the parks. Community leaders on the other hand, consider access to the parks integral to generating tourism and economic growth in the region. However, decisions by the management agencies have prevented park development to ensure resource protection. The debate over use of the parks resulted in mistrust between the MDNR and local community leaders.

However, as a result of the NEMIA process, the MDNR Parks and Recreation Department began a process for developing management plans for all three of these properties. Considering the history and importance of the park access issue, the timing of the MDNR process was important for the NEMIA discussions. Similarly, the Marine Sanctuary's 5-year Management Plan Review, which focused on maritime heritage assets within the sanctuary boundaries, was also occurring parallel to the NEMIA process. The potential for shared resources between all three of these processes was an important consideration.

Furthermore, although a variety of initiatives targeting coastal access had been developed in the past, efforts were not coordinated amongst participating regional organizations. Therefore, a key purpose of the NEMIA was to synthesize and build upon existing coastal access initiatives for the long-term. Existing research and initiatives in Northeast Michigan include the following:

- US-23 Heritage Route Initiative
- Thunder Bay Maritime Festival
- Huron Greenways study
- Great Lakes Lighthouse Festival
- Sweetwater Trails
- Salmon Tournaments
- Maritime Heritage Tourism Destination Initiative
- Birding Tours
- Lake Huron Circle Tour
- Lighthouse Tours

Although the theme of Northeast Michigan coastal access and sustainable development could address the coastal area from Saginaw Bay to the Mackinac Bridge, the scope of the project was narrowed to encompass the three-county region of Alpena, Alcona, and Presque Isle counties. These counties are in the middle of the coastal region and any work completed here could be valuable for nearby coastal communities as well. After settling on a proposed theme and scope for the NEMIA, the secretariat team, composed of representatives from MSG, MSUE, and NEMCOG, drafted a preliminary stakeholder list targeting local, regional, and state officials from an array of organizations.

1.4.2 Process Details

Two scoping meetings were held in September of 2005 and February of 2006 to introduce stakeholders to the IA concept, discuss the utility of an IA for Northeast Michigan, broaden stakeholder representation, and draft a policy question that would guide the IA. At the time of this writing, four subsequent meetings were held from 2006-2007. These meetings were used to introduce participants to and promote dialogue among the research teams identified by MSG to conduct various components of the overall assessment, to present analyses of the status, trends, causes and consequences of socioeconomic, environmental, and cultural conditions, and to outline a preferred vision for the region as well as policy options for achieving the vision.

Efforts were made to ensure that the most complete representation of stakeholder interests was included in the process. After the secretariat team identified a preliminary stakeholder list, these participants were asked to identify additional community leaders and decision-makers that would drive the process. In total, 32 organizations were represented by 58 individuals at some point during the process, with participation fluctuating over the course of the meetings. Individuals from nine organizations attended at least four of the six meetings held thus far. A majority (68%) of the participants attended one or two meetings.

MSG assembled five assessment teams to conduct the analyses of area socioeconomic, environmental, and cultural conditions as well as conduct two additional studies concerned with regional planning and zoning and sustainability. As per IA methodology, all analyses were based on existing data; no new data were collected. The teams were represented by individuals from the following organizations:

- *Socioeconomic assessment:* National Marine Sanctuary Program of the National Oceanic and Atmospheric Administration
- *Ecological assessment:* Master's students from the University of Michigan, School of Natural Resources and Environment
- *Cultural assessment:* Michigan Department of History, Arts, and Libraries, the Marine Sanctuary, and students from Alpena Community College
- *Planning and Zoning assessment:* Doctoral students from the University of Michigan, College of Architecture and Urban Planning
- *Sustainable Design Assessment Team (SDAT):* American Institute of Architects (AIA)

The purpose of each assessment was as follows:

- *Socioeconomic assessment:* Use demographic, economic, recreation, and travel data to create Geographic Information System (GIS) layers, a traffic flow model, and a tourism

economic input model that estimates total visitor spending in the area and associated economic effects.

- *Ecological assessment:* Use GIS layers to highlight the ecologically valuable lands throughout the region to illustrate how policy options can take advantage of natural features while also preserving and protecting their ecological function and value.
- *Cultural assessment:* Use data from existing documents, databases, and initiatives to compile and classify a list of coastal cultural assets of the region, both on coastal lands and in Lake Huron waters.
- *Planning and Zoning assessment:* Conduct content analyses of local comprehensive plans and zoning ordinances, followed by interviews of local elected officials and decision-makers to help evaluate the extent to which plans and codes are designed to effectively manage growth and advance community goals.
- *SDAT Report:* Provide planning and design tools and support to the NEMIA workgroup during the regional visioning process and during the drafting of policy options and strategies for implementation. The SDAT program brings multidisciplinary teams of professionals together with community decision-makers and stakeholders to help them develop a vision and framework for a sustainable future. The program focuses on the importance of developing sustainable communities through design (American Institute of Architects, 2006).

All meetings were held at the Marine Sanctuary's Great Lakes Maritime Heritage Center in Alpena, which is located in the center of the three-county region. Consideration was given for meeting dates that avoided vacation and hunting seasons during which many participants were unavailable. Meetings generally ranged from two to four hours in length, with refreshment breaks to encourage informal discussion. All meetings were facilitated by a representative from MSG or MSUE. Each meeting began with a welcome and introductions led by NEMCOG, a well-known and trusted organization within the region.

Throughout the process, the secretariat team and the technical assessment teams remained distinct from the participant group in terms of decision-making. The secretariat team coordinated meeting logistics and developed draft documents for review by the workgroup, but did not participate in the decision-making process. In addition to the meetings, the secretariat team communicated with participants through email updates and a project website. Feedback on posted draft documents was encouraged. Fact sheets about NEMIA were available on the website for participants to download and distribute to their constituents. Communication with the larger public was made through local newspaper articles outlining the project and its progress.

1.4.3 Meeting Specifics

NEMCOG invited individuals on the preliminary stakeholder list to a scoping meeting in September of 2005. Meeting attendees included 14 representatives from NEMCOG, MSG, the Marine Sanctuary, MSUE county directors and tourism and economic development team members, MDNR Fisheries and Parks and Recreation, Michigan Sunrise Side Tourism Association, Alpena Area Convention and Visitors Bureau, Presque Isle and Alpena Counties, and Alcona County Economic Development Corporation (NEMIA, 2005).

September 23, 2005

Meeting Objectives:

- Review Great Lakes and natural resource assets of Northeast Michigan
- Review the status of existing coastal access tourism and economic development initiatives
- Discuss IA as a tool for sustainable natural resource planning
- Revise the policy question proposed by the secretariat team that would guide the IA

Meeting Outcomes:

- Agreed that the IA process would be a valuable tool as the region considers its future
- Identified additional stakeholders who could contribute to the process
- Revised policy question: How can coastal access and connectivity be designed for sustainable tourism and economic development?
- MSG charged with developing a draft work plan that included identification of individuals responsible for conducting the various components of the assessment

A second scoping meeting was held in February of 2006 at the Sanctuary with the goal of exposing a broader group of stakeholders to the proposed NEMIA project. Individuals representing 29 different organizations were invited to the meeting. A total of 27 stakeholders from 19 organizations attended.

February 9, 2006

Meeting Objectives:

- Review Northeast Michigan Great Lakes coastal access needs and opportunities related to tourism and economic development (IA concept and policy question)
- Describe IA plan and process (i.e., future meetings)
- Introduce new assessment team partners and related progress/resources/opportunities
- Identify potential Task Force members that would offer feedback and advice to the assessment teams, provide communication between the assessment teams and the larger stakeholder group, and receive the final IA report

Meeting Outcomes:

- Revised policy question: How can coastal access be designed, in a regional context, for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources, and quality of life?
- Received support from the AIA Center for Communities by Design SDAT to help the workgroup develop a future vision for the region and identify issues to be addressed in order to achieve a sustainable future; Northeast Michigan was one of eight communities nationally to receive this award
- Determined not to select a smaller Task Force from the larger stakeholder group due to the high level of interest in the process by all participants and the potential community connections and expertise that each could offer

The NEMIA process was formally initiated in June of 2006 with a kick-off meeting that began dialogue between the technical assessment teams and the workgroup participants. The meeting ran for six hours and lunch was provided. All five assessment teams gave presentations explaining the contributions they could make to the final IA product and requested feedback from the participants as to which issues should be addressed by the analyses and which existing data sources were applicable. Consistent with the previous meeting, 27 stakeholders representing 18 organizations attended.

June 8, 2006

Meeting Objectives:

- Introduce new assessment team partners and review NEMIA concept and policy question
- Establish NEMIA project expectations
- Initiate dialogue with assessment team partners

Meeting Outcomes:

- Assessment teams charged with developing preliminary analyses of existing data for the subsequent meeting

Following the kick-off meeting, a series of three meetings was conducted to present analyses conducted by the assessment teams, receive feedback on these assessments, and to prioritize policy options drafted in response to the assessments. Additionally, the AIA SDAT team visited Northeast Michigan for three days in early August to meet with local government officials in the three counties and fly over the region to familiarize themselves with the area.

August 24, 2006

Meeting Objectives:

- Present preliminary analyses conducted by the socioeconomic, ecological, cultural, and planning and zoning assessment teams
- Identify most important issues to be addressed in subsequent analyses

Meeting Outcomes:

- Assessment teams charged with refining analyses based on participant comments

The SDAT scheduled a meeting in early October of 2006 to present their preliminary analyses. Before presenting to the workgroup, the team spent a day meeting with the NEMIA technical teams and with regional, state, and federal partners in order to become acquainted with the analyses conducted at that point for NEMIA as well as other area initiatives. Additionally, the SDAT traveled to each of the three counties for public discussions with community leaders and stakeholders in each county regarding the NEMIA topic.

The team spent one day analyzing the information they had received and presented their recommendations to the workgroup on October 5. Lower stakeholder attendance (14 individuals) at the October meeting compared to attendance at the previous meeting (23 individuals) was most likely due to participation in SDAT public discussions earlier in the week.

The SDAT presentation was used to launch discussion regarding the development of policy options.

October 5, 2006

Meeting Objectives:

- Present preliminary analyses and recommendations by the AIA SDAT
- Define key terms in the policy question to aid in developing a vision for the region

Meeting Outcomes:

- SDAT team charged with delivering a final written report of their analyses to the workgroup
- Key terms defined by workgroup: coastal access, regional context, sustainable tourism, economic development, integrity of natural and cultural resources, and quality of life
- Secretariat team charged with classifying the key term definitions into policy theme areas and drafting policy options for each theme

The secretariat team postponed additional workgroup meetings until January of 2007. In the interim, secretariat team members drafted a policy option document that reflected workgroup comments expressed at NEMIA meetings and distributed this document to participants for review and comment through December of 2006. Policy theme areas and policy options were finalized and prioritized by attendees at the January meeting using Turning Point® technology. Twenty-five stakeholders participated in this exercise.

January 23, 2007

Meeting Objectives:

- Prioritize policy options based on importance and achievability
- Discuss results of Turning Point® exercise

Meeting Outcomes:

- Secretariat team charged with determining which of the policy options would be further analyzed for forecasting and implementation considerations
- Assessment teams charged with developing forecasts and guidance for the selected policy options

May 10, 2007

Meeting Objectives:

- Present assessment team's policy option forecasts and secretariat's preliminary implementation guidance
- Discuss implementation guidance

Meeting Outcomes:

- Assessment teams charged with writing final reports
- Secretariat team charged with developing final report draft, incorporating assessment team reports and incorporating workgroup input on implementation guidance

As per IA methodology, after this draft is peer-reviewed it will be available for public comment. These comments will be provided in an appendix to the peer-reviewed document as additional information for the workgroup to consider as it transitions into an implementation phase. In anticipation of the public comment period, a newspaper series describing the process and results will be released and public open houses in each of the three counties will be conducted.

1.5 NEMIA POLICY THEME AREAS AND POTENTIAL ACTIONS

The primary objective of the NEMIA is to use the analyses conducted by the assessment teams to draft and evaluate policy options related to sustainable tourism and economic development that can be implemented by the appropriate decision-makers in the region. These policy options were referred to in the NEMIA process as "potential actions". In preparation for generating effective potential actions, the NEMIA participants used the ecological, socioeconomic, cultural and land-use status and trends assessments, as well as the SDAT evaluation to define key terms in the guiding question. At the October 2006 meeting, the following terms, drawn from the guiding policy question, were defined and reviewed by all members of the workgroup: coastal access, regional context, sustainable tourism, economic development, integrity of natural and cultural resources, and quality of life.

Subsequently, the secretariat team qualitatively prioritized and classified these definitions into policy theme areas. The team used workgroup meeting summaries and related documents, produced through other Northeast Michigan area initiatives that have influenced the NEMIA process, to record the number of times the definitions of the terms in the guiding policy question appeared in the targeted documents. The following documents were used:

- NEMIA Meeting Summaries from September 23, 2005, February 9, 2006, June 8, 2006, and August 24, 2006;
- *Huron Greenways: A System of Land and Water Trails* – Northeast Michigan Council of Governments, 1999;
- *US-23 Sunrise Side Coastal Highway Management Plan* – Northeast Michigan Council of Governments, 2003;
- *Sustainable Development Assessment Team: Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis* – American Institute of Architects, October 5, 2006; and
- *Sustainable Development Assessment Team (SDAT) Report: Envisioning a Future for Northeast Michigan* – American Institute of Architects, October 5, 2006

The definitions that appeared most frequently and were therefore of greatest interest to the NEMIA workgroup were further grouped into overarching policy theme areas. The following five themes resulted:

- Government Coordination and Communication,
- Growing an Entrepreneurial Community and Attracting Business Interests,
- Incorporation of Modern Technologies,
- Natural, Cultural, and Maritime Heritage Resources Tourism, and
- Preserving Sense of Place and Community Character.

Potential actions that could be undertaken by various regional entities to achieve the vision of sustainable tourism and economic development were then drafted for each policy theme area. These actions reflect workgroup comments and concerns expressed at the NEMIA meetings. The actions in bold on the following pages were considered most important and achievable by workgroup members.

1.5.1 Theme 1: Government Coordination and Communication

Improved coordination efforts among various units of government are needed to efficiently and effectively carry out regional and local initiatives. Such coordination brings together the best resources, prevents duplication of efforts, and provides buy-in from various levels of government.

Potential Actions:

- Enhance vertical governmental partnerships (e.g., township to county to state to federal) regionally by coordinating local advisory councils in order to share resources
- Enhance horizontal governmental partnerships regionally by developing a regional Master Plan
- Enhance horizontal governmental partnerships regionally by coordinating existing and future economic development and tourism initiatives across counties (e.g., Sunrise Side Tourism, US-23 Heritage Route, NEMCOG)
- Fully implement community Master Plans and coordinate ordinances with neighboring jurisdictions
- Develop a regionally coordinated strategy to identify governmental, corporate, and foundation funding opportunities

1.5.2 Theme 2: Growing an Entrepreneurial Community and Attracting Business Interests

Fostering both homegrown and external businesses that are loyal to local communities is needed to develop a sustainable regional economy. Pursuing economic diversity by utilizing *all* local resources will ensure a balanced economy.

Potential Actions:

- Enhance cooperation between the public and private sectors to promote business location in Northeast Michigan (i.e., the Chamber of Commerce draws new businesses)
- Educate local government officials about how their actions can encourage or inhibit growth and opportunities
- Recruit coastal businesses such as diving outfitters, marinas, restaurants, and equipment rental and guide services by providing education on how to launch and/or expand a business
- Partner with Alpena Community College to develop marketing strategies
- Support service industry needs by assisting with business management plans for coastal businesses
- Develop restaurants and shops around the commercial fishery
- Develop entrepreneurial lessons in middle school curriculums

- Establish a regional inventor and entrepreneur club for networking and educational purposes
- Establish funding and resources to carry out additional research for future economic decision-making including a study on where users are coming from, regional transportation trends, and a continued cultural assessment

1.5.3 Theme 3: Incorporation of Modern Technologies

Increased use of modern technologies is needed in order to effectively promote the region to non-residents. The use of modern technologies decreases marketing costs over time, ensures that the correct audiences are targeted, and ensures that the most current information is available in a timely manner.

Potential Actions:

- **Increase visibility of the area's resources to non-residents by marketing regional tourism opportunities via the web, providing itineraries for various types of tourism (drive-thru, vacation destination, second or retirement home)**
- Market entrepreneurial opportunities via the web
- Utilize GIS technology to visualize economic and tourism-related trends

1.5.4 Theme 4: Natural, Cultural, and Maritime Heritage Resources Tourism

Establishing diverse tourism opportunities is needed in order to sustain the tourism segment of the economy. Sustainable tourism opportunities that are appropriate to the landscape will protect and enhance resources.

Potential Actions:

- Diversify the tourism portfolio by increasing non-traditional tourism opportunities with viable options for tourism throughout the year
- **Balance the tourism portfolio by maintaining traditional tourism opportunities and connecting natural resources, cultural resources, and maritime heritage**
- Develop coastal access points such as camping, boating, and picnicking facilities in order to increase harbor usage
- Enhance marina access by working with the State Waterways Commission to change seasonal and transient boat slip policies
- Provide interpretive opportunities for greenways and blueways including increased signage and self-guided tours
- Offer guided educational access on the coast
- Coordinate cross-marketing partnerships between natural, cultural, and maritime heritage sites (e.g., the Marine Sanctuary interprets cultural and maritime heritage resources at state park lands)
- **Market NE MI as a maritime heritage and nature-based tourism destination**
- **Capitalize on the presence of the Marine Sanctuary to build complimentary enterprises**
- **Utilize the Marine Sanctuary as a gateway visitor center for regional opportunities**

- Develop advisory groups for state and federal planning processes that affect local natural, cultural, and maritime heritage resources (e.g., an advisory council for state parks on the model of the Marine Sanctuary advisory council)
- Network state lands through the state parks planning process

1.5.5 Theme 5: Preserving Sense of Place and Community Character

Protecting and enhancing the distinguished physical and social quality of the region reinforces a sense of place and community character. Such qualities are attractive to residents and non-residents alike.

Potential Actions:

- **Increase public awareness of regional resources through education and outreach campaigns**
- Develop place-based education curriculums for K-12 students
- Provide view-sheds along coastal highways
- Protect and enhance the unique and diverse character of regional city and village centers through distinct shops, restaurants, and festivals
- Protect quality of life by balancing local resources with economic development needs
- Protect historic architectural resources through local ordinances
- Enhance community and regional recreational and social opportunities by providing spaces for community interaction
- Preserve working landscapes through tools such as conservation easements and purchase of development rights

1.6 RANKING POTENTIAL ACTIONS

Considering the large number of proposed potential actions and the limited resources available to develop forecasts and implementation guidance for each action, it was necessary to narrow the list to those deemed most valuable by the NEMIA participants. The policy theme areas and potential actions were prioritized at the January 2007 workgroup meeting using Turning Point® technology. Turning Point® is an interactive tool that provides audience polling and results in-real time. Participants can rate lists on a scale or prioritize lists through forced-choice comparisons and results can be displayed immediately on-screen. Such a tool ensures that all participants have an equal voice in decision-making. Twenty-five stakeholders participated in this exercise.

Policy theme areas were ranked using forced-choice comparisons in response to the question: "Which is more critical?" The percentage of time a theme area was selected as "most critical" is as follows:

1 - Preserving a Sense of Place and Community Character: 65%
2 - Natural/Cultural/Maritime Heritage and Resources Tourism: 55%
2 - Growing an Entrepreneurial Community and Attracting Business Interests: 55%
3 - Government Coordination and Communication: 35%
4 - Incorporating Modern Technologies: 25%

Potential actions within these theme areas were ranked on an eight-point scale in response to the questions: “How important is this action?” and “How achievable is this action?” On the scale, zero referred to “not important” and “not achievable” while eight referred to “most important” and “most achievable”. Six potential actions scored six or above on both the importance and achievability scale. These six actions are bolded in the above list. Assessment teams focused forecasting and guidance efforts on these six selected policy options and presentation of implementation considerations is scheduled to occur in early May of 2007.

Works Cited

American Institute of Architects. (2006). *Sustainable Design Assessment Team Fact Sheet.*

Committee on Environment and Natural Resources. (2000). *Integrated assessment of hypoxia in the northern Gulf of Mexico.* Washington, D.C.: National Science and Technology Council.

Michigan Sea Grant (MSG). (2005). *Causes and consequences of environmental change: Integrated assessments.* Retrieved February 26, 2007, from http://www.miseagrant.umich.edu/downloads/about/IA-factsheet-2005.pdf

Michigan Sea Grant (MSG). (2005). *Michigan Sea Grant College Program strategic plan 2005-2010.* Retrieved February 26, 2007, from http://www.miseagrant.umich.edu/about/sp.html

National Assessment Synthesis Team. (2001). *Climate change impacts on the United States: The potential consequences of climate variability and change.* US Global Change Research Program. Cambridge, MA.: Cambridge University Press. Retrieved February 26, 2007, from http://www.usgcrp.gov/usgcrp/Library/nationalassessment/foundation.htm

Northeast Michigan Council of Governments. (2001, January 23). Community profile reports of member counties, produced 1995, update 1/23/01. Retrieved July 23, 2007, from http://www.nemcog.org/

Northeast Michigan Integrated Assessment Draft Summary. (2005, September 23). Retrieved April 13, 2007, from http://www.miseagrant.umich.edu/downloads/ coastal/NEMIA/Sept_23_2005_Meeting_Summary.pdf

Rotmans, J. & Dowlatabadi, H. (1997). Integrated assessment modeling. In: S. Rayner and E.L. Malone (Eds.) *Human choice and climate change. Vol. 3. The tools for policy analysis.* (pp. 291-377), Columbus, OH: Battle Press.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force. (2001). *Action plan for reducing, mitigating, and controlling hypoxia in the northern Gulf of Mexico.* Washington, DC.

CHAPTER 2

SOCIOECONOMIC ASSESSMENT

2. A SOCIOECONOMIC OVERVIEW OF NORTHEAST MICHIGAN COUNTIES

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2.1 INTRODUCTION

An integrated assessment (IA) brings together policy makers, scientists, and key stakeholders to address a common issue of concern through collaboration and a formal analysis process. An IA is an approach to synthesizing and delivering relevant, independent scientific input to decision making through a comprehensive analysis of existing natural and social scientific information in the context of a policy or management question (Michigan Sea Grant [MSG], 2005). The goal of an IA is to link existing natural and social scientific knowledge about a problem with policy options in order to help decision makers evaluate possible actions.

The Northeast Michigan Integrated Assessment (NEMIA) was conducted for the three-county region of Presque Isle, Alpena, and Alcona Counties in Northeast Michigan. This coastal area in along Lake Huron includes rich natural and cultural resources. Historically, the region has depended on its natural resources and accessibility to the Great Lakes for economic development. However, in recent years, as the traditional economic base (lumbering, mining, manufacturing, agriculture, hunting, and fishing) has declined, community leaders have turned to tourism to boost the economy by promoting the natural and cultural resources unique to the area, especially those associated with the coast. Despite the potential for economic development, the communities located here wish to proceed cautiously to avoid overdevelopment and destruction of the area's unique resources. A desire to strike a balance between these two interests is reflected in this IA's key policy question, as developed by the NEMIA stakeholders:

> How can coastal access be designed, in a regional context for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

2.1.1 Purpose

Socioeconomics is the selected focus of this technical assessment report, prepared by economists at the National Oceanic and Atmospheric Administration's National Marine Sanctuary Program (NMSP). The research for this report was done in coordination with the Management Plan Review Process currently taking place at Thunder Bay National Marine Sanctuary (TBNMS).

The purpose of this document is to present the necessary background information on the local social and economic (socio-economic) environment for which changes in policy actions in the northeast Michigan study area can be analyzed in a socioeconomic impact analysis. We will examine all direct uses potentially impacted (i.e. tourist/recreational use) by policy actions. With respect to the local economies, these uses will have ripple or multiplier effects as measured by market economic values (i.e. output/sales, income, employment and tax revenues). In this report, we review available information to assess how important these industries are to the local economies. The information presented here is what we have found to date to be the "best

available information". In addition to the socioeconomic characterization, we will provide discussion on gaps in the data.

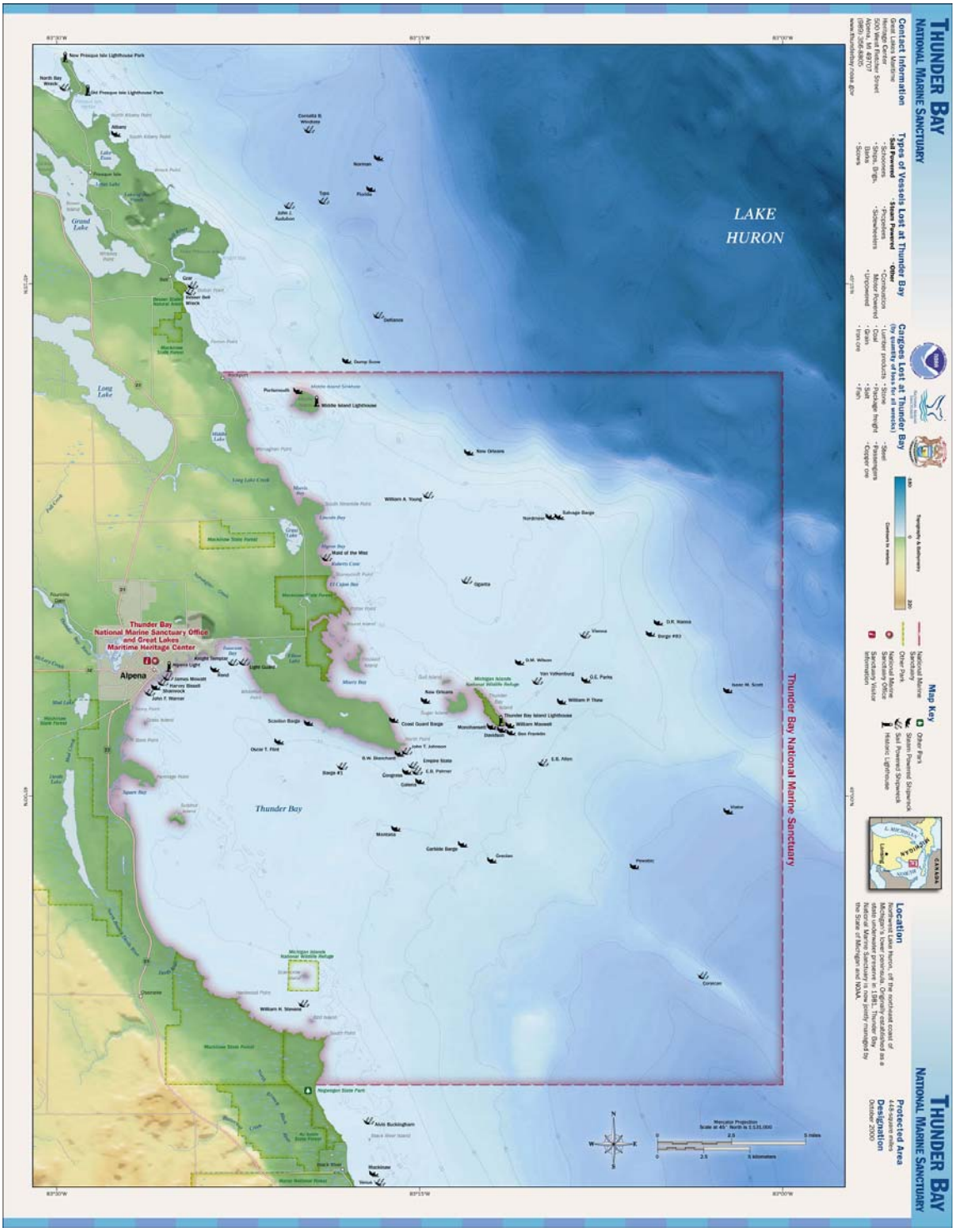
2.1.2 Background

The Northeast Michigan study area is rich in history and natural resources. Figure 2.1 is a reference map of Northeast Michigan and Figure 2.2 is a detailed map of TBNMS.

"The region's position along the Great Lakes coast has been vital to its economic development. The lakes have served as the regional highway, allowing people and goods to move freely even when roads and other infrastructure was lacking or rudimentary. During the last half of the twentieth century, the rugged and relatively undeveloped coast began to attract tourists, who come for the area's hunting, fishing and natural beauty, and to visit the network of historic lighthouses and dive the many shipwrecks" (Michigan Sea Grant, 2005).

Figure 2.1. Northeast Michigan

Figure 2.2. Thunder Bay National Marine Sanctuary



2.1.3 Methods

Linking the economy and the environment is the principal objective of the Socioeconomic Team's task. We need to be able to answer the question, if the use of the natural resources in the northeast Michigan study area are changed, what will be the impact on the income and employment in the local economies? Our approach here is to first look at the most aggregated information, and then proceed to evaluate information collected by other institutions and how it maps into the more aggregated statistics. For each step along the way our objective is to see how close we can get to linking the economy with the environment and assessing the relative importance to the economy of natural resource base uses.

To accomplish the above requires collecting all relevant socioeconomic data and pointing out any significant gaps in the data. The socioeconomic data is collected and compiled in a manner so as to capture both the temporal and spatial variation in activities. The information is linked with economic parameters from existing studies to develop estimates of economic impacts as measured by changes in market economic values (i.e. sales/output, income and employment).

This includes reviewing the existing literature and databases available. In some cases, available information will not support certain aspects of the proposed analyses. In addition, supplemental data collection and analysis may not be feasible with time and resources available. What we are left with is what is commonly referred to as the "best available information".

Initially, the background demographic data for the northeast Michigan study area is presented. This includes historical and projected population data and race, age, and gender data. In addition to this, the economic indicators of the region are profiled. The key economic indicators are labor force, per capita income, unemployment, proprietor's income, and income and employment by industry.

The main focus of this report is an assessment on the relative importance of tourism and recreation to the northeast Michigan study area economy. Data was collected from the Tourism Center at Michigan State University (MSU), the Michigan Economic Development Corporation, the National Survey on Recreation and the Environment (Leeworthy & Wiley, 2000), the Michigan Department of Transportation, and the 1998 Michigan Welcome Center Visitor Survey.

A Michigan tourism spending and economic impact model (MITEIM), developed by Dan Stynes (2000) at MSU, is used to estimate the total visitor spending in Northeast Michigan and the associated economic effects in terms of sales, income, jobs, and tax receipts. The model is also used to forecast the economic effects of various scenarios related to tourism in Northeast Michigan (i.e. the region receives 1,000 more/less visitors a year; visitors to the region spend more/less money per visit).

Also presented in this report is a case study that examines the development of the Blackstone River Valley in Rhode Island/Massachusetts. This region was selected because it has similarities with the northeast Michigan study area, and has experienced significant growth due to the development of the tourist market. This case study serves as an example of how tourism

development has impacted a specific region, which is similar in aspects to the northeast Michigan study area. This case study focuses on the socioeconomic impacts of tourism development.

A conclusive section at the end of the report discusses the prevalent trends in the data. Recommendations are given on the next steps that should be taken after the completion of this process.

2.2 DEMOGRAPHIC AND ECONOMIC PROFILE OF NORTHEAST MICHIGAN

2.2.1 Population

Historical population estimates presented here are from the U.S. Department of Commerce, Census Bureau (2007) while population projections are from the State of Michigan (2007).

Historical and Projected Population. Alcona, Alpena, and Presque Isle Counties account for 0.6 percent of Michigan's total population. Alpena County is the largest in the three county study area, with a population of 30,428 in 2005.

Table 2.1a. Population, Historical and Projected, for Northeast Michigan

	U.S. Census Bureau Actual				
Geographic Area	1970	1980	1990	2000	2005
Alcona	7,113	9,740	10,145	11,719	11,653
Alpena	30,708	32,315	30,605	31,314	30,428
Presque Isle	12,836	14,267	13,743	14,411	14,330
Study Area Total	50,657	56,322	54,493	57,444	56,411
Michigan Total	8,881,826	9,262,044	9,295,287	9,938,444	10,120,860
USA Total	203,302,037	226,542,250	248,790,925	281,421,906	296,410,404

	Michigan.gov Projections		
Geographic Area	2010	2015	2020
Alcona	10,900	11,000	11,000
Alpena	30,100	29,600	29,000
Presque Isle	14,800	15,000	15,200
Study Area Total	55,800	55,600	55,200
Michigan Total	10,121,300	10,285,000	10,454,700
USA Total	308,936,000		335,805,000

Sources: Population: U.S. Department of Commerce, Census Bureau (http://www.census.gov). Population Projections: Michigan.gov

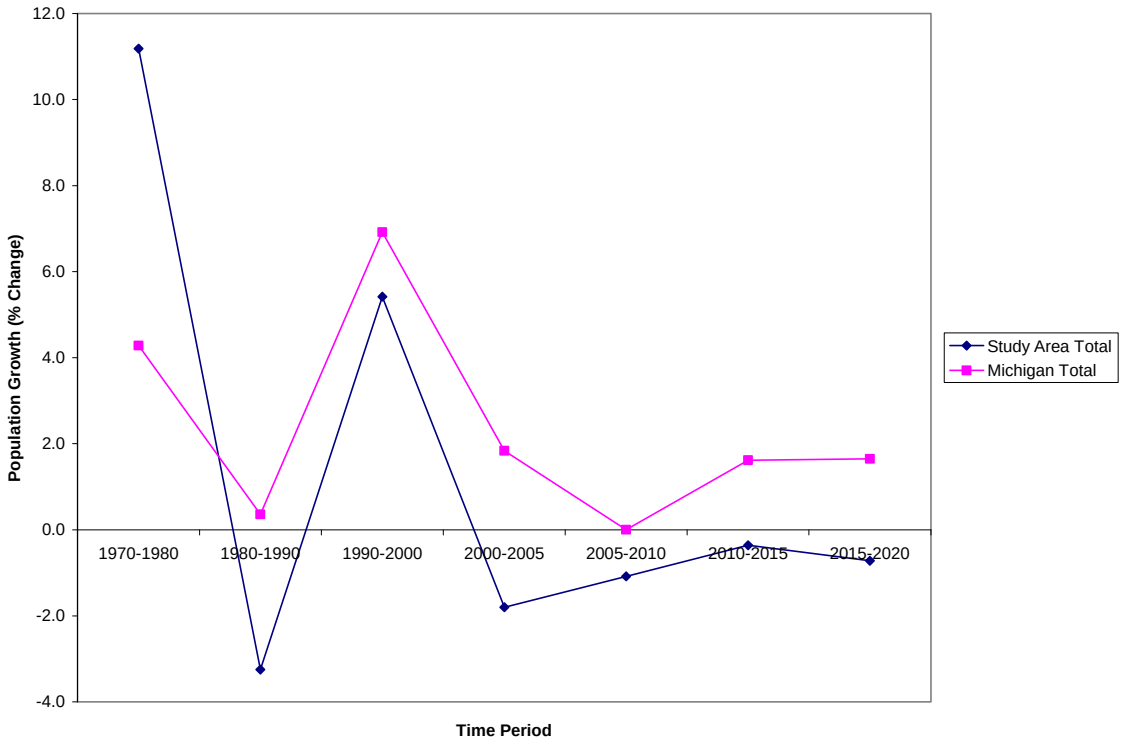
Overall from 1970 to 2005 Michigan experienced a growth rate of 13.9 percent compared to 11.4 percent in the study area. Michigan experienced a higher growth rate in each decade during this time period, except for 1970-1980, when Michigan grew by 4.3 percent and the study area grew by 11.2 percent. Michigan's population is projected to grow slightly over the next 15 years, whereas the study area's population is expected to decrease slowly.

Table 2.1b. Population Growth (% Change), Historical and Projected, for Northeast Michigan

	U.S. Census Bureau Actual				Michigan.gov Projections		
Geographic Area	1970-1980	1980-1990	1990-2000	2000-2005	2005-2010	2010-2015	2015-2020
Alcona	36.9	4.2	15.5	(0.6)	(6.5)	0.9	0.0
Alpena	5.2	(5.3)	2.3	(2.8)	(1.1)	(1.7)	(2.0)
Presque Isle	11.1	(3.7)	4.9	(0.6)	3.3	1.4	1.3
Study Area Total	11.2	(3.2)	5.4	(1.8)	(1.1)	(0.4)	(0.7)
Michigan Total	4.3	0.4	6.9	1.8	0.0	1.6	1.6
USA Total	11.4	9.8	13.1	5.3	4.2		

Sources: Population: U.S. Department of Commerce, Census Bureau (http://www.census.gov). Population Projections: Michigan.gov

Figure 2.3. Population, Historical and Projected, for Northeast Michigan



Race. In terms of race, the demographic composition of the study area does not vary throughout the counties. All counties are predominantly White, with proportions greater than 98 percent. This proportion is much higher in the study area (98.1%) compared to the state of Michigan (80.2%), where there are more diverse urban areas such as Detroit.

Table 2.2a. Demographic Profile of Northeast Michigan – Race, 2000 (%)

Geographic Area	Total Pop.	One Race						Two or more races	Hispanic or Latino (of any race)
		White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race		
Alcona	11,719	98.0	0.2	0.6	0.2	0.0	0.1	0.9	0.7
Alpena	31,314	98.2	0.2	0.4	0.3	0.0	0.1	0.7	0.6
Presque Isle	14,411	98.1	0.3	0.6	0.2	0.0	0.1	0.8	0.5
Study Area Total	57,444	98.1	0.2	0.5	0.3	0.0	0.1	0.8	0.6
Michigan Total	9,938,444	80.2	14.2	0.6	1.8	0.0	1.3	1.9	3.3
USA Total	281,421,906	75.1	12.3	0.9	3.6	0.1	5.5	2.4	12.5

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov).

Age and Gender. The study area has a higher proportion of people 65 years and older (19.9%), compared to Michigan (12.3%). Within the study area, Alpena County has a lower proportion of this age group (17.1%), compared to Alcona (24.5%) and Presque Isle (22.3%).

The study area has a lower proportion of people 18 to 24 years old (6.8%), compared to Michigan (9.4%). The study area also has a lower proportion of people 25 to 44 years old (24.3%), compared to Michigan (29.8%). This implies that the younger generations entering the workforce are finding jobs outside of Northeast Michigan.

There is some variation in gender among the county populations in the study area. Alcona County has more males than females (102 males to every 100 females), whereas Alpena County (94 males to every 100 females) has more females than males. Presque Isle County is evenly distributed between males and females.

Table 2.2b. Demographic Profile of Northeast Michigan – Age and Gender, 2000

Geographic Area	Total Population	Percent of Total Population					Median age (years)	Males per 100 females	
		Under 18 years	18 to 24 years	25 to 44 years	45 to 64 years	65 years and over		All ages	18 years and over
Alcona	11,719	19.0	4.6	20.9	31.0	24.5	49.0	102.2	99.2
Alpena	31,314	23.7	7.8	26.5	24.9	17.1	40.4	94.6	92.5
Presque Isle	14,411	20.9	6.5	22.4	27.8	22.3	45.1	99.2	97.1
Study Area Total	57,444	22.0	6.8	24.3	26.9	19.9	43.3	97.3	95.0
Michigan Total	9,938,444	26.1	9.4	29.8	22.4	12.3	35.5	96.2	93.2
USA Total	281,421,906	25.7	9.6	30.2	22.0	12.4	35.3	96.3	93.4

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov).

2.2.2 Labor Force

Total labor force includes all people classified in the civilian labor force plus members of the U.S. Armed Forces (people on active duty with the United States Army, Air Force, Navy, Marine Corps, or Coast Guard). The civilian labor force consists of people classified as employed or unemployed. In 2005, the study area counties accounted for 0.5 percent of Michigan's total labor force. From 2000-2005, Michigan's labor force decreased by 0.9 percent, whereas the study area's labor force decreased by 3.1 percent. The Alcona County labor force experienced very high growth (23.7%) from 1990-1995, but has declined 13.6% from 1995-2005..

Table 2.3. Labor Force and Labor Force Growth in Northeast Michigan

Geographic Area	Labor Force						
	Labor Force				Growth (%)		
	1990	1995	2000	2005	1990-1995	1995-2000	2000-2005
Alcona	3,934	4,866	4,465	4,225	23.7	(8.2)	(5.4)
Alpena	14,329	15,319	15,536	15,144	6.9	1.4	(2.5)
Presque Isle	6,063	6,273	6,497	6,305	3.5	3.6	(3.0)
Study Area Total	24,326	26,458	26,498	25,674	8.8	0.2	(3.1)
Michigan Total	4,620,000	4,835,000	5,144,000	5,097,000	4.7	6.4	(0.9)
USA Total	125,840,000	132,304,000	142,583,000	149,320,000	5.1	7.8	4.7

Source: U.S. Department of Labor, Bureau of Labor Statistics, Division of Labor Force Statistics.

2.2.3 Income and Employment

Income is reported from two perspectives; by place of residence and by place of work. Income and employment by place of work are further reported by industry, and for wage and salary workers versus proprietors (business owners). Differences in these measurements often reveal important differences about the nature of the local economies that are important for socioeconomic impact analyses. For example, a large difference between income by place of residence and income by place of work might reveal that the economy of the area under study is largely driven by income earned from sources unrelated to work in the area and this will dampen the impacts of management changes that impact local work related income and employment. In general, a large number of proprietors indicate the prevalence of small businesses that receive special treatment under Federal Regulatory Impact Reviews.

Income by Place of Residence and Income by Place of Work. There is wide variation in the study area when comparing income by place of residence and place of work. In 1990, net income (the difference between income by place of residence and income by place of work) in the study area counties was 68.7 percent of the income by place of work. In 2000, this ratio was 78.9 percent in the study area counties. Both these ratios were much higher than the state of Michigan ratios which were 30.2 percent of income by place of work in 1990 and 27.3 percent of income by place of work in 2000. This means that generally, more people work in the study area counties they live in, as compared to the average for Michigan.

There are several sources of income unrelated to work in a county that are recorded and they are generally referred to as transfer payments and property income. Social security and pensions are two of the most important transfer payments and dividends, interest and rent are the most important sources of property income. Social Security and Medicare deductions from current workers are recorded as a deduction in income by place of work in deriving income by place of residence. The other difference between income by place of work and residence is called the residence adjustment. The residence adjustment is the net flow of income to a county that results from some residents that work outside the county of residence and bring income into the county (inflow of income) versus residents from other counties that work inside the county but take their incomes home to their counties of residence (outflow of income).

Table 2.4. Personal Income by Place of Residence and by Place of Work for Northeast Michigan

Geographic Area	1990						2000					
	A	B	A-B=C	D	C/B	D/B	A	B	A-B=C	D	C/B	D/B
	Income by Place of Residence ($000's)	Income by Place of Work ($000's)	Income Not Earned in the County/Study Area	Adjustment for Residence	Net Income as % of Income by Place of Work	Adjustment for Residence as % of Income by Place of Work	Income by Place of Residence ($000's)	Income by Place of Work ($000's)	Income Not Earned in the County/Study Area	Adjustment for Residence	Net Income as % of Income by Place of Work	Adjustment for Residence as % of Income by Place of Work
Alcona	138,436	38,211	100,225	23,022	262.3	60.2	236,406	72,226	164,180	37,290	227.3	51.6
Alpena	465,072	331,059	134,013	-14,546	40.5	-4.4	730,198	512,810	217,388	-31,626	42.4	-6.2
Presque Isle	184,692	98,052	86,640	9,616	88.4	9.8	289,035	116,818	172,217	47,738	147.4	40.9
Study Area Total	788,200	467,322	320,878	18,092	68.7	3.9	1,255,639	701,854	553,785	53,402	78.9	7.6
Michigan Total	176,188,551	135,305,369	40,883,182	457,041	30.2	0.3	294,226,742	231,180,799	63,045,943	1,004,516	27.3	0.4
USA Total	4,861,936,000	3,702,139,000	1,159,797,000	-737,000	31.3	0.0	8,422,074,000	6,504,679,000	1,917,395,000	-1,060,000	29.5	0.0

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

Proprietors Income and Employment. Proprietors (small businesses) account for a significant proportion of both income and employment in study area counties. Proprietors Income is defined by the Bureau of Economic Analysis as the current production income of sole proprietorships, partnerships, and tax-exempt cooperatives. This value excludes dividends, monetary interest received by non-financial business, and rental income received by persons not primarily engaged in the real estate business. In 1990, proprietors in the northeast Michigan study area counties accounted for 8.4 percent of income and 23.0 percent of employment. These were higher percentages than the state of Michigan. In 2000, proprietors in the northeast Michigan study area counties accounted for a lower percent of the income (5.7%) and a higher percent of employment (23.1%). In 2000, the percent of total income from proprietors was lower in the study area counties than the state of Michigan; however the percent of employment from proprietors in the study area counties was higher than the state of Michigan. This is a fairly good indicator that small businesses are an important component of the northeast Michigan study area counties, as they employ a large percentage (23.1%) of the labor force.

Table 2.5. Proprietors Income and Employment for Northeast Michigan

Geographic Area	1990				2000			
	Proprietors Income ($000's)	% of Total Personal Income	Proprietors Employment	% of Total Employment	Proprietors Income ($000's)	% of Total Personal Income	Proprietors Employment	% of Total Employment
Alcona	10,644	7.7	1,177	43.0	17,274	7.3	1,671	43.7
Alpena	39,990	8.6	2,889	18.9	44,396	6.1	3,380	18.7
Presque Isle	15,784	8.5	1,296	24.5	9,517	3.3	1,239	23.2
Study Area Total	66,418	8.4	5,362	23.0	71,187	5.7	6,290	23.1
Michigan Total	10,374,652	5.9	675,581	14.0	17,999,716	6.1	804,885	14.3
USA Total	382,049,000	7.9	21,786,900	15.6	730,458,000	8.7	27,756,800	16.6

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System

2.2.4 Indicators of Economic Health and Wealth

Unemployment Rates and Per Capita Income. Unemployment rates and per capita incomes are probably the two most popular measures used as indicators of the health and wealth of communities, states, or nations. In 2005, the unemployment rate for the study area (8.7%) was higher than for the state of Michigan (6.7%). The differences were wider in 1995 (11.7% in the study area versus 5.3% in Michigan) and 2000 (6.4% in the study area versus 3.7% in Michigan). In general, during this time period, the unemployment rate for the United States has been similar to that of Michigan; however in 2005 the United States' rate was significantly lower at 5.1 percent.

Per capita income is defined by the Census Bureau as the average obtained by dividing aggregate income by total population of an area. The per capita income for the study area counties in 2000 was $21,211. This is significantly lower than the per capita incomes for Michigan ($29,552) and the United States ($29,845).

Over the past 15 years (1990-2005), the relatively high unemployment rates and relatively low per capita incomes in the Northeast Michigan Study Area means this area is an economically distressed area.

Table 2.6. Unemployment Rates and Per Capita Incomes for Northeast Michigan

Geographic Area	Unemployment Rate (%)			
	1990	1995	2000	2005
Alcona	13.1	10.2	6.7	10.1
Alpena	10.2	10.4	5.5	7.4
Presque Isle	11.7	16.0	8.2	10.7
Study Area Total	11.0	11.7	6.4	8.7
Michigan Total	7.7	5.3	3.7	6.7
USA Total	5.6	5.6	4.0	5.1

Geographic Area	Per Capita Income			Adjusted Per Capita Income (2000 $s)		
	1990	1995	2000	1990	1995	2000
Alcona	13,614	17,112	20,195	17,834	19,337	20,195
Alpena	15,162	18,625	23,334	19,862	21,046	23,334
Presque Isle	13,422	15,994	20,105	17,583	18,073	20,105
Study Area Total	14,066	17,244	21,211	18,426	19,485	21,211
Michigan Total	18,922	23,508	29,552	24,788	26,564	29,552
USA Total	19,477	23,076	29,845	25,515	26,076	29,845

Sources: Unemployment rates: U.S. Department of Labor, Bureau of Labor Statistics, Division of Labor Force Statistics; Income: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

Figure 2.4. Unemployment in Northeast Michigan

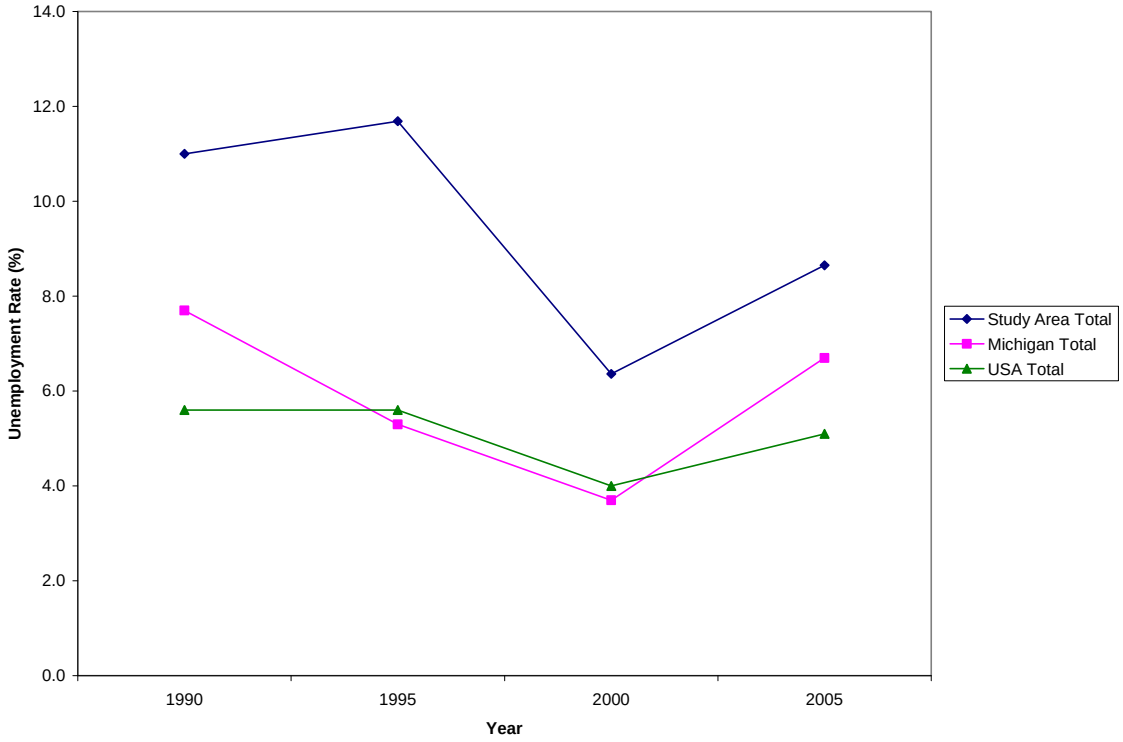
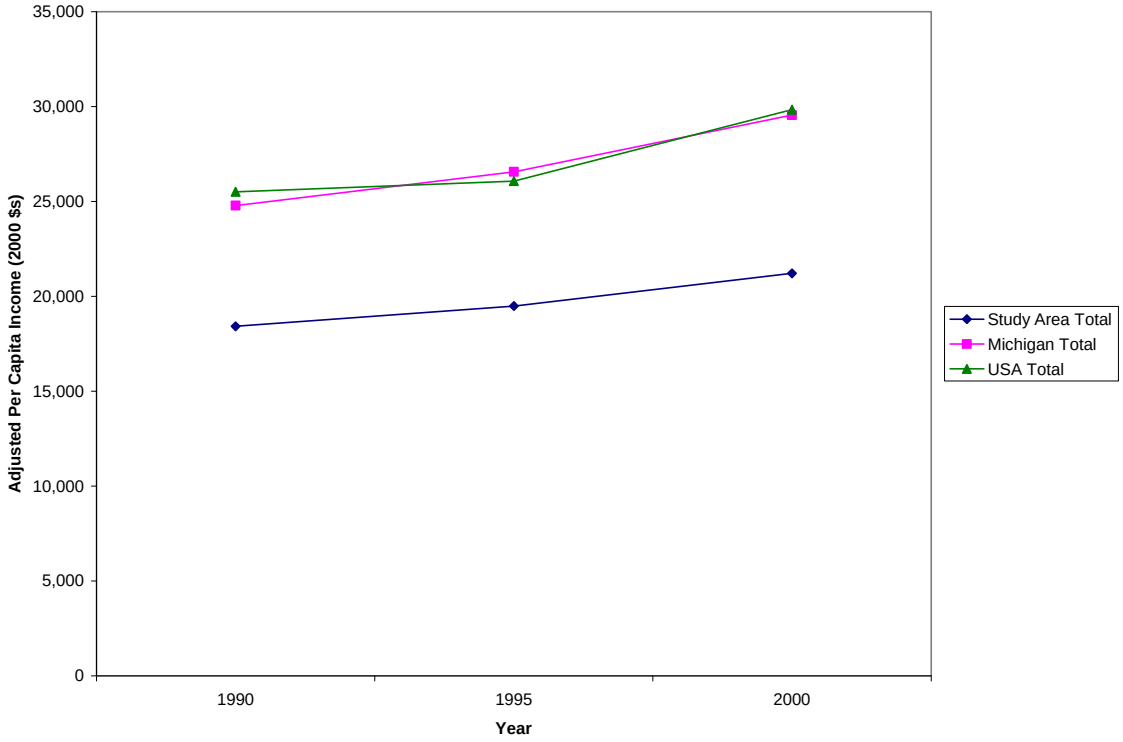


Figure 2.5. Per Capita Income for Northeast Michigan



Income and Employment by Industry. For purposes of economic impact analyses, income and employment by industry is critical because it provides the necessary control totals in the economic accounting system. A limitation of this accounting system is that it is still based on the old industrial economy and generally is not designed to yield direct insights into how the use of natural resources and the environment are connected to the economy. Linking the economy and the environment is the principal objective of the Socioeconomic Team's task. We need to be able to answer the question, if the use of the natural resources in the northeast Michigan study area are changed, what will be the impact on the income and employment in the local economies? To answer this question requires supplemental information organized so that it maps directly into the current system of accounting. In some cases, the income and employment by industry statistics can give us upper bound estimates of the direct portion of impact (i.e., not counting multiplier impacts) for particular uses. Our approach here is to first look at the most aggregated information, and then proceed to evaluate information collected by other institutions and how it maps into the more aggregated statistics. For each step along the way our objective is to see how close we can get to linking the economy with the environment and assessing the relative importance to the economy of natural resource base uses.

Tables 2.7 and 2.8 show the values and percentages of income and employment by industries to counties in the study area. The counties in the study area and the state of Michigan are driven by the Manufacturing sector, the Services sector, and the Government and Government Enterprises sector.

The Retail Trade and Services sectors are where the direct impacts of tourism/recreation are included. However, these categories are broad and can only provide a general range for the estimation of the direct impacts for tourism/recreation. The accounts, as stated above, were simply not designed for this purpose. This is why the economics profession has been doing surveys of tourism/recreation where recreation activities and expenditures made while undertaking these activities are obtained. These expenditures are then mapped back into the economic accounts (see section 2.3).

Table 2.7. Personal Income by Industry ($000s), 2000

Geographic Area	Total	Farm	Ag. Services, Forestry, Fishing, & Other	Mining	Construction	Manufacturing	Transportation and Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance, and Real Estate	Services	Government and Government Enterprises
Alcona	72,226	-344	**(D)**	147	7,682	15,014	3,526	**(D)**	9,911	2,523	17,362	14,401
Alpena	512,810	-2,944	**(D)**	**(D)**	37,682	130,145	31,770	23,251	55,958	16,760	89,476	124,215
Presque Isle	116,818	1,458	**(D)**	**(D)**	5,659	10,202	10,018	3,242	16,890	3,992	21,604	25,181
Study Area Total	701,854	-1,830			51,023	155,361	45,314	26,493	82,759	23,275	128,442	163,797
Michigan Total	231,180,799	560,225	1,152,526	809,521	13,340,130	71,827,586	11,477,630	14,293,138	18,467,500	13,387,107	56,139,941	29,725,495

Personal Income By Industry (% of total), 2000

Alcona	-0.5		0.2	10.6	20.8	4.9		13.7	3.5	24.0	19.9
Alpena	-0.6			7.3	25.4	6.2	4.5	10.9	3.3	17.4	24.2
Presque Isle	1.2			4.8	8.7	8.6	2.8	14.5	3.4	18.5	21.6
Study Area Total	-0.3		0.0	7.3	22.1	6.5	3.8	11.8	3.3	18.3	23.3
Michigan Total	0.2	0.5	0.4	5.8	31.1	5.0	6.2	8.0	5.8	24.3	12.9

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

(L) Less than $50,000, but the estimates for this item are included in the totals.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

Table 2.8. Employment by Industry (number of jobs)

Geographic Area	Total	Farm	Ag. Services, Forestry, Fishing, & Other	Mining	Construction	Manufacturing	Transportation and Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance, and Real Estate	Services	Government and Government Enterprises
Alcona	3,823	260	**(D)**	**(L)**	331	347	81	**(D)**	731	389	1,062	454
Alpena	18,045	541	**(D)**	**(D)**	1,125	2,577	728	712	3,324	999	4,443	3,345
Presque Isle	5,352	387	**(D)**	**(D)**	282	388	263	129	1,116	317	1,272	781
Study Area Total	27,220	1,188			1,738	3,312	1,072		5,171	1,705	6,777	4,580
Michigan Total	5,629,498	73,525	54,304	13,819	296,266	1,005,158	209,221	254,510	964,405	371,878	1,688,170	698,242
Employment By Industry (% of jobs), 2000												
Alcona		6.8			8.7	9.1	2.1		19.1	10.2	27.8	11.9
Alpena		3.0			6.2	14.3	4.0	3.9	18.4	5.5	24.6	18.5
Presque Isle		7.2			5.3	7.2	4.9	2.4	20.9	5.9	23.8	14.6
Study Area Total		4.4			6.4	12.2	3.9		19.0	6.3	24.9	16.8
Michigan Total		1.3	1.0	0.2	5.3	17.9	3.7	4.5	17.1	6.6	30.0	12.4

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

(L) Less than $50,000, but the estimates for this item are included in the totals.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

In 2000, the largest industry in the study area was the Government and Government Enterprises sector which accounted for approximately $164 million (23.3 % of the total income in the study area). Alpena County earned $124 million, or 76 percent of the income to this sector. The next largest industry was the Manufacturing sector which accounted for approximately $155 million (22.1% of the total income in the study area). Alpena County earned 84 percent of the $155 million income to this sector. The third largest industry was the Services sector which accounted for approximately $128 million (18.3% of the total income in the study area). Alpena County earned 70 percent of the $128 million income to this sector. These three industries have had steady growth since 1970.

In contrast, the largest industry in Michigan in 2000 was the Manufacturing sector which accounted for approximately $72 billion (31.1% of the total income in Michigan). The next largest industry was the Services sector which accounted for approximately $56 billion (24.3% of the total income in Michigan). The third larges industry was the Government and Government Enterprises sector which accounted for approximately $30 billion (12.9% of the total income in Michigan). These three industries have had steady growth in Michigan since 1970.

Relative Importance of Tourism/Recreation to the Northeast Michigan Economy. To place tourism and recreation in context with the larger economy, we estimate the relative importance of tourism/recreation to the Northeast Michigan economy. The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) web site provided the income and employment by industry data for the three counties in Northeast Michigan for 2005.

For 2005, BEA estimates the income for the three-county Northeast Michigan Area to be the following:

Place of residence: $1,387,206 (thousands of $)
Place of Work: $785,335 (thousands of $)

We estimate income generated from tourism/recreation at $35,849 (thousands of $). So the proportion of relative contribution/importance of tourism/recreation of the three-county Northeast Michigan economy is:

Place of Residence: 2.58%
Place of Work: 4.56%

For 2005, BEA estimates the employment for the three-county Northeast Michigan Area to be the following 26,269 full and part-time jobs.

We estimate the number of full and part-time jobs generated by tourism/recreation to be 1,704. So 6.5% of employment in the three-county Northeast Michigan economy is related to tourism/recreation.

2.3 TOURISM AND RECREATION IN NORTHEAST MICHIGAN

This section presents a preliminary assessment on the relative importance of tourism/recreation to the northeast Michigan study area economy. Relevant data has been compiled from previous studies on tourism and recreation in Michigan and in the study area (where available). Marine recreation uses in the northeast Michigan study area are a sub-set of these estimates.

2.3.1 Michigan Travel and Recreation Trends

For this study, a visitor to Michigan is anybody who has taken a day or overnight trip to a place at least 50 miles from home.

Where Visitors are Coming From and Where Visitors are Going. In 1995, Michigan received 21.9 million household trips (one or more visitors originating from a single household), of which 13.6 million (61.9%) originated in state. Over 80 percent of Michigan-destined household trips originate in Michigan, Illinois, Indiana, Ohio, and Wisconsin. This indicates that Michigan is primarily a regional travel destination.

Table 2.19. Distribution of Domestic Travel to Michigan by Visitor Origin, 1995

State of Origin	Number of Household Trips	Percentage of Total Household Trips
Michigan	13,561	61.9
Illinois	1,388	6.3
Ohio	1,297	5.9
Indiana	1,043	4.8
Wisconsin	748	3.4
Florida	388	1.8
California	377	1.7
New York	284	1.3
Minnesota	253	1.2
Kentucky	238	1.1
Pennsylvania	227	1.0
Other States	2,136	9.6

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

The Michigan Travel Market Survey (MTMS), prepared by Michigan State University, breaks down visitor origins by designated market areas (DMAs). This delineation is often used so that marketers can concentrate their promotion activities in specific market areas. Five of the top ten DMAs are within Michigan, with Detroit being number one.

The MTMS cites two potential problems with the high regional characterization of Michigan's travel market. "First, this prime market region is an area of slow population growth compared with other U.S. regions. Second, Michigan's tourism industry depends on a relatively small geographic area, making it highly vulnerable to local economic fluctuations. These limit the

industry's long-term growth potential and create an environment conducive to significant year-to-year fluctuations in tourism business volume" (Holecek, Herbowicz, Nikoloff, and Alexander, 2000).

Table 2.20. Top 10 Designated Market Areas Generating Pleasure Trips to Michigan, 1996-1998

Rank	Designated Market Area
1	Detroit
2	Chicago
3	Grand Rapids-Kalamazoo-Battle Creek
4	Flint-Saginaw-Bay City
5	Cleveland
6	Traverse City-Cadillac
7	South Bend-Elkhart
8	Indianapolis
9	Toledo
10	Lansing

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

The primary destination county in Michigan by respondents to the MTMS between 1996 and 2001 is Wayne County, with an estimated 9.48 percent of the market share. This is followed by Grand Traverse County (6.16%) and Saginaw County (4.66%). The Northeast Michigan counties of Alpena (0.78%), Alcona (0.42%), and Presque Isle (0.27%) have a much smaller percent of the market share, but they are still dependent upon tourism as a source of income.

Table 2.21. Estimated Michigan Pleasure Trip Market Share by County, 1996-2001

County	Estimated Market Share (%)
Alpena	0.78
Alcona	0.42
Presque Isle	0.27
…	
Wayne	9.48
Grand Traverse	6.16
Saginaw	4.66
Mackinac	3.95
Cheboygan	2.54

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

How Visitors are Getting There. The large majority (88.0%) of pleasure trip visitors to Michigan, between 1996 and 1998, used a car or truck without camping equipment as their mode of transportation.

Table 2.22. Mode(s) of Transportation Used on Respondents' Most Recent Pleasure Trips in Michigan, 1996-1998

Mode of Transportation	Percent of Respondents
Car/Truck without camping equipment	88.0
Car/Truck with camping equipment	3.2
Motorcoach/Bus	2.0
Airplane	1.9
Self-contained recreation vehicle	1.2
Ship/Boat	1.2
Other	1.2
Rental car	0.7
Motorcycle	0.5
Train	0.1
Bicycle	0.1

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

When Visitors are Coming. Visitation to Michigan is highest in months of June through September, with 52.6 percent of visitors to Michigan coming during those months. August and July are the most popular months to visit, with 17.1 percent and 15.8 percent of visitors respectively.

Table 2.23. Monthly Distribution of Pleasure Trips Generated by Residents of Michigan's Prime Market Area, 1996-1998

Month in Which Trip Began	Percent of Trips to Michigan
January	4.4%
February	5.8%
March	4.2%
April	4.2%
May	6.2%
June	9.9%
July	15.8%
August	17.1%
September	9.8%
October	8.4%
November	7.1%
December	7.0%
Total	100.0%

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

Where Visitors are Staying. An estimate of the distribution of lodging used on overnight pleasure trips in Michigan, "Travel, Tourism, and Recreation in Michigan" (Holecek, 2003) is illustrated in Table 24.

Table 2.24. Distribution of Lodging Used on Overnight Michigan Pleasure Trips

Hotel/motel/resort	43%
With friends or relatives	27%
Owned or rented second home	15%
Campground	9%
Bed & Breakfast	2%
Other	4%

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

The lodging sector is an important part of any tourism system. Destinations with greater lodging capacity are clearly better positioned to attract a larger share of tourists' dollars. The Tourism Resource Center at Michigan State University completed a survey in 2001 of commercial lodging establishments in Michigan counties. Although the number of rooms available in commercial lodging establishments is much lower in the three county study area, compared to other more developed tourism destinations in Michigan, this does not necessarily mean that tourism is not a significant factor in their economies. Each of these counties has a significant number of second homes, indicating that the influx of dollars from these second home owners is vital to the local economies.

Table 2.25. Distribution of Second Homes and Commercial Lodging Accommodations in Michigan by County

County	No. Second Homes (2000 Census)	Distribution of Rooms				
		No. Lodging Establishments	No. Available Rooms	Hotel/Motel/Lodge/ Historic Inn (%)	Cabin/Cottage/ Condo/Rental (%)	Bed and Breakfast (%)
Alcona	5,067	23	125	30	46	23
Alpena	1,658	22	485	90	8	2
Presque Isle	3,278	18	196	58	36	7
…						
Wayne	2,448	137	15,574	99	0	1
Grand Traverse	3,026	102	3,500	67	27	6
Saginaw	301	64	3,459	87	10	3
Mackinac	3,945	123	3,245	81	12	6
Cheboygan	4,777	99	2,919	89	11	1

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

What Visitors are Doing. Pleasure travelers account for over 85 percent of the visitors to Michigan. Business accounts for only 9 percent of all Michigan trips and about 6 percent of trips include a mix of business and pleasure and therefore cannot be classified as either. Forty eight percent of visitors to Michigan come for recreational purposes and approximately 37 percent of visitors come to visit friends or relatives.

Table 2.26. Distribution of Trip Purposes in Michigan's Prime Market Area, 1996-1998

Trip Purpose	Percent of Respondents
Recreation	48
Visiting friends or relatives	37
Business	9
Other	6

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

Looking at the activities that Michigan tourists partake in can provide valuable insight to why visitors are coming to Michigan. The following tables present this information in a variety of ways. From 1996-2001, the top three activities done by Michigan tourists on pleasure trips were general touring or driving for pleasure, outdoor recreation, and shopping, all with participation rates above 50 percent. The one activity that has seen an increase in participation rate over this time period is attending a festival or event.

Table 2.27. Participation in Selected Activities by Michigan Tourists on Pleasure Trips (1996-2001)

Activity	Participation Rate (%)	Trend
General touring or driving for pleasure	53.0	-
Outdoor recreation	50.9	-
Shopping	54.9	NC
Explore small city or town	49.7	NC
Dine at unique restaurant	46.4	NC
Visit other attraction	40.9	NC
Night life	29.7	NC
Visit state or national park	27.4	-
Visit historic site	25.0	-
Attend festival or event	24.8	+
Visit museum or hall of fame	12.4	NC
Casino gambling	11.5	NC
Fall color touring	9.4	NC

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

From 1996-1998, the most popular form of outdoor recreation engaged in on a respondents' most recent pleasure trip to Michigan was hiking (11.3%), followed by swimming (10.2%) and fishing (8.8%).

Table 2.28. Most Popular Forms of Outdoor Recreation Engaged in on Respondents' Most Recent Pleasure Trips in Michigan, 1996-1998

Form of Outdoor Recreation	Percent of Respondents Who Engaged in This Recreational Form
Hiking/Day-hiking	11.3
Swimming	10.2
Fishing	8.8
Walking	6.5
Golfing	5.6
Other/Outdoor Sports	5.4
Boating	5.3
Camping	4.8
Bicycling	4.6
Snowmobiling	3.4
Canoeing/Kayaking	2.2
Jet Skiing	1.8

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

The number of registered recreationalists in Michigan also shows the relative importance of various activities in Michigan. Hunting and fishing licenses by far account for the largest amount of registered recreationalists in Michigan.

Table 2.29. Number of Registered Recreationalists in Michigan

Registered watercraft	829,210
Registered snowmobiles	278,473
Hunting and fishing licenses sold of all types	4,987,048

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

What Visitors are Spending Money On. Although the tourism industry in Michigan has grown significantly since 1985, there is evidence that Michigan has lost market share of both domestic and international travelers' spending in the United States. The following table shows this decline in market share for Michigan. From 1985 to 1999 Michigan has dropped its rank from 8th to 13th in terms of capturing domestic travelers' expenditures and from 12th to 16th in terms of international travelers' expenditures.

Table 2.31. Michigan's Rank in Capturing Domestic and International Travelers' Expenditures in Selected Years

Year	Expenditure Rankings	
	Domestic	International
1985	8	12
1995	13	14
1999	13	16

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

However, the trends in Michigan tourism spending show that total spending increased each year from 1995 to 2000. This is in direct relation to the growing number of party nights each year, and the increase in spending per party night each year. A travel party constitutes a group of people traveling together (same room, vehicle) and sharing expenses. The unit of activity here is party days for day trips and party nights for overnight stays.

Table 2.32. Trends in Michigan Tourism Activity and Spending, 1995-2000

	1995	1997	1998	1999	2000
Party nights (000's)[1]	76,063	81,670	84,624	86,000	89,349
Spend $ per party night	$86.74	$89.95	$90.20	$93.00	$98.23
Total spending ($ Millions)[2]	$6,598	$7,346	$7,633	$7,998	$8,777

[1] A travel party constitutes a group of people traveling together (same room, vehicle) and sharing expenses. The unit of activity here is party days for day trips and party nights for overnight stays.

[2] Spending within 60 miles of the destination. Excludes airfares, most car rentals and some other en route expenses.

Source: Stynes, Daniel J, "Michigan Statewide Tourism Spending and Economic Impact Estimates 1998-2000," 2002.

The distribution of travel expenditures in Michigan provides valuable insight into what type of visitors are coming to Michigan, and how they spend their money. The distribution of Michigan's direct total travel expenditures by type of expenditure is presented in the following table. The breakdown of travel expenditures by type of expenditure is something we will look at in much more depth and detail later in this report.

Table 2.33. Distribution of Direct Total Travel Expenditures by Type of Expenditure for Michigan, 1999 (%)

Type of Expenditure	Michigan
Public transportation	26.8
Auto transportation	20.3
Lodging	15.5
Food service	22.5
Entertainment/recreation	7.0
General trade	7.9

Source: Holecek, Donald F., "Travel, Tourism, and Recreation in Michigan," 2003.

How Visitors Rate Their Trip. It is important to know how Michigan is perceived as a travel destination. Understanding the impressions that Michigan leaves on its visitors is fundamental to promoting tourism and designing effective marketing strategies. The two top ranked attributes that visitors to Michigan rated were the scenic appeal of Michigan, and the fact that Michigan is great for summer activities.

Table 2.34. Mean Ratings of Attributes of Michigan as Pleasure Trip Destinations, 1996-1998

Attribute	Mean Rating (1=Do not agree at all; 10=Agree completely)
Much scenic appeal	8.1
Great for summer activities	8.0
Everyone should visit	7.9
Great for winter activities	7.8
Great for family vacation	7.8
Close enough	7.6
Good place to meet people	7.4
Excellent vacation value	7.2
High Quality Lodging	7.2
Safeplace	7.2
Many historic sites	6.9
Exciting place	6.9
Popular destination	6.9
Exciting nightlife	6.4
Many museums	6.2

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

The following table lists positive impressions that visitors to Michigan have had, and the percentage of respondents who had that impression. The top three positive impressions were about lakes/lakeshores/water resources (16%), scenery (12%), and natural attractions (7%).

Table 2.35. Most Frequently Mentioned Positive Impressions of Michigan as a Pleasure Trip Destination, 1996-1998

Positive Impression	Percent of Respondents Who Had Positive Impression (%)
Lakes/lakeshores/water resources	16
Scenery	12
Natural attractions	7
Manmade attractions	4
Sports-related	4
Other	4
Upper Peninsula	4
Great Lakes	4
Straits of Mackinac	4
Cities	3
Fishing	3
Lots to do	3
Winter sports	3
Lakefront-related	3
Climate	3
North country	2
Visiting friends and relatives	2
Hospitality	2
Relaxation	2
Events/festivals	2
Camping	1
Shopping	1
Detroit	1
Distance	1

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

How Visitors Planned Their Trip. Also important for the marketing of a region as a tourism destination, is being able to understand how visitors plan for their trips. The following table shows that the most frequently cited information sources used while planning a pleasure trip to Michigan, between 1996 and 1998, were a travel agency (20.1% of respondents), AAA/CAA/auto club publications (18.0%), and friends/relatives/co-workers (15.1%).

Table 2.36. Most Frequently Cited Information Sources Used In Pleasure Trip Planning, 1996-1998

Information Source	Percent of Respondents Who Used This Source
Travel agency	20.1%
AAA/CAA/Auto club publications	18.0%
Friends/Relatives/Co-workers	15.1%
No source	14.0%
Other source	8.0%
Internet/On-line Service	5.8%
Chamber of Commerce	3.8%
Other travel guide	3.7%
Magazine(s)	3.3%
State travel office/Call state 800 number	2.7%
Travel section of newspaper	2.1%
Convention/Visitors bureau	1.7%
Mobil travel guide	1.0%
Travel show	0.3%
CD Rom	0.2%
Highway welcome centers	0.2%

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

It is also important to assess which advertisements and messages are getting through to potential visitors to Michigan. The following table shows the medium through which the most recent Michigan travel advertisement was seen or heard, during the time period 1996-1998.

Table 2.37. Medium Through Which Most Recent Michigan Travel Advertisement Was Seen or Heard, 1996-1998

Medium	Percent of Respondents Who Saw or Heard an Ad Through This Medium
TV	63.1%
Magazine	14.7%
Newspaper	11.6%
Radio	5.3%
Billboard/Outdoors	1.3%
Other	1.2%
Travel guide	0.8%
Highway welcome center	0.5%
Travel show	0.4%
Direct mail advertisement	0.4%
Convention and visitors bureau	0.3%
Chamber of Commerce	0.2%
Internet/On-line service	0.1%
CD-Rom	0.1%
At the destination	0.1%

Source: Tourism Center, Michigan State University, "Michigan Travel Market Survey," August 2000.

The tourism and recreation data presented in this section is the best available information. Most of the data is not current, dating back to 1995-2001. This is an important factor to consider, as the tourism landscape in Northeast Michigan has changed and new visitor trends may exist. This shows the need of obtaining current visitor data to the northeast Michigan region, as well as the associated economic impacts of the visitation.

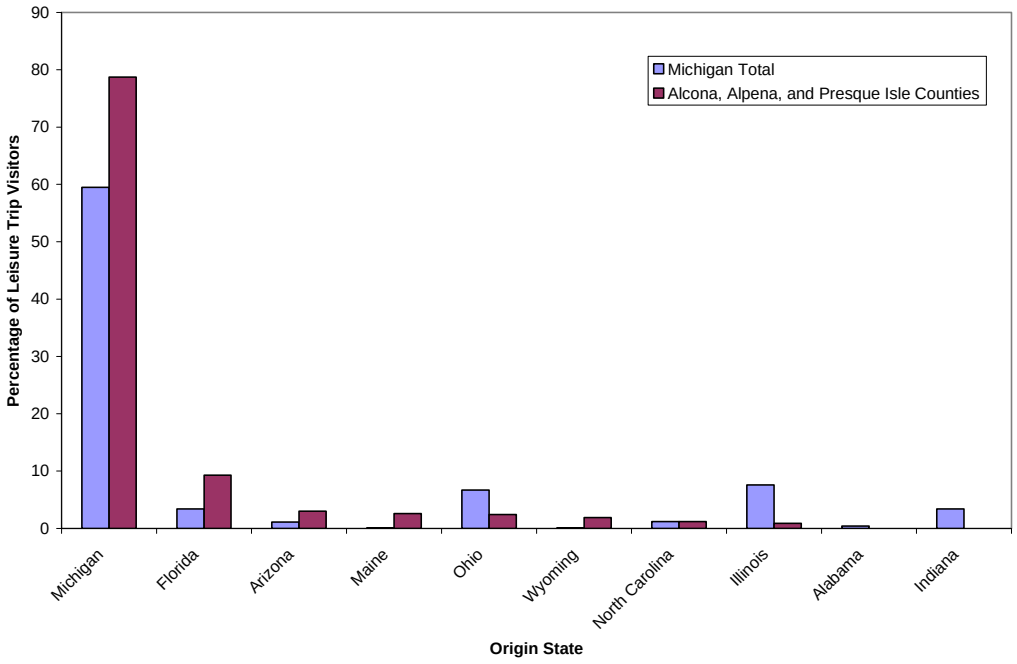
2.3.2 Updates to Michigan Travel and Recreation Trends

As mentioned previously, the travel data that has been presented in this report is five to ten years old. This report was designed to be a working document in which updates and current data can be added as they become available. This section of the report presents data that was just made available to the authors in April 2007.

David Morris at the Michigan Economic Development Corporation provided updated Michigan travel data and analysis for the combined years 2003-2005. The data is from a national Claritas phone survey that targets marketing research and customer segmentation profiling. It must be noted that this travel data, for the Northeast Michigan study area specifically, is based on a small sample size and therefore has limitations to its use. The total number of respondents for the study area is about 100 visitors, representing 280 distinct person-trips. This is a bit thin, but it is still enough to make some larger picture observations. The statewide sample size is about 6,400 visitors, representing 27,000 person-trips. The following analyses are taken from personal communication with David Morris on May 7, 2007..

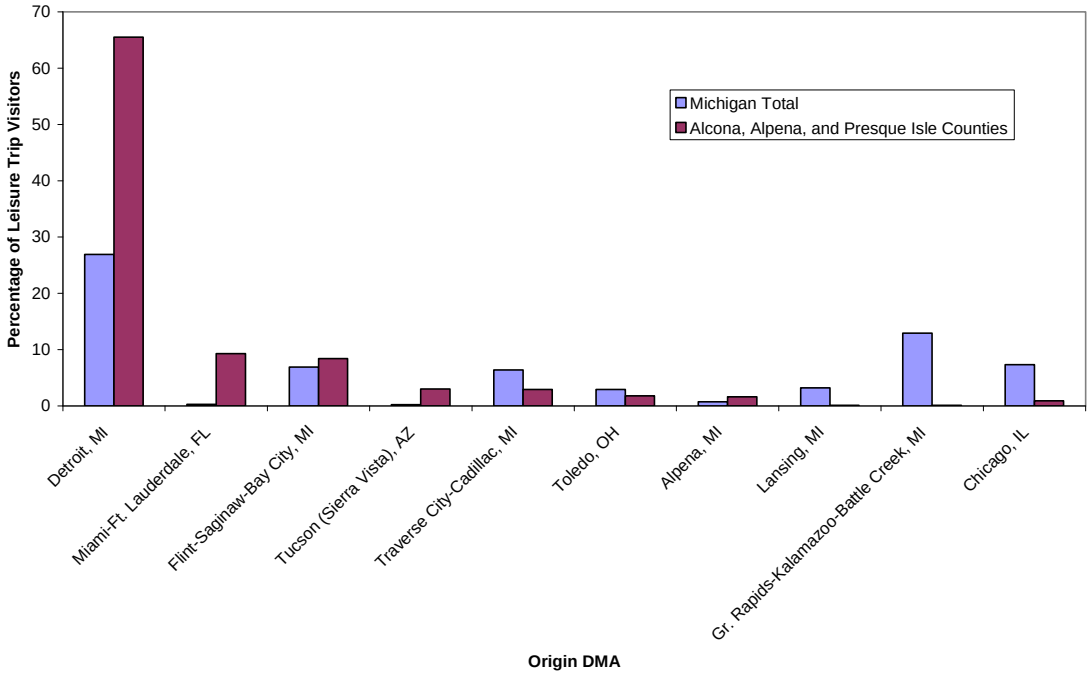
Where Visitors are Coming From. The data indicates that the northeast Michigan study area is exceptionally dependent on Michigan residents for travel, with almost 80 percent of the visitors to the region being from Michigan. Florida and Arizona show up high on the list of origin states because of "snowbird" travel from those who live in those states in the winter months and return for the warm weather. Other states that are good origin states for the rest of Michigan (Illinois, Ohio, and Indiana) are not represented well in the study area. Therefore, there is a lot of room for growth from traditional, nearby states.

Figure 2.6. Origin State of Leisure Trip Visitors to Michigan, 2003-2005



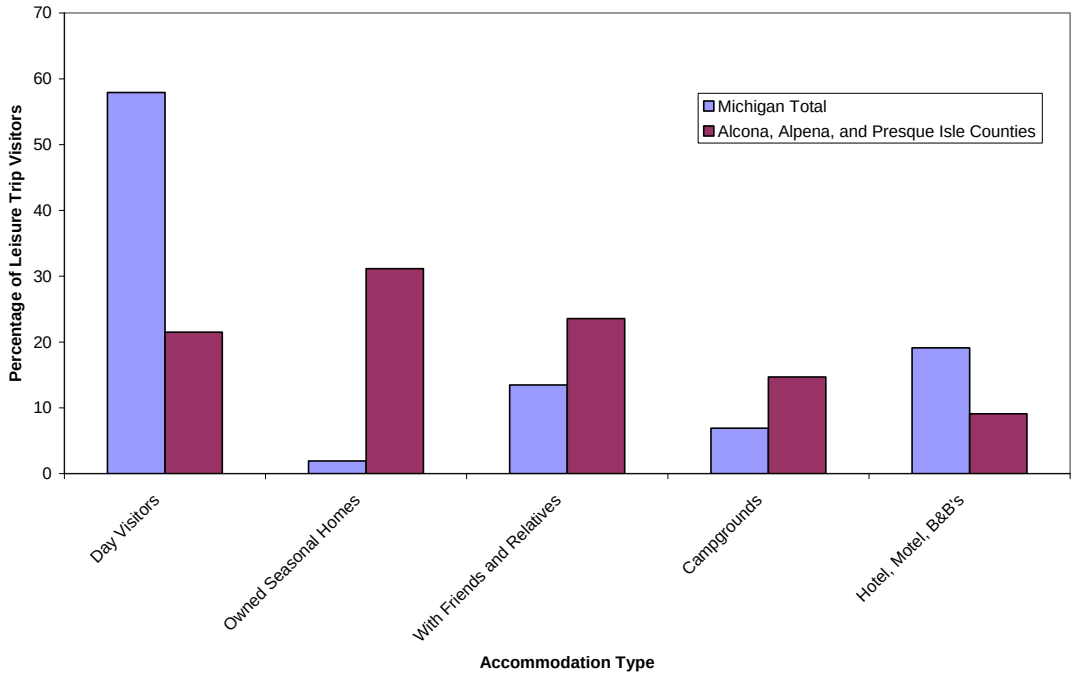
Again, Designated Market Areas (DMAs) are another way of looking at the origin location of visitors. This breakdown is often used so that marketers can concentrate their promotion activities in specific market areas. The data here shows similar patterns to what the origin state profile shows. There are a limited number of out of state visitors to the northeast Michigan region. The strongest markets to this region are Detroit, MI and Flint/Saginaw/Bay City, MI. The markets that are underperforming, compared to the rest of Michigan, are Lansing, MI and Grand Rapids/Kalamazoo/Battle Creek, MI and Chicago, IL. These latter markets represent areas that may have room for growth.

