

# Michigan Natural Features Inventory

Discover. Define. Deliver.



The Science that Guides  
**Biodiversity Conservation**

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ANNUAL REPORT 2015

# MICHIGAN NATURAL FEATURES INVENTORY

A PROGRAM OF MICHIGAN STATE UNIVERSITY EXTENSION

## OUR MISSION

To guide the conservation 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.



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*On the cover: Botanist Mike Penskar conducting surveys at Hudson Creek Poor Fen. We thank him for nearly 30 years of dedication to the Natural Heritage Program.*

## FROM THE MNFI DIRECTOR

The Michigan Natural Features Inventory (MNFI) has been generating and disseminating the highest quality scientific information on the location and condition of rare species and habitats for more than 35 years; 15 of those years as part of Michigan State University Extension. We also conduct research on issues related to biodiversity conservation and provide that information and consultation to a wide variety of decision makers, practitioners, and pretty much anybody who could use that information in the stewardship of Michigan's biological resources.

We are proud of our history. We also realize we can accomplish even more by sharing our information and expertise to an even wider audience. Just as MSU Extension endeavors to reach all Michigan residents, MNFI plans to expand our reach beyond the conservation community to the general public. We prepared this first-ever annual report in hopes that it will let more people understand the breadth, importance and public impact of our work.

The following pages demonstrate our wide range of activities, all geared toward guiding the stewardship of Michigan's biodiversity for the well-being of the plants, animals and habitats on which they depend, as well as for the benefit of Michigan's residents. In the end, the well-being of the people of Michigan also depends on the conservation and wise use of our natural resources.

Take a little time to look through what we do and what we accomplished in 2015, and join us in conserving the ecosystems on which we all depend.

Brian J. Klatt, Director, MNFI

## FROM THE MSU EXTENSION DIRECTOR

As some of you may know, I am a relative newcomer to Michigan State University Extension and certainly new to the position of director. My previous experience with Extension through my work in human medicine helped me fully understand the ways that Extension programs help people in their everyday lives. I relish discovering how other Extension programs benefit the people of Michigan. One of the surprises has been to learn about the Michigan Natural Features Inventory.

We all know the importance of biodiversity to human well-being. Everything comes from nature. From food to construction materials, clean water and pharmaceuticals, everything is derived from the ecosystem in which we live. And the economic activity that goes along with these has a huge impact on our state. The natural world is complex, and each piece is dependent on others to function. The staff of MNFI thinks about this every day.

As you will see in this report, MNFI staff members focus their energies and intellect on understanding the natural world and how all the parts fit together. From conducting field surveys to research on important issues of the day, such as climate change, invasive species, and wind energy, they work to expand our understanding of the natural world. They share that knowledge in hopes that better understanding leads to an increased appreciation of our biological resources and a will to ensure that our policies and decisions support the conservation of biodiversity for the well-being of us all.

Join me in learning more about this unique and important MSU Extension program.

Jeffrey W. Dwyer, Director, MSU Extension

What We Do:

# DISCOVER. DEFINE. DELIVER.



## GUIDING BIODIVERSITY CONSERVATION

WE **DISCOVER** new knowledge through scientific research on Michigan's biodiversity and ecosystems.

WE **DEFINE** threatened and endangered species and communities by conducting research and field surveys throughout the state.

WE **DISCOVER, DEFINE, AND DELIVER** the most current biodiversity data through research, field work, and stewardship of Michigan's 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.

