

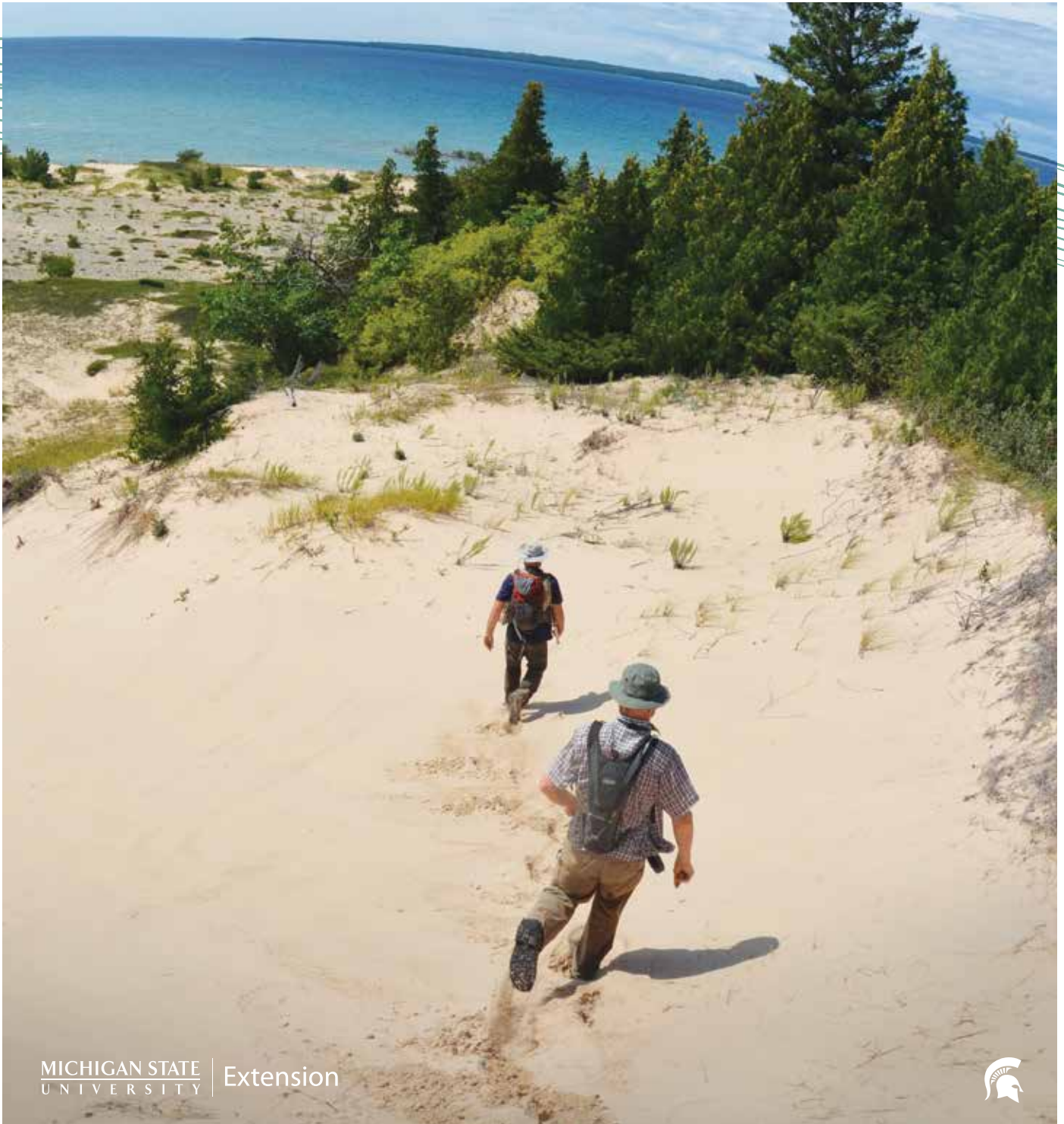


# Michigan Natural Features Inventory

Discover. Define. Deliver.

The Science that Guides  
Biodiversity Conservation and Stewardship

**Annual Report 2016**



# MICHIGAN NATURAL FEATURES INVENTORY

## A Program of Michigan State University Extension

Ludington State Park Open Dunes  
Photo by: Jesse Lincoln

### From the MNFI Director

The English poet John Donne famously wrote, “No man is an island entire of itself; every man is a piece of the continent, a part of the main.” This sentiment holds true for the world of conservation. Last year our annual report focused on what MNFI does as an organization. Simply put, we wanted you to become more familiar with MNFI and the many things we do for conservation. But what MNFI accomplishes is possible only through the efforts and support of a wide array of partners; this annual report focuses on them.

Like the species we help to conserve, each of our partners has its own niche. Some have broad niches, like the Michigan Department of Natural Resources, our most long-standing partner in terms of both a close working relationship and support for MNFI. Others define their missions more narrowly and focus on specific areas . . . land preservation, on-the-ground stewardship, timber, invasive species, birds, etc.

Regardless of niche, we and our partners recognize that conservation requires the involvement of many perspectives . . . from the scientific view of biologists, to the economic view of businesses, to the perspective of individuals who enjoy and derive benefit from those resources. The quality of human life is absolutely dependent on the natural world, and it is incumbent on all of us to do our part, individually and collectively, to ensure those resources support a good quality of life for the next generation, and the next, and the next . . . so, we are all in this together . . . none of us is an island, and if we fail to preserve a species, the natural resources that support the state’s economy, the wide range of recreational opportunities, or any other benefit nature affords us, we fail all of us. As John Donne ended his famous meditation, “. . . therefore never send to know for whom the bell tolls; it tolls for thee.”

Brian J. Klatt, Ph.D., Director  
Michigan Natural Features Inventory

### From the Michigan Department of Natural Resources Director

The Michigan Department of Natural Resources (DNR) has been an active partner with the Michigan Natural Features Inventory (MNFI) since the MNFI’s founding nearly 38 years ago. DNR employees work closely with MNFI staff to ensure that scientifically sound information is available to our wildlife and fisheries biologists, foresters and others who manage and protect Michigan’s natural resources. This partnership has been important to the conservation of the state’s plants and animals, and has been critical in helping the DNR accomplish the state’s conservation goals. We want to make sure our state’s resources are enjoyed by hunters, fishers, trail users, campers and nature enthusiasts of all kinds for generations to come.

The MNFI-DNR relationship has been productive, and as with all relationships it has continued to grow. For the past two years Dr. Bill Moritz, DNR’s Natural Resource Deputy, has worked with DNR and MNFI staff to explore ways to expand the effectiveness of our work together. A central theme of this evolving effort has been to enlist even more partners to develop natural heritage information for the state. This wealth of information will further the missions of both organizations and extend the reach of our partner groups.

We at the DNR have seen the value of partnerships in accomplishing natural resource goals—whether we are linking arms to do wildlife or aquatic habitat work, enlisting volunteers to help with stewardship at state parks or seeking to expand groups that identify and remove invasive species across the state. These partnerships are fundamental to our success as a state. We are proud to work side by side with MNFI, and we look forward to continuing our collaboration for the good of the people of Michigan.

Keith Creagh, Director  
Michigan Department of Natural Resources



## Our Mission

To guide the conservation and stewardship of Michigan’s biodiversity by providing the highest quality scientific expertise and information.

## Our Vision

To be the authoritative source of information on biodiversity that is widely used to conserve Michigan’s unique natural heritage for current and future generations.

## MSU Extension Mission

Michigan State University Extension helps people improve their lives through an educational process that applies knowledge to critical issues, needs and opportunities.

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### On the Cover

Ecologist Joshua Cohen working in an Open Dune community with Noah Jansen of the Little Traverse Bay Bands of Odawa Indians Natural Resources Department at McCauley Point on Beaver Island

See article on page 22.

Photo by: Bill Parsons

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DISCOVER.  
DEFINE. DELIVER.

Lakeplain Wet Prairie at  
Dickinson Island/St. Clair Flats  
State Wildlife Area  
Photo by: Joshua Cohen

## Guiding Biodiversity Conservation and Stewardship

WE **DISCOVER** AND **DEFINE** Michigan's most current biodiversity data through scientific research, field work, and stewardship of the Natural Heritage Database (NHD)—the most authoritative and comprehensive database available on the distribution and condition of rare species and high quality natural communities in Michigan.