Figure 2.7. Origin Designated Market Area (DMA) of Leisure Trip Visitors to Michigan, 2003-2005



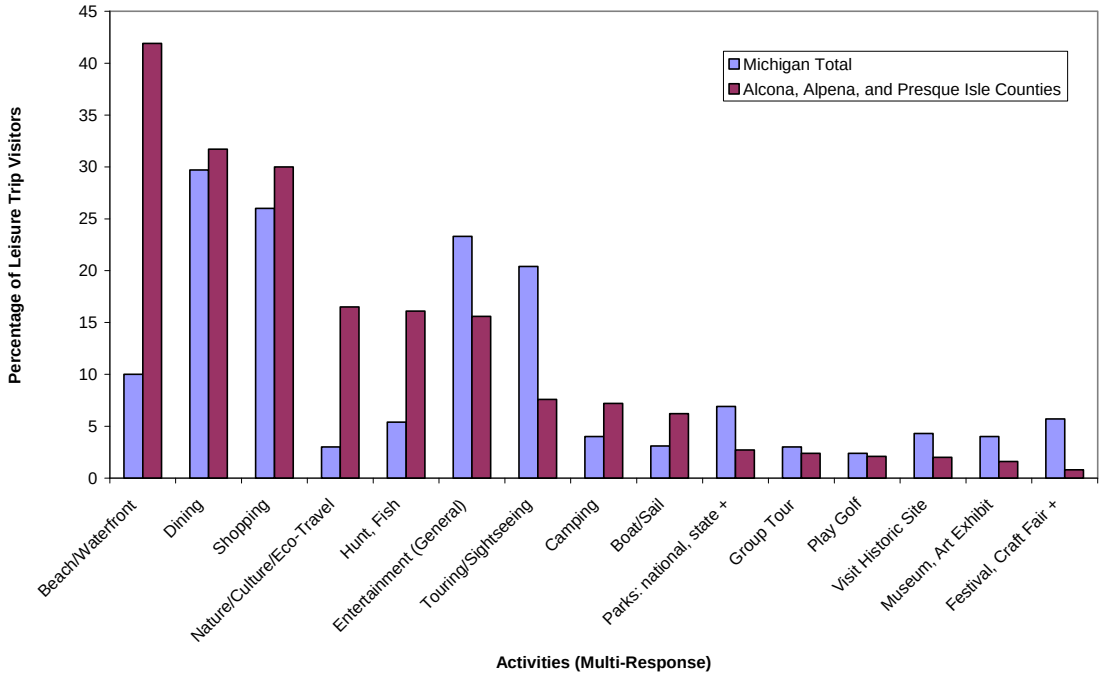
Where Visitors are Staying. The accommodation type of visitors to Michigan was broken down into the same lodging segments as the Holecek (2003) study. The northeast Michigan study area is very dependent on travelers using second homes that they own, rent, or borrow from friends or relatives. Visitors staying in owned seasonal homes account for 32 percent of visitors to Northeast Michigan, compared to only 1.9 percent in all of Michigan. Visitors staying with friends and relatives comprise 23.6 percent of visitors to Northeast Michigan, and approximately 13.5 percent in all of Michigan. The Northeast Michigan region is above the statewide average for campground usage (14.7% compared to 6.9%), but significantly lower than the rest of the state in hotel/motel/B&B usage (9.1% compared to 19.7%). The data shows that Northeast Michigan is an overnight travel destination without much day-trip activity compared to the statewide average (21.5% compared to 57.9%). This is most likely due to the long distance from primary markets.

Figure 2.8. Accommodation Type of Leisure Trip Visitors to Michigan, 2003-2005



What Visitors are Doing. The data indicates that the Northeast Michigan study area is primarily a beach/waterfront vacation destination area, with 41.9 percent participation compared to the statewide average of 10%. This beach/waterfront activity is not limited to only Lake Huron but also the large inland lakes. The study area is also a popular fishing/hunting destination (with 16.1% participation in Northeast Michigan compared to the statewide average of 5.4%) and a popular nature/culture/eco travel destination (with 16.5% participation in Northeast Michigan compared to the statewide average of 3.0%). The Northeast Michigan study area underperforms in the touring/sightseeing category, with only 7.6 percent participation compared to the statewide average of 20.4 percent. This may indicate that people are coming to Northeast Michigan for a specific recreation activity as opposed to just visiting the overall destination because of its appeal as a general attraction. This could be related to a lack of branding issue for the Northeast Michigan study area.

Figure 2.9. Activity Participation by Leisure Trip Visitors to Michigan, 2003-2005



2.3.3 GIS Layers of Recreation and Tourism Resources in Northeast Michigan

This section of the report consists of an inventory of key recreation and tourism resources in the study area counties in Northeast Michigan. In addition to quantifying many of these resources, GIS layers that include all of Michigan are also included to show the relative comparison of these resources. Comparing Northeast Michigan with the entire state of Michigan will help developers, tourism professionals, public officials, and others make informed decisions regarding the travel and tourism industry in Northeast Michigan.

It is important to note that the data presented in this section has not been previously presented in this report. It is also important to note that this data was the most current available data at the date in which it was published (June 2001).

The resources in Table 2.38 are divided into two main categories: resources that pertain to tourism infrastructure and resources that pertain to recreation opportunities.

Table 2.38. Inventory of Selected Recreation and Tourism Resources in Northeast Michigan (Study Area) Counties

	Resource	(Year)	Alcona	Alpena	Presque Isle
Tourism Infrastructure	Total no. units in commercial lodging establishments	2000	125	485	196
	Total no. campsites	2000	997	412	535
	No. owned second homes	2000	5,067	1,658	3,278
	No. licensed food service establishments	1995	70	134	69
Recreation Opportunities	No. acres of public recreation land	1990	121,200	45,180	86,426
	No. acres of publicly or privately owned forest land	1994	333,000	236,200	311,400
	No. miles of hiking/skiing/mtn. biking trails	1994	50	15	49
	No. licensed charter boats	1996	10	8	4

Source: Holecek, Donald F. et al, "Alcona, Alpena, Presque Isle County Tourism Profiles," 2001.

Lodging. There were 107,380 units in commercial lodging establishments in Michigan in 2000. In the study area, Alpena County had the greatest number of units in commercial lodging establishments, with 485 units. Presque Isle County had 196 units and Alcona County had 125 units. Compared to western Michigan and the greater Detroit area, these numbers for Northeast Michigan are extremely low. The counties with the greatest amount of units in commercial lodging establishments include Wayne County (15,574 units), Grand Traverse County (3,500 units), Mackinac County (3,245 units), and Cheboygan County (2,919 units).

Figure 2.10. Number of Units in Commercial Lodging Establishments in Michigan Counties, 2000

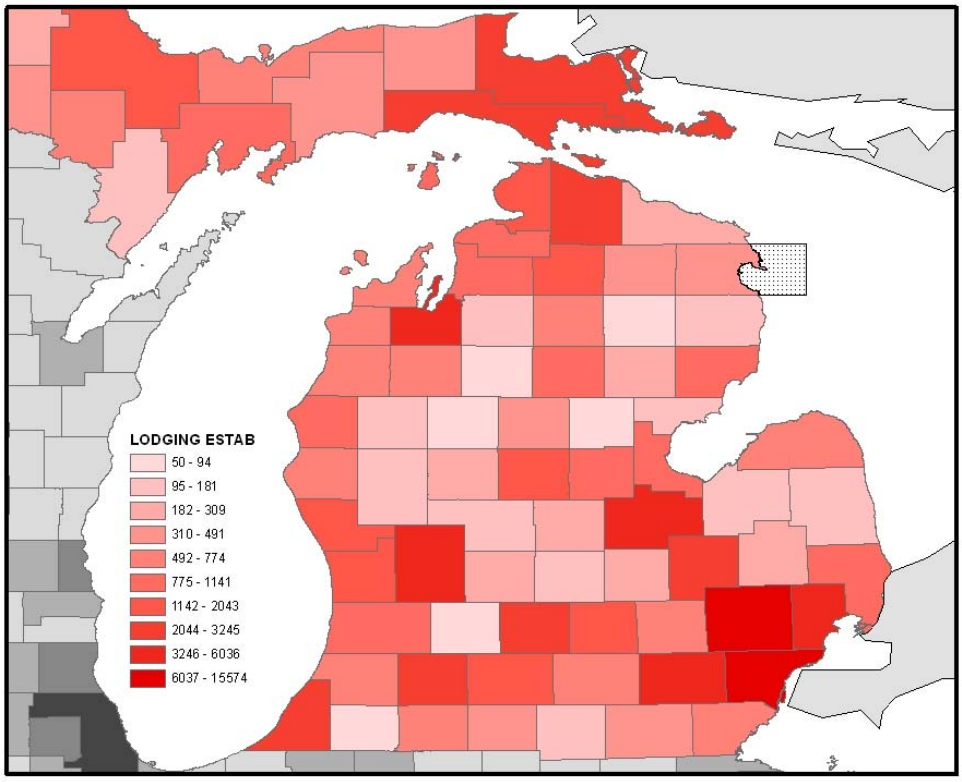


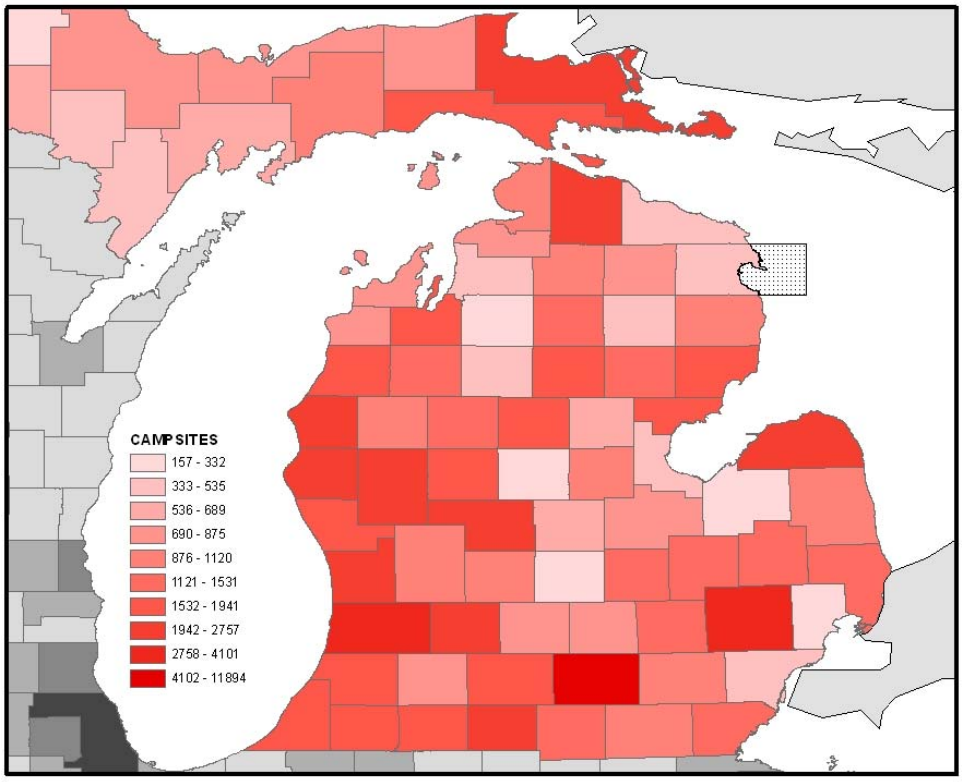
Table 39. Direct Tourism Trip Expenditures in Northeast Michigan (Study Area) Counties, 1996

	Alcona	Alpena	Presque Isle
Estimated direct tourism trip expenditures	$13,679,000	$38,254,000	$15,298,000

Source: Holecek, Donald F. et al, "Alcona, Alpena, Presque Isle County Tourism Profiles," 2001.

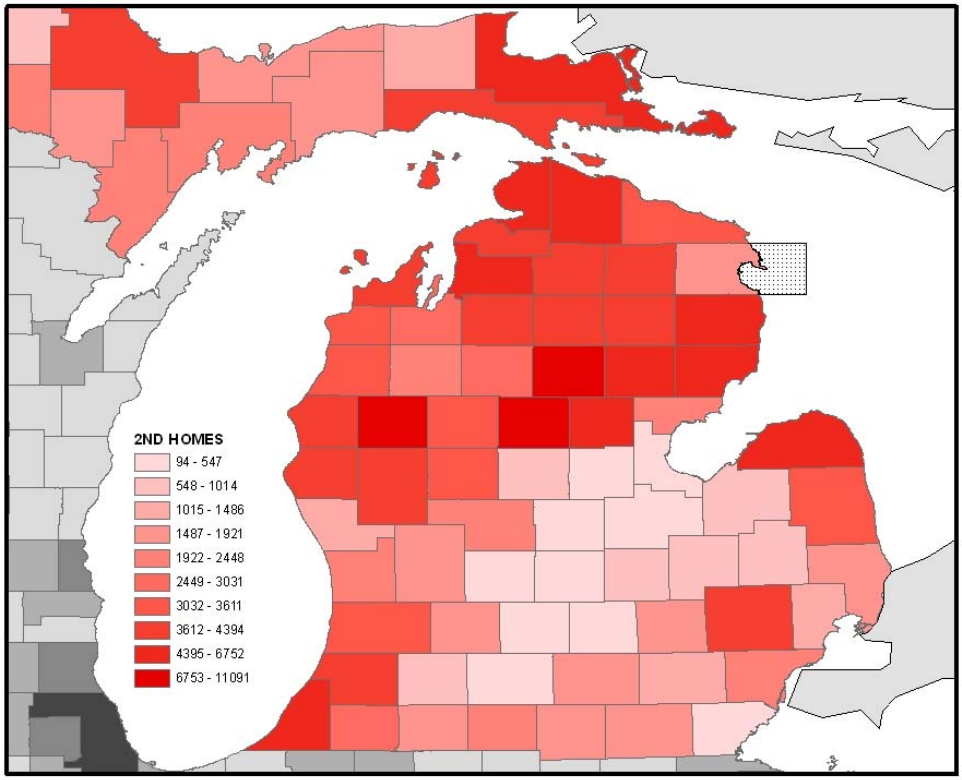
Campsites. There were 112,171 campsites in Michigan in 2000. In the study area, Alcona County had the most campsites, with 997 campsites. Presque Isle County had 535 campsites, and Alpena County had 412 campsites. These numbers are low compared to other areas in Michigan, particularly the western and northern coasts. Counties with high numbers of campsites include Jackson County (11,894 campsites), Oakland County (3,748 campsites), Oceana County (2,757 campsites), Cheboygan County (2,557 campsites), Mason County (2,273 campsites), and Chippewa County (2,049 campsites).

Figure 2.11. Number of Camp Sites in Michigan Counties, 2000



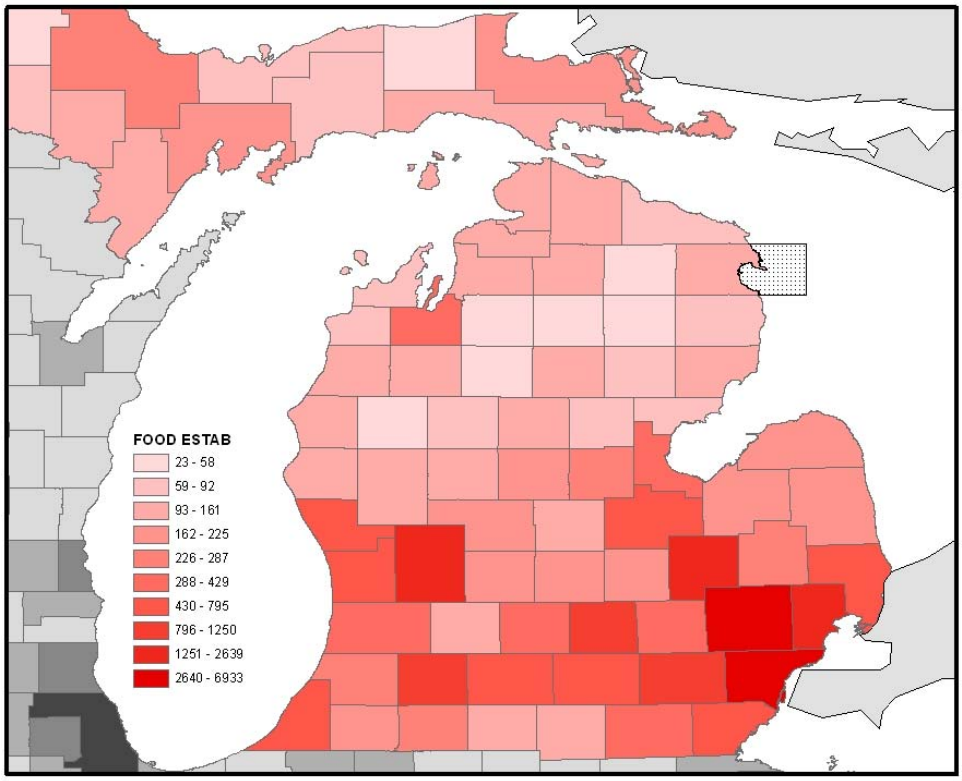
Second Homes. There were 233,922 owned second homes in Michigan in 2000. In the study area, Alcona County had the greatest number of owned second homes, with 5,067 homes. Presque Isle County had 3,278 owned second homes, and Alpena County had 1,658 owned second homes. These numbers are higher than for most counties in the greater Detroit area and in southern Michigan. They are about average with counties on the western and northern coasts of Michigan. There are a few counties in central Michigan where the number of second homes is much greater than anywhere else in Michigan. These counties include Roscommon County (11,091 second homes), Clare County (8,583 second homes), Lake County (8,235 second homes), and Iosco County (6,752 second homes).

Figure 2.12. Number of Owned Second Homes in Michigan Counties, 2000



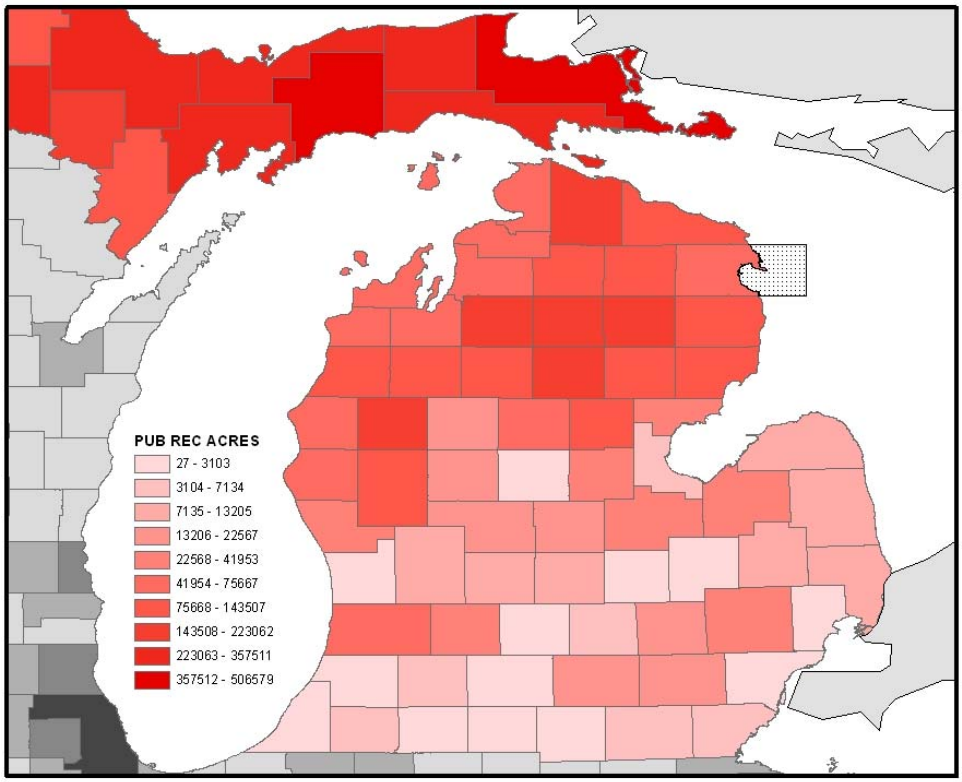
Food Services. There were 36,422 licensed food service establishments in Michigan in 1995. In the study area, Alpena County had the greatest number of food service establishments, with 134 establishments. Alcona County had 70 food service establishments, and Presque Isle County had 69 establishments. These numbers are extremely small when compared to counties in the greater Detroit area. Wayne County alone has 6,933 establishments. With the exception of a few counties, including Saginaw County (750 food service establishments), Bay County (422 food service establishments), and Grand Traverse County (342 food service establishments), all of the counties in northwest and Northeast Michigan have fewer than 150 food service establishments.

Figure 2.13. Number of Food Service Establishments in Michigan Counties, 1995



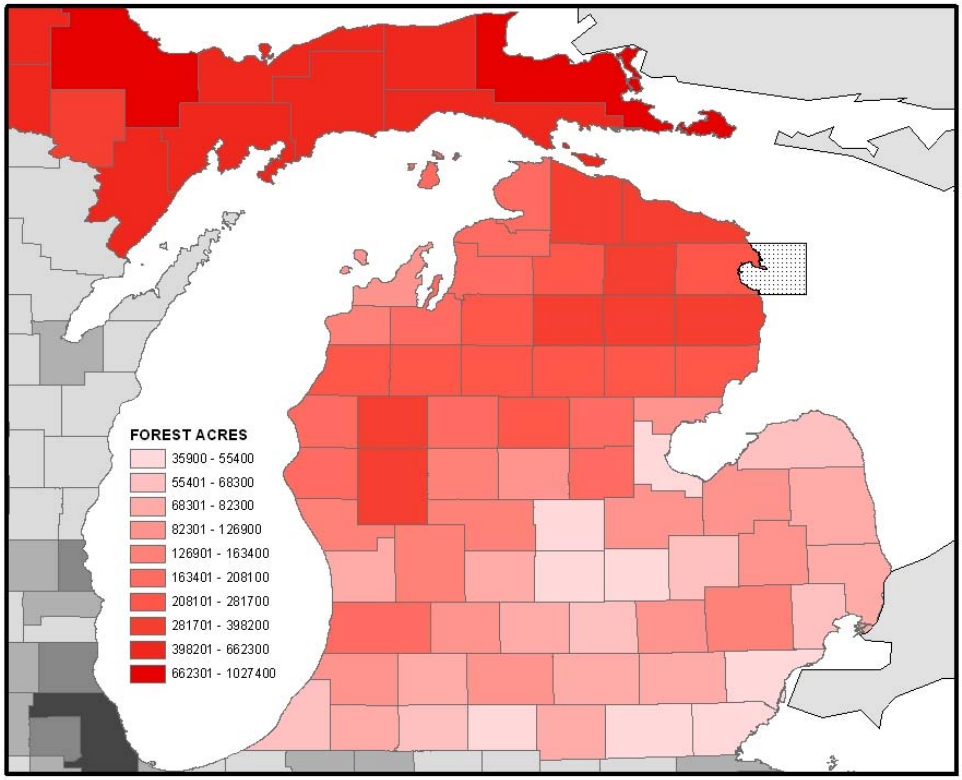
Public Recreation Land. There were approximately 7.6 million acres of public recreation land in Michigan in 1990. In the study area, Alcona County had the most public recreation land, with 121,200 acres. Presque Isle County had 86,426 acres of public recreation land, and Alpena County had 45,180 acres. Compared to southern Michigan, where there is very little public recreation land, these numbers are very high. The majority of public recreation land in Michigan is on the Upper Peninsula, with Schoolcraft County (506,579 acres), Chippewa County (458,003 acres), and Mackinac County (357,511 acres).

Figure 2.14. Acres of Public Recreation Land in Michigan Counties, 1990



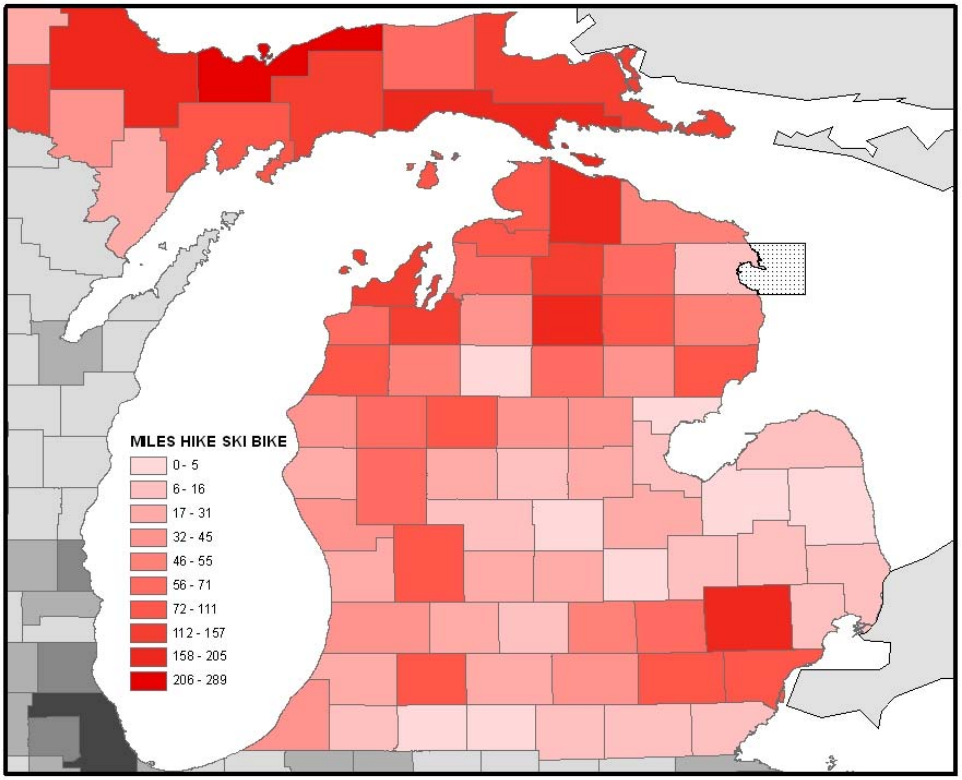
Forest Land. There were approximately 19.3 million acres of publicly or privately owned forest land in Michigan in 1994. In the study area, Alcona County had the most public or private forest land, with 333,000 acres. Presque Isle County had 311,400 acres of public or private forest land, and Alpena County had 236,200 acres. Compared to southern Michigan, where there is very little public or private forest land, these numbers are very high. Compared to the rest of the northern and coastal counties in the Lower Peninsula, these numbers are a bit above average. A large amount of public recreation land in Michigan is on the Upper Peninsula, with Marquette County (1,027,400 acres), Chippewa County (749,000 acres), Mackinac County (558,400 acres), and Schoolcraft County (540,500 acres).

Figure 2.15. Acres of Public or Private Forest in Michigan Counties, 1994



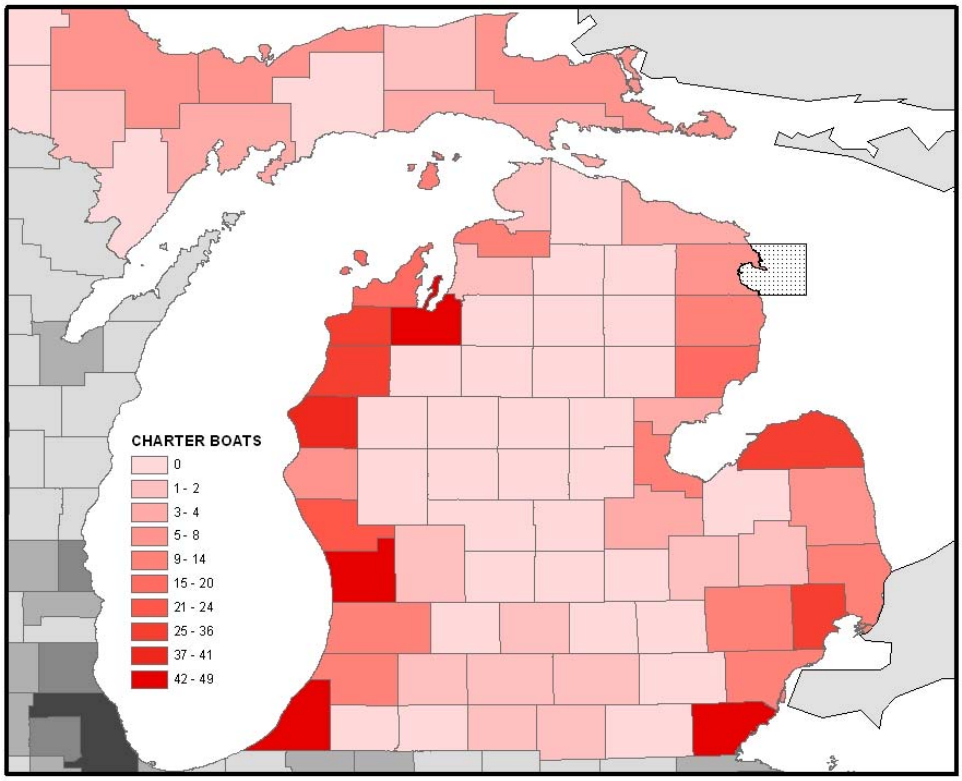
Trails. There were approximately 5,363 miles of hiking/skiing/mountain biking trails in Michigan in 1994. In the study area, Alcona County had the greatest amount of hiking/skiing/mountain biking trails, with 50 miles. Presque Isle County had 49 miles of hiking/skiing/mountain biking trails, and Alpena County had 15 miles. Alcona County and Presque Isle County have more miles of trails than most southern Michigan counties. However, when compared to a few counties in the northern Lower Peninsula, and almost every county in the Upper Peninsula, these numbers are very low. For instance, Gogebic County has 284 miles of hiking/skiing/mountain biking trails, Alger County has 230 miles of trails, Oakland County has 205 miles of trails, and Mackinac has 193 miles of trails.

Figure 2.16. Miles of Hiking/Skiing/Mountain Biking Trails in Michigan Counties, 1994



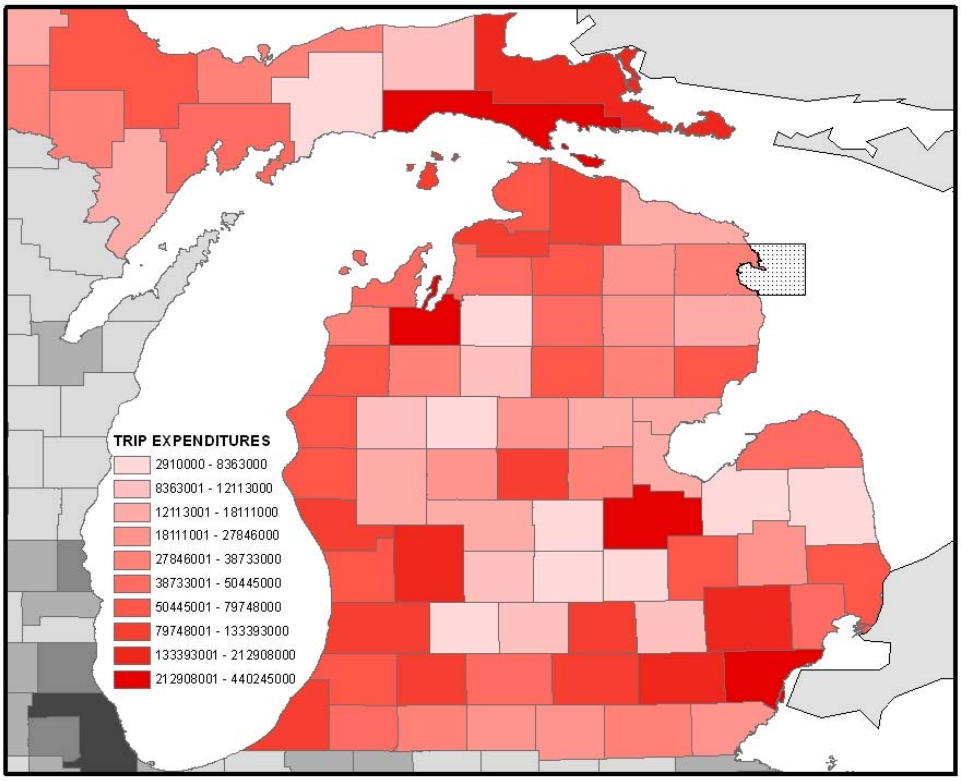
Charter Boats. There were 606 licensed charter boats in Michigan in 1996. In the study area, Alcona County had the greatest amount of licensed charter boats, with 10 boats. Alpena County had 8 licensed charter boats, and Presque Isle County had 4 boats. As would be expected, the number of licensed charter boats is greater in these counties than in almost every inland county in Michigan. There are many coastal Michigan counties, particularly on the western coast, that have larger numbers of licensed charter boats. For instance, Grand Traverse County (47 licensed charter boats), Berrien County (47), Ottawa County (45), and Mason County (41).

Figure 2.17. Number of Licensed Charter Boats in Michigan Counties, 1996



Spending. There was less spending on tourism trips in Northeast Michigan compared to the greater Detroit area and Western Michigan. Of the $5.1 billion in direct tourism trip expenditures in Michigan in 1996, approximately $38.3 million (0.75%) was spent in Alpena County, $15.3 million (0.30%) was spent in Presque Isle County, and $13.7 million (0.27%) was spent in Alcona County. Comparatively, Grand Traverse County received $310 million (6.1%) in tourism trip expenditures, Saginaw County received $280 million (5.5%), and Mackinac County received $270 million (5.3%).

Figure 2.18. Tourism Trip Expenditures in Michigan, 1996



When analyzed together, the previous GIS layers show that there are many recreational opportunities in Northeast Michigan. They also show that there is significantly less tourism infrastructure in Northeast Michigan, compared to other areas of the state.

2.4 TRAFFIC FLOW PATTERNS IN MICHIGAN

The Michigan Department of Transportation (MDOT) collects monthly traffic data for 132 permanent counter locations in the state of Michigan. This data can be used to show monthly and annual travel trends for specific roads in Michigan. Given that one recent study in 2000 found that 91.2 percent of the respondents used a car or truck as their mode of transportation during their most recent pleasure trips in Michigan (Holocek, Spencer, Williams, and Herbowicz, 2000), this traffic count data can provide valuable insight into where some of these vehicles are traveling.

Figure 2.19 shows traffic flow patterns in Michigan for 2005. It is based on data obtained from T. Lower at the Michigan Department of Transportation (personal communication, June 28, 2006). The lines represent roads in Michigan, and the thickness of the lines proportionately represent the number of vehicles counted on that road in 2005 (i.e. the thicker lines represent higher vehicle counts). This analysis focuses on the major routes where traffic counters are present and that provide access to Northeast Michigan, specifically to Alcona, Alpena, and Presque Isle counties. Since the majority of visitors to Northeast Michigan come from southern points, this analysis looks at the traffic flow from south to north on June 28, 2006

Of the roads in this analysis, the road with the heaviest traffic in 2005 was I-75 North from Detroit to Saginaw (I-75 Carrollton NWB), with 10.1 million vehicle counts. This is to be expected, as Detroit is the number one designated market area for travel in Michigan (Holocek et al, 2000), and therefore many trips to other parts of Michigan originate in or around Detroit.

From Saginaw, most vehicles either continued on I-75 North to Arenac or they traveled up US-10 to Clare. Approximately 5.5 million vehicles were counted on I-75 North (I-75 Kawkawlin NB) and 4.2 million vehicles were counted on US-10 North (US-10, US-127 Clare NB) in 2005.

The traffic going north on US-10 thinned out significantly before the traffic counter in Roscommon (US-127 Houghton LK, NB), where approximately 1.8 million vehicles were counted driving north in 2005.

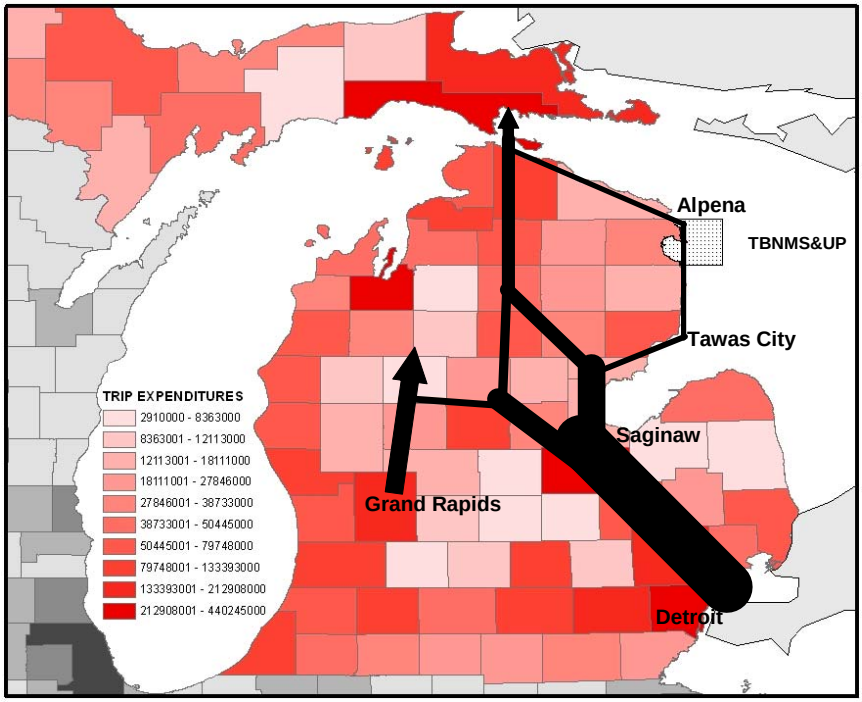
The traffic going north on I-75 has two main options when reaching Arenac. The vehicles can either continue on I-75 North towards Roscommon or they can take US-23 North along the northeast coast. The traffic counters indicate that 2.7 million vehicles traveled on I-75 North (I-75 Prudenville NB) and 1.1 million vehicles traveled on US-23 North (US-23 Au Gres EB) in 2005.

Of the 1.1 million vehicles traveling north on US-23 in 2005, approximately 1 million were counted going north through Alpena (US-23 Alpena NB).

The two roads, I-75 North and US-127 North, converge into one road, I-75 North and head north to Mackinac. The traffic counter located in Otsego County on I-75 (I-75 Vanderbilt NB) counted approximately 2.6 million vehicles traveling north in 2005.

As I-75 North approaches Mackinac, US-23 North merges into I-75. The traffic counter on I-75 going across the Mackinac Bridge after these two roads merge (I-75 Mackinac Bridge NB) indicates that there were 2.1 million vehicles traveling north to Mackinac in 2005.

Figure 2.19. Michigan Department of Transportation Annual Traffic Flow Display with Trip Expenditures



It is also helpful to break the data down in terms of seasonal fluctuations. Table 2.39 shows the 2005 total vehicle count at each traffic recorder location previously discussed, as well as the daily seasonal average at each location. Figure 16 also shows the seasonal differences in vehicle counts on these roads. From the numbers, it is clear that the heaviest vehicle traffic is in the summer months in Northeast Michigan, followed by the spring months, fall months, and winter months, in that order.

Many traffic counter locations experience large increases in traffic from the summer months compared to the next most heavily trafficked season, which are the spring months. For instance, the traffic counter location on I-75 North going over the Mackinac Bridge had an increase of 53 percent from the spring months to the summer months. The traffic counter location further north on I-75 in Otsego County (Vanderbilt counter location) had an increase of 40 percent from the spring months to the summer months. The traffic counter location on US-127 North in Roscommon County (Houghton counter location) had an increase of 39 percent from the spring months to the summer months.

Other traffic counter locations did not experience these large increases in traffic from the spring months to the summer months. For instance, the traffic counter location on US-23 in Arenac County (Au Gres counter location) had a 20 percent increase from the spring months to the summer months. The traffic counter location on US-23 in Alpena County had only a 5.7 percent increase in traffic from the spring months to the summer months.

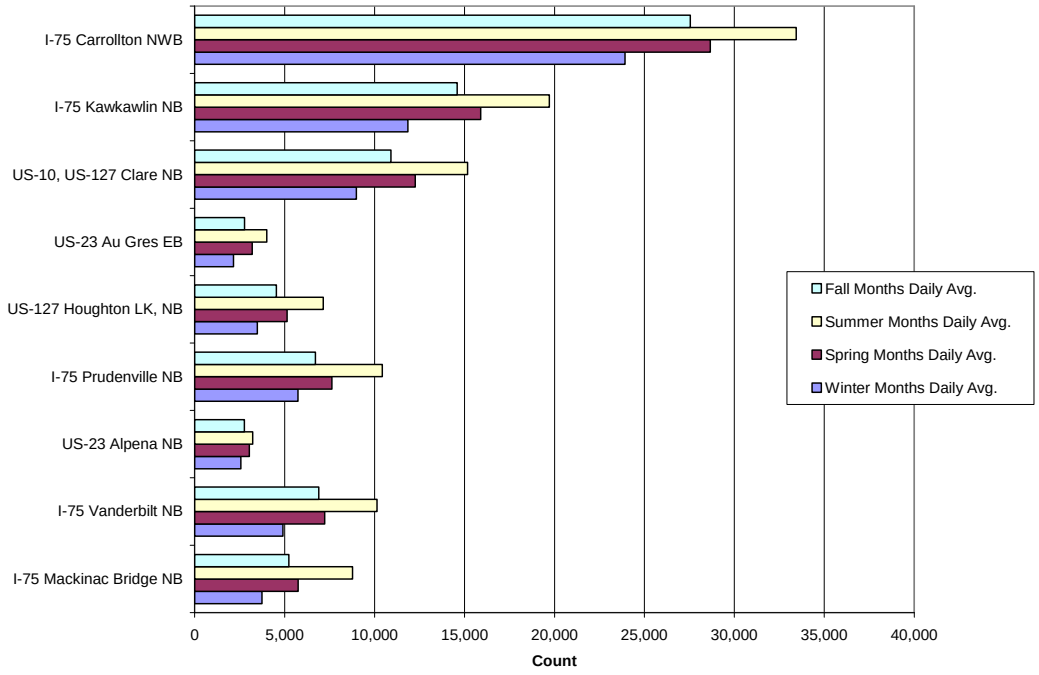
This data indicates that people are traveling more in Michigan in the summer, during the busier tourist season. Alpena County and the other study area counties are not experiencing much of this increase in tourist traffic. The potential for tourism growth in Northeast Michigan exists, as many more vehicles are traveling the roads in the summer time; however this growth will probably not be realized until more people begin traveling on US-23, through Alcona, Alpena, and Presque Isle counties.

Table 2.39. MDOT Traffic Recorder Counts for Northeast Michigan Access Roads, 2005

Traffic Counter Location	Total	Winter Months Daily Avg.	Spring Months Daily Avg.	Summer Months Daily Avg.	Fall Months Daily Avg.
I-75 Mackinac Bridge NB	2,071,140	3,743	5,751	8,776	5,243
I-75 Vanderbilt NB	2,566,380	4,911	7,230	10,140	6,895
US-23 Alpena NB	1,037,700	2,563	3,044	3,228	2,761
I-75 Prudenville NB	2,717,640	5,748	7,627	10,429	6,714
US-127 Houghton LK, NB	1,795,110	3,487	5,131	7,143	4,535
US-23 Au Gres EB	1,074,120	2,158	3,196	4,014	2,771
US-10, US-127 Clare NB	4,201,530	8,987	12,259	15,167	10,912
I-75 Kawkawlin NB	5,503,740	11,850	15,904	19,717	14,596
I-75 Carrollton NWB	10,114,050	23,924	28,669	33,443	27,553

Source: Michigan Department of Transportation, 2006.

Figure 2.20. MDOT Traffic Recorder Counts for Northeast Michigan Access Roads, 2005



2.5 NORTHEAST MICHIGAN TOURISM SPENDING AND ECONOMIC IMPACT MODEL

The Michigan tourism spending and economic impact model (MITEIM) can be used to estimate total visitor spending in an area and the associated economic effects in terms of sales, income, jobs, and tax receipts. This model was developed by Daniel J. Stynes (2000) at Michigan State University, in order to help estimate the economic impacts of tourism-related decisions in Michigan.

The model is based on the following equation:

Economic Impact = number of visits x average spending per visit x multiplier

Each part of this equation requires detailed and complex inputs, which can be estimated from local data. The more current the data is, the more accurate the model will be in portraying local economic impacts from tourism at the current time. However, data is often outdated, or not as specifically localized as an analyst would prefer. In these cases, the best available data must be used, and the possible differences in impacts due to not using the most optimal data must be discussed.

2.5.1 Number of Visits

The number of visits is organized by five types of visitors or market segments: day visitors, overnight visitors staying in motels, B&B's and other commercial lodging, overnight visitors staying in campgrounds, overnight visitors staying in owned seasonal homes, and overnight visitors staying with friends and relatives. Each market segment has a distinct spending profile. For instance, an overnight visitor staying in commercial lodging establishments will spend money differently than an overnight visitor staying in an owned seasonal home (i.e. the former will spend more money in restaurants and the latter will spend more money on groceries). When visitors are divided into these subgroups or market segments with distinct spending profiles a more accurate estimate of spending and impacts can be provided.

For estimates of visitors to Michigan, we combined data from "Travel, Tourism, and Recreation in Michigan" (Holecek, 2003) and Michigan Economic Development Corporation, 2003-2005. Overnight visitors staying in owned seasonal homes make up the largest visitor market segment with 386 thousand party-nights (31%), followed by overnight visitors staying with friends and relatives with 291 thousand party-nights (24%) and day visitors with 266 thousand party-nights (22%).

Table 2.40. Annual Visitation Inputs (Alpena, Alcona, and Presque Isle Counties), 2003-2005

Market Segment	SHARE	Party-night
Day Visitors	22%	266,063
Motels, B&B's, and Other Commercial Lodging	9%	112,613
Campgrounds	15%	181,913
Owned Seasonal Homes	31%	386,100
Visit Friends and Relatives	24%	290,813
Total	100%	1,237,501

Source: Travel, Tourism, and Recreation in Michigan" (Holecek, 2003) and Michigan Economic Development Corp. (2003-2005)

Obtaining reliable estimates of the number and type of visitors is vital to getting accurate impact estimates. The most common ways of obtaining these estimates of the number and types of visitors to an area is through local visitor surveys, various visitor counting methods, and secondary sources such as campsite inventories, motel occupancy rates, and room tax data (Stynes, 2001).

2.5.2 Average Spending Per Visit

In this MITEIM model, spending is reported in up to 12 categories in order to show differences in spending across the subgroups of tourists and also to reveal which sectors of the economy are linked to tourism spending. The spending profiles for a range of tourist market segments are included in a database that can be adjusted or edited, as necessary. This database is designed so that as new data is collected it can easily be built into the model. For our preliminary assessment, the general tourism spending profiles were estimated based on the Michigan Welcome Center visitor survey (Vogt, Pennington-Gray, Xu, Stynes, and Fridge 1998) and selected other studies. Furthermore, spending will vary depending on local prices, quality, and spending opportunities, so low, medium, and high spending profile settings are available to handle these kinds of variations. Given the spending environment in Northeast Michigan, we used the low spending profile.

The spending profiles are presented on a per party-night scale. The market segment with the highest spending profile was visitors staying in motels, B&B's, and other commercial lodging establishments. These visitors spend an average of $188 per party per night. Of this $188, approximately $73 (39%) was spent on the lodging establishment, and $38 (20%) was spent on restaurants and bars. The two market segments with the lowest spending profiles were visitors staying in seasonal homes, and visitors staying with friends and relatives. Both these groups spend an average of $77 per party per night. The sectors in which this money was spent differed between the two groups. The visitors staying in seasonal homes spent more money on restaurants and bars, vehicle expenses, local transportation, and clothing, whereas the visitors staying with friends and relatives spent more money on groceries, take-out food/drinks, and souvenirs and other expenses.

Table 2.41. Visitor Spending by Lodging Segment in Michigan ($2006)

CATEGORY	Day	Motel	Camp	Seas	VFR
Motel, hotel cabin or B&B	0.00	73.09	0.00	0.00	0.00
Camping fees	0.00	0.00	14.62	0.00	0.00
Restaurants & bars	17.75	38.42	13.14	16.70	11.12
Groceries, take-out food/drinks	5.48	11.05	11.05	13.79	19.59
Gas & oil	21.34	26.41	25.01	19.45	20.34
Other vehicle expenses	0.48	1.72	2.09	5.09	0.25
Local transportation	1.22	5.84	2.58	3.63	0.58
Admissions & fees	9.90	10.24	5.29	3.79	3.96
Clothing	4.04	6.16	2.89	4.04	2.20
Sporting goods	0.32	0.80	0.86	1.18	1.18
Gambling	0.00	0.00	0.00	0.00	0.00
Souvenirs and other expenses	17.38	14.29	9.05	9.25	17.71
Total	**77.92**	**188.01**	**86.58**	**76.94**	**76.94**

Source: Vogt et al. "A Survey of Travel Michigan Welcome Center Visitors," 1998.

2.5.3 Multipliers

In the MITEIM model, tourist spending is converted to the income generated and the number of jobs supported by using sets of economic ratios and multipliers. These multipliers are derived from input-output models estimated with the IMPLAN economic database. This model uses a set of multipliers that is specific to each Northeast Michigan county.

2.5.4 Results of the MITEIM Model

Using this MITEIM model, the economic impacts of tourism in Northeast Michigan are summarized based on the data we just described to you. The results are presented in four different tables: (1) Spending and visits by segment, (2) Economic impacts of visitor spending, (3) Tax impacts of direct sales and income, and (4) Marginal impacts.

The three county study area of Alpena, Alcona, and Presque Isle counties hosted 1.2 million visitor party nights in 2000. These visitors spent $110 million in the state. Visitors staying in owned seasonal homes account for 31 percent of party nights and 27 percent of spending. Visitors staying with friends and relatives account for 24 percent of party nights and 20 percent of spending. Day trip visitors account for 22 percent of party nights and 19 percent of spending.

Table 2.42. Spending and Visits by Segment

	Segment					
	Day	Motel	Camp	Seas	VFR	Total
Average spending ($ per party night)	$77.92	$188.01	$86.58	$76.94	$76.94	$88.67
Party nights	266,063	112,613	181,913	386,100	290,813	1,237,500
Total spending ($000's)	$20,732	$21,172	$15,750	$29,705	$22,374	$109,732
Pct of party nights	22%	9%	15%	31%	24%	100%
Pct of spending	19%	19%	14%	27%	20%	100%

Source: Stynes, Daniel J., 2001.

Of this $110 million spent by visitors in the study area, the state captures approximately $67 million (61%) in direct sales by tourism-related businesses. These sales directly support 1,365 jobs with a total payroll of $27.4 million and $36.9 million in value added. Every dollar of direct sales yields another $.38 in secondary sales through indirect and induced effects. Total impacts including secondary effects are $92 million in sales, $35.8 million in personal income, $51.3 million in value added, and 1,704 jobs.

Table 2.43. Economic Impacts of Visitor Spending

Sector/Spending category	Sales $000's	Jobs	Personal Income $000's	Value Added $000's
Direct Effects				
Motel, hotel cabin or B&B	8,230	214	3,601	5,829
Camping fees	2,659	20	264	623
Restaurants & bars	21,123	471	9,273	10,452
Admissions & fees	7,365	137	2,636	4,410
Other vehicle expenses	2,739	19	550	1,256
Local transportation	3,024	75	1,594	1,800
Retail Trade	20,478	420	9,239	12,091
Wholesale Trade	691	7	257	449
Local Production of goods	546	0	0	0
Total Direct Effects	**66,856**	**1,365**	**27,413**	**36,909**
Secondary Effects	25,112	340	8,435	14,412
Total Effects	**91,968**	**1,704**	**35,849**	**51,321**
Multiplier	1.38	1.25	1.31	1.39

Source: Stynes, Daniel J., 2001.

Taxes on direct sales and income in the study area produce $9.6 million in tax revenues to the state, and $165 thousand to local governments.

Table 2.44. Tax Impacts of Direct Sales and Income ($000's)

	Sales	Income	Total
Federal	3,266	4,003	7,269
State	8,662	932	9,595
Local	165	0	165
Total	12,093	4,935	17,029

Source: Stynes, Daniel J., 2001.

Another way of presenting this data, which may be particularly useful for analyzing different policy options, is shown in Table 2.45. This table shows the results of changing visitor spending by $1,000 increments or changing party nights by increments of 1,000. The associated economic impacts for each situation are given. This could provide very useful information for policy makers who wish to understand what impacts are associated with a certain amount of tourism development.

For every increase of $1,000 in visitor spending in the region, the economy can expect to capture an additional $250 in direct personal income and $336 in direct value added. Total impacts, including secondary effects, are $327 in personal income and $468 in value added.

For every increase of 1,000 party nights in visitation in the region, the economy can expect to capture an additional $22 thousand in direct personal income and $30 thousand in direct value added. This will support one additional job. Total impacts, including secondary effects, are $29 thousand in personal income and $41 thousand in value added. This will support one additional job.

Table 2.45. Marginal Impacts

	Change per $1,000 of visitor spending	Change per 1,000 party nights
Direct personal income	$250	$22,152
Direct value added	$336	$29,825
Direct jobs	0	1
Total personal income	$327	$28,968
Total value added	$467	$41,470
Total jobs	0	1

Source: Stynes, Daniel J., 2001.

2.6 CASE STUDY: BLACKSTONE RIVER VALLEY

2.6.1 Background

The following case study examines the development of the Blackstone River Valley. This region was selected because it has similarities with the northeast Michigan study area, and has experienced significant growth due to the development of the tourist market. This case study serves as an example of how tourism development has impacted a specific region, which is similar in aspects to the northeast Michigan study area. This case study focuses on the socioeconomic impacts of tourism development.

The Blackstone River Valley is situated in New England, 200 miles north of New York City, 40 miles south of Boston, Massachusetts and 10 miles north of Providence, Rhode Island. "The Blackstone Valley rose to national prominence in 1790, when English immigrant Samuel Slater built the first successful water-powered cotton-spinning mill in America" (Billington, 2004). This event signifies the beginning of the American Industrial Revolution, and soon hundreds of

mills were built along the Blackstone River. These textile mills drove a significant part of the United States economy, and provided 150 years of growth and prosperity in the Blackstone Valley.

This was followed by a period of hard economic times. The mills began to shut down as the technology became outdated and labor and environmental troubles arose. By the 1940's, "the region was plagued with decaying mills, contaminated landscapes, a toxic river, and plunging community moral" (Billington, 2004). The region was characterized by high unemployment and economic free-fall for decades, with the people of the Blackstone Valley moving their homes and businesses away.

In the 1970's the people of the Blackstone Valley began to initiate change and organized a 10,000 person cleanup project which cleaned the Blackstone River of trash and pollution that had existed for years. This project spurred an effort by the community to reverse the 200 years of environmental degradation in the region and to develop a program to attract visitors to the Blackstone Valley. The program was based on the idea of establishing a linear park along the river which would include the important places of heritage that characterizes the Valley. "Tangible heritage includes all assets that have some physical embodiment of cultural values such as historic towns, buildings, archaeological sites, cultural landscapes, and cultural objects" (Billington, 2004). In 1986 the Blackstone Valley National Heritage Corridor Act was signed into law and the National Park Service was assigned responsibility to work in the Blackstone Valley.

The National Park status furthered the idea of Blackstone Valley becoming a visitor destination. This led to the creation of the Blackstone Valley Tourism Council. The lessons here are relevant to the prioritized actions of the NEMIA working group, including the desire to balance the region's tourism portfolio by maintaining traditional tourism opportunities and connecting natural resources, cultural resources, and maritime heritage. The unified approach of the Blackstone Valley Tourism Council has led to the communities in Blackstone Valley working in unison to develop the goals of tourism, historical preservation, and landscape planning.

2.6.2 Application

Demographic, Economic, and Housing Characteristics.

The Blackstone River Valley is similar to the northeast Michigan region in that both areas consist of smaller towns and communities that want to work together to achieve economic development and preservation of their area's history. The Blackstone Valley consists of a larger area and a greater number of communities but the comparison is still highly applicable. The Blackstone Valley region covers 22 communities located within Providence County in northern Rhode Island and 20 communities within Worcester County in central Massachusetts. The estimated total population in the Blackstone Valley Region was nearly 603 thousand in 2004. The population in the Rhode Island side was 315 thousand, 29.1 percent of Rhode Island's total. The population in the Massachusetts side was nearly 288 thousand, 4.5 percent of Massachusetts' total (Travel Industry Association of America, 2006). This case study will be

looking at the part of Blackstone Valley which is approximated by part of Providence County, Rhode Island and consists of Cumberland town, North Smithfield town, and Central Falls city.

Tables 2.46 and 2.47 present data on key economic indicators for the state of Rhode Island and the county of Providence, RI. The unemployment rates in Providence County tend to be slightly higher than those in Rhode Island (5.7% compared to 5.2% in 2004), and the per capita income has been lower in Providence County, compared to Rhode Island, since 1980 ($31,259 compared to $34,207 in 2004).

Table 2.46. Economic Indicators in Rhode Island

	1970	1980	1990	2000	2004
Population	949,723	947,154	1,003,464	1,048,319	1,079,916
Employment	440,434	485,684	555,265	583,826	604,011
Wage and Salary Employment	399,205	431,625	484,271	503,316	511,572
Proprietors Employment	41,229	54,059	70,994	80,510	92,439
Unemployment Rate		7.1	6.1	4.2	5.2
Total Personal Income ($000's)	3,901,501	9,180,926	20,126,430	30,696,701	36,940,300
Per Capita Personal Income ($)	4,104	9,677	20,006	29,214	34,207
Per Capita Personal Income, Percent of US	100	96	103	98	104

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov). U.S. Department of Commerce, Bureau of Economic Analysis.

Table 2.47. Economic Indicators in Providence County, RI

	1970	1980	1990	2000	2004
Population	581,470	571,349	596,270	621,602	641,874
Employment	292,764	317,063	343,242	353,387	354,536
Wage and Salary Employment	267,146	287,438	305,864	312,376	307,618
Proprietors Employment	25,618	29,625	37,378	41,011	46,918
Unemployment Rate			6.6	4.5	5.7
Total Personal Income ($000's)	2,388,389	5,364,028	11,464,761	16,610,567	20,064,191
Per Capita Personal Income ($)	4,107	9,370	19,181	26,670	31,259
Per Capita Personal Income, Percent of US	101	93	98	89	95

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov). U.S. Department of Commerce, Bureau of Economic Analysis.

Tables 2.48 and 2.49 present data on housing characteristics for the state of Rhode Island and the county of Providence, RI. The median value of owner-occupied housing is less in Providence County than in the state of Rhode Island ($123,900 compared to $133,000 in 2000). The median gross rent for renter-occupied housing is also less in Providence County than in the state of Rhode Island ($527 compared to $553 in 2000).

Table 2.48. Housing Data for Rhode Island

	1990	2000
Total Housing Units	414,572	439,837
Occupied Housing Units	377,977	408,424
Median Number of Rooms		5.3
Specified Owner-Occupied Housing Units	224,829	202,216
Median Value	133,500	133,000
Specified Renter-Occupied Housing Units	153,148	156,228
Median Gross Rent	489	553

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov).

Table 2.49. Housing Data for Providence County, RI

	1,990	2,000
Total Housing Units	243,224	253,214
Occupied Housing Units	226,362	239,936
Median Number of Rooms		5.1
Specified Owner-Occupied Housing Units	121,133	99,471
Median Value		123,900
Specified Renter-Occupied Housing Units	105,229	109,065
Median Gross Rent	465	527

Source: U.S. Department of Commerce, Census Bureau (http://www.census.gov).

Comparatively, Table 2.50 shows the median housing value and the median rent for the northeast Michigan counties in 2000. Both variables are significantly lower in the northeast Michigan counties than in Providence County, RI.

Table 2.50. Housing Data for Northeast Michigan Counties

	2000
Median Housing Value	
Alcona County	$83,700
Alpena County	$78,100
Presque Isle County	$77,800
Median Gross Rent	
Alcona County	$411
Alpena County	$370
Presque Isle County	$345

Source: http://www.city-data.com/.

The towns of Cumberland and North Smithfield, along with Central Falls City were chosen for this case study because they bear resemblance in size to the northeast Michigan counties. Table 2.51 shows the populations of these three Rhode Island towns.

Table 2.51. Population of Central Falls City, Cumberland Town, and North Smithfield Town

	1980	1990	2000
Central Falls City	16,995	17,586	18,928
Cumberland Town	27,069	29,434	31,840
North Smithfield Town	9,972	9,787	10,618

Source: Rhode Island Economic Development Corporation, http://www.riedc.com/r/index.html.

The Rhode Island Economic Development Corporation (RIEDC) has township level data dating back to 1980 for selected housing, employment, construction, and property tax variables. These tables are attached as Appendix A.

In terms of housing, it is apparent that this region was experiencing changes. The RIEDC measured housing value by the median selling price of existing single family homes. Each town experienced high growth with this housing value indicator. From 1980-1989, Cumberland Town

experienced growth of 154 percent, North Smithfield Town experienced growth of 190 percent, and Central Falls City experienced growth of 143 percent. The growth of the median selling price of existing single family homes subsided significantly from 1990-2000, when Cumberland Town experienced growth of 14.8 percent, North Smithfield Town experienced growth of 20.2 percent, and Central Falls City experienced growth of 8.5 percent.

In addition, Cumberland Town authorized 2,035 new housing units from 1980-1990 and 1,754 new housing units from 1991-2001. North Smithfield Town authorized 420 new housing units from 1980-1990 and 517 new housing units from 1991-2001. Central Falls City authorized 318 new housing units from 1980-1990 and 12 new housing units from 1991-2001.

There was also significant construction occurring in the region during this time period. From 1980-1989, Cumberland Town had new construction projects that were valued at $9.5 million, and from 1990-2000 it had new construction projects that were valued at $41.3 million. From 1980-1989 North Smithfield Town had new construction projects that were valued at $4.3 million, and from 1990-2000 it had new construction projects that were valued at $20.5 million. From 1980-1989 Central Falls City had new construction projects that were valued at $6.5 million, and from 1990-2000 it had new construction projects that were valued at $3.0 million.

In terms of employment in the region, it is also apparent that the region was changing. From 1980-1990, employment in the Service Industry in Cumberland Town grew 87.1 percent, and from 1991-2001 it grew 75.9 percent. From 1980-1990, employment in the Manufacturing Industry in Cumberland Town decreased by 42.0 percent, and from 1991-2001 it decreased 6.4 percent.

From 1980-1990, employment in the Service Industry in North Smithfield Town decreased 27.4 percent, and from 1991-2001 it grew 34.4 percent. From 1980-1990, employment in the Manufacturing Industry in North Smithfield Town decreased by 40.8 percent, and from 1991-2001 it decreased 51.9 percent.

From 1980-1990, employment in the Service Industry in Central Falls City decreased 31.3 percent, and from 1991-2001 it grew 30.14 percent. From 1980-1990, employment in the Manufacturing Industry in Central Falls City decreased by 44.4 percent, and from 1991-2001 it decreased 34.5 percent.

Visitor Data

In February of 2006 the Travel Industry Association of America (TIA) conducted a study titled, *Economic Impact of Domestic Travel on the Blackstone Valley at Rhode Island/Massachusetts in 2004*. The study provides preliminary 2004 domestic traveler profile and estimates of domestic traveler expenditures on the Blackstone Valley Rhode Island/Massachusetts region, as well as the employment, payroll income, and state and local tax revenue directly generated by these expenditures. TIA uses the same Travel Economic Impact Model (TEIM) that is being used in the NEMIA project.

TIA categorized lodging in the Blackstone Valley region into three types. Among overnight visitors to the region, approximately half (48%) paid for hotels or motels; approximately 41 percent stayed in private homes or friends' homes; and around 11 percent stayed in vacation homes, camps or other places.

Table 2.52. Overnight Travel in the Blackstone Valley Region by Accommodation Type, 2004

Category	Share (%)
Total Overnight Person-Trips	100%
Hotel/Motel/B&B	48%
Private/Friend Home	41%
Vacation Home/Camp/Other	11%

Source: Travel Industry Association of America, 2006.

There were approximately 2.3 million person-trips to the Blackstone Valley Region in 2004. Domestic travelers to this region directly spent $474.4 million during 2004 on transportation, lodging, food, entertainment and recreation, and incidentals. These traveler expenditures generated 6,400 jobs and $124.6 million in payroll for the region's residents. These expenditures also contributed $26.5 million and $13.0 million in tax revenue to the Rhode Island and Massachusetts state governments and local governments, respectively (TIA, 2006).

Table 2.53. Summary of Blackstone Valley Regional Travel and Toursim

Total Person-Trips (Millions)	2.3
Travel Expenditures ($ Millions)	$474.40
Travel-Generated Employment	6,400
Travel-Generated Payroll ($Millions)	$124.60
Travel-Generated Tax Revenue for State and Local Governments ($ Millions)	$39.6

Source: Travel Industry Association of America, 2006.

Travel expenditures from domestic travelers totaled $474.4 million in the Blackstone Valley region in 2004. The largest spending sector was the food service category, where travelers spent $124.4 million (26.2% of total travel expenditures in the region). The next largest spending sector was lodging expenditures, which totaled $117.5 million (24.8% of total).

During 2004, domestic traveler spending in the Blackstone Valley region generated 6,400 jobs. The total wage and salary earned by these 6,400 employees was $124.6 million. The food service sector provided more jobs than any other sector during 2004, generating 2,400 jobs (37.5% of total). This also represented the largest payroll at $36.1 million (29% of total). The lodging sector ranked second with 1,400 jobs (21.9%) and $31.6 million in wage and salary

income (25.3%). The entertainment and recreation sector was the third largest with 1,100 jobs (17.2%) and $19.2 million in payroll (15.4%).

Table 2.54. Economic Impacts of Domestic Travel on the Blackstone Valley Region, 2004

Sector/Spending Category	Expenditures ($Millions)	Employment	Payroll ($)
Public Transportation	33.6	200	5.7
Auto Transportation	105.7	300	6.8
Lodging	117.5	1,400	31.6
Food Service	124.4	2,400	36.1
Entertainment & Recreation	46.2	1,100	19.2
General Retail Trade	47.0	300	7.0
Travel Planning		700	18.2
Total	$474.4	6,400	$124.6

Source: Travel Industry Association of America, 2006.

In 2004, total tax revenue generated by domestic traveler spending in the Blackstone Valley region totaled $39.6 million. Of this, $26.5 million was tax revenue for Rhode Island and Massachusetts state treasuries and $13.0 million was tax revenue for local governments.

Table 2.55. Domestic Travel-Generated Tax Revenue in the Blackstone Valley Region by Level of Government, 2004

2004 Tax Revenue	Domestic ($ Millions)
State Government	26.5
Local Government	13.0
Total	$39.6

Source: Travel Industry Association of America, 2006.

Federal Investment and Private Investment.

One of the prioritized actions in the NEMIA process is to capitalize on the presence of the National Marine Sanctuary and to build complimentary enterprises. Similarly, the Blackstone Valley region utilized the National Park Service presence as a regional entity that could act as a magnet for both visitors and private investment. This effort has been well documented, and Table 2.57 shows that private investors are following the public investments in the region. The private investors' "funds are spilling-over into the riverfront downtowns, that are begging for revitalization dollars…and this could mean sustainability of the historic fabric of the Blackstone Valley, which is vital to residents, their cultural history, and the visitor industry" (Billington, 2004).

Table 2.56. Blackstone River Valley National Heritage Corridor, National Park Service Investments Compared to Private Sector, River-related Heritage Project Investments in Rhode Island

Year	NPS Annual	Private Sector in RI
1987	50,000	1,200,000
1988	350,000	
1989	325,000	2,000,000
1990	320,600	
1991	696,000	
1992	2,518,000	
1993	1,537,000	
1994	1,047,000	
1995	1,325,000	
1996	860,000	
1997	1,020,000	
1998	1,069,000	
1999	1,330,000	10,000,000
2000	1,727,000	1,300,000
2001	3,391,000	500,000
2002	2,106,000	1,000,000
2003	2,107,000	57,500,000
TOTALS	$21,778,600	$73,500,000

Source: Billington, Robert, "A Case Study – Federal Investment Attracts Private Investment in Industrial Historic Sites," 2004.

"The work completed in the Blackstone Valley over the last several decades has created a generation with a new awareness of their natural, cultural, and historical resources. Community revitalization, based on education, historic preservation, landscape improvements, private and public investments, are causing this new found awareness to ensure the Blackstone Valley is not just a place to make a living, but a place worth living" (Billington, 2004).

2.7 CONCLUDING REMARKS AND RECOMMENDATIONS

The NEMIA process has brought together members of the northeast Michigan community to discuss the desired future of the region, and potential local actions to reach this vision. The first step in the process was to document the social, economic, and environmental status and trends related to the central policy question on sustainable tourism, as well as the causes and consequences of the status and trends. Through a series of meetings, this information was presented to the NEMIA working group, by the four technical assessment teams. Each technical assessment team also prepared a report on their findings, which will be compiled into the final integrated assessment report.

The socioeconomic component of the process was designed to provide background information on the local socioeconomic environment of the northeast Michigan study area. The central focus of this report is an assessment of the tourism and recreation industry in the study area economy.

Tourism in Northeast Michigan is exceptionally dependent on Michigan residents. Almost 80 percent of the visitors to the region are from Michigan. This trend is prevalent, but not as

extreme, for the entire state of Michigan. Of all visitors in Michigan, 60 percent originate from Michigan.

Other traditional, nearby states that are good origin states for the rest of Michigan, such as Illinois, Ohio, and Indiana, are not represented well in Northeast Michigan. Therefore, these are areas that represent visitor markets that may have room for growth.

Visitation to Michigan is highest during the summer. Approximately 53 percent of visitors to Michigan come during the months of June through September.

The lodging data indicates that most visitors to Northeast Michigan have lower than average spending profiles. Over 55 percent of visitors to the region stay in owned seasonal homes or with friends and relatives, and approximately 15 percent stay in campgrounds. Visitors represented by these lodging segments tend to spend less money per visit than visitors staying in hotels, motels, and B&B's, which only account for 9 percent of visitors to Northeast Michigan.

A similar trend is represented in the data for key tourism resources in the study area. Compared to other parts of Michigan, the northeast Michigan counties have low numbers of commercial lodging and food service establishments, and high numbers of campsites.

The most popular recreation activities done by visitors to Northeast Michigan are visiting a beach/waterfront (42% of visitors), dining (32%), shopping (30%), nature/culture/eco travel (17%), and hunting and fishing (16%).

A Michigan tourism spending and economic impact model (MITEIM), designed by Dan Stynes (2000) at MSU, was used to estimate total visitor spending in the northeast Michigan region. The inputs to the model were estimated from the local tourism data we collected from various sources. The limitations to the use of this model must be noted, as the data used here is 5-10 years outdated or based on a small sample size. The more current the data is, and the more localized the inputs are, the more accurate the model will be in portraying local economic impacts from tourism at the current time.

The MITEIM model shows us the marginal impacts of a given scenario. If the northeast Michigan study area received 1,000 more visitors, they would experience an increase of $103 thousand dollars in visitor spending. The economy could expect to capture $77 thousand in direct sales, which would support an additional 2.15 jobs, with a total payroll of $31 thousand and $48 thousand in value added. Total impacts including secondary effects are $98 thousand in total sales, $37 thousand in personal income, $60 thousand in value added, and 2.42 jobs.

If the visitors to the northeast Michigan study area increased their spending profiles, for every increase of $1,000 in visitor spending, the economy could expect to capture $748 in direct sales. This will support an additional .02 jobs with a total payroll of $297 and $464 in value added. Total impacts including secondary effects are $948 in sales, $362 in personal income, $582 in value added, and .02 jobs.

Through the process of collecting this data and preparing this report, the Socioeconomic Team has compiled the best available data regarding tourism and recreation in Northeast Michigan. As previously mentioned, the data is either 5-10 years outdated or based on a small sample size. This points to the important need of collecting current visitor data in the northeast Michigan study area, so that we can refine the inputs to the economic impact model and say with more certainty what the true economic impact of visitors to the region is.

The first stage of implementing this recommendation is currently underway. The NMSP and NEMCOG are planning on administering a broad visitor survey effort in the northeast Michigan study area during the summer of 2007. This survey will focus mainly on visitors to the TBNMS Great Lakes Maritime Heritage Center, and depending on community resources will also include local marinas, lighthouses, parks, charter boat operations, and other key visitor sites.

Works Cited

Billington, R. (2004). *A case study: Federal investment attracts private investment in industrial historic sites.* Pawtucket, Rhode Island: Blackstone Valley Tourism Council Inc.

Holecek, D.F. (2003). Travel, tourism, and recreation in Michigan. In C.L. Ballard. (Ed.) *Michigan at the millenium: A benchmark and analysis of its fiscal and economic structure* (pp.455-475), East Lansing: Michigan State University Press.

Holecek, D.F., Herbowicz, T., Nikoloff, A., & Alexander, P.J. (2001). *Alcona tourism profile.* East Lansing, Michigan: Michigan State University Travel, Tourism and Recreation Resource Center.

Holecek, D.F., Herbowicz, T., Nikoloff, A., & Alexander, P.J. (2001). *Alpena tourism profile*. East Lansing, Michigan: Michigan State University Travel, Tourism and Recreation Resource Center.

Holecek, D.F., Herbowicz, T., Nikoloff, A., & Alexander, P.J. (2001). *Presque Isle Tourism profile*. East Lansing, Michigan: Michigan State University Travel, Tourism and Recreation Resource Center.

Holecek, D.F., Spencer, D.M., Williams, J.E., & Herbowicz, T. (2000). *Michigan travel market survey: Final report.* East Lansing, Michigan: Michigan State University Travel, Tourism and Recreation Resource Center.

Leeworthy, V.R. & Wiley, P.C. (2000). *National survey on recreation and the environment 2000: Current participation patterns in marine recreation.* U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects.

Michigan Economic Development Corporation. (2007). *Lights of northern Lake Huron driving tour*. Retrieved July 24, 2007, from http://www.michigan.org/travel/drivingtours/ detail.asp?cid=951AACA5-53F0-491B-ADAB-FC4A3558FAAA&m=9;4

Michigan Sea Grant. (2005). *Northeast Michigan integrated assessment (NEMIA): Visioning a sustainable future for northeast Michigan.* Retrieved May, 2007, from http://www.miseagrant.umich.edu/downloads/coastal/fs-06-700-NEMIA.pdf

National Ocean Economics Program. Retrieved April, 2006 from http://noep.mbari.org/ default.asp

Rhode Island Economic Development Corporation. *RI Databank.* Retrieved March 8, 2007, from http://www.riedc.com/riedc/ri_databank/31/

State of Michigan. (January 1996). *Preliminary population projections to the year 2020 for Michigan by counties.* Retrieved October 15, 2007, from http://www.michigan.gov/documents/8510_26104_7.pdf

Stynes, D.J. (2002). *Michigan statewide tourism spending and economic impact estimates 1998-2000.* East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University.

Stynes, D.J. (2000). *Michigan tourism spending and economic impact model (MITEIM).* East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University. Retrieved July 2006, from http://www.msu.edu/course/prr/840/econimpact/MITEIM.htm/

Travel Industry Association of America (TIA). (2006). *Economic impact of domestic travel on the Blackstone Valley at Rhode Island/Massachesetts in 2004*. Washington, D.C.: TIA.

Travel Industry Association of America (TIA). (2001). *Impacts of travel on state economies.* Washington, D.C.: TIA.

U.S. Department of Commerce, Bureau of Economic Analysis. Retrieved April, 2006 from http://www.bea.gov/index.htm

U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS). Retrieved April 2006, from http://www.bea.gov/regional/index.htm

U.S. Department of Commerce, U.S. Census Bureau. Retrieved April 2006, from http://www.census.gov

U.S. Department of Labor, Bureau of Labor Statistics, Division of Labor Force Statistics,. Retrieved April 2006, from http://www.bls.gov/

Vogt, C.A., Pennington-Gray, L., Xu, X.M., Stynes, D.J., & Fridgen, J.D. (1998). *A survey of Travel Michigan Welcome Center visitors.* East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University.

APPENDIX A. SELECTED DATA FOR CENTRAL FALLS CITY, RHODE ISLAND.

Central Falls	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Resident Labor Force											
Total Employed	7,860	7,832	7,597	6,965	7,548	7,771	7,961	8,082	8,167	7,672	7,245
Unemployed	710	695	1,162	875	577	619	523	493	371	476	825
Labor Force	8,570	8,527	8,759	7,840	8,125	8,390	8,486	8,575	8,538	8,148	8,070
Unemployment Rate	8.3%	8.2%	13.3%	11.2%	7.1%	7.4%	6.2%	5.7%	4.3%	5.8%	10.2%
Average Annual											
Private Industry Employment											
Agriculture Forestry & Fisheries											
Construction	81	86	68	80	77	85	126	161	160	144	124
Manufacturing	3,965	3,811	3,509	3,587	3,748	3,604	3,822	3,768	3,724	3,403	2,206
Transportation Communications & Utilities	46	137	26	26	31	34	29	38	34	30	30
Wholesale Trade	137	590	141	144	184	202	214	243	241	225	197
Retail Trade	687	755	568	614	655	662	688	772	778	750	510
Finance, Insurance & Real Estate	89	74	68	70	73	80	79	85	85	104	97
Service Industries	809	755	848	860	866	902	931	912	998	739	556
Total Covered Private	**5,813**	**5,486**	**5,254**	**5,380**	**5,635**	**5,569**	**5,889**	**5,997**	**6,023**	**5,394**	**3,719**
% of State	1.71%	1.61%	1.59%	1.60%	1.58%	1.51%	1.54%	1.52%	1.51%	1.34%	0.96%
Construction											
Industrial Construction in Sq. Ft.	1,000	3,200	3,400	0	6,912	42,250	0	5,680	0	0	0
Commercial Construction in Sq. Ft.	5,583	0	2,500	0	8,500	11,296	7,262	3,294	0	0	0
Total	**6,583**	**3,200**	**5,900**	**0**	**15,412**	**53,546**	**7,262**	**8,974**	**0**	**0**	**0**
Industrial Construction ($) Value	80,000	330,000	125,000	0	1,511,000	1,500,000	0	200,000	0	845,000	0
Commercial Construction ($) Value	167,000	0	75,000	0	243,000	460,000	400,000	520,000	60,700	0	0
Total ($) Value	**247,000**	**330,000**	**200,000**	**0**	**1,754,000**	**1,960,000**	**400,000**	**720,000**	**60,700**	**845,000**	**0**
Authorized New Housing Units											
Single Family	1	4	1	0	0	0	3	2	3	4	6
Multi Family	0	211	4	0	0	0	5	13	30	31	0
Total	**1**	**215**	**5**	**0**	**0**	**0**	**8**	**15**	**33**	**35**	**6**
Median Selling Price of											
Existing Single Family Home	$44,000	$42,500	$41,750	$43,500	$46,500	$56,900	$75,000	$95,000	$91,000	$107,000	$79,500

Central Falls	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change	
Resident Labor Force												1991 to 2001	1991 to 2001 %
Total Employed	6,807	6,559	6,350	6,110	6,599	6,752	6,802	6,774	6,848	6,854	6,783	-24	-0.35%
Unemployed	882	928	708	660	703	540	574	517	415	444	633	-249	-28.23%
Labor Force	7,689	7,487	7,058	6,770	7,302	7,292	7,376	7,291	7,263	7,298	7,416	-273	-3.55%
Unemployment Rate	11.5%	12.4%	10.0%	9.7%	9.6%	7.4%	7.8%	7.1%	5.7%	6.1%	8.5%		
Average Annual												**Change**	**% Change**
Private Industry Employment												**1991 to 2001**	**1991 to 2001 %**
Agriculture Forestry & Fisheries													
Construction	87	114	138	155	143	156	168	168	178	167	160	73	83.91%
Manufacturing	2,805	2,594	2,524	2,545	2,424	2,277	2,203	2,035	2,031	1,903	1,525	-1,280	-45.63%
Transportation Communications & Utilities	29	13	12	17	21	21	19	21	20	19	19	-10	-34.48%
Wholesale Trade	185	205	178	184	179	226	238	230	205	183	190	5	2.70%
Retail Trade	597	596	615	538	496	422	424	406	486	536	560	-37	-6.20%
Finance, Insurance & Real Estate	111	94	99	105	102	127	148	157	185	130	124	13	11.71%
Service Industries	584	856	866	1,013	1,043	989	1,341	1,168	1,073	846	760	176	30.14%
Total Covered Private	**4,399**	**4,471**	**4,442**	**4,565**	**4,409**	**4,218**	**4,543**	**4,188**	**4,181**	**3,790**	**3,344**	-1,055	-23.98%
% of State	1.22%	1.24%	1.22%	1.24%	1.18%	1.13%	1.19%	1.08%	1.06%	0.90%	0.83%		
Construction												**Total 89 to 99**	
Industrial Construction in Sq. Ft.	0	0	0	0	0	0	0	0	0	0		0	
Commercial Construction in Sq. Ft.	0	0	0	0	0	0	2,716					2,716	
Total	**0**	**0**	**0**	**0**	**0**	**0**	**2,716**					**2,716**	
Industrial Construction ($) Value	0	0	0	0	0	0	0	0	0	0		845,000	
Commercial Construction ($) Value	0	0	0	0	0	0	2,129,000					2,129,000	
Total ($) Value	**0**	**0**	**0**	**0**	**0**	**0**	**2,129,000**					**2,974,000**	
Authorized New Housing Units												**Total 91 to 01**	
Single Family	1	0	0	0	0	0	0	0	0	0	3	4	
Multi Family	6	0	0	0	0	0	0	0	0	0	2	8	
Total	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**12**	
Median Selling Price of Existing Single Family Home	$76,000	$88,000	$75,000	$61,450	$58,500	$56,000	$67,500	$66,900	$68,100	$77,500	$86,250		

Source: Rhode Island Economic Development Corporation, http://www.riedc.com/r/index.html.

APPENDIX A. SELECTED DATA FOR CUMBERLAND TOWN, RHODE ISLAND.

Cumberland	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Resident Labor Force											
Total Employed	12,520	12,475	12,101	12,933	14,016	14,430	14,783	15,009	15,165	15,075	15,118
Unemployed	803	937	1,298	1,094	701	741	638	604	520	659	1,129
Labor Force	13,323	13,412	13,399	14,027	14,717	15,171	15,421	15,613	15,685	15,734	16,247
Unemployment Rate	6.0%	7.0%	9.7%	7.8%	4.8%	4.9%	4.1%	3.9%	3.3%	4.2%	6.9%
Average Annual											
Private Industry Employment											
Agriculture Forestry & Fisheries	26	23	21	24	22	27	36	38	52	55	45
Construction	154	170	175	235	224	311	345	437	516	390	317
Manufacturing	3,159	3,356	3,217	2,876	2,922	2,810	2,707	2,454	2,160	1,824	1,832
Transportation Communications & Utilities	305	320	355	414	439	426	447	488	545	405	380
Wholesale Trade	525	481	429	420	409	456	576	676	705	672	190
Retail Trade	1,679	1,673	1,693	1,760	1,851	1,893	2,109	2,029	1,993	1,972	1,414
Finance, Insurance & Real Estate	38	59	67	89	115	98	127	144	145	142	66
Service Industries	606	603	624	689	776	954	1,045	1,134	1,119	1,265	1,134
Total Covered Private	**6,495**	**6,690**	**6,592**	**6,515**	**6,767**	**6,981**	**7,396**	**7,404**	**7,237**	**6,725**	**5,378**
% of State	1.91%	1.96%	1.99%	1.94%	1.89%	1.89%	1.94%	1.88%	1.81%	1.68%	1.39%
Construction											
Industrial Construction in Sq. Ft.	7,000	84,200	0	0	40,712	6,250	0	0	10,000	0	0
Commercial Construction in Sq. Ft.	10,224	4,806	9,600	0	33,267	42,907	6,250	10,000	26,630	0	1,680
Total	**17,224**	**89,006**	**9,600**	**0**	**73,979**	**49,157**	**6,250**	**10,000**	**36,630**	**0**	**1,680**
Industrial Construction ($) Value	250,000	2,850,000	0	0	1,200,000	200,000	0	75,000	300,000	0	0
Commercial Construction ($) Value	286,000	131,000	272,000	0	1,085,456	924,227	309,415	400,000	1,157,589	0	668,000
Total ($) Value	**536,000**	**2,981,000**	**272,000**	**0**	**2,285,456**	**1,124,227**	**309,415**	**475,000**	**1,457,589**	**0**	**668,000**
Authorized New Housing Units											
Single Family	50	28	37	64	101	164	263	453	270	152	136
Multi Family	2	21	8	2	12	62	190	8	2	6	4
Total	**52**	**49**	**45**	**66**	**113**	**226**	**453**	**461**	**272**	**158**	**140**
Median Selling Price of											
Existing Single Family Home	$56,000	$58,000	$51,500	$64,000	$70,000	$82,000	$118,000	$137,500	$140,500	$142,000	$142,000

Cumberland	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change	
Resident Labor Force												91 to 01	91 to 01 %
Total Employed	14,815	15,198	15,378	15,300	14,449	14,901	15,140	15,354	15,738	15,751	15,587	772	5.21%
Unemployed	1,674	1,401	1,143	983	908	725	710	697	567	532	752	-922	-55.08%
Labor Force	16,189	16,599	16,521	16,283	15,357	15,624	15,850	16,051	16,305	16,283	16,339	150	0.93%
Unemployment Rate	8.5%	8.4%	6.9%	6.0%	5.9%	4.6%	4.5%	4.3%	3.5%	3.3%	4.6%		
Average Annual												Change	% Change
Private Industry Employment												91 to 01	91 to 01 %
Agriculture Forestry & Fisheries	43	36	42	44	55	61	72	75	78	86	86	43	100.00%
Construction	244	246	502	533	490	485	565	555	603	667	682	438	179.51%
Manufacturing	1,486	1,371	1,358	1,392	1,368	1,827	1,540	1,519	1,351	1,424	1,391	-95	-6.39%
Transportation Communications & Utilities	322	327	358	374	484	502	474	511	591	566	381	59	18.32%
Wholesale Trade	176	190	219	248	460	265	286	325	322	336	346	170	96.59%
Retail Trade	1,424	1,504	1,536	1,399	1,584	1,834	1,850	1,769	1,853	1,933	1,757	333	23.38%
Finance, Insurance & Real Estate	111	117	135	152	142	168	187	190	144	170	189	78	70.27%
Service Industries	1,119	1,103	1,196	1,186	1,294	1,345	1,458	1,539	1,653	1,825	1,968	849	75.87%
Total Covered Private	**4,924**	**4,896**	**5,356**	**5,334**	**5,877**	**6,385**	**6,433**	**6,483**	**6,595**	**7,008**	**6,802**	**1,878**	**38.14%**
% of State	1.36%	1.36%	1.47%	1.45%	1.57%	1.70%	1.69%	1.67%	1.67%	1.73%	1.68%		
Construction												Total 90 to 00	
Industrial Construction in Sq. Ft.	0		4,800	0	0	4,800	71,865	0	0	11,000		92,465	
Commercial Construction in Sq. Ft.	11,400		116,435	54,516	2,800	1,978	40,084	0	1,400	155,666		385,959	
Total	**11,400**	**0**	**121,235**	**54,516**	**2,800**	**6,778**	**111,949**	**0**	**1,400**	**166,666**		**478,424**	
Industrial Construction ($) Value	0	100,000	140,000	0	0	140,000	2,360,000			5,400,000		8,140,000	
Commercial Construction ($) Value	627,000	185,000	3,000,000	1,863,000	110,000	16,100	2,400,000	0	465,800	23,863,930		33,198,830	
Total ($) Value	**627,000**	**285,000**	**3,140,000**	**1,863,000**	**110,000**	**156,100**	**4,760,000**	**0**	**465,800**	**29,263,930**		**41,338,830**	
Authorized New Housing Units												Total 91 to 01	
Single Family	95	137	143	103	79	104	140	159	197	119	125	1,401	
Multi Family	2	0	6	0	4	18	0	0	290	33	0	353	
Total	**97**	**137**	**149**	**103**	**83**	**122**	**140**	**159**	**487**	**152**	**125**	**1,754**	
Median Selling Price of Existing Single Family Home	$142,000	$127,000	$129,900	$134,500	$133,250	$126,000	$130,000	$135,000	$148,900	$163,000			

Source: Rhode Island Economic Development Corporation, http://www.riedc.com/r/index.html.