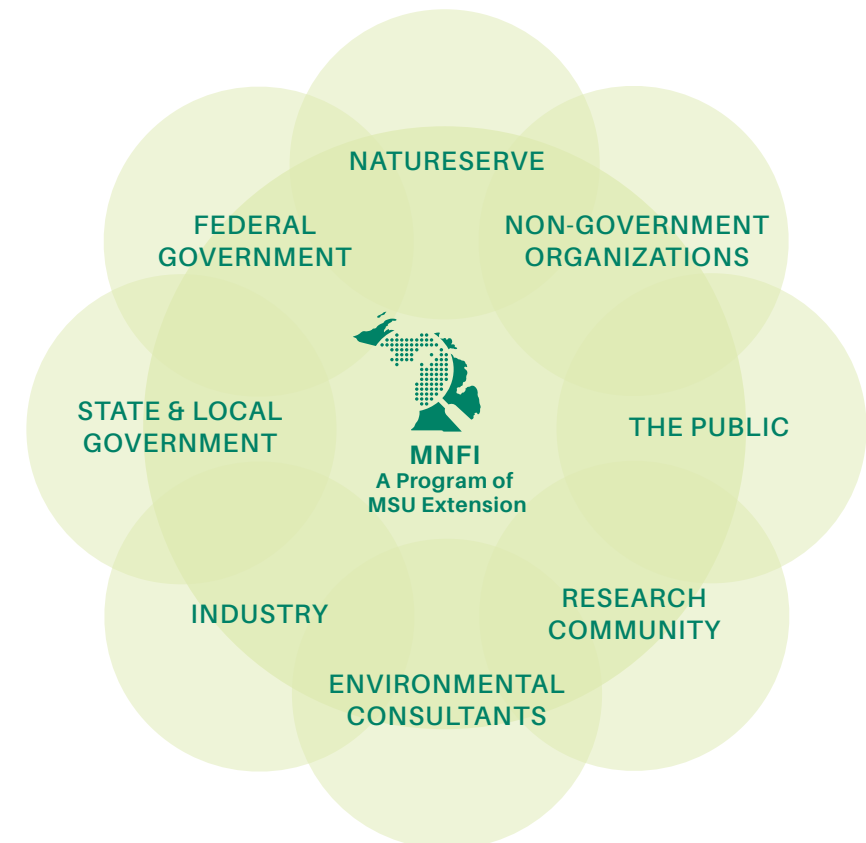
**WE DELIVER**

- Michigan NHD information to the NatureServe Network international database for regional, national and international use to inform decisions that impact biodiversity and ecosystems.

- Scientific data and expertise to inform Michigan policies and decisions that impact endangered species and habitats, and in so doing, contribute to the state's current and future economic well-being and environmental stewardship. This information is provided to:

- Federal, state and local agencies to facilitate their review of permit applications and projects, carry out government programs, and oversee private sector activities
- NGOs dedicated to conservation
- The private sector and their environmental consultants to meet industry standards on the impact of their projects and to ensure the sustainability of natural resources
- Fellow researchers in academe
- Private property owners who are interested in good stewardship of their own property

WHO WE WORK WITH



# HOW WE DELIVER



## OUR PUBLIC IMPACT

### Research

- Projects to study emerging and ongoing issues that impact Michigan's biodiversity, such as wind energy and land use
- Site Reviews and Assessments of Rare Species—including rare vascular plants, animals (insects, mammals, birds, mussels, snails, reptiles, amphibians, and fish), and rare and/or high quality natural communities
- Site Reviews and Assessments of Invasive Species
- Natural Features Inventories—generating up-to-date information that provides a more accurate and complete picture of a site's biodiversity and creates a strong foundation for sound land use, natural resource management, and conservation decisions
- Projects that include educational components for students and training for adult volunteers to become citizen scientists

### Conservation Planning Services

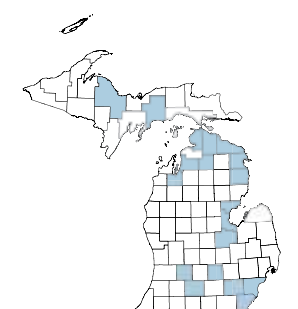
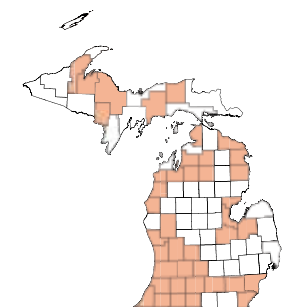
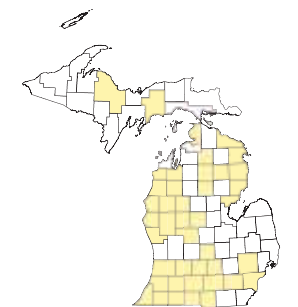
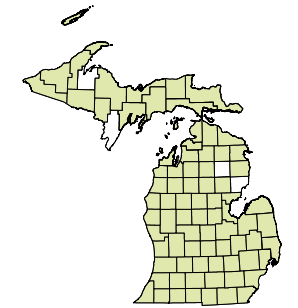
- Site ecological summaries
- Evaluation of the conservation value of a site
- Conservation plans for sites most in need of protection
- Land use planning services

### Partnerships and Outreach

- A commitment to involve a wide range of international, national, regional, and local partners from many disciplines, organizations, and perspectives to create new knowledge as a foundation for public and private decisions that impact biodiversity
- Educational workshops to inform decision-makers
- Informational materials for the general public
- Online access to Natural Heritage data through subscriptions

## WHERE WE WORK

- Planning
- Partnerships
- Research
- Invasive Species



# 2015 THE YEAR IN REVIEW

## RAVE REVIEWS RECEIVED

### ***Field Guide to the Natural Communities of Michigan***

by Joshua G. Cohen, Michael A. Kost, Bradford S. Slaughter, and Dennis A. Albert

“The authors of this beautiful book draw on their many years of work with the Michigan Natural Features Inventory (MNFI), and their field work and expertise shows through clearly. The great strength of this book is its concise yet informative differentiation between numerous ecological community types that share many broader characteristics.”