WE **DELIVER** scientific information to:

- governmental and non-governmental agencies,
- the private sector and their environmental consultants,
- fellow researchers,
- the public, and
- the NatureServe Network international database.

Our work informs state, regional, national, and international decisions that impact biodiversity and ecosystems. We contribute to the state's current and future economic well-being and environmental stewardship through:

### Research and Consulting

- Projects to study emerging and ongoing issues that impact Michigan's biodiversity
- Site Reviews and Assessments of Rare and Invasive Species to generate up-to-date information

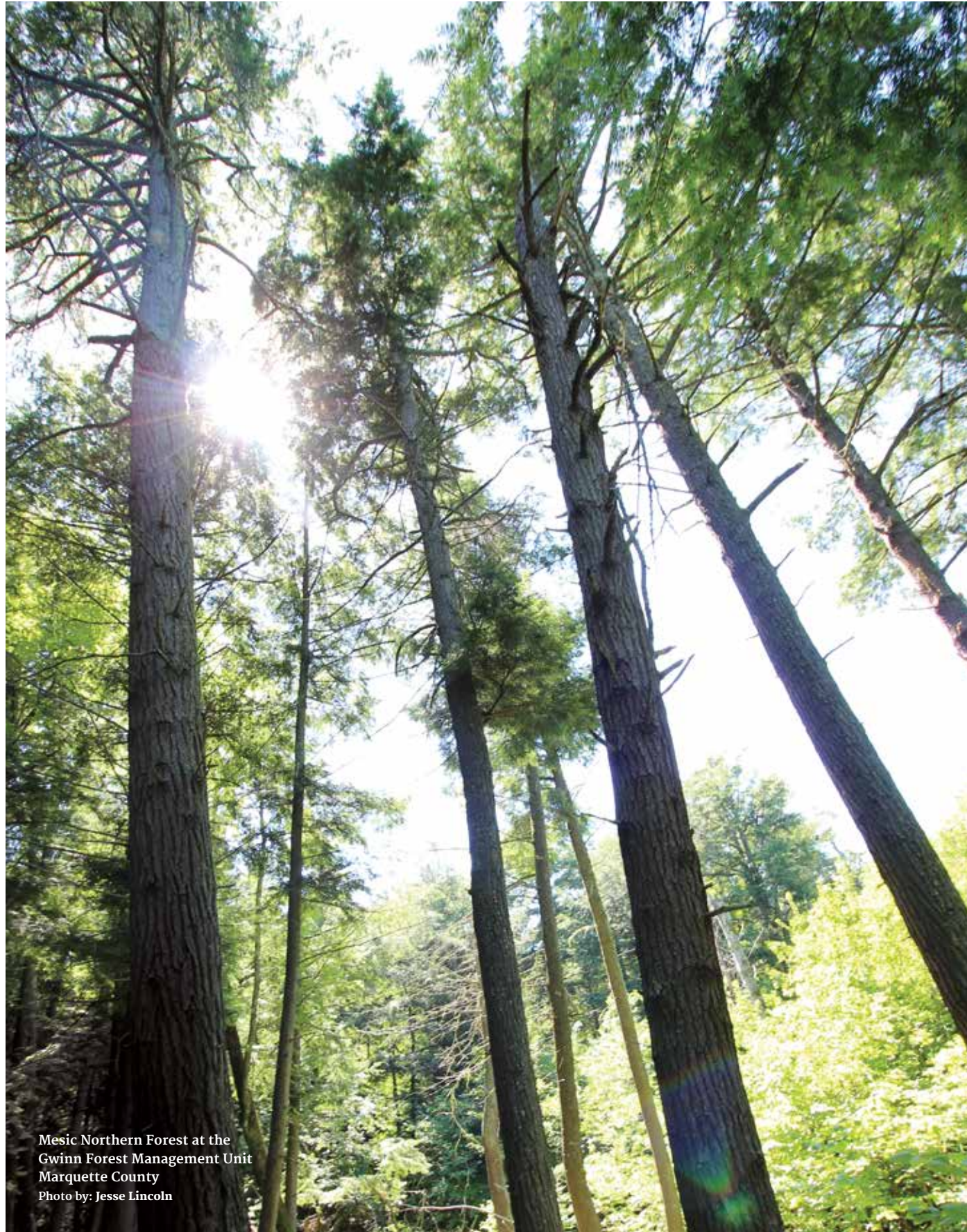
- Natural Features Inventories to create strong foundations for sound land use, natural resource management, and conservation decisions

### Conservation Planning Services

- Site ecological summaries
- Evaluation of the conservation value of a site
- Conservation plans for sites most in need of protection
- Land use planning services

### Partnerships and Outreach

- The involvement of a wide range of international, national, regional, and local partners from many disciplines, organizations, and perspectives to create and disseminate knowledge
- Educational workshops to inform decision makers
- Information available to the public online and through educational materials
- Access to in-depth heritage data through subscriptions
- Educational project components for students and adult volunteers to promote environmental stewardship



Mesic Northern Forest at the  
Gwinn Forest Management Unit  
Marquette County  
Photo by: Jesse Lincoln

# THE YEAR IN REVIEW

## In the News

### Rare Butterfly Rests its Wings in Unique Southeast Michigan Ecosystem

In July 2016, WKAR's Current State Program featured a story on the Poweshiek skipperling, a rare butterfly on the federal endangered and Michigan threatened lists. Reporter Kevin Lavery joined a search for this elusive butterfly with graduate students who are part of the collaborative effort of MNFI and Central Michigan University to research and monitor the species.

**Read more at: [wkar.org/post/rare-butterfly-rests-its-wings-unique-se-michigan-ecosystem](http://wkar.org/post/rare-butterfly-rests-its-wings-unique-se-michigan-ecosystem)**

### Testing Methods to Control Invasive Zebra Mussels

Zebra mussels have a dramatic negative impact on native species in Michigan's lakes and rivers, costing industry and communities billions of dollars. MNFI is one of the university partners investigating the effectiveness of Zequanox to control zebra mussels through a new open water application method. MNFI conducted preliminary surveys and identified an appropriate lake for the study. Pre- and post-treatment surveys of native mussels will monitor changes in the impact of zebra mussels on them.

**Read more at: [freep.com/story/news/local/michigan/2016/08/14/researchers-enlist-new-tool-against-invasive-zebra-quagga-mussels/88481078/](http://freep.com/story/news/local/michigan/2016/08/14/researchers-enlist-new-tool-against-invasive-zebra-quagga-mussels/88481078/)**

### Middle School Students Gather Data for MNFI

In April of 2016, Rogers City Middle School seventh graders participated in a hands-on learning experience about vernal pool ecology. They collected data in the Herman Vogler Conservation Area to contribute to the statewide vernal pool database. The project supports place-based education goals and next generation science standards. Supported by a grant from the Great Lakes Fishery Trust as part of the Great Lakes Stewardship Initiative, MNFI has been working with 13 schools in northern Michigan.