APPENDIX A. SELECTED DATA FOR NORTH SMITHFIELD TOWN, RHODE ISLAND.

North Smithfield	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Resident Labor Force											
Total Employed	4,612	4,596	4,458	4,769	5,168	5,321	5,451	5,534	5,592	5,509	5,147
Unemployed	266	305	405	371	201	233	203	183	108	146	339
Labor Force	4,878	4,901	4,863	5,140	5,369	5,554	5,654	5,717	5,700	5,655	5,486
Unemployment Rate	5.5%	6.2%	8.3%	7.2%	3.7%	4.2%	3.6%	3.2%	1.9%	2.6%	6.2%
Average Annual											
Private Industry Employment											
Agriculture Forestry & Fisheries	75	45	63	64	71	78	74	81	66	69	55
Construction	93	84	76	93	111	141	181	198	204	214	150
Manufacturing	2,678	2,506	2,490	2,543	2,218	1,804	1,586	1,408	1,084	1,667	1,586
Transportation Communications & Utilities	32	19	17	23	26	24	20	21	20	90	20
Wholesale Trade	245	257	225	230	236	255	275	288	275	279	270
Retail Trade	605	521	426	400	502	561	617	647	652	659	492
Finance, Insurance & Real Estate	12	32	34	34	34	46	54	52	49	48	11
Service Industries	935	896	929	941	969	1,037	976	1,006	1,064	1,159	679
Total Covered Private	**4,695**	**4,377**	**4,277**	**4,337**	**4,177**	**3,961**	**3,801**	**3,727**	**3,441**	**4,216**	**3,291**
% of State	1.38%	1.28%	1.29%	1.29%	1.17%	1.07%	0.99%	0.95%	0.86%	1.05%	0.85%
Construction											
Industrial Construction in Sq. Ft.	0	0	43,600	0	0	4,800	0	0	0	0	12,800
Commercial Construction in Sq. Ft.	0	5,542	0	0	24,000	0	22,520	3,020	11,200	5,100	0
Total	**0**	**5,542**	**43,600**	**0**	**24,000**	**4,800**	**22,520**	**3,020**	**11,200**	**5,100**	**12,800**
Industrial Construction ($) Value	0	0	1,350,000	0	0	200,000	0	0	0	0	122,000
Commercial Construction ($) Value	0	171,000	0	0	390,000	0	835,000	282,300	161,000	870,000	0
Total ($) Value	**0**	**171,000**	**1,350,000**	**0**	**390,000**	**200,000**	**835,000**	**282,300**	**161,000**	**870,000**	**122,000**
Authorized New Housing Units											
Single Family	22	13	10	24	25	42	53	67	59	46	32
Multi Family					25					0	2
Total	**22**	**13**	**10**	**24**	**50**	**42**	**53**	**67**	**59**	**46**	**34**
Median Selling Price of Existing Single Family Home	$49,900	$47,500	$45,500	$52,900	$55,000	$67,200	$94,000	$115,750	$145,000	$144,750	$158,000

North Smithfield	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change	
Resident Labor Force												91 to 01	91 to 01 %
Total Employed	4,985	5,050	5,078	5,024	4,952	5,105	5,182	4,858	4,966	4,970	4,918	-67	-1.34%
Unemployed	456	455	374	288	235	141	174	212	192	162	174	-282	-61.84%
Labor Force	5,441	5,505	5,414	5,312	5,187	5,246	5,356	5,070	5,158	5,132	5,092	-349	-6.41%
Unemployment Rate	8.4%	8.3%	6.9%	5.4%	4.5%	2.7%	3.2%	4.2%	3.7%	3.2%	3.4%		
Average Annual												Change	% Change
Private Industry Employment												91 to 01	91 to 01 %
Agriculture Forestry & Fisheries	57	51	51	43	36	35	39	52	63	70	79	22	38.60%
Construction	94	118	127	149	194	166	180	190	199	232	247	153	162.77%
Manufacturing	1,404	1,216	1,077	1,129	1,170	1,012	677	961	798	687	675	-729	-51.92%
Transportation Communications & Utilities	86	165	172	186	164	167	181	177	224	236	201	115	133.72%
Wholesale Trade	244	248	288	317	334	335	338	358	377	393	191	-53	-21.72%
Retail Trade	500	466	519	563	587	644	785	932	1,048	1,147	1,095	595	119.00%
Finance, Insurance & Real Estate	40	42	58	61	57	61	63	44	51	52	78	38	95.00%
Service Industries	819	944	1,001	1,095	1,135	1,189	1,091	1,080	1,064	1,053	1,101	282	34.43%
Total Covered Private	**3,269**	**3,279**	**3,328**	**3,586**	**3,677**	**3,653**	**3,400**	**3,843**	**3,864**	**3,909**	**3,709**	**440**	**13.46%**
% of State	0.91%	0.91%	0.91%	0.97%	0.98%	0.97%	0.89%	0.99%	0.98%	0.97%	0.92%		
Construction												Total 90 to 00	
Industrial Construction in Sq. Ft.	0	0	660	1,600	0	0			0	20,200		35,260	
Commercial Construction in Sq. Ft.	90,142	126,920	0	356,000	0	1,840	0	0	31,586	0		606,488	
Total	**90,142**	**126,920**	**660**	**357,600**	**0**	**1,840**	**0**	**0**	**31,586**	**20,200**		**641,748**	
Industrial Construction ($) Value	0	0	537,000	1,350,000	0	0	247,900		0	975,000		3,231,900	
Commercial Construction ($) Value	3,180,000	3,489,000	0	7,400,000	0	107,405	0	0	3,100,000	0		17,276,405	
Total ($) Value	**3,180,000**	**3,489,000**	**537,000**	**8,750,000**	**0**	**107,405**	**247,900**	**0**	**3,100,000**	**975,000**		**20,508,305**	
Authorized New Housing Units												Total 91 to 01	
Single Family	35	34	41	38	25	36	31	43	48	25	27	383	
Multi Family	35	23	0	0	0	0	0	0	76	0	0	134	
Total	**70**	**57**	**41**	**38**	**25**	**36**	**31**	**43**	**124**	**25**	**27**	**517**	
Median Selling Price of Existing Single Family Home	$140,000	$136,000	$139,900	$131,000	$127,500	$128,000	$140,000	$157,000	$155,000	$173,950	$189,900		

Source: Rhode Island Economic Development Corporation, http://www.riedc.com/r/index.html.

CHAPTER 3

ECOLOGICAL ASSESSMENT

3. ECOLOGICAL ASSESSMENT

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3.1 INTRODUCTION

An integrated assessment (IA) brings together policy makers, scientists, and key stakeholders to address a common issue of concern through collaboration and a formal analysis process. An IA is an approach to synthesizing and delivering relevant, independent scientific input to decision making through a comprehensive analysis of existing natural and social scientific information in the context of a policy or management question (Michigan Sea Grant [MSG], 2005). The goal of an IA is to link existing natural and social scientific knowledge about a problem with policy options in order to help decision makers evaluate possible actions.

The Northeast Michigan Integrated Assessment (NEMIA) - the first IA led by MSG – was conducted for the three-county region of Presque Isle, Alpena, and Alcona Counties in Northeast Michigan. This coastal area in along Lake Huron includes rich natural and cultural resources. Historically, the region has depended on its natural resources and accessibility to the Great Lakes for economic development. However, in recent years, as the traditional economic base (lumbering, mining, manufacturing, agriculture, hunting, and fishing) has declined, community leaders have turned to tourism to boost the economy by promoting the natural and cultural resources unique to the area, especially those associated with the coast. Despite the potential for economic development, the communities located here wish to proceed cautiously to avoid overdevelopment and destruction of the area's unique resources. These resources represent not only a growth opportunity but also a quality of life for local citizens (Northeast Michigan Integrated Assessment [NEMIA], 2005). A desire to strike a balance between these two interests is reflected in this IA's key policy question, as developed by the NEMIA stakeholders:

> How can coastal access be designed, in a regional context for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

After working with stakeholders to identify the policy or question to be addressed by the IA, assessment teams were built to conduct value-independent descriptions of the status and trends of environmental, social, and economic conditions related to the question, as well as consider the causes and consequences of those conditions. (For more information on the NEMIA process, see Chapter 1.) The cultural, socioeconomic, and planning and zoning assessment teams addressed social science aspects of this question, while the goal of the ecological team was to highlight the region's ecologically valuable lands by gathering existing GIS data layers of the region's natural features.

3.1 STUDY AREA

The NEMIA study area consisted of Alcona, Alpena, and Presque Isle counties. The three counties are located on the northeastern side of the state's Lower Peninsula, are heavily forested,

contain a large number of wetlands, and have extensive undeveloped Great Lakes shoreline on the northwest coast of Lake Huron. The three counties total just under 2000 square miles, Total population is 57,500. There are four cities, with the city of Alpena being the most populous at 20,000. The rest of the population is spread throughout the region, with roughly 14,400, 11,700, and 31,400 residents in Presque Isle, Alcona, and Alpena counties, respectively (US Census, 2007).

Historically, mining and forestry have been the staples of the regional economy, but have decreased in importance, though the area still has several large quarries. Manufacturing, agriculture, and the military have also been important in the past, but the majority of these jobs have been lost, and the region is facing economic challenges. The current major attractions to the area include Great Lakes cultural tourism, and hunting and fishing activities. However, these industries are currently addressing their own problems such as health concerns in some of the popular game species, and a lack of shoreline amenities such as hotels.

3.2 METHODS

We chose to use GIS (Geographic Information Systems) software extensively to develop two information products: 1) a set of standardized digital datasets representing natural and built features of the NEMIA region, to be transferred to the NEMIA workgroup at the conclusion of the assessment, and 2) a series of maps displaying different combinations of the digital datasets.

GIS makes it possible to collect, analyze, and display multiple sets of digital spatial data simultaneously. Datasets can be layered on top of one another to produce maps that show multiple spatial datasets and provide tools to analyze the relationships between the phenomena represented by the datasets (also called “layers”). These maps can be distributed cheaply to decision makers and the public to inform policy-making processes. Another benefit of GIS is that the information products (in this case, data layers and maps) are easily updatable. This was ideal for this inventory; at the conclusion of the IA process the data layers and maps can be transferred to decision makers who can update and improve them as new information becomes available. However, due to the lack of GIS layers representing features at a variety of points in time, we could not provide information on trends, and instead focused on identifying and mapping the current status of the region’s natural features.

To develop the information products, we acquired as many existing digital layers as possible representing features of the natural and built environment in the NEMIA study area. This process consisted of first identifying a feature of interest (e.g. highways, forest cover, rivers) and then finding an agency that may have converted the spatial information on the feature to a GIS-compatible format. A full list of all layers used and their sources is available in Appendix A of this report.

The layers representing the six ecological features that formed the basis of our analysis are: endangered ecosystems, endangered animals, endangered plants, wetlands, interior forests, and pre-settlement landcover. These layers were developed by and acquired from the following sources:

- Forest cover data was downloaded from the United States Geological Survey website

- The National Wetlands Inventory (NWI), developed by the United States Fish and Wildlife Service
- Pre-settlement landcover, developed by Michigan Natural Features Inventory (MNFI) based on data Michigan Department of Natural Resources (DNR) data.
- The endangered ecosystems and species information was acquired from the MNFI.

We standardized all layers we collected by converting them to the Michigan Georef projection.[1] Next, to focus all layers on the NEMIA region, we reduced the extent of those layers that covered an area larger than the region, and combined layers that covered an area smaller than the region. For example, layers from the Michigan Online Geographic Data Library are produced at the county scale, which means that for example, rivers in the three-county NEMIA region are represented by three separate layers. In this case, we combined the three layers to create one new layer showing rivers in the entire NEMIA region.

After acquiring all available layers and standardizing them, we produced a set of maps that would be useful for decision makers in planning for sustainable tourism and natural features protection. These maps are presented in the results section (Figures 3.1-3.12), in addition to details about what they show. Figures 3.4 and 3.5, maps displaying areas of ecological importance, were created using existing spatial data layers and data we collected specifically for this assessment. Using the results of a survey and a ranking activity to weight each natural feature, these maps compare the opinions of the NEMIA workgroup about the location of valuable natural features with researchers' opinions.[2] More details about the development of the ranking maps are included in the results section.

3.3 RESULTS

The products of this natural features inventory are a set of digital data layers and maps developed using those layers that are designed to be useful for decision makers in planning for sustainable tourism and natural features protection. A list of all data layers obtained, their sources, and details about what they represent is available in Appendix A. All of the layers used to make these maps will be transferred to the NEMIA work group for future use in regional planning and sustainable tourism efforts. The work group can then make maps specific to their needs using different combinations of layers we have provided. The remainder of this section is a presentation of themed maps developed by combining layers that we obtained in this process. For each map we list the layers included and a brief description of what each layer represents.

---

[1] When converting individual shapefile layers to and from the raster format, the projection file in each shapefile format had to be manually adjusted to make up for a flaw in how ArcGIS 9.1 converts shapefiles from rasters in the Michigan Georef projection. This flaw involves the misreading of decimal-degrees and degrees-minutes-seconds by the program in the conversion process.

[2] The use of opinions in GIS is well established, and has been used in a variety of contexts; from modeling perceptions of groundwater contamination, to modeling the distribution of flora and fauna (Pearce, Cherry, Drielsma, Ferrier, & Whish, 2001; Clevenger, Wierzchowski, Chruszcz, & Gunsuns, 2002; Theriault et al., 1999). Using the opinions of residents to help in the planning of a community's future is known as participatory Geographic Information Systems (Hawthorne, 2005). It gives residents' views a new vitality by changing them into a tool for decision makers. While the opinion maps produced for this assessment do not accurately reflect local sentiments, since the only opinions polled were members of the workgroup, the opinion mapping does represent an important first step in gauging local sentiment (Geertman, 2002).

3.3.1 Study Area Base Map

Figure 3.1 is a base map of the NEMIA study area to serve as a reference, indicating the locations of municipalities, transportation routes, and major development infrastructure. Included in this map are the following features (sources in parentheses):

- Rivers (IFR) – Lake Huron tributaries
- Trails (NEMCOG) – non-motorized trails and the Huron Greenways route systems (which includes existing trails and roads)
- Roads (MiGDL)– all roads, including highways
- Railroads (MiGDL) – Detroit and Mackinaw railways
- Highways (MiGDL) – federal and state designated routes
- Utilities (MiGDL) – power transmission lines and pipelines
- State Parks (MiDNR) – parks in the Michigan DNR's state parks system

3.3.2 Natural Features

Figure 3.2 displays the type and extent of the natural features in the region. These are the some of the features that will provide the basis for land preservation and sustainable tourism.

To clarify the areas of high concentrations of the natural features included in Figure 3.2, we created Figure 3.3, a complementary map showing areas with multiple natural features present. In GIS software, datasets are layered on top of one another, such that in areas where multiple layers overlap, only the features in the layer that was placed "on top" by the user is visible. When creating Figure 3.2, we arranged the order of the layers in such a way as to place layers with features covering a smaller spatial extent above layers with larger spatial extents. The effect is that the smaller layers are visible because they are displayed "on top" of the larger ones. Because of this aspect of the software, in Figure 3.2, it is not easy to locate the areas of high natural feature concentration because in places where multiple features overlap, only the layer on the top is visible. Using Figures 3.2 and 3.3 in conjunction provides a more complete picture of the distribution of natural features in the region.

The following features (sources in parentheses) were included in Figure 3.2 and used in developing Figure 3.3.

- Protected Lands (DU) – land that is currently mostly undeveloped, including state, county, and city parks, state and national forests, nature preserves, and golf courses (note: While golf courses are intensively managed and typically have limited significant natural features, from the perspective of the data source (DU) golf courses provide valuable staging grounds for waterfowl and geese. The structure of the data layer was binary, such that either a pixel was protected or not protected. As such, we had no way to exclude only golf courses.
- Trails (NEMCOG) – non-motorized trails and the Huron Greenways route systems (which includes existing trails and roads). We included trails to demonstrate the

Figure 3.1

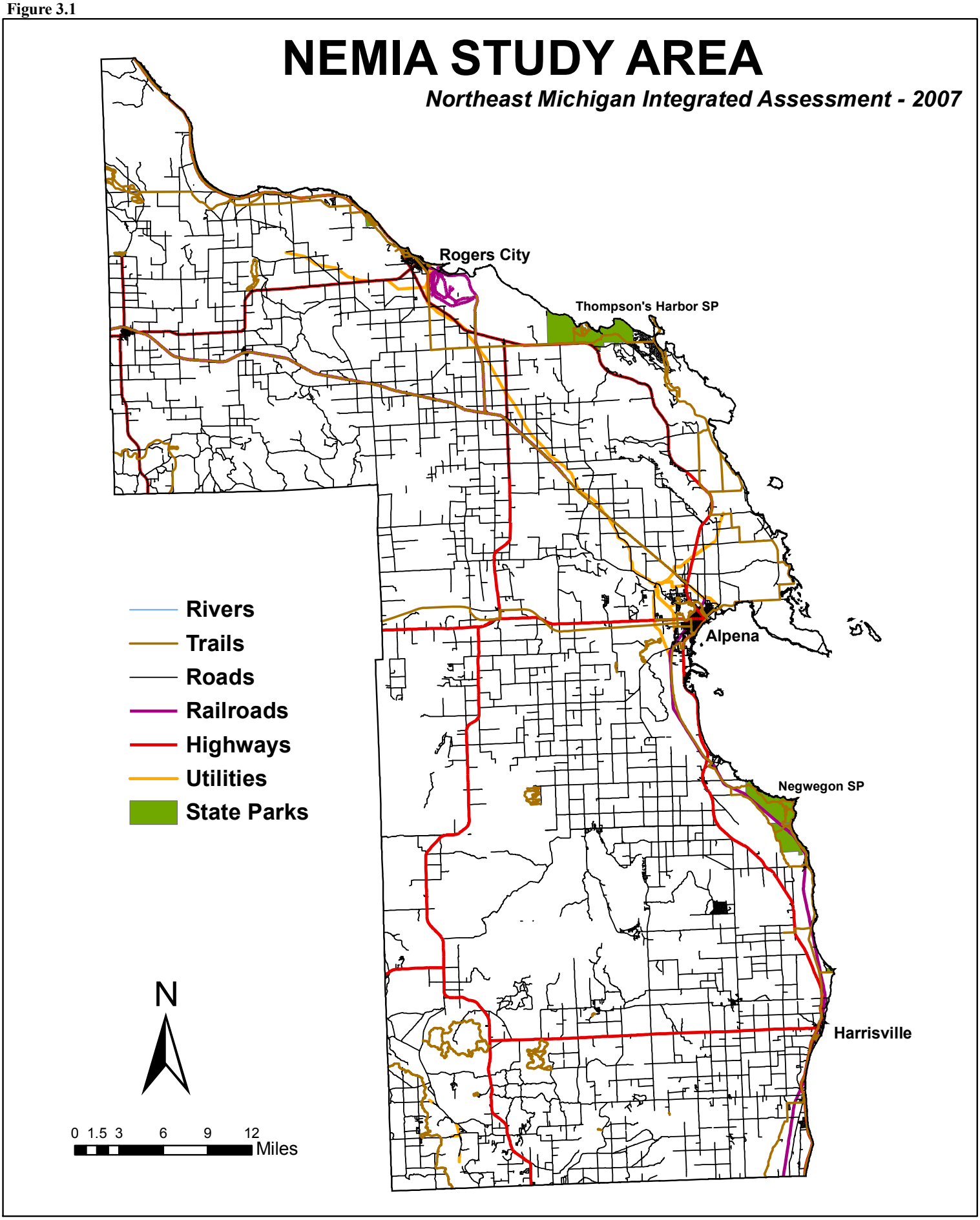

NEMIA STUDY AREA
Northeast Michigan Integrated Assessment - 2007
Rogers City
Thompson's Harbor SP
Alpena
Negwegon SP
Harrisville
Rivers
Trails
Roads
Railroads
Highways
Utilities
State Parks
N
0 1.5 3 6 9 12
Miles

Figure 3.2

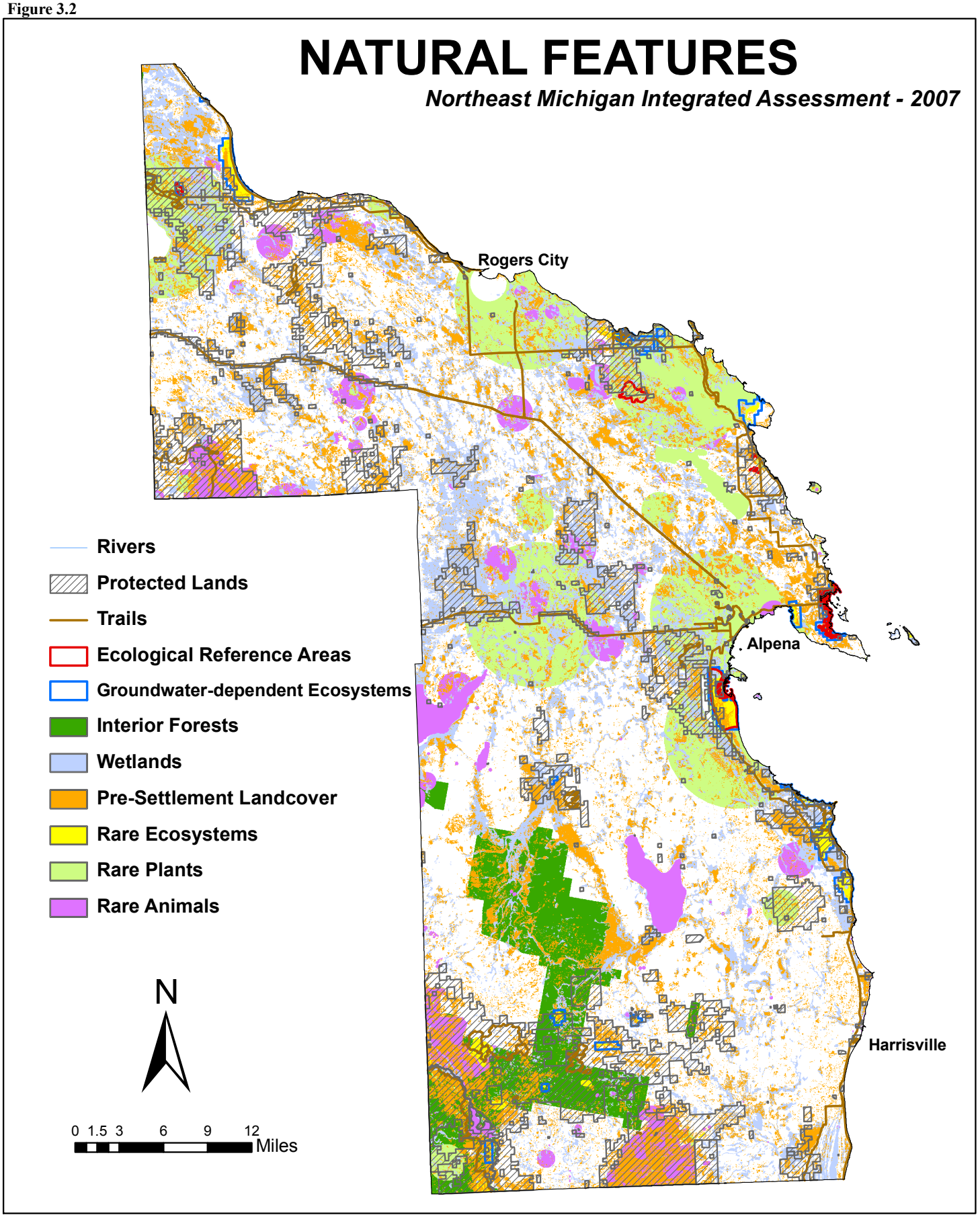
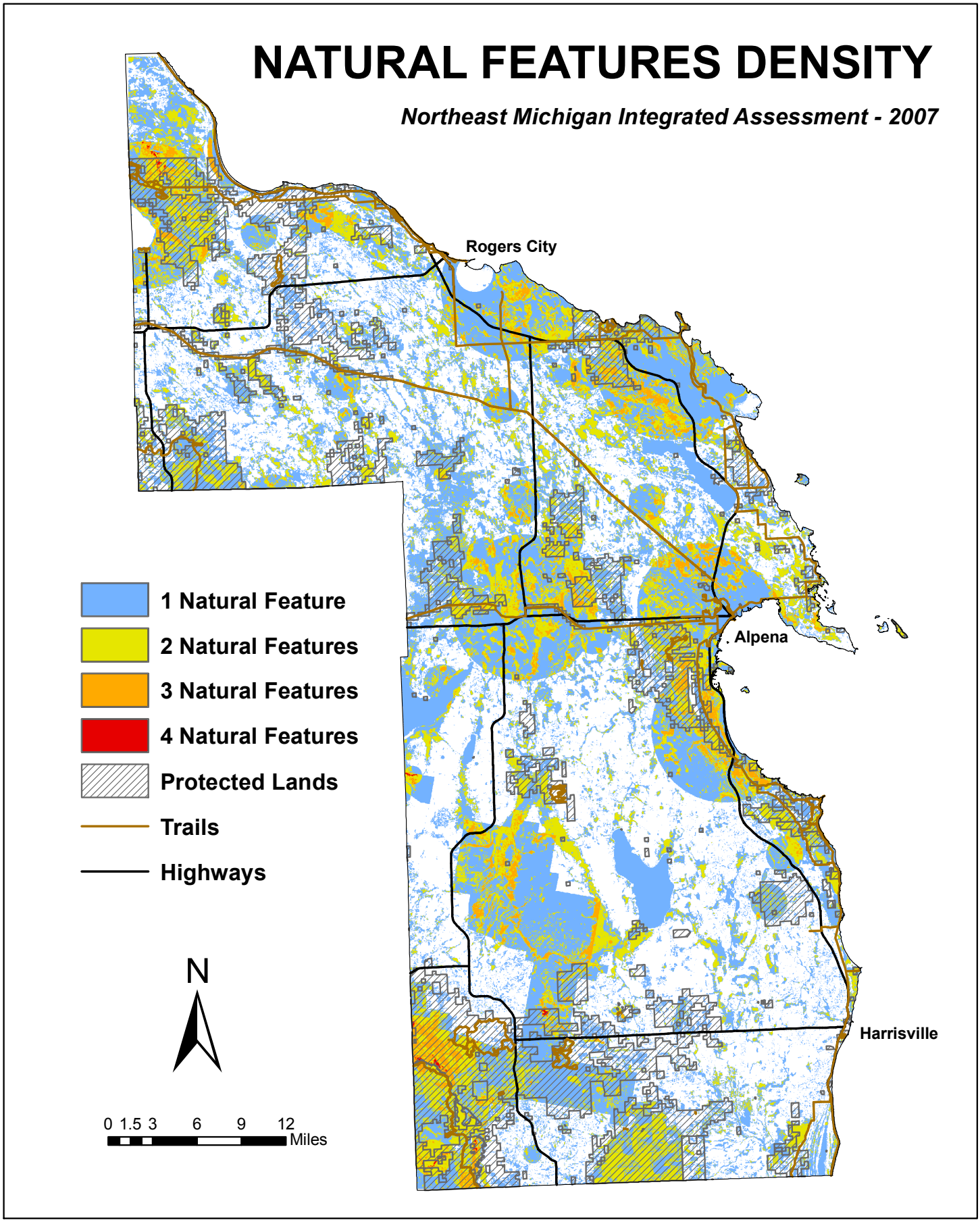

NATURAL FEATURES
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Rivers
Protected Lands
Trails
Ecological Reference Areas
Groundwater-dependent Ecosystems
Interior Forests
Wetlands
Pre-Settlement Landcover
Rare Ecosystems
Rare Plants
Rare Animals
N
0 1.5 3 6 9 12
Miles

Figure 3.3


NATURAL FEATURES DENSITY
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
1 Natural Feature
2 Natural Features
3 Natural Features
4 Natural Features
Protected Lands
Trails
Highways
N
0 1.5 3 6 9 12
Miles

accessibility of some of these important areas, both for recreational purposes and as an indicator of potential vulnerability.

- Ecological Reference Areas (MNFI) – areas that serve as models of ecological reference within the State of Michigan. They are high quality examples of functioning ecosystems that are primarily influenced by natural ecological processes, and they may be located upon any land ownership in the State. This layer includes an initial set of ERAs in the NEMIA region. They were selected because they meet the initial base requirements for ERA selection: they are known high quality sites in the Michigan Natural Features Inventory (MNFI) natural community classification system with an Element Occurrence (EO) rank of A or B and Global (G) or State (S) element ranking of endangered (1), threatened (2), or rare (3).
- Groundwater-dependent Ecosystems (MNFI) – 1000m x 1000m sections of land that are considered one of the 28 "groundwater dependent" natural community types as mapped by the Michigan Natural Features Inventory. The integrity of these natural communities depends on the presence of groundwater.
- Interior Forests (USGS) – a 1000m x 1000m section of forested land that is fully surrounded by other 1000m X 1000m sections of forested or partially forested land
- Wetlands (MiGDL) – land with one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes (plants adapted to living in water or moist soils); 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. Does not include land that is flooded on a permanent or seasonal basis because of human activity.
- Rivers (IFR) – Lake Huron tributaries, shown as reference (not included in the ranking exercise)
- Pre-settlement Landcover (MNFI) – land that has maintained its ecological character since pre-settlement times (early 1800s) even though it may have been lumbered, farmed, burned over, or otherwise altered by humans.
- Rare Ecosystems (MNFI) – the area where an ecosystem with a Global Conservation State Rank of G1 (critically imperiled), G2 (imperiled), or G3 (vulnerable) was reported (the size of the area shown relates to the certainty of the reported sighting)
- Rare Plants – (MNFI) the area where a plant species with a Global Conservation State Rank of G1 (critically imperiled), G2 (imperiled), or G3 (vulnerable) was reported (the size of the area shown relates to the certainty of the reported sighting)
- Rare Animals – (MNFI) the area where an animal species with a Global Conservation State Rank of G1 (critically imperiled), G2 (imperiled), or G3 (vulnerable) was reported (the size of the area shown relates to the certainty of the reported sighting)

The layers showing rare organisms and ecosystems represent confirmed sightings of rare plants, animals, or ecosystems from the Michigan Natural Features Inventory. Therefore the absence of a feature on the map does not mean that it is not there, it means that no one has reported any rare species in the region. In other words, an *absence of presence* of a feature on this map does not confirm the *presence of absence.* Even though common plants, animals, and ecosystems are valuable natural assets, we focused on rare organisms and ecosystems because they have priority for targeted conservation and because they have more potential as new tourist attractions. Similarly, data on the ranges and population sizes of game species would be useful since many

visitors come from outside the region to hunt, however hunting is an established tourism market, and we decided to provide information useful for developing new markets.

A special note about data layers developed using MNFI data: The MNFI uses historical records as one of its sources in developing its data layers. Each historical record is assessed for uncertainty, and this uncertainty is taken into account when developing spatial data layers. For example, in Figure 3.2, the locations of rare plants and animals are indicated by circular areas. Contrary to intuition, this does not mean that the rare plant or animal is present throughout the entire indicated area. Rather it means that someone reported the presence of a rare plant or animal at the center of that circle, and the diameter of the circle is a reflection of the amount of uncertainty associated with that reported occurrence. The larger the circle, the more uncertainty is associated with the location of the reported occurrence. Inaccuracy in the historical data led to widening of the habitat area to cover for the uncertainty. Therefore, for the MNFI data layers, it is best to view the circles as showing areas where the feature of interest may occur, rather than of actual occurrence.

We could not gain access to current data on land divisions and parcel boundaries, but these data would enhance Figure 3.2. Parcel boundaries are valuable because they show the intensity of land division, which is a good indicator of current and future development. (An area with many small parcels is more likely to have more development than a similarly sized area with only a few large parcels). In terms of preservation, it can be difficult to protect natural features when land division is intense since natural features do not follow political or civil boundaries. When a significant natural feature is located on land owned by multiple parties, preservation requires cooperation among a number of landowners who likely have diverse values and goals for their property.

3.3.3 Ranking Areas of Ecological Importance

Figures 3.4 and 3.5 provide a visual comparison of the opinions of experts (a group of researchers from the University of Michigan's School of Natural Resources and Environment) and regional decision makers (members of the NEMIA workgroup) about the relative importance of different natural features in the NEMIA study area. The opinions were used to rank each natural feature compared to the others. The purpose was twofold: to see what features each group values most (relative to the other features) and to target areas for protection by identifying the features that both groups agree are important for protection (Kyem, 2004; Theriault, 2002).

Figures 3.4 and 3.5 were developed using the results from the NEMIA Natural Features Opinion Survey (see Appendix B), which was administered to participants of the August, 2006 NEMIA work group meeting. The survey consisted of a ranking exercise in which the respondent was asked to rank each of the six ecological features of interest based on their understanding of the importance of the feature relative to the other features in the survey. The results of the survey were standardized and then used to weight each natural feature layer. It should be clarified that the spatial information for these maps was not created for this assessment; rather the expert input was incorporated as attributes for existing polygons to change how that information could be displayed. Table 3.1 summarizes the results of the survey. For example, when ranking the ecological importance of wetlands, 14 people ranked them as highest priority (3 points), 5 people

Figure 3.5

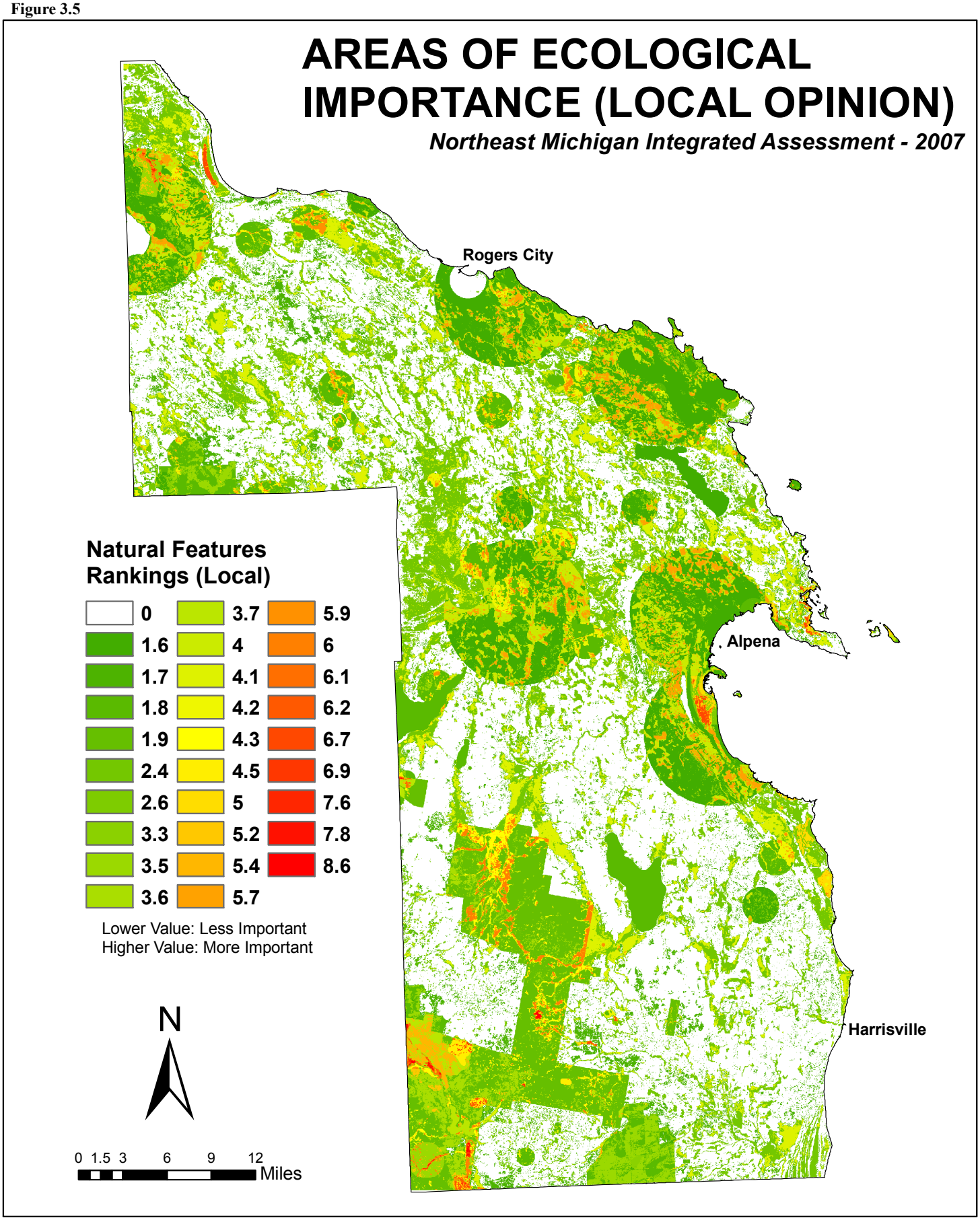
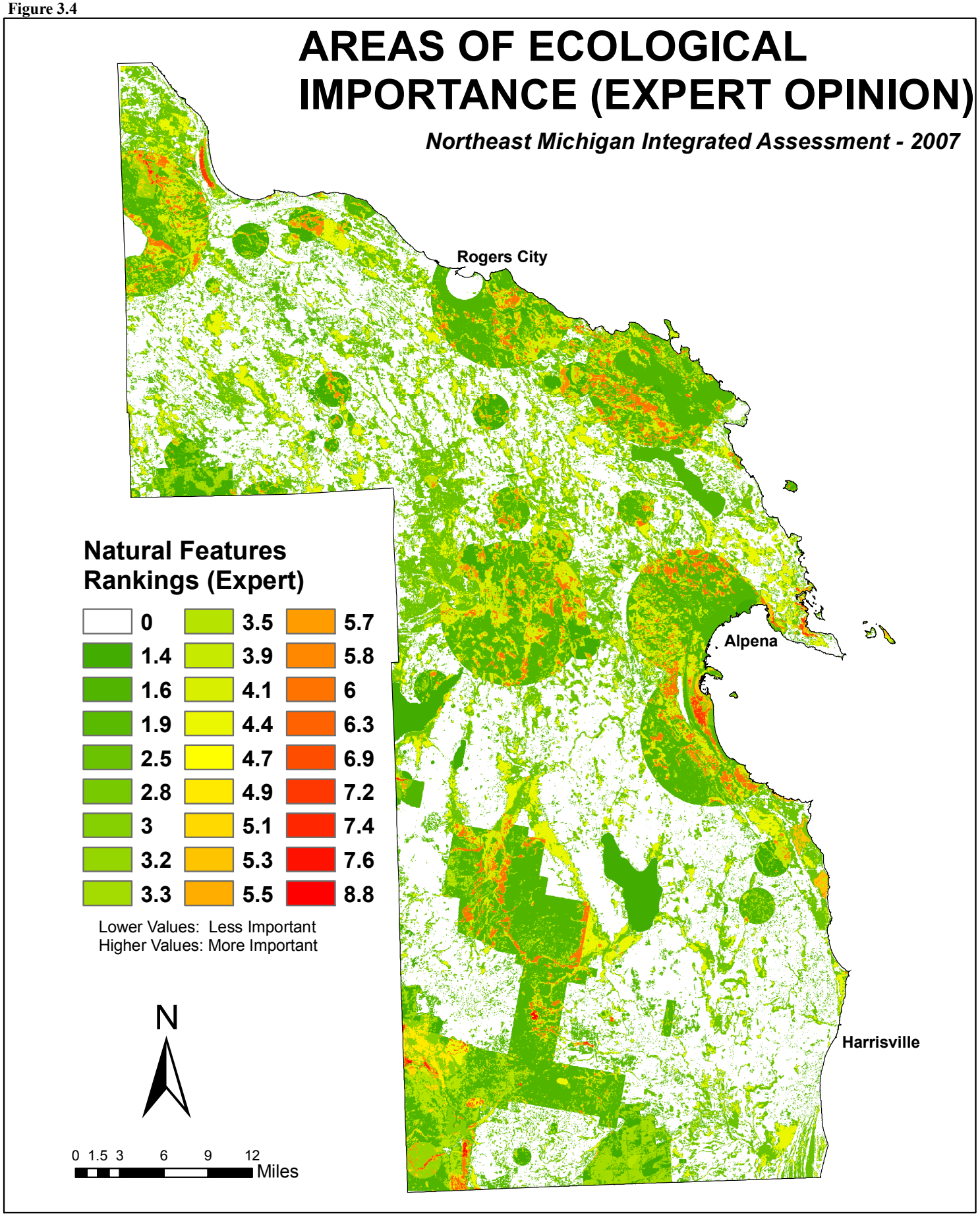

AREAS OF ECOLOGICAL IMPORTANCE (LOCAL OPINION)
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Natural Features Rankings (Local)
0
1.6
1.7
1.8
1.9
2.4
2.6
3.3
3.5
3.6
3.7
4
4.1
4.2
4.3
4.5
5
5.2
5.4
5.7
5.9
6
6.1
6.2
6.7
6.9
7.6
7.8
8.6
Lower Value: Less Important
Higher Value: More Important
N
0 1.5 3 6 9 12
Miles

Figure 3.4


AREAS OF ECOLOGICAL IMPORTANCE (EXPERT OPINION)
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Natural Features Rankings (Expert)
0
1.4
1.6
1.9
2.5
2.8
3
3.2
3.3
3.5
3.9
4.1
4.4
4.7
4.9
5.1
5.3
5.5
5.7
5.8
6
6.3
6.9
7.2
7.4
7.6
8.8
Lower Values: Less Important
Higher Values: More Important
N
0 1.5 3 6 9 12
Miles

ranked wetlands second (2 points), and 4 people voted wetlands as third priority (1 point). Appendix C, Figure 1 shows a flowchart explaining the details of development of Figures 3.4 and 3.5.

Table 3.1. Results of the Natural Features Opinion Survey.

Local Opinions	*"3 points"*	*"2 points"*	*"1 point"*	*Votes*	*"Total Points"*	*Weight=total points/votes*
Endangered Communities/Ecosystems	18	3	3	24	63	2.6
Wetlands	14	5	4	23	56	2.4
Large Forest Interiors	6	9	9	24	45	1.9
Endangered Animals	4	10	10	24	42	1.8
Pre-settlement Landcover	4	7	12	23	38	1.7
Endangered Plants	1	12	9	22	36	1.6
Expert Opinions						
Endangered Communities/Ecosystems	10	3	0	13	36	2.8
Wetlands	9	2	1	13	32	2.5
Pre-settlement Landcover	3	7	2	13	25	1.9
Large Forest Interiors	2	4	7	13	21	1.6
Endangered Plants	1	6	6	13	21	1.6
Endangered Animals	1	3	9	13	18	1.4

Note: The names of the some of the natural features used in the survey and listed in the Table 3.1 differ from those used in the rest of this document. Specifically, the terms Endangered Ecosystems, Endangered Animals, Endangered Plants, and Large Interior Forests, which were used in the survey, were changed to Rare Ecosystems, Rare Animals, Rare Plants, and Interior Forests, respectively, for this document. The changes were made to the first three terms to eliminate confusion surrounding the word endangered, which carries legal and regulatory connotations that we did not intend to invoke. We changed Large Forest Interiors to Interior Forests simply to shorten the heading.

These maps provide guidance on regional opinion and researcher opinions; however they do not represent the opinion of all residents of the region, regional decision makers or all ecologists. The maps illustrate the opinions of only the decision-makers in attendance at the NEMIA meeting where the survey was administered, and the ecologists surveyed at SNRE. The maps are designed to serve as conversation starters and to highlight the geographic areas that regional decision makers and ecologists agree need to be protected (Hansen, 2004; Balram, Dragicevic, & Meredith, 2004). Areas where these maps intersect are important to both experts and locals and should be prioritized for protection.

It should also be emphasized that these rankings are relative, not absolute. The final weights applied to each natural feature layer are based on the average rankings from the opinion survey. These maps display only the relative rankings among natural features as determined by the survey.

These maps are only meant to show how experts and regional decision makers compare a specific set of natural features to each other. They do not show how the decision-makers or ecologists would rank natural features against development. These maps do not display or provide insight into potential conflict over priority of use for the areas where these features are located.

To complement this set of maps, a more robust survey of local opinion regarding ecological features should be performed to identify the areas with strong public support for protection. This survey would explore the possibility that regional decision makers and residents have different views. The survey methodology could also be improved to better reflect residents' feelings about specific places and regions in the area, and include features not included in the original survey.

3.3.4 Geological Features

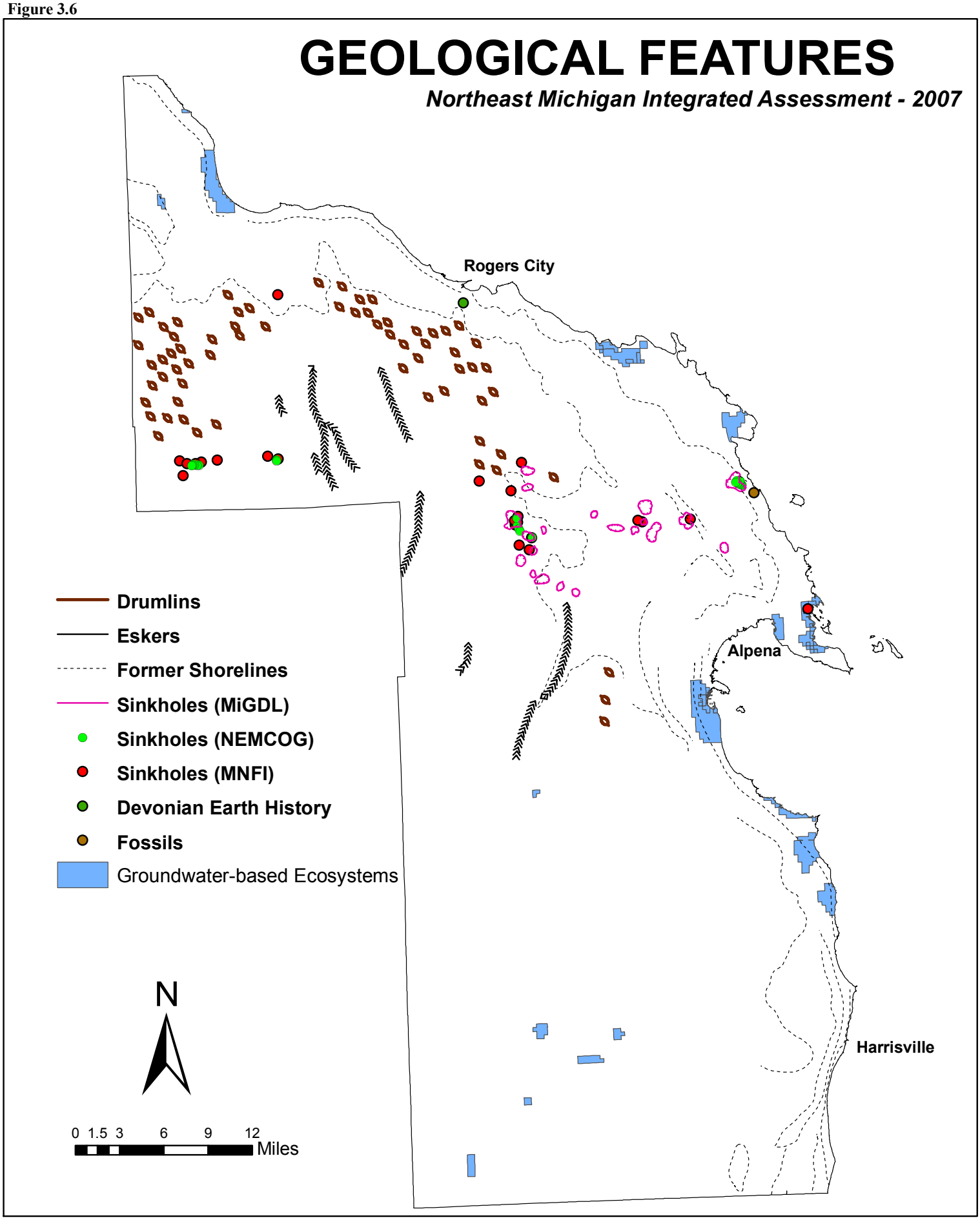
Figure 3.6 shows aboveground geological features in the NEMIA region. The region's karst topography has created unique geological features that remain untapped in terms of tourism potential. These features often possess unique historical, social, and ecological importance and should be preserved and considered for tourism development. We also included groundwater-dependent ecosystems because they are areas where geology and hydrology combine to create unique plant and animal communities.

The following features (sources in parentheses) were included in Figure 3.6:

- 1982 Quaternary Geology (MiGDL)
    - Drumlins – whale-shaped elongated hills formed by glacial action
    - Eskers – winding ridges formed from gravel and sand deposited in tunnels running through a glacier.
    - Former Shorelines – former Lake Huron shorelines
- Sinkholes (NEMCOG) – depressions or holes in the land surface resulting from the gradual removal of soluble bedrock (such as limestone) by water
- Geological Features (MNFI)
    - Sinkholes – depressions or holes in the land surface resulting from the gradual removal of soluble bedrock (such as limestone) by water
    - Devonian earth history – artifacts from the Devonian Period
    - Fossils – preserved remains of animals, plants, and other organisms
- Groundwater-dependent Ecosystems (MNFI) - land (divided into 1000m x 1000m sections) that is considered one of the 28 "groundwater dependent" natural community types as mapped by the Michigan Natural Features Inventory.

There is a lack of agreement regarding locations of sinkholes, as shown by three different sources of sinkhole data. While multiple layers agree on the location of some features, all layers show at least one sinkhole that is not shown in the other two layers, and this inconsistency should be rectified in future geological surveys. Also missing from this map are layers representing subterranean geological features.

Figure 3.6


GEOLOGICAL FEATURES
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Drumlins
Eskers
Former Shorelines
Sinkholes (MiGDL)
Sinkholes (NEMCOG)
Sinkholes (MNFI)
Devonian Earth History
Fossils
Groundwater-based Ecosystems
N
0 1.5 3 6 9 12
Miles

3.3.5 Rivers

Figure 3.7 shows the rivers in the study area that have been most impacted by human activity and those that remain relatively free of human-induced changes. This map depicts mile-long river reaches that are affected by dams, reaches that are listed as impaired (polluted) waters under Section 303(d) of the *Clean Water Act*, and reaches affected by both dams and pollution.

The following features (sources in parentheses) were included in Figure 3.7:

- Rivers (IFR) – Lake Huron tributaries
- Road Crossings (IFR) – where roads intersect with hydrology features. (Road crossings were included to indicate locations where flow modification or road run-off may pose a threat to water quality and clarity. Road crossings that do not appear to be located on a river indicate roads that pass over streams too small for this display. These crossings have been left in the display since their impact remains, even though the impacted stream is not shown.)
- Reaches with Dams (IFR)– mile-long reaches of rivers containing dams
- Polluted Reaches with Dams (IFR) – mile-long reaches of rivers containing areas listed in section 303d of the Clean Water Act and a dam
- Polluted Reaches (IFR) – mile-long reaches of rivers containing areas listed in section 303d of the Clean Water Act

The map displays mile-long river reaches containing dams because showing all individual dams at this scale is not possible. We also chose to exclude small streams (the smallest class of water bodies from the source data layer) because they are so numerous that they would have nearly filled the map and because most of the dams in the region are located on larger streams and rivers. Additional information about the size and influence of the dams and their impact on the hydrologic regime of rivers and aquatic species would allow us to refine this map. Lakes were excluded from the map because data on pollution or regime modifications for lakes could not be found in a GIS format. Further information on pollution that is not listed in Section 303(d) of the *Clean Water Act* such as dioxins and solid waste would improve the utility of this map, as would developing quantitative data about the impact of road crossings on rivers.

3.3.6 Potential Ecotourism Sites

Figure 3.8 shows the natural areas or features in the study area with potential to be successful ecotourism sites due to their uniqueness, natural beauty, accessibility, and location proximate to protected land.

We considered the following features (sources in parentheses) as potential ecotourism attractions:

- 1982 Quaternary Geology (MiGDL)
    - Drumlins – whale-shaped elongated hills formed by glacial action
    - Eskers – winding ridges formed from gravel and sand deposited in tunnels running through a glacier.

Figure 3.7

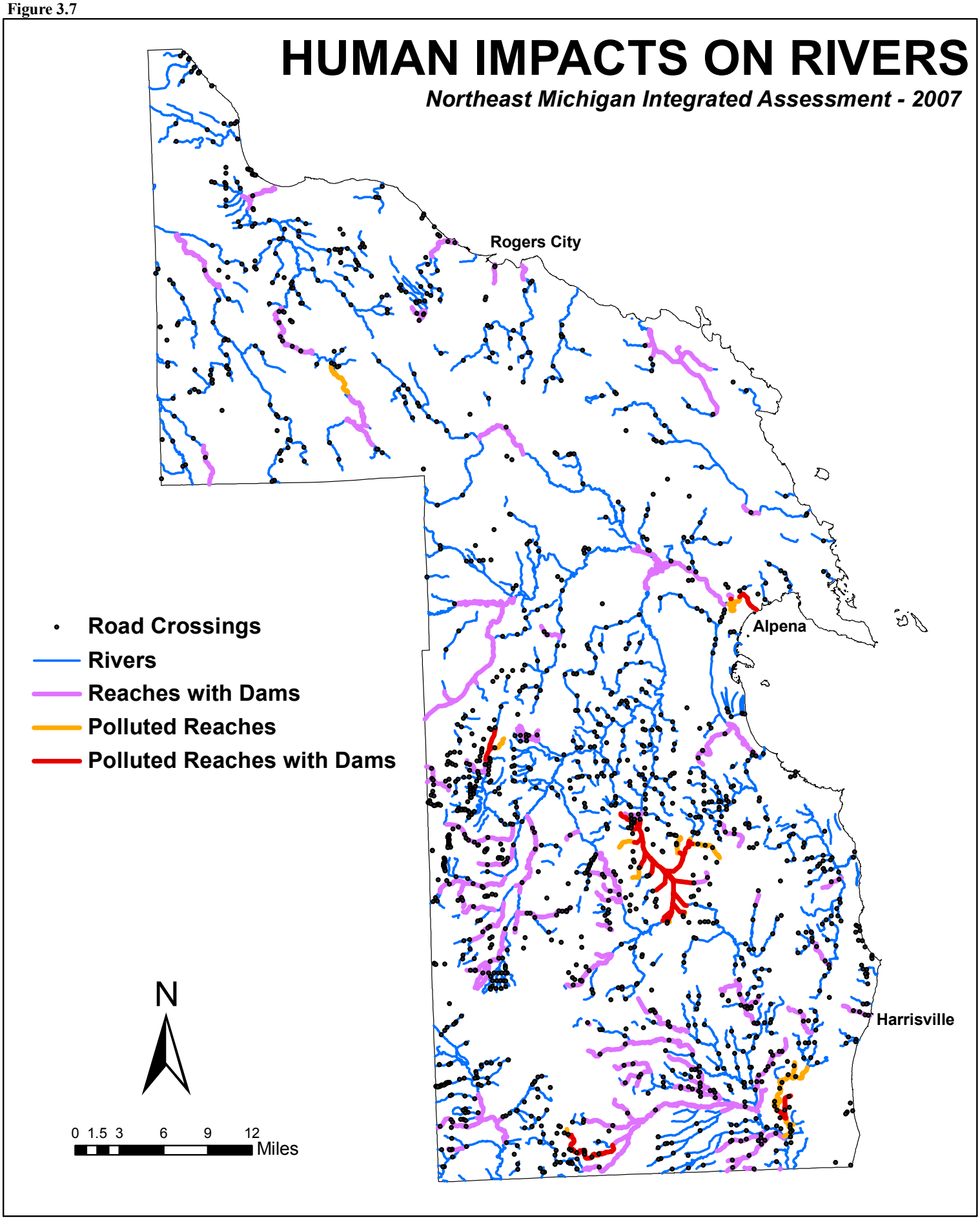
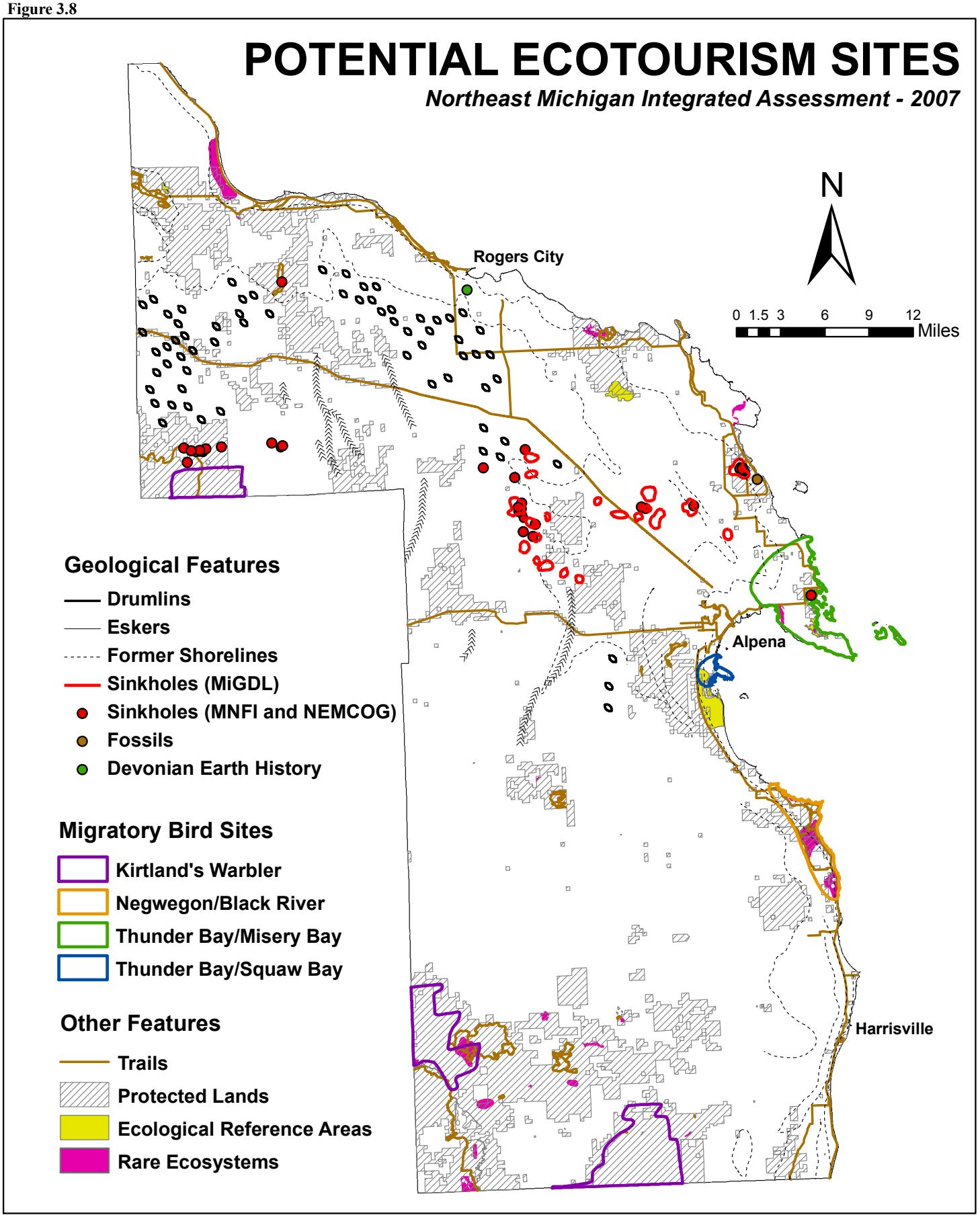

HUMAN IMPACTS ON RIVERS
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Road Crossings
Rivers
Reaches with Dams
Polluted Reaches
Polluted Reaches with Dams
N
0 1.5 3 6 9 12
Miles

Figure 3.8


POTENTIAL ECOTOURISM SITES
Northeast Michigan Integrated Assessment - 2007
N
0 1.5 3 6 9 12
Miles
Rogers City
Alpena
Harrisville
Geological Features
Drumlins
Eskers
Former Shorelines
Sinkholes (MiGDL)
Sinkholes (MNFI and NEMCOG)
Fossils
Devonian Earth History
Migratory Bird Sites
Kirtland's Warbler
Negwegon/Black River
Thunder Bay/Misery Bay
Thunder Bay/Squaw Bay
Other Features
Trails
Protected Lands
Ecological Reference Areas
Rare Ecosystems

    - Former Shorelines – former Lake Huron shorelines
- Sinkholes (MiGDL, NEMCOG, MNFI) – depressions or holes in the land surface resulting from the gradual removal of soluble bedrock (such as limestone) by water
- Fossils (MNFI) – preserved remains of animals, plants, and other organisms
- Devonian earth history (MNFI) – artifacts from the Devonian Period
- Areas of importance for birds (TNC) – polygons indicating areas of importance to migratory birds in Michigan (for breeding, migration, or overwintering)
- Ecological Reference Areas (MNFI) – The areas that the Michigan DNR has labeled as "ecological reference areas" are considered to be ideal examples of how a particular ecosystem should function. When performing restoration work, or trying to distinguish between similar ecosystems, these designated ecosystems are used as reference to a system's integrity and function. Although sites in the region have been selected, the formal approval process had not been completed, and the official status of these areas is currently unknown to the ecological assessment team.
- Rare Ecosystems (MNFI)– the area where an ecosystem with a Global Conservation State Rank of G1 (critically imperiled), G2 (imperiled), or G3 (vulnerable) was reported (the size of the area shown relates to the certainty of the reported sighting)

Potential for expansion of ecotourism opportunities may be highest on land adjacent to areas that are already protected and/or support ecotourism activities. Protected lands increase the ecotourism potential of the privately owned land adjacent to them by providing a variety of opportunities for hiking, hunting, camping, and other outdoor activities. By identifying these ecologically important areas as economically valuable, private landowners seeking economic benefit from their land will have an alternative to development or extractive uses. If private landowners can derive economic benefit from their land through ecotourism, the larger community will benefit: the landowners will earn money, the land will be preserved, and tourists will benefit from enjoying the natural resources the land has to offer. It should be noted that that offering tourist activities on a property does not in itself equate to protection of the natural resources within, although such goals can be compatible.

3.3.7 Migratory Bird Stopover Sites

Using methodology developed by The Nature Conservancy (TNC) to model stopover sites for priority species of migratory birds in the western Lake Erie basin (Ewert et al., 2006) the ecological assessment team developed a model for predicting migratory bird stopover sites in the NEMIA region. Figures 3.9-3.12 are a series of maps identifying potential migratory bird "hot spots" that should be considered for land preservation efforts or ecotourism development. These maps are a prediction of potential bird presence during migration based on landscape attributes (landcover and patch size). The model was composed of three parts: landbird and raptor habitat (Figure 3.10), shorebird habitat (Figure 3.11), and waterfowl habitat (Figure 3.12). Each cell is scored on a scale of 0 through 5 for in terms of its potential as habitat, with 0 being non-habitat and 5 being most important stopover habitat for that avian group. Those areas that score higher are more likely to be stopover sites for migratory birds because their landscape attributes more closely match the habitat needs of the group(s) of birds in question. (See Appendix D for details on development of Figures 3.9-12).

Figure 3.9

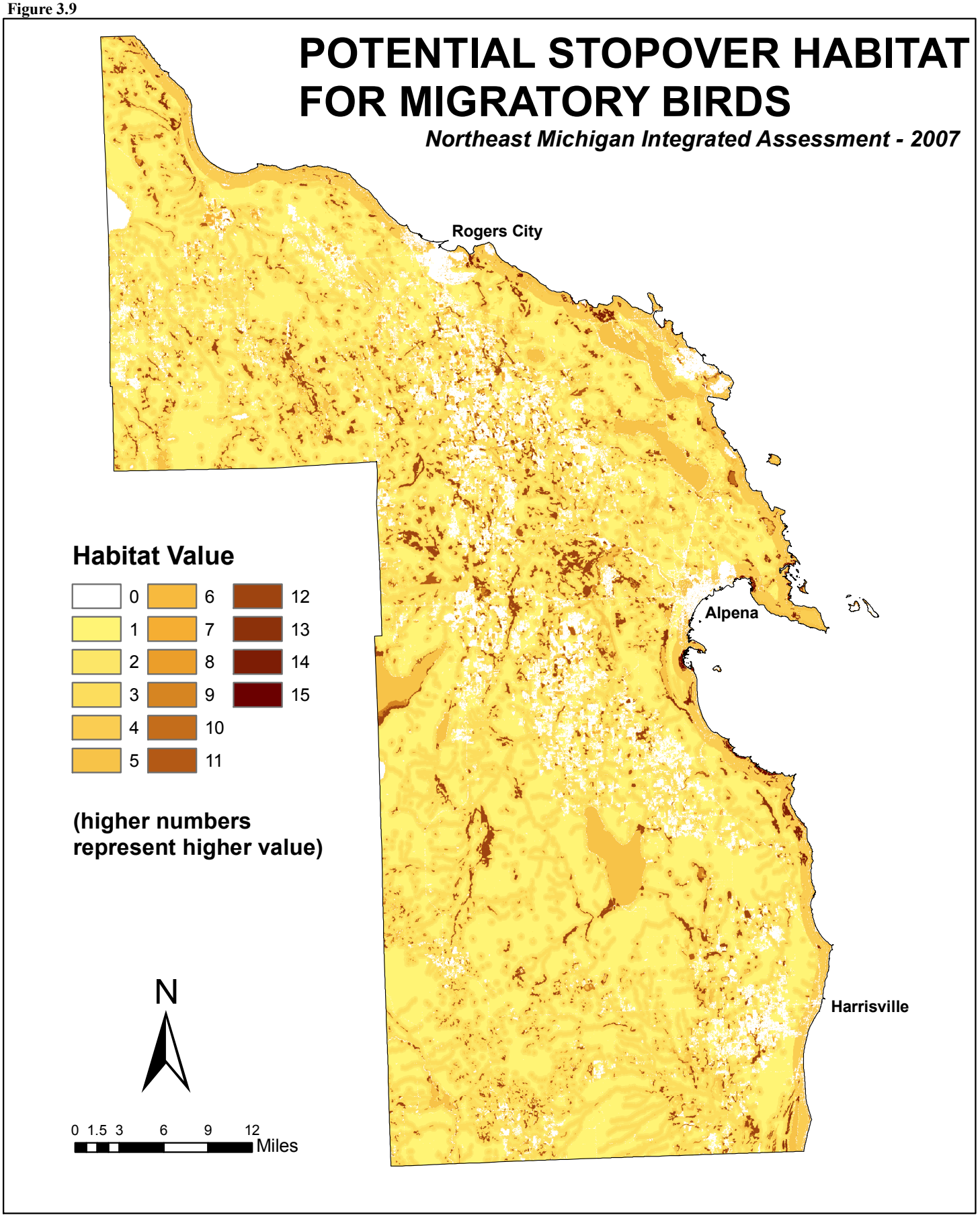

POTENTIAL STOPOVER HABITAT FOR MIGRATORY BIRDS
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Habitat Value
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
(higher numbers represent higher value)
N
0 1.5 3 6 9 12
Miles

Figure 3.10

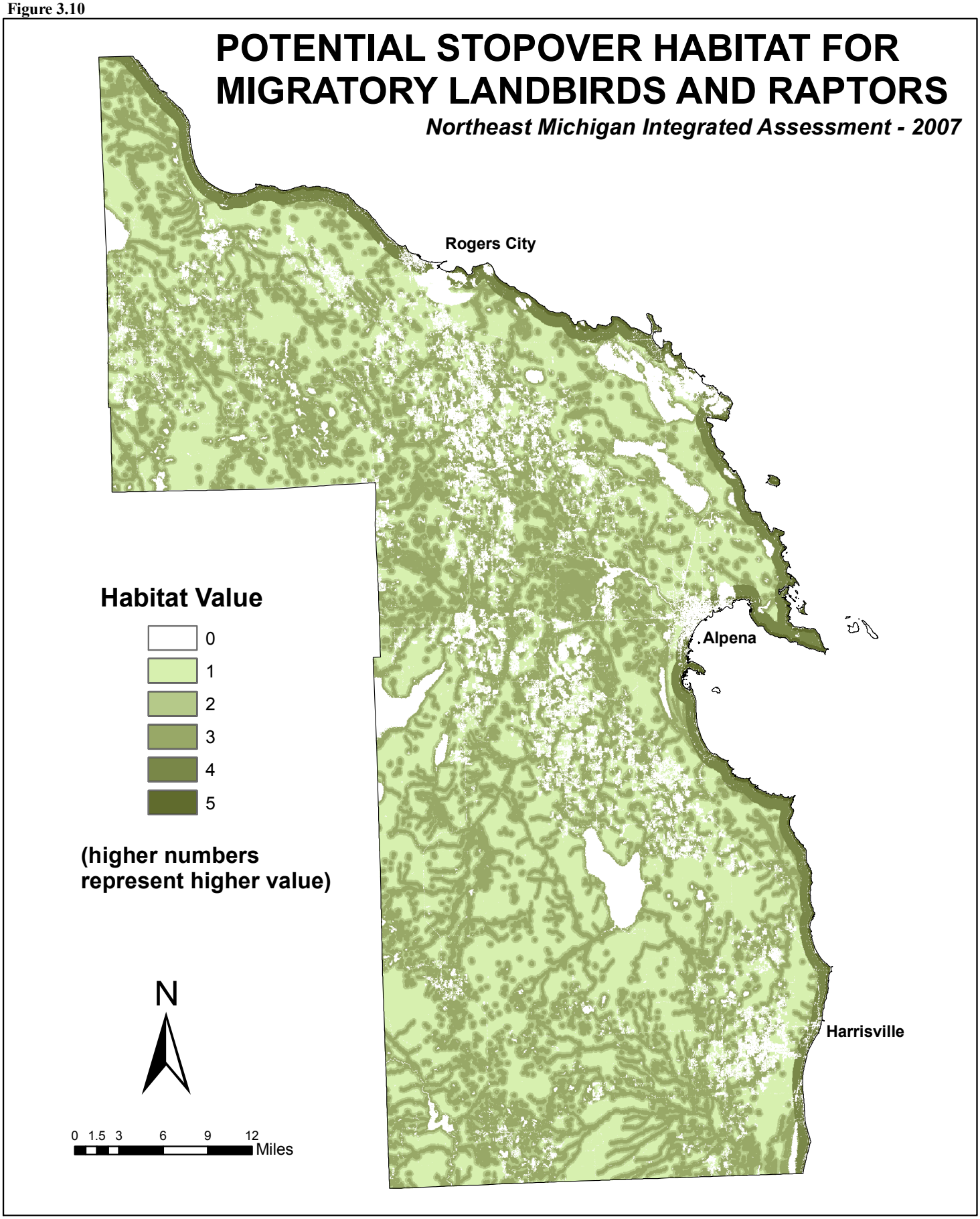

POTENTIAL STOPOVER HABITAT FOR MIGRATORY LANDBIRDS AND RAPTORS
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Habitat Value
0
1
2
3
4
5
(higher numbers represent higher value)
N
0 1.5 3 6 9 12
Miles

Figure 3.11

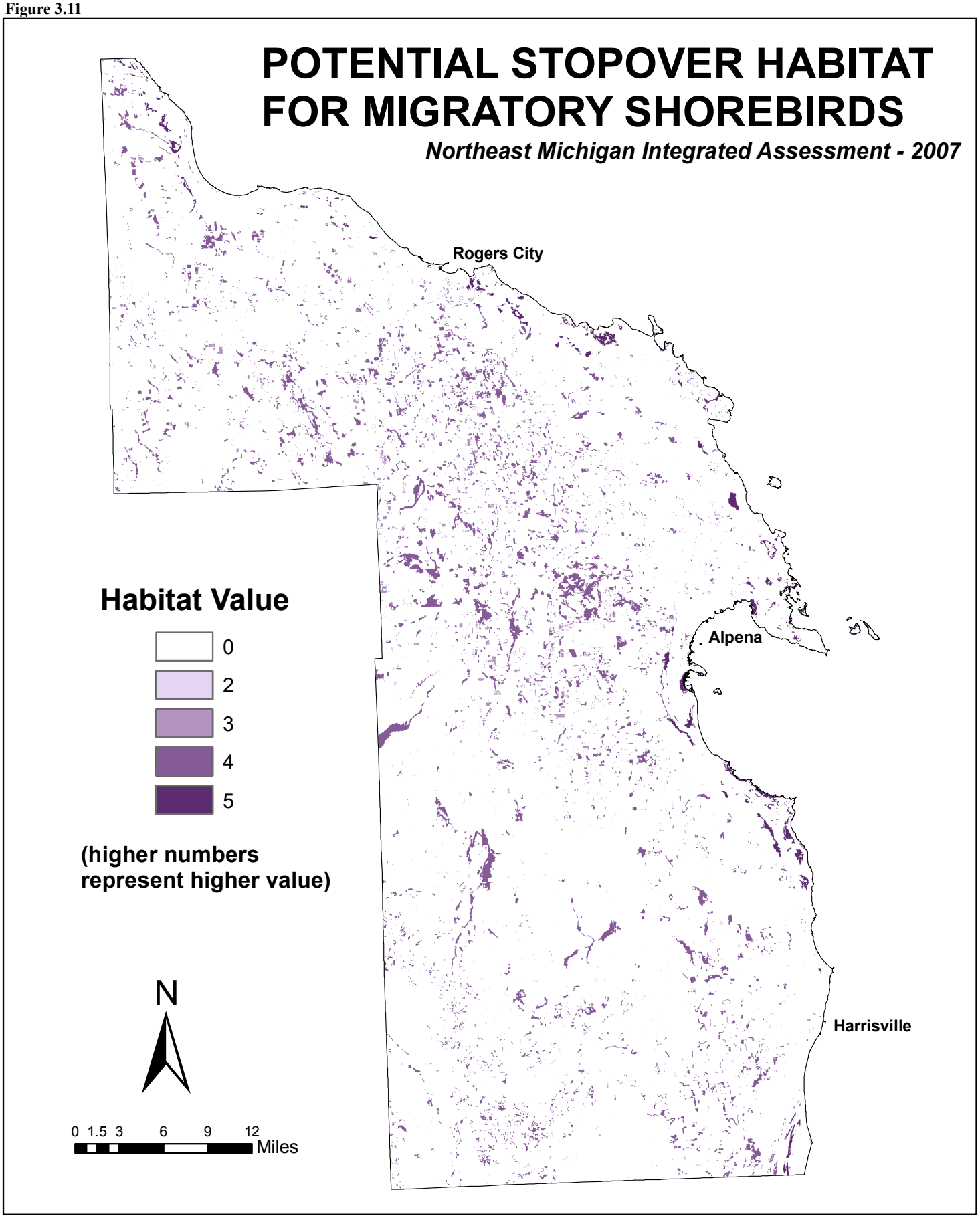
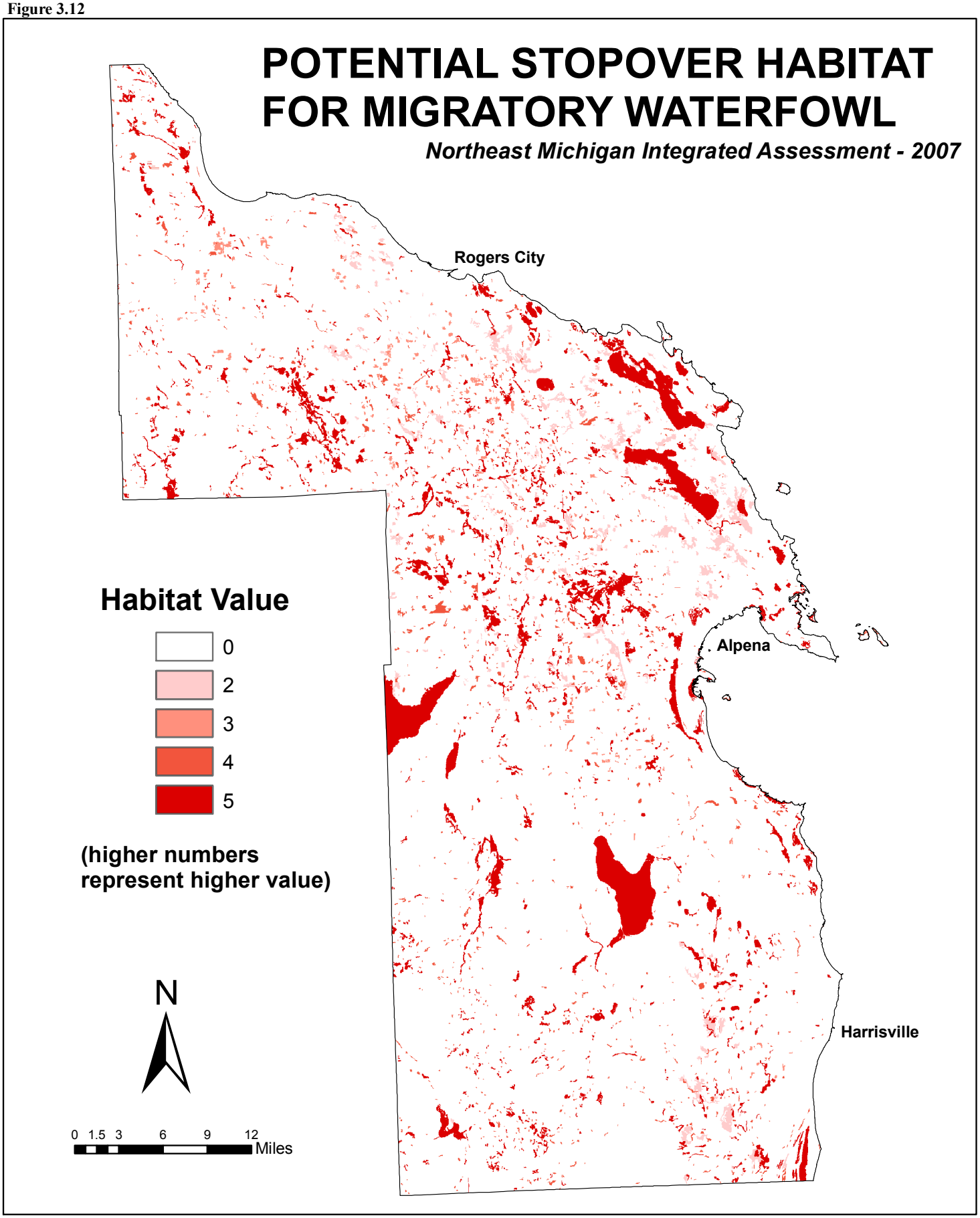

POTENTIAL STOPOVER HABITAT FOR MIGRATORY SHOREBIRDS
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Habitat Value
0
2
3
4
5
(higher numbers represent higher value)
N
0 1.5 3 6 9 12
Miles

Figure 3.12


POTENTIAL STOPOVER HABITAT FOR MIGRATORY WATERFOWL
Northeast Michigan Integrated Assessment - 2007
Rogers City
Alpena
Harrisville
Habitat Value
0
2
3
4
5
(higher numbers represent higher value)
N
0 1.5 3 6 9 12
Miles

Although the model was developed for the western Lake Erie basin, most of the priority species of concern in the original model were also found in the study area, therefore it is assumed the model is also applicable in Northeast Michigan. The map does not model the stopover habitat needs for every species of migratory bird, only the needs of species that TNC considered "priority" migratory bird species in the Western Lake Erie region. There are other important species in Northeast Michigan, such as the endangered Kirtland Warbler, that are not present in Western Lake Erie region, and were not part of this model. Additionally, these maps do not show the actual distribution of migratory birds when they stop in the region, and no groundtruthing has been done to verify the model's accuracy. The maps also do not show whether birds will prefer one habitat patch to another or how often patches are utilized, it only shows which areas are more likely to be utilized than others.

3.4 CONCLUSION

As part of the NEMIA process, we gathered existing GIS data relating to the natural and built environment in Alcona, Alpena, and Presque Isle counties. Performing this task entailed contacting a variety of sources in local, state, and federal agencies to gather the necessary information. As information was collected, themes in the data were identified, and maps were created to illustrate these themes. Additionally, a poster was produced for the working group meeting in January, 2007. This poster (Appendix E) was developed using locations with similarly high scores from the two opinion maps, and the previously mentioned layers from the natural features map (Figure 3.2). The poster highlights the regional areas of interest and displays the natural features as well as human land uses and infrastructure to illustrate the layout of the region (Ceccato, 2000).

This ecological inventory is intended to inform policy making in the NEMIA region by providing data layers and maps that display some of the many ecological factors that need to be incorporated into regional decision-making processes. However, lack of data in GIS format, and lack of time and funds limited this effort. Despite these limitations, decision makers will benefit from using these products as a starting point for a comprehensive ecotourism and green infrastructure planning effort. Future work should focus on the following:

Gathering information that could more completely inform current status of ecological features and begin to identify regional trends by incorporating data and information on the following themes if/when it becomes available, in order of priority:

- Land use at the parcel scale - a visual representation of how land is currently used in the region (including categories such as urban, agriculture, industrial, natural resource extraction, parks, brownfields, etc) would provide at minimum a coarse snapshot of where incompatible land uses may threaten natural resources, and where natural resources may be relatively cushioned from human impacts.
- Gather and/or create data GIS format data on the following features: Lake Huron access points, including boat launches and beaches; inland lakes; aquatic features of Lake Huron; subterranean geological features; game species habitats, ranges, and populations; and migratory species patterns, ranges, and season of use;

- Threats to ecological important areas and natural features - threats such as invasive species, incompatible land use, and pollution (such as dioxins, solid waste, or endocrine disruptors that are not included in Section 303d of the *Clean Water Act*) must be addressed to maintain and improve the integrity of these areas for conservation and tourism.

The development of these maps gives decision makers access to a well-rounded visual representation of the natural features in the region. Decision makers will benefit from using these products as a starting point for a comprehensive ecotourism and green infrastructure planning effort. Additionally, this ecological inventory will be incorporated into the final NEMIA document so as to ensure that regional decision makers can access this information in concert with a more complete knowledge of the region's economy, cultural resources, and planning and zoning practices.

Works Cited

American Institute of Architects. (2004). BP 15.03.01. *Best practices: Innovations in zoning.* Retrieved October 16, 2007 from http://www.aia.org/gov/SiteObjects/files/15-03-01.pdf

American Institute of Architects. (2006). *Northeast Michigan SDAT: Envisioning a sustainable future for northeast Michigan.* Washington, D.C.: AIA Center for Communities by Design.

Balram S., Dragicevic, S., & Meredith, T. (2004). A collaborative GIS method for integrating local and technical knowledge in establishing biodiversity conservation priorities. *Biodiversity and Conservation, 13,* 1195–1208.