*Ecological Restoration*, Volume 33, Number 3, September 2015, pp. 335-336 (Review)

### ***“Invasive Species Early Detection Rapid Response Program”***

Presentation at the Upper Midwest Invasive Species Conference

The choice to focus on winnable battles on uncommon high-threat plant species “makes a lot of sense. . . I was glad to hear that strategic thinking is going on in this arena.”

Marie Zhuikov, science writer

### ***“Facilitating Communication about Invasive Plants between Academics and Agencies”***

Presentation at the Michigan Consortium of Botanists 2015 Conference

“. . . impressed with the . . . well rounded approach”

The Nature Conservancy

## PRESENTATIONS

- Chippewa Valley Audubon, Mount Pleasant, MI
- Freshwater Mollusk Conservation Society Symposium, St. Charles, Missouri
- GEI Consultants Inc.
- MI Consortium of Botanists Conference
- MI Department of Environmental Quality
- MI Department of Natural Resources, Wildlife Division
- MI Department of Transportation
- MI Recreation and Park Association Annual Conference. Lansing, MI
- MI Wetlands Association Annual Conference
- Midwest Association of Fish and Wildlife Agencies Annual Conference. Indianapolis, IN
- Midwest Natural Resources Group
- NatureServe Biodiversity without Boundaries Annual Conference, Traverse City, MI
- Seney National Wildlife Refuge, Seney, MI
- Upper Midwest Invasive Species Conference

## SHARING THE EXCELLENCE

Portions of the ***Field Guide to Invasive Plants of Aquatic and Wetland Habitats for Michigan*** will be used by the Wisconsin Department of Natural Resources in their wetland monitoring program.

Portions of ***A Field Identification Guide to Invasive Plants in Michigan’s Natural Communities*** will be used in an invasive species field guide for Army National Guard training facilities in Indiana.

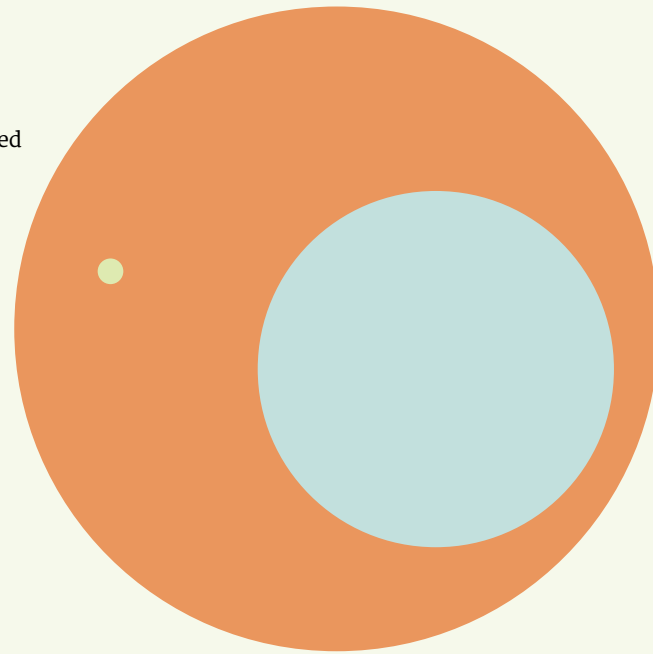
## NATURAL HERITAGE DATABASE (NHD) ACTIVITY

468 New records added    6,443 Existing records significantly updated

18,563 records in the NHD as of December 2015

### NHD Information Sharing with:

- 9,167 State and Federal agency queries
- 578 Private entity queries
- 58 Information requests
- 147 Rare Species Reviews
- 4 Rare Species Review Field Assessments