## Presentations

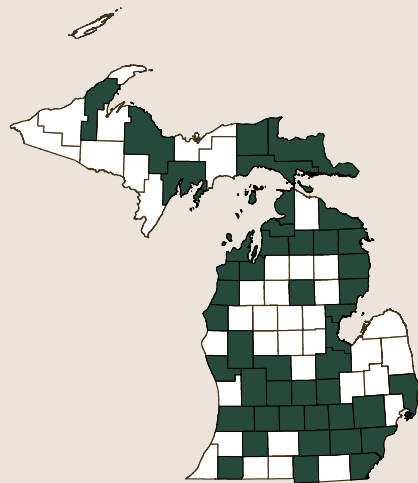
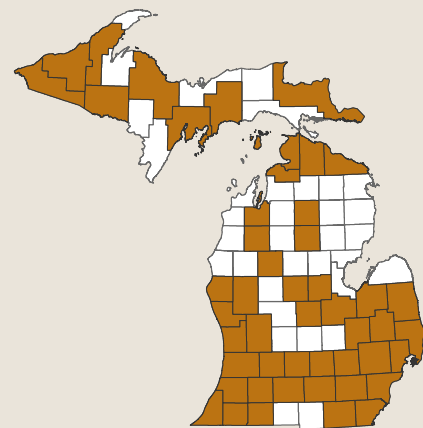
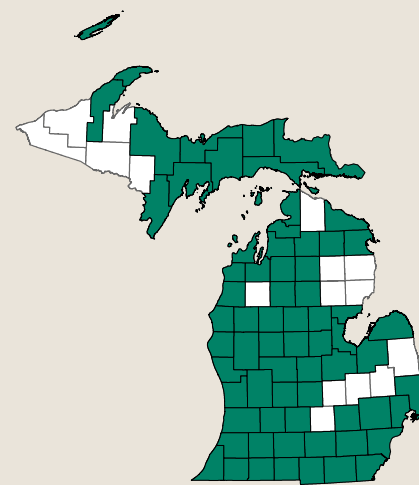
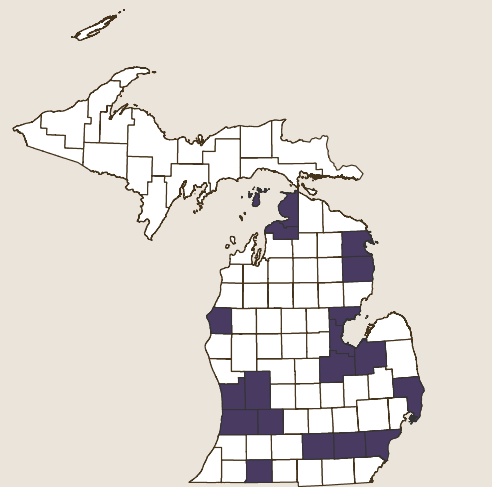
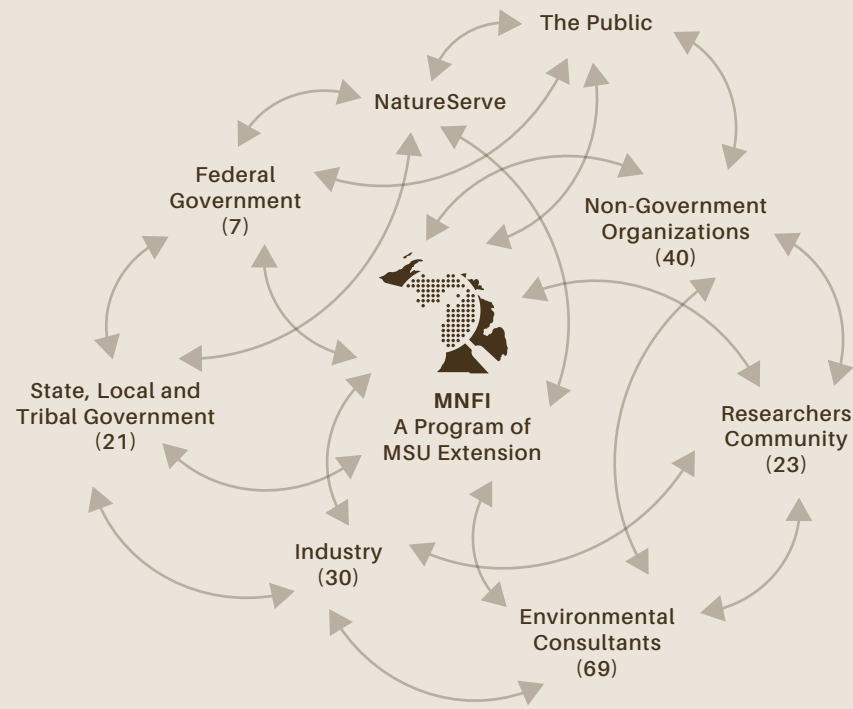
- Albion College Botany Class
- Albion College Ecology Class
- Battle Creek Books
- Beaver Island Archipelago Planning Team
- Charlevoix, Antrim, Kalkaska and Emmet (CAKE) Cooperative Invasive Species Management Area
- Detroit Seed Exchange Event, Wayne State University
- Iowa State University
- Kalamazoo Audubon Society
- Kellogg (MSU) Biological Station Teachers Institute
- Literati Bookstore, Ann Arbor—*Field Guide to the Natural Communities of Michigan*
- Michigan Association of Conservation Districts
- Michigan Consortium of Botanists
- Michigan Department of Environmental Quality, Air Quality Division
- Michigan Department of Natural Resources-Wildlife Division
- Midwest Invasive Plant Conference
- Michigan Invasive Species Coalition
- Michigan Nature Association
- Michigan State University Fundamentals of Fisheries and Wildlife Ecology and Management Class
- Saginaw Bay Cooperative Invasive Species Management Area
- Stewardship Network Conference
- West Michigan Cluster Cooperative Invasive Species Management Area
- Wild Ones, Red Cedar Chapter



Students from Rogers City Middle School  
Photo by: Brandon Schroeder

## 41 Projects and 190 Partners and the General Public

Our work includes Surveys, Rare/Threatened/Endangered Species Inventories, Habitat Assessments, Invasive Species Monitoring, Land Use Planning, and Citizen Science.



- Invasives
- Research
- Planning
- Partnerships

## Updating Our Strategic Plan and Logo

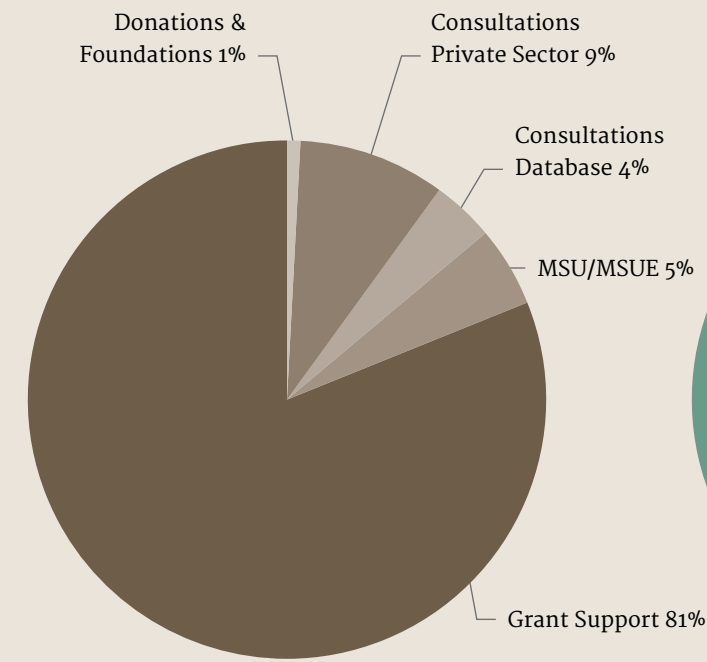
During 2016, MNFI staff worked alongside key partners to review and update our mission, vision, goals, objectives, and strategies. With input from Scott Hicks (U.S. Fish and Wildlife Service), Michael Donovan (MDNR-Wildlife Division), and Dr. Patrick Doran (The Nature Conservancy), the review produced a comprehensive list of specific actions which we are working to implement.

The message of “Discover, Define, Deliver” and the new logo, created by CiesaDesign, grew out of those discussions and underscore MNFI’s commitment to create and increase the effectiveness and reach of our high quality scientific expertise, build awareness of our organization, and encourage support and collaboration with even more public, private, non-governmental, and academic partners. All efforts serve the goal of providing information to those making decisions that impact Michigan’s natural resources, biodiversity, and economic sustainability. Read the plan on our website.