Ceccato V.A., & Snickars, F. (2000). Adapting GIS technology to the needs of local planning. *Environment and Planning B: Planning and Design, 27,* 923-937.

Clevenger, A.P., Wierzchowski, J., Chruszcz, B., & Gunsuns, K. (2002). GIS-generated, expert-based models for identifying wildlife habitat linkages and planning mitigation passages. *Conservation Biology, 16,* 503-514.

Ewert, D.N., Soulliere, G.J., Macleod, R.D., Shieldcastle, M.C., Rodewald, P.G., Fujimura, E., Shieldcastle, J., & Gates, R.J. (2005). *Migratory bird stopover site attributes in the western Lake Erie basin*. Final report to The George Gund Foundation.

Geertman, S. (2001). Participatory planning and GIS: A PSS to bridge the gap. *Environment and Planning B: Planning and Design, 29*, 21-35.

Hansen, H.S. (2004). Public participation GIS: An important tool in environmental planning. In *GIS and public participation – part I* (pp. 27-38).

Hawthorne, T.L. (2005). *Participatory GIS for growth management in the Cheat Lake Planning District of Monongalia County, West Virginia*. Unpublished master's thesis. West Virginia University, Morgantown, WV.

Kyem, P.A.K. (2004). Of intractable conflicts and participatory GIS applications: The search for consensus amidst competing claims and institutional demands. *Annals of the Association of American Geographers, 94,* 37-57.

Michigan Sea Grant (MSG). (2005). *Causes and consequences of environmental change: Integrated assessments.* Retrieved February 26, 2007, from http://www.miseagrant.umich.edu/downloads/about/IA-factsheet-2005.pdf

Northeast Michigan Integrated Assessment Draft Summary. (2005, September 23). Retrieved April 13, 2007, from http://www.miseagrant.umich.edu/downloads/ coastal/NEMIA/ Sept_23_2005_Meeting_Summary.pdf

Pearce J. L., Cherry, K., Drielsma, M., Ferrier, S., & Whish, G. (2001). Incorporating expert opinion and fine-scale vegetation mapping into statistical models of faunal distribution. *Journal of Applied Ecology, 38,* 412-424.

Thériault M., Rouffignat, J., Landry, R., Levallois, P., Chiasson, C., Tessier, S., Girard, M., & Prévil, C. (1999). *Combining opinion survey, GIS and spatial statistics to model perceptions of ground water pollution caused by agriculture: Application to the County of Portneuf, Canada.* Retrieved October 16, 2007 from http://www.crad.ulaval.ca/documents/PerceptionModels_Portneuf.PDF

Thériault M. (2002). *Modelling people's perceptions of environmental issues within GIS: A case study using opinion polls in the County of Portneuf, Canada*. Conference proceedings of the 5th AGILE Conference on Geographic Information Science, held in Palma (Balearic Islands, Spain).

United States Geological Survey (USGS). (February 21, 2006). *Frequently-asked questions on FGDC metadata.* Retrieved October 8, 2007 from http://geology.usgs.gov/tools/metadata/tools/doc/faq.html#q1.1

U.S. Census Bureau. 2007. State and County quick facts
http://quickfacts.census.gov/qfd/news.html (accessed 3/15/07)

APPENDIX A. ECOLOGICAL ASSESSMENT SPATIAL DATA INVENTORY.

We consulted multiple sources to obtain the spatial data that we used to develop the information products in this assessment. Tables 1 and 2 list all spatial data layers that we obtained from outside sources or created ourselves (using data we obtained from outside sources) throughout the ecological assessment process. Data that we obtained from an outside source we refer to as "source layers" while data that we created using one or more source layers are called "derived layers." In addition to the name of each layer (as designated by the ecological assessment team, not the organization from which we obtained it) the table includes a description of what features it represents, the methods used to create it (for derived layers), or the organization from which we obtained it (for source layers) and the date we obtained or created it. Some layers listed are not actually displayed in any of the maps we have created, but were created as intermediate steps in developing one or more of the final maps.

It should be noted that the organization from which we obtained a layer is not necessarily the organization that created the dataset. Also, the date we obtained the dataset does not reflect the date the dataset was created. Finally, all layers except those obtained from the Michigan Geographic Framework (which are already produced at the county level) were clipped to limit their extent to the three county study area.

Table 1. Source Layers.

Name*	What the layer represents	Source (more details)	Date Obtained
303(d) Impaired Water	river segments, lakes, and estuaries designated under section 303(d) of the Clean Water Act	IFR ("LHB_rad303d_area_EPA," "LHB_rad303d_line_EPA," and "LHB_rad303d_point_EPA")	Jul-06
Coastal Change Analysis Program Landcover (CCAP 2000)	land cover	IFR (derived from USGS National Land Cover Dataset)	Jul-06
Dams	Contains information on all known dams in the Lake Huron basin. Includes location information, physical dimensions of the dam, hydraulic information on the dam, as well as information on the regulatory status of the dam.	IFR ("LHB_dams_IFR")	Jul-06
DNR Land Ownership	MDNR Land and Mineral Rights information is derived weekly from the MDNR's Land Ownership Database. Parcel information is compiled to the quarter-quarter section level. Multiple parcels with varying types of rights within a quarter-quarter section result in a Mixed Ownership category. Mineral and Surface = DNR owns both mineral and surface rights on parcel(s) within the quarter-quarter section. Minerals = DNR owns only mineral rights on parcel(s)within the quarter-quarter section. Surface = DNR owns only surface rights on parcel(s) within the quarter-quarter section. Mixed Ownership = DNR has some combination of mineral and surface rights on parcels within the quarter-quarter section. Other Rights = DNR has an easement, right of way, and/or other non-ownership rights only on parcel(s) within the quarter-quarter section. Reserved Minerals = DNR owns the surface rights on parcel(s) within the quarter-quarter section. Mineral rights are held by private party for a specified period of time. Mineral rights are scheduled to revert to the MDNR when reservation period expires.	MiGDL ("Michigan DNR Land and Mineral Ownership")	Jun-06

Ecological Reference Areas	areas that serve as models of ecological reference within the State of Michigan. They are high quality examples of functioning ecosystems that are primarily influenced by natural ecological processes, and they may be located upon any land ownership in the State. This layer includes an initial set of ERAs in the NEMIA region. They were selected because they meet the initial base requirements for ERA selection: they are known high quality sites in the Michigan Natural Features Inventory (MNFI) natural community classification system with an Element Occurrence (EO) rank of A or B and Global (G) or State (S) element ranking of endangered (1), threatened (2), or rare (3).	MNFI Biological and Conservation Database	Sep-06
Geological Features	points representing sinkholes, fossils, and Devonian earth history	MNFI Biological and Conservation Database (extracted only those points representing karst topography: sinkholes, fossils, and Devonian earth history)	May-06
Groundwater-dependent Ecosystems	1000m x 1000m grid representation of the groundwater-dependent natural communities as mapped by the Michigan Natural Features Inventory (MNFI). In the MNFI Biological and Conservation Database, 28 of 74 natural community types included are considered "groundwater dependent." This sensitive database was intersected with the MDNRs quarter/quarter section polygon file to mask the exact location of the natural features. Out of the MNFI Biotics database only Palustrine and Palustrine/Terrestrial community types were used for this file. Submergent marsh, emergent marsh, Great Lakes marsh, northern wet meadow, southern wet meadow, inland salt marsh, intermittent wetland, coastal plain marsh, interdunal wetland, lakeplain wet prairie, lakeplain wet-mesic prairie, northern wet-mesic praire, wet prairie, wet-mesic prairie, prairie fen, northern fen, patterned fen, poor fen, rich conifer swamp, relict confier swamp, hardwood-conifer swamp, northern swamp, southern swamp, southern floodplain forest, northern shrub thicket, southern shrub-carr, inundated shrub swamp, and wooded dune and swale complex. It should be noted that there are numerous other groundwater dependent natural resources throughout Michigan that are not shown on this map because they have not yet been surveyed by the MNFI (e.g. most persistent lakes, streams and wetlands are probably groundwater dependent).	MNFI Biological and Conservation Database	May-06
Highways	US 23, and State Routes 32 and 65	MiGDL ("Michigan Geographic Framework")	May-06
IFMAP	Land cover data for the Southern Lower Peninsula of Michigan derived from classification of Landsat Thematic Mapper (TM) imagery (2001)	MiGDL	May-06
Inland Lakes	Inland water bodies	IFR ("LHB_inland_lakes")	Jul-06
Interior Forests	Interior forest areas are determined by the USGS based on the dominant land cover for a region on a 1000 meter by 1000 meter grid. To be considered an “interior” forest, a forest grid must be fully surrounded by other cells that qualify as either interior or edge forests.	USGS	Jun-06
Lake Huron	Lake Huron	IFR	Jul-06
Land Cover Change Map	classifies changes in ca. 1800 land cover and 2001 IFMAP land cover	TNC	Jun-06
Protected Lands	land that is currently mostly undeveloped, including state, county, and city parks, state and national forests, nature preserves, and golf courses.	Ducks Unlimited	Jun-06
Quaternary Geology	Drumlins, Eskers, Striations/Grooves, Shorelines, Sinkholes	MiGDL ("Michigan Quaternary Geology")	Jul-06
Railroads	is intended to show all railroads, both active and inactive, but appears to only show the Detroit and Mackinaw railways	MiGDL ("Michigan Geographic Framework")	May-06

Rivers	all Lake Huron tributaries	IFR ("LHB_NHD_routes_USGS")	Jul-06
Road Crossings	where MIRIS roads intersect MIRIS hydrology features	IFR ("LHB_roadcrossings_MIRIS")	Jul-06
Roads	all roads, including MDOT National Functional Classification (NFC) codes: 1-Rural Interstate (principal arterial), 2-Rural Other Prinicipal Arterial (non-freeway), 5-Rural Other Freeway (principal arterial), 6-Rural Minor Arterial, 7-Rural Major Collector, 8-Rural Minor Collector, 9-Rural Local, 11-Urban Interstate (principal arterial), 12-Urban Other Freeway (principal arterial), 14-Urban Other Principal Arterial (non-freeway), 16-Urban Minor Arterial, 17-Urban Collector, 19-Urban local, 0 or uncoded-not a certified public road; including ownership codes: 1-State Trunkline, 2-County Primary, 3-County Local, 4-City Major, 5-CIty Minor, 9-Not an Act-51 Certified Public Road	MiGDL ("Michigan Geographic Framework")	May-06
Sinkholes	sinkholes	NEMCOG	Oct-06
Soil Moisture Index (SMI)	Relative moisture levels in soil. Class 1 (very wet), class 2 (wet), class 3 (intermediate), class 4 (dry), and class 5 (very dry)	Ducks Unlimited	Aug-06
State Parks	parks in the Michigan DNR's state parks system	Michigan DNR	May-06
Three County Outline	the NEMIA study area	MiGDL ("Michigan Geographic Framework")	May-06
TNC Migratory Bird Sites	polygons indicating areas of importance to migratory birds in Michigan (for breeding, migration, or overwintering)	The Nature Conservancy	Sep-06
Trails	non-motorized trails in the NEMIA region, including trails for hiking, biking, skiing, horsebacking. The trail segments were gathered by various means - GPS and digitizing. Information about the surface type, use type, and maintenance is contained in the attributes.This layer depicts trails that are actually on the ground as well the Huron Greenways which is a designated route consisting of existing trails and roads.	NEMCOG	Oct-06
US-23	US Highway 23	MiGDL ("Michigan Geographic Framework")	May-06
Utilities	power transmission lines and pipelines	MiGDL ("Michigan Geographic Framework")	May-06

Note: All layers that covered an extent larger than the study area were clipped to limit their extent to Alcona, Alpena, and Presque Isle Counties

**as designated by the Ecological Assessment Team, not the source agency*
***MNFI data is updated on a yearly basis. MNFI data does not cover most private lands.*
****MiGDL website: http://www.mcgi.state.mi.us/mgdl/*

Table 2. Derived Layers (all layers created May 2006)

Name	What the layer represents	Methods	Source/Input layers
Agricultural Hydric Soils	all cultivated land classes that were also either wet or very wet soil	clip "Agricultural Lands" with "Hydric Soils" to extract areas that were both cultivated and wet or very wet	Agricultural Land, Hydric Soil
Agricultural Lands	cultivated land	extract cultivated lands	CCAP 2000
Agriculture	areas of high concentrations of agricultural land	extract all features in the following classes: Non-vegetated Farmland, Row Crops, Forage Crops/Non-tilled Herbaceous, Orchards/vineyards/Nursery, draw polygons around areas of high concentration of these features (estimate by eye)	IFMAP
Coastal Corridor	land within 5 miles of the Lake Huron shoreline	extract all land within 5 miles of Lake Huron	Lake Huron
Emergent Wetland Complexes	emergent and scrub shrub wetlands that are within .25 km of another emergent or scrub shrub wetland	buffer by .125km (created so that if the buffer of a wetland overlay with the buffer of another wetland, they are within .25km of each other), use 'identify overlapping polygons' script to select emergent wetlands that were within .25km of each other, reclassify selected wetlands as "emergent wetlands complexes"	Emergent Wetlands
Emergent Wetlands	emergent and scrub shrub wetlands	extract emergent and scrub-shrub wetlands	Wetlands
Forestry	areas of high concentrations of forested land	extract all features in forest classes (14-22, 24-26), draw polygons around areas of high concentration of these features (estimate by eye)	IFMAP
Hydric Soils	wet and very wet soils	extract very wet (class 1) and wet (class 2) soils	Soil Moisture Index
Natural Features Rankings (Expert Opinion)	a visual summary of the results of the NEMIA Natural Features Opinion Survey (Expert Opinion). It displays how experts ranked natural features against each other in terms of ecological importance in the NEMIA region	weight each of the layers included in "Natural Features," using the survey results listed in Table 3.1	Natural Features
Natural Features Rankings (Local Opinion)	a visual summary of the results of the NEMIA Natural Features Opinion Survey (Local Opinion). It displays how members of the NEMIA work group ranked natural features against each other in terms of ecological importance in the NEMIA region	weight each of the layers included in "Natural Features," using the survey results listed in Table 3.1	Natural Features
Polluted Reaches	reaches of rivers located within 1/2 mile (as the crow flies) of areas listed in section 303(d) of the Clean Water Act	extract reaches of rivers located within .5mi of 303(d) impaired water bodies	Rivers, 303(d) Impaired Water
Polluted Reaches with Dams	reaches of rivers located within .5mi (as the crow flies) of areas listed in section 303(d) of the Clean Water Act and within .5mi (as the crow flies) of a dam	extract reaches of rivers located within .5mi of 303(d) impaired water bodies" and within .5mi of a dam	Rivers, Dams, 303(d) Impaired Waters

Potential Migratory Bird Stopover Habitat	potential stopover habitat for migratory waterfowl, shorebirds, landbirds, and raptors	use raster calculator to sum the values of analagous pixels in each of the input layers	Potential Migratory Landbird/Raptor Stopover Habitat, Potential Migratory Shorebird Stopover Habitat, Potential Migratory Waterfowl Stopover Habitat
Potential Migratory Landbird/Raptor Stopover Habitat	potential stopover habitat for migratory landbirds and raptors	adopt attributes 1-6 from TNC model for landbirds/raptors (see Appendix 3.4 for details)	Ewert et al (2006) model for Lake Erie
Potential Migratory Shorebird Stopover Habitat	potential stopover habitat for migratory shorebirds	adopt attributes 1-6 from TNC model for shorebirds (see Appendix 3.4 for details)	Ewert et al (2006) model for Lake Erie
Potential Migratory Waterfowl Stopover Habitat	potential stopover habitat for migratory waterfowl	adopt attributes 1-3, 5-8 from TNC model for waterfowl (see Appendix 3.4 for details)	Ewert et al (2006) model for Lake Erie
Pre-settlement Landcover	Pre-settlement land cover areas are defined as having maintained their ecological character even though they may have been lumbered, farmed, burned over, or otherwise altered by humans before the development of this layer. The value of such sites is that an ecological continuity exists: these areas may serve as a species refuge and help to maintain the mosaic of land cover types and habitats necessary in an ecologically healthy region.	extract all categories of unchanged land cover	Land Cover Change Map
Rare Animals	The area where an animal species with a Global Imperilment Rank of G1 (critically imperiled - 5 or fewer occurrences range-wide or very few remaining individuals or acres), G2 (imperiled globally - 6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range), or G3 (vulnerable - either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100) was reported. The size of the area shown relates to the certainty of the reported sighting.	select animals with GRANK of G1, G2, and G3	MNFI Biological and Conservation Database
Rare Ecosystems	The area where an ecosystem with a Global Imperilment Rank of G1 (critically imperiled - 5 or fewer occurrences range-wide or very few remaining individuals or acres), G2 (imperiled globally - 6 to 20 occurrences or few remaining individuals or acres, or because of some factor(s) making it very vulnerable to extinction throughout its range), or G3 (vulnerable - either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100) was reported. The size of the area shown relates to the certainty of the reported sighting.	select ecosystem types with GRANK of G1, G2, and G3	MNFI Biological and Conservation Database

Rare Plants	The area where a plant species with a Global Imperilment Rank of G1 (critically imperiled - 5 or fewer occurrences range-wide or very few remaining individuals or acres), G2 (imperiled globally - 6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range), or G3 (vulnerable - either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100) was reported. The size of the area shown relates to the certainty of the reported sighting.	select plants with GRANK of G1, G2, and G3	MNFI Biological and Conservation Database
Reaches with Dams	reaches of rivers located within 1/2 mile (as the crow flies) of a dam	extract reaches of rivers located within .5mi of a dam	Rivers, Dams
Sensitive Natural Resources	areas of high concentrations of natural features	draw polygons around areas of high concentrations of natural features (estimate by eye)	Natural Features
Undeveloped Lands	grassland, forests, scrub/shrub, wetlands, and unconsolidated shore	extract grassland, forests, scrub/shrub, wetlands, and unconsolidated shore	CCAP 2000
Unweighted Overlay	areas where multiple natural features (Endangered Ecosystems, Endangered Plants, Endangered Animals, Groundwater dependent Ecosystems, Protected Lands, Interior Forests, Ecological Reference Areas) intersect	use raster calculator to sum the values of analagous pixels in each of the input layers	Rare Ecosystems, Rare Plants, Rare Animals, Pre-settlement Landcover, Wetlands, and Interior Forests
US-23 Corridor	land within 1/2 mile of US-23	extract land within 1/2 mile of highway US-23	US-23
Wetlands	land with one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. However, we have excluded areas that appear in the NWI but are flooded on a permanent or seasonal basis by human activity.	extract all wetlands identified in Alcona, Alpena, and Presque Isle Counties, excluding areas that are flooded on a permanent or seasonal basis by human activity	NWI/MiGDL

APPENDIX B. NATURAL FEATURES OPINION SURVEY.

Opinion Survey:

The opinion survey was conducted at the August 2006 meeting of the NEMIA working group, and the beginning of the fall 2006 semester at the University of Michigan's School of Natural resources and Environment (SNRE). At the working group meeting, each member of the working group was given three colored stickers, told what vote each color represented, and directed to place their votes on a large chart at the front of the room. For the survey of ecologists in SNRE, the request was phrased in the same terms as it had been presented to the working group. This request was distributed by email, and responses were collected in the same manner. The survey used at the working group meeting and distributed to the SNRE ecologists is displayed below.

Survey:

As part of our master's practicum involving the Northeast Michigan Integrated assessment under the guidance of Don Scavia and Jen Read, we have been collecting GIS layers for important land based ecological features. At our most recent meeting with local stakeholders, we put the features we had already collected up for the community to rank in terms of importance, with the goal of showing them ecologically important areas that were not simply important, but that they knew were important. The goal was to try to help the local residents and their representatives feel that they have a place in the ecological decision making. Now, I would like to ask you to rank the same things. The goal of this is to be able to draw parallels between public opinion and expert opinion.

I would ask you to rank these six ecological features in terms of ecological importance, based on your professional opinion. The six layers are:

- Endangered animals – as defined by the Michigan Natural Features Inventory
- Endangered plants - as defined by the Michigan Natural Features Inventory
- Endangered communities/ecosystems - as defined by the Michigan Natural Features Inventory
- Wetlands – as defined by the USFWS and their National Wetlands Inventory
- Pre-settlement landcover – an analysis done by the Nature Conservancy using DNR models of circa 1800 land cover patterns
- Large forest interiors – as defined by the USGS, on the scale of 1000 square meter parcels

I would like you to rank the 6 layers by giving out two votes each of High importance (H), medium importance (M), and low importance (L) in the spaces below:

Animals:
Plants:
Ecosystems:
Wetlands:
Old growth:
Forests:

APPENDIX C. METHODS FOR FIGURES 3.4 AND 3.5.

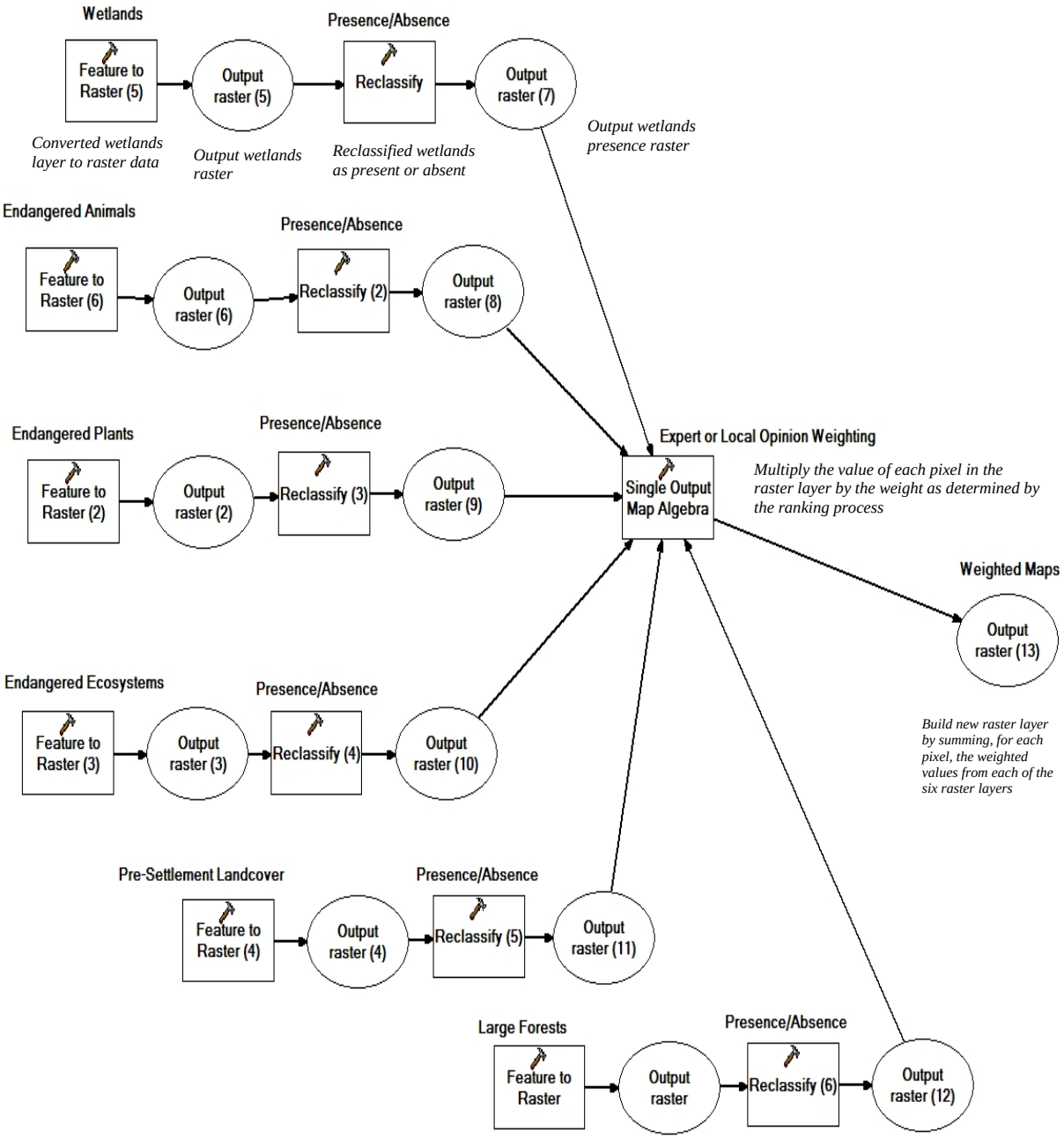
The Areas of Ecological Importance maps (Figures 3.4 and 3.5) were developed by first converting each of the six component natural features included in Figure 3.2 (Rare Animals, Rare Plants, Rare Ecosystems, Wetlands, Pre-settlement Landcover, and Interior Forests) from their shapefile format to a raster format. The raster layers were then reclassified for presence and absence of the feature of interest. (e.g., in the reclassified Wetlands raster layer, any pixel with a wetland present was given a value of 1, while pixels without wetlands were given a value of 0). Each of the newly reclassified raster layers was then weighted according to the results of the Natural Features Opinion Survey (see Appendix 3.2) displayed in Table 1 below. The raster calculator function of the ArcMap software was used to apply the weights to the six raster layers and then combine them mathematically into one combined layer, which is the layer displayed in Figures 3.4 and 3.5.

Table 1. Results of the Natural Features Opinion Survey.

Local Opinions	*"3 points"*	*"2 points"*	*"1 point"*	*Votes*	*"Total Points"*	*Weight=total points/votes*
Endangered Communities/Ecosystems	18	3	3	24	63	2.6
Wetlands	14	5	4	23	56	2.4
Large Interior Forests	6	9	9	24	45	1.9
Endangered Animals	4	10	10	24	42	1.8
Pre-settlement Landcover	4	7	12	23	38	1.7
Endangered Plants	1	12	9	22	36	1.6
Expert Opinions						
Endangered Communities/Ecosystems	10	3	0	13	36	2.8
Wetlands	9	2	1	13	32	2.5
Pre-settlement Landcover	3	7	2	13	25	1.9
Large Interior Forests	2	4	7	13	21	1.6
Endangered Plants	1	6	6	13	21	1.6
Endangered Animals	1	3	9	13	18	1.4

The raster calculator works by first multiplying the value of each pixel in a raster layer by the weight it was assigned (e.g. each pixel in the Wetlands raster is multiplied by 2.4, the result being that any pixel with wetlands present now has a value of 2.4, and those pixels with wetlands absent have a value of 0). This is done for each of the six raster layers. Then the raster calculator builds a new raster layer by summing, for each pixel, the weighted values from each of the six raster layers. Each pixel in the final raster layer was thus a composite of the same cells from each of the six contributing layers. The resulting layer displays the weighted and summed component layers, and as such is a visual summary of the opinion survey.

Figure 1. Flowchart showing development of Figures 3.4 and 3.5.



APPENDIX D. METHODS FOR FIGURES 3.10-3.13.

Figures 3.10-3.13 model the NEMIA study area in terms of its value as stopover habitat for migratory birds. The maps are based on a model developed by Ewert et. al (2006) for The Nature Conservancy for predicting stopover habitat for migratory birds along the Lake Erie shoreline. The Breeding Bird Survey (USGS, 2007) and Chartier and Ziarno (2004) suggest that most of the priority species that Ewert et. al (2006) used to develop the Lake Erie model (8 of 10 waterfowl species, 14 of 14 shorebird species, and 17 of 18 landbirds and raptors) also occur or have occurred in Northeast Michigan. Therefore, we assumed that the same model can be applied to the NEMIA study area to predict the location of migratory bird stopover sites.

The development of Figures 3.10-3.13 began with the creation of base layers representing landscape features important for migratory bird stopover habitat, such as wetlands, riparian areas, and open areas. We used the following sources to develop these base layers: Coastal Change Analysis Program Land Cover 2000 map (developed by the National Oceanic and Atmospheric Administration (NOAA), the National Wetlands Inventory map (developed by the United States Fish and Wildlife Service), a Soil Moisture Index map (developed by Ducks Unlimited), and maps showing the location of inland lakes, rivers, and Lake Huron obtained from the Institute for Fisheries Research. Table 1 explains the specific methods we used to create the base layers that went into building the model.

To build the potential stopover habitat maps, we first combined base layers to form "attributes," new data layers that represented features of the landscape useful for determining its value for stopover habitat. For each group of birds (migratory waterfowl, migratory shorebirds, migratory landbirds/raptors, and all migratory birds) we created a set of attributes – taking directly from the TNC model – that collectively model the stopover habitat needs for each group. We gave each attribute a score based on its importance to that group of birds' stopover habitat needs. The scores range from 0 to 5, where 0 represents non-habitat, and 5 represents critical habitat. Tables 2-4 show the attributes used in each bird group's habitat model, as well as the preparation process that went into creating each attribute layer, and each attribute's score.

Once the attribute layers were developed using the base layers, we created a habitat map for each group of birds by overlaying all attribute layers that applied to that group. In areas where attributes overlap, the attribute with the higher score took priority. This resulted in Figures 3.10-3.13, three maps showing modeled stopover habitat by bird group, and one map of modeled stopover habitat for all bird groups combined.

Table 1. Base layers used for all migratory bird stopover habitat models.

Layer name	Source layers	Method of layer development
Undeveloped land	Coastal change analysis program (CCAP) land cover	The CCAP classifications of "grassland", "forests", "scrub/shrub", "wetlands", and "unconsolidated shore" were reclassified as "undeveloped land."

Agricultural land	CCAP land cover	The CCAP classifications of "cultivated lands" were reclassified as "agricultural land."
Hydric soil	Soil Moisture Index (SMI)	Areas classified as "very wet" or "wet" were reclassified as "hydric."
Agricultural hydric soil	Agricultural land Hydric soil	Agricultural lands were clipped with the hydric soil layer to extract areas that were both agricultural land and had hydric soil.
Emergent wetlands	NWI	Areas that were classified as "emergent" or "scrub-shrub" according to NWI were turned into a new layer called "emergent wetlands."
Emergent wetland complex	Emergent wetlands	The emergent wetlands layer was buffered by 0.125 kilometers and an "identify overlapping polygon" script was used to select wetlands that were within 0.25 kilometers of each other. The selected wetlands were turned into a new layer called "emergent wetland complex."

Table 2. Migratory Landbird/Raptor Stopover Habitat Model: Attributes, Scores, and Methods.

Attribute number	Conservation importance	Layers used	Method of layer development
1	5	Undeveloped land Lake Huron	Undeveloped lands within 0.4 km of Lake Huron were extracted. These undeveloped lands were given the score of 5.
2	4	Undeveloped land Lake Huron	Undeveloped lands within 1.6 km of Lake Huron were extracted. Areas that overlapped with attribute 1 were removed. The remaining undeveloped lands were given the score of 4.
3	3	Undeveloped land Rivers Inland lakes Emergent wetlands	Undeveloped lands within 200 meters of rivers, lakes, or wetlands were selected. Areas that overlapped any of the above attributes were removed. The remaining undeveloped lands were given the score of 3.
4	2	Undeveloped land Rivers Inland lakes	Undeveloped lands within 400 meters of rivers, lakes, or wetlands were selected. Areas that overlapped any of the above attributes were removed.

		Emergent wetlands	The remaining undeveloped lands were given the score of 2.
5	2	Undeveloped land	Undeveloped lands were buffered by 2 kilometers to identify any undeveloped lands that were isolated by 4 kilometers. No such areas were found.
6	1	Undeveloped land	Undeveloped lands that did not fit into any of the above classifications were turned into a new layer. They were given the score of 1.

Table 3. Migratory Shorebird Stopover Habitat Model: Attributes, Scores, and Methods.

Attribute number	Conservation importance	Layers used	Method of layer development
1	5	Emergent wetlands Emergent wetlands complex Lake Huron	Emergent wetland complexes were combined with single emergent wetlands larger than 10 hectares. Those that were within 3.2 km of the Lake Huron coastline were selected. These were turned into a new layer and were given the score of 5.
2	4	Emergent wetlands Emergent wetlands complex Lake Huron	Emergent wetland complexes were combined with single emergent wetlands with areas larger than 10 hectares. Those that overlapped with attribute 1 were removed. The remaining wetlands were turned into a new layer and were given the score of 4.
3	4	Hydric soil Lake Huron	Hydric soil areas within 16 km of the Lake Huron coastline were selected. These were turned into a new layer and were given the score of 4.
4	3	Hydric soil Lake Huron	Hydric soil areas that were not selected as attribute 3 were selected. They were turned into a new layer and were given the score of 3.
5	3	Emergent wetlands Lake Huron	Emergent wetlands smaller than 10 hectares were selected. Those within 3.2 km of the Lake Huron coastline were selected. The selected wetlands were turned into a new layer and were given the score of 3.

6	2	Emergent wetlands Lake Huron	Emergent wetlands smaller than 10 hectares were selected. Those that were selected as attribute 5 were removed. The remaining wetlands were turned into a new layer and were given the score of 2.

Table 4. Migratory Waterfowl Stopover Habitat Model: Attributes, Scores, and Methods.

Attribute number	Conservation importance	Layers used	Method of layer development
1	5	Emergent wetlands Inland lakes	Emergent wetlands larger than 16 hectares were selected. From that group, those that were adjacent to a body of open water larger than one hectare were selected. Wetlands selected from that group were turned into a new layer and were given the score of 5.
2	5	Emergent wetlands Inland lakes	Initially, emergent wetlands and water bodies larger than one hectare were selected. For this group, those that were within 120 meters of another emergent wetland larger than one hectare were selected. The selected wetlands and lakes were turned into a new layer and were given the score of 5.
3	4	Emergent wetlands	Any emergent wetlands with areas larger than 1 hectare were selected and turned into a new layer. They were given the score of 4.
4	4	n/a	Use expert knowledge to identify known Diving Duck concentration areas. Due to lack of time and resources this attribute was not included in our analysis.
5	3	Agricultural hydric soil Lake Huron	Any agricultural fields with hydric soil areas larger than 5 hectares were selected. Those within 24 km of Lake Huron were selected. These areas were then turned into a new layer and were given the score of 3.
6	3	Agricultural hydric soil Lake Huron Inland lakes	Any agricultural fields with hydric soils larger than 5 hectares were selected. Within that selection those that were within 1.6 kilometers from an inland lake were selected, and those that overlapped with attribute 5 were removed. These were made into a new layer and given the score of 3.

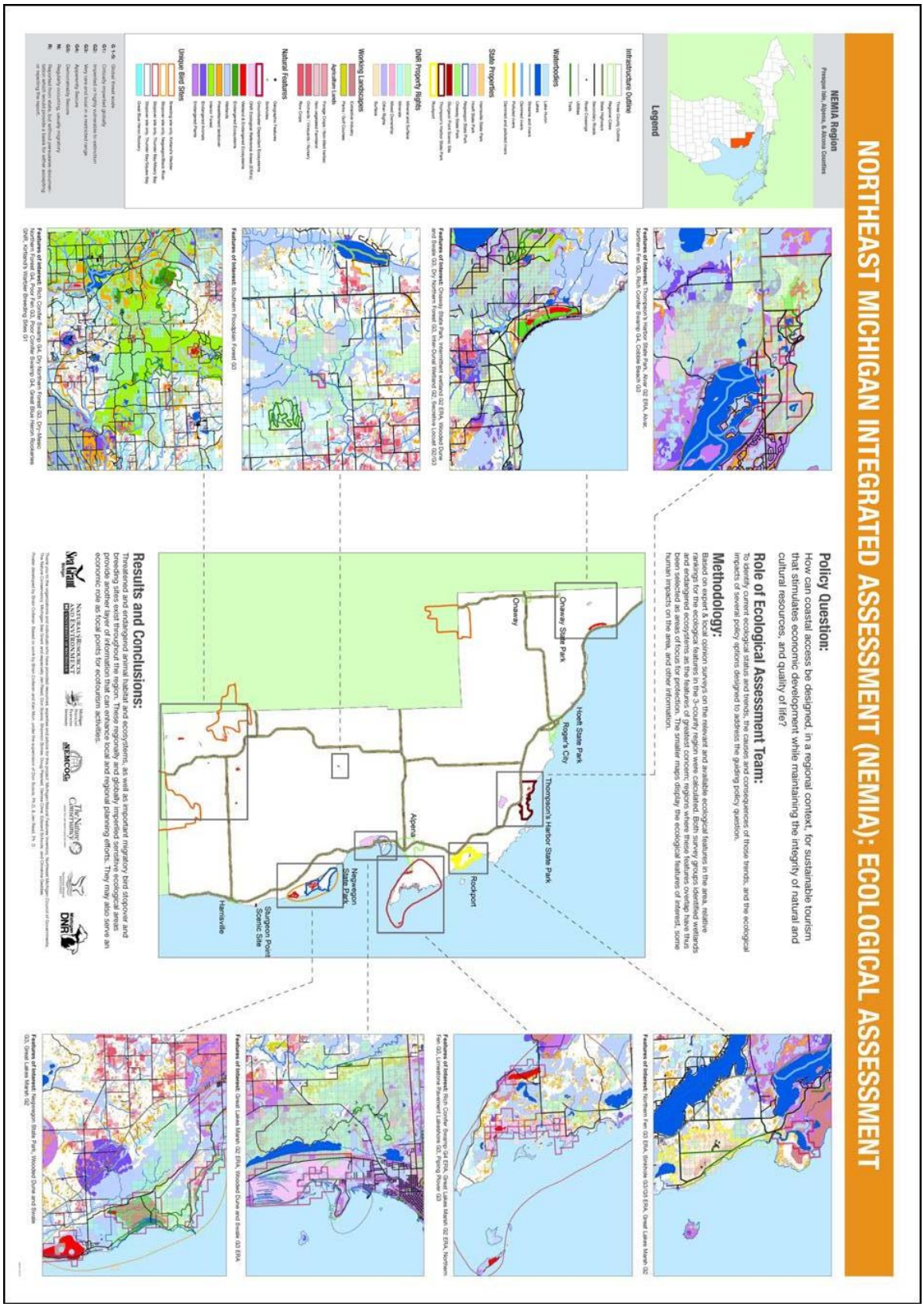
7	2	Agricultural hydric soil Lake Huron	Any agricultural fields with hydric soil areas larger than 5 hectares that were not in attribute 5 or 6 were selected. These were turned into a new layer and were given the score of 2.
8	2	NWI	NWI classification of forested class and broad-leaved deciduous wetlands were selected, and areas larger than 1 hectare were selected. These were turned into new layer and were given the score of 2.

Works Cited – Appendix D

Chartier, Allen T. and Ziarno, Jerry. (2004). *A birder's guide to Michigan*. Colorado Springs, CO: American Birding Association.

United States Geological Survey (USGS). *The Breeding Bird Survey*. Retrieved April 2007 from http://www.pwrc.usgs.gov/BBS/

APPENDIX E. POSTER FOR NEMIA WORKGROUP MEETING.



APPENDIX F. CERTAINTY ASSESSMENT

While the sources of data were all reliable, some of the information used in this report does have a certain degree of built in uncertainty. Though the layers used were the most up to date available, due to a lack of metadata by the source organizations, it is unknown how current the information displayed is, since none of the information was "ground-truthed". The exception to this is the MNFI, which is updated on a yearly basis.

Summary of potential data problems:

Unknowns:

- How old the data are. Most of our data had a statement on date of collection for information, but many did not. Because we did not collect this data, the ecological team can not verify how up to date this information is
- The positional accuracy of the information when it was gathered
- What information was not included in the attribute tables
- Data collection methodology

Summary of specific layer accuracy issues:

MNFI:

- Some of the information is historically based, and may lack spatial accuracy.
- Some of the endangered species have not been observed for many years.
- The lack of accuracy in the historical data led to widening of the habitat area to cover for the lack of accuracy.
- Most private lands were not surveyed.

USGS interior forest:

- Very large resolution. 1 km x 1 km, as opposed to 30 meter x 30 meter for most land cover maps
- 2002 data

Potential analysis errors:

Methodology

- Potential errors with opinion maps
    - Participant bias
    - How we presented the question in the survey may have influenced participant responses

- Potential errors with river map
    - The influence of dams may be more or less than the half a mile upstream and downstream. This was done because the dam layer was not perfectly aligned with our rivers layer, possibly due to an error in the layer itself

    - The reaches highlighted may be further than a half mile away from the dam, depending on the length of the highlighted reach.

- Potential errors with bird model maps
    - The model was originally developed for the western Lake Erie basin, not the northeastern coast of Lake Huron.
    - There are other important species in northeast Michigan such as the Kirtland Warbler that are not present in Western Lake Erie region, and were not part of this model.

CHAPTER 4

CULTURAL ASSESSMENT

4. NORTHEAST MICHIGAN COASTAL CULTURAL ASSETS ASSESSMENT: ALCONA, ALPENA, AND PRESQUE ISLE COUNTIES

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4.1 OVERVIEW AND PURPOSE

The purpose of this cultural assessment is to collect and compile a list of coastal cultural assets of Northeast Michigan, including assets both on coastal lands and in Lake Huron waters, to inform the Northeast Michigan Integrated Assessment (NEMIA) policy question, *"How can coastal access be designed, in a regional context, for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources, and quality of life?"*

This project utilizes data from existing documents, databases, and regional initiatives that maintain lists of cultural assets. Assets are organized by county in the study region (Alcona, Alpena, and Presque Isle) and by regional themes (lighthouses, shipwrecks, etc.). As a primary outcome, this assessment organizes existing data into formats that can be used to support and inform this regional integrated assessment and development of coastal access related policy options. In some limited cases, the assessment identifies and/or describes new assets, which are integrated to fill identified gaps. This project also supports future submission of assets or data to appropriate cultural resource inventories or databases, and potential generation of GIS data layers for this coastal region.

Lead contributors to this assessment include: NOAA Thunder Bay National Marine Sanctuary, Michigan Department of History, Arts and Libraries, Michigan Sea Grant College Program, and underwater archeology students from the Alpena Community College.

4.2 BACKGROUND

A region's cultural resources are the assets that define its culture – the assets that reflect activities that are common among the region's current or past residents. These assets vary from history and related historical artifacts to current residents' demographics and social interactions, activities such as jobs, recreational activities, and even festival celebrations, agricultural and industrial products, styles of doing things, and special places and locations important to the

region. These collective assets and related experiences help foster a sense of place for individuals within a community and the local community as a whole (Clark & Gray, 2006).

In recent years, greater interest and attention is being given to better understanding and describing the importance and value of the sense of place in the NEMIA study area (Dave Glenn, personal communication, April 20, 2007). Throughout 2005-06, residents of Presque Isle County participated in a county-wide exercise to describe and communicate their sense of place. Facilitated by staff from Michigan State University Extension, the process and outcomes of this type of exercise are described as follows:

> "The [county-wide] group was purposefully formed to be very diverse including participants that were young, seniors, new to the area, native to the area, farmers, businesses, and local officials. The initial meeting had the participants spending time relating to the rest of the group what their perception of what is unique and special about the place they live. Examples included pictures, places, people, things (like wool, tractors, barns…), some even included the smell of the woods in the spring after a rain. What the group discovered was, although their individual senses of place were different, there was a common theme that linked them together regardless of where they lived in the county (D. Glenn, personal communication, April 20, 2007)."

One of the strategic priorities of the Michigan Department of History, Arts, and Libraries (MDHAL) is creating opportunities for fostering connections between community cultural resources and economic development. MDHAL defines cultural economic development as "leveraging our creative talent, heritage and cultural assets to stimulate, support and enhance economic growth and build community prosperity" (Michigan Department of History, Arts and Libraries [MDHAL], 2005).

MDHAL's investment in this strategy includes increasing awareness and understanding of the business and economic value of cultural resources, providing support for local and regional grass-roots initiatives seeking to enhance cultural economic development opportunities, and helping to promote and market these types of cultural products or industries (MDHAL, 2005).

In the NEMIA study area, this strategy provided support for a regional coastal maritime heritage tourism initiative resulting in the *Lights of Northern Lake Huron* driving tour. This initiative engaged local tourism, economic development, and cultural resource stakeholders, and initiated a process for identifying coastal cultural resources under four different regionally connecting themes. The lighthouse theme was developed into this regional driving tour which is now promoted by the website for Travel Michigan, the state's tourism agency (Travel Michigan, 2007).

Cultural and heritage-related tourism are not new concepts, and research and development supported through the National Geographic Society's Center for Sustainable Development (NGCSD) are conceptually evolving these definitions toward an idea of "geotourism" (National Geographic Center for Sustainable Destinations [NGCSD], 2007; Clark & Gray, 2006). NGCSD

(2007) defines geotourism as "tourism that sustains or enhances the geographical character of a place—its environment, culture, aesthetics, heritage, and the well-being of its residents."

Geotourism is directly relevant to the NEMIA policy question which seeks to balance resource protection and regional quality of life with tourism and economic development opportunities. Focusing first on a geographical region's sense of place or cultural character, geotourism encompasses more of an ecosystem-based approach for emphasizing on the collective connections among cultural resources, environmental resources and the people who live (or have lived) in the region, rather than focusing singularly on an individual historical artifact. Geotourism builds on describing and protecting the features and assets that are unique, distinct, or instill an authentic experience of the region. It is designed to foster sustainable tourism that protects regional resources and provides mutual benefits for both visitors and community residents (NGCSD, 2007; Travel Industry Association of America, 2002)

Geotourism initiatives must be inclusive and synergistic in considering regional features, assets, and attributes (NGCSD, 2007; Clark & Gray, 2006). Developing through geotourism involves intensive efforts to identify and organize regional assets, both in depth of detail describing each asset and breadth of assets and attributes described. These attributes include historic, natural, recreational, cultural, scenic, and archaeological aspects of the region; and should be compiled and organized in ways that foster and convey the authentic stories and experiences of the region. Design audits, World Wide Web and other information resources, and programs and festivals are important aspects of enhancing these stories and experiences. Finally, determining needs, opportunities, and priorities for protecting local resources is important and necessary to provide sustainability for the very resources that contribute to community quality of life and a positive cultural tourism experience for visitors (Clark & Gray, 2006).

Specific to Northeast Michigan, several regional inventories and projects provide information on coastal cultural resources. These existing data include previously conducted coastal assets inventories (e.g., Huron Greenways study, U*S-23 Sunrise Side Coastal Highway Management Plan*, etc.) or efforts currently underway (e.g., the Marine Sanctuary's inventory of shipwrecks and underwater artifacts). These projects identify and provide varying levels of information related to coastal cultural and historical assets, ranging from specific archeological artifacts to parks and festivals that celebrate Northeast Michigan's history and culture. These data were collected, organized (by county, regionally connective themes, and/or illustrated on nautical charts), and used in generating this assessment. The purpose of the assessment is not necessarily to generate new data; however, in some cases, new information was included where possible and appropriate, such as through the ongoing underwater inventory.

4.3 METHODS

This cultural assessment reviews and compiles data from existing inventories and descriptions relevant to Northeast Michigan's coastal counties of Alcona, Alpena, and Presque Isle. End products are intended to support and inform policy option development related to the NEMIA policy question.

This assessment collects and describes assets in two primary categories based mainly on their physical location: “on-shore” or “in-water”. Assessment process and methods for compiling information in each category varied for each category. These categories, described in more detail below, include:

1. on-shore cultural assets – includes historical buildings and artifacts, parks/trails and access points, festivals and events, recreational opportunities and businesses, and other assets located on land and relevant to the coastline; and
2. in-water cultural assets – includes shipwrecks and other underwater artifacts

4.3.1 On-shore Assets

The on-shore assets were compiled and organized by MSG staff and Alpena Community College (ACC) students with support from MDHAL, the Marine Sanctuary, and Northeast Michigan Council of Governments (NEMCOG) staff.

Specific documents, resources, contacts, and existing inventories were identified through the NEMIA workgroup (see Appendix A for complete resource list of titled resources identified for cultural assessment). This information compiled from these resources were organized in the context of county, data sources, and regionally connective themes or categories identified through a separate regional maritime heritage tourism planning initiative (Sandra Clark, personal communication, September 7, 2005). Assets are linked with the original project, initiative, or data sources in which they where they were originally identified or described; these linkages are intended to document how often each asset is described in regional inventories, varying levels of data existing for each cultural asset, and where these data and information can be found in support of future initiatives.

The NEMIA workgroup provided resource access and review support for this portion of the assessment. The following outline describes the specific process and methods used to compile and organize these data:

a) The Marine Sanctuary and MDHAL review previous and current work; describing value and opportunity in collecting and organizing this type of information about regional community.
b) NEMIA Work Group provides recommendations and access to documents, projects, and other sources of information.
c) ACC students review, consolidate, and organize data regarding identified assets, based on two criteria:
    a. where information can be found or is documented for each identified asset
    b. regionally connective themes emerging from the regional maritime heritage tourism planning initiative led by MDHAL and Travel Michigan. Themes include:
        i. Harbors, Towns, and Ports
        ii. Seeing the Light
        iii. Commerce (or Lake Huron Bluewater Highway products in and out)
        iv. People Power of the Great Lakes
        v. Fins, Fur, and Feathers (new category added by NEMIA workgroup)

d) Summary document reviewed by lead tourism contacts in each of 3-counties; and after initial revisions, entire NEMIA workgroup provided opportunity for review
e) Finalize organizational spreadsheet and provide to NEMIA workgroup for use in NEMIA policy option development and other future uses and development

4.3.2 In-water Assets

The in-water assets were compiled and organized by the Marine Sanctuary and MDHAL staff. In-water assets consist primarily of historic shipwrecks, but also include the remains of historic docks, piers, cribs, and associated maritime cultural material. The assessment began with a thorough archival review, including primary documents and relevant secondary sources. Interviews with divers, fishermen and regional and local government entities charged with cultural resource management also contributed to this first step. In-water assessment began by locating new assets and confirming currently known assets via remote sensing surveys. Sanctuary, state, and partner archaeologists utilized side scan sonar, magnetometer, aerial photography, and other techniques in this initial assessment phase. Data from these surveys were incorporated into a database coupled with a GIS (geographic information system) package. Potential targets discovered during the initial remote sensing surveys were ground-truthed using divers and remotely operated vehicles (ROVs). Information from these reconnaissance level expeditions was catalogued in the GIS package. Once evaluated, targets were assessed for their historical significance, prioritized, and documented using underwater photography, video, and diver mapping techniques. The GIS package is continually updated, giving archaeologists an opportunity to not only evaluate single sites but also to consider the relationship of multiple sites to one another. This spatial analysis is particularly helpful in areas where shipwreck remains may be scattered over large areas. GIS data also allows researchers to better discern broader historical shipping and wrecking trends, which can help archaeologists plan future fieldwork and target particularly significant areas. Finally, GIS provides a comprehensive and intuitive way to catalog large amounts of data ranging from historic information to field research results. An added benefit to digitizing and organize information this way is that it can more easily be made available to the public and used for a variety of interpretive purposes.

4.4 RESULTS

4.4.1 On-shore Assets

A total of 303 assets were identified as a part of the on-shore assessment compiled from existing inventories, documents, and resources provided by the NEMIA Work Group. These assets are organized by county, regionally connecting theme, and data source in Appendix B.

Types of assets identified varied widely and included: historical buildings and artifacts, coastal trails and access points, parks and museums, businesses and recreational centers, and other items relevant to the Lake Huron coastline. These assets originated from over 21 separate sources, including previously conducted inventories, regional initiatives and planning documents, state and federal historic databases, personal communication with NEMIA Work Group, and internet

references. These sources maintain varying degrees and depth of detail and information relevant to each individual asset. Documents and inventories that provided the most assets include:

- *Huron Greenways: A System of Land and Water Trails* (Northeast Michigan Council of Governments [NEMCOG], 1999) [152 Assets]
- *US-23 Sunrise Side Coastal Highway Management Plan* (NEMCOG, 2003) [23 Assets]
- Northeast Michigan "Maritime Heritage Tourism Destination" planning discussion notes (S. Clark, personal communication, September 7, 2005) [148 assets]
- State Register of Historic Sites and Michigan Historical Marker Program (database for both programs is accessible at http://www.mcgi.state.mi.us/hso/) [31 assets between both programs]
- The National Park Service's National Register of Historic Places database is accessible at http://www.nr.nps.gov/nrloc1.htm [25 assets]

Arranged by county, the identified assets are distributed among the region as follows: Alcona County (57 assets), Alpena County (134 assets), and Presque Isle County (112 assets). Assets were arranged in pre-established thematic categories based on the potential for using each asset in developing a regionally connected and thematic tourism product, such as the Lights of Lake Huron driving tour. In many cases and based on appropriateness, each individual asset might be arranged or listed under multiple counties and/or multiple themes. Assets organized under each theme are categorized as follows:

- Harbors, Towns, and Ports (218 assets): This theme reflects the types of assets that define the coastal communities and harbors connected with Lake Huron. The types of assets used to describe this theme include historical sites and museums, visitor centers, festivals and events, coastal relevant businesses, coastal parks and trails, and harbors and other coastal access points.

- Seeing the Light (35 assets): This theme focuses around coastal lighthouses and shipwrecks as a means of describing the coastal highway and boat traffic of northern Lake Huron. The types of assets used to describe this theme include lighthouses, shipwrecks and museums, maritime festivals and lighthouse viewing tours, and such. These assets have already been compiled, organized, and synthesized into a regional story, which is developed as the *Lights of Northern Lake Huron* driving tour currently hosted on the Travel Michigan website (Travel Michigan, 2007).

- Commerce (or "Lake Huron Bluewater Highway") (79 assets): This theme focuses on Lake Huron as a historic water highway used in shipping products in and out of the region. Today, the use of this highway is expanded even to recreational traffic, and remains just as value for commerce and shipping. As examples, this category includes assets such as shipping history and shipwrecks that reflect this history, maritime heritage museums, and limestone quarries and other products or businesses that represent commerce moving in and out of Northeast Michigan via Lake Huron shipping.

- People Power of the Great Lakes (118 assets): This theme focuses on people and families that are closely tied with the history, culture, and coastal businesses and places

important to the region. Assets organized under this theme include famous names of people who influenced and shaped the history of the region, as well as the places they lived, the businesses or jobs they represented, and parks or memorials that celebrate their contributions to the region. This theme encompasses the reasons people settled this region and the types of things they did, such as logging, commercial fishing, mining and extraction, and other industry. Museums and other historical buildings and artifacts are also organized in describing this theme.

- Fins, Fur, and Feathers (60 assets): This theme is newly described by the NEMIA Work Group, and focuses on the natural resources-related assets and values of the region. As examples, this category includes assets such as wildlife viewing areas, fishing boat launches and access points, natural resource research and management presence, historic fishing vessels and artifacts, and fishing-related charter businesses and community festivals.

4.4.2 In-water Assessment

Assets for the in-water assessment were inventoried by staff at the Marine Sanctuary, who for the past two years, have been cataloguing in-water resources within the boundaries of the sanctuary. For this assessment, Marine Sanctuary staff documented and illustrated the assets on charts of Lake Huron waters for each county (See Figures 4.1, 4.2, and 4.3), and also provided the following narrative summary highlighting some of the notable in-water resources (Russ Green, personal communication, July 18, 2007).

Approximately 71 known shipwrecks occur in Lake Huron's waters off Alcona, Alpena, and Presque Isle counties. Based on historical research, over 100 unknown wrecks may be located anywhere in this area of Lake Huron. Based on the density of known and potential resources, and the historical, archaeological, and recreational significance of individual and collective resources, the in-water assets in this region are considerable.

The waters off Alcona and Presque Isle Counties and the waters east of the Marine Sanctuary contain over 30 known shipwrecks (wreck with available coordinates). The area contains approximately equal numbers of deep and shallow water wrecks. The deep water wrecks are popular for technical divers who venture beyond the recreational dive limit of 130 feet. Deep water sites are often well-preserved structures containing a wealth of artifacts that offer a rare opportunity to discover information about the past that is not captured in the historical record. A cluster of these shipwrecks, including the *Cornelia B. Windiate*, *Defiance, John J. Audubon*, *Florida, Norman*, and *Typo* are located just north of the current marine sanctuary boundary. The *Cornelia B. Windiate,* one of the Great Lakes' most intact shipwrecks, rests in 185 feet of water. This three-mast wooden schooner sank with all hands in December 1875 when bound from Milwaukee to Buffalo with a cargo of wheat, and was featured in an episode of *Deep Sea Detectives* on The History Channel. The *Defiance,* a two-mast schooner, is another extremely well-preserved example of mid-nineteenth century schooner construction. It collided with another schooner, the *Audubon*, in 1854. The *Florida*, a package freighter located in over 200 feet of water, contains a large amount of cargo, including wheat, flour, syrup, and whiskey, most

of which remains on the wreck site. The *Norman*, a 296 foot steel bulk freighter, and the *Typo*, a fairly intact three-mast schooner, are also located in that area.

The three-mast wooden barkentine *H.P. Bridge* is located in Alcona's deeper waters. Artifacts on this virtually intact wreck include pottery, clothing, and ship tackle and hardware. The steel bulk freighters *W.C. Franz* and *W.H. Gilbert* are also known deep water wrecks in Alcona. Few shipwrecks in and around the sanctuary are constructed of steel.

Accessibility to shipwrecks is not limited to trained scuba divers. Non-divers can snorkel shallow water wrecks, or view them by boat or kayak. These sites also offer a tremendous amount of archaeological data on ship architecture, due to their often fragmented state. In Presque Isle, the *Albany*, a paddle-wheel steamboat that sank in 1853, is located in shallow waters just south of the Presque Isle Harbor and the *American Union*, a schooner that sank in 1894, is located near shore at Thompson Harbor. A large section of the starboard side of the wooden bulk freighter *Joseph S. Fay* is located on the beach near 40 Mile Point Lighthouse in Presque Isle County. The rest of the largely intact wreck is located in very shallow water. Other shallow wrecks in the area include the *Duncan City, W.G. Mason*, and *Czar*.

Many of the known shipwrecks in Alcona County are shallow water wrecks. Included in this group are the *Marine City* and *City of Alpena.* Twenty lives were lost when the wooden side-wheel steamboat *Marine City* burned off Alcona in 1880. The same year, the wooden harbor tub *City of Alpena* also burned off Alcona. The tub operated out of Alpena for five years before it burned. Other shallow water wrecks located off Alcona include the *Mackinaw, Buckingham, Venus, and Detroit*.

The waters off Alcona, Alpena, and Presque Isle Counties likely contain over 100 additional unknown shipwrecks (historic wrecks believed to be lost in this area of Lake Huron). The *Clifton* and *Choctaw* are likely located in Presque Isle County. Both were built in 1892 and represent crafts unique to the Great Lakes. The *Clifton*, a whaleback, is a steel-hulled bulk carrier with a rounded deck and long, snout-like bow resembling the hull of early submarines. Only 41 were constructed. The *Choctaw*, a straight-back, is similar to the *Clifton*, but has more vertical sides and a fuller bow. Locating one or both of these vessels would provide significant historical information of an understudied class of vessels. Likely located in Alcona County are the wooden propellers *R.G. Coburn* and the *Egyptian*. The *R.G Coburn* reportedly carried wheat, flour, and valuable silver ore. The *Egyptian* is significant because it was equipped with the first fore-and-aft compound engine used on the Great Lakes.

Figure 4.1. In-water assets in Alcona County, Michigan.

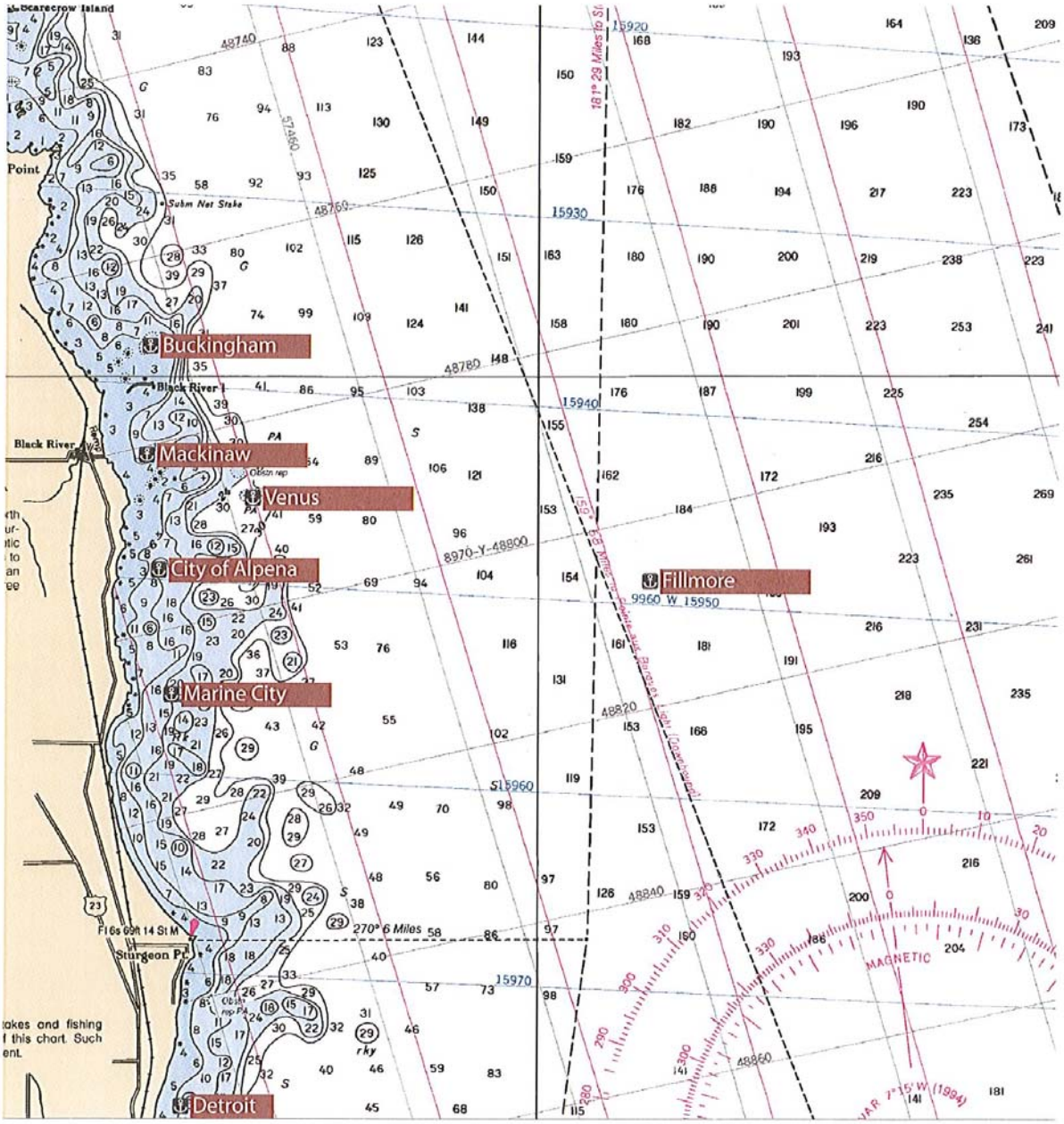


Figure 4.2. In-water assets in Alpena County, Michigan.

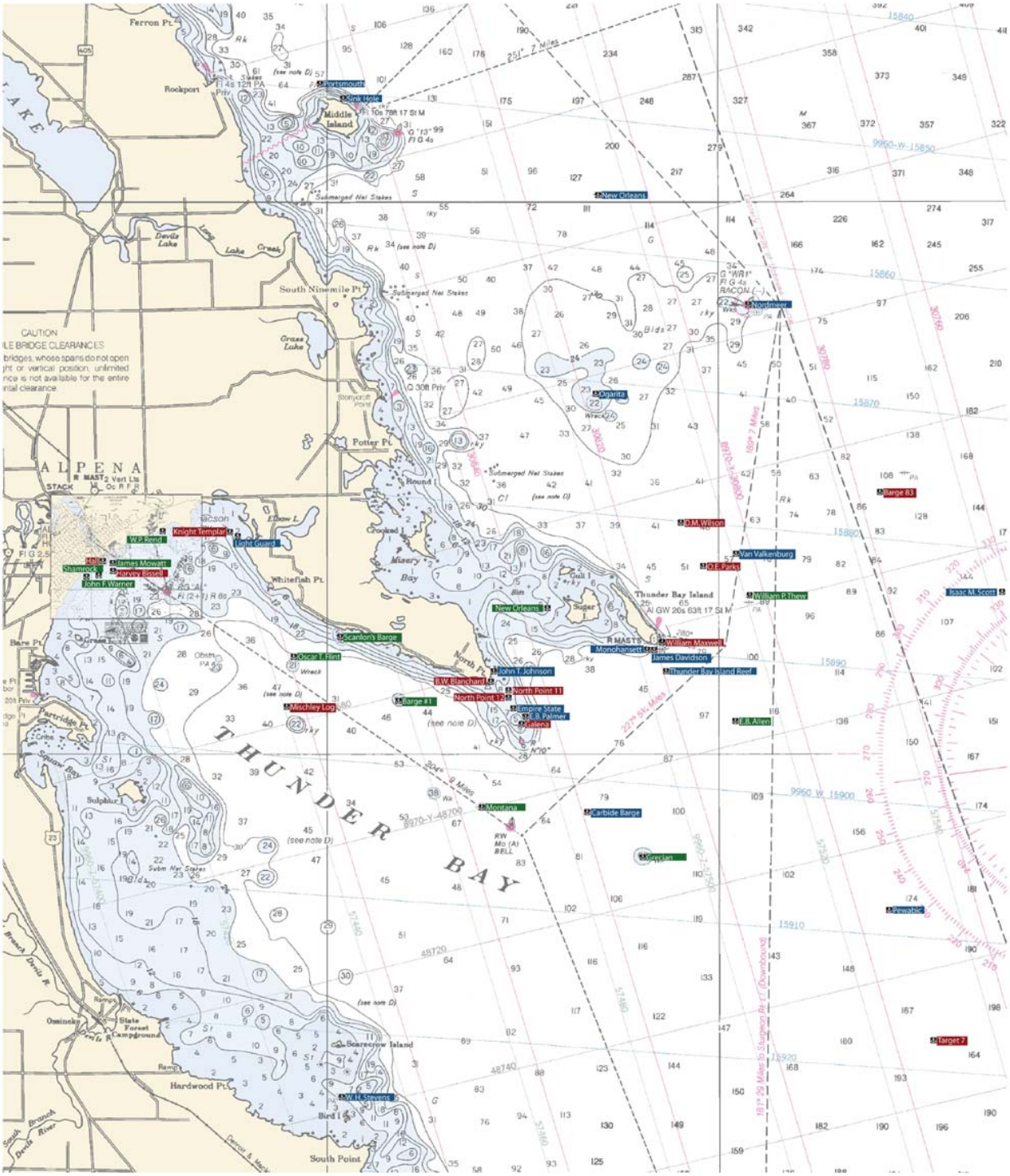
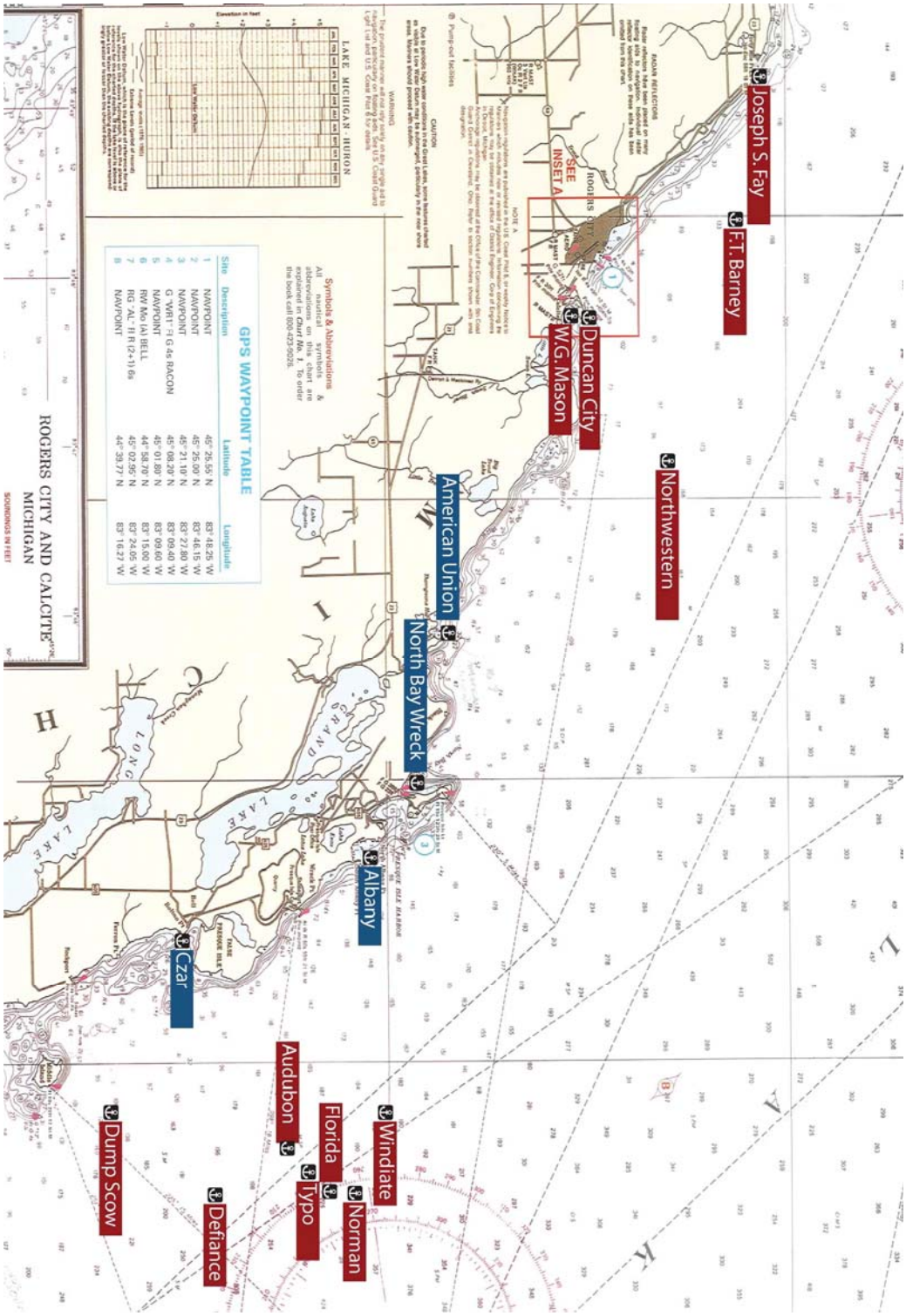


Figure 4.3. In-water assets in Presque Isle County, Michigan



4.5 CONCLUSION

Significant investment and work has already been done in Northeast Michigan to inventory and map both on-shore and in-water cultural and maritime heritage-related assets, resources, and how to access them. This region is rich in cultural assets, and identification of these assets is an important first step in both protecting these resources and sustainable development of these assets to enhance local quality of life and economic benefits from tourism-related interests in these assets.

Efforts toward protection, interpretation, and development of coastal cultural and historical assets development should seek to leverage resources of the Marine Sanctuary, MDHAL, and local historical societies and groups most knowledgeable about these assets. These partners can help identify most at-risk resources and other resource protection needs, as well as identify opportunities for interpretation, education, and sustainable tourism development opportunities related to these resources. Strong connections with ecological resources and partners, such as the Michigan Department of Natural Resources and their coastal state-owned properties (Negwegon, Rockport, and Thompson's Harbor), can also add value to geotourism related efforts and products for the region. Many of these primarily natural resource focused areas also host significant cultural and historical components or assets that can benefit from protection, interpretation, education, and tourism opportunities that can be developed in partnership with cultural and history oriented partners.

Developing additional supporting information and depth of detail for each individual asset is an opportunity for further enhancing these current, existing projects. Interpretation (signage, information brochures, etc.) and education (local tours, programs, etc.) efforts related to these existing cultural assets and access points can help foster awareness, appreciation, and stewardship toward existing cultural assets for both local community members and tourism industries' visitors to the area. This region has done some initial work in developing regional "stories" or tourism products that regionally connect these cultural, maritime heritage assets. One example is the *Lights of Northern Lake Huron* driving tour developed with support from MDHAL. The Marine Sanctuary has also initiated work to develop a water-based kayak trail connecting in-water assets such as shipwrecks and lighthouses that can be experienced from the water. These foundations can be expanded upon to develop additional regionally thematic stories that connect regional assets, interpret their historic relevance and cultural value to the region, and enhance products that can generate authentic coastal geotourism opportunities. The Lake Erie Coastal Ohio Initiative provides a good example of a well-developed assets inventory, and how to incorporate these assets into many regional, thematic "stories" that are used to interpret and tell the region's story. The Lake Erie Coastal Ohio Initiative demonstrates regionally developed themes that encompass, integrate, and interpret cultural, historical, and ecological resources of the region while generating and delivering tourism marketing products via the internet. Coastal Ohio work is catalogued online at http://www.coastalohio.com.

Works Cited

Clark, S. & Gray, J. (2006, June 8). *Cultural resources: It's all about this place.* Retrieved July 24, 2007, from http://www.miseagrant.umich.edu/downloads/coastal/NEMIA/Cultural-Assessment_Clark_Gray.pdf

Michigan Department of History, Arts and Libraries (MDHAL). (2005, December). *Cultural economic development: A strategy to leverage Michigan's creative talent and cultural assets to spur economic growth and build community prosperity*. Lansing, Michigan: Michigan Department of History, Arts and Libraries. Retrieved December 18, 2007, from http://www.michigan.gov/documents/hal_ced_strategy_144333_7.pdf

National Geographic Center for Sustainable Destinations (NGCSD). (2007). *About geotourism*. National Geographic Society. Retrieved August 8, 2007, from http://www.national geographic.com/travel/sustainable/about_geotourism.html

Northeast Michigan Council of Governments (NEMCOG) and East Central Michigan Planning and Development Regional Commission. (2003). *US-23 sunrise side coastal highway management plan.* Retrieved December 18, 2007, from http://heritageroute.com/ ManagementPlan/index.htm

Northeast Michigan Council of Governments (NEMCOG). (1999). *Huron Greenways: A system of land and water trails for Alcona, Alpena, Cheboygan, and Presque Isle Counties.* Gaylord, MI: NEMCOG. Retrieved December 18, 2007, from http://www.nemcog.org/ greenways/greenways.html

Stueve, A.M., Cook, S.D., & Drew, D. (2002). *The geotourism study: Phase I executive summary*. Washington, D.C.: Travel Industry Association of America. Retrieved December 18, 2007, from http://rogharris.org/GeotourismPhaseFinal.pdf

Travel Michigan. (2007). *Lights of Northern Lake Huron.* Retrieved July 24, 2007, from http://www.michigan.org/travel/drivingtours/detail.asp?cid=951AACA5-53F0-491B-ADAB-FC4A3558FAAA&m=9;4

APPENDIX A. RESOURCES IDENTIFIED FOR CULTURAL ASSETS ASSESSMENT.

Data Set (Source)

- National Register of Historic Places – limited info for NE MI (National Park Service)
- State Register of Historic Sites and Michigan Historical Marker Program (MDHAL State Historic Preservation Office)
- Huron Greenways Initiative/Database (NEMCOG)
- U.S. 23 Heritage Route (MDOT)
- Non-motorized Trail Maps (NEMCOG, MDOT)
- Sweetwater Trails (maps)
- NE MI Maritime Heritage Destination Initiative (MDHAL, Travel Michigan)
- Thunder Bay National Marine Sanctuary Inventory of Shipwrecks (TBNMS)
- Marine Protected Areas Inventory – database (per Vrana)
- "Preliminary Comparative and Theme Study of National Historic Landmark Potential for Thunder Bay, MI" (Martin, J.C., NOAA NMS, 1996)
- "The Distribution and Abundance of Archaelogical Sites in the Coastal Zone of Michigan (Peebles, C. S., and D. B. Black, 1976, A report of the Michigan History Division, Michigan Department of State, from Division of the Great Lakes, Museum of Anthropology, University of Michigan, Ann Arbor – on loan from MDEQ CMP)
- Thunder Bay Region Inventory of Resources (Michigan Sea Grant 1993)
- Other NEMIA working group contributions, including:
    - City of Alpena Comprehensive Plan (Sundin, NEMCOG) study by committee chaired by Del Conley and initiated by the City of Rogers City -- City Council (per Anne Belanger)
    - Tri-Townships - Master Plan (Alcona, Caledonia and Hawes) (NEMCOG)
    - Presque Isle County Comprehensive Plan (NEMCOG)
    - Hazard Mitigation (NEMCOG)
    - The Community Foundation of Northeast Michigan (Barb Willyard, bwillyard@cfnem.org)
    - List from Thunder Bay Scuba (Joe Sobczak)
- Web searches (Alpena Community College Students)

APPENDIX B. SUMMARY OF ON-SHORE CULTURAL ASSETS.

