A Vision of Green

for Michigan's Bay, Midland, and Saginaw Counties

Saginaw Bay Greenways

A Science- and Community-Based Process

Green Infrastructure is an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations.

— from "Smart Conservation for the 21st Century" by Mark A. Benedict and Edward T. McMahon

..."It is our nation's natural life support system — an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks and other conservation lands; working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute to the health and quality of life for America's communities and people."

— from www.greeninfrastructure.net

"Just as we must carefully plan for and invest in our capital infrastructure — our roads, bridges and waterlines, we must invest in our environmental or green infrastructure — our forests, wetlands, streams and rivers . . . . Just as we must carefully plan for and invest in our human infrastructure — education, health service, care for the elderly and disabled — we must also invest in our green infrastructure."

— Maryland Governor Paris Glendening, January 1999

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Former Gov. William G. Milliken

"This is all the Michigan we have"

Former Michigan Governor William G. Milliken
Co-chair of Michigan's Land Use Leadership Council

As Michigan enters the 21st century, it faces enormous challenges in ensuring that it meets the environmental, economic, and social needs of the future. Chief among these challenges is determining a sustainable land use and growth strategy — one that allows us to capitalize on the tremendous economic opportunities that lie ahead of us, while at the same time protecting and conserving those special places that make our great state a desirable place to live and work.

Creating a strategy to protect our state's green infrastructure is a key component of sustainable development. Furthermore, coupling this strategy with a broad vision for the future of a multi-county, non-motorized transportation network allows our population to enjoy those areas that are protected and conserved. Green infrastructure planning is what I like to call "smart conservation." It helps ensure that limited public funds are spent wisely and that rational decisions are made not only about areas that are suitable for development, but also those that need special conservation and protection measures.

The Saginaw Bay Greenways Collaborative has done a remarkable job of blending the interests of a variety of sectors to produce this report, which identifies both our existing and potential green infrastructure areas. It has reached across artificial political boundaries to build partnerships that can help create a region that is economically competitive, environmentally responsible, and socially equitable far into the future.

If Michigan is to succeed, its various regions must succeed. I commend the work that the Collaborative has done in Bay, Midland and Saginaw counties to create a regional Green Infrastructure vision. This report will serve as a model of regional cooperation to help ensure a better Michigan for all.

William G. Milliken

Contact the Land Use Leadership Council on the web at www.michiganlanduse.org.

A Critical Need

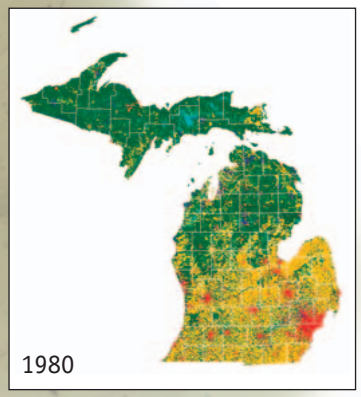
The Mid-Michigan region — Bay, Midland, and Saginaw counties — is at a crossroads. This area, known throughout the state for its tremendous natural beauty — from its scenic lakeshore areas along Saginaw Bay, to its many miles of sparkling rivers and lush forests, to its working landscapes and rich farmland — can be strategically protected and conserved, or a choice can be made to let uncoordinated development fragment our landscape. If you've traveled in this area, you have seen that this is a special place, but you have also seen something else: the seemingly uncontrolled conversion of our natural areas into a built environment. While this growth has brought cultural and economic benefits, it has often put at risk those features that make this area unique.

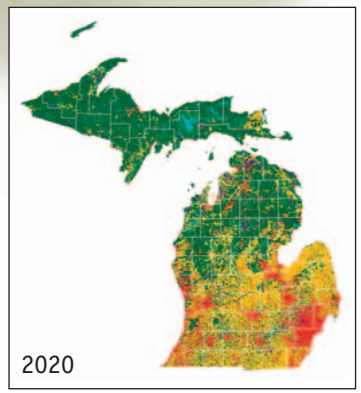
In 2001, the Michigan Land Resource Project (www.publicconsultants.com/documents/lbilo/index.htm) study predicted that if current land use patterns continue, by 2040 — a generation from now — Michigan's built or developed areas will increase by 178%. On average, the State of Michigan develops its land eight times faster than its population grows. In our region, the rate of land conversion is even more striking. For example, the rate in Bay County alone exceeds the state average by 27 times.

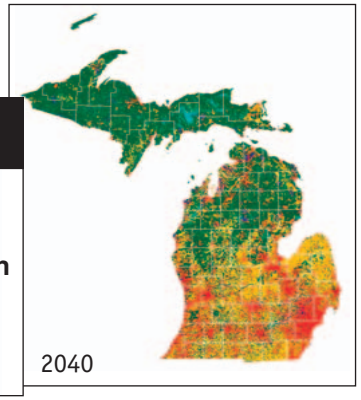
As haphazard development increases, so too does the cost of providing services that are needed to support it. New developments often require huge public investments in roads, sewers, schools, and other public infrastructure. As new communities are built, the public infrastructure must expand to accommodate them, forcing municipalities to provide services across a larger geographic area, stretching utilities, and resulting in higher taxes and service fees.

The social impacts may not be as apparent, but we've all experienced a sense of loss and helplessness when a scenic view is destroyed, a forest is bulldozed, a wetland is filled, a farm is developed, or a potential trail corridor is lost. The community loses its sense of place — its link with nature, its history and culture, and its identity.

The Saginaw Bay Greenways Collaborative was formed within this framework. This group, made up of dedicated individuals representing more than two dozen agencies and organizations, has completed a green infrastructure plan that identifies and connects significant wildlife habitats, threatened natural resources, and opportunities for a non-motorized trail network in the Saginaw Bay region. In many ways the project has established a new relationship between smart growth and smart conservation. That relationship is known as Green Infrastructure.







Michigan Land Use Projections

- Built
- Agriculture
- Other vegetation
- Forest
- Lake
- Wetland

Definition

According to Webster's New World Dictionary, ***infrastructure*** is defined as "the substructure or underlying foundation, especially the basic installations and facilities, on which the continuance and growth of a community or state depends." When we think of infrastructure, we usually think of built infrastructure, such as roads, electric power lines, and water systems, as well as social infrastructure, such as schools, hospitals, and libraries. However, the concept of ***green infrastructure*** elevates air, land, and water to an equal footing with built infrastructure and transforms open space from "nice to have" to "must have."

Green space, greenways, and green infrastructure. What's the difference?

Green space refers to undeveloped or developed lands where the surface is permeable to rainfall and groundwater recharge. It is green with trees, grass, or even weeds. This term is often used in traditional planning ordinances and conservation practices.

Greenways are corridors of protected open space, often following natural land or water features, that are managed for conservation and recreation. They can connect communities, urban sites, and natural areas and often include trails, river corridors, parks, and natural preserves. Greenways often emphasize recreation and focus on linear land parcels — those that are longer than they are wide.

Green infrastructure is all of the above, and more. Green infrastructure is our natural life support system — an interconnected network of private and public waterways, wetlands, woodlands, wildlife habitats, working landscapes, and other natural areas that support native species, maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life for communities. Green infrastructure includes large, ecologically important hubs as well as key landscape linkages that join hubs together.

The term green infrastructure was selected to help emphasize that green space is a basic necessity that should be planned and developed as an integrated system. People understand the need to plan and invest in infrastructure — roads, bridges, sewers, and other forms of "gray infrastructure." Just as we must plan for and invest in our gray infrastructure, we too must invest in our environmental or green infrastructure.

Key Points About Green Infrastructure

The term "green infrastructure" implies that it is a necessity, not an amenity — something that communities must have, not something that is nice to have.

Green infrastructure emphasizes interconnected systems of natural areas and other open spaces that are protected and managed for the ecological benefits they provide to people and the environment. Green infrastructure must be developed as a system, not as isolated parts.

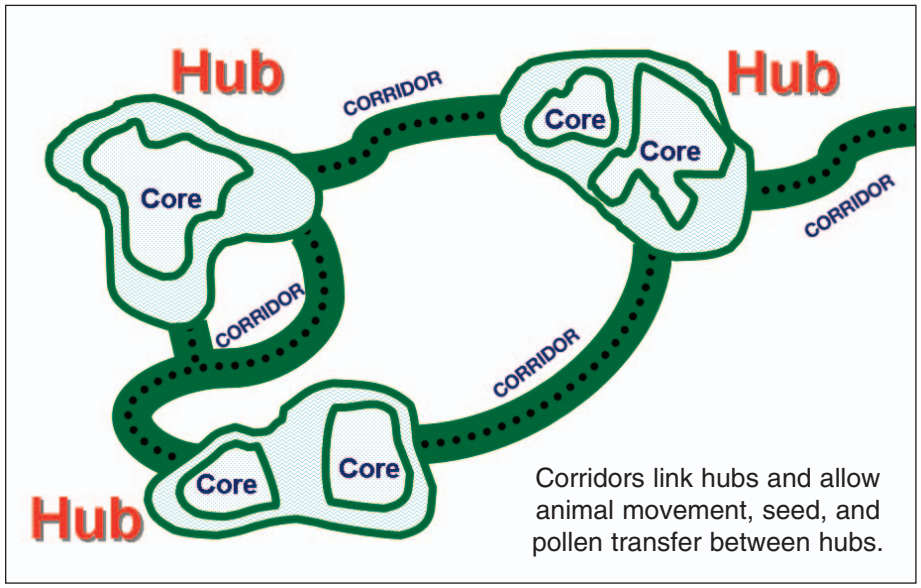
Green infrastructure recognizes that given the pressure of development on the landscape, our natural systems must be protected and managed for a secure future.

Concept

Green infrastructure encompasses a wide variety of natural and restored native ecosystems and landscapes that make up a system of hubs and links.

Hubs anchor the network and provide an origin or destination for wildlife and a center for undisturbed ecological processes. Cores are the most protected areas within the hub and represent lands and waters most valued and necessary for the long term integrity of the natural lanscape. Hubs include large natural areas such as national and state parks and wildlife refuges; public lands such as national and state forests managed for resource extraction and recreation; working lands such as farms, timberland, and ranches that are managed for production yet remain primarily open and undeveloped; and regional parks and preserves managed for conservation.

Links tie the system together and enable the green infrastructure network to work. Links include linear land parcels that provide sufficient space for native plants and animals to flourish and move between ecosystems and protected hubs; river and stream corridors that serve as biological conduits for wildlife and may provide recreational opportunities; greenways that are protected corridors of open space managed for resource conservation and recreation; and greenbelt corridors of both natural and working lands, including farms, ranches, and forests.



Corridors link hubs and allow animal movement, seed, and pollen transfer between hubs.

The hub and link elements of green infrastructure combine to create an interconnected and interdependent system of natural areas and other open spaces that conserves natural ecosystem functions and is managed for the ecological benefits it provides people, wildlife, and communities.

Just as we need "smart growth" to strategically direct and influence the patterns of built infrastructure, we need "smart conservation" to strategically direct our patterns of green infrastructure. This concept helps ensure environmental protection and a higher quality of life for communities as well as regulatory predictability for landowners and investors.

Benefits

Green infrastructure systems help protect and restore naturally functioning ecosystems and provide a framework for future development. A well planned, managed, and maintained green infrastructure system can provide many ecological, social, and economic benefits:

- Enhance biodiversity by supporting native species and protecting wildlife habitat
- Filter and store fresh water by maintaining natural landscape processes
- Carry storm water and reduce flooding by protecting floodplains
- Clean polluted air and moderate air temperatures by maintaining forest cover
- Reduce public costs associated with water treatment, flood protection, and air quality
- Improve health and increase physical activity by providing open space for recreation and non-motorized transportation
- Provide a sense of place by connecting people to the nature, history, and culture of their communities
- Increase property values and stimulate private investment by enhancing quality of life amenities such as access to open space, recreational opportunities, transportation choices, and a clean, green environment

Examples of benefits from green infrastructure can be found across the country, and right here in Michigan too.