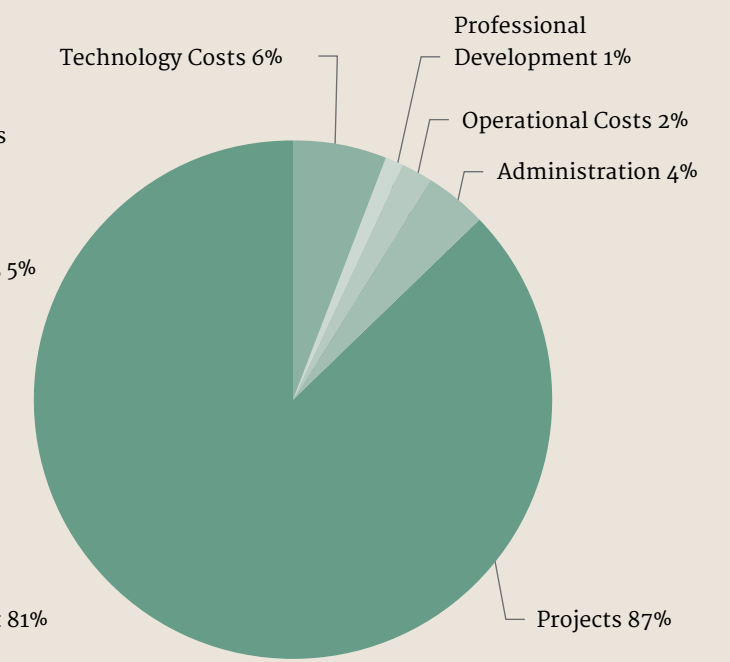
Explore MNFI’s Strategic Plan at: [mnfi.anr.msu.edu/about/strategic-plan.cfm](http://mnfi.anr.msu.edu/about/strategic-plan.cfm)

### Funding



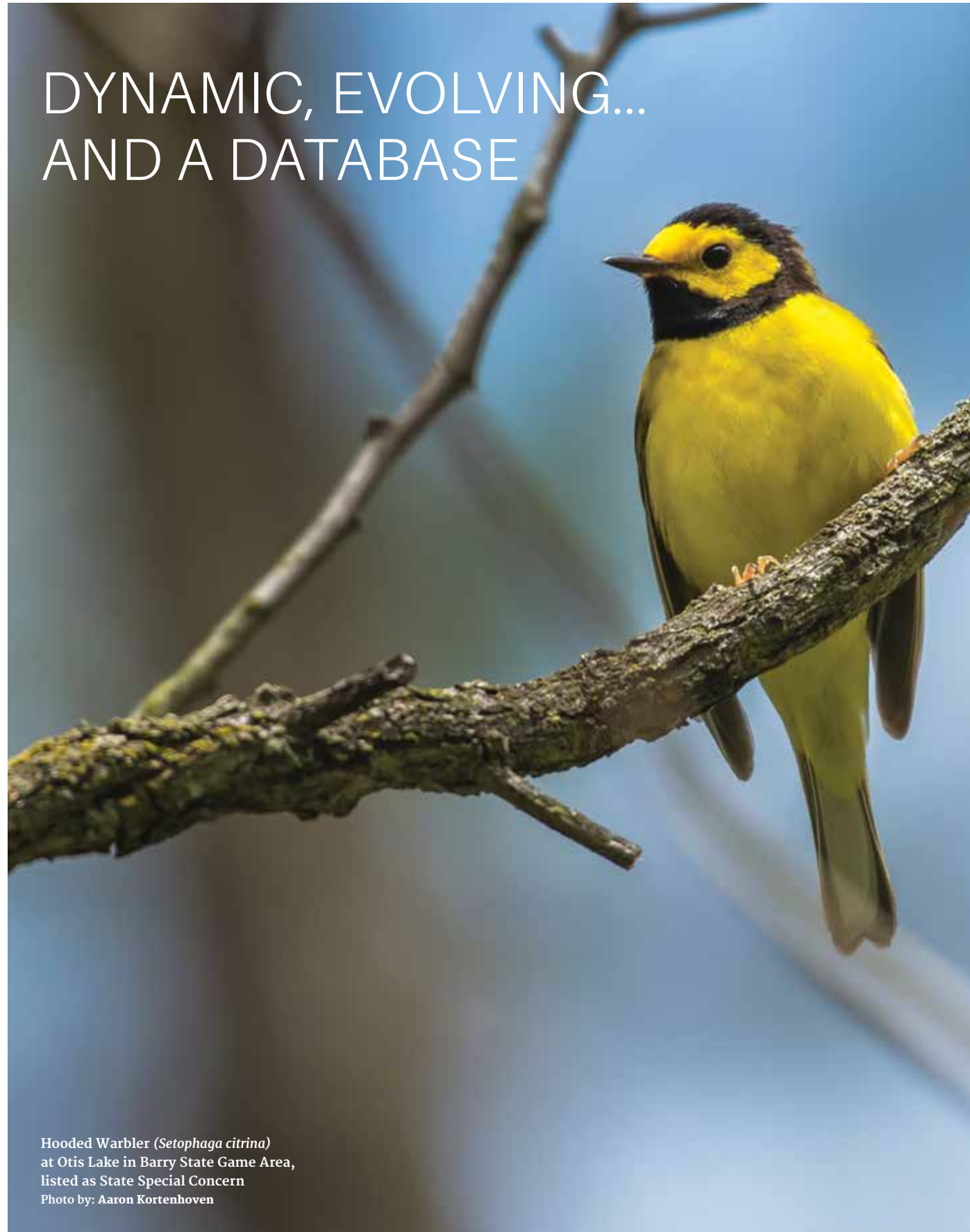
Total Funding: \$2,575,000

### Expenses

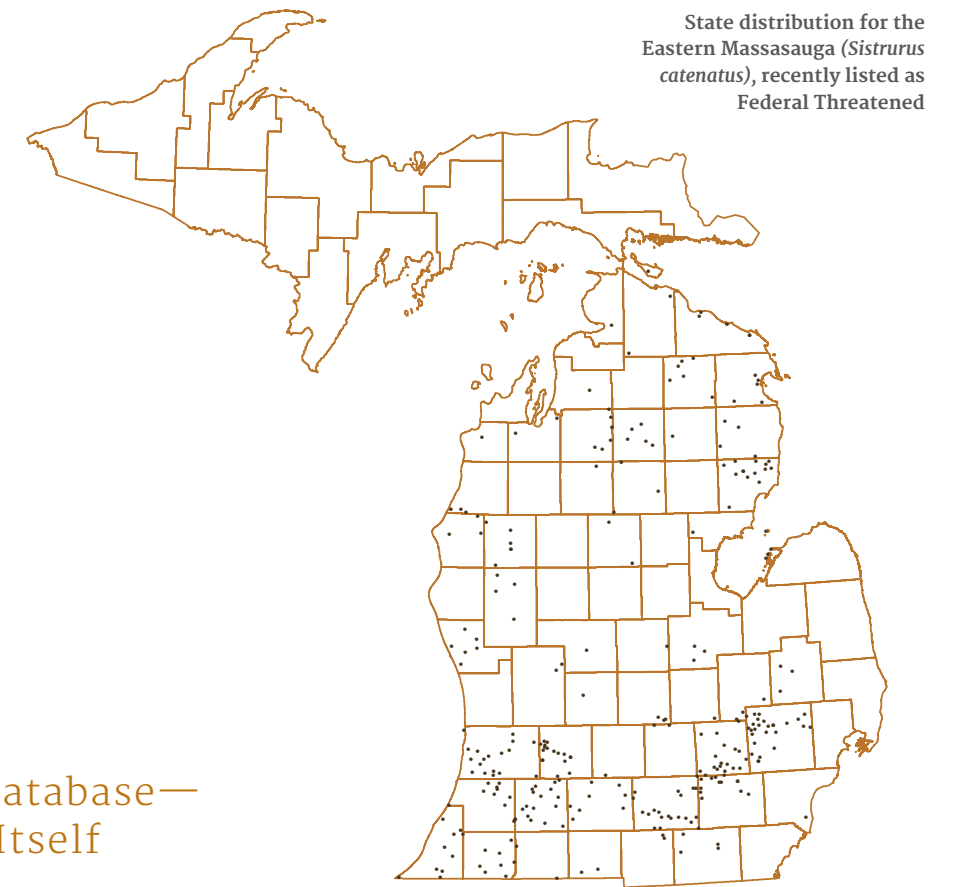


Total Expenses: \$2,500,000

# DYNAMIC, EVOLVING... AND A DATABASE



Hooded Warbler (*Setophaga citrina*)  
at Otis Lake in Barry State Game Area,  
listed as State Special Concern  
Photo by: Aaron Kortenhoven



## The Natural Heritage Database— Almost a Living Thing Itself

**M**NFI is one of the oldest, largest and highly successful Natural Heritage programs in the international NatureServe Network. Every day MNFI experts add to and update Michigan’s biodiversity data in the Natural Heritage Database (NHD). The organic nature of the NHD provides a current comprehensive body of knowledge which is vital to decisions which impact Michigan’s environment.