	Asset	County	Maritime Heritage Themes						Resources/Background Documents							
			Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
1	Great Lakes Lighthouse Festival	Alpena	x	x	x	x						x				
2	Alcona County Library	Alcona				x						x				
3	Alcona County Review	Alcona				x						x				
4	Alcona Historical Society	Alcona				x						x				
5	AuSable River Canoe Marathon	Alcona	x			x						x				x
6	AuSable State Forest	Alcona	x				x					x				
7	Baily School	Alcona	x									x				
8	Basketball Court	Alcona				x			x							
9	Beyer's Charter Service	Alcona	x		x	x	x					x				
10	Black River Island	Alcona	x									x				
11	Black River Mouth Access	Alcona	x				x		x	x						
12	Black River Swamp	Alcona	x									x				
13	Blue Bird Charter	Alcona			x	x	x					x				
14	Cedar Lake Access Site	Alcona	x						x							
15	Cedar Lake Swamp	Alcona	x									x				
16	Cricket Charter Service	Alcona			x	x	x					x				
17	Dobis Charter	Alcona			x	x	x					x				
18	Gail Force Charters	Alcona			x	x	x					x				
19	Greenbush County School	Alcona				x			x							
20	Greenbush Golf Course	Alcona	x						x							
21	Greenbush Recreational Area	Alcona	x						x							
22	Greenbush School	Alcona				x					x				x	
23	Harrisville Access	Alcona	x				x		x							
24	Harrisville Arts and Craft Show	Alcona	x	x	x	x	x					x				

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other	
25	Harrisville Depot Dragon Days	Alcona	x			x						x					
26	Harrisville Harbor	Alcona	x				x		x								
27	Harrisville Municipal Marina	Alcona	x				x					x					
28	Harrisville State Park	Alcona	x						x								
29	Harrisville Township Rec. Area	Alcona	x						x								
30	Henry R. Schoolcraft "the beautiful plains"	Alcona				x						x					
31	Huron National Forest	Alcona	x				x		x	x							
32	J&J Campground	Alcona	x						x								
33	Lakewood Shores Resort	Alcona	x									x					
34	Lincoln Car Show	Alcona	x									x					
35	Lincoln Train Depot (West Harrisville Depot)	Alcona	x									x			x		
36	Main Street Park	Alcona	x						x			x					
37	Michigan DEQ Coastal Zone	Alcona	x	x	x	x	x					x					
38	Mill Creek	Alcona	x		x							x					
39	Mill Pond	Alcona	x				x		x								
40	Negwegon State Park	Alcona	x						x	x		x					
41	Paul Bunyan Kampground	Alcona	x		x							x					
42	Perley Silverhorn	Alcona	x	x		x	x					x					
43	Pine River	Alcona	x									x					
44	Silverthorn, Addison, Jewelry Store	Alcona												x			
45	South Point	Alcona	x									x					
46	Spring Hills Golf Course	Alcona	x						x								
47	Springport Inn	Alcona	x			x					x						
48	Springport Road ROW	Alcona	x						x								
49	Stormy Chinook Service	Alcona			x	x	x					x					
50	Sturgeon Point Lighthouse	Alcona	x	x					x	x		x	x	x			
51	Sturgeon Point State Park	Alcona	x						x			x					
52	Tennis Courts	Alcona				x			x								

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
53	Township Beach Park	Alcona	x						x							
54	Trask Lake Road ROW	Alcona	x						x							
55	U.S. Life Saving Service	Alcona	x	x	x	x	x					x				
56	Van Buskirk, Joseph, House	Alcona												x		
57	Vets Club Ponds	Alcona	x			x	x		x							
58	Worm Dirt Charters	Alcona	x		x	x	x					x				
59	Alpena Area Chamber of Commerce	Alpena				x						x				
60	Alpena Area Convention and Visitor's Bureau	Alpena	x			x				x						
61	Alpena Chamber of Commerce	Alpena	x			x						x				
62	Alpena City Hall	Alpena				x					x				x	
63	Alpena Civic Theater	Alpena			x	x			x							
64	Alpena Community College	Alpena				x			x			x				
65	Alpena County Courthouse	Alpena	x			x					x		x	x		
66	Alpena County Fairgrounds	Alpena	x						x			x				
67	Alpena County Fairgrounds Access	Alpena	x						x							
68	Alpena County George N. Fletcher Library	Alpena	x	x	x	x	x			x						
69	Alpena County Library	Alpena	x	x	x	x	x		x							
70	Alpena Downtown Development Authority	Alpena				x				x						
71	Alpena Federal Building	Alpena	x		x	x					x		x			
72	Alpena Flour Mills	Alpena	x		x						x		x			
73	Alpena Golf Club Inc.	Alpena	x						x							
74	Alpena Municipal Marina	Alpena	x						x			x				
75	Alpena Plaza Pool & Tennis Courts	Alpena			x	x			x							
76	Alpena Township Park	Alpena	x						x			x				
77	Alpena Yacht Club	Alpena	x		x	x			x							
78	Alpena Yacht Club	Alpena	x		x	x						x				
79	Alpena Youth Sailing club	Alpena	x									x				
80	Art on the Loft Gallery	Alpena				x						x				

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
81	Arthur Sytek Park	Alpena	x						x			x				
82	Avery Park	Alpena	x						x			x				
83	Bay View Park	Alpena	x						x			x				
84	Beach Park	Alpena	x						x			x				
85	Bertrand, Joseph, House	Alpena												x		
86	Besser Bell Pathway and Natural Area	Alpena	x									x				
87	Besser Company	Alpena			x	x						x				
88	Besser Museum Fall Harvest Days	Alpena	x			x						x				
89	Blair Street Park	Alpena	x						x			x				
90	Boys & Girls Club of Alpena	Alpena				x			x							
91	Brown Trout Festival	Alpena	x	x	x	x	x					x				x
92	Carter, Daniel, Commemorative Designation	Alpena													x	
93	Centennial Block	Alpena	x								x		x			
94	Chippewa Hills Pathway	Alpena	x									x				
95	Concrete Block Houses	Alpena				x					x					
96	Cultural Arts Alliance	Alpena				x				x						
97	Deckside Marina	Alpena	x						x							
98	Devil's Lake Area Snowmoblie Trail	Alpena	x						x			x				
99	Devil's Lake Wildlife Flooding	Alpena	x				x		x			x				
100	Dodge Marina & Storage (Sinbad's)	Alpena	x						x							
101	Downtown Fitness Center	Alpena				x			x							
102	DPI Decorative Panneling Inc.	Alpena			x	x						x				
103	El Cajon Bay	Alpena	x				x		x			x				
104	First Congregational Church	Alpena													x	
105	Foghorn Building	Alpena	x	x	x		x					x				
106	Glass Bottom Boat Tours	Alpena	x	x	x	x	x					x				
107	Gleason Roadside Park	Alpena	x						x			x				
108	Great Lakes Enviromental Research Laboratory	Alpena	x			x	x					x				

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
109	Great Lakes Maritime Heritage Center	Alpena	x	x	x	x	x			x		x					
110	Great Lakes Yngling Championship	Alpena	x		x	x						x					
111	Great Lakes Bottomland Preserve	Alpena			x				x		x						
112	Green School	Alpena	x			x						x					
113	Hamilton Road Natural Beauty Trail	Alpena	x				x		x								
114	Harbor Lights, LLC	Alpena	x	x					x								
115	Historic Neighborhoods	Alpena	x			x					x						
116	Holmes Building	Alpena			x	x						x					
117	I.O.O.F. Centennial Building	Alpena												x			
118	Island Park	Alpena	x				x		x			x					
119	J.J. Awesome Acres	Alpena			x				x								
120	Jesse Besser House	Alpena	x			x					x		x	x			
121	Jesse Besser Museum for Northeast Michigan	Alpena	x	x	x	x	x		x		x	x					
122	Katherine V (Fishing Tug)	Alpena	x		x		x					x	x	x			
123	LaCross Marina	Alpena	x		x	x						x					
124	Lafarge Corporation	Alpena	x		x	x					x						
125	LaMarre Park	Alpena	x						x			x					
126	Long Lake County Park	Alpena	x						x			x					
127	Maltz Exchange Bank	Alpena	x		x	x						x					
128	McCollum Lake Rustic Camp	Alpena	x									x					
129	McKay Log Cabin	Alpena	x			x						x					
130	McRea Park	Alpena	x						x			x					
131	Mich-e-ki-wis Park	Alpena	x						x	x		x					
132	Michigan Nature Association	Alpena				x	x		x								
133	Middle Island Boat Tours	Alpena	x	x	x		x					x					
134	Middle Island Lighthouse	Alpena	x	x					x			x					
135	Monaghan Point	Alpena	x						x								
136	National Guard Armory	Alpena	x			x					x		x				

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
137	Nicholson, George R., House	Alpena											x			
138	Ninth Avenue Dam	Alpena	x						x							
139	Nordmeer	Alpena			x		x				x					
140	North American Sailing Instruction	Alpena	x			x						x				
141	North Riverfront Park	Alpena	x						x			x				
142	Northern Lights Arena	Alpena			x	x						x				
143	Northland Cooperative Library	Alpena				x						x				
144	Norway Ridge Pathway	Alpena	x						x			x				
145	Old Township Hall	Alpena	x						x							
146	Ossineke Pathway	Alpena	x						x							
147	Ossineke State Forest Campground	Alpena	x									x				
148	Outdoor Nature Classroom	Alpena				x	x		x							
149	Oxbow Park	Alpena	x						x			x				
150	Partridge Point Marina, Inc.	Alpena	x						x							
151	Partridge Point Road Access	Alpena	x						x			x				
152	Paul Bunyan Festival Horseshoe Pitching	Alpena			x	x						x				
153	Punas Playground	Alpena	x						x							
154	Rockport Access	Alpena	x						x	x		x				
155	Rockport Property	Alpena	x		x				x							
156	Rockport South	Alpena	x						x			x				
157	Royal Knight Cinema	Alpena			x	x			x							
158	Saginaw Treaty Marker	Alpena	x			x	x				x					
159	Schalk's Creek	Alpena	x						x							
160	Season of Light IV at Besser Museum	Alpena	x	x		x						x				
161	Shingaba Shores	Alpena	x						x							
162	Shipmates-Group	Alpena	x		x	x						x				
163	Shipwreck Mooring Buoy Program	Alpena	x	x	x											
164	Sink Hole	Alpena	x				x		x							

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other	
165	Snug Harbor	Alpena	x						x								
166	South Riverfront Park	Alpena	x						x			x					
167	Spratt Church	Alpena	x			x						x					
168	Squaw Bay Nature Conservation	Alpena	x				x		x			x					
169	Squaw Bay Wetland Area	Alpena	x				x		x								
170	St.Bernard Catholic Church	Alpena				x					x		x		x		
171	Starlite Beach	Alpena	x							x							
172	State Theatre	Alpena			x	x			x								
173	Sunrise Side Heritage Bike Rally	Alpena				x						x					
174	Sunrise Side Wine and Food Festival	Alpena	x		x							x					
175	Temple Beth El	Alpena				x					x						
176	The BiPath	Alpena	x						x	x		x					
177	The Daniel Carter Family	Alpena			x	x						x					
178	The Huron Lights (Gift Shop)	Alpena	x	x	x	x	x					x					
179	The Narrows	Alpena	x				x		x								
180	Thunder Bay Community Boat Building	Alpena	x		x	x						x					
181	Thunder Bay Divers	Alpena				x			x								
182	Thunder Bay Island	Alpena	x				x		x				x	x			
183	Thunder Bay Light Station	Alpena											x				
184	Thunder Bay NMS and Underwater Perserve	Alpena	x	x	x	x	x			x		x					
185	Thunder Bay Recreational Park	Alpena	x						x			x					
186	Thunder Bay River Forrest Campground	Alpena	x									x					
187	Thunder Bay Shores Marine	Alpena	x						x								
188	Thunder Bay Theater	Alpena			x	x			x		x						
189	Trinity Episcopal Church	Alpena				x					x						
190	W.F. Cullings	Alpena				x											
191	Wildlife Sanctuary	Alpena	x	x	x	x	x		x			x					
192	Adeline Simm's Grave	Presque Isle		x	x	x					x						

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
193	Anna Garraty	Presque Isle	x	x		x						x				
194	Barney F.T. Shipwreck	Presque Isle			x	x						x				
195	Bell Landing Roadside Park	Presque Isle	x						x			x				
196	Besser Bell	Presque Isle	x						x	x	x					
197	Besser Natural Area	Presque Isle	x						x	x	x					
198	Belz & Sons Marina	Presque Isle	x						x							
199	Birch Hill Park	Presque Isle	x						x							
200	Black Mountain Recreation Area	Presque Isle	x						x	x						
201	Boat Launch, Co Rd 489	Presque Isle	x						x							
202	Bradley House	Presque Isle	x		x	x						x	x	x		
203	Burnham's Landing	Presque Isle	x								x					
204	Burnham's Landing Informational Designation	Presque Isle													x	
205	Calcite Woods -- Calcite Harbor	Presque Isle	x		x				x							
206	Camp Chickagami	Presque Isle	x						x							
207	Carl Bradley Memorial (Sailor's Memorial)	Presque Isle			x	x					x					
208	Children's House	Presque Isle				x			x							
209	Clay Banks	Presque Isle	x						x							
210	Elowsky Mill	Presque Isle													x	
211	Ferron Point Beach	Presque Isle														
212	First Street Lot	Presque Isle	x						x							
213	Fletcher Gilcrest Park	Presque Isle	x						x			x				
214	Forty Mile Point County Park	Presque Isle	x	x					x	x			x	x		
215	Forty Mile Point Lighthouse	Presque Isle											x			
216	Gilpin Field	Presque Isle				x			x							
217	Grambeau Education Center	Presque Isle				x			x							
218	Grand Lake Marina	Presque Isle	x						x							
219	Grand Lake Roadside Park	Presque Isle	x						x			x				
220	Grand Lake Fish Derby	Presque Isle	x		x	x	x					x				x

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
221	Great Lakes Lore Maritime Museum	Presque Isle	x	x	x	x	x					x				
222	Hammond Bay Biological Station	Presque Isle	x						x							
223	Hammond Bay Harbor	Presque Isle	x						x			x				
224	Harbor View	Presque Isle	x		x	x			x			x				
225	Herman Volger Conservation Area	Presque Isle	x			x	x		x							
226	Huron Dunes Roadside Park	Presque Isle	x						x							
227	Huron Sunrise Trail	Presque Isle														
228	Joseph S. Fay	Presque Isle	x		x							x				
229	Kauffman, John C., House	Presque Isle												x		
230	Lake Huron Informational Designation	Presque Isle													x	
231	Lakeside Park	Presque Isle	x						x			x				
232	Last Chance Salmon Tournament	Presque Isle	x		x	x	x					x				
233	Long Lake Trail	Presque Isle	x						x							
234	Mackinaw State Forest	Presque Isle	x			x	x		x	x						
235	MDOT Roadside Park	Presque Isle	x						x			x				
236	Memorial Park Cemetary	Presque Isle				x			x							
237	Metz Fire Informational Designation	Presque Isle													x	
238	Michigan Limestone & Chemical Company (Calcite)	Presque Isle	x		x	x						x	x			
239	Nautical City Festival	Presque Isle	x	x	x	x	x					x				x
240	Night at the lighthouse 40 mile point	Presque Isle	x	x								x				
241	North Shore Park	Presque Isle	x						x							
242	Ocqueoc Falls	Presque Isle														
243	Ocqueoc Falls Bicentennial Pathway	Presque Isle	x						x			x	x	x		
244	Ocqueoc Falls Campground	Presque Isle	x				x		x			x	x	x		
245	Ocqueoc Falls Hwy/Ocqueoc River Bridge	Presque Isle											x			
246	Ocqueoc Lake Boat Launch	Presque Isle	x						x							
247	Ocqueoc Outdoor Center	Presque Isle	x		x		x		x							
248	Ocqueoc River Canoe Trail	Presque Isle	x						x				x	x		

	Asset	County	Maritime Heritage Themes						Resources/Background Documents								
			Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
249	Ocqueoc Roadside Park	Presque Isle	x						x			x	x	x		
250	Old Presque Isle Light	Presque Isle	x	x					x	x	x	x	x	x		
251	P.H. Heoft State Park	Presque Isle	x						x	x		x				
252	Plath Meats	Presque Isle	x		x	x	x					x				
253	Posen Potato Festival	Presque Isle	x		x	x						x				
254	Presque Isle County Court House	Presque Isle			x	x						x				
255	Presque Isle County Fair	Presque Isle	x		x							x				x
256	Presque Isle County Historical Museum	Presque Isle	x	x	x	x	x					x	x	x		
257	Presque Isle County Tourism Council	Presque Isle	x			x						x				
258	Presque Isle Courthouse	Presque Isle											x			
259	Presque Isle District Library	Presque Isle														
260	Presque Isle Electric Cooperative Monument	Presque Isle													x	
261	Presque Isle Habor Development	Presque Isle	x						x							
262	Presque Isle Harbor	Presque Isle	x	x					x		x	x				
263	Presque Isle Historical Museum	Presque Isle	x	x	x	x	x				x					
264	Presque Isle Lighthouse Park	Presque Isle	x	x					x	x		x	x	x		
265	Presque Isle Lodge	Presque Isle	x		x		x				x					
266	Presque Isle Township Hall	Presque Isle	x						x							
267	Public Access-East Grand Lake	Presque Isle	x						x							
268	Public Access-East Long Lake	Presque Isle	x						x							
269	Public Access-Southeast Grand Lake	Presque Isle	x						x							
270	Public Access-West Grand Lake	Presque Isle	x						x							
271	Public Access-West Long Lake	Presque Isle	x						x							
272	Quarry View Roadside Park	Presque Isle	x						x			x				
273	Radka-Bradley House	Presque Isle											x			
274	Range Light Park	Presque Isle	x	x					x			x				
275	Refuge Harbor	Presque Isle	x								x					
276	Rockport -- boat access (commercial and sport)	Presque Isle														

			Maritime Heritage Themes						Resources/Background Documents								
	Asset	County	Harbors, Towns, and Ports	Seeing the Light	Commerce	People Power of the Great Lakes	Fins, Fur, and Feathers		Huron Greenways	U.S. 23 Heritage Route	Sweetwater Trails	Maritime Heritage Destination Initiative (MDHAL, Travel MI)	National Register of Historic Places	State Register of Historic Places	Michigan Historical Markers	Other
277	Rockport State Forest	Presque Isle														
278	Rockport -- abandoned quarry, deep draft port	Presque Isle														
279	Rockport -- sinkholes	Presque Isle														
280	Rogers City Chamber of Commerce	Presque Isle	x			x						x				
281	Rogers City Elementary School	Presque Isle				x			x							
282	Rogers City Golf & Country Club	Presque Isle	x		x				x							
283	Rogers City High School	Presque Isle				x			x							
284	Rogers City Marina	Presque Isle	x						x							
285	Rogers City Post Office	Presque Isle			x	x					x					
286	Rogers City Salmon Tournament	Presque Isle	x	x	x	x	x					x				x
287	Rogers City Theater	Presque Isle														
288	S.S.Calcite	Presque Isle	x		x							x				
289	Sacred Rock	Presque Isle	x						x							
290	Safty Trail	Presque Isle	x						x							
291	Scared Rock	Presque Isle	x						x			x				
292	Seagull Point	Presque Isle	x						x							
293	South Shore Park	Presque Isle	x						x			x				
294	Sports Park	Presque Isle	x						x			x				
295	St. John' s Luthern Elementary	Presque Isle				x			x							
296	St.Ignatious Elementary School	Presque Isle				x					x					
297	The Portage Restaurant and Portage General Store	Presque Isle	x	x	x	x	x					x				
298	Thompson's Harbor State Park	Presque Isle	x						x	x		x				
299	Trout River Park	Presque Isle	x						x							
300	Underground River	Presque Isle	x						x							
301	US Fish and Wildlife Research Station	Presque Isle	x		x	x	x					x				
302	Westmnster Park	Presque Isle	x						x			x				
303	Wooden Boat Show	Presque Isle	x		x	x						x				

CHAPTER 5

PLANNING AND ZONING ASSESSMENT

5. AN ANALYSIS OF LOCAL PLANNING AND ZONING FOR THE NORTHEAST MICHIGAN INTEGRATED ASSESSMENT

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5.1 INTRODUCTION

5.1.1 Purpose of this Chapter

As discussed in Chapter 1, an integrated assessment brings together scientists with policy makers and other key stakeholders to address a common issue or concern through collaboration and a formal analysis process. The purpose of this IA is to help the Northeast Michigan region promote more ecotourism-based economic development in a way that provides the benefits of a vital economy without promoting overdevelopment or the destruction of the region's natural resource base. The key policy question addressed is: How can coastal access be designed, in a regional context, for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

Natural coastal resources, especially resources near the land-water interface like coastal wetlands and fish habitat, are influenced greatly by the kinds of land development patterns occurring within the coastal region (see generally Beatley, Brower, and Schwab 2002; Cicin-Sain and Knecht 1998; Randolph 2004). Most importantly, near-shore and regional land development can result in the destruction of these resources directly, such as through land clearing, or indirectly, such as through increases in impervious surfaces that yield increases in polluted stormwater runoff into coastal waterways. Given state-local institutional structures in the U.S., where states have delegated much of their land management authorities to local governments, coastal localities play a vital role in shaping land development patterns within their coastal regions over time (e.g., Burby 1998; Brody 2003; Norton 2005b, 2005a). The question of how to promote ecotourism-based development within the Northeast Michigan region without degrading coastal resources at the same time thus necessarily implicates the public management of both public and private land use, which in turn necessarily implicates local planning and development management.

The environmental, social, and ecological outcomes from local land management efforts have garnered substantial attention from both academics and advocates for the last several decades. Often these topics are discussed in terms of "sustainable development" or sometimes "smart growth" or, more broadly, "growth management," all concepts presented as an alternative to conventional land management practices. At the broadest level, the concept of sustainable development is used to focus policy-making simultaneously on environmental and social concerns as well as more conventional economic development goals, transforming our collective approach from worrying about the economy first and foremost (and mitigating any resulting environmental and social harms later, if at all) to promoting economic development within the constraints of safeguarding natural and social resources now and into the future (see, e.g., World

Commission on Environment and Development 1987; Beatley 1995; Berke 2002; Wheeler 2001; Wheeler and Beatley 2004; American Planning Association 2000). The rapid Sustainable Development Assessment Team (SDAT) study prepared for this IA and presented in Chapter 6 of this report is based upon these concepts of sustainability.

The concept of "smart growth" (or more generally "growth management") addresses more traditional land use planning and development management concerns, with a particular focus on the topics of urban revitalization, rural area conservation, and the efficient use of infrastructure, such and roads, water systems, and wastewater systems (Freilich 1999; National Association of Home Builders 2000; Pollard 2000; American Planning Association 2002; Johnson et al. 2002; Local Government Commission 2004; Smart Growth Network 2002, 2003). Debates around the idea of smart growth have thus focused specifically on land development and use, particularly in terms of central city decline and so-called "urban sprawl," more so than debates around sustainable development, which generally extend more broadly to other social issues (e.g., the effects of modern consumer lifestyles in general). Nonetheless, the concepts of sustainable development and smart growth encompass the related ideas of promoting ecotourism-based economic development within the larger goals of safeguarding the regions' natural resources and social well-being. Governments might advance these goals, for example, by adopting coastal resource protection policies (e.g., shoreline setbacks), promoting the development of compact and mixed used urban centers, and protecting productive rural agricultural and natural areas. Given their similarities in the context of land use, the terms "sustainable development" and "smart growth" are thus used interchangeably throughout this chapter.

The purpose of this chapter is to present findings from the study of local officials' and other stakeholders' policy concerns within the NEMIA region, the analysis of selected local master plans within the region, and the results from a forward-looking analysis of potential build-out scenarios illustrating the various land development patterns the region might experience in the foreseeable future based on current zoning. These research findings, while not exhaustive, provide a backdrop picture of current conditions in two respects. They suggest, first, the extent to which NEMIA participants are concerned about a variety of land management goals related to sustainable development and, second, the extent to which local governments in particular appear to be taking steps to advance sustainability goals through their current planning and development management efforts. These findings set the stage for the analysis and recommendations made by the SDAT team as reported in Chapter 6.

Finally, it is important to note that this research was focused specifically on the NEMIA region itself for the purposes of the IA only; it was not meant to yield generalizable findings in terms of the larger region or in terms of the planning and development management processes described. Accordingly, stakeholder participants surveyed for this work were identified through the IA process (i.e., not randomly selected from among residents or public officials in the region). Similarly, the plans and zoning codes evaluated were selected by the research team as reasonably representative of the localities in the region, not through a random-selection process. Also, because of limited resources, local master plans were evaluated systematically to provide some indication of the extent to which localities are addressing resource management through their planning efforts, but it was not possible to prepare a similarly detailed zoning code content evaluation (i.e., beyond the buildout assessments provided below) or analyze the links between

plans, policies, and regulations in the region, or to collect data and evaluate systematically other plan implementation mechanisms (e.g., capital improvement programs).

5.1.2 Local Planning and Land Management in Coastal Michigan

In 1992, a blue-ribbon commission of scientists, private citizens, and state officials issued a report entitled *Michigan's Environment and Relative Risk*. The report concluded "to the surprise of many…that an '*absence of land use planning that considers resources and the integrity of ecosystems*' was among the most critical environmental problems facing Michigan" (Smyth, 1995, pg. 1, emphasis in original, citing to the Relative Risk Report). In 2001, the Michigan Department of Environmental Quality concluded that cumulative and secondary impacts from coastal development constituted the highest priority issue in coastal Michigan, and that "fragmentation of coastal habitats, loss of agricultural and forestlands, increased impervious surfaces and resulting stormwater runoff, and the increased development in coastal hazard areas, wetlands, and Great Lakes Islands, could be improved through better coastal land use planning" (Klepinger, 2002, pg. 7).

In 2002, the Michigan State Senate's Great Lakes Conservation Task Force concluded that the "quality of the Great Lakes is strongly impacted by activities that occur on the land" and that one aspect of land use not sufficiently integrated with water impact is land use planning and zoning (Great Lakes Conservation Task Force, 2002, pg. 64). In 2003, Governor Granholm appointed a blue-ribbon commission on land use in response to growing concerns about the environmental, social, and fiscal impacts resulting from suburbanization occurring throughout the state. This ad-hoc commission produced a report premised on the tenets of smart growth and sustainable development. It incorporated a wide array of recommendations designed to improve and re-focus local planning and policy-making efforts to achieve more sustainable landscapes and communities state-wide (Michigan Land Use Leadership Council, 2003).

All of these studies and events point to two key conclusions: first, that local planning, zoning, and other development management activities substantially influence efforts to protect the state's natural resources, including especially its coastal area resources; and second, that communities across Michigan—and especially within its coastal region—do not appear to be using their planning and land management authorities to provide the protections needed. Despite widespread consensus on these conclusions, however, there remains much we do not know about current local planning and land management efforts throughout Michigan, including its Northeast Michigan coastal region.

5.1.3 Northeast Michigan

Northeastern Michigan is currently the least populous area in the Lower Peninsula. The eight counties that make up Northeastern Michigan total 2.8 million acres of land. The area contains approximately 524 inland lakes, 2,311 miles of streams, eight major watersheds and 190 miles of Lake Huron shoreline (Northeast Michigan Council of Governments, 1996). The rich and diverse extent of natural resources in this region coupled with the presence of the numerous cultural resources, the Thunder Bay National Marine Sanctuary and its associated marine resources,

makes this area a ripe environment for tensions relating to growth, land development, and resource protection.

As noted, this Northeast Michigan Integrated Assessment (NEMIA), through which participants hope to promote greater ecotourism-oriented development, provides a platform for examining these tensions in three of the eight counties comprising the Northeast Michigan region. Of particular interest to us was the role local planning and development management could play in striking a balance between the economic needs and desires of the Northeast Michigan communities, on the one hand, and their desire to protect the cultural and natural resources and the corresponding "sense of place" they highly value, on the other.

Through the NEMIA process we hoped to explore three key aspects relating to resource management and sustainable development in this three-county NEMIA region: 1) which issues the stakeholders viewed as the most important resource issues in their jurisdictions and in the larger region, and their vision for the future of the three-county area; 2) the role local master plans could play in achieving this vision and alleviating resource problems (as indicated by stakeholders and as indicated in the goals and policies of the master plans themselves); and 3) the impact of current plan policies on future development patterns, including whether policies could be shaped to result in development patterns that incorporate stakeholders concerns about sensitive resources, community character and a sense of place.

5.2 RESOURCE ASSESSMENT SURVEY

5.2.1 Introduction and Methods

A resource assessment survey was administered to NEMIA stakeholders during May 2006. The purpose of the survey was to better understand how the NEMIA stakeholders view a variety of issues related to the use, development, and conservation of land within the Northeast Michigan region. In the survey we asked several questions on the respondent's general sense of the importance of a number of issues related to coastal area management. Then we asked a series of more specific questions about the respondents' understanding and opinions regarding selected coastal area management issues, including (in no particular order of importance) socio-economic conditions, cultural-historic conditions, environmental conditions, and local planning and development management efforts. Finally, we concluded with several questions about the respondents and about the agency or organization they represented.

The survey was disseminated to the 81 NEMIA stakeholders identified through the NEMIA process itself. These stakeholders represented a variety of organizations, including local governments; regional governments; non-governmental organizations (NGOs) like watershed groups, land conservancies, and chambers of commerce; area businesses; state agencies; and federal agencies and legislative offices. We received 31 completed surveys providing a response rate of 38%. Table 1 shows the distribution of surveys by group, including the numbers of NEMIA participants initially surveyed and corresponding response rates. As this table illustrates, participation in the NEMIA (and the corresponding survey distribution) favored federal and state representatives (including MSU extension), county and regional representatives, and then NGO representatives, with less direct participation by local officials. This same general pattern was

reflected in the response rates as well, both in terms of respondents for a given category and across the several categories. The important thing to note in terms of the response rate distribution, therefore, is that the policy concerns and assessments expressed by the NEMIA stakeholders represent the views more of non-local governmental actors than local officials, in some cases evaluating the *apparent* policy preferences of local government officials rather than the reported views of the local officials themselves.

Table 5.1. Survey Distribution and Responses by Participant Category

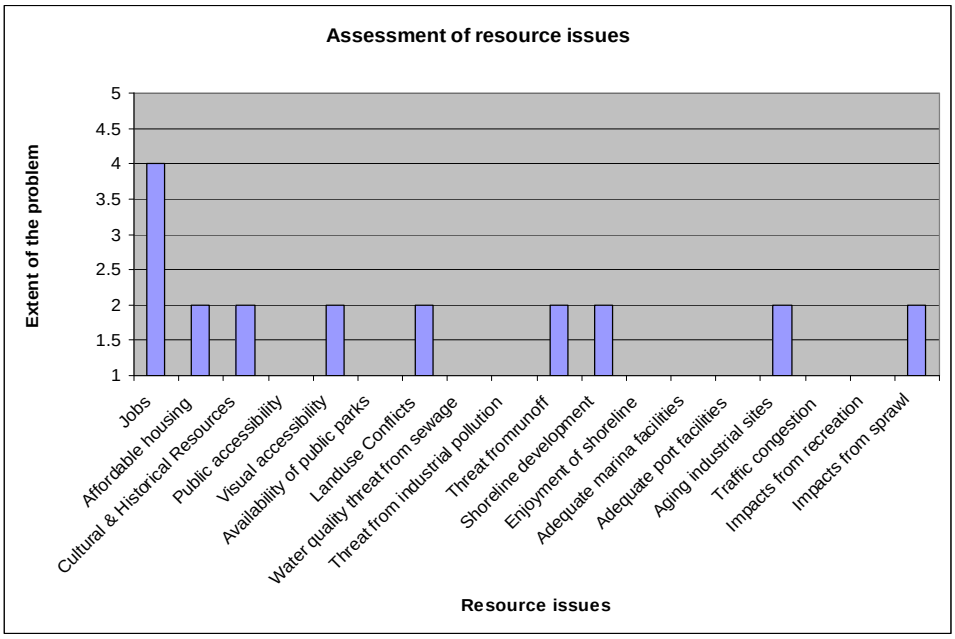
Category	Number Surveyed	Category as % of Total Surveyed	Number of Responses	Responses as % of Category Surveyed	Responses by Category as % of Total Responses
Township Official	6	7%	1	17%	3%
City Official	7	9	1	14	3
County Official	12	15	5	42	16
Regional Agency	4	5	3	75	10
NGO Representative	9	11	5	56	16
State / Federal Official	28	35	12	43	39
Other	15	19	4	27	13
Total	81	100	31		100

Given that caveat, the returned surveys were analyzed and the data were presented to stakeholders at an initial meeting of the process to initiate discussions on the perceived resource problems in the region and the goals and policies that needed to be prioritized through the NEMIA process, as well as the role planning and development management efforts might play in fostering social, environmental and economic sustainability in the Northeast Michigan region. The remainder of this section presents a summary of the survey data results and analysis presented to the NEMIA stakeholders.

5.2.2 Assessment of resource issues

As anticipated, when asked about the resource issues deserving public attention within stakeholders' jurisdiction's or service areas, jobs emerged as the most important issue of concern. More than 60% of respondents identified the lack of local jobs in the Northeast area as deserving immediate attention. On a 5 point scale of the extent to which the lack of jobs presented a problem, ranging from 1 (Not a problem) to 5 (Serious problem), the median value was 4. This is notable compared to the median values of the other resource issues presented to respondents for evaluation, all of which had median values of only 2 or less, indicating that respondents generally did not view these issues as serious problems in their jurisdictions (see Figure 5.1).

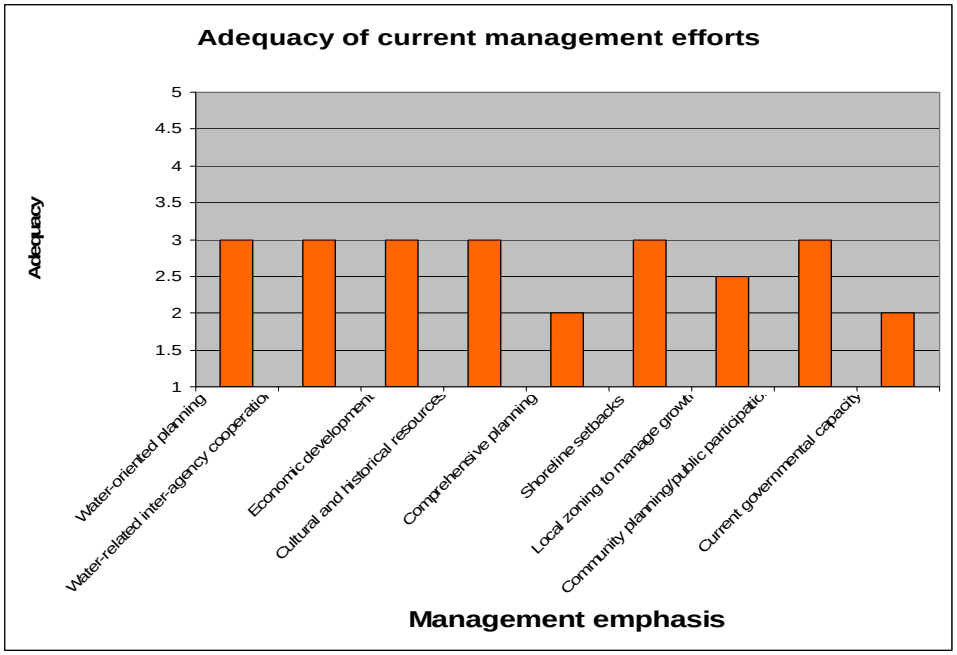
Figure 5.1. Assessment of resource issues



5.2.3 Assessment of management efforts to address resource problems

Given the extent of resource management problems present throughout the state's coastal regions, as described in the background section of this chapter, stakeholders were then asked to evaluate the extent to which management efforts in their jurisdictions addressed several resource problems. On a scale of 1(inadequate) to 5 (very adequate) representing the adequacy of current management efforts, all efforts to address resource issues listed in the survey received a median value of 3 or less, indicating that stakeholders in general identified resource management efforts as being only moderately adequate to inadequate. The perceived inadequacy of current management efforts with regard to land use planning and zoning should be noted (see Figure 5.2).

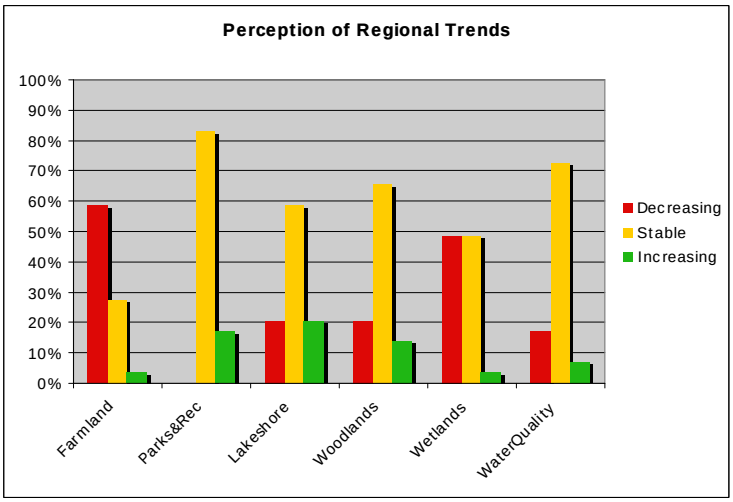
Figure 5.2. Adequacy of current management efforts



5.2.4 Assessment of regional resource trends

Stakeholders were also asked to evaluate the 5-year regional trend for a number of resources. They were asked to indicate whether the listed resource bases were increasing, decreasing or stable. As anticipated, 59% of respondents listed decreasing farmland in their jurisdictions, while 48% of respondents also indicated loss of wetlands. Most respondents listed all other resources as being stable (see Figure 5.3).

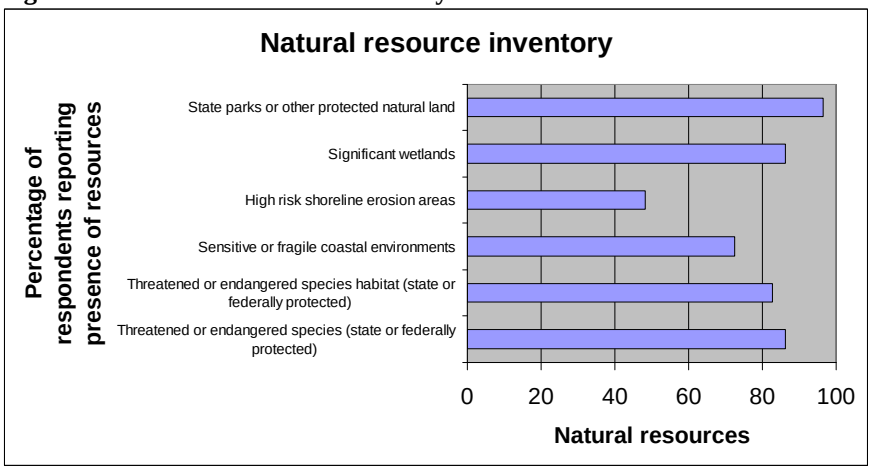
Figure 5.3. Perception of regional resource trends



5.2.5 Natural resource inventory

To inventory the extent of natural resources in the Northeast Michigan region, stakeholders were asked to indicate whether one or several natural resources were present in their jurisdictions. The richness of natural features in the Northeast is apparent in Figure 5.4.

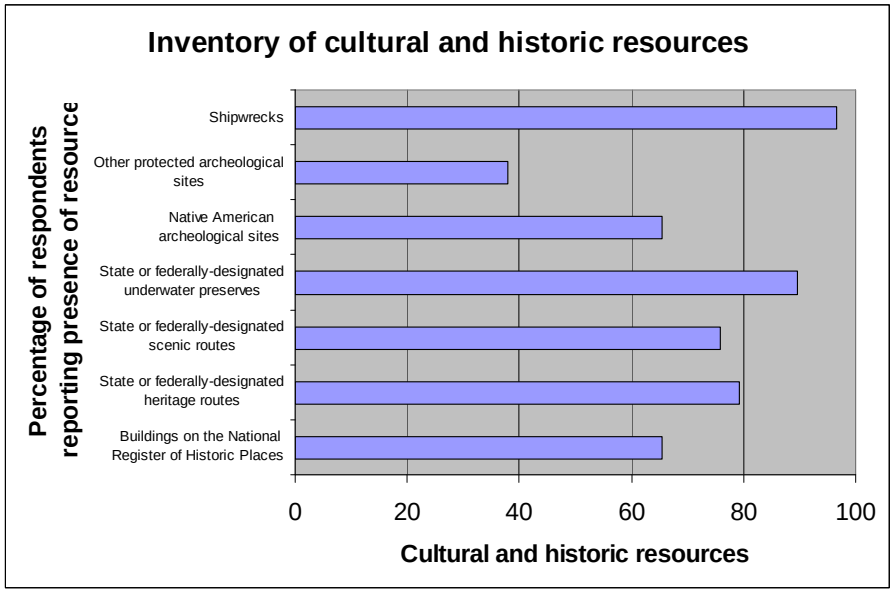
Figure 5.4. Natural Resource Inventory



5.2.6 Cultural and historic resource inventory

Similar to the natural resource inventory, stakeholders were asked to report the presence of a number of regionally significant cultural and historic resources in their jurisdictions. Figure 5.5 shows that more than 60% of respondents indicated that most of the resources listed in the survey were present within their jurisdictions.

Figure 5.5. Cultural and historic resource inventory



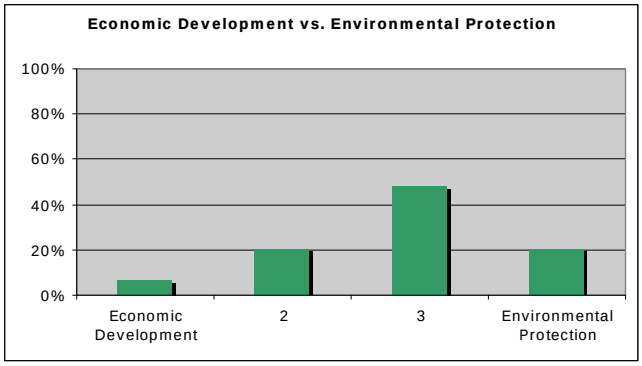
The analysis presented so far depicts one of the most fundamental tensions that planners encounter while planning for the local and regional sustainable development. As indicated by stakeholders, economic development that fosters a good supply of local jobs is much needed in the Northeast Michigan region. At the same time, most respondents indicated the presence of a diverse and rich range of natural and cultural resources in their jurisdictions. Ideally, economic development can be accommodated while protecting natural and cultural resources to yield a balanced and comprehensive land use strategy. Indeed, many proponents of sustainable development today argue that the dichotomy between economy and environment is a false one—that it is possible to promote ecologically sound economic development—and in many ways it is. Nonetheless, land management issues are often framed by local officials in a way that pits one against the other, or they are presented to local officials in such a way that they cannot avoid contemplating that trade-off. Moreover, if there is any place where the potential tradeoff between environmental integrity and land-based economic development is real, it is in places like highly dynamic and ecologically sensitive Great Lakes shoreline settings.

Thus recognizing that policy tradeoffs—in one sense or another—are sometimes unavoidable, stakeholders were presented with a series of questions on resource tradeoffs that local officials might have to face (or have already faced) in order to better understand how stakeholders in this region viewed the relative importance of jobs, natural resources, and cultural resources relative to one another. Specifically, they were asked to indicate, on a scale of 1 to 4, which goal they would be primarily concerned about pursuing if a tradeoff had to be made in two different contexts.

a. *Economic development versus environmental protection*, "where 1 indicates a primary interest in economic development, even though it could necessitate some environmental degradation, and 4 indicates a primary interest in environmental protection, even though it might cause some limitations on economic development."

More than 70% of respondents indicate a preference of environmental protection over economic development when faced with a tradeoff (Figure 5.6).

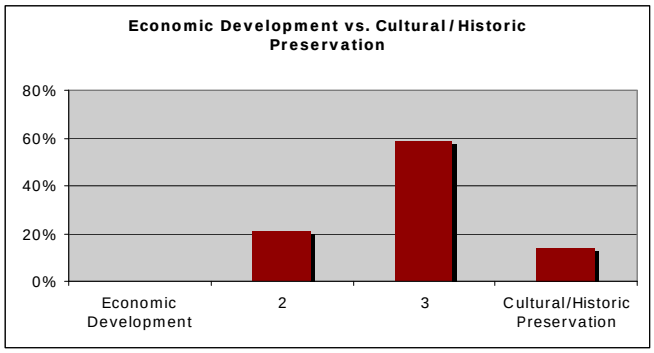
Figure 5.6. Tradeoff: Economic development vs. Environmental protection



b. *Economic development versus cultural and historic resource protection*, "where 1 indicates a primary interest in economic development, even though it could necessitate the loss of some cultural and historic resources, and 4 indicates a primary interest in cultural and historic protection, even though it might cause some limitations on economic development."

Again, more than 70% of respondents indicated a tradeoff preference of protecting cultural and historic resources over economic development when confronted with such a choice (Figure 5.7).

Figure 5.7. Tradeoff: Economic development vs. Cultural and historic protection

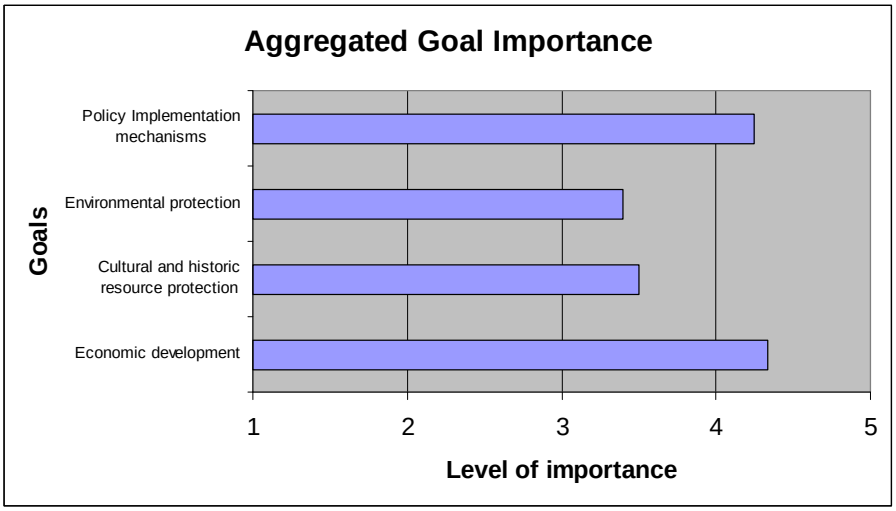


Given the resource concerns listed by respondents, the presence of natural, cultural and historic resources in respondents' jurisdictions, and their stated policy tradeoff preferences, the final section of the survey asked stakeholders to evaluate the importance of several goals and policies to the future development of their respective jurisdictions.

5.2.7 Policy importance

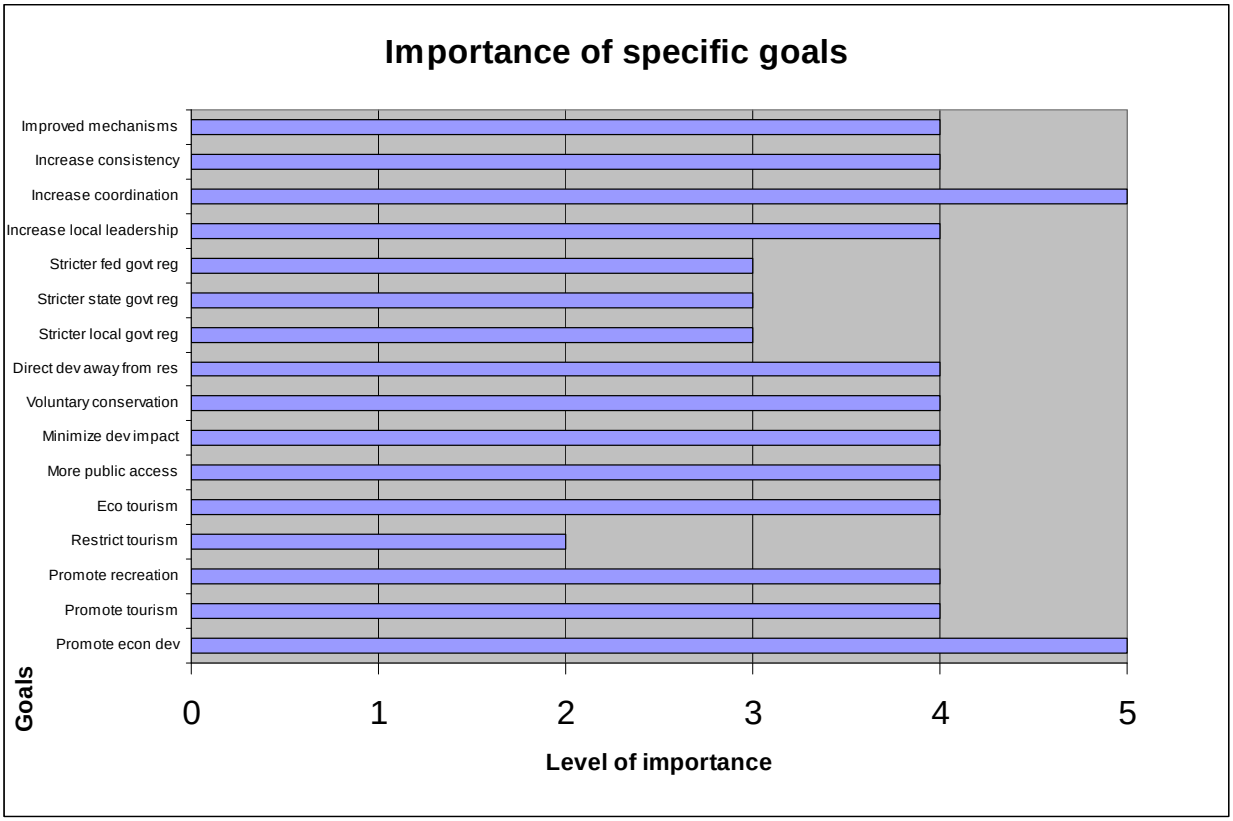
Stakeholders evaluated the importance of a number of specific goals in four categories: economic development, environmental protection, cultural and historic resource protection, and policy implementation. Figure 5.8 shows median levels of importance of the aggregated goal categories. Figure 5.9 shows the median level of importance of the specific goals included in the aggregated categories. Despite tradeoff questions indicating a preference for natural and cultural resource protection when set against economic development, Figures 5.8 and 5.9 show the importance of economic development to most respondents in the abstract, or when tradeoffs are not suggested (or required). These figures also illustrate the importance that stakeholders attribute to regional governance through voluntary regionalism and cooperation.

Figure 5.8. Aggregated goal importance



The idea of voluntary regionalism is also apparent in stakeholders' assessment of the extent to which they anticipate cooperating with a number of agencies in the future. Through a specific survey question that evaluated current and future levels of cooperation among a number of listed agencies, we found that most respondents expect cooperation to increase significantly from current levels.

Figure 5.9 Specific goal importance



This survey, along with the policy question and goals identified by stakeholders at the outset of the NEMIA process, the natural resource prioritization exercise conducted by the environmental team, and the policy action prioritization and voting exercise conducted by Michigan State Extension staff, provides a comprehensive understanding of the stakeholders' collective vision and goals for the NEMIA effort.

Given this vision, the next step undertaken by the planning and zoning team was to evaluate the extent to which current planning and development management efforts in NEMIA communities appear to help further sustainable development and growth management goals. Current planning policies were analyzed by primarily focusing on the local master plans of 8 local jurisdictions distributed across the three NEMIA counties. Building on recent scholarship in the land use planning literature, the local master plans were evaluated based on the extent to which the policies of local plans supported a movement toward "smart growth" or the "sustainable" development and use of land.

5.3 EVALUATING LOCAL MASTER PLANNING FOR DEVELOPMENT MANAGEMENT

One of the principal aims of the planning and zoning study was to develop an understanding of how local plans and regulations in NEMIA communities appeared to be shaping land development patterns, and more specifically the extent to which these plans and regulations advanced growth management principles. In order to do so, we developed a framework for evaluating the content of local master plans that is drawn conceptually from the planning and development management literature (Baer, 1997; Berke & French, 1994; Berke & Manta Conroy, 2000; Brody, 2003a; Burby & May, 1997; Norton, 2005a, 2008). Our starting premise was that a fundamental purpose of a local master plan is to inform and guide local officials' decision making as they adopt various infrastructure policies and local regulations pertaining to land use and development management. A fundamental component of the plan, accordingly, is the set of goals and policy recommendations that it makes. These goals and policies do not exist in a vacuum, however, and are often subjected to political and legal scrutiny. To stand up to this scrutiny, a plan and its policy recommendations should be well supported and justified. Evaluating local planning efforts, therefore, requires focusing on three concepts: policy focus, plan quality, and consistency, with the latter two collectively describing "plan quality."

5.3.1 Conceptual Framework

Policy Focus

A single vision statement provided in a plan—if one is provided at all—is usually so abstract that it does not provide a good metric of the overall policy vision actually embodied by the plan in its entirety. Moreover, a comprehensive local plan will articulate a large number of goals and policies through a number of distinct plan elements, such as housing, transportation, parks and recreation, land use, and so on. To the extent they are not well supported or articulated, or are not consistent with one another, it may not be possible to characterize the plan as having a clear policy focus in a very precise way. But it should be possible to at least characterize the overall policy focus of that plan more generally. The collection of a given plan's goal and policy

statements, or a code's requirements, can be grouped into several separate categories such as those relating to land use management, development management, economic development, housing, community character, environmental quality, natural area conservation, and resource production. These statements can then be grouped and considered collectively to characterize the policy content of a plan or code along two distinct dimensions of policy focus, including its growth management approach and its landscape approach.

1. Growth management approach. The first dimension speaks to the growth management approach of the plan as evident through the plan's goal and policy statements. The question here is whether the "procedural" policies of a given plan (i.e., policies establishing analysis and/or decision-making procedures), taken altogether, appear to be designed to promote two distinct ideas: a focus on providing public services efficiently, or a focus on promoting a quality of life consistent with smart growth principles like urban revitalization, rural conservation, and attention to social equity concerns (see Table 5.2 at the end of this report for representative criteria used to measure these principles).

2. Landscape approach. The second dimension of policy focus speaks to the landscape approach apparent in the plan. The focus here is on whether the "substantive" polices of the plan (i.e., policies focused on a promoting a particular landscape type), taken altogether, appear to be designed to facilitate and support the kinds of landscapes themselves that define a sustainable community.[1] For purposes here, this approach can focus on two different forms: a focus on vital urban centers (see Table 5.3 for representative criteria used to measure this focus), and a focus on conserved rural areas i.e., working farmland, working forestland, ecologically viable natural areas (see Table 5.4 for representative criteria used to measure this focus). A given plan or code may show a landscape focus that emphasizes both urban revitalization and rural conservation at the same time, especially if the jurisdiction encompasses both urban and rural areas, or it may emphasize one but not the other.

Plan Quality

Advancing sustainable development through local planning requires attending to the policy focus of a plan. But addressing the plan's policies alone is not sufficient. It is equally important to consider the *quality* of the planning effort used to inform and justify those plan policies. To see why this is so, consider the role played by local planning in Michigan, along with most U.S. states. Local master planning—by itself—is not a legally enforceable means to manage land use. Rather, local governments manage the development and use of public and private lands within their jurisdictions through the zoning, subdivision, and other regulations they adopt, along with the roadway, water, wastewater, and other infrastructure services they provide. (These various regulatory and infrastructure decisions taken together comprise a community's "development management" program, as distinct from its master plan.)

The master plan—and specifically its policies—provide guidance to local officials on how best to make those regulatory and infrastructure decisions. In order to ensure that the plan policies—and ultimately the development management decisions made to implement them—are effective

[1] The measures described for these different landscape types incorporate primarily substantive policies, but also include a limited number of procedural policies that are addressed specifically to the given landscape type.

and reasonable, the plan should ideally provide a coherent vision of how the community wants to develop along with compelling arguments that demonstrate why the plan's various policies are necessary and how they will achieve that vision. The concept of plan quality speaks to how well the plan does just that. For evaluation purposes, the concept of overall plan quality can be divided into two important components: the analytical quality of the plan and plan consistency. Each of these attributes of overall plan quality is discussed in more detail next.

Analytical Quality

The analytical quality of the plan is based in part on the process that was used to develop the plan, as can be discerned from the plan itself, and the comprehensiveness and coherence of the various analyses presented in the plan. Building on scholarship on the planning and development management process (Kaiser, Godschalk, and Chapin 1995; Randolph, 2004) and on plan evaluation (Baer, 1997; Burby & May, 1997; Norton, 2005a), six distinct attributes of plan quality can be identified (see Table 5.5 for representative criteria used to measure these attributes). All of these attributes are premised on the idea that a plan both documents the plan-making process employed and provides the background analysis and justifications used to support the plan's policy recommendations.

- ***General Presentation:*** Extent to which the plan is readable and well-organized, provides references to information sources, clearly articulates goals and policies, and employs tables, maps, and figures that are informative and easy to interpret.

- ***Public Participation:*** The extent to which multiple and meaningful avenues for public participation were provided in the plan-making process in order to leverage local citizen knowledge, leverage the "social learning" function of planning, and increase the legitimacy of the plan.

- ***Fact Base:*** The overall thoroughness and clarity of the descriptive information about the community presented in the plan, provided to describe where the community is now, where it appears to be headed, and what the status is of past planning efforts.

- ***Infrastructure Capacity Analysis:*** The identification of services currently available and analysis of both the likely impacts from infrastructure decisions on population and land development trends and the reciprocal impacts from those trends on long-term capacities.

- ***Land Suitability Analysis:*** The analysis of inherent land attributes to identify areas both *most* suitable and *least* suitable for both urbanized land development and for rural area conservation.

- ***Implementation:*** The extent to which the plan identifies the timeframes, mechanisms, and responsible parties for implementing the plan policies.

Consistency

Like policy focus and analytical quality, plan consistency has several dimensions, including the consistent deployment of a plan and the inherent consistency of the plan (or overall planning effort) itself. The need for consistency in the use of a plan to justify development management decisions has been recognized for a very long time. Indeed, the Michigan Zoning Enabling Act ((2006 PA 110 §203(1)), like the zoning enabling laws of most states, requires that the "zoning ordinance shall be based upon a plan…." (see also Meck,1996; Crawford, 1998; Juergensmeyer & Roberts, 2003. From a planning-as-policymaking perspective, this requirement makes good sense. To the extent that a zoning code is used to implement the policies articulated in a local master plan, the plan serves little purpose if the code is not consistent with those policies, and the code itself arguably exceeds the boundaries of reasonable governmental regulation if it is inconsistent with the underlying rationale provided by the plan. The idea that reasonable policy decisions and regulations require adequate justification in fact implicates several dimensions of consistency, beyond the consistent use of a plan for making decisions and its consistent application across similarly situated cases. For this study, six different types of consistency—all related specifically to the quality of a plan as a basis for decision making—can be distinguished. These include vertical, horizontal, internal, and implementation consistency, as defined below (see Table 5.6 for representative criteria used to measure these types of consistency).

- ***Vertical Mandate Consistency (All):*** Presence of plan elements mandated of all local units of government in the state's planning enabling laws.[2]

- ***Vertical Mandate Consistency (Cities / Villages):*** Presence of plan elements mandated only for cities and villages in the state's planning enabling laws for cities and villages.

- ***Vertical Coordination:*** Extent to which the plan demonstrates consultation and/or coordination between the community and "higher" units of government.

- ***Horizontal Consultation and Coordination:*** Extent to which the plan appears to be compatible with the policies and spatial characteristics of neighboring jurisdictions and extent to which the community is consulting and/or coordinating with neighboring jurisdictions or other "horizontal" units of government.

- ***Internal Policy, Spatial & Implementation Consistency:*** Degree of internal coherence between the plan's facts, goals, and policies and between multiple plan documents in a jurisdiction with multiple plans (e.g., subarea plans). Several attributes of internal consistency include inter-goal, inter-policy, goal-policy, inter-plan, and spatial consistency (i.e., degree to which the stated goals and policies of the plan are consistent with the limitations on and opportunities for development based on the infrastructure

[2] Local governments in Michigan are not required to plan, but when they do plan, the state's planning enabling acts mandate that they incorporate a number of planning elements. See 1945 PA 282, Sec.4(2) (County Planning); 1959 PA 168, Sec. 7 (Township Planning); 1931 PA 285, Sec. 6 (Municipal Planning). Note that all of these acts were recently repealed by the Michigan Legislature and consolidated into a single Michigan Zoning Enabling Act, 2006 PA 110 (as amended).

capacity and land suitability analyses). Also, the extent to which the implementation steps identified in the plan are consistent with (or are reasonably designed to advance) the plan's articulated goals and policies.

5.3.2 Evaluation Methodology

Following the development of the conceptual framework just described, our next task was to operationalize that framework through a set of content evaluation protocols and an evaluation methodology. A primary goal was to develop protocols that would allow for relatively straightforward analysis and relatively easy interpretation of analytical results. Our content evaluation protocols and methodology build directly from the methodological approach employed for planning and plan implementation analyses in the current literature (see generally Berke et al. 1999; Brody 2003; Burby and May 1997; Norton 2005a, 2005c, 2008; Talen 1996), except that the specific protocol items and concept measurements have been tailored to reflect the various attributes of our conceptual framework described above. Given our focus on growth management principles, the evaluation criteria for the "policy focus" category of the plans and codes in particular were derived from smart growth and watershed protection principles drawn from a variety of academic and professional sources, as well as selected state and local government publications (American Planning Association 2000, 2002; Arendt 1994; Juergensmeyer and Roberts 2003; Meck 2002; National Association of Home Builders 2004; Nelson and Duncan 1995; Oregon Department of Land Conservation and Development 2004). For the goal and policy statements, we identified a range of goals and policies that a community might have adopted to advance a given growth management objective, such as urban revitalization or open space preservation, and then looked for the presence of those goal and policy statements in the plans and codes.

Following the development of the plan protocol, each plan was coded twice so as to reduce subjectivity in the interpretation of evaluation criteria. The coders were asked to work separately and then to compare their completed protocols to reconcile differences in their assessments of the assigned plans.

Following the methodology commonly employed for the evaluation of local master plans, the plan policy focus, analytical quality, and consistency components of each plan for this study were evaluated by looking for the presence of each of the various items illustrated by the "measurement" column of tables at the end of this section of this report. When present, each of these items was assessed in terms of its level of detail. Policies were also evaluated in terms of their level of prescriptiveness. "Prescriptiveness" refers to the whether the policy was prescriptive (e.g., "the community shall take the following steps…") rather than merely exhortative (e.g., "the community should consider taking the following steps…").

For example, in assessing the land suitability analysis of a plan, the prime farmland item was scored as "0" if absent, "1" if present but not detailed, "2' if present and detailed, or "3" if present, detailed, and mapped. For the policy focus component, a given evaluation item such as a policy of establishing an urban services boundary was scored for level of detail as "0" if absent, "1" if present but not detailed, or "2' if present and detailed, and for level of prescriptiveness as "0" if low, "1" if moderate, or "2" if high. These scores were then summed according to the

groupings of analysis categories corresponding to each of the separate criteria to create separate measures, and then standardized by dividing the actual score by the maximum possible score and multiplying by 100. The standardized score for each evaluation criterion thus indicates the degree to which a plan meets the given criterion relative to the total score that could be achieved, measured as the "percent of the possible score."

One of the reasons for using a simple "percent of possible score" measure for plan components or attributes is that it is both easy to calculate and easy to interpret. In addition, the evaluation criteria were developed so that the each has a comparable total raw score, making comparisons of relative scores across criteria reasonable. The findings from this type of plan evaluation study are presented most readily using bar graphs. For this study, the plan scores were averaged by jurisdiction type—county, township, city and village—to facilitate analysis and comparison at an aggregated level rather than for a given community.

An important aspect of this type of analysis is worth noting here. The comparison method, criteria, and calculations employed effectively amount to "benchmarking" an actual plan against a fully comprehensive plan in an abstract sense. Yet plans are always tailored to the unique situations of a given community, including its development trends, landscape conditions, and fiscal capacity. Thus even the best plan would not encompass all of the evaluation criteria used for this study. Working through this analysis for a given community could help that community assess its own planning efforts, but it is not so useful for a generalized research study to focus too much on the findings for one particular locality (i.e., without a more detailed assessment of conditions unique to that community and the appropriateness of the plan's analyses and policies within that context). Moreover, given these considerations, it would not be appropriate to use the methods employed here to pronounce that the average overall quality or the policy focus of the local master plans evaluated here are, for example, "A" or "B" or "C" plans in a standard-based sense.

Nonetheless, this method does provide a good general sense of policy focus and overall plan quality of plans evaluated taken as a whole. It also provides useful information for understanding the relationships between those local planning efforts generally and ongoing resource management efforts more broadly. Finally, it points to areas for improving local planning and development management efforts accordingly.

With these caveats, the following discussion presents the findings from the evaluation of the 8 local master plans (2 county plans, 2 city plans and 4 township plans) from the NEMIA region.

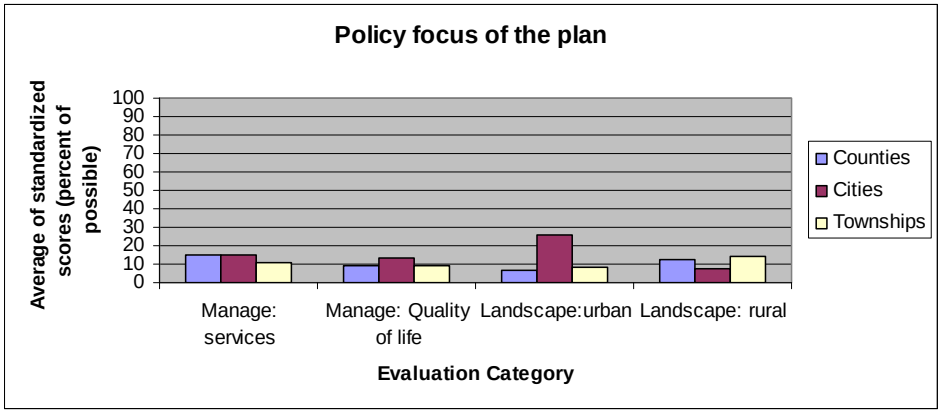
5.3.3 Findings

Plan Policy Focus

The policy focus of plans was evaluated along two aspects: growth management and landscape focus. Growth management was further divided into two categories: growth management for effective service provision and growth management for quality of life. Similarly the landscape focus of plans was divided into two categories: urban landscape focus and rural landscape focus. The scores of the NEMIA plans along these categories are evaluated in this section (see Figure

5.10). In general, except for cities' policies supporting vital urban centers, all other jurisdiction types scored less than 20% of the ideal (or total points possible) on all policy evaluation categories. Also, it should be noted that while cities scored better than counties and townships in terms of planning for vital urban centers, townships scored better than cities and counties in terms of planning for rural preservation. This would be expected especially in the case of cities with little rural undeveloped land, and predominantly rural townships. Further, the findings also indicate that cities and counties are engaging in somewhat better growth management for service provision than townships.

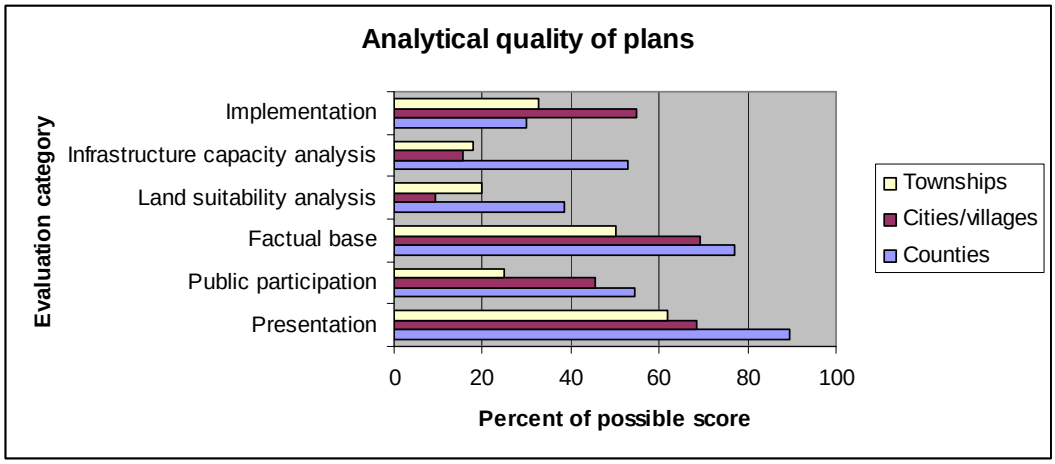
Figure 5.10. Plan Policy focus



Plan Quality: Analytical quality

Several notable observations can be drawn from Figure 5.11, which reports the results from the analysis of plan analytical quality. The first is that the county plans score better than city and township plans across all categories except "implementation." This might be expected considering that counties in Michigan do not have power over local land use and therefore no implementing ability. The fact that county plans scored higher than other local government plans in all other categories could be potentially explained by capacity and resource related problems of local governments in the Northeast Michigan region. Second, both cities and townships have notably low scores in both the infrastructure capacity analysis and land suitability analysis categories. Third, all jurisdiction types scored over 50% of the ideal in terms of documenting the fact base of the jurisdiction and plan presentation.

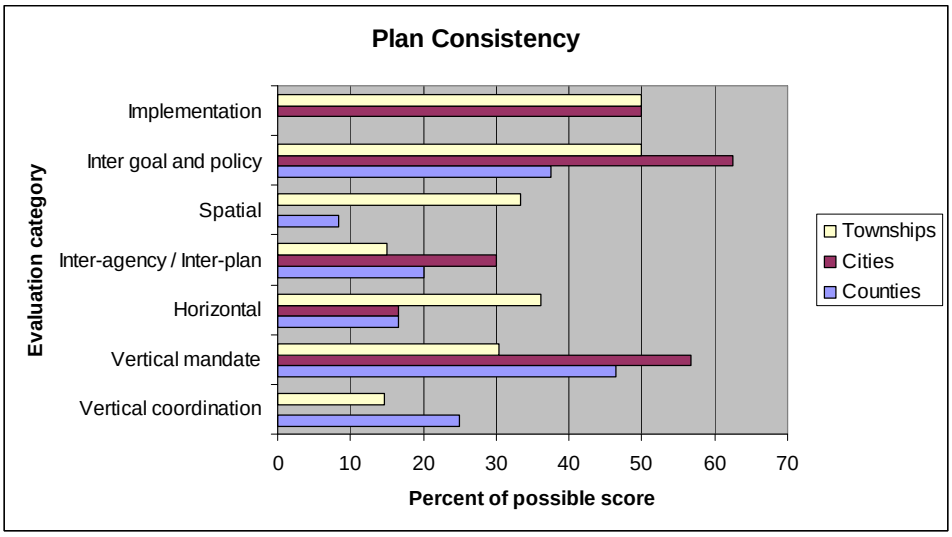
Figure 5.11. Analytical quality of plans



Plan Quality: Plan Consistency

Again as anticipated, and as illustrated by Figure 5.12, county plans have the lowest score for the implementation consistency category. Also, it should be noted that cities scored more than 50% of the ideal in the vertical mandate category. This is also not surprising as the elements in this evaluation category are mandated only for municipalities. Another observation to note is that cities have a very low score for both vertical coordination and spatial consistency. The highest scores are observed for the implementation and inter-goal and policy consistency categories. In other words, plans are generally consistent internally.

Figure 5.12. Plan consistency



Discussion

Taken altogether, the plan content analyses conducted for this study reveal that counties in general do not have plans that have strong provisions related to implementation. This can be expected as Michigan counties do not have implementation powers. In addition, cities in the NEMIA region appear more focused on promoting vital urban centers while townships appear more focused on conserving rural landscapes. Cities and counties also scored higher on policies relating to the efficient management of services. These findings tend to validate the methodology employed for this study.

Although all jurisdiction types seem to score high on plan quality measures, they score relatively low in all of the plan policy focus measures. Benchmarking the plans against a fully comprehensive plan for promoting sustainable development, most of the plans evaluated, on average, scored less than 20% of the possible score in terms of their policy content for virtually all of the attributes evaluated. Most importantly, the land suitability analysis scores and the infrastructure capacity analysis scores are among the lowest of the plan quality categories. This is of special concern considering that these two aspects of plans are especially important for ensuring the protection of natural resources (especially coastal resources) and cultural resources. Incidentally, these two areas also emerged (through survey results presented at the outset) as particularly important areas of concern to the stakeholder respondents, and consequently important policy emphasis areas for the NEMIA process.

In sum, the findings from this study highlight the ways in which selected NEMIA communities are currently *not* planning for sustainable development through their master plans. In so doing, the study also provides a road map that communities can use to effect such a transition toward sustainability through their planning and development management efforts. Most important—and currently most lacking—will be the need to undertake high quality planning efforts—especially through the use of rigorous land suitability analysis—to inform and justify that transition.

5.4 ZONING AND BUILDOUT ANALYSIS

Having completed our plan content evaluation, the next step of our study was to map buildout scenarios using the current zoning policies of selected jurisdictions in the region. Once buildout scenarios based on current development densities were established, alternative scenarios were also constructed. These alternative scenarios show how altering existing densities can result in substantial changes to future development patterns while still accommodating a considerable amount of growth and development. The buildout assessment that follows was primarily conducted by Denise Cline of NEMCOG, with conceptual and analytical assistance provided by Norton, David, and other members of the NEMIA research team.

Buildout scenarios were developed for 3 selected areas in the NEMIA region: Alpena City and Alpena Township; Alcona Township; and Rogers City and Rogers Township. Three development scenarios were developed to apply to these areas. The first scenario is a total level of buildout based on current allowable zoning densities in each of these jurisdictions. In order to illustrate the potential impacts of buildout based on more reasonable growth levels (i.e., using

levels that are less than "total" buildout but greater than current growth trends in Northeast Michigan and that might be expected should the goal of promoting greater economic development succeed), the second scenario is a level of buildout based on *current* allowable zoning densities but using growth rates borrowed from comparable jurisdictions in Northwest Michigan, an area of the state with similar coastal resources but that has experienced substantial economic growth and development over the past several decades. Finally, the third scenario is buildout based on *alternative* development densities and current growth rates drawn from Northeast Michigan. All three development scenarios were applies to Alpena City and Alpena Township and Alcona Township, however only the first and third (current zoning and current growth rate, reduced density zoning and current growth) scenarios were used for Rogers City and Township. The following discussion briefly describes the methods and assumptions used for each of these scenarios.

5.4.1 Buildout scenario 1 – Current zoning, current growth rate

To complete the buildout analysis, zoning layers were obtained from each of the communities. Public lands and lands that were already highly developed were clipped out of the zoning layer. To calculate buildout numbers, current density allowances in each residential district were first added to the attribute table. Total acreage in each zoning district was calculated and then multiplied by 0.9 to take into account roadways and other land areas which are not able to be developed. This amended acreage was then multiplied by the density allowances in each district to obtain the total number of dwelling units that would be allowed in a total buildout scenario. The same procedure was also used to demonstrate the two alternate scenarios.

5.4.2 Buildout scenario 2 – Current zoning, higher growth rate

In order to look at development patterns using an increased rate of development, each community was compared to a similar community in Northwest Michigan where development rates currently exceed the Northeast Michigan area. Each community was analyzed to determine the number of dwelling units that would occur if these development rates occurred in Northeast Michigan. These dwelling units were distributed on the map according to the currently allowable densities in each district to show the development patterns that would likely occur if development rates increase.

5.4.3 Buildout scenario 3 – Reduced density zoning, current growth rate

Lastly, density allowances in most districts were significantly reduced in order to show an altered development pattern that would still accommodate the current growth rates that the Northeast Michigan area is currently experiencing.

For all three buildout scenarios, dwelling units are shown two different ways, first in conjunction with infrastructure and then in conjunction with significant natural features. These maps visually demonstrate the stresses that would occur to roadways, water systems, septic systems, and the environment if development were to occur as per the scenarios outlined. Maps are organized in three sets by geographic area. Due to large file size, these maps are available as separate files through the following weblinks:

City of Alpena and Alpena Township Buildout Maps
http://www.miseagrant.umich.edu/downloads/nemia/Alpena-City-and-Alpena-Township-Buildout-Maps.pdf

Alcona Township Buildout Maps
http://www.miseagrant.umich.edu/downloads/nemia/Alcona-Township-Buildout-Maps.pdf

Rogers City and Rogers Township Buildout Maps
http://www.miseagrant.umich.edu/downloads/nemia/Rogers-City-and-Rogers-Township-Buildout-Maps.pdf

5.5 CONCLUSIONS

This chapter summarized the NEMIA stakeholders' policy concerns and their perspectives on current land management activities within the region, presented findings from the analysis of selected local master plans within the region, and presented the results from a forward-looking analysis of potential build-out scenarios. Those scenarios illustrate the various land development patterns the region might experience in the foreseeable future based on current zoning. In brief, these findings suggest that the NEMIA stakeholders taken together are primarily concerned about unemployment in the region first, followed by a range of secondary concerns such as land use conflicts and natural and cultural resource protection. The stakeholders also expressed concerns about a lack of sufficient local government capacity and a corresponding lack of local attention to comprehensive planning. Despite these concerns, the stakeholders also sensed that, in general, if local officials were faced with the need to make a tradeoff between economic development and either natural resource or cultural resource protection, those officials would favor protecting their natural and cultural resources.

This latter finding notwithstanding, the results from the analysis of local master plans evaluated for this study are largely consistent with the stakeholders' sense of current local policy goals and planning efforts in the region. That is, taken as a whole, the local master plans are generally weak analytically, not providing the foundations necessary to adequately address complex land management challenges such as promoting economic development in ecologically and socially sustainable ways. Moreover, the plans evaluated contain few if any of the policies that advocates for sustainable development and smart growth prescribe, including especially policies vital for protecting ecologically valuable settings like coastal regions. Similarly, a buildout analysis using current zoning code districts and corresponding requirements suggest that the several subregions studied are taking few if any steps to promote the development of a sustainable landscape, one characterized especially by compact urban centers, conserved rural areas, and protected natural areas. Even short of the level of urban development that would be permitted by right under current codes, a substantial amount of moderate to low density development could occur under those current regulations, yielding exactly the same kinds of ecological and cultural resource harms of greatest concern to the authors of the various studies cited at the front of this chapter.

In sum, the NEMIA stakeholders seek to promote ecotourism-based economic development while safeguarding the natural and cultural resources that make the NEMIA region unique and

special, but the results of the analyses presented here suggest that the local land use planning and development manage system as it is currently configured within the region appears to be inadequate for that task. Thus in addition to providing a backdrop picture of current conditions and local land management efforts, the findings presented here also emphasize the need for and set the stage to consider the analyses and recommendations prepared by the SDAT team as part of the NEMIA process, reported next in Chapter 6.

Table 5.2. Plan Policy Emphasis – Growth Management Policies (Efficient services and Quality of life)

		Growth Management – Efficient Services	**Growth Management – Quality of life**
Criterion	Concept Description	Measurement	Measurement
Development Management	Procedural policies addressing how land development or redevelopment will be shaped or managed (e.g., through tax policies, regulations, reliance on the market, etc.).	Urban Growth Boundaries; growth controlled by infrastructure placement, regional collaboration; downtown development authorities; brownfield redevelopment authorities; urban service boundary.	Regional or multi-jurisdictional collaboration; urban growth or services boundary; mapping of conservation and development zones; manage growth by infrastructure carrying capacity and land suitability.
Land Use Management	Procedural policies establishing the various land uses or land use forms that the community will ultimately take (e.g., urban, rural, suburban).	Planned Unit Development, density bonuses; infill Development	Promote compact development; recreational uses within walking and biking distances; use of planned unit developments, density bonuses; remediation and reuse of brownfield sites; site plan review for regulations; design boards and aesthetic guidelines.
Infrastructure Management	Procedural policies addressing the range of infrastructure services under the control of the local government (e.g., roads, water, wastewater), including "green" infrastructure (e.g., parks and trails).	Traffic management plans; transit oriented development; coordination of local transportation to regional network; waste-water conservation and treatment; conversion of septic to sewer where necessary; recycle / reduce / reuse programs.	Variety of transportation options, performance monitoring; public transportation and concomitant infrastructure; transit oriented development; traffic calming techniques
Housing	Procedural policies allowing for the efficient coordination of housing with other infrastructure and the provision of a variety of housing types	Housing located close to employment centers	Affordable housing, mixed income housing, variety of housing options, manufactured housing
Community Character	Procedural policies relating to the preservation and enhancement of sense of place and community		Historic preservation, cultural resource preservation
General Environmental Quality	Procedural policies on the control of environmental pollutants (e.g., control of contaminated stormwater runoff).		Use of watershed-based planning; environmental quality public education; parking lot run-off controls; native landscaping; pesticide and fertilizer controls; controls on new septic installation.
Natural resource preservation	Procedural policies for the preservation of open space and the development of contiguous natural environments		Conservation easements; fee simple acquisition; landscaping standards; buffering standards; greenway and trail connectivity requirements; conservation planning and design
Resource production	Procedural policies for the protection of productive lands		Right to farm ordinances; Purchase and Transfer of Development Rights; Exclusive agricultural zoning; cluster development

Table 5.3. Plan Policy Emphasis – Urban Landscapes

Criterion	Concept Description	Measurement
Development and Redevelopment	Procedural policies promoting the development and redevelopment of compact, mixed-use urban centers.	Mixed use and compact development and retrofitting; traditional neighborhoods; tax increment financing; downtown development authorities; brownfield redevelopment authorities; urban growth/services boundary.
Land Use Management	Substantive policies promoting attractive, viable, and compatible urban land uses and forms.	Form-based zoning; mixed-use zoning; design standards and review board; locally and regionally-appropriate facades, etc.; pedestrian amenities in commercial centers; auto-dependent retail design discouraged.
Transportation & Connectivity	Substantive policies promoting multiple and connected transportation systems between residential, commercial and business, and recreational centers.	Siting and connectivity of recreational, commercial, residential, and institutional centers to facilitate walking and biking; development of public transportation; traffic-calming in residential neighborhoods; connectivity in roadways between existing and new developments; transit-oriented development.
Housing Variety	Substantive policies promoting a variety of housing types across price range and location.	Variety of housing types provided for; housing located near employment centers; affordable, manufactured, and mixed-income housing provided for.
Urban Environmental Quality & Community Character	Substantive policies promoting environmentally and culturally healthy and desirable urban forms.	Environmental overlay districts; landscaping standards, setbacks, buffers; on-site stormwater management systems; management districts for important cultural and historic resources.

Table 5.4. Plan Policy Emphasis – Rural Landscapes

Criterion	Description	Measurement
Development Management	Procedural policies promoting the development of compact urban areas and the conservation of rural areas.	Compact development encouraged; auto-oriented retail discouraged; natural resource protection coordinated with rural area economic activity; mapping of conservation and development zones; growth managed by infrastructure carrying capacity and land suitability.
Land Use & Environmental Quality	Substantive policies promoting access to rural and natural areas and the protection of those areas from environmental degradation.	Access to natural areas provided; standards for preservation of natural terrain, drainage, vegetation; environmental overlay districts; landscaping and vegetative standards, setbacks, buffers; on-site stormwater management; standards for vegetated open channels.
Resource Production Area Protection	Substantive policies promoting the identification and conservation of contiguous and economically viable resource production areas.	Easement acquisition; cluster zoning; buffer zones for agricultural lands; purchase and / or transfer of development rights programs; exclusive agricultural zoning; right to farm ordinance.
Open Space / Natural Area Protection	Substantive policies promoting the identification and conservation of contiguous and ecologically viable natural areas.	Conservation planning; property acquisition; buffer zones to protect sensitive and unique natural areas; connectivity between natural areas, wildlife corridors, connecting park trails, greenway systems.

Table 5.5. Plan Analytical Quality

Criterion	Concept Description	Measurement
General Presentation	The comprehensibility and completeness of the plan as an informational document. The clarity and thoroughness of the plan's statements about the role of planning and the plan itself.	Readiblity of text; use and quality of maps; provision of table of contents; executive summary; data and information sources. Also, Discussion of the planning process and plan's purpose; clear statements of goals, objectives, and policies; land classification with clear description of land use classifications.
Public Participation	Extent to which multiple and meaningful avenues for public participation were provided in the plan-making process in order to leverage local citizen knowledge, leverage the "social learning" function of planning, and increase the legitimacy of the plan.	Description of public participation process; use of public participation techniques (e.g., public education campaigns, workshops, surveys, etc.).
Fact Base	The overall thoroughness and clarity of the descriptive information about the community presented in the plan, provided to describe where the community is now, where it appears to be headed, and what the status is of past planning efforts.	Discussion of data collection and analysis process used; assessment of past plan implementation efforts and effectiveness; discussion of current plans, policies and regulations; discussion of current conditions (land use, economic base, etc.); trends assessment (economic activity, land development, environmental trends).
Infrastructure Capacity Analysis (Average)	Identification of services currently available and analysis of both the likely impacts from infrastructure decisions on population and land development trends and the reciprocal impacts from those trends on long-term capacities.	Average score of infrastructure analysis criteria (see table below).
Land Suitability Analysis (Average)	Analysis of inherent land attributes to identify areas both most suitable and least suitable for urbanized land development and for rural area conservation.	Average score of land suitability analysis criteria (see table below).
Implementation	Extent to which the plan identifies the timeframes, mechanisms, and responsible parties for implementing the plan policies.	Provision of timetable, responsibilities, and mechanisms to be used to implement the plan; discussion of monitoring system, benchmarks and dates, updating process and timeframe.

Table 5.6. Plan Consistency

Criterion	Concept Description	Measurement
Vertical Mandate Consistency (All)	Presence of plan elements mandated of all local units of government in state planning enabling laws.	Plan elements for, e.g., a land classification program, transportation infrastructure, water quality and quantity, public utilities.
Vertical Mandate Consistency (Cities / Villages)	Presence of plan elements mandated only for cities and villages in state planning enabling laws for cities and villages.	Plan elements for, e.g., community centers, playgrounds and open spaces.
Vertical Coordination	Extent to which the plan demonstrates consultation and/or coordination between the locality and "higher" units of government (e.g., state coastal area management programs).	Discussion of vertical plan policy consistency and planning coordination efforts with federal and state agencies; coordination by cities, townships and villages with county government.
Horizontal Consultation and Coordination	Extent to which the plan appears to be compatible with the policies and spatial characteristics of neighboring jurisdictions and extent to which the locality is consulting and/or coordinating with neighboring jurisdictions or other "horizontal" units of government.	Discussion of plan policy consistency with neighboring jurisdictions, inter-governmental consultation and coordination efforts.
Internal Policy, Spatial & Implementation Consistency	Degree of internal coherence between the plan's facts, goals, and policies and between multiple plan documents in a jurisdiction with multiple plans (e.g., subarea plans). Several attributes of internal consistency include inter-goal, inter-policy, goal-policy, inter-plan, and spatial consistency (i.e., degree to which the stated goals and policies of the plan are consistent with the limitations on and opportunities for development based on the infrastructure capacity and land suitability analyses). Also, extent to which the implementation steps identified in the plan are consistent with (or are reasonably designed to advance) the plan's articulated goals and policies.	Discussion of internal policy within the plan itself, inter-plan/program consistency, and inter-agency coordination; discussion of consistency between land suitability analysis, constraints/land classification maps, and plan policies; analyst's assessment of consistency between plan goals, objectives, and policies; discussion of consistency between plan policies and implementation mechanisms.

Works Cited

American Planning Association. (2000). *Policy guide on planning for sustainability.* Chicago, IL: American Planning Association.

American Planning Association (2002). *Policy guide on smart growth.* Chicago, IL: American Planning Association.

Arendt, R. (1994). *Rural by design: Maintaining small town character*. Chicago, IL: American Planning Association Planners Press.

Baer, W.C. (1997). General plan evaluation criteria: An approach to making better plans. *Journal of the American Planning Association, 63*(3), 329-344.

Beatley, T. (1995). Planning and Sustainability: The Elements of a New (Improved?) Paradigm. *Journal of Planning Literature* 9 (4):383-395.

Beatley, T., Brower, D.J., & Schwab, A.K. (2002). *An Introduction to Coastal Zone Management*. 2nd ed. Washington, DC: Island Press.

Berke, P.R. (2002). Does sustainable development offer a new direction for planning? Challenges for the Twenty-First Century. *Journal of Planning Literature* 17 (1):21-36.

Berke, P.R., Crawford J, Dixon, J.E., & and Ericksen, N.J. (1999). Do cooperative environmental planning mandates produce good plans? Empirical results from the New Zealand experience. *Environment and Planning B: Planning and Design* 26:643-664.

Brody, S.D. (2003). Implementing the principles of ecosystem management through local land use planning. *Population and Environment* 29 (6):511-540.

———. 2003. Measuring the effects of stakeholder participation on the quality of local plans based on the principles of collaborative ecosystem management. *Journal of Planning Education and Research* 22:407-419.

Berke, P.R., & Conroy, M.M. (2000). Are we planning for sustainable development? An evaluation of 30 comprehensive plans. *Journal of the American Planning Association*, *66*(1), 21-32.

Burby, R. J., ed. (1998). *Cooperating with nature: Confronting natural hazards with land-use planning for sustainable communities*. Washington, DC: Joseph Henry Press.

Burby, R.J, & May, P.J. (1997). *Making governments plan: State experiments in managing land use*. Baltimore, MD: Johns Hopkins University Press.

Cicin-Sain, B. & Knecht, R.W. (1998). *Integrated Coastal and Ocean Management: Concepts and Practices*. Washington, D.C.: Island Press.

Crawford, Jr., C. (1998). *Michigan zoning and planning*. 3rd ed. (with 2005 Cumulative Supplement). Ann Arbor, MI: Institute of Continuing Legal Education.

Freilich, R. H. (1999). *From Sprawl to Smart Growth: Successful Legal, Planning, and Environmental Systems*. Chicago, IL: American Bar Association.

Great Lakes Conservation Task Force. (2002). *The citizens' agenda: An action plan to protect the Great Lakes*. Lansing, MI: Michigan State Senate.

Johnson, D., Salkin, P. E., Jordan, J., & Finucan, K. (2002). Planning for smart growth: 2002 state of the states. Washington, DC: American Planning Association and the Smart Growth Network.

Juergensmeyer, J.C, & Roberts, T.E. (2003). *Land use planning and development regulation law*. St. Paul, MN: Thompson West.

Kaiser, E.J, Godschalk, D.R. & Chapin, Jr., S.F. (1995). *Urban land use planning*. 4th ed. Urbana, IL: University of Illinois Press.

Klepinger, M.R. (2002). *Status of planning and zoning in Michigan's Great Lakes shoreline communities*. Lansing, MI: MI College Sea Grant Program.

Local Government Commission.(2004). Overcoming Obstacles to Smart Growth through Code Reform. Sacramento, CA.

Meck, S. (1996). Model planning and zoning enabling legislation: A short history. In *Modernizing state planning statutes: The growing smart working papers - volume 1*. Chicago, IL: APA Planning Service Advisory Report No. 462/463.

Meck, S. (2002). *The growing smart legislative guidebook: Model statutes for planning and the management of change*. Chicago, IL: American Planning Association.

Michigan Land Use Leadership Council. (August 2003). *Michigan's land, Michigan's future: Final report of the Michigan Land Use Leadership Council*. Lansing, MI: Michigan Land Use Leadership Council.

National Association of Home Builders. (2000). *Smart growth: Building better places to live, work and play*. Washington, DC: National Association of Home Builders.

———. (2004). *High density development and mixed use development* (http://www.nahb.org/generic.aspx?sectionID=628&genericContentID=17371) 2004 [cited July 2004].

Nelson, A.C., & Duncan, J.B. (1995). *Growth management principles and practices*. Chicago, IL: Planners Press, American Planning Association.

Northeast Michigan Council of Governments (NEMCOG). (1996). *Coastal zone management: Current trends in northeast Michigan, an analysis with recommendations.* Gaylord, MI: NEMCOG.

Norton, R.K. (2005a). Local commitment to state-mandated planning in coastal North Carolina. *Journal of Planning Education and Research 25* (2),149-171.

———. (2005b). More and better planning: State-mandated local planning in coastal North Carolina. *Journal of the American Planning Association 71* (1), 55-71.

———. (2005c). Striking the balance between environment and economy in Coastal North Carolina. *Journal of Environmental Planning and Management* 48 (2):177-207.

———. (2008). Using content analysis to evaluate local master plans and zoning codes. *Land Use Policy* 25:432-454.

Oregon Department of Land Conservation and Development, Transportation & Growth Management Program. (2004). *Minimum density zoning.* Retrieved July, 2004 from http://www.lcd.state.or.us/tgm/pub/1minzone.htm

Pollard, O. A. III. (2000). Smart Growth: The Promise, Politics, and Pitfalls of Emerging Growth Management Strategies. *Virginia Environmental Law Journal* 19:247-285.