Support Native Species and Protect Wildlife Habitat

About 25,000 acres of wetlands nationwide are lost each year due to sprawl. As natural areas are diminished, so is habitat and biodiversity.

In an effort to reverse this trend, the Detroit River International Wildlife Refuge was designated in 2002 to preserve and restore coastal wetlands, unique habitats, and ecological features important to at least 29 species of waterfowl and 65 kinds of fish.

The Saginaw Bay Watershed is located on the Central Flyway for migratory birds and is home to more than 138 endangered or threatened species. The Shiawassee National Wildlife Refuge was established to manage a variety of habitats for nearly 300 species of resident and migratory birds. The 9,700-acre refuge is considering a 7,500-acre expansion to preserve and restore a greater diversity of habitat and species.

(Benefits cont'd)

Filter and Store Fresh Water

Natural systems can effectively serve as filters and buffers, raising water quality and reducing our dependence on artificial water filtration systems.

The estimated value of water filtration attributed to wetlands along a three-mile stretch of Georgia's Alchoy River is $3 million per year.

New Jersey, New York, and the federal government spent $55 million to purchase 15,280 acres of the Sterling Forest Watershed to preserve open space for the citizens of New York State and to provide a vital water supply for 25% of New Jersey's residents.

Carry Storm Water and Reduce Flooding

Floodplain vegetation can slow flood waters and allow time for the waters to percolate into the soil, thereby reducing the intensity of flooding.

Johnson County, Kansas, expected to spend $120 million on storm water control projects. Instead, voters passed a $600,000 levy to develop a countywide streamway park system. Development of greenways along streambeds has addressed many of the county's flooding problems and has provided a valuable recreation and wildlife resource.

Clean Polluted Air and Moderate Ambient Air Temperature

Trees and vegetation take in carbon dioxide and release oxygen, replenishing our air. They also remove pollutants and particulates, which cause a number of health problems, from the air.

Urban forests in the Washington, D.C., metropolitan area remove 20 million pounds of pollutants from the air each year, a benefit worth $49.8 million annually.

The ambient air temperature in urban areas tends to be five degrees warmer than the surrounding vegetated rural or open space areas. That five-degree increase in temperature translates into a 20% increase in air conditioning energy costs.

Reduce Public Costs

Natural systems often can provide similar services as built infrastructure but at reduced public cost.

In the 1990s New York City was able to forego spending approximately $6 billion on new water filtration and treatment plants by purchasing and protecting watershed land in the Catskill Mountains at a cost of about $1.5 billion.

Fosters Reservoir in Saginaw County reduces traditional built infrastructure flood control works by combining gray and green infrastructure. A reservoir was constructed to store 41 million cubic feet of flood water and has resulted in creation of a 160-acre Waterfowl Production Area managed by the Shiawassee National Wildlife Refuge. The area also provides opportunities for wildlife observation and recreation.

(Benefits cont'd)

Improve Health and Increase Physical Activity

Green infrastructure systems can provide open space for recreation and trails for non-motorized transportation.

An on-site survey of users on the Pere Marquette Rail Trail in Midland found that 60% cited exercise as the primary reason for using the trail and 47% reported improvement in health due to use of the trail.

Urban Magazine conducted a national survey in 1997 in which 74% of those responding stated that walking and biking trails are a priority for outdoor recreation.

Connect People To The Nature, History, and Culture of Their Communities

People appreciate and benefit from trails linking their community's natural and cultural history.

In a 2000 Midland Area Community Foundation survey, citizens rated the Pere Marquette Rail Trail the number one community asset in Midland, Michigan. The trailway was more highly regarded than churches and the Center for the Arts.

At the Saginaw Bay Visitors Center on Saginaw Bay, more than 100,000 visitors each year participate in special events, interpretive programs, and school outreach programs.

Stimulate Investment and Economic Benefits

Many communities have successfully attracted new businesses, retained existing ones, and stimulated private investment by enhancing environmental, recreational, and cultural/historic amenities associated with local systems of greenways and other open space.

Chattanooga, Tennessee and Providence, Rhode Island transformed industrial blight into beautiful and useful riverfront greenways and trails as part of plans to attract businesses and residents. Other communities successful in these endeavors include Boulder, Colorado; Portland, Oregon; Seattle, Washington; and Raleigh, North Carolina.

The Kresge Foundation, General Motors Corporation, City of Detroit, and State of Michigan are investing $500 million to develop the Detroit Riverwalk and Centennial State Park as the centerpiece of downtown Detroit. Centennial State Park is Michigan's newest and first urban state park.

The U.S. Fish and Wildlife Service report, "2001 National Survey of Fishing, Hunting and Wildlife – related Recreation – Michigan" finds that over $2.8 billion were spent by 3.5 million resident and non-resident hunters, anglers and wildlife watchers in 2001 alone. Of this total, $964 million were associated with trip-related costs, $1.6 billion involved equipment purchases and $186 million went toward purchase of licenses, contributions, land ownership and leasing, etc.

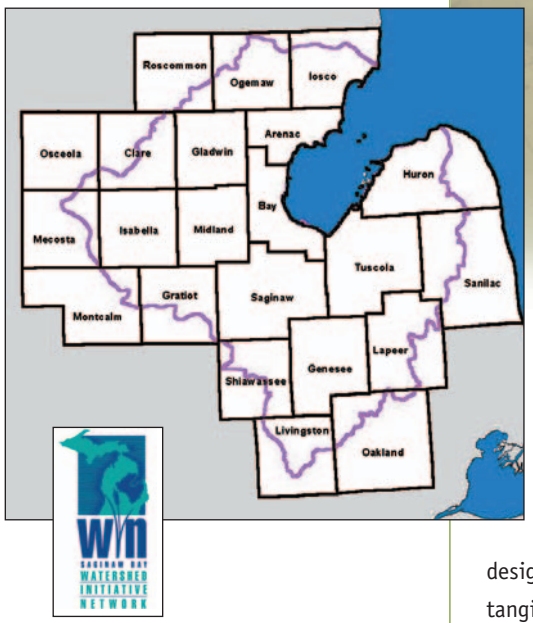
The Saginaw Bay Greenways Collaborative

In 1998 representatives of more than two dozen agencies and organizations met to explore the potential of a non-motorized trail network in Bay, Midland, and Saginaw counties. The result was the Tri-County Trail Guide (www.co.bay.mi.us), which identified 33 existing parks, nature preserves, state and national wildlife refuges, and trails in the Saginaw Bay region. This effort proved to be the catalyst and inspiration to develop a greenways vision that incorporates not only an integrated trail network, but also a systematic and strategic approach to the conservation of existing land and important natural features.

The Saginaw Bay Greenways Collaborative (the Collaborative) formed in 1999 to develop the Saginaw Bay Greenways plan "to connect communities to the area's natural and cultural amenities for the benefits of recreation, transportation, education, health and well being of its citizens." The Collaborative is a voluntary association with representatives from national, state, and local governments, non-profit organizations, and concerned citizens with interests in wildlife, water quality, non-motorized transportation, recreation, urban and land-use planning, tourism, and economic development.

The Saginaw Bay Watershed Initiative Network supported this vision and granted the Collaborative approximately $130,000 to develop a regional greenways plan, demonstrating the philanthropic community's support for sustainable development in the Saginaw Bay Watershed. (See sidebar)

The project evolved from a regional greenways planning effort to planning a regional green infrastructure network. This natural evolution sprang from a number of factors: previous Saginaw Bay Watershed and sustainable development initiatives, public comment and stakeholder interests, current emphasis on land use issues, and significant wildlife and water-related resources in the region.



Formed in 1996, the Saginaw Bay Watershed Initiative Network (WIN) is a collaborative effort of communities, conservationists, foundations, and businesses to establish a unique partnership to enhance the Saginaw Bay Watershed and create a more sustainable future for all who live, work, or recreate here. Through the WIN process, members identify issues, set priorities, and tackle projects designed to address concerns with tangible solutions that encourage the stewardship of natural resources, strengthen local economies, and nurture the communities that make this region one of Michigan's most special places.

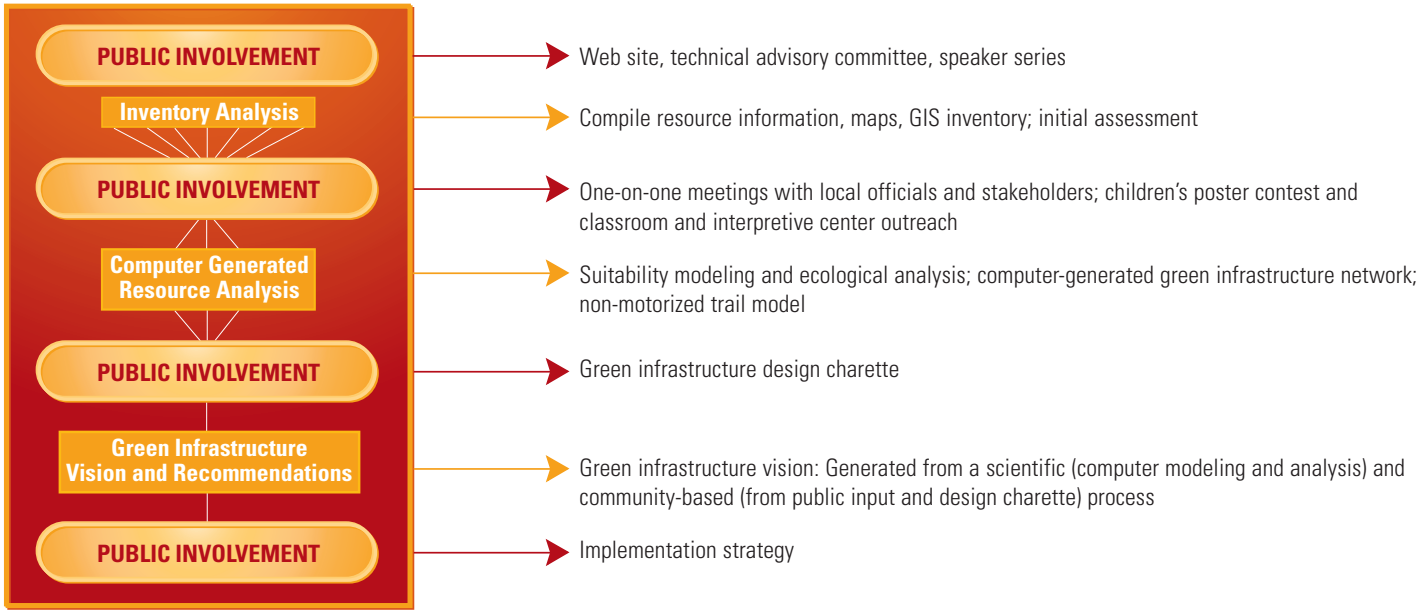
A Science- and Community-Based Approach

The Collaborative used a scientific and community-based approach to identify land best suited for conservation and recreation throughout Bay, Midland, and Saginaw counties. These lands are the basis for a green infrastructure network and provide a strategic framework for resource protection and conservation activities. With successful implementation and proper management, this approach will help to ensure the sustainability of the region's land, water, and wildlife resources.

The Collaborative based the planning process on three key elements of successful greenway and green infrastructure initiatives:

- A thorough resource inventory and analysis of the project area, based on the most accurate and current resource information available.
- Public input from diverse stakeholders in the identification and development of a green infrastructure vision.
- Public outreach to inform citizens about the project and the benefits of greenways and green infrastructure and to build support for implementation.

Science- and Community-Based Planning Process



Resource Inventory and Analysis

Guiding Principles

The Collaborative conducted a landscape-scale analysis for conservation and recreation suitability of the resource base throughout the Saginaw Bay region to identify a preliminary green infrastructure network. This network could provide a strategic framework for future resource protection and land conservation activities. This vision recognizes both the importance of establishing the network over the short-term, as well provides the template necessary for long-term planning initiatives.