Of the 18,242 records in the database in 2016, 303 new records were added and 1,045 were significantly updated.

Each rare species or natural community type has an in-depth profile or “element” which includes its description, scientific information and the reason for its listing. Every occurrence of that species is documented in a “record.” Each element occurrence record includes data on location, date, condition, and details such as counts of flowering plants or offspring produced. Based on data on the species throughout the state, our scientists also rank the viability of the species at that location.

Location information is spatialized, mapping the known extent of that species in the landscape. Detailed maps for one or all rare species or community types can be produced to help inform decisions that have the potential to impact them. When a species

is removed from the list, information is archived so it is accessible for future use.

### Monitoring the Species Needing Protection

The Michigan Endangered Species Act provides legal protection for species on the list—a list that evolves as data becomes available. Threatened or endangered species are added. Others are “delisted” or removed when found to be sufficiently abundant, either through successful intervention or newly discovered population levels.

MNFI provides distribution and rarity information to Technical Committees convened by the Michigan Department of Natural Resources (MDNR). Committees composed of MNFI experts, public agency members, private consultants, private citizens, and academics review information and make listing recommendations on insects, mammals, birds, fish, mollusks, plants, and reptiles/amphibians to the MDNR. The next step is formal approval by the state legislature.

NHD information is also provided to the U.S. Fish and Wildlife Service when requested for listing decisions.

# FEATURED LISTED SPECIES



**Rusty Patched Bumble Bee (*Bombus affinis*)**

**Federal Endangered—by the U.S. Fish & Wildlife Service**

Bumble bees are keystone species in most ecosystems, as pollinators of crops and wildflowers.

They are more effective pollinators than honey bees for some crops because of their ability to “buzz pollinate.”



**Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)**

**Federal Threatened—by the U.S. Fish & Wildlife Service Michigan Special Concern**

As prey and predator, the massasauga plays an important role in wetlands ecosystems. Conservation of this species conserves a system that supports many other plants and animals.



**Merlin (*Falco columbarius*)**

**Recommended to be State Down-Listed from Threatened to Special Concern**

These small fierce falcons use surprise attacks to bring down small songbirds and shorebirds. Their population has increased, and they now breed in the more urban environments of southern Michigan.



**American Lotus (*Nelumbo lutea*)**

**Recommended to be State Down-Listed from Threatened to Special Concern**

Often mistaken for water lilies and sometimes considered a nuisance, this aquatic perennial of Great Lakes marshes has emergent or floating, round, large leaves with a long petiole attached to the center of the blade and large white to yellow flowers.



**Wild Indigo Duskywing (*Erynnis baptisiae*)**

**Recommended to be Removed from Michigan Special Concern List**

Once thought to be very uncommon, this butterfly is increasing in abundance and distribution. Its larvae can feed on crown vetch, which is commonly planted for erosion control along roadways.



**Eastern Elliptio (*Elliptio complanata*)**

**Recommended to be Added to Michigan Special Concern List**

The larvae of this native freshwater mussel utilize fish hosts to migrate to new habitat and maintain gene flow among populations. Very few recent records for it are documented in Michigan. Expanding survey efforts in the Upper Peninsula, its primary range in the state, could add to the number of populations known for this species.

Photos by: (Top to Bottom) Dan Mullen via Flickr/Creative Commons, Joseph Sage, SMWPHOTO

(Top to Bottom) R.W. Smith, David Cuthrell, Kurt Stepnitz

**34% State Threatened (T)**

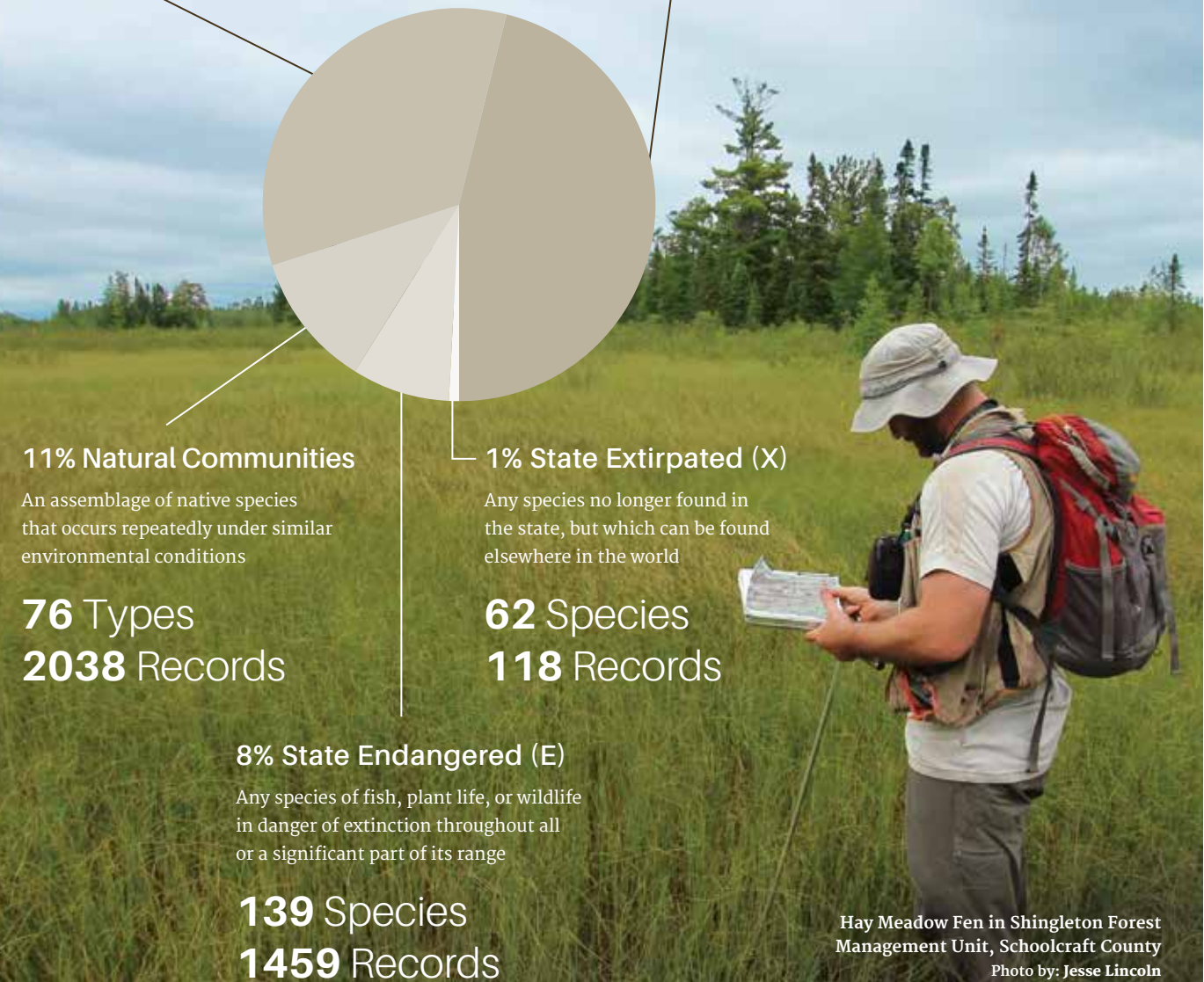
Any species likely to become an endangered species within the foreseeable future

**247 Species**  
**6155 Records**

**46% State Special Concern (SC)**

Any species of concern due to declining or relict populations in the state

**275 Species**  
**8472 Records**



**11% Natural Communities**

An assemblage of native species that occurs repeatedly under similar environmental conditions