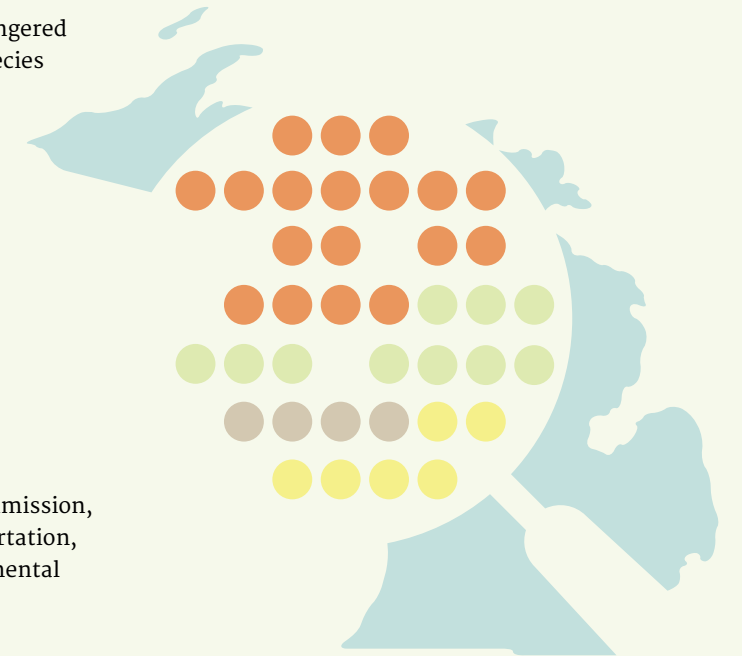


## 38 PROJECTS

Our Projects consist of Surveys, Rare/Threatened/Endangered Species Inventories, Habitat Assessments, Invasive Species Monitoring, Land Use Planning, and Citizen Science

Of which:

- 18 MI Department of Natural Resources
- 10 U.S. Fish and Wildlife Service
- 4 for U.S. Forest Service
- 6 joint efforts which also included the Great Lakes Commission, Great Lakes Fisheries Trust, MI Department of Transportation, MI Department of Environmental Quality, MI Environmental Council, and NOAA



## 145 PARTNERS AND THE GENERAL PUBLIC

46 Non-Governmental Organizations

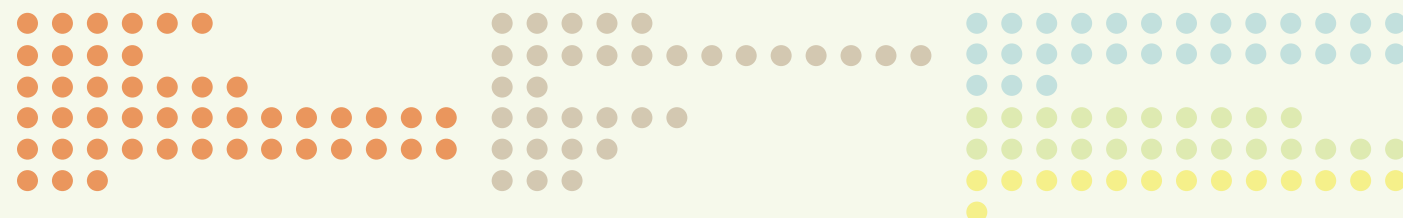
- **National/International** (6—NatureServe, NatureServe/Canada, United Nations, International Union for Conservation of Nature, The Nature Conservancy, and National Fish and Wildlife Foundation)
- **Regional** (4)
- **State** (7)
- **Local** (29)

33 Governmental Agencies

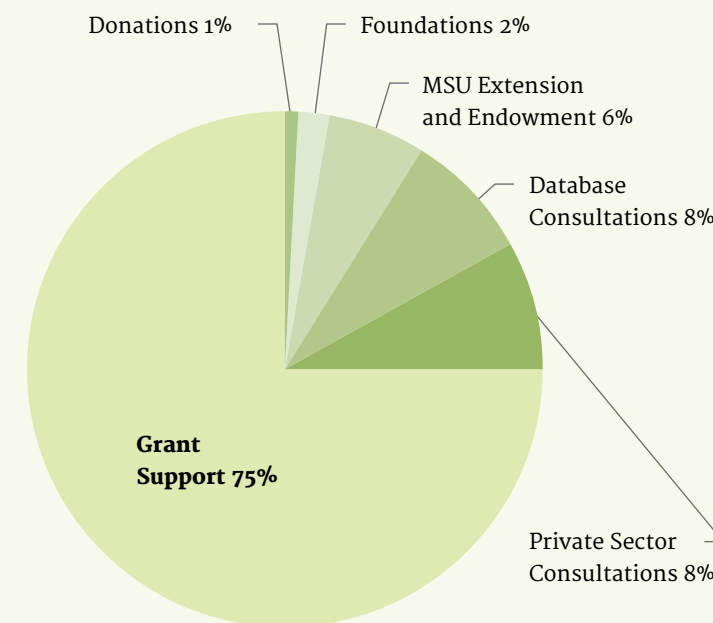
- **Federal** (5 agencies)
- **State** (13 departments in 9 states and 1 Canadian province)
- **Regional** (2 in Michigan)
- **County** (6 in Michigan)
- **Local** (4 towns in Michigan)
- **Tribal** (3 in Michigan)