The results are intended to provide information and guidance to citizens and decision makers alike, and are ultimately designed as a framework for managing the Saginaw Bay region's natural resource base over time. The development of geographic information systems (GIS)-based models guided us in identifying the most important lands in our region for conservation and recreation.

All too often, conservation and recreation planning are not integrated in a comprehensive framework, and they lack quantifiable and generally accepted goals. Little attention is paid to the question of how local measures should reflect the necessities of a larger region. Instead, much of today's land use and conservation planning is still ad hoc action, guided by what is possible under the present political or social condition rather than by what has been found necessary by analysis.

Our analysis and accompanying models, however, were based on the notion that prioritizing single locations — while appropriate for many planning applications — is often not the best technique for identifying linked natural systems. In general, the analysis assumes that any location that contains multiple linkages to additional resources has more value than isolated locations. Our preliminary network design was based on the conceptual goals of connectivity, conservation value, complementarity, threats, feasibility, and leverage.

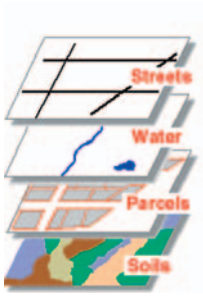
Key factors considered in the Collaborative's design efforts included the linkage of "on the ground" components emphasizing core areas; the linkage of species, habitats, and processes (e.g., fire, flood); the identification of valuable areas to protect as well as "wounded areas" to heal and restore; and the consideration of the distribution and relationship of landscape features over space and time.

Tools

Geographic information systems (GIS), remotely sensed data, and other planning information systems were the predominant tools used in the inventory and analysis portion of our green infrastructure planning. The inventory and analysis attempted to explore conservation suitability for green space networks within the Saginaw Bay region through the development of a computer-aided model based on principles of landscape ecology and conservation biology.

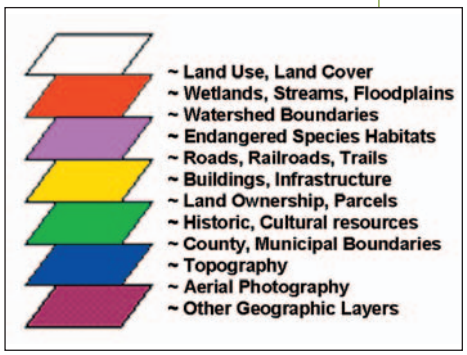
A GIS is a computer system for collecting, verifying, integrating, and analyzing information related to the earth. Remote sensing derives information from radiation reflected or emitted from land and water surfaces using images acquired in flight or orbit.

Because GIS is particularly useful for map creation and production, it played an important role in the Collaborative's meetings

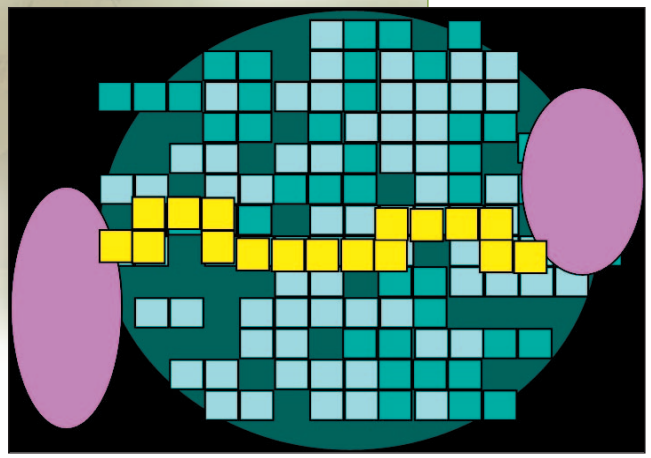


A Geographic Information System (GIS) is a computer system for collecting, checking, integrating and analyzing information related to the surface of the earth.

(Resource Inventory and Analysis cont'd)



Our model collected and categorized land use data and information on significant ecological and recreational components.



A "suitability surface" for hub identification is created. Then "optimal paths" are identified for landscape connectivity.

with municipalities and in providing maps and other community aides throughout the planning process. We produced working drafts of maps for use at meetings and for distribution to various stakeholders for review.

The Saginaw Bay Greenways conservation and recreation analysis and its accompanying models are:

- A tool for prioritizing lands for conservation and recreation
- A coarse-scale GIS analysis for identifying and prioritizing key landscape features in the Saginaw Bay region
- Modeled after Florida's Statewide Greenways Planning Project, Maryland's Green Infrastructure Assessment, and the Southeastern Ecological Framework.

The model collected and categorized land use data and information on significant ecological and recreational components, including trails, social and cultural points of interest, utility and rail corridors, critical habitats areas, ecological communities, wetlands, forests, roadless areas, and important aquatic systems. We obtained or developed this information from government agencies such as the Michigan Department of Natural Resources, non-profit agencies such as Ducks Unlimited, Inc., University Outreach Centers, Michigan GAP (Geographic Area Planning) Analysis, subject experts, and workshops.

Once information had been gathered on the characteristics of our region, we conducted a landscape prioritization process and a preliminary reserve network of conservation and recreation lands, linkages, and restoration areas was designated. This process took into consideration the basic principles of conservation biology and landscape ecology. It was also soundly based on the environmental, social, and political reality of the Saginaw Bay region's landscape.

Approach

Ecological Network. We used basic GIS suitability models to identify the most valuable lands in our region's landscape as well as potential connecting corridors between these lands. Suitability analysis or suitability modeling involves finding optimum locations across a landscape based on sets of decisions made by examining best available knowledge and consulting with experts in their respective fields. A suitability analysis enables decision makers and stakeholders to obtain a relative measure of suitability for a given characteristic across an entire landscape. Thus, all locations in a region can be compared to each other on an equal basis.

The key analysis steps in the conservation and recreation suitability analysis were 1) to identify the region's landscape features that could adequately serve as cores and hubs, 2) to identify landscape linkages between adjacent cores and hubs, and 3) to create a green infrastructure network from these identified features.

We examined natural areas across the region for their suitability to be cores for the

(Resource Inventory and Analysis cont'd)

reserve network. Core areas contain at least 250 acres of interior natural cover and are often bounded by different land cover, roads, railroads, power line corridors, and pipeline corridors. Existing conservation and recreation lands that cover at least 100 contiguous acres were also included as cores. We then examined the natural areas surrounding these identified cores for their suitability as hubs.

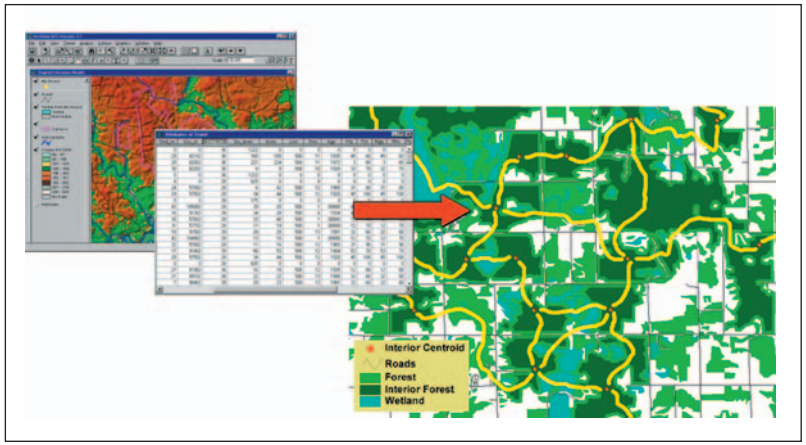
Hubs are natural areas containing one or more core areas and bounded by major roads and unsuitable land cover greater than 300 feet across. We then identified "optimal paths" or links between adjoining cores and hubs for landscape connectivity.

We used a GIS technique called least-cost path analysis to determine the most appropriate corridors between core areas and hubs. These corridors are linear habitats or landscape features that connect larger blocks and are continuous and sufficiently wide to minimize edge effects and provide interior habitat conditions. To minimize the strain on wildlife from edge habitat, these landscape linkages are at least 1,100 feet wide and are designed to provide interior habitat with a minimum 300-foot transition zone. We then optimized these links by adding other appropriate adjoining lands that had resource significance.

Recreation Network. We conducted the recreation suitability analysis using a similar concept, although the assumptions and characteristics for which the landscape was examined differed considerably. The emphasis was on developing a non-motorized transportation network that would connect the region's existing parks and recreation land and populated place locations (a U.S. Census designation). These populated locations are most often the center point of a city or village, but also represent rural areas that have a relatively high density of people. Particularly in the case of cities and villages, the populated locations represented the cores and the boundaries of the municipalities became the hubs.

We used least-cost path analysis again to determine the most appropriate corridors or future trailways between the recreation cores and hubs. Landscape features such as abandoned and active railroad corridors, utility and gas corridor rights-of-way, existing pathways or trails, road rights-of-way, and public lands provided the basis for connecting our region's recreation facilities with the communities and people who use them.

Limitations. There are, admittedly, limitations to the use of GIS in these types of projects. The greatest is that our analysis was based on the best available knowledge at a given time. The scale of the currently available data of our analysis makes it largely limited to regional decision making. We conducted analyses for this project at a scale of 1:63,360. On a map of this scale (1.5 inches equals one mile) the analysis is generally not suitable for site-specific planning.



Rich database attribution provides a wealth of information which, when linked with spatial data, provides a tool for decision support, and a means of building and analyzing spatial information.

Public Involvement — A Cornerstone

Carly Thomas

Amanda Lazarowicz

Dominic Sakon

The success of a green infrastructure plan lies not only in the science, but also in the quality of community input and the public outreach process.

Key Elements of The Collaborative Public Planning Process

Engaging leaders

The Collaborative met one-on-one with more than 50 municipal leaders and land managers in Saginaw, Bay, and Midland counties to provide an overview of the project, identify important social, cultural, historic, and environmental resources, and verify inventory and mapping data. We felt more was gained from these one-on-one meetings with stakeholders than from hosting a series of large group meetings.

Technical advisory committee

The committee consisted of 30 specialists representing public, private, and academic institutions and was assembled to assist with technical matters and review project data and results.

Youth involvement

Collaborative members introduced teachers and students to the greenways concept through the Saginaw Bay Visitor Center's programs and through classroom visits. More than 150 students submitted artwork for a youth poster contest based on the theme, "Greenways in our Community." Twenty-two students won prizes. The poster "It's Great to Be Green," which celebrates the benefits of greenways, was developed using art from the poster contest. The greenways poster contest winners were announced at the Tittabawassee River Greenway Discovery Day in May, 2002.

Saginaw Bay Green Infrastructure Charette

More than 100 people participated in the visioning charette held in November, 2002, to develop a community — generated green infrastructure vision — a Vision of Green. The charette is discussed fully on page 17.

Other Community Outreach and Input Techniques

Public input and outreach

- Project Web site — www.saginawbaygreenways.org
- Tri-County Trail Guide
- Project PowerPoint presentations
- General public presentations, such as speaker series, television and radio spots, presence at related events
- Public schools and nature center presentations and poster contest.
- Educational forum on green infrastructure
- Poster — "A Vision of Green – A Guide for the Conservation of Green Infrastructure in the Saginaw Bay Region" distributed across the tri-counties
- Conducted open planning team meetings
- Utilized Watershed Initiative Network's Land Use Committee for guidance and assistance
- Final report — "A Vision of Green"

Public Involvement — Charette

The preliminary green infrastructure design generated by the GIS resource inventory and analysis provided only one piece of the puzzle. Participants in the Saginaw Bay Green Infrastructure Charette added another piece by providing their experience and expertise on a county scale to the design of a green infrastructure network. We decided to focus at the county level for the planning charette because of the geographic scale and participant knowledge of the area. For the first half of the day-long event, participants had a unique opportunity to learn about the concept and values of green infrastructure and the basic components of the green infrastructure network.