Randolph, John. (2004). *Environmental land use planning and management*. Washington, D.C.: Island Press.

Smart Growth Network. (2002). Getting to Smart Growth. Washington, DC: Smart Growth Network and the International City/County Management Association.

———. (2003). Getting to Smart Growth II. Washington, DC: Smart Growth Network and the International City/County Management Association.

Smyth, P. (1995). *Patterns on the land: Our choice-our future.* Rochester, MI: Michigan Society of Planning Officials.

Talen, E. (1996). Do plans get implemented? A review of evaluation in planning. *Journal of Planning Literature 10* (3), 248-259.

Wheeler, S.M. (2001). Planning for Metropolitan Sustainability. *Journal of Planning Education and Research* 20 (2):133-145.

Wheeler, S. M., & Beatley, T., eds. (2004). *The Sustainable Urban Development Reader*. London: Routledge.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford, UK: Oxford University Press.

Appendix B: Zoning Code Audit Protocol - Coastal MI Communities - Winter 2007

Name of Community:
Site ID:
Date of Review:
Document(s) Reviewed:
Reviewer Name:

Evaluation Criterion	Items	Raw Score	% Score	Corresponding Districts
Innovative / flexible process and design	5, 6, 13, 14, 47, 48	0	*0*	
Compact development	1-5,37,41-43,45, 48, 51	0	*0*	
Mixed used (residential / commercial / small business)	6-13, 49-50	0	*0*	
Mixed / affordable residential	17-20	0	*0*	
Urban revitalization	1,2,10-13,23,50	0	*0*	
Non-auto oriented transportation (pedestrian / transit friendly; minimized parking)	22-29	0	*0*	
Water quality/quantity protection and management	30-36	0	*0*	
Historic / scenic / cultural preservation	15,16	0	*0*	
Natural area open space preservation	37-40, 51	0	*0*	
Working agricultural area preservation	41-46, 51	0	*0*	

			Value Key	Value	Page	Comment
Category	Item	**Policy**				
Land Supply, Land Use, and	1	**Urban growth boundary used to prevent outward development.**	**0= No 2= Yes**			
	2	**Urban service boundary (water, sewer and roads) used to manage and direct growth.**	**0= No 2= Yes**			
	3	**High density (8-15 units per acre) allowed in at least 1 district.**	**0= No 2= Yes If yes, which districts?**			
	4	**Minimum densities specified in at least 1 district.**	**0= No 2= Yes If yes, which districts?**			
	5	**Density bonus and/or incentive zoning permitted in non-PUD districts. *See Note 1***	**0= No 2= Yes If yes, which districts?**			
	6	**Areas zoned by building type, not by use, to allow for a mix of land uses (also "form-based zoning").**	**0= No 2= Yes If yes, which districts?**			
	7	**Mixed use zoning via a non-PUD district: Specific "mixed used district" with different uses in separate structures (whether by this name or some other name). *See Note 2***	**0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?**			
	8	**Mixed use zoning via a non-PUD district: Residential permitted in commercial / business (may be same structure, e.g., 2nd story appartments). *NOTE: This may overlap with the above item.***	**0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?**			

Land Use, and Urban Form	9	"Live/work" zoning via conventional "home occupation" provision.	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			
	10	Non-traditional live/work zoning (e.g., studio lofts) via a non-PUD district.	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			
	11	Small-scale neighborhood commercial uses adjacent to or within residential neighborhoods via a non-PUD district?	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			
	12	"Traditional Neighborhood Ordinance" (TND) and/or provisions. *See Note 3*	0= No 2= Yes			
	13	"Flexible zoning" via a non-PUD district (e.g., permitting multiple uses in transitional zones without requiring a variance or rezoning). *See Note 4*	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			
	14	"Conditional zoning" authorized.	0= No 2= Yes			
Character	15	Scenic preservation districts and/or provisions. *See Note 5*	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	16	Historic preservation districts and/or provisions.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
Housing	17	"Accessory apartments" permitted within single-family residential zoning districts (separate or connected structures from residence). *See Note 6*	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			
	18	Muti-family residential units (e.g., townhomes, condos, duplexes, apartments) allowed within Single Family (detached) Residential districts. (Specify type allowed.)	0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?			

	19	**Mobile homes / manufactured housing permitted in a least one residential zoning district as individual units (e.g., with special provisions for foundations, etc.) (specify which).**	**0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?**			
	20	**Mobile homes permitted in a separate mobile home park / zoning district.**	**0= No 2= Yes**			
Transportation/ Parking	21	**Sidewalks encouraged or required.**	**0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?**			
	22	**Bike lanes encouraged or required.**	**0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?**			
	23	**"Pedestrian walkability" or "transit friendly" orientation used as a review standard.**	**0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?**			
	24	**Reductions in off-site parking requirements if within specified districts (e.g., TND neighbohood districts).**	**0=not present; 1=permitted as of right; 2=permitted by conditional use. If yes, which districts?**			
	25	**Reductions in off-site parking requirements if within a specified distance of a municipal garage or other parking opportunity (specify other).**	**0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?**			
	26	**Reductions in parking ratios for shared parking.**	**0=not present; 1=permitted by conditional use; 2=permitted as of right. If yes, which districts?**			
	27	**Maximum parking ratios defined (cap on the number of parking spaces that can be built in a particular development).**	**0= No 2= Yes If yes, which districts?**			
	28	**On-street parking specifically allowed in places where it can be safely provided (downtown areas and pedestrian-retail districts).**	**0= No 2= Yes If yes, which districts?**			
	29	**On-street parking specifically prohibited.** ***See Note 7***	**0= No -2= Yes If yes, which districts?**			

Water Quality and Quantity	30	Wetland protection ordinance/provisions for wetlands < 5 acres. *See Note 8*	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	31	Swales allowed in place of curbs and gutters (for water management purposes) in one or more districts.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	32	Standards provide for limited chemical use for lawn maintenace in one or more districts.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	33	Development setbacks / buffers required adjacent to water bodies in one or more districts.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	34	Standards provide for control of runoff from parking lots/drives/streets in one or more districts.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	35	Floodplain management district and/or provisions in at least 1 district.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	36	Other water quality/quantity standards provided for one or more districts (specify).	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
Natural Resource Area Preservation	37	Cluster/Open Space Ordinance or provisions via a non-PUD district.	0=not present; 1=present but not detailed; 2=present and detailed. If yes, which districts?			
	38	Standards provide for ensuring connectivity of open space / natural areas.	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	39	Standards provide for flexible/peformance zoning and/or flexible site design specifically for open space / natural area preservation (specify).	0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?			
	40	Environmental overlay districts and/or provisions (e.g., tree, habitat, other; specify). *See Note 9*	0= No 2= Yes			

Agriculture/ Open space Preservation	41	**Exclusive agricultural zoning districts provided.** ***See Note 10***	**0=not present; 1=present but not detailed; 2=present and detailed**			
	42	**Purchase of Development Rights (PDR/PACE) provided.**	**0=not present; 1=present but not detailed; 2=present and detailed**			
	43	**Transfer of Development Rights (TDR) provided.**	**0=not present; 1=present but not detailed; 2=present and detailed**			
	44	**Buffer zones for agricultural lands required (i.e., in non-agricultural districts).**	**0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?**			
	45	**Right to farm ordinance / provisions.** ***See Note 11***	**0= No 2= Yes**			
	46	**Other innovative agricultural area preservation provisions (e.g., sliding scale zoning, area based allocation, quarter-quarter zoning; specify).** ***See Note 12***	**0=not present; 1=suggested; 2=mandatory. If mentioned, which districts?**			
Planned Unit Developments	47	**Planned Unit Development (PUD) authorized.**	**0= No 2= Yes**			
	48	**Density bonus and/or incentive zoning permitted via PUD.**	**0= No 2= Yes**			
	49	**Mixed use zoning via PUD.**	**0= No 2= Yes**			
	50	**Live/work zoning via PUD.**	**0= No 2= Yes**			
	51	**Cluster/open space provisions via PUD.**	**0= No 2= Yes**			

NOTE 1: Bonus and incentive zoning allows local government to grant a bonus, usually in the form of density or the size of the development, in exchange for amenities (such as increased open space, pedestrian paths, etc.) or a higher quality of required provisions (enhanced stormwater management facilities, landscaping, etc.) provided by the developer not required by traditional zoning. Density bonuses may be offered to encourage cluster development. In many instances, the use of bonus and incentive zoning is tied to a site plan approval process. Communities often provide density bonuses to entice developers into providing public amenities such as parks, plazas or structured parking.

NOTE 2: In general, mixed use districts are characterized by multi-story construction that uses the ground floor for retail, service or office space, while upper floors are usually residential; mixed use zoning typically allows for higher density development than single use zoning. Mixed use zoning also helps to provide a transition from one single-use zone to another. Some mixed use codes attempt to protect an existing mixed-use area from incompatible auto-oriented development. Mixed use zoning can also serve to intensify and diversify uses in an already developed area, for example, transforming a conventional, suburban, single-use commercial environment to a more walkable, 24-hour district with both commercial and residential uses. Source: http://www.lgc.org/freepub/PDF/Land_Use/sg_code_exec_summary.pdf

NOTE: Do not include "mixed use" provisions that allow only mixed residential (e.g., SFR with MFR) but not residential / commercial / business. ALSO: Do not include "mixed use" provisions achieved via a cumulative zoning scheme alone.

NOTE 3: Traditional neighborhood design ordinances generally require new development to meet specific characteristics that result in a higher density, mixed-use, pedestrian oriented community to emulate the characteristics of neighborhoods developed during the 18th through 20th century. Traditional neighborhood design elements include but are not limited to: connectedness of the street and alleyway networks walkability, i.e. short blocks (under 500 ft. long), street landscaping, and human scale, street-oriented storefronts and residential centers; diversity of housing types and a mix of commercial and residential land uses; minimal parking requirements and transit-oriented design; usable public space such as civic and community centers. Source: Overcoming Obstacles to Smart Growth through Code Reform, Retrieved May 19, 2004, from http://www.lgc.org/freepub/PDF/Land_Use/sg_code_exec_summary.pdf.

NOTE 4: Flexible zoning allows developers to respond to market demands. Flexible zoning is often used in areas of transition between commercial and residential streets in response to market fluctuations to accommodate retail, office or residential space needs. Owners of properties within the zone are able to change the use of the building (in compliance with local building codes) without going through a lengthy variance or approval process.

NOTE 5: Scenic preservation is intended to enhance the appearance of a municipality in order to make it a better place to live and work as well as improve its economic vitality by enhancing its attractiveness to both citizens and to visitors. Scenic preservation is often achieved by establishing height limits to protect significant views and by establishing landscaping and screening standards to preserve and enhance identified scenic resources. Source: http://www.planning.ci.portland.or.us/zoning/ZCTest/400/480_Scenic.pdf.

NOTE: Record this only if required for unique or special natural/scenic features (i.e., not for landscaping requirements alone).

NOTE 6: Accessory dwelling units are either detached or internal residential living units that provide complete independent living facilities for one or more persons. They include permanent provisions for living, sleeping, eating, cooking, and sanitation on the same parcel as the single-family dwelling they accompany. When permitted, accessory dwelling units or apartments are allowed in single-family residential districts.

NOTE: Do not include "accessory units" for home occupations or room rental/boarding house provisions.

NOTE 7: Be careful to reverse value on this measure.

NOTE 8: State law (Natural Resources and Environmental Protection Act, Part 303, Wetlands Protection) mandates the protection of wetlands over 5 acres in size and requires development activities to be approved by permit from the State (requiring landowners to secure a wetland permit before receiving other local permits mandates a review of wetlands at the beginning of the development process and helps to avoid expensive delays and ensures that landowners are fully aware of development restrictions before making a significant investment). Local programs can fill in areas not covered by state and federal laws, such as regulating small wetlands and exempt activities.

NOTE 9: Environmental overlay districts protect resources and functional values that have been identified as providing benefits to the public. Environmental regulations encourage flexibility and innovation in site planning and provide for development that is carefully designed to be sensitive to the site's protected resources. Environmental overlay zone conserves important resources and functional values in areas where the resources and functional values can be protected while allowing environmentally sensitive development. In general, environmental overlay districts are intended to: encourage sensitive development while minimizing impact on resources; provide clear limitations on disturbance within resource areas; ensure that new development and alterations to existing development are compatible with and preserve natural resources; provide clear planting and erosion control requirements within natural resource areas; buffer the natural resource area from the noise, fumes, lights, and motion of vehicular traffic associated with industrial, commercial, and multi-dwelling residential uses. Source: http://www.planning.ci.portland.or.us/zoning/ZCTest/400/430_Envir.pdf.

NOTE 10: Exclusive agricultural zoning seeks to promote and protect the practice of farming through the preservation of lands on which agriculture is most viable by making agriculture the primary permitted use. Effective agricultural zoning ordinances seek to protect prime agricultural soils and to preserve the culture and landscape of farming. Conditional uses or special exceptions should be limited to ag-related, religious, utility, institutional or governmental uses. Site development standards within the exclusive agricultural zoning district may include: a maximum lot area for non-farm, residential uses; a large minimum lot area for a farm dwelling unit; a maximum lot to depth ration of 1:3; large minimum lot widths and setbacks.

NOTE 11: Michigan Right to Farm Act (5.7.2s) (Act 93 of 1981): An Act to define certain farm uses, operations, practices, and products; to provide certain disclosures; to provide for circumstances under which a farm shall not be found to be a public or private nuisance; to provide for certain powers and duties for certain state agencies and departments; and to provide for certain remedies for certain persons.

NOTE 12: Sliding scale zoning limits the number of times that a parent parcel (a parcel existing on the date of ordinance adoption) can be split based on its size. More splits are allowed on larger parcels. A minimum parcel size and a maximum number of splits are established.

Quarter/quarter zoning refers to a quarter of a quarter section of land (1/16 of 640 acres, or 40 acres) where a limited number of non-farm homes are allowed for every 40-acres of land.

Area based allocation zoning requires homes to be on smaller parcels to avoid fragmentation of the resource base into “farmettes.” The number of house lots allowed is directly proportional to the farmer’s total acreage (e.g., one lot for every 20 acres), but these lots are subject to maximum size restrictions (often two acres), and are sometimes further required to be located on the parts of a property that are least suitable for farming. By requiring small lots for the non-farm dwelling units, large areas are left intact for agricultural uses. (Rural by Design, Randall Arendt, et al., p. 296).

Lot Size/Setback Requirements

	Optimal	Page	Regulation (Note District Name and Appropriate Standard)
Minimum pavement width	18-24 ft.*		
Minimum ROW	35-45 ft.*		
Minimum Lot Size, **Lowest-Density SF/Duplex Residential****	5,000 sq. ft.** (8 units/a		
Minimum Lot Size, **Next Lowest Density Residential****	4,000 sq. ft.** (10 units/		
Minimum Lot Size, **Next Lowest Density Residential****	3,000 sq. ft.** (14.5 unit		
Minimum Lot Size, **Multi-Family Residential****			
Minimum Lot Size, other Res. Districts (add more lines as needed)			
Maximum density, **SF Residential**			
Maximum density, **Commercial**			
Land occupancy / site foot print limits (percent) for Residential			
Land occupancy / site foot print limits (percent) for Commercial			
Land occupancy / site foot print limits (percent) for Business			
Minimum Front Setback, **Lowest-Density Residential**	20 ft.		
Minimum Front Setback, **Next Lowest Density Residential**			
Minimum Front Setback, **Next Lowest Density Residential**			
Minimum Front Setback, other Res. Districts (add more lines as needed)			
Minimum Setback, Commercial District (add more lines as needed)	0 ft.		

Parking Requirement, **SF Residential**	2 per DU#		
Parking Requirement, **Commercial**	3-8 per 1,000 ft. #		
Parking Requirement, **Industrial**	1 per every 2-5 employ		
Maximum Block Length	500 ft. ^		

FINAL QUESTIONS: **value** **page**

Is there a separate ZBA? (Or does the legislative body serve as the ZBA)? 1 = separate, 0 = legislative body sits as ZBA

Does the code using MF housing to "buffer" SFR from other uses? 1 = yes, 0 = no

Which entity makes the following recommended and final decisions on the following actions (leave blank if not specified):

NOTE: LB=legislative body; PC=planning commission; ZC=zoning commission; ZA=zoning administrator/staff; ZBA=zoning board of appeals; O=other (specify)

	Rec'd	Final	Page / comments
Site plan review / permits			
Special use permits			
PUDs			
Surety bonds/performance guarantees			
Dimensional variances			
Use variances			

Plan Evaluation Coding Form: Michigan Coastal Communities

County / Community:

Purpose of the master plan:

	Variable Description	Variable Key	Code	Pg	Comments
1.0 General Information					
1.0a	Place type	1 = county; 2 = municipality; 3 = township			
1.0b	Place type for townships	1= urban township (> ~ ½ developed); 2 = rural township (< ~ ½ developed); 3 = urbanizing township (rural twp ~ ½ developed and urbanizing)			
1.0c	Date of evaluation / Evaluated by		Date:	Evaluator:	
1.0d	Plan title				
1.0e	Plan type	e.g., master, parks & rec, etc.			
1.0f	Type of copy	1= hard copy; 2 = electronic copy			
1.0g	Plan update	1 = yes; 0 = no (i.e., first plan)			
1.0h	Date adopted by locality	NA = Not formally adopted			
1.0i	Adopted by	Name of entity			
1.0j	Endorsed by	Name of entity			
1.0k	Approximate page length				
1.0l	Consultant used for plan preparation	1 = yes; 0 = no			
1.0m	Consultant used for plan compilation	1 = yes; 0 = no			
1.0n	Consultant's name				
1.0o	Other / comments				
2. Plan Presentation					

2.1 Supporting Components					
2.1a	Table of contents	Provided? 1 = yes; 0 = no			
2.1b	Glossary of terms	Provided? 1 = yes; 0 = no			
2.1c	Index	Provided? 1 = yes; 0 = no			
2.1d	Executive summary	Provided? 1 = yes; 0 = no			
2.1e	Sources in text/tables	Provided? 1 = yes; 0 = no			
2.1f	Source list provided	Provided? 1 = yes; 0 = no			
2.1g	Use / quality of maps[1]	0 = none; 1 = limited or poor; 2 = standard; 3 = extensive, clear and usable			
2.1h	Use / quality of tables / figures (readability, clarity of purpose, etc.)	0 = none; 1 = limited or poor; 2 = standard; 3 = extensive, clear and usable			
2.1i	Readability of text[2]	0 = poor; 1 = average; 2 = high			
2.2 Statement of goals, objectives and policies					
2.2a	Clear statement of goals, policies, and objectives	Provided? 1 = yes; 0 = no			
2.2b	Emphasis of values/goals/policies[3] Please check the appropriate boxes. Check as many as you see appropriate.	Rural Residential Character			
		Single Family Residential Character			
		Agricultural and Farmland Preservation			
		Natural Resource Protection			
		Urban Revitalization			
		Historic and Cultural Preservation			
		Economic Development			
		Other			
2.2c	Other / comments				
3. Planning Process					
3.0a	Explanation of planning process provided	0 = not present; 1 = present but not detailed; 2 = present and detailed			
3.0b	Discussion of planning, plan's purpose	0 = not present; 1 = present but not detailed; 2 = present and detailed			
3.0c	Other / comments				

3.1 Public Participation					
3.1a	Description of public participation process	0 = not present; 1 = present but not detailed; 2 = present and detailed			
3.1b	Stakeholder involvement	Discussed? 1 = yes; 0 = no			
3.1c	Public education and information	Discussed? 1 = yes; 0 = no			
3.1d	Community visioning session, design charette, etc.	Discussed? 1 = yes; 0 = no			
3.1e	Planning or steering committee	Discussed? 1 = yes; 0 = no			
3.1f	Focus groups	Discussed? 1 = yes; 0 = no			
3.1g	Survey of public opinion conducted	Discussed? 1 = yes; 0 = no			
3.1h	If yes, results tabulated or summarized in the plan itself	Provided? 1 = yes; 0 = no			
3.1i	Preliminary drafts circulated for public comment	Discussed? 1= yes; 0 = no			
3.1j	Other public participation mechanisms	Discussed? 1 = yes; 0 = no			
3.1k	Other / comments				
4. Data Collection and Analysis					
4.0a	Summary of data collection and analysis process	Provided? 1 = yes; 0 = no			
4.1 Existing Local Policies, Plans and Background Studies					
4.1a	Past plan implementation status	Discussed? 1 = yes; 0 = no			
4.1b	Assessment of past plan implementation effectiveness	Discussed? 1 = yes; 0 = no			
4.1c	Current plans, policies, regulations	Discussed? 1 = yes; 0 = no			
4.1d	Assessment of consistency between plans and ordinances	Discussed? 1 = yes; 0 = no			
4.1e	Background studies / reports	Discussed? 1 = yes; 0 = no			
		Attached? 1 = yes; 0 = no			
4.2 Present Conditions					

4.2a	Present problems/threats identified in the jurisdiction	Provided? 1 = yes; 0 = no			
4.2b	Trends re: development and/or land use change	Discussed? 1 = yes; 0 = no			
4.2c	Trends/problems re: environment	Discussed? 1 = yes; 0 = no			
4.2d	Population trend	0 = not provided, 1 = declining; 2 = stable; 3 = increasing			
4.2e	Existing land uses	Provided? 0 = no; 1 = discussed; 2 = discussed and mapped			
4.2f	Future land uses	Provided? 0 = no; 1 = discussed; 2 = discussed and mapped			
4.2g	Zoning	Provided? 0 = no; 1 = discussed; 2 = discussed and mapped			
4.2h	Build-out capacity	Discussed? 1 = yes; 0 = no			
4.2i	Time to reach build out	Provided? 1-yes; 0 = no			
4.2j	Population to reach build out	Provided? 1-yes; 0 = no			
4.2k	Regional context (relative to jurisdiction type)	Discussed? 1 = yes; 0 = no			
5. INFRASTRUCTURE, FACILITIES AND SERVICES					
5A ASSESSMENT					
5A.1 Existing Infrastructure, Facilities and Services					
5A.1.1Transportation		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried	**Code**	**Pg**	**Comments**
5A.1.1a	Transit (availability of and access to)				
5A.1.1b	Auto / Roadway system quality				
5A.1.1c	Non motorized Transportation (availability of and access to)				
5A.1.1d	Regional, State and Interstate Roads				

5A.1.1 e	Traffic Demand Management	Discussed? 0 = no; 1 = discussed generally; 2 = discussed specifically with respect to the community			
5A.1.2 Drinking water supply		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.2 a	Wellhead protection (if groundwater DW source)				
5A.1.2 b	Sources Identified?				
5A.1.2 c	Stormwater management (quantity / system capacity)				
5A.1.3 Wastewater management		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.4 Solid waste management		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.5 Schools		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.6 Police and fire protection		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.7 Recreational infrastructure and parks		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.7 a	Greenways / green spaces (trails)				
5A.1.7 b	Active recreation facilities (soccer fields)				
5A.1.8 Housing stock (present condition, supply, and future need)		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.9 Community Facilities		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.10 Historic and cultural resources		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.11 Brownfield Properties		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.12 Existing commercial, industrial, retail areas		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5A.1.13 Analysis of potential infrastructure related impacts on					

5A.1.13a	Transportation	Discussed/Analyzed? 0 = no; 1 = discussed generally; 2 = discussed specifically with regard to the community			
5A.1.13b	Water / wastewater	Discussed/Analyzed? 0 = no; 1 = discussed generally; 2 = discussed specifically with regard to the community			
5A.1.13c	Solidwaste	Discussed/Analyzed? 0 = no; 1 = discussed generally; 2 = discussed specifically with regard to the community			
5A.1.13d	Parks / recreation	Discussed/Analyzed? 0 = no; 1 = discussed generally; 2 = discussed specifically with regard to the community			
5A.1.13e	Schools	Discussed/Analyzed? 0 = no; 1 = discussed generally; 2 = discussed specifically with regard to the community			
5A.1.14 Analysis of the connection between population projections and infrastructure related concerns		Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
5A.1.15 Other facilities / services		Discussed/Identified? 0 = no; 1 = yes; 2 = inventoried			
5B. INFRASTRUCTURE: GOALS, OBJECTIVES, AND POLICIES					
5B.1 Goals, Objectives and Policies – Infrastructure: Transportation and Access					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and detailed*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
5B.1a	Transit-oriented development				
5B.1b	Public transportation and concomitant infrastructure (bus centers, park & ride lots, etc.)				
5B.1c	Transportation/Roads				

5B.1d	Employer and/or government-sponsored commute reduction programs				
5B.1e	Traffic management plans to reduce peak period congestion				
5B.1f	Traffic calming techniques implemented in neighborhoods				
5B.1g	Traffic Impact Analysis				
5B.1h	New neighborhood streets that connect to existing stub streets				
5B.1i	Regular performance monitoring of transportation modes				
5B.1j	A variety of transportation options				
5B.1k	Access to parks, trails, open space (including greenways) and infrastructure (including bike racks)				
5B.1l	Walkable communities				
5B.1m	Recreational opportunities within walking/biking distance				
5B.1n	Office, research, industrial, and commercial areas with direct multimodal links to surrounding areas				
5B.1o	Commercial centers provide pedestrian amenities (transit stops, awnings, landscaping, minimal setbacks, etc.)				
5B.1p	Automobile-oriented retail development discouraged				

5B.1q	Improve the connectivity of local transportation systems to regional networks				
5B.2 Goals, Objectives and Polices – Infrastructure: Wastewater, solid waste and other services					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
5B.2a	On-site wastewater conservation, treatment, and/or re-use				
5B.2a b	Conversion from septic/well to public sewer and water				
5B.2c	Pricing mechanisms and/or demand management used to control water use				
5B.2d	Sustainable water resource and waste water management				
5B.2e	Sustainable solid waste management				
5B.2f	Centralized sewage disposal facilities				
5B.2g	Recycle/Reduce/Reuse programs				
5B.2h	Composting programs				
5B.2i	Coordinated infrastructure planning (local, regional and state) Water and Sewer				
5B.2j	Coordinated infrastructure planning (local, regional and state) Schools				
5B.2k	Existing infrastructure upgraded and maintained first				
5B.2l	Infrastructure concurrency				

5B.2m	Investments in new infrastructure that promote smart growth				
5B.2n	Efficient use of land and infrastructure				
5B.2o	Higher density development concentrated in areas with urban services and infrastructure (also infill dev't)				
5B.2p	Growth inducement by expanded infrastructure capacity				
5B.2q	Control growth by controlling infrastructure placement				
5B.2r	Centralized water recreation facilities / accessory structures				
5B.2s	Provision of passive recreational facilities such as parks				
5B.2t	Provision of active recreational facilities				
5.3 Goals, Objectives and Policies – Infrastructure: Housing					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
5B.3a	Variety of housing options (size, density, income levels, design, accessibility, affordability, location, hosuing types)				
5B.3b	Manufactured housing				
5B.3c	Mixed income development				

5B.3d	Housing located near employment centers				
5B.3e	Affordable housing				
5B. 4 Goals, Objectives and Policies – Infrastructure: Neighborhoods, and Local Character					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
5B.4a	High quality of life for residents				
5B.4b	Local character preservation (except historic preservation)				
5B.4c	Historic preservation				
5B.4d	Cultural resources				
5B.4e	Racial equity				
5B.4f	Reclamation of brownfield sites				
5B.4g	Urban revitalization				
5B.4h	Renovation and reuse of existing buildings				
5B.4i	Maintain existing commercial, residential and industrial areas				
5B.4j	Design standards and design review board				
5B.4k	Locally and regionally-appropriate façades, landscaping and site designs,				
5B.4l	Preserve existing rural residential character				
6. ECONOMIC DEVELOPMENT					
6A ASSESSMENT					
6A.1	Primary economic base(s)	Noted? 1 = yes; 0 = no Specified as _____			
6A.2	Economic trend	0 = not provided, 1 = declining; 2 = stable; 3 = increasing			

6A.3	Poverty levels	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.4	Unemployment levels	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.5	Employment analysis by sector	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.6	Retail and market analysis	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.7	Labor Force analysis	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.8	Education analysis	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.9	Infrastructure capacity analysis tied to economic growth projections	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6A.10	Population projections linked to economic projections	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
6B ECONOMIC DEVELOPMENT: GOALS, OBJECTIVES, AND POLICIES					
6B.1 Goals, Objectives and Policies - Conventional Economic Development					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
6B.1a	Inventory of economic assets				
6B.1b	Develop a strategic economic development plan				
6B.1c	Education (Public sector, public and private sector)				
6B.1d	Regional collaboration for economic development				

6B.1e	Collaboration for economic development with Downtown Development Authorities				
6B.1f	Collaboration for economic development with other economic development agencies				
6B.1g	Collaboration for economic development with citizens groups				
6B.1h	Collaboration for economic development with businesses, trade organizations and other groups				
6B.2 Goals, Objectives and Policies - Sustainable Economic Development					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
6B.2a	New investment and reinvestment in already developed areas				
6B.2b	Socially and environmentally responsible business and industry				
6B.2c	Retention of existing businesses				
6B.2d	Collaboration - Tax increment financing				
6B.2e	Collaboration - Brownfield Redevelopment Authorities				
6B.2f	Natural resource protection in conjunction with economic activity				
6B.2g	Regional or multi-jurisdictional collaboration				

6B.2h	Stable employment and revenues				
6B.3 Goals, Objectives and Policies - Emphasis of Economic Development					
No	***Goals, Objectives and Policies***	***Description***	***Code***	***Pg***	***Comments***
6B.3a	Economic development emphasis of goals and policies	0 = limit ED; 1 = accommodate ED; 2 = seek ED			
6B.3b	Infrastructure for ED / growth accommodation	1 = yes; 0 = no			
6B.3c	Promotion of private economic / commercial activities	1 = yes; 0 = no			
6B.3d	Recruitment of industry	1 = yes; 0 = no			
6B.3e	Other/Comment				
7. RESOURCE PROTECTION					
7A ASSESSMENT					
	Assessment Variable	***Description***	***Code***	***Pg***	***Comments***
7A.1	Land cover	Identified? 0 = no; 1 = yes, but not detailed; 2 = yes detailed; 3 = mapped			
7A.2	Land use incompatibilities	Identified? 0 = no; 1 = yes, but not detailed; 2 = yes detailed; 3 = mapped			
7A.3	Population projection linked to natural resources	Provided? 0 = no; 1 = present but not detailed; 2 = present and detailed			
7A.4	**Constraints on development and land related impacts**	Identified? 0 = no; 1 = yes, but not detailed; 2 = yes detailed; 3 = mapped	**Code**	**Pg**	**Comments**
7A.4a	Physical limitations for development				
7A.4b	Manmade hazards and hazardous activities				
7A.4c	Natural hazards				
7A.4d	Floodplains				

7A.4e	Soil Analysis and limitations to development				
7A.4f	Water supply				
7A.4g	Coastal zones				
7A.4h	Steep slopes				
7A.4i	Erosion				
7A.4j	Other physical limitations				
7A.4k	Impacts from impervious surfaces				
7A.4l	Cumulative impacts of development				
7A.4m	Sprawl	Discussed? 0 = no; 1 = discussed generally; 2 = discussed soecifically with respect to the community			
7A.5	**Natural areas**	Identified? 0 = no; 1 = yes, but not detailed; 2 = yes detailed; 3 = mapped	**Code**	**Pg**	**Comments**
7A.5a	Impaired quality watersheds				
7A.5b	High quality waters				
7A.5c	Other waters identified				
7A.5d	Coastal resources and zones				
7A.5e	Fragile natural areas[4]				
7A.5f	High quality natural areas[5]				
7A.5g	Regionally critical or unique natural resources				
7A.6	**Resource production Lands**	Identified? 0 = no; 1 = yes, but not detailed; 2 = yes detailed; 3 = mapped	**Code**	**Pg**	**Comments**
7A.6a	Existing farmland and agricultural areas				
7A.6b	Soil analysis for agricultural areas				
7A.6b	Prime farmland				
7A.6c	Agricultural and vacant land combined in one category				

7A.6d	Agricultural and rural residential combined in one category				
7A.6e	Woodlots/forest production lands[6]				
7A.6f	Mineral/other production lands				
7A.6g	Micro-agriculture lands[7]				
7A.6h	Coastal resource production aquaculture				
7B.1 Goals, Objectives and Polices – Development					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
7B.1a	Growth limited by carrying capacity				
7B.1b	New growth directed to existing urban areas				
7B.1c	Low density outward expansion controlled or limited				
7B.1d	Growth directed away from important resource areas[8]				
7B.1e	Discourage “sprawl”				
7B.1f					
7B.1g	Mapping of conservation zones				
7B.1h	Urban growth boundary				
7B.1i	Public education efforts				
7B.1j	Development tools/incentives for natural resource protection				
7B.1k	Compact development				

7B.1l	Innovative zoning tools to encourage compact and mixed use developments including:				
7B.1m	Areas zoned by building type, not by use				
7B.1n	Planned Unit Development				
7B.1o	Density bonuses[9]				
7B.1p	Mixed use zoning				
7B.1q	Traditional neighborhood ordinance				
7B.1r	Opportunities to retrofit single use buildings to mixed use				
7B.1s	Limits on development because of impacts				
7B.2 Goals and Objectives - Natural Resources					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
7B.2a	Protection of natural areas, and open spaces				
7B.2b	Parks and recreational areas				
7B.2c	Biodiversity				
7B.2d	Important resources identified (ag, forestry, mining, fishing, recreation)				
7B.2e	Important resources	List resources identified _____			
7B.2f	Sustainable use of natural resources				
7B.2g	Preservation of natural resources				
7B.2h	Maintain natural terrain, drainage, and vegetation				

7B.2i	Environmentally-conscious production techniques and materials				
7B.2j	Minimize impact to natural systems				
7B.2k	Connectivity between natural areas				
7B.2l	Wildlife corridors				
7B.2m	Trails connecting parks				
7B.2n	Greenway system				
7B.2o	Night sky safeguards / light pollution controls[10]				
7B.2p	Fee simple property acquisition				
7B.2q	Easement acquisition				
7B.2r	Buffer zones near sensitive/unique natural areas				
7B.2s	Cluster zoning (open space development)				
7B.2t	Conservation planning and design				
7B.2u	Site plan review regulations				
7B.2v	Landscaping standards				
7B.2w	Incentives for native landscaping				
7B.2x	Development standards to encourage contiguous open space				
7B.2y	Environmental overlay districts				
7B.2z	Watershed-based planning				
7B.3 Goals, Objectives and Policies – Resource production					
		Degree of specificity and detail0=not present; 1=present but not	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*

No	*Goals, Objectives and Policies*	*detailed;2=present and*			
7B.3a	Tools to promote sustainable agriculture				
7B.3b	Best Management Practices				
7B.3c	Tools for Ag and open space preservation including:				
7B.3c.1	Purchase of development rights[11] (PDR/PACE)				
7B.3c.2	Transfer of development rights[12]				
7B.3c.3	Exclusive agricultural zoning				
7B.3c.4	Cluster development[13]				
7B.3c.5	Right to farm ordinances[14]				
7B.3c.6	Buffer zones for Ag land[15]				
7B.3c.7	Other incentives for Ag land protection				
7B.4 Goals, Objectives and Policies – Water Quality					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
7B.4a	Water quality/pollution prevention				
7B.4a.1	Surface water protection (including wetlands)				
7B.4a.2	Groundwater protection				
7B.4b	Water quality management tools (non-ag)				
7B.4b.1	Flood plain development restrictions				
7B.4b.2	Acquire wetland permit before other permits[16]				
7B.4b.3	Public acquisition of floodplain lands				

7B.4b.4	Flood management overlay zoning district in place				
7B.4b.5	Development setbacks and vegetative buffers				
7B.4c	On-site storm water management systems				
7B.4c.1	Design criteria for vegetated open channels				
7B.4c.2	Parking lot runoff controls				
7B.4c.3	Parking lot vegetation				
7B.4c.4	Pesticide controls				
7B.4c.5	Fertilizer controls				
7B.4c.6	Controls on new septic installation				
7B.4c.7	Conservative use and proper storage of de-icing agents for roads				
7B.5 Goals, Objectives and Policies - Coastal resources					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
7B.5a	Coastal resource protection				
7B.5a.1	Dune protection overlay zoning districts				
7B.5a.2	Dune management				
7B.5a.3	Coastal wetlands protection				
7B.5a.4	Coastal setbacks				
7B.5a.5	Shoreline protection overlay district				
7B.5a.6	Shoreline erosion BMPs				

7B.5b	Adoption of state dune and wetland protection permit provisions[17]				
7B.5c	Public education on coastal management				
7B.5d	Public access/use restrictions				
7B.5e	Preserve existing vegetation, rocks and berms along shoreline				
7B.5f	Critical coastal habitat protection[18]				
8. Consistency					
8A Vertical Consistency- Interagency coordination					
No	*Goals, Objectives and Policies*	*Degree of specificity and detail0=not present; 1=present but not detailed;2=present and*	*Level of prescriptiveness 0 = Low; 1= Moderate; 2=High*	*Pg*	*Comments*
8A.1	Vertical consistency				
8A.2	Coordination with federal agencies				
8A.3	Coordination with state agencies				
8B Consistency with State-mandated plan components					
	For all plans	0 = not present; 1 = present but not detailed; 2 = present and detailed	*Code*	*Pg*	*Comments*
8B.1	A land use plan and program with land classification and allocation				
8B.2	Recommendations for general location, character, and extent of:				
8B.2.a	Transportation infrastructure (roads, bridges, etc.)				
8B.2.b	Waterways and waterfront development				

8B.2.c	Water quality and quantity infrastructure				
8B.2.d	Public utilities and structures				
8B.3	Recommendations for the redevelopment of blighted areas				
8B.4	Recommendations for implementation				
	For municipal plans, recommendations for:	0 = not present; 1 = present but not detailed; 2 = present and detailed	*Code*	*Pg*	*Comments*
8B.9	Playgrounds and open spaces				
8B.10	Community centers				
8B.11	Neighborhood units				
8B.12	Zoning for building controls (bulk, location, etc.)				
8B.13	Other/Comment				
8C Horizontal Consistency					
No	***Variable description***	***Variable measurement***	***Code***	***Pg***	***Comments***
8C.1	Horizontal consistency (local/regional jurisdictions)	Discussed / analyzed? 1= yes; 0 = no			
8C.2	Discussion of intergovernmental coordination	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8C.3	Neighboring jurisdiction's plans	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8C.4	Other local jurisdictions identified (county to county, locality to locality)	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8C.5	Other local jurisdictions consulted (county to county, locality to locality)	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8D Internal Consistency					

8D.1	Internal consistency (within jurisdiction)	Discussed / analyzed? 1= yes; 0 = no			
8D.2	Discussion of interagency / interdepartmental coordination	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8D.3	Consistency with other plans, policies and ordinances	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8D.4	**Intergoal, policy and objective consistency**				
8D.4a	Consistency between goals, policies and objectives in the plan	Discussed / analyzed? 1 = yes; 0 = no			
8D.4b	Consistency between goals, policies and objectives in the plan - Analyst's assessment	1 = objectives and policies are internally inconsistent 2 = Goals, objectives and policies are not internally inconsistent 3 = Goals, objectives and policies are consistent and mutually supporting			
8D.5	**Spatial Consistency - Land Classification Consistent with Policies / Goals**				
8D.5a	Land classification map	Provided? 1 = yes; 0 = no			
8D.5b	Types of land use classifications	Discussed? 1 = yes; 0 = no			
8D.5c	Discussion of link to land suitability analysis	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8D.5d	Discussion of link to policies	0 = not present; 1 = present but not detailed; 2 = present and detailed			
8D.5e	Discussion of link between constraints and classification map	0 = not present; 1 = present but not detailed; 2 = present and detailed			

8D.5e	Consistency between the map, policies, and analyses Analyst's assessment	1 = Map, analyses and policies are inconsistent 2 = Map, analyses and policies are not inconsistent 3 = Map, analyses and policies are consistent and mutually supporting			
9. Implementation Procedures					
9.1	Timetable for implementation	Provided? 1 = yes; 0 = no			
9.2	Implementation responsibilities	Provided? 1 = yes; 0 = no			
9.3	Implementation mechanisms	Discussed generally? 1 = yes; 0 = no			
9.3a	Land use regulations, subdivision ordinances, and/or zoning	Discussed? 1 = yes; 0 = no			
9.3b	Capital improvement plans (CIPs) and/or facilities plans	Discussed? 1 = yes; 0 = no			
9.3c	Education	Discussed? 1 = yes; 0 = no			
9.3d	Consistency between plan and implementation mechanisms	Discussed? 1 = yes; 0 = no			
9.8	Monitoring / evaluation process	Discussed? 1 = yes; 0 = no			
9.9	Achievement benchmarks	Established? 1 = yes; 0 = no			
9.1	Specific benchmark dates	Established? 1 = yes; 0 = no			
9.11	Updating process / plan	Discussed? 1 = yes; 0 = no			
9.12	Other / comments				

[1] Map quality can be coded based on the following criteria:
Use of color (yes/no and simplicity of coloration)
Readability in black and white
Basic information (scale bar, legend, north arrow)
Scale of map appropriate for information conveyed
Similar maps of consistent scale throughout plan
Does the point of the map come across clearly, or is there so much extraneous information that the reader gets lost?
Do maps use GIS technology, or are they crudely drawn?
Is source information identified?
Context provided (e.g., inset map with location in county/state)
A plan that, in an overall view, meets less than 25% of these criteria should be scored as a 1; 25-75% should be scored as a 2; and greater than 75% should be scored as a 3.

[2] Readability of text refers to the general flow of the plan document. Subjective factors include the type of language used, the intended audience of the plan, technical aspects of the writing, etc.

[3] 'Emphasis of values/goals' is a qualitative field to be completed by the protocol user after reading the entire plan. . Generally, the protocol user should comment on the apparent priority or overall 'slant' of the plan, noting whether goal statements and policy statements generally agree.

[4] Fragile natural areas include wetlands, ground water recharge areas, surface water, steep slopes, erodible soils, floodplains, and woodlands.

[5] High quality natural areas are those areas which may not be directly threatened but that are desirable for conservation and/or protection.

[6] Including Christmas tree farms

[7] Including cherry farming

[8] 'Important resource areas' include productive farmland, fragile and high quality natural areas, etc.

[9] Density bonuses involve granting developers the opportunity to increase building density beyond that which is allowed under existing zoning codes, in exchange for meeting additional requirements. Communities often provide density bonuses to entice developers into providing public amenities such as parks, plazas or structured parking.

[10] Night sky controls seek to limit light pollution, which affects habitat and wildlife

[11] PDR enables communities to permanently preserve farmland by purchasing the rights to develop land without purchasing the land outright. In addition to receiving payment for the PDR, landowners may also be eligible for property tax or income tax benefits.

[12] TDR permanently preserves farmland by compensating landowners in designated areas for voluntarily surrendering their development rights. TDR is distinct from PDR in that it aims to "send" new development to "receiving areas" that can better accommodate growth.

[13] The State of Michigan recently passed legislation requiring local governments to provide developers with the option of using

cluster development zoning (5.7.2o) as an alternative to traditional zoning in order to maximize the amount of open space preserved. To encourage the use of cluster developments, local governments should develop design guidelines for cluster developments.

[14] Michigan Right to Farm Act (Act 93 of 1981): An Act to define certain farm uses, operations, practices, and products; to provide certain disclosures; to provide for circumstances under which a farm shall not be found to be a public or private nuisance; to provide for certain powers and duties for certain state agencies and departments; and to provide for certain remedies for certain persons.

[15] Open space buffers can help reduce residential and agricultural land use conflicts. They should be sufficiently wide to protect the farming operation from lawn fertilizers, playing children, and other conflicts. At the same time, they cannot be so burdensome as to require excessive land commitments from residential property owners.

[16] Wetland permits should be issued before other permits so as to make people aware of their limitations and prevent investment in a project that harms wetlands.

[17] The MI Sand Dune Protection and Management Act allows local officials to take action on non-compliance.

[18] Critical coastal habitat protection includes endangered species protection from pets, off-road vehicles, bonfires, etc., as well as protecting tall structures/perches for birds of prey.

Appendix C: BMPs and Resource Guide

Organization / Resource Type	**Website / Link**
APA Smart Growth Policy Guide	http://www.crcmich.org/PUBLICAT/1990s/1997/rpt323.pdf
National Trust for Historic Preservation - Smart Growth Toolkit	http://www.nationaltrust.org/smartgrowth/
Environmental Protection and Land use Planning - Best Management Practices from Florida	http://www.dca.state.fl.us/fdcp/DCP/publications/springsmanual.pdf
APA Growing Smart Legislative Guidebook	http://www.planning.org/growingsmart/
HUD – Smart Codes for Building Rehabilitation	http://www.huduser.org/publications/destech/smartcodes.html
Smart Codes – Andres Duany	http://www.smartcodecomplete.com/learn/downloads.html
Field Guide to New Urbanism	http://www.realtor.org/libweb.nsf/pages/fg314#topicb
Promoting active communities – Design Guidebook	http://www.mihealthtools.org/Communities/default.asp?tab=about
EPA – Model Ordinance – Open Space Preservation	http://www.epa.gov/owow/nps/ordinance/openspace.htm
EPA – Model Ordinance – Storm water Control	http://www.epa.gov/owow/nps/ordinance/stormwater.htm
EPA – Model Ordinance – Erosion and Sedimentation Control	http://www.epa.gov/owow/nps/ordinance/erosion.htm
EPA – Model Ordinance – Aquatic Buffers	http://www.epa.gov/owow/nps/ordinance/buffers.htm
Model Traditional Neighborhood Design (TND) Ordinances	http://www.co.dane.wi.us/plandev/community/build/tndordinance.asp http://www.wisc.edu/urpl/people/ohm/projects/tndord.pdf http://www.mass.gov/envir/smart_growth_toolkit/bylaws/TND-Bylaw.pdf http://www.dca.state.ga.us/intra_nonpub/Toolkit/ModelOrdinances/TND_ModOrd.pdf

Smart Growth Online – Land Development Ordinances	http://www.smartgrowth.org/library/byldrtype.asp?typ=1
Transit Villages	http://www.transitvillages.org/
Minnesota Planning and Environmental Quality Board – Ordinances for Sustainable Planning	http://www.mnplan.state.mn.us/pdf/2000/eqb/ModelOrdWhole.pdf
Conservation subdivisions – Model Ordinances	http://www.doa.state.wi.us/dhir/documents/conserv_subdiv_Model_ordinance_Feb2001.pdf
Land Preservation Model Ordinances – e.g. farmland Preservation	http://www.cals.ncsu.edu/wq/lpn/modelordinances.htm
Smart Communities Net – Land Development Codes	http://www.smartcommunities.ncat.org/landuse/lucodtoc.shtml
MI Specific Planning Resources	http://www.landpolicy.msu.edu/sgrat/ http://www.landpolicy.msu.edu/summit/presentations/SGRAT_7_min_intro.pdf

CHAPTER 6

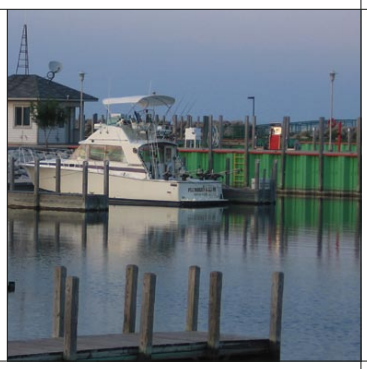
SUSTAINABLE DESIGN ASSESSMENT

6. AMERICAN INSTITUTE OF ARCHITECTS SUSTAINABLE DESIGN ASSESSMENT TEAM REPORT

6.1 INTRODUCTION

With the support of the Integration Team, the Northeast Michigan Council of Governments applied for a Sustainable Design Assessment Team (SDAT) grant. Administered by American Institute of Architects' Center for Communities by Design, this process included an intensive 3-day site visit by a team of multidisciplinary professionals with experience in sustainability principals. The SDAT team provided input on five issues relevant to the future of northeast Michigan: sustainable vision; economic prosperity; sense of place; environmental resources; and land use. Their report served both to underscore the work of the other assessment teams and to frame the focal issue of access and eco/geo-tourism in a larger economic context.

The SDAT report is appended in its entirety in the following pages.



Northeast Michigan SDAT

Envisioning a Sustainable Future for Northeast Michigan

A Sustainable Design Assessment Team Report

Northeast Michigan
October 3–5, 2006

AIA Center for Communities by Design

Northeast Michigan SDAT

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A Sustainable Design Assessment Team Report

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AIA Center for Communities by Design

EXECUTIVE SUMMARY

Northeast Michigan is a region that has fallen from former pinnacles of economic success and sociocultural prosperity. The engines that powered commerce and generated wealth over the past 150 years are in decline and community spirit has begun to wither. Massive international transformations have marginalized a former way of life and, essentially, bypassed this region.

Recognition, however, begets opportunity. Political, social, and intellectual leaders have recognized this transformation and are beginning to ask the hard question, How does Northeast Michigan reinvent itself for the next century?

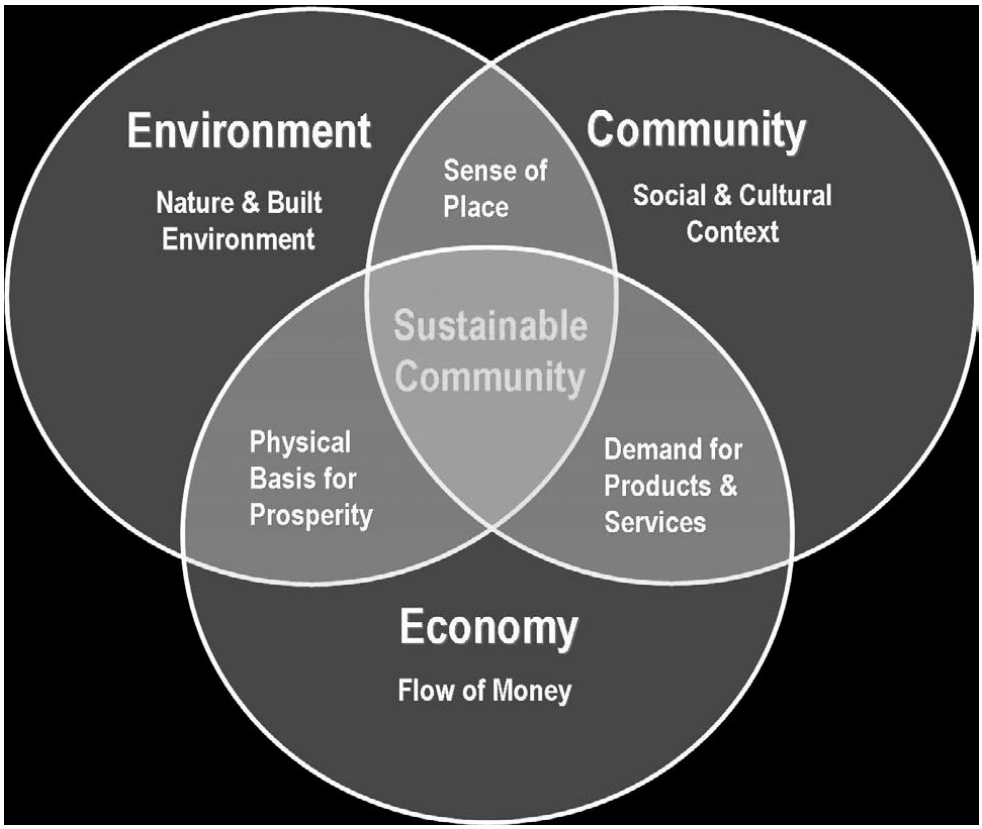
This report is part of an ongoing discussion and study. It presents the process undertaken by a team of professionals invited to work with the community, and it includes an attempt to match quantitative data on the past and present with qualitative perceptions of the present and desires for the future.

The report speaks to five significant elements that hold enormous potential for helping effect a viable future:

- Sustainable vision
- Economic prosperity
- Sense of place
- Environmental resources
- Land use

Overlying all of these elements is a single, primary theme: think regionally. To compete and succeed in the future, Northeast Michigan must think of itself as a coherent entity, composed of many diverse and varied parts but unified in its vision of how it fits into the global society of today and tomorrow.

Following this line of thinking, the region must create a sustainable vision for the future; a vision that can be viable in perpetuity. Such a vision derives from a revised understanding of economic prosperity. True wealth is renewable and rechargeable, and this region has abundant resources to help create such a vision. The primary basis for future wealth and vitality are both the myriad environmental resources available within



the region and the historic, present, and future "sense of place" that can describe one's interventions. Taken together, these elements make it easy to envision a future that balances the natural and built environments into regional harmony and productivity. The means for achieving these goals and for activating the overarching theme of regionalism is a single unified regional land-use plan.

This document presents the five elements and a generalized discussion of how they apply to Northeast Michigan, and how they might be used to help generate a viable and sustainable future for this wonderful and beautiful part of the country. As such, it attempts to tie together the numerous ongoing efforts, both formal and informal, and create a framework for future efforts and activities.

A closing section offers some additional thoughts on how the community can best move forward to address the range of issues and recommendations covered in the report.

INTRODUCTION

In January 2006 Northeast Michigan submitted a proposal to the American Institute of Architects (AIA) for a Sustainable Design Assessment Team (SDAT) to assist the region and its citizens in addressing key issues facing the community. The issues ranged from concerns about the inability of young people to find educational opportunities and jobs to the sense that the region was not properly optimizing its enormous wealth of natural resources and pristine environmental conditions.

The AIA accepted the proposal and, after a preliminary visit by a small group in August, the SDAT members arrived in Alpena, Mich., on October 3, 2006. For three days, the team members, working closely with local officials, community leaders, technical experts, and citizens, studied the community and its concerns. During those three days, the team came to understand the issues and used its expertise to frame a wide range of recommendations, which were presented to the community in a public meeting on October 5, 2006.

This report is a more detailed version of the findings and recommendations that were presented to the community on October 5.

What is the SDAT Program?

The SDAT program is an interdisciplinary community assistance program that focuses on principles of sustainability. Launched in 2005, the program represents an exciting new chapter in the AIA's history of supporting communities with volunteer design expertise.

The SDAT program is modeled on the AIA's R/UDAT (Regional and Urban Design Assistance Team) program. While the R/UDAT program provides communities with specific design solutions, the SDAT program provides broad assessments to help frame

future policies or design solutions in the context of sustainability and helps communities plan the first steps of implementation. The SDAT program is based on an understanding of design as a process that

- Is integrative, holistic, and visual
- Is central to achieving a sustainable relationship among humans, the natural environment, and the place
- Gives three-dimensional form to a culture and a place
- Achieves balance among culture, environment, and economic systems

The SDAT program is grounded in the AIA design assistance team values, which call for a multidisciplinary approach, objectivity of the participating team members, and broad public participation.

Why is the SDAT Program Valuable?

Many communities are immobilized by conflicting agendas, politics, personalities, or even the overabundance of opportunity. Many communities have not yet taken stock of their current practices and policies within a sustainability framework, while others have identified issues of concern but desire assistance in developing a plan of action to increase sustainability. The SDAT process ensures that alternative solutions are given a fair hearing and that options are weighed impartially. The SDAT process

- Informs the community of opportunities and encourages it to take action to protect local and regional resources
- Helps the community understand the structure of the place at various scales and contexts—from regional resources to the neighborhood scale
- Explores and articulates the larger contexts and interactions of ecological, sociological, economic, and physical systems
- Visualizes potential futures
- Recognizes and describes the qualities of a place by preserving the best elements of the past, addressing the needs of the present, and planning for the needs of future generations
- Identifies and describes choices and consequences

- Connects plans and actions
- Advances the principles of quality sustainable communities
- Helps the community define the roles of various stakeholders
- Develops a roadmap for the implementation of more sustainable policies and practices

The key to SDAT success is diversity and participation; the process involves multiple disciplines and multiple stakeholders. The SDAT process includes not only the expert team but also government agencies and officials, private businesses, schools and students, community members, and other parties as appropriate.

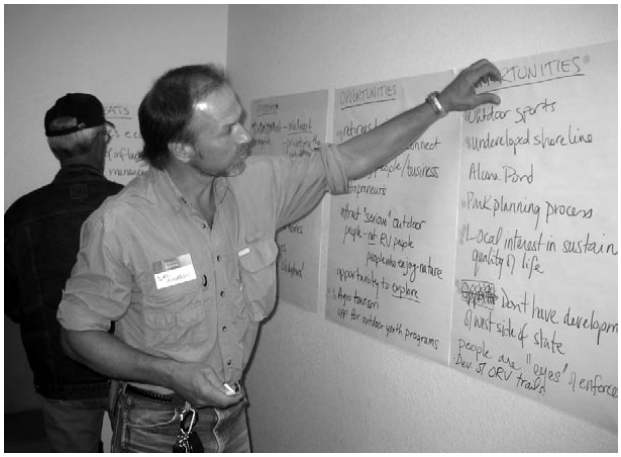
Who are the Key Participants in the SDAT Process?

SDATs bring a team of respected professionals, selected on the basis of their experience with the specific issues facing the community, to work with community decision-makers to help them develop a vision and framework for a sustainable future. Team members volunteer their time to be a member of the SDAT. To ensure their objectivity, they agree to refrain from taking paid work for three years from the date of completion of the SDAT project. A distinct team is assembled for each project based on the project's unique features. The team consists of a leader, five to seven members, and a staff person from the AIA Center for Communities by Design.

The professional stature of the SDAT members, their independence, and the pro bono nature of their work generate community respect and enthusiasm for the SDAT process which, in turn, encourage the participation of community stakeholders. The passion and creativity that are unleashed by a top-notch multidisciplinary team of professionals working collaboratively can produce extraordinary results.

Local Steering Committee

The steering committee is the key organizing group for an SDAT project. It is responsible for assembling local and regional information, organizing the preliminary meeting and SDAT visit, and generating local media coverage during the entire project. After the SDAT visits, the steering committee typically evolves into a group that is dedicated to implementing the SDAT recommendations.



Local Technical Committee

The local technical committee is the technical support group for the SDAT project, including local design professionals, environmental professionals, economists, and others whose skills and experience parallel those of the SDAT members and who bring with them detailed knowledge of local conditions, issues, and information resources. Their presence magnifies the effectiveness of the team.

Citizens

In the end, the citizens of the community are the critical players, both for their insights and observations during the team visit and for their support for the new directions that emerge from the SDAT process.

On behalf of the Northeast Michigan SDAT and the American Institute of Architects, it is hoped this report will be a useful guide to Northeast Michigan as it charts its future for the coming years and for coming generations.

A SUSTAINABLE VISION

Northeast Michigan has phenomenal assets. Its natural and built environment and its strong sense of community and fairness are second to none. Its three coastal communities, Harrisville, Alpena, and Rogers City; the region's working landscape; and the natural resources infrastructure that supports those assets are the basis on which to ensure regional sustainability. Focusing on these and other community assets will build economic prosperity that contributes to the environment and the sense of community will attract visitors who will contribute to the region.

Key Assets and Recommendations

Lake Huron and Thunder Bay

Few regions of the country have such a beautiful and ecologically rich shoreline.

- Character-defining features: The combination of easy access to the water and, with the exception of those locations immediately adjacent to coastal communities, a generally undeveloped shoreline.
- Primary opportunities: New shoreline development outside existing coastal communities and marinas should be minimized, while providing adequate access and information about cultural (history, shipwrecks, and lighthouses) and ecological resources. Commercial and sport fishing, sailing, motor boating, kayaking, canoeing, diving, snorkeling, swimming, beach activities, or simply strolling along the water's edge can all thrive without new coastal development.

Natural Resources

The region's renewable resources (wildlife, wood, water, and wind) and mineral resources (limestone and gypsum) support natural systems and the economy and have the ability to do so indefinitely.

- Character-defining features: Resources of great scenic beauty and ecological value exist that contribute to the economy and sense of place.

- Primary opportunities: Valuable ecological resources and vistas should be preserved, but the focus should be on working landscapes. Development outside existing village centers and hamlets should be minimized and large-scale wind power generation should be developed as the newest working landscape.

Pastoral Landscape

The countryside includes productive farmland which supports the economy and makes the region more attractive for residents and visitors.

- Character-defining features: Productive farmland, scenic beauty, small farms, and agricultural resources are often either sold or processed locally.
- Primary opportunities: Farmland from nonfarming-related development should be preserved and a focus on locally sold and processed agricultural products should be increased.

Coastal Cities and Villages

Coastal cities and villages are special draws for residents and visitors.

- Character-defining features: A unique character exists that is not "Anywhere USA." Strip development, which feels and looks like similar development in every other American community, is still limited. There is a great quality of life and sense of place.
- Primary opportunities: The three primary coastal communities should be enhanced: Alpena as the commercial and medical hub, Rogers City to rebuild some of its downtown vitality, and Harrisville as a village center. Most nonnatural resource jobs should be in these three coastal communities in sustainable niches.

The Sea Grant publication, *Northeast Michigan Integrated Assessment: Connecting Great Lakes Coastal Access, Tourism, and Economic Development*, asks

> How can coastal access be designed, in a regional context, for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

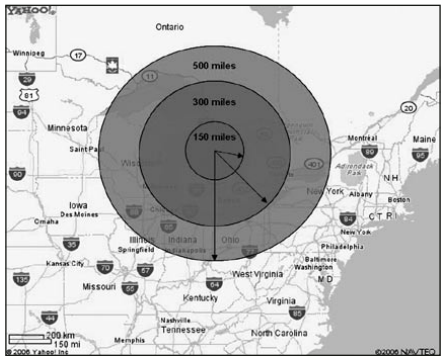
We suggest rephrasing and broadening the question:

> How can great communities be designed, in a regional context, for sustainable economic development while maintaining the integrity of natural and cultural resources and quality of life?

Sustainable economic development and the creation of great communities enhances the natural and cultural environment and community. This then attracts visitors and their money. A focus on coastal access and tourism, however, creates conflict over limited coastal and inland resources. Regions that focus solely on tourism face a false choice of tourist-based economic development vs. preservation of a sense of place and a way of life.

ECONOMIC PROSPERITY

Northeast Michigan's economy has many strengths that will serve it well in the future. The natural resources upon which many jobs are based and upon which the region gets its sense of identity will, if husbanded carefully, be available indefinitely. The incredible lake shore environment, if not overdeveloped or threatened, will continue to make the region a draw for those interested in the outdoors, the quality of life, active vacations, and retirement. The coastal communities are exciting and unique communities.



The distance from major markets, interstate highways, and major airports all limit Northeast Michigan's attraction for many kinds of industry (e.g., weekend tourism, perishable items, distribution centers, and high-volume manufacturing centers). Millions of people, however, live within a 24-hour drive, making the region well suited for certain industries (e.g., value-added agriculture, tourism focused on visitors staying for a week or longer, and retirement living).

Nevertheless the economy is clearly the weakest link in the region's sustainability. Young people are voting with their feet and leaving, and the demographic profile is one of a rapidly aging community. Unemployment rates are lower than in many rural communities but median salaries are slightly higher. Both metrics, however, are significantly worse than the national average.

Key Recommendations

Given the small size of the economy, small projects and economic changes can make a huge difference in the direction of Northeast Michigan.

Develop a Shared Regional Expectation of the Future

These efforts should build on the current *Sea Grant Northeast Michigan Integrated Assessment* as well as ongoing comprehensive planning in Alpena and elsewhere.

- Seek Michigan Department of Environmental Quality coastal zone management funding to examine economic development opportunities compatible with good coastal zone management practices.
- Hold an honest and realistic regional conversation about what the regional economy needs and address the tough issues. For example, given current trends, can the region accommodate a shrinking population of people under the age of 65 and in those areas inland from the coast?

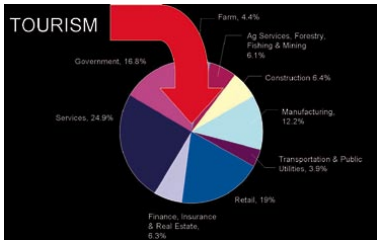
Develop Local Programs to Build the Economy

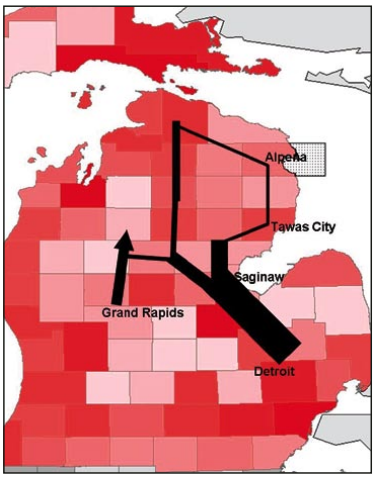
Most job creation in the region will be from businesses, people, and investors who are already in the region, not from outside interests, so the focus should be on those people.

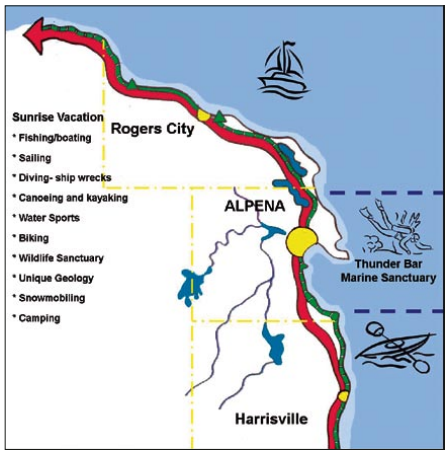
- Create a joint business-calling program. Existing staff at economic development agencies, university extension services, regional planning, and municipal governments should coordinate a business-calling program to ask every major employer and representative of every employment sector what they need to stay in business and expand.
- Develop local financial and information resources. Work with economic development staff, local banks, community development corporations, investors, and Alpena Community College to share information on financing, tax incentives, available property, and training resources. Encourage future entrepreneurs and train them to create and implement a business plan.
- Improve broadband Internet offerings in all three coastal communities.

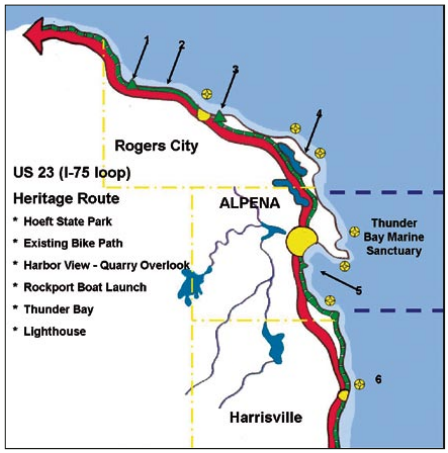
View Tourism as One Part of the Economic Mix

- Expand the amount of business coming to existing year-round businesses. Otherwise, tourism will create low-paying, seasonal jobs that may go to outsiders, produce more vehicular traffic, potentially harm the area's quality of life, and possibly create new competition for existing local businesses.
- Recognize that visitors who spend their money in restaurants and hotels and on entertainment in the three coastal communities provide new income streams to support local businesses and a way of life; new coastal development away from the community core can be harmful.
- Focus tourist efforts on those who are already driving on Interstate 75 (i.e., Heritage Loop) and might want a more scenic trip and on those who might come for a full-week vacation trip centered on the three coastal communities and the National Marine Sanctuary ("sunrise vacation").









Identify Economic Niches

- Retain those dollars the community is losing. All jobs are not the same. All economic niches are not the same. A dollar spent at the farmers market, for example, stays in the community and will be spent repeatedly. A dollar spent at Wal*Mart or on the Internet leaves the community.
- Emphasize local sales to help farmers earn more money and add to regional sustainability. The agricultural sector is critical to the region's sense of place and supports its economy.
- Attract and retain retirees, and their money and community building, in existing coastal communities. Avoid sprawl and the construction of new retirement developments in order to build a sense of community.
- Harness wind resources as a sustainable industry. Industry that builds on regional natural, mineral, and agricultural resources and access to transportation on the lake are sustainable and consistent with the historic employment pattern.
- Place a greater emphasis on processing locally grown, harvested, and extracted materials that can build the economy and job market.
- Create medical-related jobs to retain the majority of health care dollars within the local economy and make the community attractive for retirees and others.

Focus New Development on the Downtown Coastal Areas

- Build a community to which visitors, retirees, and investors will flock. Build Anywhere USA and there is nothing to offer. No strip development anywhere has the character that Harrisville, Alpena, and Rogers City have already. Tourist infrastructure should not be new infrastructure; it's the places where everyone wants to visit and spend money.

Thunder Bay National Marine Sanctuary should be developed as a magnet to draw visitors. It provides a unique experience, built around the Great Lakes marine heritage and shipwrecks that does not exist anywhere else in the Great Lakes. The visitors center's status as a LEED-gold green building, adds to the environmental theme of the site. The sanctuary has the potential to become the single focal point of tourism in the entire Northeast Michigan region. With proper wayfinding, the cooperation of the sanctuary, and adjacent development, the sanctuary and the Fletcher Street papermills redevelopment can entice visitors to stay longer and explore other sustainable activities such as kayaking, canoeing, bicycling, hiking, and exploring downtown Alpena.

Alpena can best capitalize on its historic downtown, the National Marine Sanctuary, and Thunder Bay. This is the place to which retirees, visitors, and new residents who want a full range of city services, cultural resources, and a rich history will flock.

Harrisville can best capitalize on its identity as a strong lakefront village center. A visitor starting a road bicycle trip, a kayak trip, or a lighthouse tour might want to stay in a Harrisville bed and breakfast, rent equipment from a local store, and eat in a local restaurant. No new business is likely to be created but existing businesses and a home with a bed and breakfast would have an economic gain.

Rogers City can best capitalize on its identity as a small lakefront community. A visitor kayaking or bicycling might want to stay in an existing hotel or a new bed and breakfast and spend money downtown. Existing businesses could rent bicycles and kayaks and sell food. Downtown Rogers City can certainly grow to accommodate more businesses within its downtown or simply focus on more business. The center is well suited for visitors who want to stay longer and retire in town.

FLETCHER STREET BREWING COMPANY, ALPENA:
A MODEL OF SUSTAINABLE DEVELOPMENT

Sustainable development builds existing urban centers and community resources and contributes to a sense of place and community. The development of the former Fletcher Street papermills in the heart of historic downtown Alpena, near Lake Huron, into a brew pub will make a stronger, healthier community and support the rest of downtown.

Fletcher Street Brewing Company could never have been as interesting nor would it have contributed to downtown if had been developed outside a city or town center.

The brew pub is part of a larger sustainable development project developed by Alpena Marc LLC. The larger project started with the Thunder Bay Marine Sanctuary headquarters and visitors center and will eventually include housing, retail, and service. This project will make Alpena and Northeast Michigan a stronger region. The same project located outside of downtown (as is the model with most national park and national forest visitor centers and some marine sanctuaries) could have robbed downtown of its vitality.

In addition to the federal sanctuary investment, an investment of public money, for needed infrastructure and recreation improvements and brownfields cleanup, is leveraging a huge private investment in the overall project. In addition to providing a key downtown investment, the project will get a brownfield site with some hazardous waste releases cleaned up and back into productive use and will create recreation and trail opportunities.

Every dollar spent and every job generated from the project will spin off more dollars and jobs throughout the region than almost any alternative investment. Investing in downtown and bringing new jobs, money, and visitors to the existing urban center is by far the most cost-effective and sustainable development model. The project is also an example of how one person, in this case the Alpena Marc's CEO, Jeff Konczak, can profitably help make Northeast Michigan sustainable.

SENSE OF PLACE

Many elements come together to create a "sense of place" for residents and visitors for any particular place. Beyond the natural landscape and environmental features, there are a variety of built elements influencing the sense of place, including the network of public spaces such as parks, sidewalks, waterfronts, and public buildings, as well as the story of a place embodied in historical architecture. Relationships people experience with a place further enrich the sense of place. Those relationships can be defined by scale, safety, and ease of navigation.

Northeast Michigan has already begun to develop the opportunities of the unique Lake Huron shoreline and Thunder Bay features. Continuing the development of the public infrastructure can enhance those natural features that already exist. Gathering places, whether they are parks, plazas, or local libraries, bring the community together fostering pride and a richer identity. These spaces encourage community members to engage in their built environment, to use available resources, and, coincidentally, they can aid to establish important people/space relationships. Cities, villages, and townships have a unique opportunity to assist the development of these important built assets.

Existing vibrant public spaces include

- City and township parks
- Thunder Bay Marine Sanctuary
- Farmers market
- Marinas

On the other hand, existing connections to waterways and the lakefront are underused spaces or opportunities.

Alpena, Rogers City, and Harrisville are three unique urban centers along the Northeast Michigan lakeshore. They provide physical gateways for residents and visitors to engage with the community. They also possess the majority of the architectural resources in the area, which establish a sense of history and collective experience. These elements assist in creating an identity. Community members should strive to make design and planning choices that continually reinforce and develop their unique identity. As noted earlier in this report, none of these urban centers is Anywhere USA.

The quality of unique retail already found in the region should be supported and variety should be encouraged. Organizations such as a merchant's association can foster positive growth through development of a shared vision. Design guidelines for downtown urban zones can also set a course for positive growth and the development of good design, which reinforces the identity of a place. "Big box" development should be carefully evaluated to reduce the perception of living in or visiting Anywhere USA. Such "boxes" and chair retailers have a role to play within the regional economy but they should not be allowed to dominate or to diminish the role of traditional indigenous stores and shops.

Signage at the major routes into a community can create a physical gateway welcoming visitors and reinforcing identity to residents. It can immediately identify special characteristics of a place through graphic presentation. What do visitors see when they enter any of these urban centers? Are they welcomed? What are the subliminal cues they receive about the identity of this place and do they tell a positive story? Design does matter.

Gateways need not just be signage, however. More metaphorically, gateways are conduits to connect people to the community. For instance the Thunder Bay National Marine Sanctuary is a gateway, drawing visitors in to see this national landmark. The sanctuary already is encouraged to serve as a gateway location for other visitor services as well. Communities are being challenged to look introspectively to understand where visitors go in their communities and where they spend their money in a community. Where are opportunities for new visitor gateways?

Also, it is important to realize that "visitors" may include those who are traveling from a smaller rural area, 50 miles or fewer, or those who are truly tourists traveling as part of a multiple-day excursion. Each of these types of visitors may have different needs. If communities first focus on enhancing their spaces for residents and local visitors, their unique, authentic identity will be magnified. Tourism can be a secondary outcome which can continue to be fostered.

Improving traffic relationships can enhance public spaces. Safe routes should be provided for bikes and skateboards as well as pedestrians and vehicles. The Michigan Department of Transportation (MDOT) has developed many programs to assist communities tackle their traffic problems along state routes. MDOT can be used as a resource and catalyst for changing existing traffic patterns.

Protecting the existing historic assets in a community preserves the embodied history that creates a unique place. The built environment tells the story of a community. It can generate community pride and identity as well as tourism. Opportunities to establish a local historic district should be evaluated. Both national and state registration opportunities may exist allowing the advantage of national and state tax credits and grants.

The AIA Center for Communities by Design has developed a set of 10 principles for design to enrich a community's sense of place:

Design on a Human Scale

Compact, pedestrian-friendly communities allow residents to walk to shops, services, cultural resources, and jobs and can reduce traffic congestion and benefit people's health.

Provide Choices

People want variety in housing, shopping, recreation, transportation, and employment. Variety creates lively neighborhoods and accommodates residents in different stages of their lives.

Encourage Mixed-Use Development

Integrating different land uses and varied building types creates vibrant, pedestrian-friendly, and diverse communities.

Preserve Urban Centers

Restoring, revitalizing, and infilling urban centers takes advantage of existing streets, services, and buildings and avoids the need for new infrastructure. This helps to curb sprawl and promote stability for city neighborhoods.

Vary Transportation Options

Giving people the option of walking, biking, and using public transit, in addition to driving, reduces traffic congestion, protects the environment, and encourages physical activity.

Build Vibrant Public Spaces

Citizens need welcoming, well-defined public places to stimulate face-to-face interaction, collectively celebrate and mourn, encourage civic participation, admire public art, and gather for public events.

Create a Neighborhood Identity

A sense of place gives neighborhoods a unique character, enhances the walking environment, and creates pride in the community.

Protect Environmental Resources

A well-designed balance of nature and development preserves natural systems, protects waterways from pollution, reduces air pollution, and protects property values.

Conserve Landscapes

Open space, farms, and wildlife habitat are essential for environmental, recreational, and cultural reasons.

Recognize that Design Matters

Design excellence is the foundation of successful and healthy communities.

ENVIRONMENTAL RESOURCES

Environmental resources is an all-encompassing term that focuses on the health, abundance, and connectivity of an area's land productivity and environmental conditions. For the coastal lake regions of Northeast Michigan, it will be important to focus on several key priorities:

- Renewable energy
- Energy conservation
- Sustainable agriculture

The three-county region of the study area is fortunate to have 157 miles of lake frontage, 964 miles of rivers and streams, and more than 200,000 acres of farmland (as reported in 1997 studies). The study area also has many challenges: polluted air and water from industry, a sagging economy, aging farmers, and perceived and real disconnection to national markets.

Renewable Energy

Wind

Michigan is ranked 14th in the United States by the U.S. Environmental Protection Agency for potential for wind energy production. The study area in Northeast Michigan has a great ability to take advantage of this potential due to relatively flat topography and exposed coastal and offshore areas. Tapping into these resources can increase the economic activity and increase energy independence of the region.

Wind energy production in the United States is still in its infancy; therefore, businesses have many choices for where to invest. Businesses are investing in areas that have known resources and that will not have a legal or political battle to confront. Two actions items that can increase the potential of business investment:

- Apply to the Michigan Anemometer Loan Program (MALP). The MALP is a 12-month program to further establish state wind data and promote wind power generation.[1] Program staff installs equipment, monitors conditions, and reports findings of wind conditions for an area. The program is looking for applications in Northeast Michigan, the only region in Michigan not participating in the program thus far.

1 Michigan Anemometer Loan Program, *http://web1.msue.msu.edu/wind/*.

- Create a wind energy overlay district. A wind energy overlay district identifies specific areas within an agricultural district best situated for the development of wind energy facilities. This will ensure that investors will be able to launch a wind project in the area without redistricting or rezoning procedures.

Solar

Michigan receives 89 percent of the solar radiation per year that Florida receives. This is enough to meet 30–70 percent of the average residential space heating and hot water needs.[2] Diversifying community energy resources not only can save money in operational costs but can increase monies coming into a region through state and federal incentive and grant programs.

- Collaborate with the Hillman Mill Project. Take advantage of the region's existing demonstration facilities to learn about local solar potential. The Hillman Mill Project is a project of Northern Innovative Communities, a grassroots organization dedicated to assisting the people of northern Michigan in creating economically viable, socially equitable, and ecologically sound projects that foster sustainable communities.[3] The project includes a state grant funded 10-kilowatt photovoltaic demonstration array. Combining this with the Great Lakes Maritime Heritage Center, which is on track to become a gold-certified LEED building, could be part of a green building/renewable energy tour.[4]
- Take advantage of state and federal incentives and grants. Create a relationship with the Michigan Energy Office so that your communities may take advantage of its incentive programs. For example, homeowners can claim up to $2,000 for installing a solar electric or solar hot water system and public and nonprofit organizations can apply for Community Energy Project Grants for a variety of small demonstrations (up to $6,000) and also larger photovoltaic electric demonstrations (up to $50,000).

2 National Renewable Energy Laboratory, *http://rredc.nrel.gov/solar/pubs/redbook/*.

3 Hillman Mill Project, *www.northcountrypride.org/gristmill/*.

4 Great Lakes Maritime Heritage Center, *http://thunderbay.noaa.gov/welcome.html*.

Energy Conservation

Communities that embrace energy conservation increase economic security, environmental value, and quality of life while maintaining similar ends. Individuals and organizations that are direct consumers of energy want to conserve energy in order to reduce energy costs and promote environmental values. Industrial and commercial users also want to increase efficiency and maximize profit. Clearly, energy conservation increases a community's capacity for sustainable living.

One of the most effective ways communities can increase energy conservation, and also one of the most simplest, is by upgrading insulation, windows, and doors. This not only increases the energy efficiency of homes and businesses; it also increases property values. Federal incentives for consumers and/or homebuilders can help to achieve upgrades while adding an income stream to the local economy.

- Take advantage of state and federal incentives and grants. The Michigan Department of Labor and Economic Growth's Energy Office sponsors the Energy Star Home Grant Program to promote the construction of Energy Star-rated homes in Michigan. Licensed residential homebuilders can apply for up to $8,000 to help construct and market an Energy Star-rated home. The grant period will run from March 1 through December 30, 2007.
- Organize publicity of residential tax credits. Existing homes are eligible for a series of efficiency measures. Taxpayers can take a percentage credit of material costs up to $200 for windows and storm windows, $500 for doors and storm doors, $500 for insulation or roofs, and $300 for highly efficient heating, cooling, and water heating equipment.

Many of these improvements are already being done in the community, but not everyone is taking advantage of these financial incentives. As stated earlier in the report, small changes can make large impacts to the study area communities.

Sustainable Agriculture

It is also essential to recognize the positive environmental impacts and services performed by small scale and sustainable agriculture, including protecting biodiversity and wildlife habitat, cleansing and purifying water, and providing open space and improving the quality of life. Northeast Michigan grows little of its own food and is

almost wholly dependent on food imported from elsewhere. A short growing season and winter conditions are perceived as fundamental limitations to food self-sufficiency. Thus, existing area agriculture is currently commodity-based and export-oriented, always dependent on markets outside the area or region.

Continuing to focus on commodity production or on just one or two crops appears unlikely to achieve the goal of sustained economic vitality for area farmers and processors. Commodity production, however, can be an effective part of a complete sustainable agricultural portfolio. Suggested actions to be taken include

- Examining holes in the current commodity production and supply chains. Identify where products need intermediate processing, sorting, and/or cleaning. Are there economies of scale that can be reached by creating cooperatives? Examples of cooperatives include grain elevators, fuel depots (alternative or otherwise), distribution networks, small-scale food processing, and quick-freeze or drying operations.
- Diversifying agriculture components. Diversification into niche enterprises will benefit local producers and processors. Consider a suite of agricultural enterprises to provide the breadth and resilience needed for sustainability. A key constraint for most producers is lack of inclination or skill in processing and marketing. An additional constraint is the limited market represented by the 50,000 inhabitants of the three-county region; demand for novel products may be saturated by a limited community.

To address these constraints while capitalizing on the strengths of Northeast Michigan agriculture, it is recommended that the region

- Capture, establish, and support new market demand for Michigan products by increasing exposure and accessibility through the growing “buy local” movement.
- Ensure a value-chain approach that rewards primary producers and processors. For example, co-ops and individual producers/processors ensure value-added benefits make their way back to the producer and processor more effectively.

- Focus on local, branded products such as Sunrise Coast logo cheese, raspberry jam, and grass-fed beef. Expand these products and encourage connections with other distributors to increase market reach.
- Think outside the box. Examine nontraditional value-added products using commodity excess, e.g., potatoes into potato chips. Better yet, combine local heritage with food entrepreneurs, e.g., potatoes to Thunder Bay Vodka.

Expanding Local Markets

Ultimately the most efficient way to feed people is to feed them with local ingredients. This saves fuel costs and other distribution costs. Local markets mean support for local agriculturalists and farmland is preserved because it is being used. However, the most important reason to capture a local market is to create deep relationships between those who eat food and the people and place their food comes from. Options for the region include

- Using state or regional organizations to help facilitate the process and reduce the complications for producers/processors to get their products into the marketplace. For example, Michigan Food and Farming Systems has a Marketline service, a free Web site linking farmers seeking to add or expand marketing opportunities to food buyers. Chefs, produce managers, processors, dieticians, caterers, school food service directors, and others find Marketline to be an easy way to source local, fresh foods.
- Helping to kick start institutional purchasing by setting up a meeting with institutional buyers such as the regional medical center, large restaurants, and school districts and local farmers. Successful projects around the state have started by just getting these people into the same room. A little Michigan wine and cheese often helps!

Keeping Farmers Young

Younger farmers are attracted to boutique farming using sustainable methods and farms that use direct marketing to local consumers. This reemergence of farmer connection in the community can provide a measure of food security and encourage personal interaction at farmers markets and agricultural fairs. A concerted effort could be made to attract young farmers to lease or buy local farmland and receive mentoring from long-time farmers. Michigan State University is becoming an organic farming leader by training many emerging farmers through its successful 48-week Community Supported Agriculture (CSA) program, proving that (similarly shown in the Renewable Energy: Solar section) Michigan gets a significant amount of solar gain that can be effectively harnessed.

It is recommended that the region

- Organize CSA groups to share the risk and the harvest. CSAs are subscription farms where members pay in advance for a weekly share of a farm's fresh produce.
- Recruit, train, and mentor young farmers. This includes actively connecting young farmers with those on their way to retirement.