29 Consultants to Heritage Work

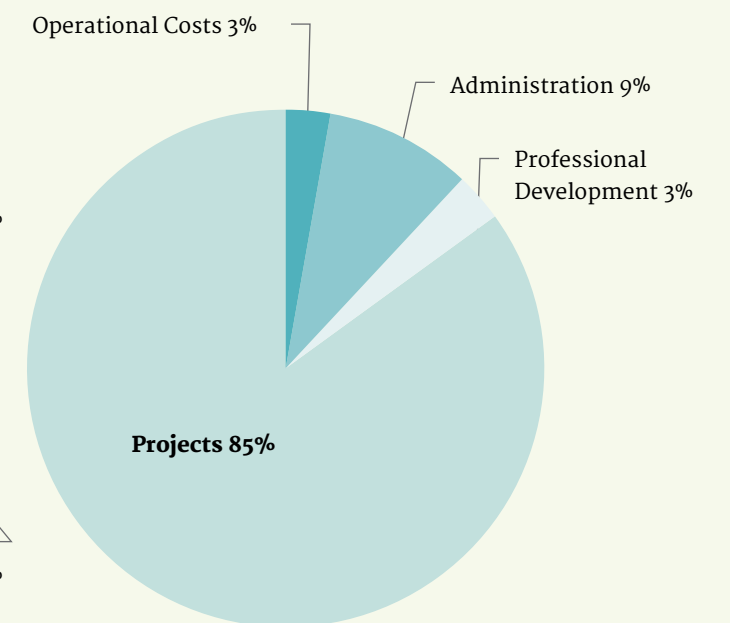
- **23 Educational Institutions**
  - **Primary/Secondary** (10)
  - **Colleges and Universities** (13 in 4 states)
- **14 Industry**



## INCOME



## EXPENSES



The Wide Reaching Impacts of

# INFORMATION ON CONSERVATION



## Creating Data through DISCOVERY

Ever since the founding of MNFI in 1979, our scientists have been hunter/gatherers of data on Michigan's biodiversity. Originally affiliated with The Nature Conservancy, MNFI has been a program of Michigan State University Extension for the past 15 years.

In addition to field research, MNFI staff collaborate with other scientists, and work closely with the U.S. Fish and Wildlife Service and the State of Michigan. We mine information from museum and herbarium records, apps such as iBird and iNaturalist, and other vetted social media. New knowledge, gathered through grant-funded research and fee-for-service consultations, is added daily to the Natural Heritage Database (NHD), which is administered by MNFI.

## DEFINING and Organizing the Information

Dynamic, versatile, growing and evolving, the NHD practically qualifies as a living breathing thing itself. A powerful combination of a Geographical Information System (GIS) and database, it provides pinpoint information on Michigan's biodiversity. It also interacts seamlessly with the NatureServe Network worldwide.

Its spatial/geographic data can be analyzed, managed, and interpreted to understand relationships, patterns, and trends. The nearly 19,000 records in the database provide details on species, habitat, and natural community observations, locations and viability.

The fusion of geographic and research data provide tools for:

- modeling projects such as targeted surveys and the reintroduction of species,
- monitoring and management of current populations, and
- assessing the relationship between humans and the natural world.

## DELIVERING and Interpreting Data

Organizations, agencies, researchers, students, and individuals making queries by phone or email often connect with Rebecca Rogers, GIS Specialist and Database Administrator, who helps interpret the data for them.

Projects conducted by MNFI scientists impact a wide range of activities throughout the state.



## MNFI Impact on Activities throughout the State

*(Top Left) Newly Listed Threatened Species:* MNFI worked with the local office of the U.S. Fish and Wildlife Service to compile current data and locations for the Northern Long-Eared Bat, for use by the public and the timber harvesting industry.

Photo by Wisconsin Dept. of Natural Resources—Heather Kaarakka

*(Top Right) Road Maintenance:* MNFI reviewed a county road commission's roadwork plans to minimize impacts on threatened/endangered species or rare natural communities as required by state and federal regulations.

*(Bottom Left) Wind Energy:* MNFI database and field expertise identified large raptor migration patterns to inform placement of wind turbines for a large wind energy company project.

*(Bottom Right) Rare Species & Communities Research:* Multiple joint effort research projects at Central Michigan University on Prairie Fens and the federally listed Poweshiek Skipperling generate new data, build university collaborations, and facilitate publications.

Protecting One of Nature's Gems

# THE HINE'S EMERALD DRAGONFLY

## ENGAGING CITIZEN SCIENTISTS

It's not just a walk in a park anymore for volunteers, teachers, and students. They have been learning about citizen science through a MNFI-led project. It tested an approach to training local volunteers to help experts reconfirm the presence of one of North America's most endangered insects, the Hine's Emerald Dragonfly (*Somatochlora hineana*). As non-scientists, they gathered data according to specific scientific protocols, and at the same time, mapped invasive species that threaten its habitat.