During the second half of the day, participants performed a hands-on resource analysis similar to the GIS inventory and analysis. By overlaying various combinations of maps, they generated their own county green infrastructure map. Their involvement strengthened the computerized resource inventory and database, reintroduced human perspective and priorities, and helped build understanding and support for the green infrastructure design.

The data maps for each team included:

- 1:100,000 topographic (from U.S. Geological Survey)
- IFMAP land cover (from Michigan Department of Natural Resources)
- 1998 color infrared orthophotos
- Conservation and recreation lands, points of interest
- Forest and water resources
- National Wetlands Inventory
- Computer-generated green infrastructure model
- Non-motorized recreational trail model

Teams of professionals and laypersons drafted nine alternative green infrastructure designs for Bay, Midland, and Saginaw counties. Even though charette teams had the computer-generated green infrastructure and non-motorized recreation models as two of their data layers, they preferred to use them only after they completed their own analysis and green infrastructure design. In comparing the computer-generated analysis and design with the analysis and design from the work groups, the results were strikingly similar.

The planning team evaluated the nine alternative stakeholder designs along with the computer-generated models and consolidated them into a green infrastructure design for each county. The county designs were then assembled and assessed to create the Vision of Green, shown on p. 19.

The following section describes the results of this scientific and community-based planning process and provides a detailed description of the green infrastructure vision for each county and for the Saginaw Bay region.

The Saginaw Bay Green Infrastructure Network

"The Saginaw Bay Watershed is a region of tremendous natural beauty, an ecosystem that supports some of the most productive natural and social landscapes in Michigan, and an area that continues to be an important part of our state's economic matrix. However, one might also think of a region that has seen the adverse affects of pollution and the damaging ramifications of fragmented landscapes and habitats, and an area that lacks the coordination of governments, corporations, and agencies in their attempts to search for answers to some of the challenges that we must face together."

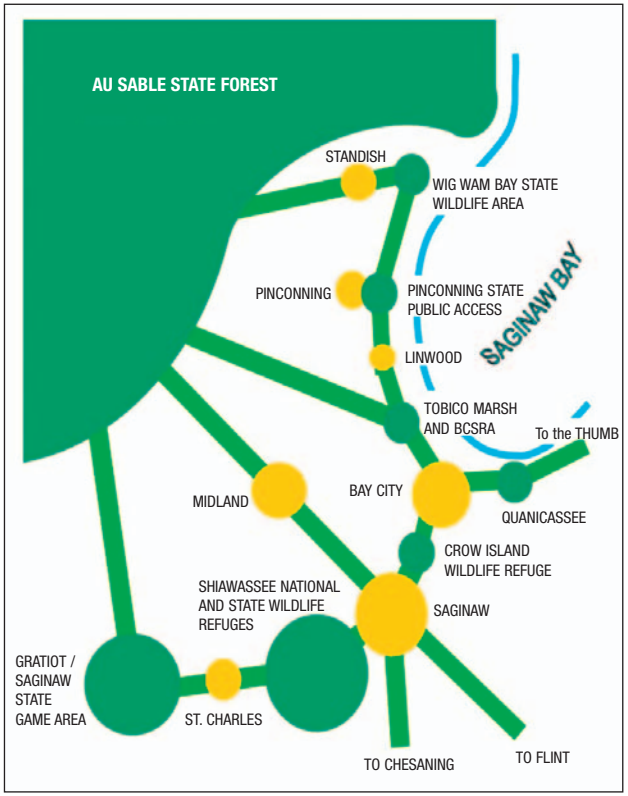
— Mike Kelly,
The Conservation Fund

Regional Findings

The maps on the following pages illustrate the Green Infrastructure Vision by identifying key landscape features that serve as cores and hubs; significant ecological corridors and landscape linkages between adjacent cores and hubs; and principal regional connections. The maps also show how existing and potential trail corridors can be used to develop a non-motorized transportation network that would connect the region's existing parks and recreation facilities with the communities and people who use them.

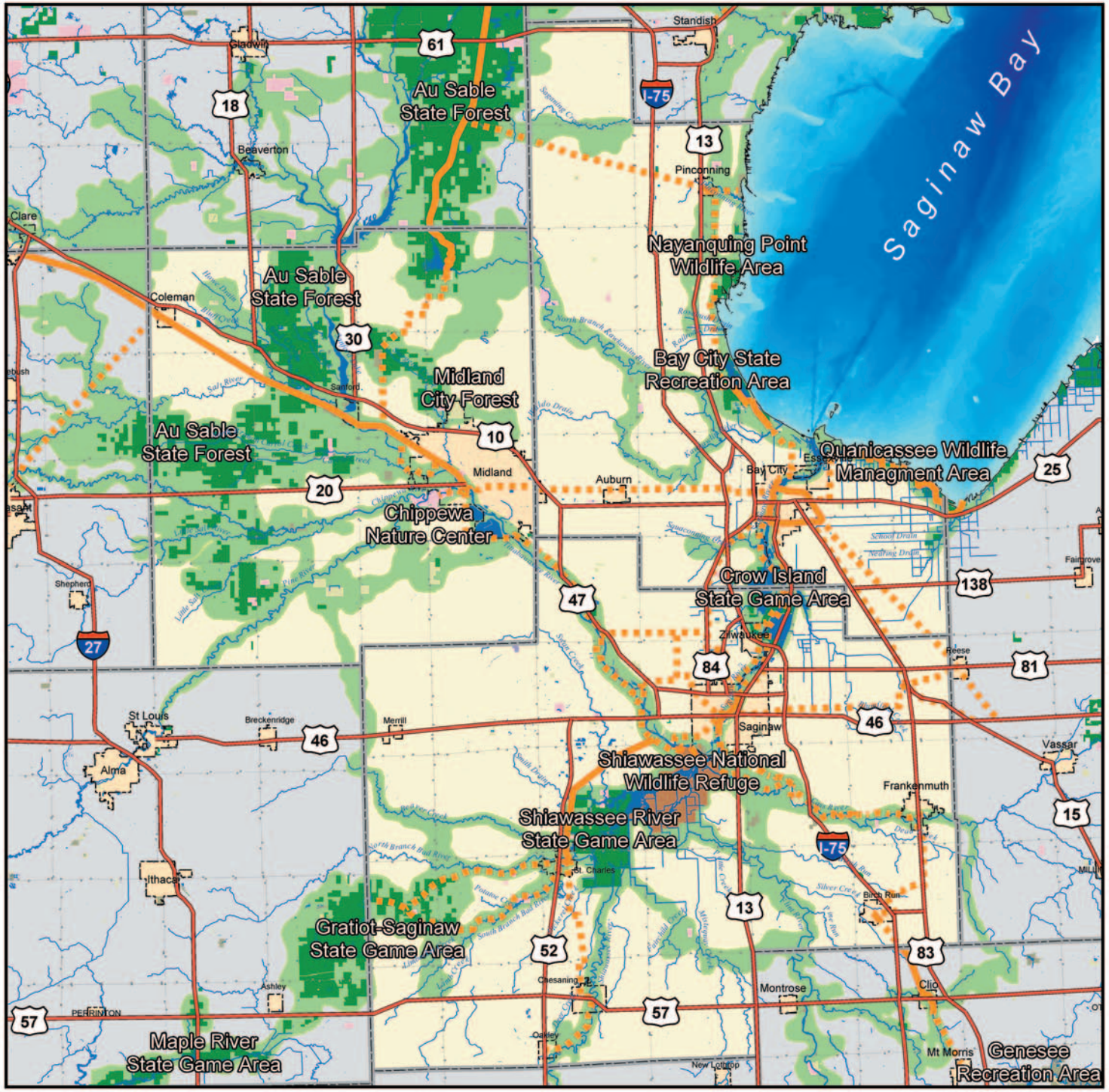
By simplifying or reducing the regional green infrastructure network to its most significant elements, a conceptual framework begins to emerge, represented by the hub and spoke pattern shown here. Key among the ecological hubs in our region are the vast tracts of forested land in Midland County, which are in turn supported by the coastal wetlands in Bay County and the riparian wetlands in Saginaw County.

Although many of the network's identified hubs are existing state or federally owned lands (Au Sable State Forest, Shiawassee National Wildlife Refugee, Bay City State Recreation Area and Tobico Marsh, etc.), there is a tremendous opportunity to contribute to their long-term vitality by working to further enhance and protect these lands that directly support our region's long-term sustainability. Significant ecological corridors are found along our region's major rivers (the Cass, Flint, Saginaw, Shiawassee, and Tittabawassee rivers) and their tributaries that drain Michigan's largest watershed. Interspersed among the hubs and located along these river corridors are the communities we call home. Conserving and enhancing the region's green infrastructure network will continue to provide quality-of-life benefits to the region's residents.



Saginaw Bay Region

A Vision of Green . . .



Saginaw Bay Watershed

Map Legend

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- Potential Non-Motorized Transportation Network
- Potential Green Infrastructure
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  - County
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- County Boundaries
- Cities and Villages
- Major Roadways
- Rivers and Streams
- Lakes

1:525,000

0 2.5 5 10 Miles

Saginaw Bay Greenways

(The Saginaw Bay Green Infrastructure Vision cont'd)

It is also possible to quantify the existing and proposed conditions in our region as outlined in the Green Infrastructure Vision. This is done using the data collected or created during the inventory and analysis portion of our green infrastructure planning and in conjunction with GIS. For example, the GIS allows a user to calculate the total land area within a county's political boundaries or to calculate only the existing conservation and recreation land within those same boundaries. By dividing those two numbers (existing conservation lands/total acres in the county), we can determine the percentage of existing land managed for conservation and recreation.

Currently there are approximately 93,080 acres of conservation and recreation land in Bay, Midland, and Saginaw counties. This existing land mass accounts for approximately 8% of the total land in the three counties but is insufficient to properly sustain our region's natural resource base. An increase of just slightly over 200% in our conservation efforts is needed to raise the amount of protected land to 285,134 acres and to ensure proper and continued ecosystem functioning.

Equally important to our region's sustainability are the social and cultural connections that can be provided by planning for our green infrastructure. Combined, trail systems and non-motorized transportation routes in the three counties total 217 miles. To ensure access to recreational facilities and non-motorized transportation equity for all of the communities in our region, an additional 331 miles of non-motorized trail corridor is proposed.

Use of this green infrastructure vision at a local level will not only help guide our future conservation efforts but will also help direct our future development and land use patterns. It can support our communities' decision making by discouraging haphazard conservation and development. It helps us avoid conflicts by providing predictability for all community members and preventing expensive future mitigation and restoration. It complements existing environmental and natural hazard prevention programs and helps justify local open space and other planning decisions. It facilitates ecological, social, and political connections across jurisdictional boundaries. And perhaps most importantly, it leaves a positive legacy for future generations.

Conservation and Recreation Lands

County	Total Acres	Existing Cons/Rec Land (Acres)	Proposed New Cons/Rec Land (Acres)	Total GI Network (Acres)	Existing Cons/Rec Land as Percent of Total Acreage[1]	GI Network as Percent of Total Acreage[1]	Percent Change in Total Cons/Rec Land Acreage
Bay	287,179	10,554	50,788	61,342	3.68%	21.36%	481.22%[3]
Midland	337,710	49,643	125,540	175,183[2]	14.70%	51.87%	252.88%
Saginaw	521,847	32,833	15,727	48,609	6.30%	9.31%	47.83%
Total:	1,146,736	93,080	192,055	285,134	8.12%	24.86%	206.33%

Non-motorized Trails

County	Total Poplulation (Census 2000)	Existing Trails (Miles)	Proposed Trails (Miles)	Total Non-motorized Network (Miles)	Existing Per Capita Trail Mileage[4]	Proposed Per Capita Trail Mileage[4]	Percent Change in Total Trail Mileage
Bay	110,157	77	94	171	0.000699002	0.001552	122.08%
Midland	82,874	76	46	122	0.000917055	0.001472	60.53%
Saginaw	210,039	64	191	255	0.000304705	0.001214	298.44%
Total:	403,070	217	331	548	0.000538368	0.00136	152.53%

[1] "Percent of total" metrics are included to equalize the relative differences between geographic area, total population, and existing resources among the three counties.