**76 Types**  
**2038 Records**

**1% State Extirpated (X)**

Any species no longer found in the state, but which can be found elsewhere in the world

**62 Species**  
**118 Records**

**8% State Endangered (E)**

Any species of fish, plant life, or wildlife in danger of extinction throughout all or a significant part of its range

**139 Species**  
**1459 Records**

Hay Meadow Fen in Shingleton Forest Management Unit, Schoolcraft County  
Photo by: Jesse Lincoln

Explore Michigan's Rare Species and Natural Communities at: [mnfi.anr.msu.edu](http://mnfi.anr.msu.edu)

**18,242** Total Records

Database includes records for federally listed species

**Listed Endangered (LE):** Any species in danger of becoming extinct throughout all or a significant portion of its range—legally protected by the Endangered Species Act  
**18 Species, 538 Records**

**Listed Threatened (LT):** Any species at risk of becoming endangered within the foreseeable future—legally protected by the Endangered Species Act  
**11 Species, 744 Records**



# A Vital and Unique Partnership with MICHIGAN DEPARTMENT OF NATURAL RESOURCES

St. John's Marsh State Wildlife Area  
in St. Clair County  
Photo by: Jesse Lincoln

## Working Together to Protect Michigan's Natural Resources

**W**ise policies and effective management of Michigan's natural resources depend on solid science. Since MNFI's founding nearly 38 years ago, our experts have generated essential data for our longest-standing partner, the Michigan Department of Natural Resources (MDNR).

This unique partnership makes good things happen in and for the state of Michigan. Through our work together, we leverage expertise and resources to accomplish multiple goals and involve public and private stakeholders to advance stewardship of natural resources. MDNR's annual contracts for conservation planning services and Natural Heritage Database management have provided important support to MNFI, which is Michigan's Natural Heritage Program, a program of Michigan State University Extension, and member of NatureServe. Although not part of state government, MNFI has always been co-housed with MDNR in order to work closely together to meet the state's conservation goals.

### Conserving Game Areas for Hunters and Anglers Protects Rare Species as Well

The State Game Area system contains about 400,000 acres of public land managed by the MDNR to provide outstanding wildlife habitat and publicly



accessible hunting land. The designation of state game areas has kept these public lands largely untouched by urban, agricultural and development impacts to their ecosystems. Conservation efforts are nonetheless important to maintain habitat essential to game species and the natural communities that support non-game and rare species of plants and animals.

It takes many partners to manage and maintain these public lands. For the Allegan State Game Area project, it took scientists, chainsaws, volunteers, 35% glyphosate, students, technology, and inmates. The project prioritized habitat management efforts for three important natural community types: oak-pine barrens, coastal plain marshes, and wet-mesic sand prairies. Partners pitched in to reduce invasive species and cut back woody encroachment. The project improved habitat for game and non-game species, increased public awareness of the game area, and generated information for an ecosystem stewardship model. Its use will ensure game, natural communities, and rare species can all thrive.

### Taking to the Air

Also on the docket was a survey of St. Johns Marsh and St. Clair Flats, part of the largest freshwater delta in North America. Located in the northeastern portion of Lake St. Clair, these natural communities provide habitat essential to migratory birds as well as waterfowl hunting and recreation opportunities. Fluctuating lake levels, boat traffic and invasive species have led to a near-loss of lakeplain prairie.

Nearly impenetrable walls of phragmites created a big challenge for scientists. Thanks to MDNR Wildlife Biologist Terry McFadden, MNFI ecologists got seats on a U.S. Coast Guard H-65 Dolphin helicopter to survey the wetland complex, while the crew performed communications training. The aerial survey proved extremely valuable. It confirmed a large amount of previously undocumented lakeplain prairie, but also brought the scope of the phragmites problem into sharp focus.

### Choosing Winnable Battles against Invasive Species

In 2007, MDNR contracted with MNFI to assess the status of invasive species in Michigan and develop strategies to address their impacts. This groundbreaking report has stimulated a wide range of efforts to meet this challenge throughout Michigan and beyond.

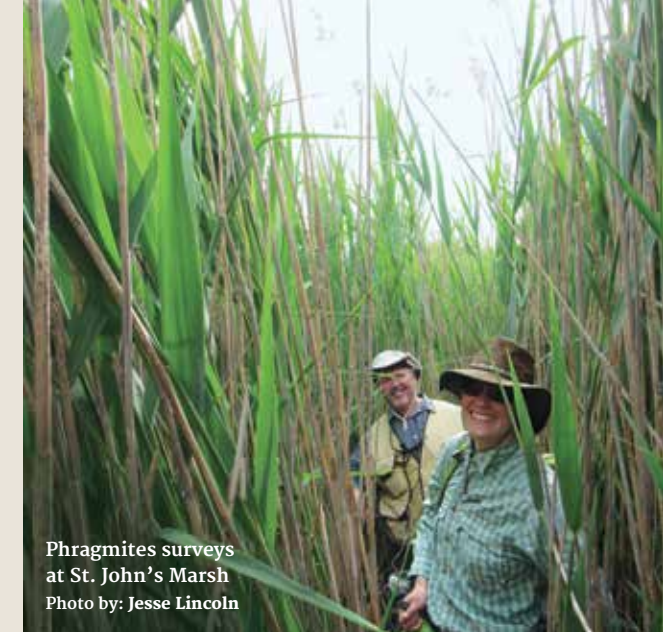
In it, MNFI proposed a practical and cost effective approach to identifying threat and prioritizing response—a strategy which



Stewardship work at Allegan State Game Area  
Photo by: Jesse Lincoln



St. John's Marsh State Wildlife Area in St. Clair County  
Photo by: Jesse Lincoln



Phragmites surveys at St. John's Marsh  
Photo by: Jesse Lincoln

has drawn praise from professionals throughout the region. MNFI training sessions for MDNR staff and others focus on three lines of defense:

- Prevention (through identification and best management practices)
- Early Detection and Rapid Response (reporting and response for high-threat species)
- Control Management and Restoration (prioritizing, implementing and monitoring treatments)

Lists of targeted high-threat invasive species have been developed, including a centralized GIS-based database for mapping them. This information is available at conferences, presentations, on the web, and through two publications. The Midwest Invasive Species Information Network (MISIN) is a regional effort to develop and provide an early detection and rapid response (EDRR) resource for invasive species. It is led by researchers with a growing consortium of supporting partners, including MNFI.

### Supporting the Sustainability of Michigan's Forestry Resources

Forestry is big business in Michigan, generating about \$16.3 billion annually and employing 77,000 people. Management of four million acres of state forest land falls to the MDNR.

Since 2005, MDNR has held both FSC® and SFI® forest management certificates for one of the largest dual-certified public forest systems in the U.S. The department uses a planning

structure to manage forest resources at the state, regional and local unit levels, and has emerged as a leader in its approach to inventorying forest land.

MNFI experts support these efforts with information on rare species, as well as training sessions for MDNR staff in the use of it to develop forest management plans.

### Providing Data for State Agencies to Fulfill their Functions

The Michigan Departments of Environmental Quality (MDEQ) and Transportation (MDOT) depend on MNFI information to perform their regulatory functions and meet Federal requirements. Many functions tie back to the Natural Resources and Environmental Protection Act (Act 451) of 1994, as well as the National Environment Policy Act.

MDNR support of the Natural Heritage Database makes it possible for environmental reviews to take place. For MDEQ's Water Resources Division online MI Waters permitting and compliance process, MNFI provides essential information. In another example, when a company plans to build a cell tower, they are required by law to mitigate any impact on rare or endangered species. MNFI spatial data on species at the location informs the permitting process.