Thoughtfully designed programs engaged nature lovers of all ages to contribute to new knowledge about the dragonfly in two of its four known locations in northeast Michigan—Negwegon State Park, and Thompson's Harbor State Park.

### The Thrill of the Hunt

The Friends organizations from each park recruited volunteers. After a three-hour training session, adult volunteers worked in shifts all week to hunt for the dragonfly, its habitat, and the crayfish burrows in which larvae are found. Along the way, they also identified other rare species as well as five major invasive species while Huron Pines AmeriCorps staff walked alongside and treated the invasives with herbicide.

One day was dedicated to place-based education for groups from local middle schools, a community college class, and a 4-H club.

### The Hine's Emerald Dragonfly (*Somatochlora hineana*)

**Status:** Federal and State endangered

**Distribution:** 8 sites in the Upper Peninsula and 4 island sites, 4 sites in northeast Michigan, 40 sites in the U.S.

**Description:** The adult has brilliant green eyes. It can be distinguished by a combination of its dark metallic green thorax with two distinct creamy-yellow lateral lines and distinctively shaped terminal appendages.

**Habitat:** Shallow, flowing, cool water provides important larval habitat, and open areas with adjacent woodland edge provide adult hunting and roosting habitat.

**Threats:** Invasive species, contaminants, and changes in the quality and flow of ground water



Working in teams, students participated in hands-on modules which included looking for the dragonfly and its habitat, identifying other rare species and birds, spotting and removing invasive species, cleaning the beach, and nature photography.

A day in nature off the trail and on the shores of Lake Huron was also lots of fun. One happy boy was up to his armpits in mud pumping out a crayfish burrow to look for larvae. Other students used the bird call app they had just learned to use to try to “fool” their MNFI guide into thinking rare birds abounded.

Technology played a big role in the effort. Participants recorded locations of the dragonfly, habitat, and invasive species using a special mapping program on tablets. The data were later analyzed by MNFI scientists. Acting as a GPS, the map also ensured that no volunteers working off the trail got lost.

### Adding to Knowledge

Adult Hine’s Emerald Dragonflies were successfully documented at Negwegon State Park, Thompson’s Harbor State Park and two sites in Misery Bay. Larvae collected from two sites were confirmed as “probable” or “likely,” but require further analysis for verification.

Over the two-year project, a total of 510 acres were surveyed for the dragonfly, its habitat, and the threats to it by invasive species. This data represents an important update to the 2007 findings.

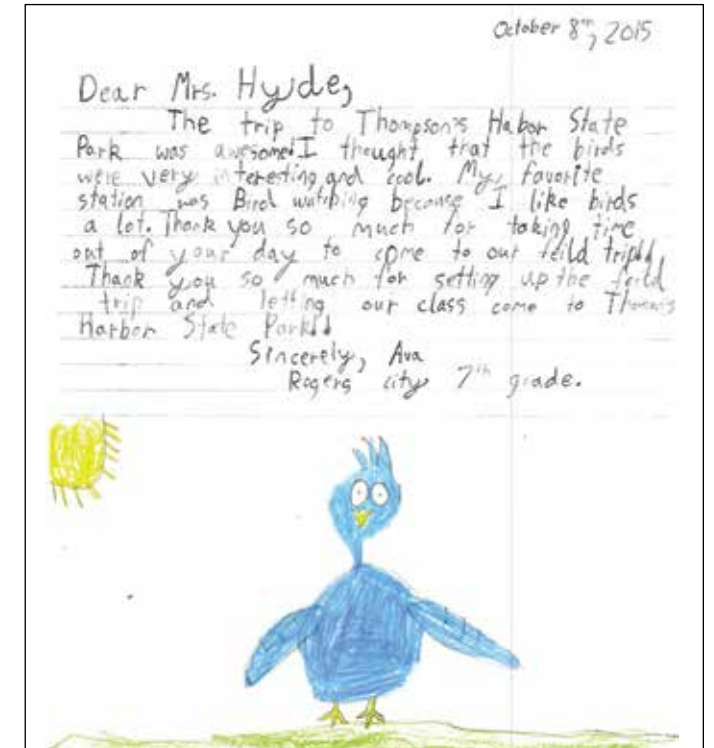
### Offering Meaningful Volunteerism

Working in teams with project organizers, volunteers contributed 825 hours of work and mapped 548 locations of invasive plants, treating 463 of them.

Volunteers, as well as state park personnel, are now better informed stewards of these beautiful and unique areas of the state. They have gone on to spread awareness and enthusiasm for biodiversity conservation beyond the parks. Sue Keller, head of Friends of Negwegon, has taken the message to the City of Harrisville, a neighborhood association, and garden clubs.