[2] Of the three counties in the Saginaw Bay Region, Midland has the largest blocks of existing conservation land, which functions as the principal terrestrial hub for our green infrastructure vision. The in-fill of existing lands and a smoothing of transitional edges in land use accounts for the amount of land proposed to fall under the green infrastructure network.

[3] Although Bay County has considerable coastal resources currently under some form of protection, the majority of the county's interior is not protected through any identified form of stewardship. Land in the interior of the county makes up the large proposed percent change in total conservation and recreation acreage.

[4] Per capita metrics are included in order to equalize the relative differences between geographic area, total population, and existing resources among the three counties.

Bay County

General Description of Bay County's Green Infrastructure Resources

As our region's gateway to the Saginaw Bay and Lake Huron, Bay County offers tremendous opportunities for the continued preservation and future enhancement of the area's green infrastructure resources. From its substantial network of currently protected wetland resources to conservation opportunities along its river systems, careful planning will ensure that Bay County maintains the resources that have historically been important to this area.

Hubs

Of special note in Bay County are the coastal wetland complexes and adjacent fish-spawning reefs found along its nearly 30 miles of shoreline. The wetlands include such areas as Tobico Marsh in Bangor and Kawkawlin townships, Nayanquing Point in Fraser Township, and protected areas east of the Saginaw River along the Hampton Township shoreline. The contribution of these considerable wetland resources to waterfowl maintenance and production and the contribution of the off-shore spawning areas to fish reproduction is recognized both locally and nationally.

Perhaps the greatest example of such a coastal wetland complex is Tobico Marsh. As part of the Bay City State Recreation Area, Tobico is one of the largest, intact coastal wetland complexes in the Great Lakes region, consisting of more than 2,000 acres of wooded, emergent, and open water wetland. A private landowner donated it to the State of Michigan, and it's listed as a National Natural Landmark for its contributions to waterfowl production.

Serving as the interpretive center for Tobico Marsh and for watershed education within the Saginaw Bay Watershed, the Saginaw Bay Visitors Center services both urban and rural schools within a 100-mile radius of the recreation area. Each year, more than 100,000 visitors participate in special events, interpretive programs, and school outreach programs.

Although largely dominated by lowland wetlands, Bay County's natural resource base also contains fragments of wetland and upland forest. The county's last remaining patch of interior forest habitat is in Gibson and Mt. Forest townships. In addition to supporting interior-breeding species of plants and animals, protecting and enhancing this unique feature would tie northern Bay County into the Au Sable State Forest and would allow for the long-term enhancement of ecosystem services to this area.

Bay County

A Vision of Green . . .

Saginaw Bay Watershed

Map Legend

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1:310,000

0 1.5 3 6 Miles

Saginaw Bay Greenways

(Bay County cont'd)

Conservation Links and Connections

A series of publicly protected open spaces extends along the Saginaw Bay shoreline in Bay County, connecting the area with Arenac and Iosco counties to the north, and with Tuscola and Huron counties in the Thumb. The Saginaw River corridor also connects the shore through the urban center of Bay City and on into the wetland complexes of the Crow Island State Game Area, and eventually to Saginaw.

Bay County is home to two significant river systems, the Kawkawlin and the Saginaw, which differ greatly in surrounding land use.

In northern Bay County, the North Branch of the Kawkawlin River runs from the Saginaw Bay northwesterly toward the Kawkawlin Flooding in Mills Township, Midland County, at the southern tip of Au Sable State Forest. The riparian corridor of the North Branch is bordered almost entirely by forested floodplain and agricultural lands. Land uses and ownership patterns along this corridor offer a number of opportunities for private landowners to help protect this resource and maintain high water quality. Additionally, the remnant of interior forest identified in Gibson and Mt. Forest townships could be restored to create a natural connection back into the Au Sable State Forest.

In southern Bay County, the Saginaw River empties Saginaw's Shiawassee Flats into Saginaw Bay. While historically functioning as a focal point and highway for lumber, trading, and industry, the latter half of the 20th century saw a rebirth of this corridor for recreation and tourism. Years of manufacturing use and discharge of toxic chemicals and contaminants into the Saginaw River, however, have had a significant negative impact on the growth and survival of a number of fish and other aquatic species. Efforts continue to reverse these changes, and with appropriate attention and concerted restoration activities focusing on water pollution and the invasion of exotic species, a cleaner and more vibrant Saginaw River is not far away.

Non-Motorized Trail Links and Connections

Bay County hosts a growing recreational trail network supported by citizens and area non-profits. This network, proposed to connect with nearby counties, is an important part of our region's non-motorized transportation network. Using the existing Bay Area Riverwalk and trailway system, there are a number of prospects for connecting the resources centered around Bay City to other areas in the county and beyond.

By completing trail extensions through Hampton Township to provide a link to the coastal wetlands of Saginaw Bay, and by developing a riverfront greenway and non-motorized pathway linking the Bay City Riverwalk to the Crow Island State Game Area along the Saginaw River, Bay County's trail network can become truly regional in its reach.

Further development of the Frank Andersen Nature Trail in the Bay City State Recreation Area north through Tobico Marsh will join the nature trail with an abandoned rail

(Bay County cont'd)

corridor adjacent to Nayanquing Point Wildlife Area. The trail could continue north to join the City of Pinconning's existing trail, from which users could travel along an old railroad grade to the Midland-to-Mackinaw Trail in the Au Sable State Forest.

Benefits and Action Recommendations

Massive land use changes in Bay County since the mid-1800s have significantly altered the quantity, diversity, and quality of habitat available to support wildlife. Habitat has been destroyed through human development of riparian lands along Saginaw Bay and Saginaw River and the drainage of wetlands throughout the county.

Other habitat degradation includes the sedimentation of fish-spawning reefs in Saginaw Bay and numerous impacts from exotic species. Although this habitat loss and degradation has impaired the reproductive success and growth of numerous aquatic and wildlife species, a number of non-profit and state and local government organizations are working toward the enhancement and restoration of the county's riparian corridors. By providing a framework for future restoration of our water-based resources, continued work by these organizations will assist these natural systems in the process of cleansing and rebuilding. This work can be complemented by area non-governmental organizations working with private landowners to help stop the further removal and degradation of the natural elements around which the county's communities were built.

As one of the major land holders and managers in Bay County, the Michigan Department of Natural Resources depends on the assistance of its partners, particularly that of non-profit agencies such as Ducks Unlimited, Inc., and the Saginaw Basin Land Conservancy. As member-driven organizations, the work of these non-profits in land acquisition and conservation activities is guided directly by the involvement and contributions of their membership. By becoming more involved with those organizations that protect the place they call home, the residents of Bay County can have a direct and personal impact on the resources around them.

The Bay Area Community Foundation is another Bay County group that depends on the contributions of individuals, corporations, and philanthropic foundations to help create a sustainable future. The Community Foundation's Riverwalk-Rail Trail Committee has taken the lead on the development of non-motorized trailways throughout the county, and the region's citizens can support this work by either volunteer or financial contributions.

By supporting local trail groups, municipal planning and recreation authorities, and land conservancies, we can realize a Vision of Green for Bay County!

Midland County

General Description of Midland County's Green Infrastructure Resources

Of the three counties in our region, Midland has the largest blocks of existing conservation land, mostly in the form of wetland forests. The county's river system flows from extensive tracts of the Au Sable State Forest in Arenac, Gladwin, Isabella, and Midland counties before reaching the City of Midland. This massive forest, our regional connection to the north, consists of a patchwork of state and national forest land that covers northern lower Michigan from Midland up to the Straits of Mackinac.

Cores and Hubs

The Au Sable State Forest functions as the principal terrestrial hub of the Saginaw Bay region's green infrastructure network. The extensive forest system in Midland County is not just the backbone to the larger network, it is also the majority of the body of green infrastructure for the greater Midland community. Shaped like a water droplet, the "great north woods" of Michigan extends in a peninsula of forestland from Roscommon County all the way to the southern edge of Midland County. This "droplet" of almost 45,000 acres of forest in Midland County alone is surrounded by agricultural lands on three sides.

At the urban level, the City of Midland benefits from an abundance of parks, open spaces, and recreational opportunities supported by the backbone that is the Pere-Marquette Rail Trail. The result of an historic zoning ordinance, the city's park system is often heralded as one of the key contributors to the city's quality of life and is made possible by the city's commitment to green space and parks.

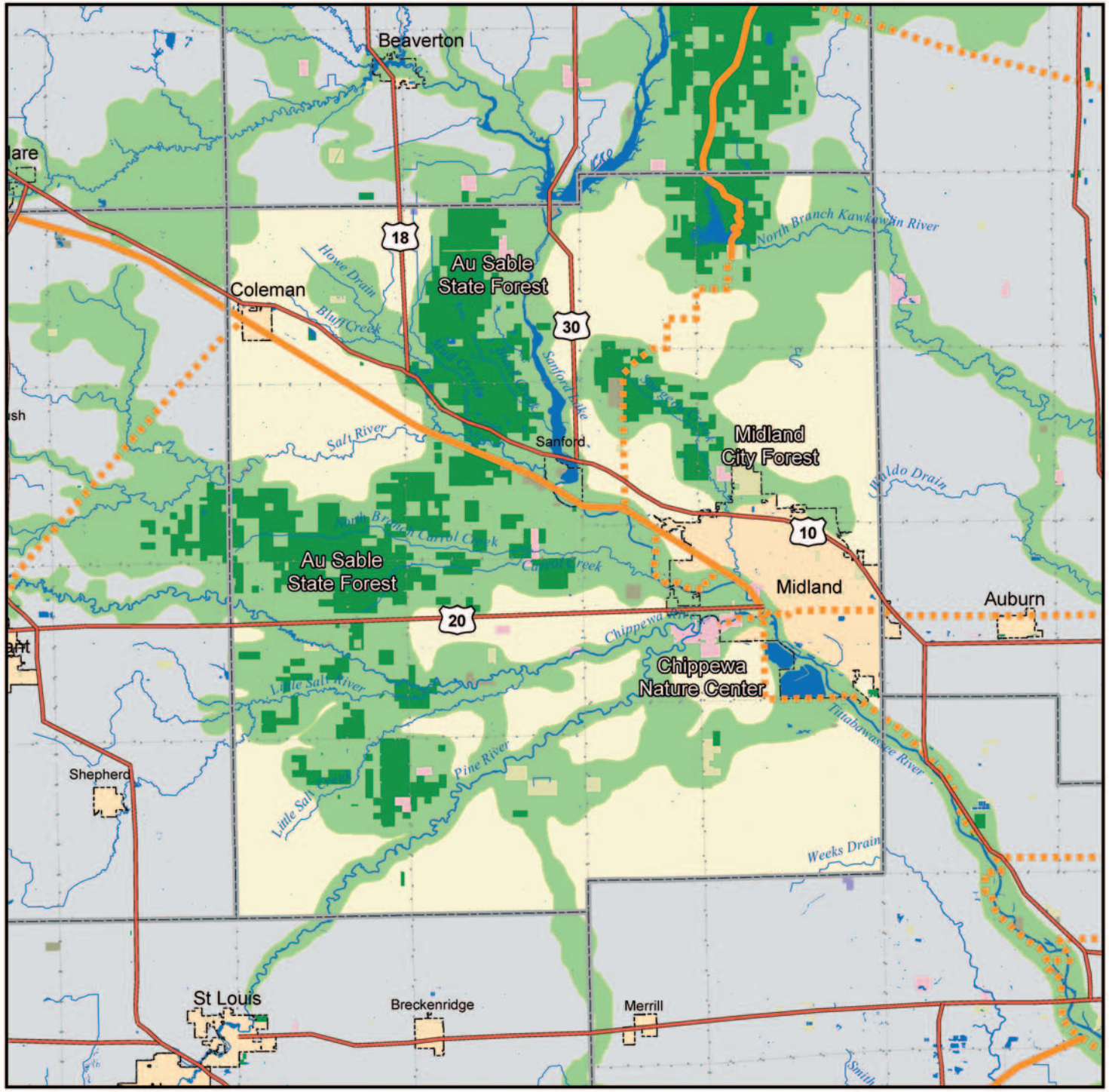
Conservation Links and Connections

Slicing through Midland County's landscape is an intertwined network of rivers and streams that provide passageways for plants, animals, and people. These river systems are remnants of glacial movements that gave birth to our region's landscape. The river system in Midland County — particularly the Chippewa and Tittabawassee rivers — plays an important role in the conservation of the area's green infrastructure.