### Allegan State Game Area Rare Ecosystem Project Partners

- MDNR-Wildlife Division
- MNFI
- Allegan County Jail Staff and Inmates
- Grand Valley State University Students
- Michigan United Conservation Club Members

#### 🔍 MNFI Team

- Jesse Lincoln, *Plant Ecologist, Project Lead*
- Joshua Cohen, *Lead Ecologist*
- Helen Enander, *Lead GIS Analyst*
- Brian Klatt, *Ecologist and Director*

### Survey of St. Johns Marsh and St. Clair Flats Project Partners

- MDNR-Wildlife Division

#### 🔍 MNFI Team

- Joshua Cohen, *Lead Ecologist*
- Jesse Lincoln, *Plant Ecologist*

### Invasive Species Management Project Partners

- MDNR-Wildlife Division
- Midwest Invasive Species Information Network

#### 🔍 MNFI

- Phyllis Higman, *Botanist and Invasive Species Lead*



# THE I-75 CORRIDOR CONSERVATION ACTION PLAN

**A Process as Significant  
as Its Outcomes**

I-75 Bridge over Ford Marsh and the River Raisin  
Photo by: MDOT

## So Much More than Road Construction

If you have driven on I-75 between Detroit and Toledo in the last few years, you know that it is in really bad shape. Not only did it need reconstruction from the subbase up, but thanks to a grant from the Federal Highway Administration's (FHWA) Strategic Highway Research Program (SHRP2), it was also a chance to integrate environmental benefits into highway construction decisions during this 20-year project.

The goal was to develop a collaboratively-based, landscape-scale conservation plan to guide transportation planning while maximizing conservation and restoration outcomes for the region. MNFI experts led study participants in a process that took the SHRP2 "Eco-Logical" planning tool to the next level by cross-walking it with other conservation planning approaches, such as the highly effective "Integrated Ecological Framework" (IEF), and the Open Standards for the Practice of Conservation (OS).

### A Plan for Many Users

The 2013 grant partnered the Michigan Department of Transportation (MDOT) with the Southeast Michigan Council of Governments (SEMCOG) and MNFI. The team brought all stakeholders with decision-making authority together to form a Technical Advisory Committee (TAC). Playing the role of trainer and coaches, MNFI encouraged this large group to create a plan that informs decisions for the I-75 reconstruction effort, while also providing a guide for public and private entities committed to the conservation of the region's unique ecological features and challenges.

### WHAT IS A WICKED PROBLEM?

"Government officials and other decision makers increasingly encounter a daunting class of problems that involve systems composed of very large numbers of diverse interacting parts. These systems are prone to surprising, large-scale, seemingly uncontrollable behaviors. These traits are the hallmarks of what scientists call complex systems."

Applications of Complexity Science for Public Policy  
OECD Global Science Forum, 2009



The installation of larger culverts facilitates fish and wildlife passage and mimics the natural stream.  
Photo by: MDOT



Transplanting State Threatened Sullivant's Milkweed (*Asclepias sullivantii*) to Sterling State Park  
Photo by: MDOT

## Wicked Problems

Connecting Detroit and Toledo, I-75 runs roughly parallel and often close to the western shore of Lake Erie. It traverses the Maumee Lakeplain, a relatively flat, poorly drained landform that supported a diverse array of natural communities, some of which are only found in this part of the world. Great Lakes marsh, lakeplain prairie, oak openings, and wet-mesic flatwoods were once common natural communities of the lakeplain. At one time, wetlands extended as far as six miles inland from the lake edge, and the area was famous for its abundant wildlife and plant diversity.

Now, the remains of those natural features are mostly found in small isolated patches. Some species, such as eastern fox snake or Sullivant's milkweed (both state threatened), can be found in ditches, backyards and along roadsides, hidden in plain sight. It is in many ways a highly altered and sometimes forgotten landscape. Numerous invasive species have become established and continue to flourish. In fact, Monroe County has been ground zero for several of these species. The region has an unhealthy share of "wicked problems," including water quality issues, massive wetland alteration, more drains per square mile than anywhere in the state, and harmful algal blooms in Lake Erie. The challenges to reverse degradation are indeed "wicked."

## Identifying Conservation Targets

The team defined two project boundaries: a primary 90,000 acre coastal zone and a secondary 250,000 acre coastal watershed zone. MNFI's Natural Heritage Database data along with information gathered from other sources revealed the natural communities, plants and animals that once were there, the realities of what is there now, and what has not been sufficiently studied.

Based on that information, the TAC identified seven conservation priorities: aerial migrants, migratory fish, amphibian and reptile connectivity, coastal marsh, coastal tributaries, inland wetlands, and rare plant communities. Local and subject matter experts collaborated with the team to assess each priority for its viability. The major stressors were also identified and ranked.

## Creating Strategies to Make Things Happen

The culmination of this in-depth research, brainstorming and analysis resulted in the identification of numerous strategies

*"The I-75 conservation plan succeeded because it combined technology through the use of Geographic Information Systems with public and stakeholder outreach to prioritize conservation goals for both MDOT and local interests. I feel that MDOT staff gained a new appreciation for conservation planning because of MNFI's work."*

**Margaret Barondess,**  
MDOT Environmental Services Section Manager

to address the four major stressors. The top strategy for each major stressor is listed below:

- Agricultural Runoff and Drainage Systems: Develop and implement a Demonstration Smart Drain Assessment Project to decrease nutrient loading
- Aquatic and Terrestrial Invasive Species: Enhance the impact and capacity of the two existing Cooperative Invasive Species Management Areas (CISMA) to reduce high-priority invasive species
- Road/Stream Crossings: Conduct a comprehensive needs assessment to use best management practices at highest priority crossings
- Urban Development and Runoff: Create a new county initiative that takes an integrative approach to economic development and ecological enhancement by incorporating design elements into large-scale projects that improve the health of conservation targets and decrease runoff.

## Good Things Already Happening

During design, MDOT approached wetland mitigation in a more holistic manner and will design the new freeway with road stream crossings for fish, reptiles and amphibians. They also developed a plan to manage the three state-listed threatened species growing within the I-75 right-of-way. As part of this effort, volunteers transplanted about 1,550 Sullivant's milkweed (state-threatened) into the Sterling State Park lakeplain prairie restoration area.

As a result of the project, partnerships with other state and federal agencies have been significantly strengthened, as have potential partnerships across state lines among non-governmental agencies.

One outgrowth project, "B-Wet," will deliver educational programs on watershed health to middle and high schools both in the classroom and in the field. Under the NOAA grant, educational display materials will be created for the Michigan Welcome Center on I-75 just north of the Ohio border to raise awareness of this area's unique natural features and what's being done to improve their health.

*"SEMCOG looks forward to applying this I-75 framework to support water resource, economic development and transportation planning across the Southeast Michigan region. The approach really helps identify strategic, cost-effective priorities that achieve multiple outcomes."*

**Kelly Karll,**  
PE, SEMCOG Engineer

## I-75 Construction Project Partners

### Technical Advisory Committee Members

- Michigan Department of Transportation
- Michigan Natural Features Inventory
- Southeast Michigan Council of Governments
- County of Monroe, Michigan
- Detroit River International Wildlife Refuge
- Michigan Department of Environmental Quality
- Michigan Department of Natural Resources
- Michigan Department of Rural and Agricultural Development
- Michigan Sea Grant
- Natural Resources Conservation Service
- The Nature Conservancy
- U.S. Army Corps of Engineers
- U.S. Department of Transportation, Federal Highway Administration
- U.S. Fish & Wildlife Service