“I cannot express enough how important it is to have a school/community relationship with experts in their fields of study. My seventh grade students learned so much more by being out in the field with you than they could ever think of learning out of a textbook. . . I always like to think that maybe, just maybe, one or more of my students will consider a career in the outdoors. And, the answer to that is yes, they have!”

**Holly J. Wirgau, Rogers City Middle School teacher**



### Planting the Seeds of Future Stewardship

Place-based education offered each student a vivid experience of field work. For some, it was the first real contact with the subject of biology outdoors. For nature lovers, it created new layers of understanding. Meeting and working with botanists, zoologists and conservation scientists opened some young eyes to potential career choices.

Every participant came away with an increased appreciation for endangered species, Michigan’s biodiversity, and the importance of individual and collective stewardship.

## IT’S ALL ABOUT PARTNERSHIPS

### Building Local Capacity to Protect and Restore Hine’s Emerald Dragonfly Habitat in Northeast Michigan

—Led by MNFI, Michigan State University Extension

#### GRANT FUNDING:

- U.S. Fish and Wildlife Service Coastal Program through the Great Lakes Restoration Initiative
- Community Foundation for Northeast Michigan

#### A PARTNERSHIP OF FUNDERS AND:

- MNFI
- Huron Pines (Staff and AmeriCorps members)
- Michigan Sea Grant, MSU Extension
- NE Michigan Great Lakes Stewardship Initiative Hub
- Friends of Negwegon
- Friends of Thompson’s Harbor
- MDNR State Parks Stewardship Program

- MDNR State Parks Unit Supervisors— Negwegon and Thompson’s Harbor
- Northeast Michigan Great Lakes Stewardship Initiative

#### Education partners at Negwegon State Park (2014 and 2015):

- Alcona 4-H Environmental Science Club
- Alcona Community Middle School students
- Alpena Community College field biology class
- USFWS Coastal Program student intern

#### Education partner at Thompson’s Harbor State Park (2015):

- Rogers City Middle School



#### MNFI TEAM

- Daria A. Hyde (Principal Investigator), Zoologist, Conservation Planner and Educator
- Phyllis J. Higman, Botanist and Invasive Species Lead
- David L. Cuthrell, Lead Zoologist

The Ripple Effect of MNFI

# RESEARCH ON VERNAL POOLS

## CORAL REEFS OF THE FOREST

**S**mall, scenic, isolated, and ephemeral, vernal pools fill with water in the spring or fall and dry out during the summer or drought. It takes just the right set of conditions (geology, landform, soils, vegetation, etc.) to form one. And given that some factors can vary among sites and years, each vernal pool occurrence is biologically unique.

They may be physically small, but they play an enormous role in forest health. They provide habitat for more than 500 animal species, including rare species and several specialized for life in vernal pools. As “Nature’s Nursery,” they supply critical breeding habitat for many forest-dwelling amphibians and invertebrates, which form the base of the food chain. As part of the forest ecosystem, they are key to nutrient cycling, water storage and infiltration, groundwater recharge, and flood control.

Attention is growing among conservation scientists, governmental agencies, and industry to research, map, and monitor vernal pools in order to protect and conserve these natural features and the health of the forests they sustain. Because their value is not widely understood and they are small and difficult to identify when dry, they are often inadvertently damaged or destroyed by development, road building, or timber harvesting.

### Vernal Pools

**Description:** Vernal pools are small temporary pools of water that form in shallow depressions primarily in forested areas throughout Michigan and provide diverse and productive ecosystems.

**Habitat:** As nature’s nursery, vernal pools are used by forest-dwelling amphibians and invertebrates for breeding, foraging, drinking, shelter, and/or dispersal.

**Threats:** Difficult to identify, they are easily damaged or destroyed unintentionally by various land use activities.

**Species:**  
Fairy Shrimp (*Eubranchipus spp.*): only found in habitats that dry up, freeze, and are fishless

**Rare Species:** spotted turtles, smallmouth salamanders, copperbelly water snakes, Blanding’s and wood turtles, red-shouldered hawks, prothonotary warblers, northern long-eared bats, little brown bats, and more

**Common Species:** white-tailed deer, black bear, raccoons, wood ducks, great blue herons, spring peepers, gray treefrogs, northern watersnakes, painted turtles, red-backed salamanders, and more

## Involving Citizen Scientists at the Local Level

As part of an ongoing statewide vernal pool mapping project initially funded by Michigan's Department of Environmental Quality (MDEQ), MNFI is training citizen scientists in the methodology and protocols to identify and collect data on them. Work with the Michigan Department of Natural Resources, MDEQ, and a number of other partners began first in southeast Michigan in 2012. In 2014 and 2015, volunteers of all ages from Huron Pines and Little Traverse Conservancy, and teachers and students from several middle and high schools in northern Michigan joined the effort. This program, which includes place-based education for students, will expand to other parts of the state in the future.