The Chippewa River has unique potential to contribute to the green infrastructure of our region because of existing public access and a variety of available recreation opportunities. Nestled in an oxbow near the City of Midland, one of the country's premiere private nature centers works to promote environmental awareness and foster responsible stewardship of the

Midland County

A Vision of Green . . .



Saginaw Bay Watershed

Map Legend

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0 1.5 3 6 Miles

Saginaw Bay Greenways

(Midland County cont'd)

region's resources. The Chippewa Nature Center's more than 1,000 acres, with habitats ranging from deciduous and coniferous woods to rivers, ponds, wetlands, and upland fields, are used for the sole purpose of providing an educational gateway to the natural world.

The Tittabawassee River flows from extensive tracts of the Au Sable State Forest in Gladwin and Midland counties through the City of Midland, where it then joins the Chippewa River. The Tittabawassee and the North Branch of the Kawkawlin River are two potential corridors for wildlife movement between state forest lands, the Shiawassee Flats, and the coastal wetlands of Bay County.

Non-Motorized Trail Links and Connections

The Pere Marquette Rail Trail runs northwesterly from the City of Midland to Reed City and Baldwin, for a total of 152 miles of publicly owned trail. In Midland County, the trail is nationally recognized for enhancing the county's quality of life. The trail was purchased and developed by the Midland Community Foundation and the County Parks and Recreation Department and links the City of Midland and other communities with the area's cultural, recreational, and historic resources. Using both abandoned railroad grades and active utility and railroad corridors, opportunities exist for linking the Pere-Marquette trail to Bay City and Mt. Pleasant. These extensions would create a truly regional non-motorized network.

At Reed City, the Pere Marquette Rail Trail connects to the 93-mile north/south White Pine Rail Trail. These two trails provide the framework for Michigan's statewide system of rail trails, which will one day allow for non-motorized travel across the state from east to west and from north to south.

Beginning near the Kawkawlin Flooding in the northeastern corner of the county and stretching 210 miles to Mackinaw City, the original Mackinac Pathway (a migratory route used by the Chippewa tribe) has been recently reopened by area Boy Scouts and other volunteers. The Midland-Mackinac Trail is not well known, but just as the AuSable State Forest is, this trail is one of our key regional connections to the north.

(Midland County cont'd)

Benefits and Action Recommendations

Of the three counties, the landscape of Midland County is the richest, with intact ecosystems represented by wetland forests and riparian corridors. The county's recreational and ecological resources are being managed independently by a variety of organizations, including state and local governments and non-profit organizations. Greater cooperation and coordination is needed among all of the county's land managers and land use stakeholders to ensure the sustainable use and conservation of these intact ecosystems.

Continued work by these organizations to in-fill existing land holdings and manage existing resources is also needed to ensure the highest level of ecosystem functioning and its resultant benefits. Opportunities exist for the protection of interior forest habitat in the northwestern and southwestern quarters of the county, and can be complemented by the work of area non-governmental organizations with private landowners.

Working at the community level to protect and in some cases acquire land adjacent to Midland County's riparian systems, the Little Forks Conservancy, the Chippewa Nature Center, and the Midland Conservation District depend on the contributions of individuals, corporations, and foundations to continue their work. With citizen, corporate, and governmental support, these agencies can continue to play a significant role in river restoration and corridor acquisition. Also vitally important to recreation and resource protection in Midland County is open and vocal public support for the Midland County Parks and Recreation Department. To implement a Vision of Green, it is crucial that they continue to be well prepared to properly maintain existing facilities and to acquire additional park lands in strategic locations throughout the county.

A spin-off of mid-Michigan's Tri-City Cyclists — Safe Trails and Roads for Pedestrians and Cyclists (STARPAC) — is urging the creation of safer opportunities for non-motorized travel in the greater Midland area. The continued growth of STARPAC will help to establish safe routes for human-powered activities and aid in the development of a comprehensive plan for non-motorized transportation in the City of Midland and adjacent townships.

By supporting local trail and recreation groups and land conservancies and encouraging coordinated municipal planning and recreation opportunities, we can realize a Vision of Green for Midland County!

Saginaw County

General Description of Saginaw County's Green Infrastructure Resources

At the heart of the Saginaw Bay Watershed's network of rivers and streams (riparian system) lies Saginaw County. Here, an area known as the Shiawassee Flats is created by the confluence of the Tittabawassee, Shiawassee, Flint, and Cass rivers. This web of tributary rivers joins to form the Saginaw River, the largest tributary to the Saginaw Bay. This riparian system is the aquatic foundation for the county's green infrastructure network and the Saginaw Bay Watershed.

Hubs

The Shiawassee Flats is Saginaw County's central green infrastructure hub — nearly 20,000 acres of marsh, swamp, and low-lying farmland are owned by the Michigan Department of Natural Resources and the U.S. Fish and Wildlife Service. These agencies coordinate the management of this area and receive regular input from the Shiawassee Flats Advisory Council, a coalition of local hunting, fishing, and conservation groups.

Each spring and fall, thousands of migrating waterfowl visit the Flats. This gives both birders and hunters some remarkable opportunities. Continued expansion of the Shiawassee River State Game Area in Swan Creek and St. Charles townships is adding new land for managed habitat.

The Shiawassee National Wildlife Refuge is implementing a long-range plan to expand the refuge by acquiring several thousand acres along the Cass, Tittabawassee, and Shiawassee rivers, extending the protected habitat area along the south and west sides of the Saginaw urban area. Saginaw County's other green infrastructure hubs are shared with adjoining counties.

The Crow Island State Game Area includes 6,000 acres of wetlands on both sides of the Saginaw River in Bay and Saginaw counties. The Gratiot-Saginaw State Game Area includes a patchwork of woodland in Marion and Brant townships in Saginaw County and an extensive tract of woods and wetlands in Gratiot County. This includes the headwaters of small drains and streams that are tributaries of the Bad and Maple rivers.

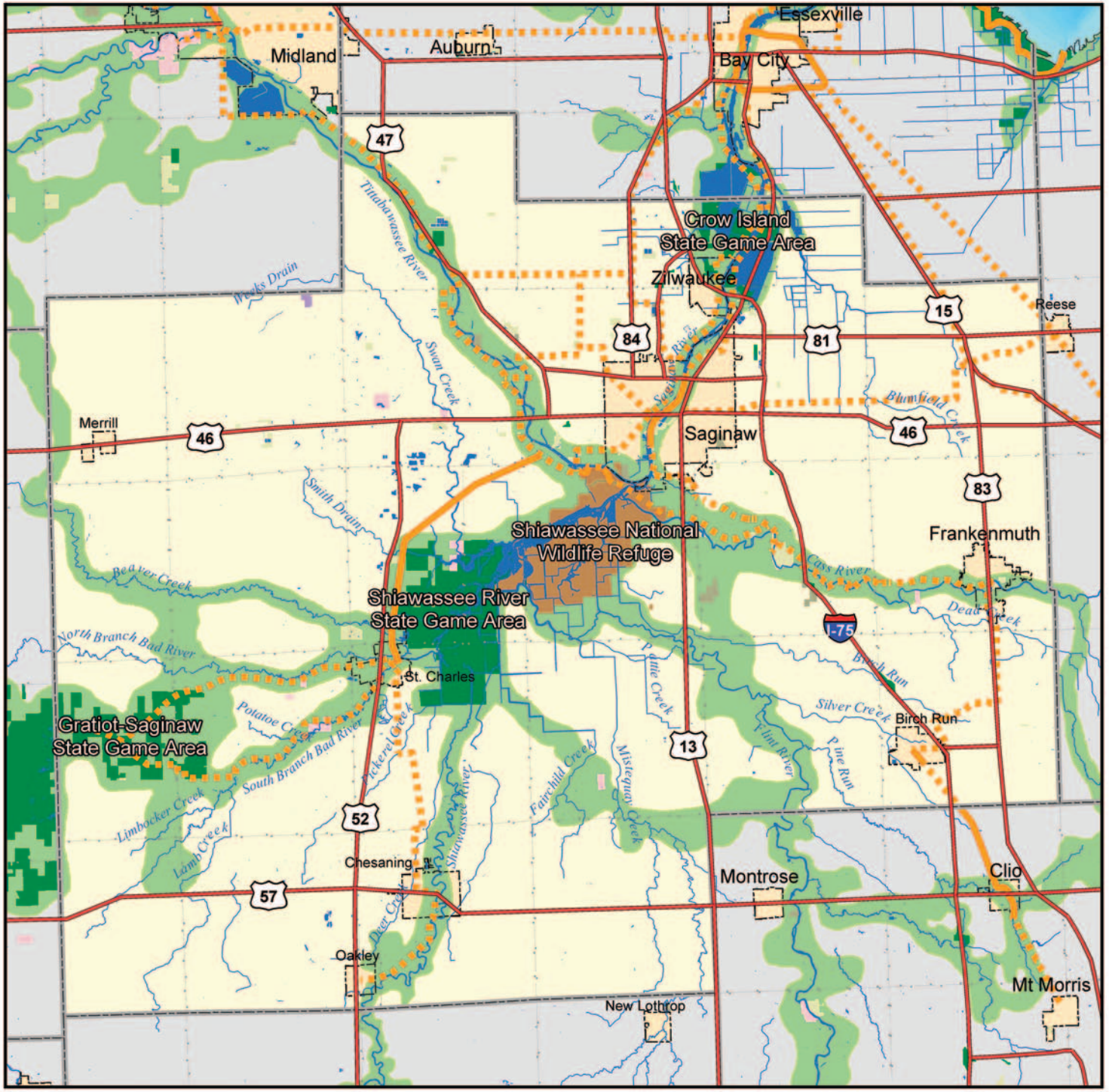
The green infrastructure of the Saginaw Bay region, and particularly of Saginaw County, forms a key piece in a web of potential conservation areas and trail systems extending throughout Michigan's Lower Peninsula.

Conservation Links and Connections

The "X" formed by the junction of the Saginaw, Cass, Shiawassee, and Tittabawassee rivers just south of Saginaw and adjacent to the open space hub of the Shiawassee Flats is a major intersection of

Saginaw County

A Vision of Green . . .



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Saginaw Bay Greenways

(Saginaw County cont'd)

regional linkages. These corridors extend across the state, as the north and south branches of the Bad River connect the Shiawassee River State Game Area to the Gratiot-Saginaw State Game Area. Wildlife biologists at the Michigan Department of Natural Resources have noted that only a few miles separate the Gratiot-Saginaw and Maple River State Game Areas. From there, wooded corridors along the Grand River and its tributaries and other rivers in southwest Michigan connect a string of game areas and other state land all the way to Lake Michigan. With appropriate protection and concerted efforts to restore forest and wetland habitat, this corridor could accommodate wildlife movement clear across this urbanized part of the state from Lake Michigan to Saginaw Bay.