### Action Team Members

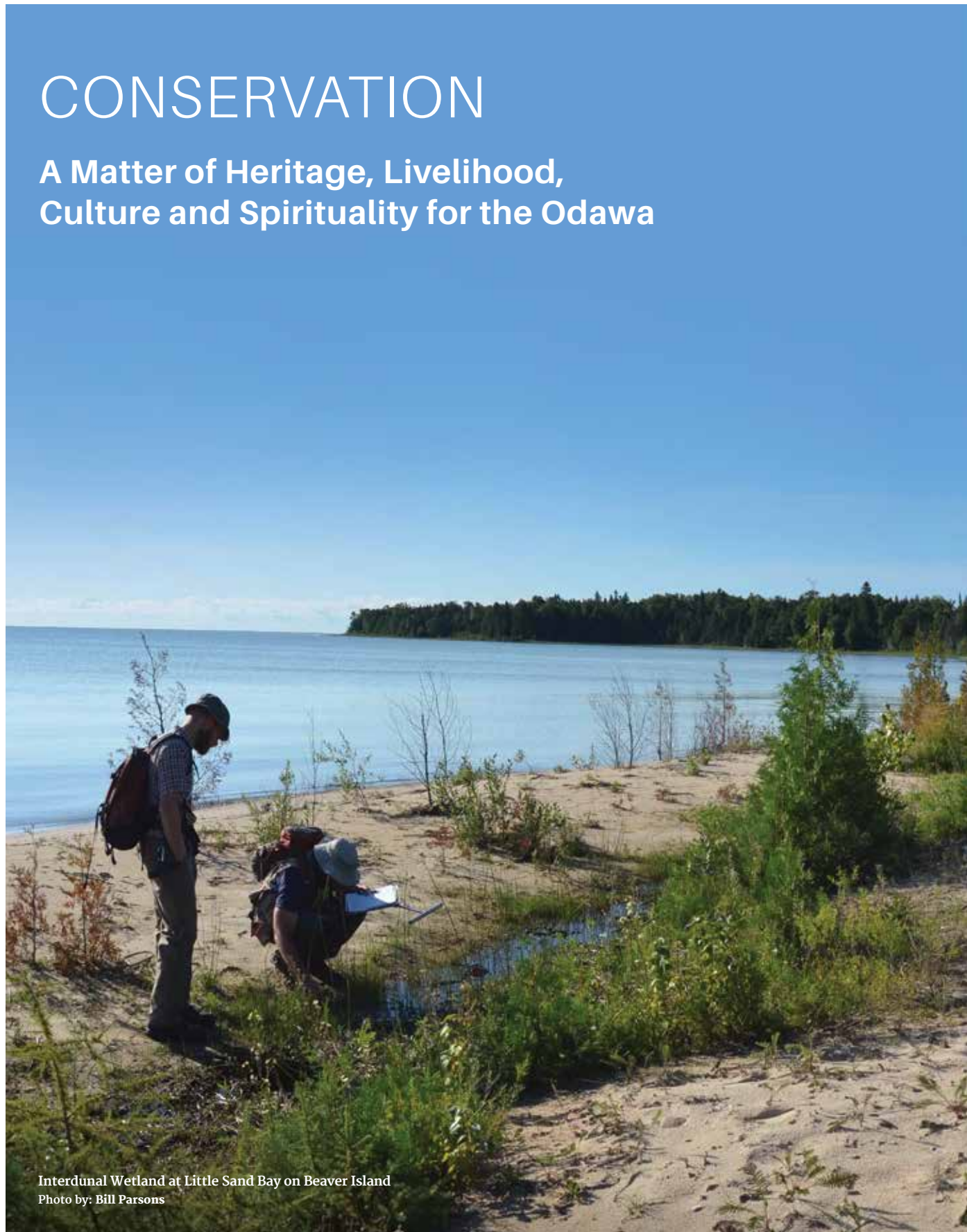
- City of Monroe
- County of Monroe
  - Business Development Corporation
  - Conservation District
  - Drain Commission
  - Planning
  - Road Commission
- Detroit River—Lake Erie Cooperative Weed Management Area
- Detroit International Wildlife Refuge
- IHM Sisters
- Oak Openings Cooperative Weed Management Area
- Oak Openings Region Green Ribbon Initiative
- Southeast Michigan Land Conservancy
- The Nature Conservancy of Ohio
- Toledo Metropolitan Area Council of Governments

### 🔍 MNFI Team

- John Paskus, *Lead Conservation Planner and Project Lead*
- Joshua Cohen, *Lead Ecologist*
- Yu Man Lee, *Wildlife Ecologist and Herpetologist*
- Michael Monfils, *Wildlife Ecologist*
- Brad Slaughter, *Botanist and Plant Ecologist*

# CONSERVATION

## A Matter of Heritage, Livelihood, Culture and Spirituality for the Odawa



Interdunal Wetland at Little Sand Bay on Beaver Island  
Photo by: Bill Parsons

## Working Toward a Biodiversity Management Plan

**M**NFI's multi-year, ongoing partnership with the Little Traverse Bay Bands of Odawa Indians (LTBB) creates results on several levels—data, training and conservation.

Projects over the last several years have been laying the groundwork for development of a biodiversity management plan for the Beaver Island archipelago. In the process, the projects train the small but highly effective and dedicated staff of the LTBB Natural Resources Department in Natural Heritage and MNFI methodology. For the Odawa, conservation of the land and its resources is vital to tribal life.

Working side-by-side with LTBB staff, in 2015, MNFI updated the 2009 natural community, rare species and invasive plant surveys for Garden Island and High Island. Pilot surveys for bats and snails began to document their diversity and evaluate the potential for rare species. A scoring matrix, using indices of ecological integrity, rarity, and threat severity, provided the basis for a stewardship prioritization table. Together with detailed baseline data, the information offers a flexible framework for site-specific management and monitoring for each natural community occurrence.

The relationship has grown to include natural community inventories and wetland plant identification assistance for monitoring Odawa preserves on the mainland.

Working together again in 2016, natural community surveys were conducted on Beaver Island. Fifteen high-quality natural communities were surveyed and evaluated using size, landscape context and condition to assess their ecological integrity. The final report described each type in detail, including threats and management recommendations.

Each project builds another layer of vital information needed to create a comprehensive biodiversity plan for the Odawa, who remain strongly connected to the land and retain hunting and fishing rights under the 1855 treaty with the state of Michigan.

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*“The hardworking staff at MNFI was willing to work with LTBB Biologists in the field, sharing their knowledge and empowering the Odawa Natural Resource Department to conduct our own surveys in the future. The dedicated MNFI staff was a pleasure to work with, and the information from their surveys and reports has helped LTBB to better define our conservation and research goals and enabled the Tribe to pursue funding to achieve those goals.”*

**Bill Parsons, LTBB Natural Resources Department**

### Little Traverse Bay Bands of Odawa Indians Research Project Partners

- LTBB Natural Resources Department

#### 🔍 MNFI Team

- Peter Badra, *Aquatic Zoologist*
- Joshua Cohen, *Lead Ecologist*
- Phyllis Higman, *Botanist and Invasive Species Lead*
- Brian Klatt, *Ecologist and Director*

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Photo by: Brad Slaughter

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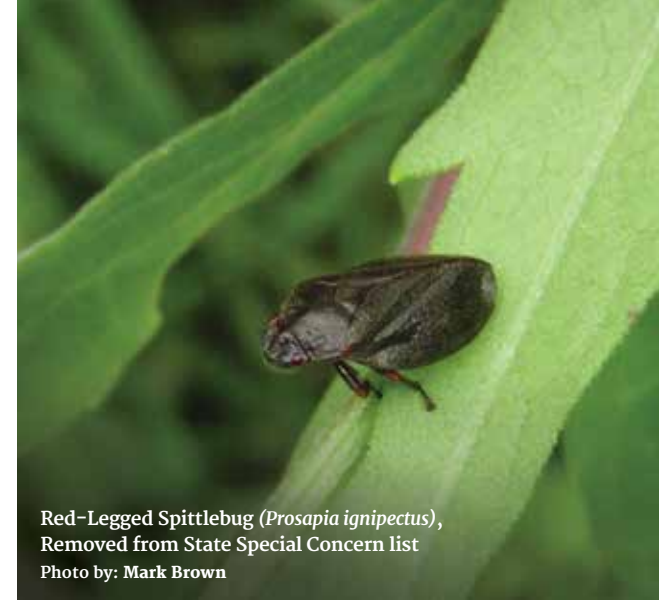
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Photo by: Mark Brown

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Female Karner Blue Butterfly,  
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Photo by: David Cuthrell

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# THE PEOPLE OF MICHIGAN NATURAL FEATURES INVENTORY



Granite Bedrock Glade at the Gwinn Forest Management Unit, Marquette County  
Photo by: Jesse Lincoln



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**David L. Cuthrell**  
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**Bradford S. Slaughter**  
Botanist and Plant Ecologist



**Nancy Toben**  
Financial Officer



2016 saw the retirement of Edward H. Schools, a passionate birder, whose 17 years in GIS and IT at MNEI brought humor to the workplace and helped everyone maximize the use of technology at the office and in the field.



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