An Argument for Regional Land-Use Planning

Based on the previous discussions for the potential for economic development and growth in the region, it is apparent that the landscape and character of the region is one of the most important characteristics that make it a special and marketable "place." To hold onto this sense of place, the region needs to act as a whole with constant goals and policies. A regional land-use plan could be a powerful tool toward this end and would be a significant step toward preserving and enhancing the unique character of Northeast Michigan.

Benefits of a Regional Land-Use Plan

- It would create a coordinated development plan for the region across all municipalities
- It would create coordinated zoning and land use ordinances for municipalities that have limited resources to create their own plans and enable them to stay ahead of development pressures
- It would create coordinated utility and service plans so that municipalities could maximize their resources budgets
- It would create a legal basis for fighting sprawl and unwanted development that take away from the character of the region

When observing a cross-section of the region, certain specific natural features and land types become apparent. Flood plains, agricultural lands, and low-lying areas are along the coast, and there are centers of development. This pattern is directly connected to the environmental and cultural framework of the region. For example, farms exist on rich soils with low property value and development occurs adjacent to good vehicular

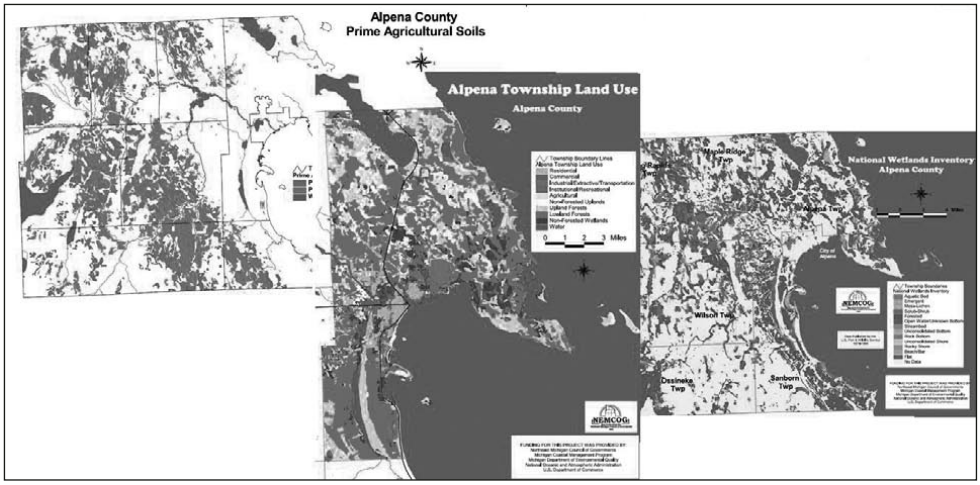
access and scenic amenities such as the lake. To preserve and enhance this character and to limit unwanted development in the future, a regional land-use plan should consider the following goals:

- Focus development in cities and villages to reduce suburban sprawl
- Keep working landscapes productive
- Preserve and enhance coastal access and views for all visitors and residents
- Manage inland natural areas for habitat and environmental resource protection

Creating a Regional Land-Use Plan

The first task in developing a regional land-use plan may be to define what the region is. There are certain policies that would be beneficial to all communities along the Sunrise Corridor of U.S. 23. On the other hand, working with too large of an area could make it difficult to gain consensus. In general, communities with similar physical features and economic interests and communities that depend on cooperation with one another would be candidates for inclusion in the plan.

The second, and perhaps most crucial, step would be to develop an inclusive process by gathering input and feedback from all stakeholders, major property owners, and municipalities and creating an action team made up of representatives from each major municipality.

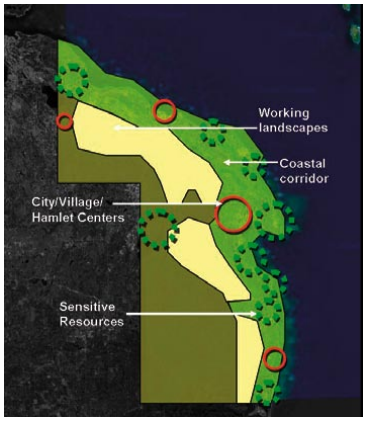


The third step would be to analyze the data that exist related to natural resources, prime agricultural lands, land ownership, development patterns, and vehicular access. These data will be the benchmark for a discussion about the region's values for future development and character.

Finally, through this process, create a series of land use types and associated policies that can be adopted by each municipality to form a cohesive land-use plan for the region. Depending on support for the effort, the range of policies can vary to meet the interests of the stakeholders. On one end, the shared policies could be broad and more along the lines of consensus goals and guidelines. On the other end, the shared policies could be in the form of a shared zoning code that has legally binding requirements to shape development and land use. In relatively rural areas such as Northeast Michigan, a shared set of policies and perhaps shared regulatory body could take much of the administrative burden off over-taxed municipalities.

A Sample Regional Land-Use Plan

To help illustrate and frame the discussion of what a regional land-use plan might look like, the following plan has been created to represent a series of possible land-use types and the policies that could be implemented with each to ensure their sustainability in the future. The pattern of land use shown on the map is a simplified representation of a possible regional land-use plan. In other words, this is one way to break down the region at the most general level.



Working Landscapes

(may include prime farm lands and forested areas)

Potential concepts:

- Require low-density development with limited services
- Divest public-owned lands that do not contribute to natural resource protection and/or recreational opportunities
- Maintain private ownership in farmsteads
- Encourage managed forestry production

Coastal Corridor

(may include areas adjacent to the U.S. 23 corridor)

Potential concepts:

- Require low-density development with restrictions on percentage of development frontage
- Provide limited public services
- Require visual impact mitigation
- Preserve views to the lake

City/Village/Hamlet Centers

Potential concepts:

- Encourage compact, mixed-use development
- Provide a high level of public services and amenities
- Provide a mix of housing types
- Develop as nodes along U.S. 23 corridor

Sensitive Resources

(includes wetlands, habitat corridors, and stream corridors)

Potential concepts:

- Provide regionally attractive recreation opportunities
- Restrict future residential and commercial development
- Encourage public acquisition
- Encourage stewardship of privately owned lands

Other Items to Consider

The U.S. 23 Sunrise Side Coastal Highway Management Plan

The recommendations brought forward with the Sunrise Side plan are a great start to help produce a more coherent regional identity. Some of the recommendations the SDAT thought should be given priority are

- A coherent signage and wayfinding plan from I-75 as well as on the U.S. 23 corridor
- A series of visual impact mitigation guidelines for private and public lands
- The nonmotorized activities such as a bike plan that would extend the user groups to the corridor

The team also thought there is the opportunity to think about the corridor as a way to extend infrastructure to the region, especially high-tech infrastructure such as fiber optics.

State Land Management

In the short format of the SDAT, it was not possible to establish specific recommendations for the publicly owned lands in the region. However, the team has the following recommendations on how to approach their evaluation:

- Focus resources based on actual need by determining what areas need what facilities for specific user groups
- Manage land to specific user groups locally and regionally and create a plan to respond to future growth while managing today's actual needs
- Manage lands to protect resources based on sensitivity

MOVING FORWARD

The discussions presented here and the ideas and potentials they generate represent a framework for addressing the future of the Northeast Michigan region. Not every idea suggested in this document is fully applicable to the region, nor is it anticipated that each and every recommendation will be applied as described.

The keys to the rejuvenation of Northeast Michigan are found in the five broad categories, and are already embodied in the central element upon which this SDAT report is grounded: think regionally.

Northeast Michigan is a region whose fundamental economic and social foundations have been shaken. The economy that helped this area thrive over the past 150 years has disappeared. The social and cultural vitality that attended this prosperity is withering. The challenge before the communities is to work together; to build upon existing resources; to carefully assess available strengths and contrast them with the demands of a new regional, national, and international market; and to devise a coherent program for matching strengths to demands in a renewable fashion.

Sustainable Vision

Is there a vision for the region as a whole that can not only reverse current declines but provide the basis for renewed and renewable vitality, moving forward, in perpetuity?

Economic Prosperity

Can the region move away from the extractive economies of the past century to a more balanced and renewable source of income that not only builds up on existing assets but, at the same time, replenishes these assets, even as they help create wealth?

Sense of Place

Is there a way of accentuating the existing natural and built features of the region, thereby further highlighting the uniqueness of Northeast Michigan in distinct contrast to many other regions in the country that are similarly trying to address macroeconomic and sociocultural transitions?

Environmental Resources

The history of Northeast Michigan describes society's attempt to gain access to indigenous environmental wealth, primarily through extraction and processing of these resources. Can a program be established that similarly uses these resources to create wealth while, at the same time, replenishing and nourishing the very resources themselves?

Land Use

Can the communities of Northeast Michigan think regionally, not simply at the conceptual level, but at the detailed level of creating formal policies and programs for addressing future growth and change in a way that streamlines administrative issues, unifies an overarching strategy, and creates a distinct and achievable vision of the future?

The answers to all five of these generalized questions are clearly in the affirmative. In the past decades, Northeast Michigan began to enter a period of significant decline. Working together, this decline can be stopped and reversed. A variation of the prosperity that blessed this region in the past can be formulated and achieved. This short document represents one small piece of this effort at regional rejuvenation. As such it discusses a generalized future in terms of these five key elements, sketching out options and ideas for achieving a viable future for the region. The discussion of each element in this document includes a wide variety of recommendations and potential future actions. In some combination, these actions and programs represent an achievable long-term vision for success. The challenge, going forward into the future, is to determine the appropriate combination of efforts and to work collaboratively and collectively toward implementing the programs and activities essential to not only reversing current declines but to lead Northeast Michigan back to prominence and sustainable vitality.

Appendix: SWOT Analysis

The Northeast Michigan SDAT led participants through a structured analysis of the region's strengths, weaknesses, opportunities, and threats (SWOT). A SWOT analysis is a technique for collecting qualitative information about current conditions and future potentials associated with a defined situation. The technique originated in organizational management associated with businesses and corporations but has been successfully applied to a wide variety of situations.

The SDAT met with community representatives in Rogers City, Alpena, and Harrisville. Each meeting adhered to the same format and each included a structured SWOT exercise. At the end of the SWOT discussions, participants were asked to review all of the strengths, weaknesses, opportunities, and threats that had been listed. The lists often ran to more than 20 distinct items per category. Each participant was then asked to highlight two items in each category that he or she thought were the most important issues with respect to the overall situation in northeastern Michigan. In this way, the SDAT was able to not only see the full range of issues and concerns, but also was able to hone in on those issues that are seen by the local constituents as the most important.

The results of the three SWOT workshops were combined and are summarized below.

Strengths

Strengths are those elements and attributes of the current situation that make it successful or viable or which have the latent potential to do so.

Community

- Quality of life (4)
- History (3)
- Heritage/culture (2)
- No traffic (1)

- Safety/lack of people (1)
- Sense of community (1)
- Walkable community (1)
- Lack of regulation (1)
- Skate parks (2)
- Community college (1)
- Airport (1)

Other significant items that were nominated by more than one person but were not ranked as most important:

- Schools (2)
- Library (2)
- Northern Lights Arena (2)

Environment

- Clean water, air, rivers, and lake (14)
- Woods, forests, and water (11)
- Natural resources (12)
- Beauty of nature (6)
- Public waterfront (1)
- Recreational opportunities (6)
- Marine sanctuary (1)
- Scuba diving (1)

Items that were nominated by more than one person but that were not ranked:

- Boating (3)
- Fishing (2)

Economy

- Agriculture (3)

Weaknesses

Weaknesses are those attributes or characteristics of the current situation that take away from its viability or otherwise hamper the overall success of the region.

Community

- Not a destination (2)
- "Penned in"–too many people (2)
- Declining school population (2)
- No technical infrastructure–Internet and cable (2)
- Infrastructure (1)
- Resistance (fear) of change (5)
- Negativity (2)
- Lack of public awareness of strengths and uses (1)
- Lack of higher education opportunities (3)
- Night life is lacking or limited (2)
- Limited cultural opportunities (1)

Environment

- Tuberculosis in deer herd/quarantine (4)
- Enforcement of (alleged) park abuses (2)

Economy

- Lack of family-supporting jobs, especially for young people (8)
- Underdeveloped tourist destination (7)
- Lafarge and other industries on the shore (5)
- Underemployment (5)
- Fishery decline (4)
- Lack of opportunities for young people (3)
- Lack of jobs (2)

- Low income/wages (2)
- Decline in corporate involvement (1)
- Need medical service/community (1)

The discussion of weaknesses is dominated by the real and perceived problems with the local economy and, by extension, its impacts on the local community life. One element of this discussion highlights the fact that even within the region there are clear distinctions among the different communities. Many attendees at one of the workshops felt quite strongly that one of the problems with the current situation is that there are too many people, tourists and residents, and that the region is losing its distinctly rural feeling.

Opportunities

Opportunities are those elements or potentials within the region that are currently underdeveloped but which, if tapped, present the capacity for future success.

Community

- Development of tourist attractions (5)
- Local interest in sustaining quality of life (4)
- NOAA and sanctuary (3)
- Maritime heritage (2)
- Cruise ship (2)
- Year-round tourism development (not just for summer) (2)
- Equal development of east and west sides (2)
- People are the “eyes” of enforcement (1)
- Senior-related services and housing (1)
- Entrepreneurial spirit (1)
- Amusement, i.e., water park (1)
- Bike path at Squaw Bay (1)
- Tourism outreach (1)

Environment

- Outdoor sports (11)
- Eco-tourism (4)
- Undeveloped shoreline (3)
- Attract "serious" outdoor people, not RV people (2)
- Opportunities to explore (1)
- State park planning process (1)
- More use of public lands (1)

Economy

- Value added agricultural products (5)
- Agro-tourism (4)
- Retirees bring skills and experience, connect with young people/business entrepreneurs (3)
- Industry based on regional resources (3)
- Brochures for marketing (graphics project) (2)
- Develop state lands; work with local government (2)
- Affordable housing to fill (2)
- Using deep water ports (1)

Opportunities can be found almost equally within all three of the primary categories. The community can build upon its new and existing cultural resources, as well as upon the myriad natural resources that dominate the region. The economy can be diversified to build up on its existing agricultural heritage as well as other regional resources.

Threats

Threats are those elements or potentials impacting the current situation which can, if not addressed, hinder the ability to move forward successfully or lead to the worsening of the current situation.

Community

- Lack of regional cooperation (6)
- Drug/alcohol problems among young people (6)
- Lack of political clout (3)
- Not being selective with development (2)
- Complacency (2)
- Changes in retail that don't support downtown (1)
- TV, video, computers, and Internet (1)
- Declining school enrollment (declining population) (1)

Environment

- Invasive species (4)
- Lake levels/quality (1)

Economy

- Michigan economy (10)
- Misdevelopment (Wal*Mart, privatizing the waterfront) (9)
- Lack of influence and input in land management (8)
- Lack of government funding (6)
- Corporations/big business (6)
- Fuel prices (3)

Threats are attributed primarily to exogenous economic factors, the state's economy, and the nature of large-scale national development, as well as to the continuing deterioration of the community's social fabric. This category reveals an underlying sentiment that some of the current situation may be beyond the control of the local inhabitants.

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CHAPTER 7

POLICY ACTIONS AND IMPLEMENTATION GUIDANCE

7. POLICY ACTIONS AND IMPLEMENTATION GUIDANCE

Brandon Schroeder, Michigan Sea Grant
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7. 1 INTRODUCTION

An integrated assessment (IA) brings together policy makers, scientists, and key stakeholders to address a common issue of concern through collaboration and a formal analysis process. An IA is an approach to synthesizing and delivering relevant, independent scientific input to decision making through a comprehensive analysis of existing natural and social scientific information in the context of a policy or management question (Michigan Sea Grant [MSG], 2005). The goal of an IA is to link existing natural and social scientific knowledge about a problem with policy options in order to help decision makers evaluate possible actions.

The Northeast Michigan Integrated Assessment (NEMIA) - the first IA led by MSG – was conducted for the three-county region of Presque Isle, Alpena, and Alcona Counties in Northeast Michigan. This coastal area in along Lake Huron includes rich natural and cultural resources. Historically, the region has depended on its natural resources and accessibility to the Great Lakes for economic development. However, in recent years, as the traditional economic base (lumbering, mining, manufacturing, agriculture, hunting, and fishing) has declined, community leaders have turned to tourism to boost the economy by promoting the natural and cultural resources unique to the area, especially those associated with the coast. Despite the potential for economic development, the communities located here wish to proceed cautiously to avoid overdevelopment and destruction of the area's unique resources. These resources represent not only a growth opportunity but also a quality of life for local citizens (Northeast Michigan Integrated Assessment [NEMIA], 2005). A desire to strike a balance between these two interests is reflected in this IA's key policy question, as developed by the NEMIA stakeholders:

> How can coastal access be designed, in a regional context for sustainable tourism that stimulates economic development while maintaining the integrity of natural and cultural resources and quality of life?

After working with stakeholders to identify the policy or question to be addressed by the IA, assessment teams were built to conduct value-independent descriptions of the status and trends of environmental, social, and economic conditions related to the question, as well as consider the causes and consequences of those conditions. (For more information on the NEMIA process, see Chapter 1.)

The primary objective of NEMIA is to use the analyses conducted by the assessment teams (socioeconomic, ecological, cultural, and planning and zoning) to draft and evaluate policy options related to sustainable tourism and economic development that can be implemented by the appropriate decision-makers in the region. These policy options were referred to in the NEMIA process as "potential actions."

7.1.1 Development of Potential Actions

The development of the potential actions began at the October 2006 meeting, where the following terms, drawn from the guiding policy question, were defined by members of the workgroup: coastal access, regional context, sustainable tourism, economic development, integrity of natural and cultural resources, and quality of life.

Subsequently, the Integration Team (Schroeder, Read, Powell) qualitatively grouped these definitions into policy theme areas. The team used workgroup meeting summaries and related documents, produced through other Northeast Michigan area initiatives that have influenced the NEMIA process, to record the number of times that the definitions of the terms and actions related to those definitions appeared in the targeted documents. The following documents were used:

- NEMIA Meeting Summaries from September 23, 2005, February 9, 2006, June 8, 2006, and August 24, 2006;
- *Huron Greenways: A System of Land and Water Trails* – Northeast Michigan Council of Governments, 1999;
- *US-23 Sunrise Side Coastal Highway Management Plan* – Northeast Michigan Council of Governments, 2003;
- *Sustainable Design Assessment Team: Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis* – American Institute of Architects, October 5, 2006; and
- *Sustainable Design Assessment Team (SDAT) Report: Envisioning a Future for Northeast Michigan* – American Institute of Architects, October 5, 2006

The definitions that appeared most frequently and were therefore of greatest interest to the NEMIA workgroup were further grouped into overarching policy theme areas. The following five themes resulted:

- Natural, Cultural, and Maritime Heritage Resources Tourism;
- Preserving Sense of Place and Community Character;
- Government Coordination and Communication;
- Growing an Entrepreneurial Community and Attracting Business Interests; and
- Incorporation of Modern Technologies.

Potential actions were then developed for each policy theme area. These actions reflected workgroup comments and concerns expressed at the NEMIA meetings as well as relevant actions identified in related regional documents. Using these methods, the Integration Team identified 35 potential actions.

7.1.2 Prioritized Themes and Potential Actions

At a workgroup meeting on January 23, 2007 the Integration Team used the instant display, audience polling technology, Turning Point®, to have the workgroup prioritize the five theme areas using paired comparisons. The top three theme areas were *Preserving Sense of Place and Community Character* (which was chosen over the other four options 65 percent of the time), *Natural, Cultural, and Maritime Heritage Resources Tourism***,** and *Growing an Entrepreneurial Community and Attracting Business Interests***,** which were each selected before the other four themes 55 percent of the time.

Additionally, the workgroup rated each of the 35 potential actions under the five themes according to their relative importance and relative achievability on a scale of 1 to 8, with 1 being not at all important and unachievable and 8 being very important and achievable.

The Integration Team decided to provide implementation advice for the top scoring potential actions, defined as those that scored 6 or higher on both importance and achievability. There were six potential actions that fit this criteria (See Figure 7.1). Interestingly, none of the actions in the *Growing an Entrepreneurial Community and Attracting Business Interests* theme scored in the top six. In addition, although the workgroup did not place the theme of *Incorporating Modern Technologies* as high as *Growing an Entrepreneurial Community and Attracting Business Interests*, one of the actions within that area scored high on importance and achievability.

Figure 7.1. Prioritized Themes and Potential Actions

Preserving a Sense of Place and Community Character

- Increase public awareness of regional resources through education and outreach campaigns (6/6)

Natural/Cultural/Maritime Heritage and Resources Tourism

- Balance the tourism portfolio by maintaining traditional tourism opportunities and connecting natural resources, cultural resources, and maritime heritage (6/6)
- Market NE MI as a maritime heritage and nature-based tourism destination (6/6)
- Capitalize on the presence of the Marine Sanctuary to build complimentary enterprises (6/6)
- Utilize TBNMS as a gateway visitor center for regional opportunities (6/6)

Incorporating Modern Technologies

- Increase visibility of the area's resources to non-residents by marketing regional tourism opportunities via the web, providing itineraries for various types of tourism (drive-thru, vacation destination, second or retirement home) (7/6)

In this chapter, the Integration Team provides implementation guidance for meeting the six potential actions (hereafter called objectives) prioritized by the stakeholders. It should be clarified up front that it was not the job of the authors to judge or critique the selected actions; rather we were tasked with providing implementation guidance for the actions *as chosen by the stakeholders*. In developing the guidance for meeting these objectives, we drew from a number of resources including scientific literature, products developed by the technical assessment teams, and case studies, to identify best practices used in other places to meet the objectives.

At the final workgroup meeting on May 10, 2007, the Integration Team provided the workgroup an overview of the selected best practices for comment, question, and refinement. The result of the research, input from that meeting, and subsequent peer review is incorporated into this chapter.

7.2 GUIDING CONCEPT: GEOTOURISM

The results of the theme prioritization exercise show that the primary concern of the workgroup is to have successful coastal tourism while protecting sense of place and community character. The concept of geotourism, and the way in which it has been developed and applied, appears to address much of this concern. As such, the implementation advice provided in this chapter is guided by the concept of geotourism.

7.2.1 What is geotourism?

Geotourism is sustainable tourism taken to the next level. Sustainable tourism holds as the primary principle: "First, do no harm" (National Geographic Center for Sustainable Destinations [NGCSD], 2007). Sustainable tourism conserves natural and cultural resources and provides a quality experience for fewer visitors rather than multitudes. The approach anticipates and plans for demands on a destination to avoid degradation of natural and cultural resources through overuse.

Geotourism builds on sustainable tourism through recognition that a locale's uniqueness is based on its history, culture, natural resources, and other unique features. These all combine to define a unique sense of place. The locale is attractive because it is unique and it sustains residents; it provides them economic opportunities, activities, and amenities that enhance their lifestyle. This also makes it an attractive place to visit. Residents who are not directly engaged in tourism-related industry nevertheless recognize the industry's value because geotourism encourages tourism businesses to hire, secure services, and shop/supply locally. This improves the local economy and multiplies the economic impact of external visitors.

According to the NGCSD (2007), geotourism involves community members in developing and promoting the authentic experience that represents the region. Education among community members – in order that they can, in turn, teach visitors – and tourists is a critically important aspect of geotourism. As such, geotourism provides mutual benefits for visiting tourists *and* community residents. Residents have opportunities to discover and learn about their community, contributing to their quality of life and pride in community. Tourists gain an authentic cultural tourism experience, learning and interacting with residents who are informed and engaged in promoting their region. Geotourism focuses on retaining the integrity of the region through educational activities focused both on tourists and residents, an emphasis on resource conservation, and respect for local culture and traditions.

Additionally, geotourism strategies are designed to appeal to "quality" tourists rather than "quantity" tourists. This strategy promotes economic growth by seeking visitors who stay longer or invest in repeat visits, resulting in more money spent per visitor. Reducing the number of visitors overall promotes sustainability because lower visitor traffic ensures resident quality of

life and that cultural/natural resources are not negatively affected. Having fewer visitors also provides an opportunity to better educate those that arrive, contributing to their positive visitor experience. (National Oceanic and Atmospheric Administration Thunder Bay National Marine Sanctuary [TBNMS], 2006).

Sense of Place

Having a strong sense of place is key to the geotourism concept and experience. A simple definition of sense of place is "the collection of meanings, beliefs, symbols, values, and feelings that individuals or groups associate with a particular locality" (Williams & Stewart, 1998). However, sense of place is a complex concept that is difficult to capture in a single definition. For the purposes of this project, it is most useful to consider what components contribute to developing a sense of place rather than defining the term precisely. An individual's sense of place about a location is a combination of the place's environmental features and the interactions an individual has had with significant others there (Shamai & Ilatov, 2004; Eisenhauer et al., 2000). In the case of this project, sense of place plays two roles: it is something felt by the residents of each locale, *and* it is a characteristic of each locale that makes it attractive to visitors from outside the region – either as an attraction by itself or as an integral piece of the complete visitor experience. The common theme is an emphasis on people's tendency to form strong emotional bonds with places.

The Visitor Experience

Geotourism has, at its root, the goal of creating a visitor experience so memorable that the visitor leaves changed in some way and talks about the experience with his/her friends. Word-of-mouth advertising is free, credible, effective, and powerful (Hanlan & Kelly, 2005; Pritchard, 2003; Morais et al., 2004). (It is wise to be very careful, however, as negative word-of-mouth can be very difficult to overcome, for all the same reasons.) The goal of geotourism is to provide a complete and authentic experience for the visitor that connects him/her to the locale through cultural/historical/archaeological, natural, recreational, and/or scenic resources which together sum to a holistic experience. An integral part of the experience is the service that goes along with the resource – interpretation, food services, accommodations, and other supporting infrastructure. However, the visitor experience also includes interaction with people and businesses that are not directly connected to the tourism industry. The visitor's experience is heightened by encountering residents who understand and have pride in their community's natural and cultural assets. It is the residents' knowledge and pride of place that leads the visitor to feel they "know" the people and the place, that they had an authentic experience (NGCSD, 2007).

7.2.2 Applying Geotourism to Northeast Michigan

Conceptually, the goals and principles of geotourism fit nicely with the themes and potential actions prioritized by the NEMIA workgroup, but how can tourism and economic development partners put these principles into action on the ground?

A tourism strategy based on the concepts of geotourism would involve the actions listed in Figure 7.2 below, with the involvement of community members critical throughout the process.

Figure 7.2. How to apply geotourism.

(1) Identify the region's cultural and natural resources and assets
(2) Protect the resources
(3) Identify the stories that tie the resources together
(4) Market the region as a tourist destination through these stories
(5) Enhance the tourist experience

(Clark & Gray, 2006)

The implementation advice in this chapter utilized tools and information generated by the technical assessments and best practices identified in other regions to put these steps in action in Northeast Michigan.

7.3 EXISTING EFFORTS IN THE NEMIA STUDY AREA

There is already significant work being done in Northeast Michigan that aligns with the goals of geotourism. Three significant regionally-developed initiatives that inventory, describe, and market the coastal resources of this region include (1) The *Huron Greenways* study, (2) the designation of US-23 from Standish to Mackinaw City as a State of Michigan Recreational Heritage Route, and (3) the development of the *Lights of Northern Lake Huron* driving tour.

7.3.1 Huron Greenways

The *Huron Greenways* study (Northeast Michigan Council of Governments [NEMCOG], 1999) provides an inventory and mapping foundation for collecting and describing coastal assets. This community-driven process identified coastal, land-based features, access points, and trails (e.g., biking or hiking trails) in Cheboygan, Presque Isle, Alpena, and Alcona Counties. Conducted by the Northeast Michigan Council of Governments (NEMCOG), the study resulted in a database that catalogued data related to these features and assets, generated regional and county maps, and the development of a website that maintains information and maps for the public.[1] Several recommendations resulting from this study address the protection of existing resources and the involvement of the community in the process of planning and resource management.

7.3.2 US-23 Heritage Route

With regional leadership by the Sunrise Side Travel Association, the US-23 Heritage Route was designated through the Michigan Department of Transportation as a recreational byway in 2004. The US-23 Heritage Route, known as the Sunrise Side Coastal Highway, includes nearly 200 miles of the coastal US-23 corridor running from Standish (south) to Mackinaw City (north). The designation provides a structure and process for regional cooperation and development of tourism opportunities along the US-23 corridor. Heritage Route planning and coordination occurs on two scales: county-level planning and project development in each of the six participating counties, and regional coordination among counties via the management team.

[1] *Huron Greenways* study website: http://www.nemcog.org/greenways/greenways.html

The *US-23 Sunrise Side Coastal Highway Management Plan* (NEMCOG, 2003), a requirement for designation as a Heritage Route, reflects a regional planning process to identify and describe significant recreational, natural or ecological, cultural, and historical assets along US-23. The management plan identifies a suite of strategic priorities and actions related to tourism development along the route. It sets strategic goals and objectives for the region, identifying projects and priorities for marketing and promotion, transportation and tourism enhancement, and environmental and beautification. Among these are a significant number of actions that directly relate to community enhancement and engagement, and resource protection. These recommendations identify opportunities for preserving and enhancing Northeast Michigan's sense of place.

7.3.3 Lights of Northern Lake Huron

The region also recently invested in the *Lights of Northern Lake Huron*, a regional maritime heritage-based driving tour intended to enhance cultural tourism. The tour links coastal cultural and historical artifacts through the story of Lake Huron's storm of 1913 and Captain James B. Watts and his ship, the *Durston,* which survived this storm by sheltering along the northern Lake Huron coastline. This initiative focused on developing a tourism product that promotes Northeast Michigan as a maritime heritage tourism destination. This regionally-developed project included leadership from Michigan Department of History, Arts, and Libraries (MDHAL), the NOAA Thunder Bay National Marine Sanctuary (Marine Sanctuary), and regional tourism leaders, including the Sunrise Side Travel Association, Alpena Convention and Visitor's Bureau, and others (Sandra Clark, personal communication, September 7, 2005).

The purpose of the *Lights of Northern Lake Huron* driving tour was to establish a story that connected multiple historical or heritage assets across the region, enhancing the visitor experience and fostering cooperative tourism marketing connections among coastal communities. This also allows the region to focus on and market specific tourist attractions in the context of the region's history and heritage. The process resulted in web-based maps and marketing products delivered through the Travel Michigan (the State of Michigan's official tourism agency) website. [2] This lighthouse-themed tour is the first of several regional tours to be completed (Sandra Clark, personal communication, September 7, 2005).

These three efforts are examples of existing, regionally-coordinated planning and development efforts that promote coastal access and tourism. These initiatives identify important regional resources and provide stories and related information that both educate residents and provide interpretative material that could support the development of local, coastal-dependent businesses. Northeast Michigan stakeholders should work cooperatively to use these existing platforms to expand opportunities to advance geotourism in the region.

7.4 CHAPTER OVERVIEW

[2] Lights of Northern Lake Huron driving tour website: http://www.michigan.org/travel/drivingtours/detail.asp?cid=951AACA5-53F0-491B-ADAB-FC4A3558FAAA&m=9;4

What follows is implementation guidance for meeting the six objectives prioritized by the workgroup, organized by theme. Drawing from peer-reviewed literature, products developed by the technical assessment teams, and case studies, the Integration Team identifies best practices used in other, similar locations and opportunities to build on existing efforts such as those outlined above.

Throughout the chapter, four case study locations are referenced. These locations – Blackstone Valley, MA/RI; Olympic Peninsula, WA; Queensland, Australia; and Lake Erie Coastal Ohio – all have tourism industries that exhibit the aspects of geotourism outlined above to some degree. These common themes made them excellent choices from which to select applicable best practices with the potential to profoundly shape the already exciting activities underway in the NEMIA study area. More detailed information can be found about these locations, their tourism industries, geographical and historical context, and similarities and differences to the Northeast Michigan study area in Appendix A.

7.5 THEME: PRESERVING SENSE OF PLACE AND COMMUNITY CHARACTER

The NEMIA workgroup identified *Preserving Sense of Place and Community Character* as one of the three priority themes to focus on while pursuing sustainable costal tourism and economic development.

7.5.1 Introduction

As described in section 7.2.1, sense of place plays two roles in Northeast Michigan: it is both felt by the residents of a locale, *and* it is a characteristic of the area that makes it attractive to visitors – either as an attraction by itself or as an integral piece of the complete visitor experience.

The Integration Team broadly organized activities geared towards fostering a sense of place in Northeast Michigan into two categories: internal and external marketing. Internal marketing activities mainly target local residents and are more closely aligned with sense of place as a *feeling toward a location.* This is because in order to promote geotourism the region needs residents with a strong and clearly defined sense of place, who display knowledge about their regional resources, and enjoy a good quality of life. In order to be effective "internal ambassadors," residents need to be aware of the unique natural and cultural features of their region. Further, they need to develop emotional attachments to these places by learning about them and developing memories involving them through direct experience (Tuan, 1977).

External marketing activities target tourists, and therefore focus more heavily on the *characteristics of a location.* This is because tourists are ephemeral, and the region needs to develop and promote the unique, authentic, and memorable cultural and natural resources of the region to which visitors can become emotionally attached during brief trips to the region. These emotional attachments will make them want to return year after year and convey their experiences to others by word of mouth.

Internal and external marketing activities are mutually supportive. Internal marketing efforts to increase public awareness of regional resources will enhance the quality of life for residents and develop their sense of place, which in turn supports external marketing. For example, a resident may learn about, and become fascinated by, Northeast Michigan's karst topography because she took part in a tour of local geological features. When a tourist at a gas station asks her advice on local attractions, she can contribute to external marketing efforts by conveying her knowledge and interest in karst features to an outsider. The result of the geology tour, which was intended to be an internal marketing activity, is not only enhanced quality of life for the resident who has developed a new interest in local geology, but is also a more personal, authentic visitor experience for the tourist, which contributes to the tourist's sense of place of Northeast Michigan. Conversely, marketing efforts aimed at tourists – such as interpretive signage at heritage site or a pamphlet highlighting popular birding hotspots – will inevitably reach locals as well and may stimulate residents' interests in their communities. .

The remainder of this section provides implementation guidance for using internal marketing to define and preserve Northeast Michigan's sense of place and community character in the context of coastal access, tourism, and economic development. Activities to develop sense of place among tourists – outsiders to the region – fall under external marketing and are discussed in Section 7.6.

7.5.2 Tools from the NEMIA Assessment Teams

Identifying the assets that are unique to Northeast Michigan are important first steps in prioritizing the resources and characteristics to preserve, as well as the stories and experiences that communities can market internally and externally. This integrated assessment determined that Northeast Michigan is rich in coastal cultural and natural resources and that there is interest in developing these resources for tourism and other economic opportunities. In addition, the process has identified and engaged many of the key local, state, and federal partners and programs that can support development of a shared understanding of the past and a shared vision for the future.

The Ecological Assessment Team identified and organized GIS layers representing the natural features in the area and then surveyed both the workgroup and a group of research ecologists, asking them to prioritize the layers according to their value (see Chapter 3). Similarly, the Cultural Assessment Team inventoried, described, and charted (e.g. underwater shipwrecks) cultural resources (see Chapter 4).

These tools can be used by decision-makers and community leaders in mapping, identifying, and prioritizing potential protection, restoration, or research projects. They can also be used to consider strategic interpretation, wayfinding, development needs and opportunities. For example, if a significant distance gap exists between two well-known assets or areas, these tools can be used to identify areas where signage might direct a traveler from one point to the other; or they might help identify a lesser-known asset or feature that could serve as a point of interest for a visitor moving between two well-known points.

7.5.3 Identifying Sense of Place

Before developing internal or marketing strategies based on the region's sense of place, it is important to invest in exploring and understanding sense of place in Northeast Michigan.

Northeast Michigan already works to enhance awareness of community resources and involvement in developing the region's sense of place. Presque Isle County leaders hosted "be a tourist in your own town" community bus tours, and held brown bag lunches with guest speakers to enhance community learning and sharing. In addition, community members have participated in exchange programs, such as with Ireland, to bring back lessons learned from other areas facing similar challenges.

Exercises Exploring Sense of Place - Presque Isle County

In the summer of 2005, Michigan State University Extension (MSUE) in Presque Isle County initiated an intensive sense of place project that included 28 participants. The group was selected for diversity —youth, seniors, newly arrived, born in the area, farmers, businesses, and local officials. The participants first identified their own perceptions of what is unique and special about the region, discovering that although their individual senses of place were different, there was a common theme that linked them together regardless of where they lived in the county. The group designed and participated in a bus tour in October 2005 to highlight specific places they associated with their sense of place. Group members were then given cameras to photo-document their special places, resulting in over 1500 photos. These photos were developed into an exhibit which traveled around the county sharing 99 selected photos and associated stories. Each picture tells a story, relaying what is special about the place where the photographer lives (Dave Glenn, personal communication, April 20, 2007).

This type of county-wide project can be duplicated in other Northeast Michigan counties as a method of capturing, describing, and sharing the community's perspective of its own sense of place. In addition to identifying regional assets that may not yet have been considered, these interviews, discussions, and photographs can provide content for developing community tours, and interpretive and educational products.

Residents as Tourists - Blackstone Valley, Rhode Island

In 2007 the Blackstone Valley Tourism Council (BVTC) participated in a Rhode Island Tourism Division program called Tour Rhode Island: There's No Place Like Home. The program developed bus tours for Rhode Island residents, with the purpose of building an understanding of and appreciation for Rhode Island attractions both to enhance residents' lives in general but also to provide them with information and experience to draw upon when visitors in their homes and communities are searching for activities. Rather than send visitors to out-of-state attractions, the assumption is that residents will direct visitors to in-state activities with which they are familiar. These tours provide additional support to the tourism industry by informing non-industry residents about the goals of the tourism industry, thus building support among the people visitors will encounter and helping to enhance the visitor experience. There were three Blackstone Valley tours in this series that highlighted the narrative upon which the BVTC is building geotourism

efforts – the Valley's history (settlement through the industrial revolution), agricultural, and natural heritage (Rhode Island Tourism Division, 2007).[3]

In addition to participating with state-wide sense of place activities, the BVTC developed its own presentation highlighting the areas they believe to be the most attractive areas. They present the material at community meetings to sell the idea of how special the Valley is and all the ways people can experience it. The goal is to create an understanding about the purpose of tourism activities and therefore reduce resentment that could surface among an uninformed public (Robert Billington, personal communication, April 23, 2007).

The Blackstone Valley case study provides a model for Northeast Michigan in developing education and outreach programs that engage community members in identifying sense of place and teaching them about (and taking them to) the many unique natural, historical, and cultural features, assets, and attributes of their region.

Monitoring Sense of Place – City of Calgary, Alberta

Monitoring Northeast Michigan's sense of place is an important consideration, particularly given the desire to preserve it. It would be valuable to develop an ongoing evaluation or survey instrument to monitor sense of place. In addition to asking questions that provide a meaningful description of the regional sense of place, the instrument could also determine how strong it is and whether it has changed/is changing as a result of actions. This tool can be used periodically to identify the characteristics that define the region's sense of place, and should seek to measure the level of attachment to these characteristics of the community, region, and state (Samai, 1991).

The City of Calgary has developed a Sense of Community Index as part of its innovative Sense of Community Project. The project's goals are to develop a reliable method of measuring sense of community, determine how strong the sense of community is, and understand how the city can help sustain and enhance the levels of sense of community that exist (City of Calgary, 2007). The Sense of Community Index asks telephone respondents how much they agree/disagree with 18 statements, such as:

- When I travel I am proud to tell others where I live;
- I like living in this city;
- There is a strong sense of community in Calgary;
- I feel very much like I belong in Calgary;
- It would take a lot for me to move from this city; and
- I help out by volunteering in Calgary (City of Calgary, 2007)

Northeast Michigan could use the Calgary Sense of Community Index as a model to develop a sense of place index that would allow decision-makers to gather baseline information about the region's sense of place, incorporating this information into decision-making process, and then as a tool to monitor how sense of place changes in response to various projects and initiatives.

[3] For a complete list of all of the tours available through the Tour Rhode Island: There's No Place Like Home program, see http://www.visitrhodeisland.com/tourri/tourri.aspx

7.5.4 Preserving Sense of Place through Planning, Design, and Community Development

Developing coastal access that balances resource protection, retention of the community's quality of life and sense of place, and generates tourism and economic development benefits must be thoughtfully considered and incorporated into broader regional planning, and community design, and development initiatives.

The *Sustainable Design Assessment Team (SDAT) Report* (American Institute of Architects [AIA], 2006) provides suggestions for considering the coastal focus of the NEMIA process within the context of broader regional planning, design, and development. Most importantly, the *SDAT Report* notes the importance of development that benefits the community first and foremost, and protects the assets and resources that define the community character.

The *SDAT Report* provides several recommendations directly related to preserving community sense of place. It suggests that Northeast Michigan communities should "first focus on enhancing their spaces for residents" because "tourism can be a secondary outcome which can continue to be fostered." The report points out improvements that strengthen community vitality and sense of place will also enhance the experience for visitors to the region, reminding the region that tourism should only be considered as "one slice of economic development pie." It cautions Northeast Michigan decision-makers to not to focus too much on tourism. Coastal development work should be considered primarily through a "quality of life for residents" lens; seeking first to enhance local access, information, and opportunities for residents or as a means of recruiting new folks to live and work in region. Coastal access, as a component of a high quality of life, does have important marketing implications for economic development. For example, coastal access can be presented as an asset for attracting and retaining an excellent labor force to the area (AIA, 2006).

Figure 7.3. Sense of Place principles relevant to the NEMIA region.

1) Design on a human scale;
2) Provide choices for housing, shopping, recreation, employment etc.;
3) Encourage mixed-use development;
4) Preserve urban centers;
5) Vary transportation options;
6) Build vibrant public spaces;
7) Create a neighborhood identity;
8) Protect environmental resources;
9) Conserve landscapes (Lake Huron, pastoral, coastal cities); and
10) Recognize that design matters.

From the *SDAT Report* (AIA, 2006):

Additionally, the *SDAT Report* recommends managing lands for specific uses at the local and regional level, and developing a regional plan that responds to future growth while managing today's needs. The report notes that "connections to waterways and lakefront are underused spaces or opportunities." At the same time, it also indicates that new infrastructure development along the shoreline outside of existing coastal communities and marinas is unnecessary and should be minimized, and that the region should instead focus on providing adequate access, information, and wayfinding related to existing cultural and ecological resources. Finally, the *SDAT Report* recommends that Northeast Michigan focus any new development on downtown coastal areas: "build a community to which visitors, retirees, and investors will flock – NOT Anywhere, USA." Alpena, Rogers City, and Harrisville are three unique urban centers along the Northeast Michigan lakeshore; these should be utilized as physical gateways to engage residents and visitors (AIA, 2006).

Additional planning tools to help the community preserve sense of place and quality of life were generated by the Planning and Zoning Assessment Team, who provided an overview of planning efforts in the region and forecasted potential impacts of planning and zoning decisions. The team provided buildout scenarios based on current planning and zoning for the region that provided both a picture of the region at total buildout and what it might look like in ten years based on the rapid growth experienced in northwest Michigan. These buildout scenarios were then evaluated for potential environmental impacts, e.g., habitat fragmentation and wetland loss. The buildout scenarios enhance the community's understanding of how current planning efforts could potentially impact the region's valuable natural resources. The planning and zoning team also provided buildout scenarios under an alternative zoning regime that reduced rural density and clustered development in urban areas in order to demonstrate that there are still good options for protecting resources. (See Chapter 5 for more on the buildout scenarios.) These buildout scenarios are not intended to serve as recommendations for a specific planning or zoning scenario. Rather these tools demonstrate the value of using GIS tools to forecast potential buildout scenarios under current or other potential conditions. These data are housed with NEMCOG for use and application by the region in future planning, design, and development projects and initiatives.

Finally, the planning and zoning assessment team provided protocols and best practices for Sustainable Communities/Smart Growth, as well as significant web resources for managers and decision-makers (See Chapter 5 Appendices A, B, and C).

Putting the Community First - Northwest Ireland

Several NEMIA workgroup members participated in an exchange program to northwest Ireland, and these members developed case studies based on their interactions, observations, and lessons learned through the exchange. Their case studies focused on programming that develops sense of place and tourism focused on enhancing quality of life.

Dave Glenn (personal communication, April 20, 2007) provides a case study of how northwest Ireland focused on developing their sense of place as an economic development strategy. Rural communities in this region struggled despite national economic boom. Kiltimagh, in County Mayo, was considered a "decimated town with no hope." Work to overcome these economic development challenges focused first on developing Kiltimagh "for the people who live there 365 days a year." Enhancement of the tourism industry was a secondary impact resulting from positive community development; the residents felt if they improved the community first, visitors would enjoy their experience and return. Their emphasis on community development began by identifying and developing their assets: people, community spirit, and pride in the place where they live. Strategies developed by the community, for its own benefit, included identifying local assets, retaining jobs and young people, revitalizing the town and surrounding areas, and fundraising and earmarking a special community tax for revitalization projects.

Ed Lamb (personal communication, February 22, 2007) provides a case study of a local development association with specific tourism interests. The Murrisk Development Association's (MDA) initial charge was to develop tourism focused around two major National Heritage listed attractions: Croagh Patrick pilgrimage mountain climb and Famine Memorial Park. The MDA initially engaged the local community about their mission and role, and through that process realized that their tourism development work would be most successful if they refocused their work on improving the community first.

Initially, the MDA served as a voice for the community, facilitating local group activities and encouraging local entrepreneurship and innovation which, in turn, helped to optimize community assets to enhance quality of life and foster a spirit of community development. These efforts resulted in significant investment in community infrastructure, streetscapes, and community festivals. They found an increase in volunteerism for these projects, possibly because the primary benefits were for the community itself. Efforts were also invested in various fundraising activities, including increased support for sustaining existing and growing new local businesses. As a result of this initial investment in community, the MDA describes significant tourism impacts. They have since facilitated partnerships with 15 other local communities in the Tochar Valley region, formed a tourist development network, and developed the regional Clew Harbor Archeological Trail. Communities are invested in and support these tourism efforts in their own and neighboring communities, encouraging tourists to stay longer in region.

Northwest Ireland's work represents the importance and value in planning and developing tourism-related projects that seek to serve the community first. This is a key point and recommendation to Northeast Michigan also made by the *SDAT Report* (AIA, 2006). Through this strategy, the MDA was not only able to enhance their community's quality of life, but they identified that community members had a stronger sense of place, increasing their own investment in the community. For this region in Ireland, tourism was a secondary consideration, but they found a more vibrant community fostered a more vibrant tourism industry.

Creative Product Development – Olympic Peninsula, WA

An example of development to preserve and enhance a sense of place and maintain quality of life that has had considerable "spin-off" tourism impacts comes from the Olympic Peninsula case study. In Washington State's Olympic Peninsula, the Sequim-Dungeness Valley is known as the Lavender Capital of North America and annually holds a festival that attracts upwards of 30,000 visitors over a three-day period. Lavender farming began in the mid-1990s in response to the loss of prime dairy agricultural land to development. A group of people, intent on saving the agricultural base which contributed considerably to their sense of place and quality of life, identified lavender as a great potential specialty crop requiring little water and plenty of sunshine, both of which describe the valley's climate. According to the Lavender Growers Association, the first focus of the farmers was to convince their neighbors that the valley was more valuable as working farmland than in housing. Lavender, a scenic, scented, and profitable crop, seemed to be the ideal solution. Gradual success resulted, both in terms of product development and marketing, and the simultaneous growth of the Lavender Festival. The growth of the festival is a textbook example of the development of geotourism. It began initially as local people went to the farms to see how "regular folks had transformed small plots of land into arable, productive gardens and farms." From there the festival grew; community members volunteered as the event grew, promoted the "lavender legend," and learned about lavender alongside the farmers (Sequim Lavender Growers Association, 2007). In Northeast Michigan, development of a water heritage festival associated with local natural and cultural assets, initially developed by and for the community, is one way to foster sense of place and develop something that will be attractive and engaging for tourists as well.

7.5.5 Preserving Sense of Place through Resource Protection

After identifying the valuable cultural and natural assets, the next step in preserving sense of place is protecting the resources. The ecological and cultural assessment teams have demonstrated that Northeast Michigan is rich in coastal cultural and historical resources. Multiple processes and projects find that a primary consideration for decision-makers and community leaders is protecting and enhancing these resources. The American Institute of Architects *Sustainable Design Assessment Team (SDAT) Repor*t (AIA, 2006) emphasizes protecting existing resources/access/infrastructure (assets, marinas, trails, etc.), while the *Huron Greenways* study (NEMCOG, 1999) emphasizes resource protection as a priority over acquiring new properties or undergoing new physical infrastructure developments. Additionally, the *US-23 Sunrise Side Coastal Highway Management Plan* (NEMCOG, 2003) outlines environmental protection as an important goal for the development of this regionally-developed initiative. The management plan outlines the following environmental protection objectives:

- Maintain existing recreational, historical, and cultural attributes currently found along Coastal Highway;
- Encourage preservation of natural environment along coastal highway;
- Encourage preservation and enjoyment of forests, open spaces and scenic views; and
- Encourage cities and communities along coastal highway to continue to improve attractiveness.

Risk Assessment

Degradation or loss of resources may result where there is not appropriate attention and resources given to their protection, such as for oversight and management processes, and public education. An immediate activity to preserve sense of place should be to identify individual assets or artifacts that are of special concern and at high risk of degradation or loss. A priority for protecting these assets should then be established. A regional resource risk assessment process would prioritize resource protection projects based on an evaluation of level of damage/loss risk, and the current level of investment in resource protection. Types of risk considered would vary and include both human and environmental risks. Human use, such as excessive visitor traffic or vandalism, may generate resource risks. Environmental impacts might include such things such as artifact weathering for land-based assets and the impact of colonization of shipwrecks by zebra and quagga mussels underwater.

Queensland, Australia

In Queensland, Australia, resource protection is built into tourism strategic planning and development. In fact, Queensland's cultural and natural resource agencies leverage ecotourism businesses as the education and outreach mechanism that provides resource protection information. Their resource protection strategies depend on collaboration among tourism businesses, community members, and resource managers. Two documents outline the strategic planning, development, and working partnerships that have been developed to implement this approach:

1) *Successful Tourism at Heritage Places: A Guide for Operators, Managers, and Communities* (Australian Heritage Commission and CRC for Sustainable Tourism [AHC and CRC], 2001) is an example of a collaboratively developed, research-based document that provides tools and best practices for cultural economic development with sustainability and resource protection in mind. The document identifies the following guiding principles for development in heritage places, including:
    - Recognize the importance of heritage places;
    - Look after heritage places;
    - Develop mutually beneficial partnerships;
    - Incorporate heritage issues into business planning;
    - Invest in people and place;
    - Market and promote products responsibly;
    - Provide high quality visitor experiences; and
    - Respect indigenous rights and obligations.

2) *Tourism Management in Queensland Protected Areas* (Tourism in Protected Areas Working Group, 2003) provides strategies and best practices for ecotourism businesses, including advice on partnering with resource managers, developing eco-friendly businesses, and incorporating resource protection into visitor programming. This document outlines "visitor codes of practice for industry, government, and community." Additional strategies include "decreasing impediments, increasing incentives for industry to adopt ecotourism best practice and technologies." In practice, Tourism Queensland (the regional entity supporting the tourism industry) provides multiple training resources and programs, such as nature/ecotourism accreditation programs for businesses that adopt sustainable tourism practices."

Finally, Queensland's marketing and visitor management approach functions as a resource protection strategy, while simultaneously supporting smaller tourism businesses. The goal is to disperse visitor pressure by attracting customers based on high profile attractions (e.g., Great Barrier Reef); once the customer is "captured" they work to "reduce growth of visitor pressure on icon sites by focusing on alternative regional ecotourism opportunities" (Tourism Queensland, 2002; AHC and CRC, 2001). This strategy allows them to capture visitors for "more than a day," as noted on their welcome signs, and reduce pressure on any given attraction or feature. Additionally, many local businesses achieve economic benefits through longer visits by fewer customers who spend more money.

Lake Erie Coastal Ohio

The Coastal Ohio case study is an example of tourism development that focuses on identifying and protecting coastal assets, and then packaging and marketing these assets in an appealing and accessible manner for visitors. It also provides ideas for education and outreach tools for businesses and visitors to enjoy their experience in a more resource-friendly way.

In developing their tourism strategy, Coastal Ohio identified several theme areas for tourism development, one of which is resource protection. According to the *Lake Erie Coastal Ohio Trail Scenic Byway Corridor Management Plan 2005* (LECO, 2005), tourism development should:

> **"**focus on protecting the valuable natural, historic, and cultural resources that provide a foundation for the tourism industry. This focus area includes development of protection tools and "best practices" for both tourism industry and visitors, and seeks to enhance awareness, appreciation, and interpretation of attractions and resources visited. Investing in conservation and restoration efforts of historic, cultural, and natural resources is also a priority here."

To support this priority, the region provides business tools, interpretive resources, and eco-friendly best practices to educate and empower community members and tourists about resource protection. Specific examples include promoting natural resource awareness through interpretive guides and checklists (such as for birders) and developing and distributing fact sheets providing eco-tips for tourists.

Northeast Michigan has a wealth of similar interpretive materials and resources relevant to the region's coastal resources, and would benefit from developing opportunities for strategically organizing and delivering these products among community members, to visitors, and through coastal businesses. In Ohio, tourists can acquire business cards that identify themselves as someone who cares about Lake Erie coastal resources; tourists are encouraged to leave these cards with businesses where they spend money, so that businesses can recognize the value of supporting sustainable ecotourism activities in their communities. These educational products and interpretive resources are made available publicly through the Lake Erie Coastal Ohio website.

Agencies such as the MDNR or the Marine Sanctuary in Northeast Michigan could provide leadership in developing resource protection best practices for businesses. At the same time, tourism and economic development partners can help new businesses consider how cultural and ecological assets can best serve a new or growing business venture. Business training and support programs can educate business owners about resources and management strategies, establish appropriate partnerships between management agencies and businesses, and consider interpretative and educational opportunities that they can provide for the customer. The customer then receives an enhanced ecotourism experience from the business, while management agencies have leveraged the business to deliver important resource conservation messages and best practices.

7.5.6 Preserving Sense of Place through Stewardship

Educating community members and coastal-dependent businesses about local resources through internal marketing is the key to empowering them to become stewards of Northeast Michigan's unique cultural and national resources, and thus, sense of place. Environmental stewardship can be defined as empowering "learners with skills to address environmental issues and to take positive environmental action with a sense of personal and civic responsibility within their community" (Athman & Monroe, 2001). The Great Lakes Fishery Trust's (GLFT) Great Lakes Stewardship Initiative defines stewardship as "increase[ing] awareness and understanding of the ecology of the Great Lakes so that Michigan's residents become active and effective stewards of the Great Lakes and advocates for strategies that support the long-term sustainability of the Great Lakes [resources]" (Great Lakes Fishery Trust [GLFT], 2007).

Hungerford and Volk (1990) describe essential precursors or variables critical for fostering environmental stewardship at the entry level, ownership level, and empowerment level: (1) Entry-level variables include basic *awareness* and *positive attitudes* about resources as first steps in engaging learners in stewardship activities; (2) Ownership-level variables include more *in-depth knowledge of resources and related issues*, as well as a *stronger personal investment* in these resources; and (3) Empowerment-level variables, which include *knowledge and skills related to action strategies*, *locus of control* or belief that one's actions can make a difference, and a commitment or *intention to act*.

Outreach

Interpretative signage and informative fact sheets are simple examples of outreach and education products that raise awareness of resources, convey their value, and identify potential impacts of a user's actions. Developing and providing best practices to be used in information and programs for residents and visitors can empower tourism-related businesses, community members, and visitors to exercise stewardship practices during their activities.

An example from the Lake Erie Coastal Ohio case study is the website which offers many valuable products, including maps, field guides, books about the local area, and fact sheets offering tips for environmentally conscious residents and visitors.[4] One example is a tip sheet offering guidance for minimizing impacts on habitats and wildlife to wildlife-viewing residents and tourists (see Figure 7.4).

Figure 7.4. Lake Erie Coastal Ohio – wildlife-watching tipsheet.

Source: Lake Erie Coastal Ohio, Inc. Retrieved on November 28, 2007 from http://www.coastalohio.com/discover/ecoguidelines.asp

[4] See http://www.coastalohio.com

Another example of educational signage that informs residents and visitors is from the case study in Queensland, Australia. The area's Daintree Rainforest is the last remaining habitat for the Cassowary, an endangered bird. Signage about this unique bird and its habitats are located at strategic spots so that they can be viewed throughout a visit. The signs include biological information about the bird, the importance of their habitats, and what visitors can do to protect it (see Figure 7.5). In addition, the heavy emphasis on the Cassowary allows visitor centers and businesses to sell postcards, posters, books, stuffed animals, and many other related items. A souvenir for the informed visitor provides revenue for the local economy.

Figure 7.5. Queensland, Australia – endangered Cassowary signs.

Source: Brandon Schroeder, Michigan Sea Grant

In Northeast Michigan, Michigan Sea Grant (MSG) partners with the Michigan Department of Environmental Quality (MDEQ) and MDNR to place signs related to the negative ecological and economic impacts of aquatic invasive species with information about what boaters and anglers can do to prevent their spread (see Figure 7.6).

Figure 7.6. Preventing spread of Invasive Species.

Source: Todd Marsee, Michigan Sea Grant

Of immediate relevance to this project, the Marine Sanctuary is developing trail markers along the Thunder Bay River which has been designated as the Great Lakes Maritime Heritage Trail. These markers will interpret historic and cultural aspects of the river front. The NEMIA study area offers many miles of publicly owned coastal properties where many unique natural resources and significant historical features provide interpretation opportunities for residents and visitors.

Place-based Education

Engaging youth (e.g., school projects) and community members (e.g., "friends groups" or agencies) in research or management projects is a more intensive educational effort that both engages users in stewardship activities and can foster a sense of investment in the resources with which they are working. This type of education should be considered a long-term commitment that includes continued, multiple, and connected learning opportunities for various ages, audiences, and contexts.

Youth development provides an opportunity to engage students in describing and developing their community's sense of place and then engaging them in community service projects that enhance conservation and management of important coastal cultural and natural resources. Williams (2007) describes the importance of school-community partnerships in recognizing students as valuable assets of the community, and that community organizations and conflicts can provide youth education opportunities. Successful school-community partnerships depend on committed community partners and resources; the community becomes the context for

learning, and learning is focused on community issues. Communities that engage students can accomplish work that is meaningful and productive in addressing environmental needs and locally important issues, providing mutual benefits for both the community and students.

In the same way, place-based education is a process that encompasses and enhances student academic achievement, environmental stewardship, and community engagement and vitality (Sobel, 2007). Researchers from the Great Lakes Water Studies Institute have concluded that place-based learning provides an opportunity to foster stewardship in learners through knowledge about local resources, enhanced sense of place, and community connections (Great Lakes Water Studies Institute at Northwestern Michigan College, 2005). Sobel (2007) describes how community issues and environmental issues/projects can become a learning opportunity for students. Students engage in service projects that benefit both the community and the environment, and in turn learn about issues that are important to their community through hands-on lessons or problem-solving. Students become important players and leaders within the community, empowered to contribute to it, and enhance their own commitment and sense of place within it.

Place-based education can be applied to discovering and interpreting local culture, history, and natural resources. Sobel (2007) provides two examples from New Hampshire. In Littleton, NH, high school students worked with community leaders to develop plans and maps for a trail that loops through historic sites in their school district. Third grade students in the same area produced a book outlining Littleton's history; this book was later sold in local bookstores and visitor centers. In Keene, NH, Keene High School students developed a weekly newspaper column called Tracing Places, researching and telling stories about significant history and places in their town. Keene students, working at the Rachel Marchall Outdoor Learning Lab, are involved at various grade levels in the stewardship and study of all 2000 acres of Keene's public land. Some of their projects include developing a riverwalk with interpretive signs explaining both natural and built environments along their river. Currently students are working with community leaders in developing a River Discovery Center Museum. These students' stewardship efforts, research contributions, and educational products provide community assets that benefit local residents and visitors alike.

Research and literature on place-based education provide a framework for community partners to engage schools and students in developing the priority projects identified throughout the NEMIA process. The NEMIA process has established that sense of place, quality of community, and resource protection are important aspects of coastal tourism and economic development activities undertaken in the area. Schools and students can be challenged to develop projects that address these priorities and, in the process, can learn about their community and its historical and natural resources and heritage. With little creativity, these can in turn become lessons in biology, mathematics, history, social studies, government, or any other subject or topics required for school degrees.

Existing Place-based Education Efforts in Northeast Michigan

Northeast Michigan boasts several schools already invested in experiential, service-learning that incorporates Great Lakes and aquatic education programming and demonstrates strong

community partnerships. The Northeast Michigan Great Lakes and Aquatic Education Networking Summit, held in 2006, brought together education and community partners invested in youth development and aquatic education, including those from Alcona, Alpena, and Presque Isle Counties.[5] Three projects providing evidence of this include:

(1) Presque Isle County: Onaway School's and the Ocqueoc River Commission's Ocqueoc River Project, where a 5th grade student-led study of the watershed occurred over a six week period, culminating in a "River Celebration" event where students provided educational presentations for the community;

(2) Alpena County: Alpena-Montmorency-Alcona Educational Service District sponsored a film festival where local schools studied, developed, and produced maritime heritage-related documentary films in cooperation with the Marine Sanctuary; and

(3) Alcona County: Alcona High School Agriculture and Natural Resources Program engages students in entrepreneurial, resource-based activities in the region such as maple syrup making, aquaculture through connections with a local trout farm, and aquatic invasive species projects with local MDNR and MSG staff.

The 2006 Aquatic Education Networking Summit participants identified the need to support, enhance, and expand these types of in-school aquatic education efforts that make strong community connections. In 2007, Northeast Michigan was funded to conduct a second, follow-up regional networking meeting that focused on bringing school and community partners together to learn about and strategize on the application of place-based education opportunities that promote Great Lakes stewardship in the region.

Currently, the Great Lakes Fishery Trust (GLFT) is developing a Great Lakes Stewardship Initiative which applies place-based education theory to coastal communities with the purpose of supporting Great Lakes stewardship. Starting in 2007, GLFT is funding regional hubs to support school and community partnerships with these goals (GLFT, 2007) Given the region's 2006 Summit investment, Northeast Michigan is well-positioned to apply for and use these funds to engage schools and students in developing coastal projects identified throughout the NEMIA process. A regional team for Northeast Michigan has been established to explore this funding resource and to host a 2007 Great Lakes and Aquatic Education Regional Networking meeting focused on the topic of place-based education.

7.6 THEME: NATURAL, CULTURAL, AND MARITIME HERITAGE RESOURCES TOURISM

After the theme of *Preserving a Sense of Place and Community Character*, the workgroup gave highest priority to *Natural/Cultural/Maritime Heritage and Natural Resources Tourism.* Four of the six potential actions prioritized by the NEMIA workgroup fell under this theme. The

[5] For more information on the Great Lakes and Aquatic Education Networking Summit, see http://www.miseagrant.umich.edu/education/gl-aquatic-edu-network.html

workgroup prioritized maintaining traditional tourism opportunities while also diversifying the tourism portfolio to include new tourism opportunities (See Figure 7.1).

7.6.1 Introduction

Northeast Michigan already boasts a strong coastal tourism industry. As discussed in Chapter 2, the Lake Huron sportfishing industry has been and continues to be an important contributor to the region's tourism economy. However, coastal tourism trends have changed. These changes reflect declining participation (and travel to participate) in the Lake Huron fishery. These trends are driven by economic conditions (such as increasing fuel prices) and changes to the Lake Huron fishery due to ecosystem alterations caused by aquatic invasive species that negatively impact the Chinook salmon fishery (Michigan Department of Natural Resources, 2007). Nationally, there is a decline in participation in nature-based recreation generally (Pergams and Zaradic, 2008). Coastal tourism trends also reflect an increasing interest in maritime heritage and diving, a trend influenced by an increasing regional presence by the Marine Sanctuary. These changes present an opportunity for the region to develop a stronger and more diverse coastal tourism portfolio by focusing attention on (1) protecting and enhancing traditional coastal tourism industries such as those connected with the fishery, and (2) supporting growth in tourism businesses focused on new coastal tourism opportunities, such as diving, kayaking, or ecotourism.

Coastal tourism development, whether it means sustaining existing business or growing new businesses, should be considered in the context of the larger community's economic development vision and direction, goals, and objectives. The *SDAT Report* (AIA, 2006) provides recommendations for supporting downtown development opportunities, as these collective set of businesses support and enhance appeal for coastal tourism customers and, more importantly, they contribute to the local quality of life through services and jobs provided. The *SDAT Report* notes that coastal tourism development can benefit from linkages to and growth of other industries, such as agriculture and coastal city centers that define the regional culture and landscape. Specifically, the *SDAT Report* urges attention to development efforts within coastal city-centers and rebuilding downtown vitality, noting that "these businesses and vitality support healthy tourism and quality of life."

7.6.2 Supporting and Sustaining Existing Coastal Businesses

The workgroup prioritized developing new coastal tourism business opportunities, but also emphasized supporting and sustaining existing coastal businesses to maintain its traditional tourism base. Specifically, commercial and charter fishing, marinas, and boating industries that rely on the Lake Huron sportfishery are examples of existing coastal businesses that have recently faced challenges due to declining participation, increasing travel costs for visitors, or simple competition from other similar coastal tourism providers. Investing in programs or initiatives that address emerging issues, needs, and opportunities can help businesses adapt and grow as markets change. Michigan Sea Grant (MSG) is one regional partner that provides this type of business assistance to the more traditional Great Lakes tourism industries.

The Lake Huron sportfishery has made news headlines with its changing fishery. However, despite changes, the fishery continues to be productive and diverse, providing both sport and commercial fishing benefits to the region. Closely associated with the region's heritage, culture, and sense of place, these industries warrant additional investment to sustain them. Investment strategies include shifting marketing focus and differential pricing.

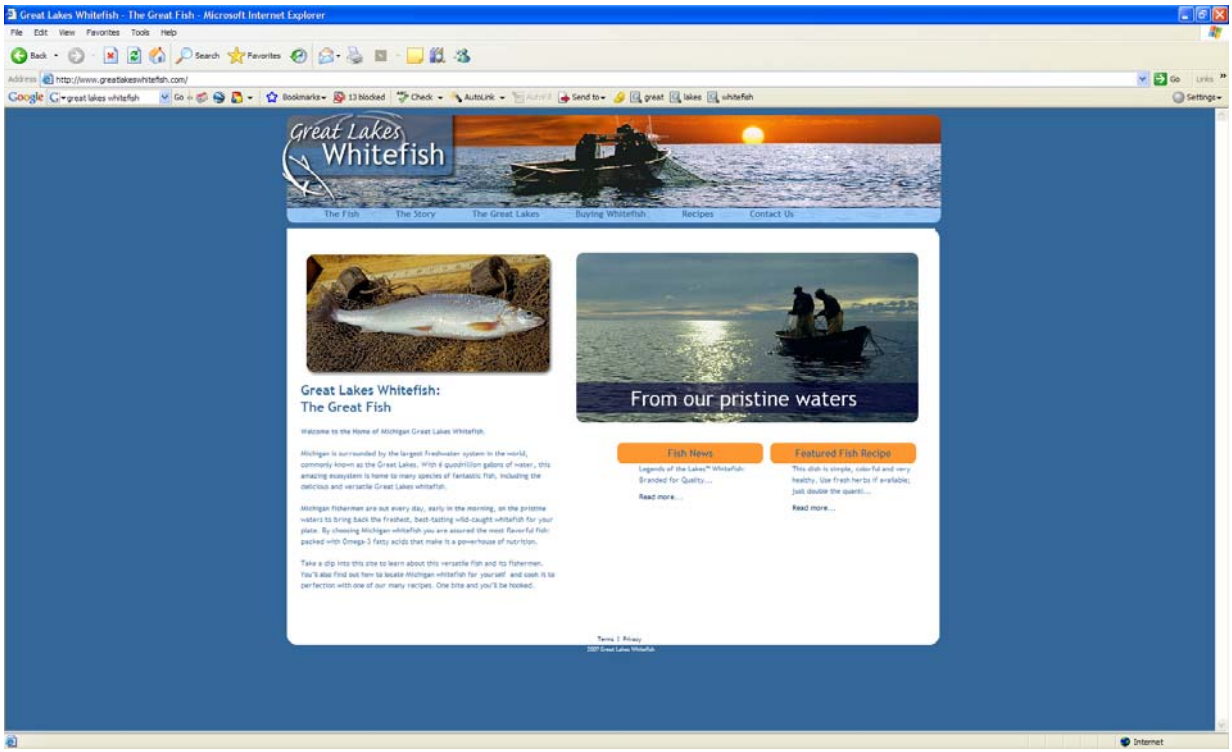
A simple shift in marketing focus can have big dividends. For example, Northeast Michigan can successfully provide several types of fishing opportunities from river, nearshore, and open water fisheries where anglers can catch a diversity of species. Currently, Lake Huron charter fishing trips are closely grouped in a three-month window (Charles Pistis, personal communication, April 21, 2007) with between 75-80% of business occurring in June, July, and August, that is associated with the optimal Chinook fishing season. Opportunities exist to expand the charter fishing window if coastal communities and charter captains invest in marketing early and late season species and strategies. While a previously popular month and/or species may be in decline, communities can continue to profit by charter captains adding days of fishing and targeting different species. For example, while Chinook salmon have declined in size and numbers, Saginaw Bay walleye – which also feed northern Lake Huron fisheries – and lake trout are greatly improved, and pink salmon are unique to northern Lake Huron altogether. A regional marketing strategy that focuses on these other, excellent sportfishing opportunities would benefit both the charter industry as well as the coastal communities that host it. As interest in other species develops, there will be additional anglers fishing without guides who will provide additional revenue to Northeast Michigan's coastal communities.

The concept of differential pricing provides another strategy that the recreational fishery could employ to attract customers in what have previously been considered the off-peak seasons. Essentially, charter captains would offer different prices for the same product, a half-day or full day on the lake, on the basis of customer type (repeat or first-time anglers) or time of purchase (season). Other coastal businesses, such as motels or bed and breakfasts, might offer lower prices in off seasons to complement differential charter pricing. Together these prices serve to extend the season and to attract new customers during off-peak seasons or attract repeat visits from already captured customers. This strategy will help to attract customers during off-peak seasons, and attract completely new and different markets to the fishery, such as different demographics or regional markets.

Michigan Sea Grant has historically provided support for the Great Lakes sport/charter and commercial fishing industries. Northern Lake Huron is a primary producer of lake whitefish, and home to a significant number of state licensed and tribal commercial fishermen. Currently, MSG is conducting Great Lakes whitefish marketing studies and product development with the commercial fishing industry. The concept is that education regarding the quality and value of these fish products can help commercial fishing businesses thrive economically, while harvesting sustainably. The Great Lakes Whitefish website (http://www.greatlakeswhitefish.com) offers visitors information about the fish, the cultural and historical stories behind the fishermen, and health information regarding the value of spending money on buying Great Lakes whitefish (see Figure 7.7). These commercial businesses and their northern Lake Huron product, if protected and supported, can add value to markets and restaurants serving residents and visitors of the region.

For the sport/charter fishing industry, MSG hosts annual spring workshops for Lake Huron sport and charter anglers. These workshops offer business education opportunities for charter captains, and in 2007 local tourism partners played an important role in offering captains ideas and opportunities for diversifying their charter fishing product and connecting with other regional tourism development and marketing efforts. These types of opportunities for networking and support should be continued.

Figure 7.7. Screenshot of Great Lakes Whitefish marketing website.



Source: Retrieved from http://www.greatlakeswhitefish.com on December 6, 2007.

Finally, MSG, in partnership with MDEQ and Michigan Boating Industries Association, offers the Michigan Clean Marinas Program, a training and certification program for marinas. This program offers environmentally friendly best practices toward which marinas can voluntarily work. Certified marinas receive marketing support for their efforts. This opportunity can provide tools and resources for marinas to protect the coastal resources they depend upon, while obtaining certification and a competitive advantage as a marina operating within a specialty market niche. Northeast Michigan can adopt this and other coastal business accreditation programs to develop resource protection strategies and best practices for businesses while fostering a competitive marketing advantage for participating businesses.

Education programs, market research, product development, and marketing strategies can help existing businesses establish market niches that are relevant and representative of the Northeast Michigan "experience." The *SDAT Report* (AIA, 2006) recommends querying existing local businesses about their needs and growth interests. It is important to know what these businesses

will need to survive, grow and expand, and continue to remain an active business working and employing from within the region.

7.6.3 Identifying New Tourism Assets and Opportunities

Several projects and initiatives in Northeast Michigan have inventoried and compiled coastal assets, however they could be more complete (e.g., quantity) and extensive (e.g., data-rich) to serve the purposes of geotourism. On-shore inventories should be revisited in a more comprehensive manner, with the purpose of filling gaps and adding new resources that would be identified if looking at the region through a broader geotourism lens. Also, there is always room for adding depth and detail of information and interpretation for each asset identified. The *Huron Greenways* study (NEMCOG, 1999) provides a database of assets, as well as other relevant data indicating ownership, status, and details related to access. This project provides a format and foundation for collecting and mapping data and, as such, additional data should be compiled within the context of this existing work. Sense of place exercises, such as those conducted for Presque Isle County, can serve as opportunities for identifying additional data and attributes useful in developing these inventories further.

The Lake Erie Coastal Ohio inventory could be used as a template when expanding the information available for each asset in Northeast Michigan inventories. Their inventory is similar to the inventories developed through the *Huron Greenways* study and in the designation of the US-23 Heritage Route. However, Lake Erie Coastal Ohio invested significant resources in both identifying assets and in developing detailed descriptions of each asset. The Coastal Ohio inventory provides information on a wide array of assets including harbors, museums, lighthouses, boat tours, scenic tours, gardens, restaurants, bed and breakfasts, wetlands, theaters, springs, stargazing, rivers, beaches, forests, farmlands, neighborhoods, main streets, galleries, state parks, festivals, fishing, and craftspeople. In addition, each asset has its own dedicated webpage where maps, images, a detailed description, driving directions, and contact information (if applicable) on the Coastal Ohio website.

The Marine Sanctuary is completing an inventory of shipwrecks and other underwater resources in the region as part of the Great Lakes Maritime Heritage Trail. This activity should be coordinated with other state and regional partners and inventory projects compiling data related to both cultural and ecological assets. This rich data source could then serve as the foundation of the system of water trails for which NEMCOG is seeking funding to complement the *Huron Greenways* study (NEMCOG, 1999). These data can be used to organize and map water assets, trails, and access points accessible by water, such as by boat or kayak.

7.6.4 Supporting Emerging Coastal Tourism Industries

The *SDAT Report* (AIA, 2006) reaffirms that there are ample opportunities along the northern Lake Huron coastline to support diverse and multiple uses, indicating that, “commercial and sport fishing, sailing, motor boating, kayaking, canoeing, diving, snorkeling, swimming, beach activities, or simply strolling along water’s edge can all thrive without new coastal development.” Diverse coastal tourism opportunities take advantage of multiple seasons, increase opportunities for small business development, and decrease dependency on any one type

of tourism market. The designation of the Marine Sanctuary provides an opportunity for growth in diving, snorkeling, and kayaking tourism in relation to the increased investment in preservation, interpretation, education, and access to shipwrecks and other underwater artifacts. This type of tourism can also be built upon the significant coastal natural resource assets and areas in public ownership through local, state, and federal agencies. Many of these natural areas remain largely undeveloped, such as the state-owned Negwegon State Park, Rockport State Forest, and Thompson's Harbor State Park. These areas lend themselves to entrepreneurial ecotourism businesses, such as guided nature hikes or birding tours, that can highlight these unique natural areas and require little physical infrastructure. The Blackstone Valley case study and the Presque Isle sense of place project provide two examples of getting these types of hikes/tours started. In the short-term, these may be community tours developed through the tourism industry, or possibly a place-based education project for a local school. In the long-term, established tourism businesses might provide these services in trade for the marketing services of the community.

The *SDAT Report* (AIA, 2006) suggests the region's existing businesses consider expanding into cultural or ecotourism areas and service. For example, a restaurant could expand to include a bike rental service that allows visitors to take advantage of existing investments in byways. This requires a lower investment than recruiting new businesses altogether, presents less of a business risk to the entrepreneur, and provides an immediate opportunity to generate new jobs (even if part time). The *SDAT Report* also suggests businesses expand to take advantage of seasonal tourism opportunities. Color tours and farm harvest tours in the fall, snowmobiling and cross country skiing in the winter, or birding tours in the spring are all examples of seasonal activities that can provide a more sustainable, year-around tourism economy.

Recruiting and supporting new coastal tourism businesses (e.g., a kayaking business or guided nature hike service) is a higher investment tourism development strategy than expansion of existing businesses. To be successful, it is important for the tourism industry to make strong linkages with the economic development partners in the region. Northeast Michigan can look to Queensland's tourism industry as a model for providing economic development tools, assistance, and support for tourism businesses. Tourism Queensland's support toolbox is delivered through training and a web-based clearinghouse targeting entrepreneurial tourism businesses. The NEMIA process brings together regional tourism and economic development partners and initiatives such as the US-23 Sunrise Side Coastal Highway that can serve as platforms for delivering a web-based coastal tourism business support tool.

NEMIA economic development partners have been participating in Michigan State University Extension's "Creating Entrepreneurial Communities" training program, which provides access to resources and expertise necessary to generate a toolbox targeted to aspiring entrepreneurs. This team has been trained and is cooperating with MSU Extension economic and community development experts, the MSU Product Center, and the national Energizing Entrepreneurs (E2) Institute. This team is exploring entrepreneurial development initiatives, specifically youth entrepreneurial education programming. In addition, the NxLevel Training[6] offered through local MSU Extension offices or the Small Business and Technology Development Center[7] staff and

[6] For more information, see http://www.nxlevel.org
[7] For more information, see http://www.gvsu.edu/misbtdc/region3/

programs offered through Alpena Community College can provide resources, training, and assistance for newly emerging and entrepreneurial businesses. The MSU Product Center provides support and assistance in product development, business start-up, and marketing strategies for new businesses.

Ecotourism Business Development and Support – Queensland, Australia

The Queensland, Australia case study provides an example of how to support the ecotourism industry through the development and delivery of business tools and training programs. Training and support for businesses to create a quality experience based on the region's scenery, natural resources, recreational activities, agricultural products, history, culture, and small town/village centers is the focus of the Queensland program. Similar to the NEMIA process, the *Queensland Ecotourism Plan 2003-2008* (Tourism Queensland, 2002) is a strategic plan developed through planning and consultation with the tourism industry – specifically ecotourism industry stakeholders, visitors, government bodies (federal, state, and local), natural area managers, conservation groups, local community leaders, aboriginal communities, education and research institutions, and other special interest groups. The group determined that for Queensland, ecotourism should encompass a spectrum of "…nature-based activities that foster visitor appreciation and understanding of natural and cultural heritage and are managed to be ecologically, economically, and socially sustainable.**"**

Core values identified in this strategic planning process articulate that: (1) ecotourism is a significant contributor to Queensland's tourism industry and economy; (2) ecotourism depends on healthy natural resources; (3) conservation and protection of area attractions is a priority, considering both quality and diversity of resources accessible throughout the region; and (4) ecotourism depends on providing education and support that empowers the tourism industry. Education support can allow the tourism industry to provide leadership in adopting ecologically sustainable principles and practices while continuing to grow their businesses.

Tourism Queensland, the State of Queensland's tourism agency, focuses on providing business support specifically to the ecotourism industry. The *Queensland Ecotourism Plan 2003-2008* identifies actions and deliverables participants would like in support of the ecotourism industry, many of which have been accomplished or are underway including. A sample of these actions includes:

- Consumer and industry ecotourism research and product development;
- Self-help guidelines published to assist government, industry, and community to implement best-practices;
- Ecotourism training workshops;
- Web-based clearinghouse;
- Nature/ecotourism accreditation program;
- Broad community involvement in ecotourism planning and product development; and
- Tourism management system for Queensland protected areas.

(Tourism Queensland, 2002)

The Tourism Queensland website serves as a clearinghouse, housing many of the products identified in the ecoutourism plan: market research, strategic plans, training and support for business development, customer service and visitor experience, involving local communities and citizens/stakeholders, and best practices for ecotourism or heritage tourism developed with resource protection as a priority. Some examples of tools and products offered by Tourism Queensland include[8]:

- *Environmental Impact Monitoring: A guide for tourism operators* (2002)
- *Working with Communities: A guide for tourism operators*
- *Innovation in Interpretation: 30 Case Studies* (2000)

In Queensland, ecotourism certification and recognition/reward-type programs offer an opportunity to provide quality control of businesses. Ecotourism businesses can achieve various types and levels of certification offered by units of local and state government, inter-industry programs, all based on international standards and programs. There are also award programs and promotional opportunities for businesses adopting ecotourism best practices. They are rewarded by receiving premier designation which, in turn, adds value to their individual marketability and by being spotlighted on the Tourism Queensland website as successful, ecofriendly businesses.

7.6.7 Adding Value by Connecting and Linking Coastal Tourism Assets

Strong linkages between coastal tourism assets add value to existing and new coastal tourism-related business by providing for a richer visitor experience reflective of the diverse and abundant coastal natural, cultural, and historical resources of the region. These linkages also increase the likelihood that customers will stay longer, repeat visit, and share their positive experiences with others (Tourism Industry Planning Council, 2006).

For example, archeological research and interpretation of underwater artifacts can add tremendous value to the tourism product that a dive or snorkel charter business can provide for customers. These same resources can complement other businesses indirectly. Charter fishing captains who provide interpretive resources for lighthouses their customers see or shipwrecks they pass over, or provide information about restaurants, festivals, and other events while also catching fish, will enhance the customers' flavor of the community and region. The same charter fishing captains can also serve as marketing outlets when they refer customers to visit the Marine Sanctuary's Great Lakes Maritime Heritage Visitor Center, or other cultural resource organizations.

Connecting Coastal Assets through Coordination and Partnerships

Successfully linking tourism opportunities requires coordination between and among natural resource and cultural/historical resource agencies and organizations, tourism businesses, outreach experts, and economic development partners.

[8] all are available for download on http://www.tq.com.au/tqcorp_06/index.cfm?5F2C8EAD-FACA-8356-5B7D-CE7ACCFD5C34 as of December 6, 2007

Federal, state, and local cultural resource organizations are the most credible partners for developing interpretive materials and business training programs that focus on best practices for cultural/historical tourism, such as managing tourists on fragile shipwreck sites so as to ensure resource protection. Partnerships between the Marine Sanctuary, MDHAL, and local historical societies can be used to interpret shipwrecks, lighthouses, and other coastal historical artifacts, thus adding to the tourism value of regional maritime heritage assets. MSU Extension and MSG should also be considered partners for developing these programs and for packaging and delivering research and interpretive materials for coastal business development opportunities.

In Queensland, both natural and cultural resource agencies utilize tourism businesses as partners in developing interpretive and educational products related to these resources that the business depends upon. Businesses are considered spokespeople for resource protection and conservation, and agencies provide resources, best practices, and training opportunities for businesses to learn more about the resources they are sharing with their customers. For example, a recreational canopy surfing experience includes information about the rainforest ecosystem and conservation issues/preservation needs related to old growth vegetation and trees. The businesses provide a service for the agency and in doing so they also offer quality and depth of resources and information for the visitors participating in their business and seeking to learn more about the resources they are visiting. This results in a quality visitor experience, and offers some awareness, investment and ownership for the visitor in the resources they are exploring, potentially leading toward stewardship oriented actions on the end of the visitor.

Opportunities exist for cultural resource partners to coordinate and partner with natural resources partners to add to the tourism value of coastal resources. As an example, MDNR manages several coastal properties, including Harrisville State Park, Sturgeon Point Lighthouse, Negwegon State Park, Rockport State Forest, Thompson's Harbor State Park, and Hoeft State Park. These areas contain significant historical and archaeological resources. For example, Rockport and the Besser Natural Areas host the shipwreck CZAR, an abandoned deep draft port that once loaded raw material for the Mackinaw Bridge, Native American artifacts, and the abandoned early settlement of Belle. The Marine Sanctuary, MDHAL, and local historical societies can all serve as partners in developing, interpreting, and marketing these maritime heritage resources in complement to the natural resources management, interpretation, and marketing done by the MDNR. As an example of such a partnership, MSG is currently partnering with the Marine Sanctuary in developing trail markers for the Thunder Bay Maritime Heritage Trail. While the trail is primarily history-oriented, the MSG program provides interpretive content regarding ecological aspects of this area’s history, such as fisheries (e.g., sport and commercial fisheries) and impacts of aquatic invasive species which have been introduced throughout past years. Connections between cultural and natural resources are important considerations in developing strong geotourism opportunities.

These partnerships can strengthen regional connections among cultural resource partners, interpretative and education products, and coastal tourism assets. Businesses themselves can be key partners in developing and delivering interpretive opportunities relevant to the coastal assets around which their businesses may be built.