The other leg of this riparian "X" is formed by the Cass and Tittabawassee rivers. Both the Cass and Tittabawassee give birth to the Saginaw River, and they ultimately flow into Saginaw Bay. Near the City of Saginaw, the proposed Tittabawassee conservation corridor meets with another proposed corridor along the Cass River, creating a ribbon of green across the county. Other linkages radiate out from the Shiawassee Flats, including corridors along the Flint and Shiawassee rivers.

Non-Motorized Trail Links and Connections

Just as the Shiawassee Flats serve as the central hub for the county's ecological network, the City of Saginaw provides the core of the county's system of trails and riverwalks. Radiating outward from the city are a number of existing and proposed trails such as the Saginaw Valley Rail Trail, the Saginaw Riverwalk, the M-84 Trail, the Cass River Trail, the Trolley Line Trail, and the Bay-Zilwaukee Rail Trail.

As of 2004, another phase of the Saginaw Valley Rail Trail, the newest Saginaw County park, is under construction. Completed portions come in contact with state-owned land at several points, and this adds wildlife-viewing opportunities to the outdoor recreation and fitness benefits offered by the trail. Continued expansion will allow the trail to reach out to the communities of Chesaning and Oakley while reaching northward to proposed trails running adjacent to the Tittabawassee River.

An exciting opportunity also exists to connect two of the region's population centers by use of a rail corridor stretching from Bay City's south end to the northern limits of the City of Zilwaukee. A once-active rail line used to transport cargo to northern Michigan, this corridor could now provide the area's residents with a means of non-motorized travel between the two cities. The Bay-Zilwaukee trail would also give access to one of the region's rich wetland and wildlife resources, as nearly two-thirds of its five-mile length pass through the Crow Island State Game Area.

Efforts are also underway to finalize the alignment for the Trolley Line Trail. When completed, the Trolley Line Trail will run from Bridgeport to Birch Run and Frankenmuth, and then on to the communities of Clio and Mt. Morris in Genesee County to the south. It is hoped that this trail will provide a conduit between the county's major tourist destinations, allowing visitors to experience a variety of opportunities from wildlife viewing to shopping and dining, while reaping economic benefits for the communities that construct it. The eventual construction of the

(Saginaw County cont'd)

Trolley Line Trail and several other small connecting trails would allow residents to travel all the way from northern Bay County to southeast Michigan, all without using a car!

Benefits and Action Recommendations

Of the three counties, the landscape of Saginaw County has been the most severely influenced by human-centered development. This has left little outside of currently owned state and federal land in a naturally functioning state. Enhancement of the county's riparian corridors will serve to maintain what is left and provide benefits including improved water quality and wildlife habitat.

Voluntary landowner stewardship programs such as the Wetland Reserve Program, Conservation Reserve Enhancement Program, and Partners for Wildlife have been central to restoring non-productive agricultural lands for wildlife habitat in Saginaw County. Long-term funding and public support for these and other related landowner incentive programs is essential to continue building on the remarkable work that has already been done.

Complementing these incentive programs, technical assistance by the Michigan department of Natural Resources and the U.S. Fish and Wildlife Service has been critical to the county's preservation of riparian and wetland resources. As they work through their management and expansion planning, continued support for these agencies by municipal governments and citizen action groups is vital to the success of conservation and resource protection in Saginaw County.

Although some non-motorized trail resources presently exist in the county, it has the lowest per capita access to these resources in the region. Working with county and city parks and recreation departments and their associated planning commissions, citizens and neighborhood groups can encourage greater access to recreational resources such as trails and neighborhood parks.

By supporting local trail groups, municipal planning and recreation authorities, and land conservancies, we can realize a Vision of Green for Saginaw County!

Introduction

"If our children are to find a pleasant peninsula when they look around them . . . we need to seek answers to our land use issues today," challenges Governor Jennifer Grandholm.

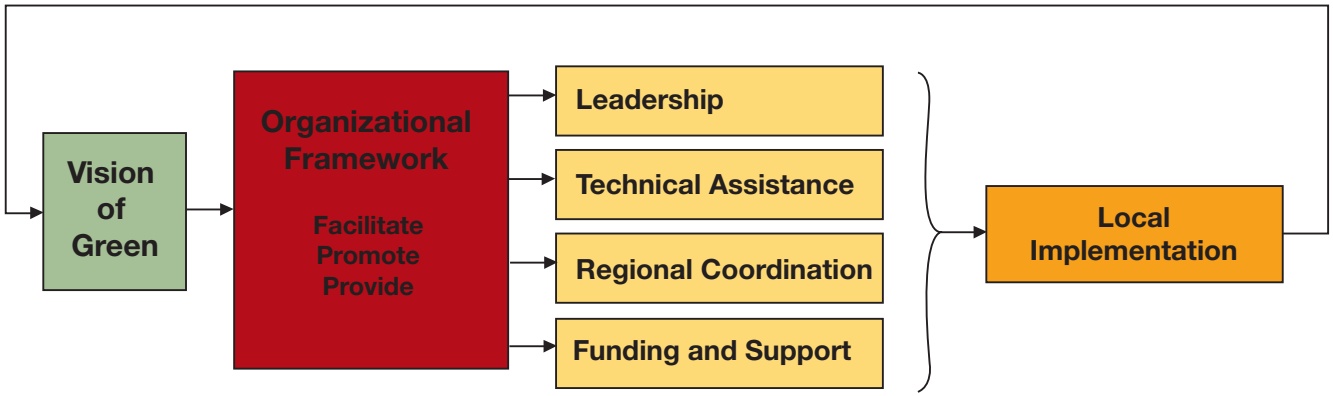
The Collaborative has taken important steps to meet this challenge by identifying significant conservation, recreation, and resource-based lands that form a viable green infrastructure vision for Bay, Midland, and Saginaw counties. But the hard work of implementing the vision has just begun.

Green infrastructure is essential to the sustainability of every community, and both public and private sectors have a responsibility to plan, build, and maintain this aspect of the infrastructure. The Vision of Green can become part of a "community map" that guides both conservation activities and development. The recommendations in this section are directed toward the development and management of a regional public/private partnership that facilitates regional coordination and assists local planning, conservation, and development actions. Ultimately, conservation and development activities are carried out at the local level.

The Collaborative recommends focusing on four principle areas where issues must be addressed and actions taken to implement a green infrastructure vision:

- Organizational Framework and Leadership
- Technical Assistance — Information and Education
- Intergovernmental Cooperation and Regional Coordination
- Funding and Support

For each principle area, we have identified below a number of actions and recommendations to be considered. These are starting points for further discussion and decision making as implementation of the regional green infrastructure vision becomes a conservation priority for public, private and non-governmental organizations.



Organizational Framework and Leadership

As the project progresses from the planning stage to the implementation stage or from vision to reality, the leadership, organizational framework, and support for the project must evolve as well. The project is at a critical juncture, and effective leadership and coordination from a regional public/private partnership is necessary to ensure that the vision becomes a blue print for conservation and a framework for growth for Bay, Midland, and Saginaw counties.

The Collaborative recommends the formation of a Green Infrastructure Implementation Partnership to facilitate regional coordination and provide leadership and technical and funding assistance. This is an essential first step toward implementing the green infrastructure vision. WIN should help foster the leadership, cultivate committed partners, and leverage financial support to establish such a partnership. Once the organization is established, the "Partnership" should consider the following operational recommendations.

Recommendations:

- Convene representatives of local, regional, and state governments, non-profit organizations, and the private sector and facilitate the development of green infrastructure implementation strategies and plans.
- Ensure multi-jurisdictional coordination of green infrastructure implementation and management plans.
- Secure funding from existing programs and sources and help develop new sources of funds for green infrastructure protection, development, and management.
- Provide technical assistance, education programs, and materials for communities, agencies, and organizations to build support and capacity for implementing the green infrastructure vision plan.
- Dedicate staff to work with local communities and conservation organizations on plan implementation by translating regional conservation goals to local planning and implementation actions.
- Maintain and update the green infrastructure maps and database.
- Cultivate new partnerships and constituencies that support green infrastructure, including the health care sector, educational institutions, chambers of commerce, and home builders associations.
- Support and promote several collaborative pilot green infrastructure projects in the Saginaw Bay area and introduce innovative implementation models from around the state/country.
- Expand the green infrastructure planning process to include the entire Saginaw Bay Watershed.

The Collaborative recommends the formation of a Green Infrastructure Implementation Partnership to facilitate regional coordination and provide leadership and technical and funding assistance.

Technical Assistance and Outreach

WIN has been instrumental in facilitating the exchange of land use information and sustainable development practices in the region. The Collaborative compiled and assessed resource and land use information that is available to state and local governments, regional planning organizations, and non-profit organizations for well-informed decision making. Information is a valuable tool for local planning as well as for understanding changes in land use over time and the effects of those changes on the Saginaw Bay region.

Education and outreach is critical to building support for green infrastructure preservation and management. It's key in changing the public's perception that the natural environment is an amenity rather than a necessity upon which all life depends. WIN and The Collaborative have initiated this educational campaign, but there is much more to be done.

This section identifies a number of education and technical assistance programs and outreach activities that a Green Infrastructure Implementation Partnership could provide in support of sustainable land use and green infrastructure implementation and management.

Recommendations:

- Distribute computerized green infrastructure maps, data, models, and other land use decision-making information generated from the project to all municipalities, agencies, and organizations working on land use planning activities and issues in the Saginaw Bay region. The GIS maps and data should be "user friendly" and available at both county and township scales so the information can be applied to regional land use decisions and township plans.
- Continue to educate the public and private sectors about the concept and benefits of green infrastructure, especially the economic benefits. Support initiatives to document local examples and benefits of sustainable land use and conserving green infrastructure.
- Provide technical assistance for local community planning, zoning, and public works development on where to locate development based on existing gray infrastructure and where to target conservation efforts based on the Vision of Green plan.
- Offer educational programs on sustainable land use planning and zoning tools and techniques and provide incentives for local elected officials to participate.
- Provide information and encourage greater landowner participation in land management programs such as the Wetland Reserve Program, Conservation Reserve Program, Conservation Reserve Enhancement Program, Forest Stewardship Program, Forest Land Enhancement Program, and Partners for Wildlife.
- Develop a "One Stop Shop" program or clearinghouse that offers information on land use planning tools and techniques, resource inventories and data, sources of technical assistance and funding for conservation and sustainable land use activities, and best management practices.

Continue to educate the public and private sectors about the concept and benefits of green infrastructure, especially the economic benefits. Support initiatives to document local examples and benefits of sustainable land use and conserving green infrastructure.

Intergovernmental Cooperation and Regional Coordination

More than 1,800 units of local government have legal authority to engage in land use planning and/or zoning in Michigan. Green infrastructure planning and implementation requires collaboration among government, private, and nonprofit sectors. Governmental units lack the authority, scope, and resource capabilities to address many of the major challenges and opportunities related to multi-jurisdictional land use planning. A Green Infrastructure Implementation Partnership could help these three sectors have a joint vision with mutually beneficial goals. The Vision of Green could guide both conservation activities and development.