Tourism partners in Northeast Michigan should continue to seek additional national and even international support, ideas, and resources through programs such as the National Scenic Byways Program, Preserve America, or National Geographic Center for Sustainable Destinations Geotourism program. In terms of funding support, the Lake Erie Coastal Ohio initiative utilized the federal designation and grant funding ($25,000/year for three years) through the NSBP provided the opportunity and incentive for continued regional collaboration. These opportunities enabled the region to hire a consultant to facilitate an inventory that built upon existing work, adding depth and detail to these assets already identified. The region started with 160 assets, now there are over 350 identified. This consultant also facilitated development of the regional marketing message and target market, then fostered the networking and coordination required to develop and launch the Lake Erie Coastal Ohio website. Eventually, the effort required an executive director dedicated to sustaining these relationship and partnership networks, core website clearinghouse, and oversight of new funding and development opportunities. This position is sustained through a partnership that includes The Ohio State University, Ohio Sea Grant College Program, and local partners (Frank Lichtkoppler, personal communication, March 2007).

Partners in Northeast Michigan could also encourage the State of Michigan to adopt a strategy identifying a series of potential UNESCO World Heritage Sites and a parallel series of potential UNESCO biospheres. There are ample examples for the state to review, the latest example being the Rideau Canal World Heritage Site in nearby Ontario. The economic potential of a World Heritage Site is tremendous.[9]

Connecting Coastal Tourism Assets by Expanding Wayfinding and Mapping

The *SDAT Report* (AIA, 2006) indicated mapping and wayfinding as opportunities for enhancing the tourism value of both cultural and natural coastal resources. The US-23 Sunrise Side Coastal Highway, inventory and maps from the *Huron Greenways* study, and *Lights of Northern Lake Huron* driving tour offer examples and products that address mapping and wayfinding needs. Partners should continue to use, and expand usage of these initiatives and products, making maps and information more widely available. For example, by offering information and maps from the *Huron Greenways* study more widely available via regional and local tourism websites.

Two additional opportunities exist to expand mapping and wayfinding among coastal cultural resources of the region. First, continue partnerships with MDHAL and Travel Michigan in developing additional thematic regional coastal heritage driving tours. This integrated assessment provides a summary of resources and assets that can be used as a foundation for developing these regionally themed driving tours.

Second, consider developing water-based trails, as much of the framework is established for inventorying, developing, and marketing them. The Marine Sanctuary is providing leadership to the Maritime Heritage Water Trail which involves interpretive signage and infrastructure to enhance walkability along the waterfront. This effort also involves inventorying and developing "water trails" in Thunder Bay for tourists to visit shipwrecks and view lighthouses from the

[9] For more information on the Rideau Canal WHS, see: http://whc.unesco.org/en/list/1221.

water. NEMCOG is also seeking funding to conduct an inventory and generate maps related to the Huron Blueways which is a system of water trails that would complement and connect with the *Huron Greenways* study. Huron Blueways is intended to highlight assets (access to features, views, etc) for tourists such as kayakers. The expertise and archival assets at the Marine Sanctuary, such as the shipwreck inventory, will be critical in developing, interpreting, and even marketing these types of tourism trails on the water.

The Huron County Coastal Paddling Trail is an example of a countywide water trail that connects cultural, historic, and ecological features along the Lake Huron coastline.[10] The trail guides paddlers on a tour of the county's coastline, highlighting local assets and information specific to access points and communities. This trail is an example of a regional project using maps and internet tools to provide interpretive and wayfinding services targeted at a specific user group. Similar to Northeast Michigan, Huron County is a rural county, with land uses primarily in agriculture. The county has looked to tourism to add economic value, and also promotes other assets such as natural resources (fishing, hunting, and bogs), agricultural, historical (petroglyphs), and cultural resources (art trails, festivals, etc.). The Huron County Coastal Paddling Trail is a tool that connects visitors along the entire county-wide coastline; individual towns and areas are then able to connect paddlers with other tourism assets as locally available and appropriate.

Other opportunities for connecting assets using inventory work might include adding historical assets to state and federal historical registries or adding new assets and details to the existing *Huron Greenways* study database framework. Data can also be organized in developing GIS data layers, generating regional maps, and other educational or interpretive materials. These products should be available for use by resource managers, stakeholder interest groups, tourism and economic development partners, businesses, and others in developing and marketing cultural assets through various initiatives. Tourism partners should also seek opportunities to make inventory data available for tourism and other economic development opportunities.

Adding Value through Cross-Promotion – Queensland, Australia

Queensland, Australia's coastal ecotourism industry has focused on developing formalized regional linkages among tourism businesses resulting in an effective cross-marketing strategy that seeks to capture visitors for multiple days. A sign entering the Daintree Cape Tribulation Rainforest area boasts, "Experience the Daintree Cape Tribulationo Rainforest, where the Rainforest meets the [Great Barrier] Reef. You need to stay for more than a day." This message emphasizes the region's interest in drawing linkages among multiple assets, and marketing to attract customers that stay multiple days (increasing visitor expenditure per person) in the region.

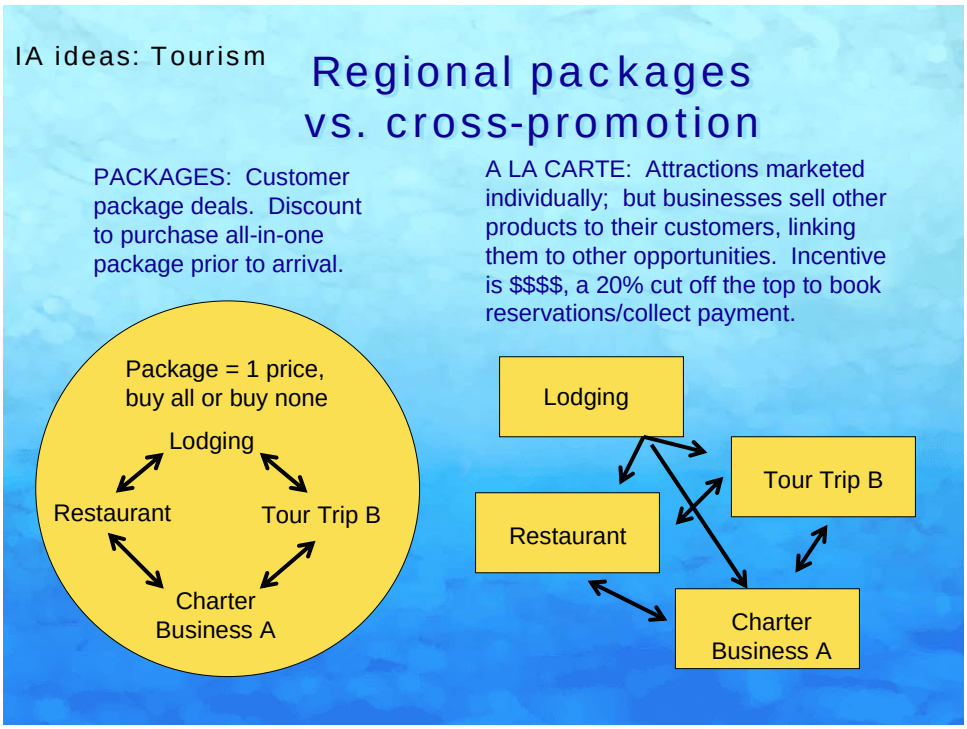
The Queensland region attracts customers based on individual and high profile assets, such as the Great Barrier Reef or the World Heritage Daintree Cape Tribulation Rainforest. Once visitors are in the region they are on their own to explore and engage in various tourism activities. The region hosts many smaller scale tourism operations that benefit from tourists that visit for the larger attractions. These businesses flourish and attract visitors to stay longer by a cooperative culture of businesses that cross-market each other.

[10] For more information, see http://www.thumbtrails.com

In Queensland, rather than emphasizing "package deal" marketing where the customer pays a discounted price for a group of services (food, lodging, tours, etc.) prior to arriving, the customer is exposed to an a la carte tourist experience, resulting in more time and resources spent in the region (see Figure 7.8). This strategy is successful because most businesses and visitor bureaus are positioned to recommend, and even book and take money for tours and trips, lodging, and restaurants, thus passing their customers on to the next community business. In trade, many of these businesses build in a twenty percent overhead that serves as a commission for the businesses that successfully refer a customer. This allows an additional profit for businesses that effectively promote themselves, and a financial reward for businesses that successfully refer customers from which they have already benefited.

This strategy promotes a culture of competitive businesses that also seek to cross-promote other ecotourism businesses in the community. For the visitor, these businesses provide a service of sharing all of the authentic experiences, large and small, that the region has to offer, and then helping the customer to move between and among different venues and activities. This promoting a positive customer service and visitor experience resulting in longer visits and increased investment by the customer in their visit to the region (Alison Gotts, personal communication, April 20, 2007).

Figure 7.8. How an a la carte trip (compared to a packaged trip) can add up in time and resources spent in one location.



Source: Brandon Schroeder, presentation at May 10 NEMIA meeting.

Packaging and Marketing Assets through Regionally-developed Themes and Stories

The Lake Erie Coastal Ohio initiative is an example of using an asset inventory to connect regional assets thematically (Lake Erie Landscapes, Lake Erie Cultural History, or Lake Erie Natural History), by audience (active outdoor recreation, history buffs, etc.) and by geographic sub-region (Western, Central, Eastern) and disseminating this information to tourists and the community tourism partners via the web. The inventory and thematic organization has also provided a foundation for developing regional partnerships, pursuing funding and Federal Scenic By-way designation, and has resulted in a fully funded regional director who oversees the marketing and web development related to the Lake Erie Coastal Ohio initiative.

Northeast Michigan already has the interest, ability, and infrastructure necessary to support connected tourism experiences based on geography or theme. The *Huron Greenways* inventory and maps, the US-23 Sunrise Side Coastal Highway initiative, and the Sunrise Side Travel Association provide the products and platform necessary to support coordination across the region. More importantly they can link regional projects with efforts and initiatives of local tourism bureaus or coastal businesses that continue to develop and market their own local products unique to a particular county, community, or subregion.

Figure 7.9. Examples of Coastal Ohio assets grouped under each thematic category.

- Lake Erie Landscapes
  - Bays, Ports and Harbors
  - Forests and Farmlands
  - Glacial Islands
  - Grasslands and Savannas
  - Lakes and Beaches
  - Rivers and Streams
  - Wetlands
- Lake Erie Cultural History
  - Legacy of Freedom
  - Patterns of the People
  - Pursuit of Leisure
  - The First West
  - Working Waterfronts
- Lake Erie Natural History
  - Geological Influences
  - Glacial Beginnings
  - Smoke on the Water
  - Renaissance

(LECO, 2005)

The SDAT process identified that Northeast Michigan's "sellable" assets can broadly described or categorized as: (a) Lake Huron and Thunder Bay, (b) Natural Resources, (c) Pastoral Landscapes, and (d) Coastal Cities and Villages (AIA, 2006). The maritime heritage initiative led by MDHAL and Travel Michigan that resulted in *Lights of Northern Lake Huron* driving tour has also identified several additional themes or stories to market to visitors. Among these potential themes are: (1) Harbors, Towns, and Ports, (2) Lake Huron Commerce "Lake Huron Bluewater Highway," (3) People Power of the Great Lakes, and (4) Fins, Fur, and Feathers (this category added by the NEMIA working group). Regional tourism partners should leverage the existing inventory work to develop these additional themes into additional driving tours or other packaged experiences.

7.6.8 Leveraging the Thunder Bay Marine Sanctuary

The Marine Sanctuary should be leveraged to develop cultural tourism opportunities, connect cultural attractions throughout the region through "satellite" partnerships, and support cultural resource management.

The federal and state resources brought by NOAA and MDHAL to Northeast Michigan through their co-management of the Marine Sanctuary can be used to support regional decision-making and provide educational programs on resource protection, interpreting and marketing, and managing tourism for sustainability. For example, MDHAL helped facilitate the *Lights of Northern Lake Huron* driving tour hosted online via Travel Michigan website. The Marine Sanctuary can help leverage additional such activities and support through MDHAL on similar such projects.

As mentioned above, the Marine Sanctuary, MDHAL, and local historical societies can partner to interpret coastal historical artifacts. At sites where historical assets are focal tourism attractions (e.g., Sturgeon Point Lighthouse or 40-mile point), the Marine Sanctuary can use these attractions as satellite locations for delivering regionally developed programs and resources developed by the Marine Sanctuary. At these satellite displays, historical society volunteers could interpret local resources, and also link local resources back to regionally significant attractions, such as the Great Lakes Maritime Heritage Visitor Center, or other local historical museums and other satellite locations. Regional support in developing these satellite products or displays can generate partnerships, leverage resources, and add significant value for a local non-profit that is volunteer run.

The Marine Sanctuary's Great Lakes Maritime Heritage Visitor Center's Internet 2 and tele-presence capabilities can benefit regional cultural resource protection, education, and tourism projects. Partnerships with the Sanctuary can help utilize this technology for various projects, ranging from enhancing education and local residents ability to virtually travel to other parts of the country/world, marketing Northeast Michigan and the Marine Sanctuary to other parts of the country/world and even attracting "virtual visitors," and just connecting with outside resources, partners, and such in developing program planning, development, marketing, and implementation (such as virtual meetings with key researchers from somewhere else in the country).

As mentioned above, Queensland, Australia uses big draw attractions (such as the Great Barrier Reef) to draw visitors to the area. Once people are "captured visitors" they downplay the main attraction and focus marketing and attention toward many smaller, less known, lower profile businesses and activities (Tourism Queensland, 2002). A parallel opportunity for Northeast Michigan is to market the Marine Sanctuary and the Great Lakes Maritime Heritage Visitor Center as a high profile attraction, and then develop management and marketing strategies for diverting visitors to other attractions once visitors arrive.

7.7 THEME: INCORPORATING MODERN TECHNOLOGIES

Incorporating modern technology logically follows on the implementation advice related to both preserving sense of place and increasing tourism opportunities. Sense of place exercises help determine the stories to tell, best practices to develop tourism opportunities help determine what resources best tell those stories, and ideas for incorporating modern technology can provide the means to package these resources into tourist itineraries and advertise them to the desired audience(s).

The Integration Team identified a number of best practices to increase visibility of the area's resources to non-residents by marketing regional tourism opportunities via the web.

7.7.1 Introduction

Existing regional activities, upon which NEMIA is building, including the *Huron Greenways* study and the *US-23 Sunrise Side Coastal Highway Management Plan*, emphasize the importance of building a well-linked web presence as an important strategic element.

The *Huron Greenways* study (NEMCOG, 1999) recommends that regional tourism partners "develop a website, connected to existing tourism bureaus and chambers." Similarly, the *US-23 Sunrise Side Coastal Highway Management Plan* (NEMCOG, 2003) calls for significant marketing and promotion as well as tourism enhancement activities that could easily be reflected in web-based, as well as on-the-ground, activities. The following Priority Projects from the Management Plan can draw upon web technology in implementation:

Marketing and Promotion:

- Develop and distribute educational and informational brochures and other promotional literature and a website about the Route.
- Identify where to establish informational and educational tourist centers at strategic places along the Route. Determine how the tourist centers will be designed, staffed and maintained.

Tourism Enhancement:

- Improve hiking, non-motorized and snowmobile paths in public lands as a part of a regional network system.
- Plan to develop self-guided theme tours (e.g. ghost towns, genealogy).
- Delineate and mark water trails.
- Develop and deliver hospitality training programs for tourism related businesses.

In addition to the regional web building blocks and material, Travel Michigan's Lights of Northern Lake Huron driving tour places regional stories in a state-wide context. There are several additional stories that have been identified through regional tourism visioning sessions that should be developed and added to the Travel Michigan website immediately *and* then to the web presence developed for the region. These include:

- Harbors, Towns, and Ports;
- Commerce (or "Lake Huron Bluewater Highway");
- People Power of the Great Lakes; and
- Fins, Fur, and Feathers

A strategy for promoting these stories and tourism in Northeast Michigan via the web must include the following components: website hosting, website content and design, and Internet marketing and search strategies. This section will first quickly review the region's current tourism web presence then it will consider how each of the components above can be used to improve the regional web presence. It will conclude by highlighting some best practices

regarding web presence from the case studies, and finally important things to keep in mind when developing web-based products.

7.7.2 Existing web presence

Presently, the Michigan Sunrise Side Travel Association maintains the only regional tourism website at http://www.misunriseside.com. A sample of local tourism websites includes the following:

- http://www.alpenacvb.com – Alpena tourism website, which is maintained by the Alpena Convention and Visitors Bureau
- http://www.downtownalpena.com/ - information on Downtown Alpena, maintained by the Alpena Chamber of Commerce
- http://www.presqueislemi.com/main.html - Presque Isle County tourism website, maintained by the county tourism council
- http://www.rogerscitychamber.com – information on Rogers City, maintained by the Rogers City Chamber of Commerce.

Other tourism-related websites include the *Huron Greenways* study (NEMCOG, 1999), found at http://www.nemcog.org/greenways/greenways.html and the Thunder Bay National Marine Sanctuary, found at http://www.thunderbay.noaa.gov.

The tourism-related content of these websites is focused on providing information for potential visitors and promoting attractions and events. When combined, these websites provide information on the overwhelming majority of recreational opportunities for tourists. However they could be much more effectively designed, organized, and linked to maximize the number and duration of visits they receive. Although the importance of linking between local websites is recognized in the region, (for example, it is a recommendation in the *Huron Greenways* study as shown above) these linkages have not been made. The only way to access the *Huron Greenways* study is to know to look for it at the NEMCOG website. In addition, while the inventory and maps from the *Huron Greenways* inventory are available online, they are NOT linked to local tourism websites.

The Northeast Michigan websites reviewed by the Integration Team also lack an important component that is common to the case study websites which is a section that supports geo-tourism businesses and/or regional entrepreneurs. Typically this provides a series of tools for local businesses that promote the regional sense of place, provide a uniform image (e.g., through branding items such as logos, tour maps, checklists) and enhance the service the business is able to provide visitors to the region.

7.7.3 Promoting Tourism in Northeast Michigan via the Internet

Although website design falls under the category of information technology, a website has the potential to be much more than a conduit of information. A website provides capacity to control the information people gather about the region as well as the ability to shape how people perceive the region from a distance. All of which should be guided by the sense of place

developed by and for residents. Creative design and careful consideration of content allows the development of a web presence that is not only an information gateway to the region, but also reinforces the sense of place that residents want visitors to experience while in Northeast Michigan.

Web hosting

The first component to consider for marketing the region's tourism opportunities more effectively is the "location" of the website. Who will host the website and what will be the Internet address, its uniform resource locator or url? There are two possibilities. A new url could be purchased and an entirely new website developed. It would need to link to and from the existing websites but could provide a new face for the region. Conversely, an existing website and url could be redesigned to provide continuity for web visitors already used to visiting the website while attracting new visitors. A good candidate for that might be the US-23 Coastal Highway website that would logically link all of the communities in northeast Michigan.

If it is decided that a new url is the best choice, it is important that the url reflect the regional identity and desired tourism experience. Even the url can tell a story! It should invoke images, feelings, symbols, connotations, or memories that you want the user to associate with northeast Michigan. For example, the url www.visitnemichigan.___ is quite literal, and while it is direct and reflects the content of the website, it does little to stir the mind of the web visitor. On the other hand, a url such as www.truenorth.___, is more descriptive, evoking images and associations in the user's mind even before they visit the website.

Regardless of which option is pursued, the design phase is the best time to give thought to issues such as maintenance, adding content and sustainability – who can update the website and how frequently does that occur, how are additional pages designed and added, who pays for hosting the website?

Website Content and Design

When developing a web presence, there are four essential components to consider: content, navigation, visual appeal/design, and updates/maintenance.

Content

It is important to have the information that people are looking for when they are considering and/or planning vacation travel. The website provides the first opportunity for potential visitors to discover the region's identity; the message on the website must match other message/ marketing tools used to advance the region.

According to an analysis of the top five websites returned by a Google search of the five most searched keywords, there were several elements of content that the top websites hold in common (Webcredible, 2007):

1. The websites were *frequently updated*, many once a week or more. This reduces frustration among users when something interesting is no longer available or well past the event date;
2. There were *few or no spelling or grammar errors* which helps ensure credibility of the website;
3. *Paragraphs* were short, 1-4 sentences, with few or no blocks of text. Most people skip over long blocks of text as the Internet promotes a get-in-and-get-out approach to information gathering;
4. *Sentences* were also short, with 10 words or fewer. Medium and longer-length sentences were avoided and definitely not clumped when unavoidable;
5. Frequent use of *bulleted and numbered lists*. This breaks text into "digestible" chunks and prevents information overload;
6. The text content contains many *terms related to the keyword* as possible, including as many variations of the keyword.

Navigation

It is equally important, however, to organize information on your website in a way that is familiar to the average Internet user. It does no good to have a great looking, content rich website unless people can find the information for which they are looking where they generally expect to find it.

There is a lot of information related to website design available addressing design standards and criteria. Some of the best resources include material developed by the Neilsen-Norman Group founded by Jacob Neilsen and Donald Norman[11] and Internet pages with design tips related to website accessibility. The primary factor to remember is that people are looking for results that are fast and easy to achieve – they should take no more than three clicks to get where they want to go or they may be lost to another website.

Websites that use the same navigation template on all pages are most effective. Select a navigation bar with logical, but broad categories that can be further divided. Visitors will be looking for key categories such as: Home; About Us/the Region; What to Do/Events/Activities; Lodging; News/Media; Tools for Business. These broad headings can be further divided through the use of drop down menus or pop-up boxes.

Visual Appeal/Design

The consistent message conveyed by the website begins with the website's design. Design should be simple, but not boring. That can be achieved through the use of HTML and cascading

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[11] Jakob Nielsen, Ph.D., is a User Advocate and principal of the Nielsen Norman Group which he co-founded with Dr. Donald A. Norman (former VP of research at Apple Computer). Until 1998 he was a Sun Microsystems Distinguished Engineer. Dr. Nielsen founded the "discount usability engineering" movement for fast and cheap improvements of user interfaces and has invented several usability methods, including heuristic evaluation. He holds 79 United States patents, mainly on ways of making the Internet easier to use. (from http://www.accessibility101.org.uk/tips/7.htm, retrieved June 14, 2007)

style sheets (all stylistic elements, e.g., fonts, color, spacing, look the same regardless of the page visited on the website. Flashy or gimmicky elements such as blinking boxes, moving objects, flashing banners are distracting and are negatively associated with pop-up advertising which can turn-off some visitors. Additionally these elements are challenging to keep up. The best advice is Keep It Simple, Stupid also known as the KISS Principle (Accessibility 101, 2007).

Keeping design simple does not mean it cannot be visually stunning and also help meet one of the key internal and external marketing objectives – building, enhancing and maintaining a strong sense of place and community character. Websites offer an opportunity to reflect the sense of place that visitors can expect to experience when they are in the region. A well-designed website can help sway a potential visitor, leading them to explore regional offerings on the web further and therefore increasing the chance they will select the region as their travel destination. For travelers committed to traveling to the region, a website reflective of the region's identity will prepare them for the regional experience, building expectation and anticipation.

Maintenance

Since one of the keys to website content is frequent updating, it is important that updates be easy and fast, especially if the website will not be maintained by the designer/builder after its initial unveiling. Developing an easily maintained website may take more planning time initially and cost a little more, but will be worth it in the long run because it is so integrally linked to the ability to maintain content.

Internet Marketing

A website is only effective if people visit it. Resources spent designing and building a website can only be maximized if considerable resources are also invested in ensuring people will visit the website. Two ways of directing visitors to a website are search engine optimization and search engine marketing.

Searching for "Northeast Michigan travel" in three popular search engines (Google, Yahoo, and Ask) resulted in surprisingly few optimal returns. The goal in search engine optimization is to have your website come up on the first page of search results, preferably on the top half of that page using natural, that is, organic or algorithmic search results. You can improve the quantity and quality of visitors to your website if it ranks high in searches.

There are several strategies that can be employed when constructing and maintaining a website that will optimize the results of web searches. One factor Internet search engines use in ranking a website is its link popularity which is a measure of both the quantity and quality of the links to and from the website in question. Link quality relates to the types of websites that are linked to the website in question with certain types of websites considered higher quality than others. Securing high quality links can be challenging and potentially expensive. Securing the advice of an experienced search engine optimization consultant is well worth the resources and time that will be saved as a result.

Link quantity is also important, especially incoming links, which are websites that link to yours. Links from other websites bring visitors with them. They also offer search engine spiders, virtual robots that comb the Internet indexing pages in order to provide fast search results when the search engine is queried. Finally, links from other websites are more significant in providing higher ranking search engine results than links to other websites. They demonstrate that the editor of another website finds your content a valuable addition to his/her readers and is willing to potentially lose them to your website in exchange for that information.

As noted above, there are a good number of websites in Northeast Michigan that could provide relevant content for potential visitors. If all of these websites linked to and from each other, they would all increase their popularity and most likely their rank in search engine results.

The other, relatively inexpensive, way to promote more visitors to your website is to engage in search engine marketing. This is typically the paid or advertising space on the right-hand side of the search results page that are typically called "sponsored links." Variously, Google "click-ads," Yahoo "search marketing," and Ask "sponsored listings," these paid links can be useful ways to get visitors to your website. Website managers select a list of keywords that the target audience is most likely to use to search for information. People who search using those key words will see the ad developed by the website manager and the website is only charged for that advertising if the person actually clicks on the ad and goes to the website in question. This type of advertising begins as low as $0.05 per click and, with most search engines, can be capped after a daily limit is reached. That way the website controls how much is spent on advertising (Google, 2007).

Technology Support for Business

In addition to information to convince potential visitors and help confirmed visitors plan their trips, the best websites also included materials to support local tourism businesses. Business support materials include maps and itineraries that can be used to enhance guest experiences. One of the Olympic Peninsula tourism-related websites[12] provides tourist-related businesses with a list of events in their community that they can provide to visitors. Good photos and graphics to be used on brochures and other materials developed by the business and promoting regional identity are also useful. Research related to the tourism industry such as jobs and wages, tax information, visitor spending profiles and other useful information can also be found on these websites.

Additional best practices that supported geotourism from the case study websites included providing interpretive tools for local businesses. This ranged from theme-based maps and itineraries, to ecotourism interpretive tools. For example, the Queensland, Australia Regional Tourism Association website (http://www.tq.com.au/index.cfm) and the Lake Erie Coastal Ohio website (http://www.coastalohio.com) provide materials such as guidelines for managing visitor impacts, wildlife watch check lists, and other materials that enhance the individual and collective visitor experience.

7.7.4 Best Practices

[12] http://www.peninsulaevents.com/industry/index.html

The following examination of best practices from the case study regions and other locations will illustrate how design, navigation/organization, links and support for geo-tourism business have been incorporated into an effective web presence that definitely enhances the regions' visibility.

The first example is the **Blackstone Valley** website: http://www.tourblackstone.com.

1. Content: This website provides a lot of well-organized material. The content is presented in short paragraphs with short, simple sentences for the most part. Bullets and/or numbers are used whenever possible. The website has a calendar displaying the current week's events that conveys the number of activities a visitor can enjoy. Potential visitors are able to click on the calendar button and see events for the period in which they are interested in visiting. Some of the key activities – biking, dining, tours, and local festivals – are also highlighted on the front page and illustrated with thumbnail images; this attractive presentation will draw the potential visitor to explore further.

2. Navigation: The website has a common vertical menu bar used throughout with drop-down menus.

3. Visual: The website is attractive with lots of photos. It has a fairly simple design and is not graphic-heavy. Later examples will demonstrate how with just a little additional effort, the visual element can be further enhanced to convey sense of place/community character with even more strength.

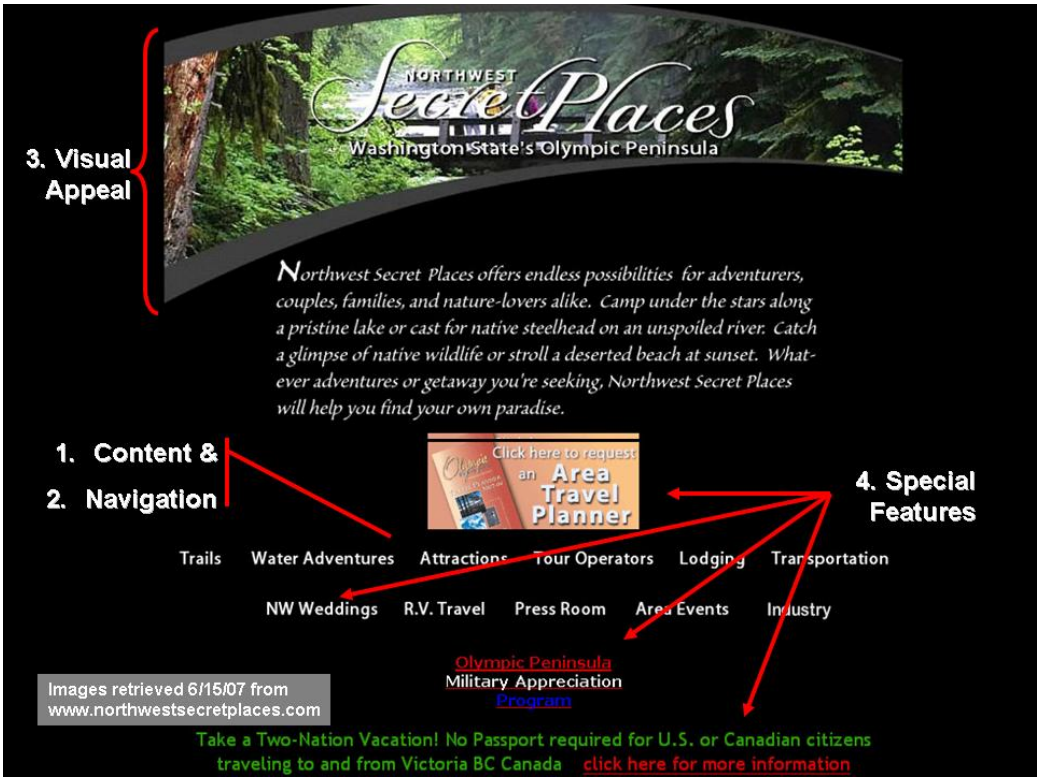
The **Olympic Peninsula** website at http://www.northwestsecretplaces.com is one example of the many websites available for potential visitors to the Pacific Northwest to explore. This website is profiled here because it is the most comprehensive; it represents all of Clallam County and it is the most visually appealing of the websites.

1. Content: This website is very comprehensive and includes specific information on activities and/or attractions specific to the region for which a potential visitor might be searching specifically such as information on weddings, and water adventure.

2. Navigation: This website provides a horizontal navigation bar along the bottom of the front page and a vertical navigation bar along the left side of interior pages. This website breaks some of the fundamental navigation rules – there is no "home" tab, nor are the vertical navigation bar contents the same for all the interior pages. That makes the website somewhat cumbersome to navigate and might curtail additional exploration by potential visitors.

3. Visual: This website has a clean design with beautiful, evocative images and interior pages that convey the sense of the activity, if not always the place.

4. Special Features: Northwest Weddings pages that include links to help plan all aspects of the wedding from a distance; Military Appreciation Program provides a page of links to businesses that provide discounts to active members of the armed services; Two Nation Vacation provides information for US and/or Canadian citizens and permanent residents on border crossing procedures and opportunities. The front page button for requesting a travel planner (in reality a link to the Chambers of Commerce website which provides "additional information;" it is unclear what that means).



An even richer example of what can be done with a regional website is the example of the **State of Minnesota's** "Explore Minnesota" tourism website: http://www.exploreminnesota.com.

1. Content: This website has all of the material a potential visitor needs to plan a trip to Minnesota.

2. Navigation: The navigation is horizontal across the top. The website search tab is an excellent feature because visitors who are not finding what they seek are likely to use this resort before leaving the website in frustration.

3. Visual: The Minnesota website reflects sense of place in look, photo album design, wood carving, and powerful photos. There are no gimmicks or flashy elements.

4. Special Features: Travel Tools is an excellent feature that leads to a page with a secondary menu including "travel counselor" telephone and e-mail contact for people located in Minnesota to answer travel-related questions; "e-newsletters" provide an opportunity to sign up for e-mail updates on places and events; "brochures" a host of brochures on lots of travel topics to be sent via mail; "general travel information" answers common questions such as sales/accommodation tax, tipping, transportation; "travel information centers" lists where travel information can be located on the road; and

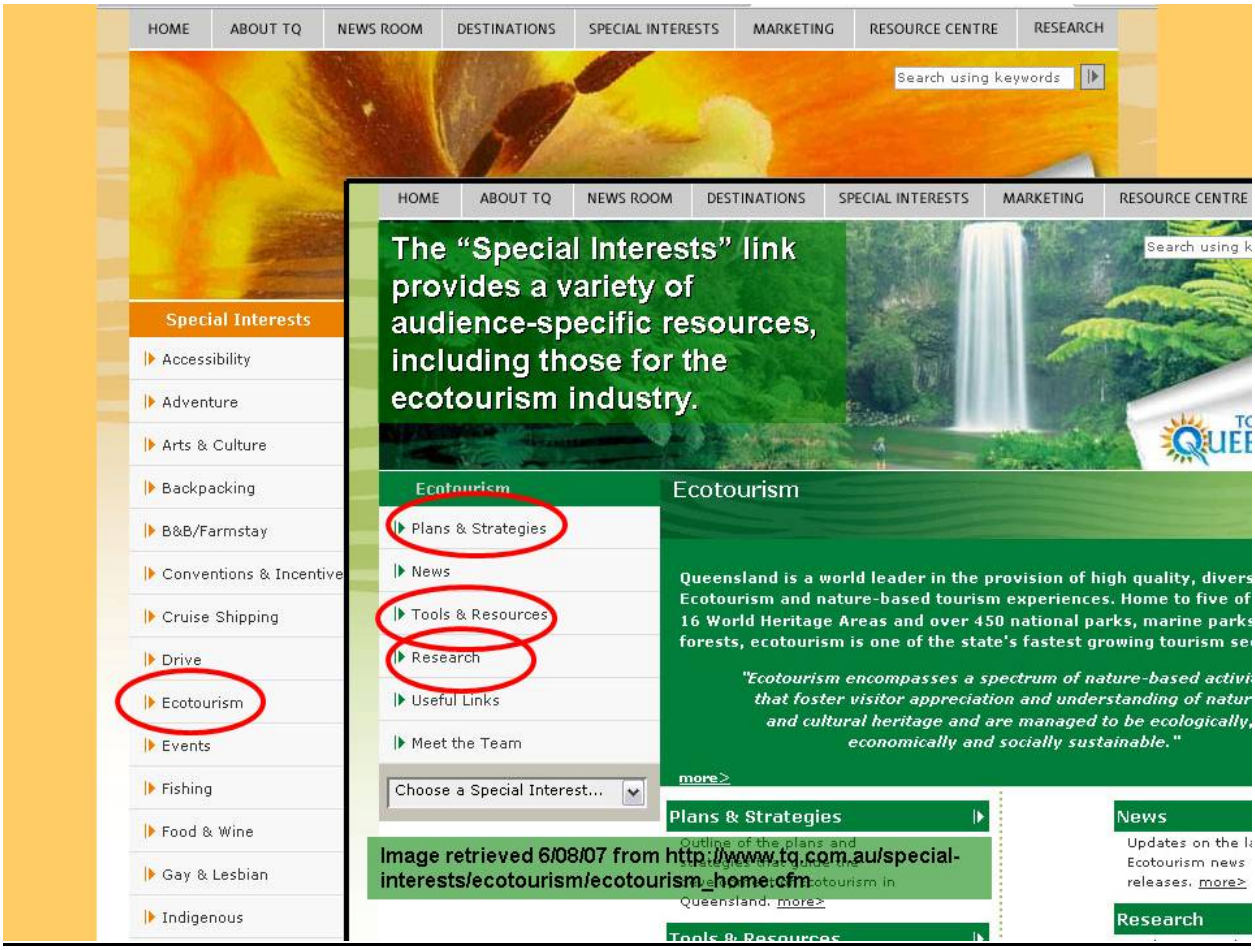
"local tourist information" connection to local chambers of commerce and tourism information websites. My Favorite Minnesota is an excellent example of how sense of place can be used to pique and/or enhance a potential visitor's interest in the location. "Real" Minnesotans recommend their top ten places in a variety of categories, such as family fun, outdoor adventure, scenic byways, golf, camping, etc.

The **Queensland, Australia** Regional Tourism Association website, called Travel Queensland, is an excellent example of Internet use to support the tourism industry: http://www.tq.com.au/index.cfm. There appears to be a division of labor in Australia, in that the local websites provide information for potential visitors planning trips, while the regional website primarily provides support to the tourism industry itself. The website provides a library of tools, research (data, information and reports), and other resources such as marketing products and best practices. The material includes specific content directed to the cultural and eco-tourism specific businesses practicing geo-tourism.

On a regional scale, an ecotourism web-based "clearinghouse" provides a foundation for organizing and delivering products and services for the ecotourism industry. While the Travel Queensland website serves valuable information to visitors, the website specifically targets the ecotourism industry for delivery of plans and strategies, industry research, tools and best practices, publications and training, and current news. Some examples of specific

products/training services available on the website that support ecotourism business development with resource protection in mind include: (1) *Successful Tourism at Heritage Places: A guide for tourism operators, heritage managers, and communities* (Australian Heritage Commission and CRC for Sustainable Tourism, 2001); (2) *Tourism Management in Queensland Protected Areas* (Tourism in Protected Areas Working Group, 2003); and (3) *Environmental Impact Monitoring: A guide for tourism operators* (Tourism Queensland, 2002).

For new or existing businesses, a significant amount of market research is provided on the Tourism Queensland website (Tourism Queensland, 2007), for example, providing information about: (1) "what tourists are looking for in nature tourism," (2) birdwatching tourism, (3) "markets for nature-based activities," and (4) snorkeling and diving tourism. Finally, tools, best practices, and accreditation programs provide support for businesses ranging from resource protection, business planning and start-up, visitor management, engaging communities, and using technology for interpretation.

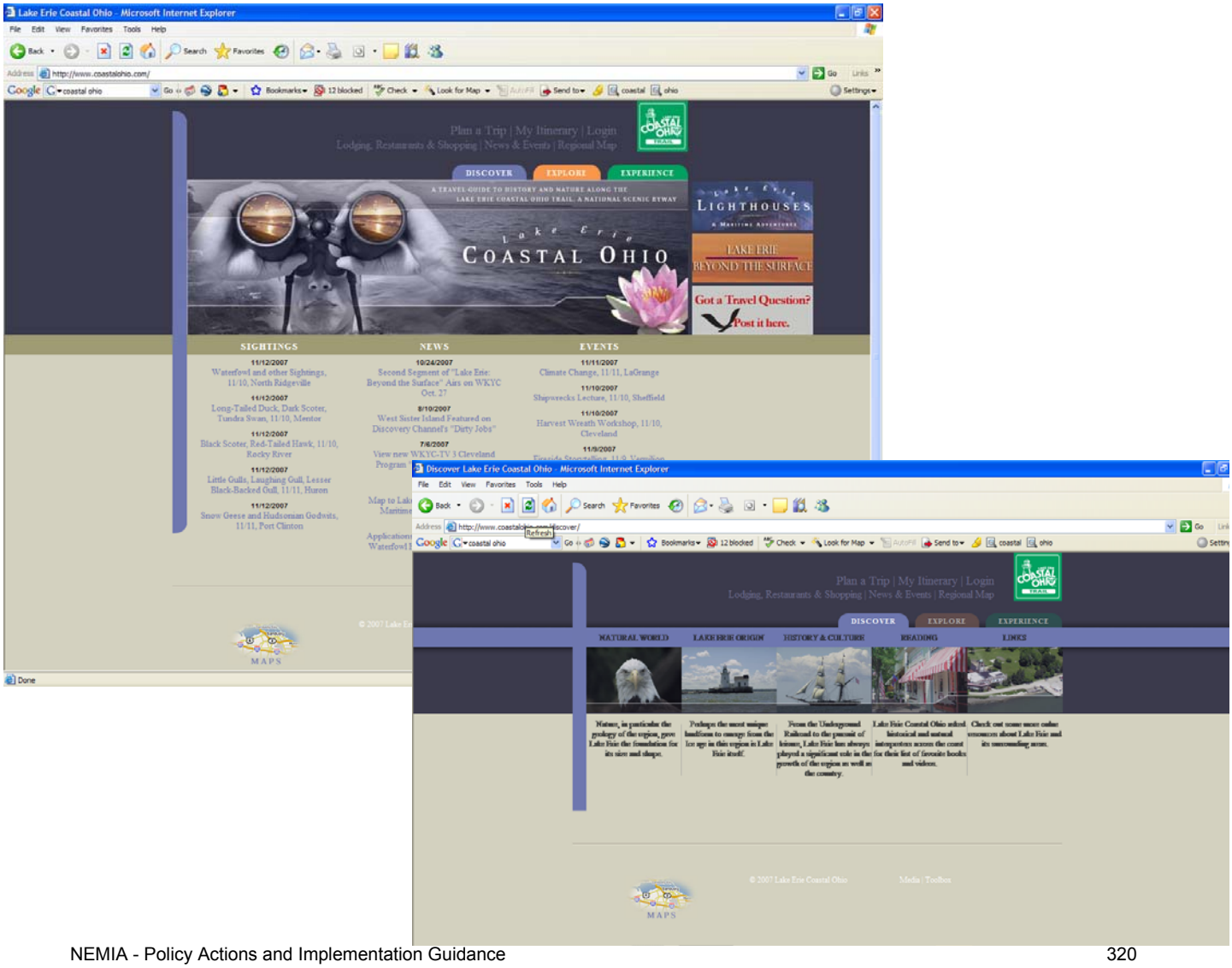


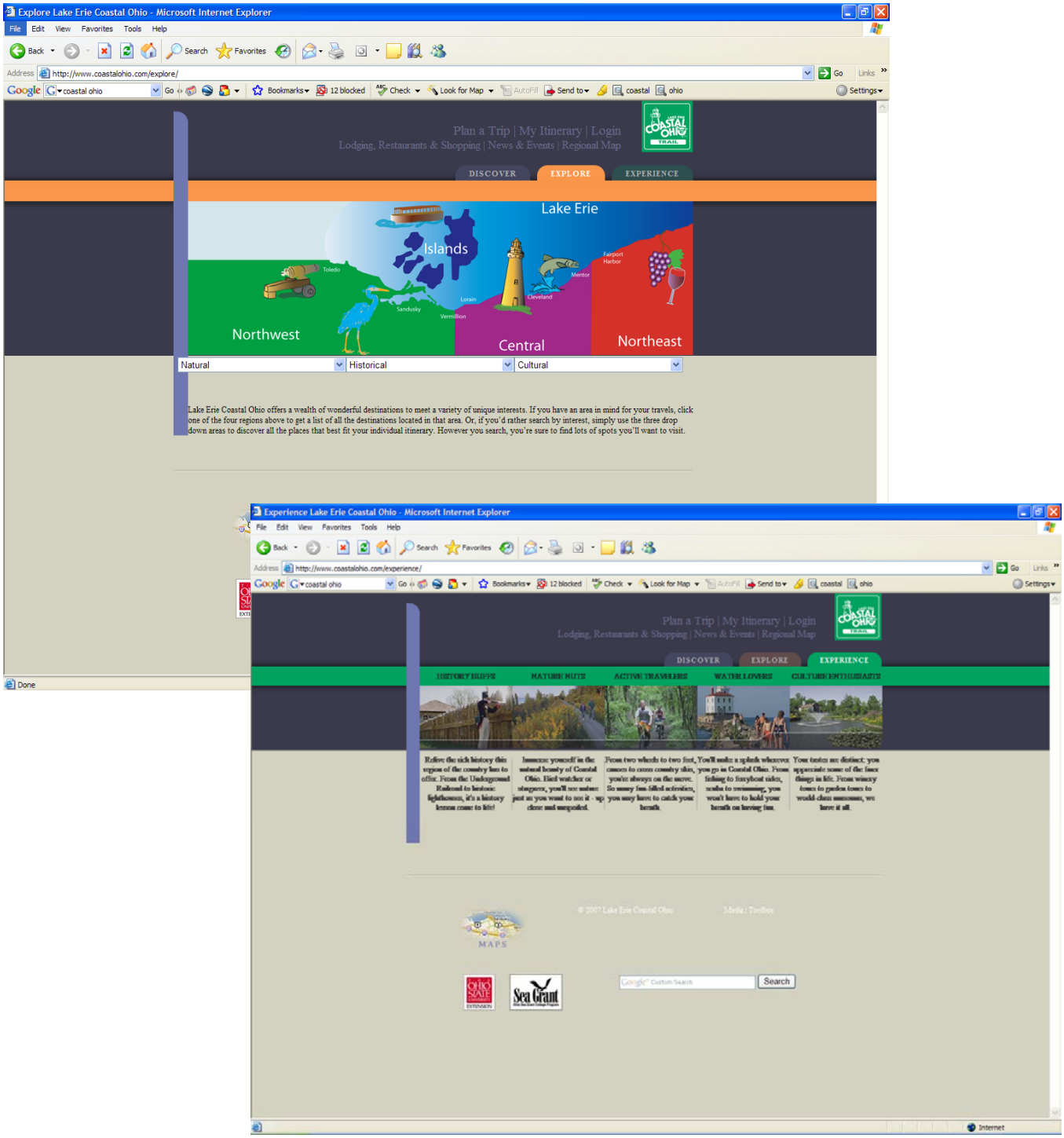
The **Lake Erie Coastal Ohio** initiative utilizes the Internet as a primary tool for connecting and marketing coastal tourism regionally. Federal grants through the NSBP were pivotal in developing the Lake Erie Coastal Ohio website as one deliverable. This regional website (http://www.coastalohio.com) serves the dual purpose of providing tools and resources for the

tourism industry, as well interpretive information, maps, and announcements useful to visitors traveling to and through the region. The background and process in arriving at this regionally serving product was equally important in fostering cooperative relationships and partnerships toward sustainable tourism development.

As a primary tourism tool, the Lake Erie Coastal Ohio website serves as a clearinghouse to organize and disseminate coastal tourism related information, tools, and resources in support of the tourism industry and for the benefit of providing a better tourism experience for visitors. For the industry, this website provides a clearinghouse format by which to collect and organize tourism relevant tools, such as interpretive maps and resources, best practices for businesses, media resources, and trainings and other business development products. For the visitor, this website provides information organized in three primary categories: 1) Discover, 2) Explore, and 3) Experience.

Visitors seeking to "Discover" find information and attractions related to specific regional themes, such as the natural world, Lake Erie origin (geological history and features), history and culture, reading resources, and relevant Internet links. Visitors "Exploring" Coastal Ohio can search natural, historical, and cultural features, attractions, and businesses by sub-region (e.g., northwest, central, or northeast Ohio). Finally, the "Experience" section provides activities and events by which participants can actively participate; these organized by history, culture, nature, active travelers (i.e., biking), and water lovers (i.e., boating) (LECO, 2007).




Explore Lake Erie Coastal Ohio - Microsoft Internet Explorer
http://www.coastalohio.com/explore/
Plan a Trip | My Itinerary | Login
Lodging, Restaurants & Shopping | News & Events | Regional Map
DISCOVER
EXPLORE
EXPERIENCE
Lake Erie
Islands
Toledo
Sandusky
Lorain
Vermilion
Cleveland
Mentor
Fairport Harbor
Northwest
Central
Northeast
Natural
Historical
Cultural
Lake Erie Coastal Ohio offers a wealth of wonderful destinations to meet a variety of unique interests. If you have an area in mind for your travels, click one of the four regions above to get a list of all the destinations located in that area. Or, if you'd rather search by interest, simply use the three drop down areas to discover all the places that best fit your individual itinerary. However you search, you're sure to find lots of spots you'll want to visit.
Done
Experience Lake Erie Coastal Ohio - Microsoft Internet Explorer
http://www.coastalohio.com/experience/
Plan a Trip | My Itinerary | Login
Lodging, Restaurants & Shopping | News & Events | Regional Map
DISCOVER
EXPLORE
EXPERIENCE
HISTORY BUFFS
NATURE NUTS
ACTIVE TRAVELERS
WATER LOVERS
CULTURE ENTHUSIASTS
MAPS
Search
Internet

Works Cited

Accessibility 101. (2007). *KISS – Keep it simple stupid!* Retrieved June 14, 2007, from http://www.accessibility101.org.uk/tips/30.htm

American Institute of Architects (AIA). (2006). American Institute of Architects Sustainable *Design Assessment Team Northern Michigan SDAT report: Envisioning a future for Northeast Michigan*. AIA Center for Communities by Design.

Athman & Monroe. (2001). Elements of effective environmental education programs. In *Defining best practices in boating, fishing, and stewardship education*, eds. A. J. Fedler and B. E. Matthews, pp. 37-48. Arlington, VA: Recreational Boating and Fishing Foundation. Retrieved December 18, 2007, from http://www.rbff.org/uploads/Resources_bestpractices/julieathman_paper.pdf

Australian Heritage Commission and CRC for Sustainable Tourism. (2001). *Successful tourism at heritage places: A guide for tourism operators, heritage managers, and communities.* Australian Heritage Commission. Canberra, Australia: Australian Government. Retrieved December 18, 2007, from http://www.ahc.gov.au/publications/successful-tourism.html

City of Calgary, Alberta. (2007). *The city of Calgary: Sense of community.* Retrieved December 6, 2007, from http://www.calgary.ca/portal/server.pt/gateway/PTARGS_0_2_395_203_0_47/http;/content.calgary.ca/CCA/CityHall/BusinessUnits/CommunityandNeighbourhoodServices/SocialResearchPolicyandResources/SenseofCommunity/SenseofCommunity.htm

City of Calgary, Alberta. (2007). *The city of Calgary: Sense of community index.* Retrieved December 6, 2007, from http://www.calgary.ca/portal/server.pt/gateway/PTARGS_0_0_395_203_0_47/http%3B/content.calgary.ca/CCA/CityHall/BusinessUnits/CommunityandNeighbourhoodServices/SocialResearchPolicyandResources/SenseofCommunity/CalgarySenseofCommunityIndex.htm

Clark, S. & Gray, J. (2006, June 8). *Cultural resources: It's all about this place.* Retrieved July 24, 2007, from http://www.miseagrant.umich.edu/downloads/coastal/NEMIA/Cultural-Assessment_Clark_Gray.pdf

Eisenhauer, B.W., Krannich, R.S., & Blahna, D.J. (2000). Attachments to special places on public lands: An analysis of activities, reason for attachments, and community connections. *Society & Natural Resources, 13*, 421-441.

Google. (2007). *Welcome to AdWords*. Retrieved December 7, 2007, from http://adwords.google.com/select/Login

Great Lakes Fishery Trust. (2007). *Great lakes stewardship initiative overview.* Retrieved December 3, 2007, from http://www.glft.org/StewardshipInitiative/GLSIOverview.pdf

Great Lakes Water Studies Institute at Northwestern Michigan College. (2005). *Creating stewards of the Great Lakes.* Retrieved December 3, 2007, from http://www.miseagrant.umich.edu/downloads/education/aquatic-edu-network/GLFTPBEFinalReport2.pdf

Hanlan, J. & Kelly, S. (2005). Image formation, information sources and an iconic Australian tourist destination. *Journal of Vacation Marketing, 11*(2), 163-177.

Hungerford H.R. & T. Volk. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education 21*(3), 8-21.

Lake Erie Coastal Ohio, Inc. (2005). *Lake Erie coastal Ohio trail scenic byway corridor management plan 2005*. Lake Erie Coastal Ohio, Inc.

Michigan Department of Natural Resources. (2007). *Lake Huron's new ecosystem and food web.* Retrieved December 3, 2007, from http://www.michigan.gov/documents/LakeHuron NewEcosystem-foodweb_122463_7.pdf

Morais, D.B., Dorsch, M.J., & Backman, S.J. (2004). Can tourism providers buy their customers' loyalty? Examining the influence of customer-provider investments on loyalty. *Journal of Travel Research, 42*(3), 235-243.

National Geographic Center for Sustainable Destinations (NGCSD). (2007). *About geotourism*. National Geographic Society. Retrieved August 8, 2007, from http://www.nationalgeographic.com/travel/sustainable/ about_geotourism.html

Northeast Michigan Council of Governments (NEMCOG) and East Central Michigan Planning and Development Regional Commission. (2003). *US-23 sunrise side coastal highway management plan.* Retrieved December 18, 2007, from http://heritageroute.com/ ManagementPlan/index.htm

Northeast Michigan Council of Governments (NEMCOG). (1999). *Huron Greenways: A system of land and water trails for Alcona, Alpena, Cheboygan, and Presque Isle Counties.* Gaylord, MI: NEMCOG. Retrieved December 18, 2007, from http://www.nemcog.org/ greenways/greenways.html

Pergams, Oliver R.W., & Patricia Zaradic. (2008). Evidence for a fundamental and pervasive shift away from nature-based recreation. Proceedings of the National Academy of Sciences 95 (107), 2295-2300.

Pritchard, M.P. (2003). The attitudinal and behavioral consequences of destination performance. *Tourism Analysis, 8*(1), 61-73.

Rhode Island Tourism Division. (2007). *Tour Rhode Island, There's No Place Like Home - May 5, 2007.* Retrieved December 7, 2007, from http://www.visitrhodeisland.com/tourri/ tourri.aspx

Schroeder, B.C. (2007, May 10). *Tourism marketing: Integrated assessment ideas.* Retrieved December 7, 2007, from http://www.miseagrant.umich.edu/downloads/coastal/NEMIA/NEMIA-May10-Part3tourism-marketing.pdf

Sequim Lavender Growers Association. (2007). *About the lavender festival.* Retrieved on December 7, 2007, from http://www.lavendergrowers.org/about.html

Shamai, S & Ilatov, Z. (2004). Measuring sense of place: Methodological aspects. *Tijdschrift voor Economische en Sociale Geografie, 96*(5), 467-476.

Shamai, Shmuel. (1991). Sense of place: An empirical measurement. *Geoforum 22* (3),347-358.

Sobel, David. (2007). Place-based education: *A path to improved academic achievement, community economic vitality, environmental quality.* Retrieved April 24, 2007, from http://www.glft.org/StewardshipInitiative/Sobel.pdf

Stueve, A.M., Cook, S.D., & Drew, D. (2002). *The geotourism study: Phase I executive summary*. Washington, D.C.: Travel Industry Association of America. Retrieved December 18, 2007, from http://rogharris.org/GeotourismPhaseFinal.pdf

Thunder Bay National Marine Sanctuary (TBNMS). (2007). *Thunder Bay National Marine Sanctuary state of the sanctuary report 2006.* National Oceanic and Atmospheric Administration. Retrieved December 18, 2007, from http://thunderbay.noaa.gov/pdfs/SOS.pdf

Tourism in Protected Areas Working Group Report. (2003). *Tourism management in Queensland protected areas.* Brisbane, Australia: State of Queensland. Retrieved December 18, 2007, from http://www.tq.com.au/shadomx/apps/fms/fmsdownload.cfm?file_uuid=5FDD22E5-D9B6-577D-431C-DD3F4EF4BD3D&siteName=tqcorp_06

Tourism Industry Planning Council. (2006). *Michigan tourism strategic plan: Visitor experience.* Retrieved on December 4, 3007, from http://tourismplan.msu.edu/Resources/FinRepMtg/VisExp_Report.pdf

Tourism Queensland. (2002). *Queensland ecotourism plan 2003-2008: Sustainable tourism in Queensland's natural areas*. Brisbane, Australia: State of Queensland. Retrieved December 18, 2007, from http://www.tq.com.au/tqcorp_06/index.cfm?5F94D737-A8F7-4AA4-DC2D-48ABCB495D22

Tourism Queensland. (2007). *Ecotourism – research: Tourism fact sheets.* Brisbane, Australia: State of Queensland. Retrieved December 7, 2007, from http://www.tq.com.au/tqcorp_06/special- interests/ecotourism/research/research_home.cfm

Travel Michigan. (2007). *Lights of Northern Lake Huron.* Retrieved July 24, 2007, from http://www.michigan.org/travel/drivingtours/detail.asp?cid=951AACA5-53F0-491B-ADAB-FC4A3558FAAA&m=9;4

Tuan, Y. (1977). *Space and place: The perspective of experience.* Minneapolis: University of Minnesota Press.

Webcredible. June, 2006. *Google's advice for your website: Content.* Retrieved June 14, 2007, from http://www.webcredible.co.uk/user-friendly-resources/search-engine-optimisation/google-content.shtml

Williams, D.R. & Stewart, S.I. (1998). Sense of place: An elusive concept that is finding a home in ecosystem management. *Journal of Forestry, 96*(5), 18-23.

Williams, Doris. (2007). *Connecting schools and communities.* Retrieved December 3, 2007, from http://www.glft.org/StewardshipInitiative/DorisWilliams.pdf

APPENDIX A. CASE STUDIES

The four case studies that follow – Blackstone Valley, MA/RI; Olympic Peninsula, WA; Queensland, Australia; and Coastal Ohio – have several themes in common that make them excellent choices from which to select applicable best practices. They all exhibit a geotourism focus to their tourism industry, a strong sense of place, and a quality visitor experience. In so doing they provide a variety of best practices that have the potential to profoundly shape the already exciting activities underway in the NEMIA study area.

1. Blackstone Valley, MA/RI

Overview

Blackstone Valley is a river valley shared between Massachusetts and Rhode Island. It encompasses twenty four communities, some 400,000 acres and over 500,000 people. The valley was the first industrialized region of the United States and led the country in manufacture of everything from automobiles to locomotives to textiles. As the industrial revolution moved through and beyond the Valley, it left behind significant environmental degradation so that by the early 1970s and the emergence of the environmental movement, a movement to "take back the landscape" began to emerge there too (Robert Billington, personal communication, April 23, 2007; A significant step forward in that activity occurred in the mid-1980s when Congress declared the valley a National Heritage Corridor under the auspices of the National Park Service (Blackstone Valley Tourism Council, Inc., 2007).

Similarities to the Study Area

Blackstone Valley had a reputation as an environmentally degraded and economically poor community, described in a national magazine in the 1990s as the "poor corner in a poor house." The comment referred to Rhode Island's challenging economic situation at that time and noted that in this poor state, the Blackstone Valley was even poorer. Reference was made to "bombed out" mill-towns, degraded land and polluted river water. The area also had a reputation as a heavily immigrant, blue-collar area with negative stereotypes related to violence and illicit drugs (R. Billington, personal communication, April 23, 2007). Northeast Michigan is not environmentally degraded. It has, however, in recent years experienced some environmental issues that have negatively impacted some perceptions of the region. These include the health of the deer herd on which bovine tuberculosis has had a significant impact (Michigan Department of Natural Resources [MDNR], 2006; MDNR, 2007) and a relatively recent dispute between the Michigan Department of Environmental Quality and LaFarge North America Plant in Alpena related to mercury discharges (WOODTV, 2006; Alpena News, 2006).

In the mid-1980s discussion began to focus on tourism and the idea that there was a unique story to tell about Blackstone Valley in which others might also be interested. The initial, and ongoing, focus was on community development, rebuilding from the roots of the valley's culture and history. By the end of the 1980s the valley had been designated a National Heritage Corridor within the National Park System, which provided the necessary cachet to begin building an experience that would lure visitors to the area. It also allowed the region to access critical

federal resources to support the new tourism activities. The National Heritage Corridor designation covers about 600 square miles within which around 500,000 people reside. Despite the large population and "near-urban" location, the valley has a strong rural character.

Differences

The Blackstone Valley is not identical to the study area. However the differences, as significant as they might appear, are ones of scale, not qualitative. The Blackstone Valley is somewhat smaller geographically, than the study area – 600 square miles compared to the 1,909 square miles of the three counties. Average population density is also different, with portions of the Blackstone Valley having upwards of 5,000 people per square mile (Wikipedia, 2007). Comparatively, the three counties of the study area average 27 people per square mile (NEMCOG, 2001a, b, c).

Tourism Industry

The perceived tourism competition for Blackstone Valley is with areas within an hour's drive – such as Newport, RI; Boston, MA; Mystic, ME; Plymouth, MA. There was no tradition of tourism in the valley therefore tourism infrastructure has been developed from scratch, building upon the residents' understanding of themselves and their past. The approach has been geotourism based. They have built upon culture and history, while commercial, educational, and natural resources are important too. The focus has been on connecting all these resources in one holistic package.

In 2004, Blackstone Valley had approximately 2.3 million visitors with an associated $474 million in travel expenditure generating 6,400 travel-related jobs. Overnight trips broke down to 48 percent of visitors staying in hotel/motel/B&B accommodations, 41 percent in private/friend homes and 11 percent in vacation home/camps (Tourism Industry Association of America, 2006). Between 1987 and 2003, there has been some $21.8 million of federal investment associated with the National Heritage Corridor. The Blackstone Valley has been able to leverage this money, garnering more than three times as much ($73.5 million) in private investment. This indicates how public investment can be leveraged but also demonstrates that private investment will not necessarily occur at a steady state but sometimes happens almost all at once. For example, $70.3 million of the private funds have been invested since 1999 (Billington, 2004). One of the goals identified by the NEMIA workgroup is to capitalize on the presence of Thunder Bay National Marine Sanctuary to build complementary enterprise – this may be a long-term strategy but, when it pays off, obviously well worth it.

> Blackstone Valley Tourism Council Director, Bob Billington says, *"Tourism will come, if you make the place right and true to the heritage, stories, [and] truth of the place. Once you have a sense of place and pride of ownership, you are much of the way you need to go.*" (Robert Billington, April 23, 2007)

2. Olympic Peninsula, WA

Overview

Washington State's North Olympic Peninsula is located just northwest of Seattle and is accessible by ferry, plane, boat, or highway. The area boasts a multifaceted landscape encompassing ocean beaches, the Olympic Mountain range, lakes, waterfalls, rivers, and a temperate rain forest. Just over one million acres in size, the peninsula boasts Olympic National Park at its center and the Olympic Coast National Marine Sanctuary along its north and west coasts.

The Olympic National Park is set in the center of the peninsula and combines the Olympic Mountain peaks, the unique rain forests covering the Park's western coastal valleys, and the rocky Pacific Ocean coast. The Olympic Coast National Marine Sanctuary boundary encompasses approximately 2500 square nautical miles of coastal and ocean waters, and associated submerged lands, and runs more than 65 miles along a landward boundary with Olympic National Park and Cape Flattery on the Makah Indian reservation.

Port Angeles, the county seat, has airline service to William R. Fairchild International Airport. Port Angeles is also the gateway city to Victoria, BC, Canada with two modes of ferry travel available at the waterfront.

Similarities to the Study Area

In the early 1990s the Olympic Peninsula suffered economic displacement due to significant changes in harvest regulations for National Forests. These regulatory changes were in response to concerns over endangered spotted owl populations and associated habitat in old-growth forests (Phillips, 1999). The federal government provided a significant economic recovery program – the Northwest Economic Adjustment Initiative – for the three states most affected: California, Oregon, and Washington. These resources, to a certain extent, allowed residents in the region to develop a variety of nontraditional business opportunities including ecotourism. Recent concern that the region, or at least some communities within it, might be overrun by tourists has led to the consideration of geotourism-related issues (Allen, 2003).

The region's geography is similar to the Northeast Michigan study area. It shares a similar rural character and its location on a peninsula with one major highway for access to the region is similar to transportation in the study area.

Differences

Because of the national and international discussion of the controversy causing the economic displacement outline above – the fate of the spotted owl and its habitat – the region has had considerable "free" advertising among a key tourist market – the ecotourists – which the region has subsequently been able to exploit. To a certain extent the region also benefits from being more closely connected to major metropolitan locations, such as Seattle, than the study area. It is also able to take advantage of the general trend of investment and self-employed income moving to coastal and mountain regions along the west coast (Nelson, 1999).

Tourism Industry

There is no doubt that tourism is a significant economic driver for the Olympic Peninsula. Like the Northeast Michigan study area, tourism opportunities range from breathtaking natural resources – mountains, oceans and alpine meadows – to historic and contemporary cultural resources in the relatively few and small coastal communities sprinkled across the peninsula. Olympic National Park alone boasted just over 3.3 million visitors in 2000. Those visitors spent about $89 million related to their stay in or proximate to the Park. This economic activity resulted in an additional $45 million in value added to the local economy and 1,881 tourism-related jobs (Stynes et al., 2001).

3. Queensland, Australia

Overview

Ecotourism is considered a significant contributor to the Queensland economy and the northeast coastline offers many businesses that benefit from the area's unique assets. This coastal region has branded their area as the place where the "rainforest meets the reef," and has developed ecotourism opportunities that build around these assets, such as:

- scenery in jungle and ocean vistas highlighted on various maps and at turnouts;
- natural resources both in Daintree Rainforest wildlife and aquatic life of the Great Barrier Reef showcased through night hikes and diving;
- agricultural products that include tropical fruits marketed through fruit tasting farms and fruit wineries;
- recreational activities such as jungle canopy surfing, diving, and snorkeling; and
- town centers providing shopping and dining that reflect local history and culture.

Queensland, Australia has developed a regional strategic *Queensland Ecotourism Plan 2003-2008* (Tourism Queensland, 2002). Similar to the NEMIA process, this strategic plan was developed through planning and consultation with the tourism industry specifically ecotourism industry stakeholders, visitors, government bodies (federal, state, and local), natural area managers, conservation groups, local community leaders, aboriginal communities, education and research institutions, and other special interest groups. This group determined that for Queensland, ecotourism should encompass a spectrum of "…nature-based activities that foster visitor appreciation and understanding of natural and cultural heritage and are managed to be ecologically, economically, and socially sustainable.**"**

Similarities to the Study Area

Northeast Queensland's coastal cultural and natural resources, including the world heritage Daintree rainforest and the Great Barrier Reef, are unique to this region of Australia and different from those of Northeast Michigan. However, there are also many similarities. Both regions take pride in their significant undeveloped, unspoiled resources, and have little built infrastructure outside of major city centers.

The regional economies are dependent on tourism, and while they draw tourists based on major attractions (e.g., the Great Barrier Reef), the majority are "mom and pop" or smaller entrepreneurial businesses developed around a diversity of coastal tourism opportunities and

activities. City and towns in this region are rural, and populations of villages, towns, and cities are similar to less populated than those of Northeast Michigan. The Daintree Village (<100 residents) and Port Douglas (~1000 residents) are examples of small coastal communities in this region; Cairns (~125,000 residents) is the nearest major city center, located 70 kilometers (approx. 43 miles) south of Port Douglas. (Australian Bureau of Statistics, 2006a, b, and c).

Northeast Queensland's geographic context is similar to Northeast Michigan. This area is peninsular in nature, and somewhat difficult location for tourists to get to (with increasing difficulty and equipment needs as you travel farther north). Therefore, this is an area that people must go out of their way to visit, and have to consciously choose to visit, and would not likely be only passing through. Finally, Australian fuel prices ($3.76 in Sydney in May 2006, (Cable News Network, 2007)) are not necessarily considered a hindrance to tourism. It is interesting to note that these prices are similar and still higher than the highest fuel rates in Michigan in 2007 (state average of $3.52/gallon in May 2007 (Mlive.com, 2007)) where increasing fuel costs are commonly blamed for impeding tourist travel. Therefore, the region's geographic location, socio-economic contexts of the region, and the region's interest and investment in ecotourism and cultural/heritage tourism provide a comparable connection with the NEMIA study area.

Differences

Queensland, Australia is different from Northeast Michigan in that its tourism visitors are drawn from a worldwide market, with a majority of the visitors traveling from outside the region (and even country) to visit the Northeast Australian coastline. Queensland represents an entirely different continent, and so there are differences in governmental structure, types of programs, and resource management rules, regulations, and culture. Finally, the coastal tourism industry in Northeast Queensland has a significantly different climate, their latitudinal position offering year-round warm weather tourism opportunities (so longer seasons for recreational boating, diving, etc.).

Tourism Industry

Northeast Queensland's tourism industry structure is comparable to that of Northeast Michigan in that there are many localized tourism associations or visitor bureaus, many of these working on limited budgets and even voluntarily run. Specific examples include the Daintree Village Tourism Association, the Port Douglas Tourism Association, and the Daintree Cape Tribulation Tourism Association. The role of these organizations is to promote local tourism and provide visitors with local travel information and resources. In many cases, the local tourism offices are able to reserve and book tours or services offered by local businesses for the visiting customer. Currently there is little cooperation between local tourism agencies, but they are working to develop some cooperative projects of common, strategic interest in response to incentives by funding agencies including criteria for cooperation among tourism groups (Alison Gotts, personal communication, April 27, 2007)

Similar to the regional Sunrise Side Travel Association or even Travel Michigan (the State of Michigan's tourism agency), Tourism Queensland is the regional or state governmental body supporting tourism in this part of Australia. Tourism Queensland is governmentally subsidized,

and focuses primarily on providing services and support for businesses within the tourism industry, including a web-based clearinghouse, market research, business development training, and best practices. Tourism Queensland has facilitated focused strategic planning processes (similar to the NEMIA process) and industry support products and best practices specific to ecotourism (Tourism Queensland, 2002) and heritage tourism (Australian Heritage Commission and CRC for Sustainable Tourism, 2001). Connections and collaborative work among local and regional entities has yielded mixed results; by one local account, some larger businesses work with regional tourism organizations, but the majority of smaller businesses are simply "trying to make ends meet" and not able to take full advantage of regional programs (A. Gotts, personal communication, April 27, 2007).

4. Coastal Ohio: Ohio's Lake Erie Coastal Tourism Initiative

Overview

The Lake Erie coastline stretches 293 miles across northern Ohio. Similar to Northeast Michigan, the Ohio tourism industry recognizes the opportunity to enhance economic returns from these resources through sustainable coastal tourism development and marketing. This challenge involves understanding opportunities to diversify the types of tourists that visit the region (and the seasons in which they visit). This region continues to place significant investment in various forms of coastal tourism initiatives, such as the Lake Erie Circle Tour.[13] One challenge for this region has been sustaining regional commitment to the Circle Tour, as well as determining next developmental steps for this project. The region, rich in coastal tourism assets, has faced challenges in how to best connect multiple disparate, disconnected, and competing efforts along the coastline (Frank Lichtkoppler, personal communication, March 2007).

To address these challenges and opportunities, this region has drawn upon local, regional, and federal Scenic Byway program resources in developing the Lake Erie Coastal Ohio initiative (heretofore Coastal Ohio). The mission of Coastal Ohio is to: "…improve the tourism economy and quality of life by telling the story of Lake Erie while advocating for the preservation and enhancement of the lake's natural, historical, and cultural resources**"** (Lake Erie Coastal Ohio, Inc. [LECO], 2005). In accomplishing this mission, Coastal Ohio has focused their investment and work in four primary areas, including:

1. Regionally coordinated asset inventory;
2. Resource protection and interpretation;
3. Providing support tools for industry; and
4. Marketing to "improve experiences for visitors"

In mission and strategic focus, this regionally-developed initiative (and corresponding planning process) provides a similar parallel to Northeast Michigan's US-23 Sunrise Side Coastal Highway and the specific policy question and work being conducted through this integrated assessment and study area.

[13] For more information, see http://www.circle-erie.com

Similarities to the Study Area

This Ohio region is comparable to Northeast Michigan in that their work is focused around packaging and marketing their collective coastal assets, including natural, cultural, historical, scenic, and recreational assets. Through Coastal Ohio they seek to accomplish this through coordinated and collaborative regional partnerships.

Ohio and Lake Erie share a Great Lakes identity with Northeast Michigan. In this context, their tourism industry is marketing the same general types of historic, cultural, and natural resources that are relevant across the Great Lakes Basin or associated with the Midwest United States. Geographic location means the tourism industry and types of coastal activities are limited by similar climate and varying seasons, so Ohio would have similar timeframes for marketing tourism based on varying seasons. They draw visitors from same types of tourism markets; their target audience being mainly within the Great Lakes region with additional tourism from around country (and few international visitors).

Differences

A primary difference between coastal Ohio and the Northeast Michigan study area is that the Lake Erie coastline is not as peninsular as Michigan's Lake Huron coastline. One can often just be traveling through Lake Erie (by water) or Ohio (by land) to go from one place to another. To arrive in Northeast Michigan requires a traveler to deviate from the more heavily traveled I-75 north-south route in order to travel the US-23 corridor. Given the east-west traffic flow along the Lake Erie corridor, coastal Ohio also has higher population densities and more city centers. Correspondingly, there are more built, developed assets along this shoreline, such as coastal access facilities and tourism serving businesses (e.g., hotels, restaurants, etc.).

Tourism Industry

Tourism development in coastal Ohio is centralized around identifying and protecting diverse coastal assets, and then packaging and marketing these assets in a manner appealing and accessible for visitors. In developing this strategy, the region has developed several core goals or theme areas for tourism development including visitor experience, education, resource protection, and management goals. According to the *Lake Erie Coastal Ohio Trail Scenic Byway Corridor Management Plan 2005* (LECO, 2005), these include:

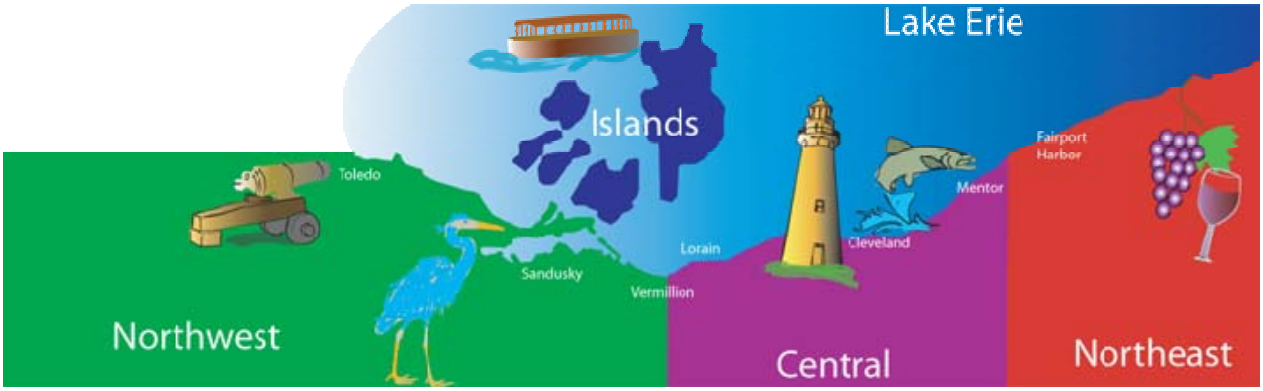
- ***Experience goals:*** focus on enhancing how the visitors can engage, participate, or feel when they visit the region, including making them more aware of tourism opportunities, informing them of coastal access point and trails (i.e., maps), developing and providing interpretive materials, and enhancing wayfinding along the coastline.

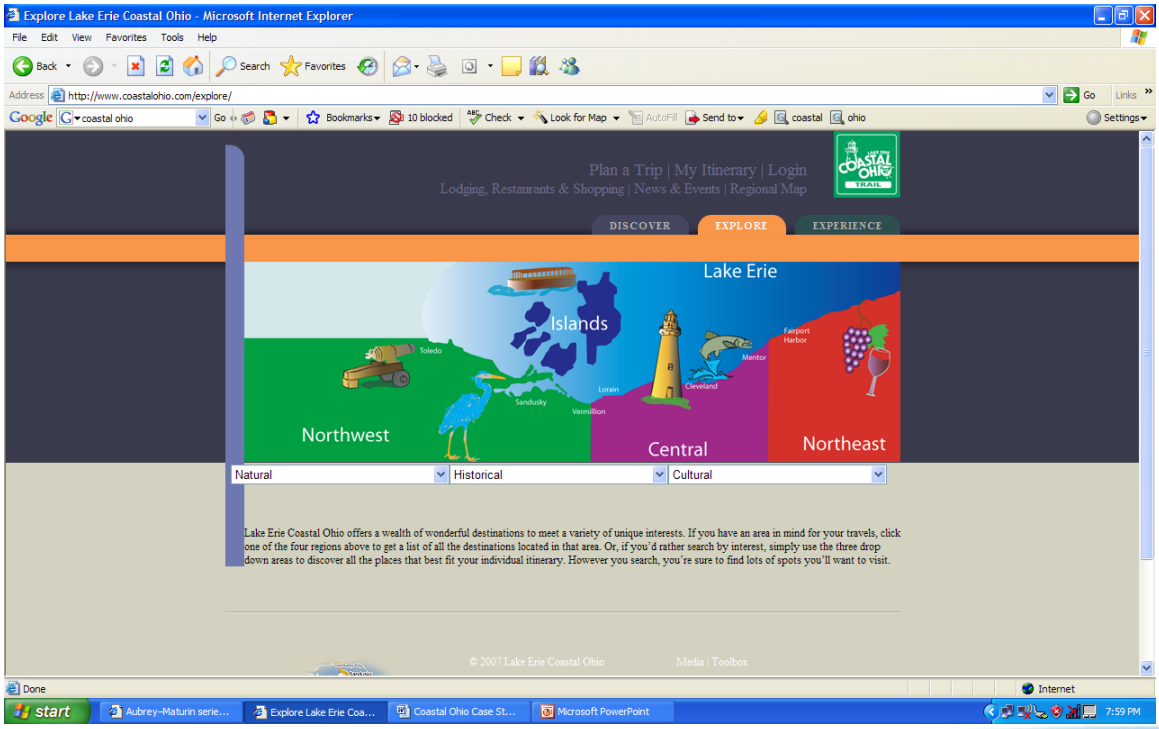
- ***Education Goals:*** focus on how information will be distributed among businesses and visitors. Information shared includes byway marketing and promotion products, public awareness campaigns. Education also targets coastal business entrepreneurs to provide support for guide/outfitter services and cultural programming, such as providing interpretive tools or environmentally friendly "best practices" for the tourism industry.

- ***Resource Protection Goals:*** focus on protecting the valuable natural, historic, and cultural resources that provide a foundation for the tourism industry. This focus area includes development of protection tools and "best practices" for both tourism industry and visitors, and seeks to enhance awareness, appreciation, and interpretation of attractions and resources visited. Investing in conservation and restoration efforts of historic, cultural, and natural resources is also a priority here.

- ***Management Goals:*** focus on facilitating the appropriate local, regional, state, and federal networking and partnerships necessary to accomplish all goals. These partnerships are intended to generate and enhance funding support, coordination of efforts, and evaluation efforts.

The tourism marketing strategy for this region has been to focus on regional investment in developing and promoting a marketable brand for their regional product. This effort includes the regionally-coordinated inventory and efforts to link and market natural, historic, and cultural assets toward an enhanced regional visitor experience. As a strategy, this region is not necessarily seeking to attract new customers, but rather to capture visitors along coastal corridor to stay additional days or repeat visits; therefore rather than increasing the number of visitors, they are looking to economically benefit from the increased economic quality of a customer who stays longer, spends more money, and has more of an appreciation and investment in the region. Finally, their marketing strategy is dependent on internet technology to provide delivery of a consistent message and marketing tools among residents, visitors, and businesses alike.




Explore Lake Erie Coastal Ohio - Microsoft Internet Explorer
http://www.coastalohio.com/explore/
Plan a Trip | My Itinerary | Login
Lodging, Restaurants & Shopping | News & Events | Regional Map
DISCOVER
EXPLORE
EXPERIENCE
Lake Erie
Islands
Toledo
Sandusky
Lorain
Vermilion
Cleveland
Mentor
Fairport Harbor
Northwest
Central
Northeast
Natural
Historical
Cultural
Lake Erie Coastal Ohio offers a wealth of wonderful destinations to meet a variety of unique interests. If you have an area in mind for your travels, click one of the four regions above to get a list of all the destinations located in that area. Or, if you'd rather search by interest, simply use the three drop down areas to discover all the places that best fit your individual itinerary. However you search, you're sure to find lots of spots you'll want to visit.
© 2007 Lake Erie Coastal Ohio
Media | Toolbox
Done
Internet
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Area Of Detail
Lake Erie
ISLANDS
Toledo
Sandusky
Lorain
Vermilion
Cleveland
Mentor
Fairport Harbor
Ashtabula
Conneaut
NORTHWEST
CENTRAL
NORTHEAST

Appendix A - Works Cited

Allen, L. (2003, August 8). Puget Sound town weighs impact of tourism development. *Travel Watch: National Geographic Traveler.* National Geographic Society. Retrieved May 25, 2007, from http://news.nationalgeographic.com/news/2003/08/0808_030808_townsend.html

Australian Bureau of Statistics (2006). *2006 Census QuickStats: Cairns (C) (Local Government Area).* Retrieved December 7, 2007, from http://www.censusdata.abs.gov.au/

Australian Bureau of Statistics (2006). *2006 Census QuickStats: Daintree (Douglas Shire) (State Suburb).* Retrieved December 7, 2007, from http://www.censusdata.abs.gov.au/

Australian Bureau of Statistics (2006). *2006 Census QuickStats: Port Douglas (Urban Centre/Locality).* Retrieved December 7, 2007, from http://www.censusdata.abs.gov.au/

Australian Heritage Commission and CRC for Sustainable Tourism. (2001). *Successful tourism at heritage places: A guide for tourism operators, heritage managers, and communities.* Australian Heritage Commission. Canberra, Australia: Australian Government. Retrieved December 18, 2007, from http://www.ahc.gov.au/publications/successful-tourism.html

Billington, R. (2004). *A case study: Federal investment attracts private investment in industrial historic sites.* Pawtucket, RI: Blackstone Valley Tourism Council, Inc. Retrieved December 18, 2007, from http://www.nps.gov/history/heritageareas/REP/investhist.pdf

Blackstone Valley Tourism Council, Inc. (2007). *About the valley*. Retrieved December 7, 2007, from http://www.tourblackstone.com/about3.htm

Cable News Network. (2007). *Global gas prices.* Retrieved December 17, 2007, from http://money.cnn.com/pf/features/lists/global_gasprices/byprice.exclude.html

Lake Erie Coastal Ohio, Inc. (2005). *Lake Erie coastal Ohio trail scenic byway corridor management plan 2005*. Lake Erie Coastal Ohio, Inc.

Michigan Department of Natural Resources [MDNR] (2006, July 24). *2006-2007 Deer and elk "baiting" and "feeding" regulations.* Retrieved July 23, 2007, from http://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/deer_elk_06baiting_feeding.pdf

Michigan Department of Natural Resources [MDNR]. (2007, February 22). *Bovine tuberculosis.* Retrieved July 23, 2007, from http://www.michigan.gov/printerFriendly/0,1687,7-153-10370_12150_12220-99064--,00.html

Mlive.com. (2007, May 25). *Michigan gas prices highest in nation.* Retrieved December 17, 2007, from http://blog.mlive.com/michigan_travel/2007/05/michigan_gas_prices_highest_in.html

Nelson, P.B. (1999). Quality of life, nontraditional income, and economic growth: New development opportunities for the rural west. *Rural Development Perspectives, 14*(2), 32-37. Retrieved December 18, 2007, from http://www.ers.usda.gov/publications/rdp/rdpsept99/rdpsept99e.pdf

Northeast Michigan Council of Governments (NEMCOG). (2001). Community profile reports of member counties, produced 1995, update 1/23/01. Retrieved July 23, 2007, from http://www.nemcog.org/

Phillips Jr., R.H. (1999). Chapter 2 – Socioeconomic overview: The situation in 1993, in *Northwest forest plan: Outcomes and lessons learned from the northwest economic adjustment initiative* (General Technical Report PNW-GTR-484). Pacific Northwest Research Station, USDA Forest Service. Retrieved May 25, 2007, from http://www.fs.fed.us/pnw/pubs/gtr_484.pdf

Stynes, D., Propst, D, & Sun, Y. (2001, December). *Economic impacts of visitors to Olympic National Park, 2000*. Final report to National Park Service. East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University. Retrieved December 18, 2007, from http://web4.canr.msu.edu/mgm2/

The Alpena News. (2006). *Lafarge emissions below permit limit.* Retrieved July 23, 2007, from http://www.thealpenanews.com/stories/articles.asp?articleID=4396

Tourism Queensland. (2002). *Queensland ecotourism plan 2003-2008: Sustainable tourism in Queensland's natural areas*. Brisbane, Australia: State of Queensland. Retrieved December 18, 2007, from http://www.tq.com.au/tqcorp_06/index.cfm?5F94D737-A8F7-4AA4-DC2D-48ABCB495D22

Travel Industry Association of America. (2006, February). *Economic impact of domestic travel on the Blackstone Valley at Rhode Island/Massachusetts in 2004*. Washington, D.C.: Travel Industry Association of America. Retrieved December 7, 2007, from http://www.blackstonevalleytourismcouncil.com/econstudy.htm

Wikipedia. (2007). *Image: Rhode Island population map.png.* Retrieved July 23, 2007, from http://en.wikipedia.org/wiki/Rhode_Island

WOODTV. (2006). *Cement plant's mercury emissions draw closer scrutiny*. Retrieved July 23, 2007, from http://www.woodtv.com/Global/story.asp?S=5570349&nav=menu44_2.

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