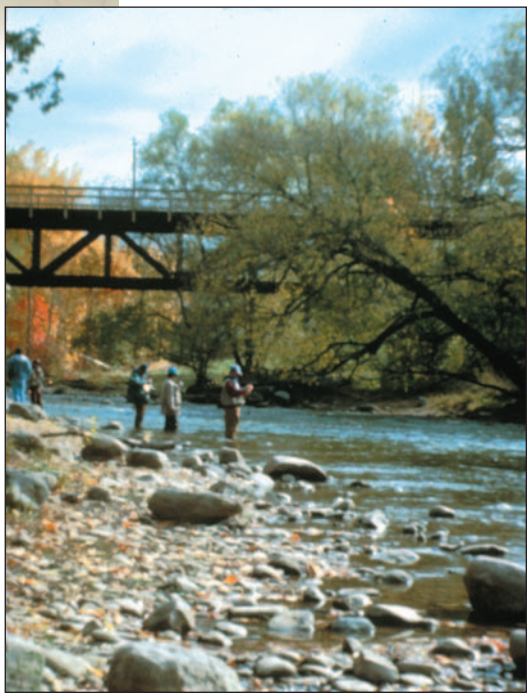
Recommendations:

- Encourage municipalities to review and revise their land use, recreation, open space, storm water management, and transportation plans and policies within the context of the green infrastructure vision plan.
- Encourage local conservation organizations to adopt the Vision of Green report as their strategic plan for prioritizing land protection.
- Create incentives for communities to collaborate on development of integrated regional plans and policies for transportation, infrastructure, and land protection activities.
- Facilitate intergovernmental agreements with municipalities, public land managers, and non-governmental organizations to protect and manage multi-jurisdictional green infrastructure resources (e.g., rail-trails or river corridors).
- Pursue partnerships with commercial and residential developers and local businesses to include green infrastructure in new construction projects or retrofit existing projects. If developers understand the benefits and economic value of green infrastructure, they are more likely to include the concepts in their site and development plans.
- Encourage philanthropic foundations that support green infrastructure principles and projects to provide incentives to communities through the grants process for projects that demonstrate multi-jurisdictional planning, prioritization, and coordination.
- Investigate and develop incentives for local jurisdictions to build and maintain green infrastructure, such as storm water management systems that provide cost-effective, environmentally beneficial alternatives for the treatment, storage, and flow of storm water.
- Work with the regional planning organization to prepare a regional land use plan that represents all jurisdictions.
- Prepare a composite of current local land use and zoning maps so that all jurisdictions in the region can share information.

Encourage municipalities to review and revise their land use, recreation, open space, storm water management, and transportation plans and policies within the context of the green infrastructure vision plan.

Funding and Support

Green infrastructure protection and implementation requires knitting together existing funding and technical assistance programs with innovative financing techniques. It also requires public and private investment and partnerships. A Green Infrastructure Implementation Partnership could help partners develop the framework or "implementation quilt" necessary to pull together the pieces of a green infrastructure network.



Establish a "Green Infrastructure Fund" to be used for greenway and open space acquisition, natural resource restoration, and recreational improvements in accordance with completed greenways and/or green infrastructure plans.

Recommendations:

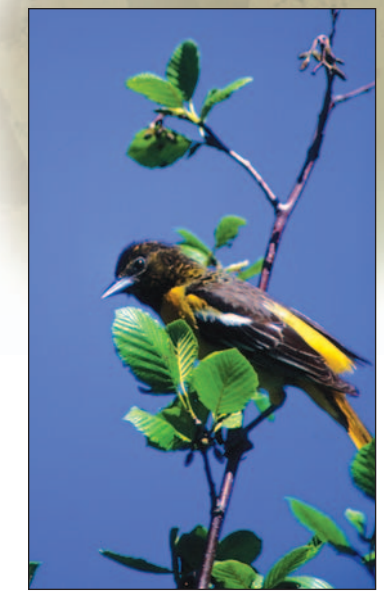
- Develop a "implementation quilt" that identifies: different land uses, conservation activities, and stakeholders within the green infrastructure network; potential funding sources and programs (federal and state programs, land protection tools and techniques, regulatory tools, rates/fees, public financing options); different stages of green infrastructure projects (planning, capital projects, land acquisition, education and outreach, management and maintenance); which agency, organization, or partnership should take action on specific green infrastructure projects.
- Establish a "Green Infrastructure Fund" to be used for greenway and open space acquisition, natural resource restoration, and recreational improvements in accordance with completed greenways and/or green infrastructure plans. Funds could also be used to develop multi-jurisdictional green infrastructure plans. It is anticipated that this private sector fund will leverage both state and federal funding sources for acquisition and project implementation. The GreenWays Initiative of Southeastern Michigan provides a similar model and on an average, leverages $6 public dollars for every $1 from the private GreenWays Fund.
- Encourage state and local governments, private sector, and conservation organizations to use the Vision of Green plan to set priorities and strategically guide their conservation funding and investment in the region.
- Explore, in cooperation with municipalities, the use of development impact fees, tax incentives, and other strategies for application to green infrastructure implementation.

(Funding and Support cont'd)

- Assess and investigate the suitability and feasibility of public financing options for green infrastructure projects, including ballot initiatives.
- Assist the region in determining the feasibility of developing a farmland preservation and purchase of development rights program.
- Pursue with the private sector the development of a low-interest loan program that allows nonprofit conservation organizations and local governments to acquire an interest in private land to protect critical natural environments and preserve farmland and open space through the purchase of development rights, conservation easements, and similar mechanisms.
- Work with the state to expand the Conservation Reserve Enhancement Program, which targets the Saginaw Bay Watershed. The program, which pays farmers to establish and maintain buffer strips along water courses, has been beneficial to farmers, wildlife and wildlife corridors, and water quality.

Develop an "implementation quilt" which identifies land uses and activities, stakeholders, potential funding sources and programs, different stages of green infrastructure projects, and which agencies or partnerships should take action on specific green infrastructure projects.

Resource Directory



County Planning and Parks Departments

Bay County

Department of Environmental Affairs and Community Development
515 Center Avenue
Bay City, MI 48708
(989) 895-4135

Midland County

Midland County Planning
220 W. Ellsworth, 3rd Floor
Midland, MI 48640
(989) 832-6879

Midland County Parks
220 W. Ellsworth, 3rd floor
Midland, MI 48640
(989) 832-6876

Saginaw County

Saginaw County Metropolitan Planning Commission
111 S. Michigan Ave.
Saginaw, MI 48602
(989) 797-6800

Saginaw County Parks and Recreation
111 S. Michigan
Saginaw, MI 48602
(989) 790-5280

Regional Contacts

East Central Michigan Planning and Development Regional Commission
3144 Davenport Avenue - Suite 200
Saginaw, MI 48602
(989) 797-0800

Regional Non-Profit Organizations

Saginaw Bay Watershed Initiative Network
c/o The Conservation Fund
P.O. Box 111
Auburn, MI 48611
(989) 662-6024

Little Forks Conservancy
414 Townsend St
Midland, MI 48640-5266
(989) 835-4886

Saginaw Basin Land Conservancy
4044 S. Three Mile Rd
Bay City, MI 48706-9206
(989) 686-0220

Bay Area Community Foundation
River Walk and
Rail-Trail Committee
703 Washington Avenue
Bay City, MI 48708
(989) 893-4438

Saginaw Valley Rail Trail
111 S. Michigan
Saginaw, MI 48602
(989) 790-5280

Trolley Line Trail
130 Griffes St.
Clio, MI 48420
Phone (810) 687-7590

State and Federal Governmental Contacts

Michigan Department of Natural Resources

Michigan Trailways Program
Forest Management Division
MDNR
P.O. Box 30452
Lansing, MI 48909
(517) 373-1275

Fisheries and Wildlife Division
503 N. Euclid Ave.
Bay City, MI 48706
(989) 684-9141

(Resource Directory cont'd)

State and Federal Governmental Contacts (cont'd)

Bay City State Recreation Area and
Saginaw Bay Visitor Center
3582 State Park Drive
Bay City, MI 48706
(989) 667-0717

Michigan Department of Environmental Quality

Land and Water Management Division
503 North Euclid Avenue
Bay City, MI 48706
(989) 684-9141

Coastal Management Program
Land and Water Management Division
MDEQ
P.O. Box 30458
Lansing, MI 48909-7958
(517) 335-3168

Michigan Department of Transportation

Bay Region Office
55 East Morley Road
Saginaw, MI 48601
(989) 754-7443

Non-Motorized Transportation,
Intermodal Services Section
425 W. Ottawa St.
P.O. Box 30050
Lansing, MI 48909
(517) 335-2823

U.S. Department of Interior

U.S. National Park Service
Rivers, Trails, and Conservation
Assistance Program
9922 Front Street
Empire, MI 49630
(231) 334-3130

U.S. Fish and Wildlife Service
Shiawassee National Wildlife Refuge
6975 Mower
Saginaw, MI 48601
(989) 777-5930

U.S. Department of Agriculture

Saginaw Bay Resource Conservation and
Development Area
4044 S. Three Mile Rd
Bay City, MI 48706-9206
(989) 684-5650

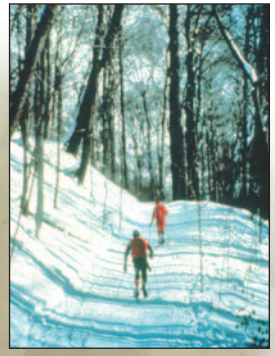
Nonprofit Organizations

Ducks Unlimited
Great Lakes/Atlantic Regional Office
331 Metty Drive, Suite 4
Ann Arbor, MI 48203
(734) 623-2000

Rails to Trails Conservancy
Michigan Field Office
416 S Cedar St. Suite C
Lansing, MI 48912
(517) 485-6022

The Conservation Fund
1800 North Kent Street, Suite 1120
Arlington, VA 22209
(703) 525-6300

The Nature Conservancy-Michigan Chapter
101 East Grand River
Lansing, MI 48906
(517) 316-0300



Acknowledgments

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Bill Gibson (ret.)–Midland County Parks
Jonathan Jarosz–East Central Michigan Planning
Mike Kelly–The Conservation Fund
Doug Koop–Little Forks Conservancy
Elan Lipschitz–Little Forks Conservancy
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Little Forks Conservancy
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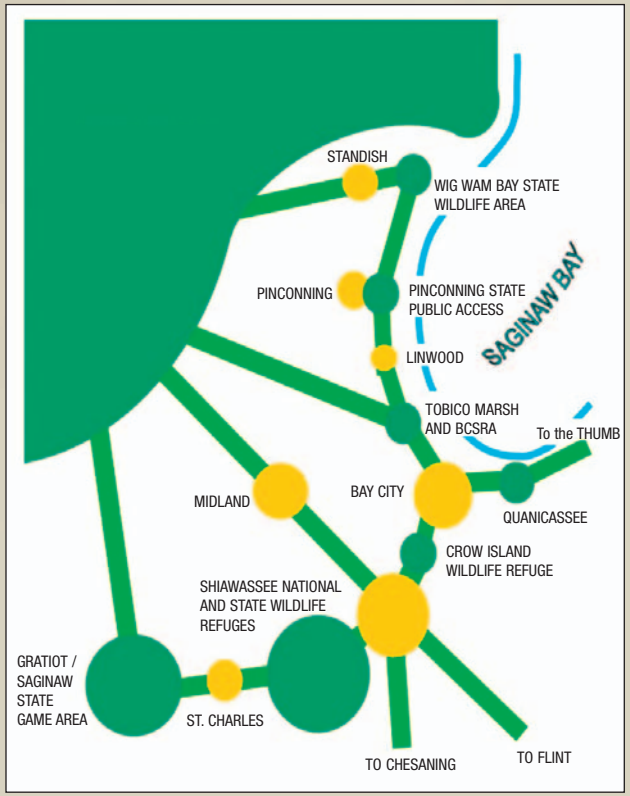
CD-Rom Resource Material

The accompanying cd-rom contains resource material designed to assist those who are interested in implementing the green infrastructure vision. Included on this cd are individual green infrastructure maps for all of the local jurisdictions in the tri-county area, a full copy of the report, a bibliography of information sources, and a variety of resource material that can assist local governments and resource conservation organizations begin to think about planning opportunities for green infrastructure protection.

You will need a copy of Adobe Acrobat software installed on your computer to view the maps and most of the documents. This software is included on the cd.

For more information or for additional copies of the cd, please contact The Conservation Fund at 989-662-6024.


A Vision of Green
A Guide for the Conservation of
Green Infrastructure in the Saginaw Bay Region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