## Collaborating with Industry in an Award Winning Project

The mapping project drew the attention of Verso Paper Corporation, a producer of paper and pulp with a mill and fiber harvesting operations in the western Upper Peninsula (U.P.). Their Sustainability Group sought ways to efficiently and effectively identify and protect vernal pools, features they understood to be essential to the natural resource their industry depends upon.

A unique collaboration of industry and public funders, the project relied on MNFI expertise. Aerial imagery interpretation identified a total of 1,332 potential vernal pools across 120,000 acres within two study areas in the Baraga and Crystal Falls State Forest areas in Houghton, Iron, and Dickinson Counties. Follow-up field work surveyed 207 potential and new vernal pools, of which 112 were verified as vernal pools, resulting in a 54% accuracy rate. A smaller project component conducted by Michigan Tech Research

Institute studied the effectiveness of using radar for mapping vernal pools.

## Widening the Circles of Public Value and Impact

**Locally:** Citizen science and place-based educational programs for adults and children are expanding awareness of the beauty and importance of vernal pools in the forest ecosystem.

**Statewide:** Representatives from 24 organizations from industry, government, and NGOs are involved in establishing a Michigan Vernal Pool Partnership.

The continuing study of aerial photo interpretation and radar mapping techniques will lead to effective and efficient methods for vernal pool identification statewide. Research is currently underway in the eastern U.P. in the Hiawatha National Forest.

The statewide vernal pool database under development is already providing data. Industry knowledge and awareness of vernal pool location and importance will inform forest planning, harvesting, and sustainable business practices. State agency access to data will inform development of appropriate guidelines for the management of these wetlands.

**Regionally and Nationally:** The MNFI-led vernal pool symposium and field trip at the 2015 NatureServe conference took the issue of vernal pools to the regional and national level. Researchers shared information, discussed the need to standardize vernal pool definition and evaluation criteria, and explored vernal pools in the Pere Marquette State Forest.

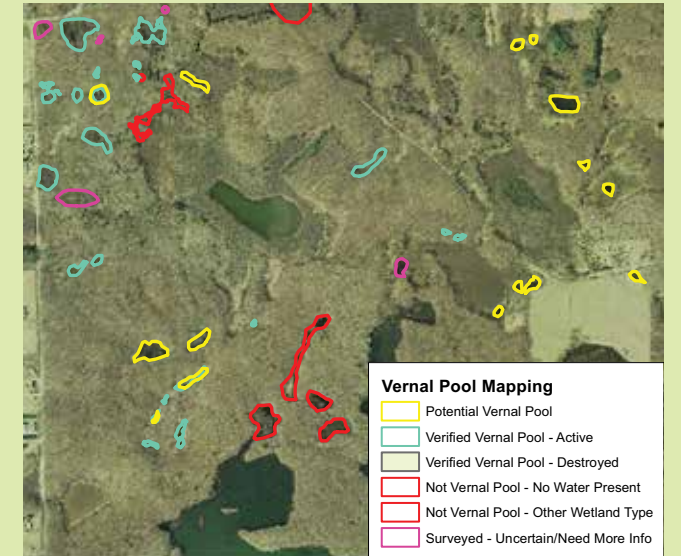


### MNFI Team

- Yu Man Lee, *(Principal Investigator)*
- Pete Badra, *Aquatic Zoologist*
- Josh Cohen, *Lead Ecologist*
- Helen Enander, *GIS Analyst*
- Brian Klatt, *Ecologist and Director*
- Phyllis Higman, *Botanist and Invasive Species Lead*
- Daria Hyde, *Zoologist, Conservation Planner and Educator*
- Mike Monfils, *Wildlife Ecologist*
- Ed Schools, *GIS and IT Manager*



Male *Eubranchipus vernalis* — Photo by Jack Ray



## American Forest and Paper Association Award for Innovation in Sustainability, 2015

An award for innovations that contribute to sustainable business practices awarded to Verso Paper Corporation for the Vernal Pools Project.

### Project partners included:

- MNFI
- Verso Paper Corporation
- Michigan Forest Products Council
- Michigan Department of Natural Resources
- Michigan Tech Research Institute



Co-Hosting the International

# NATURESERVE CONFERENCE

## **A Gathering of International Conservation Expertise**

Every year, NatureServe, the international non-profit organization which provides high-quality scientific expertise for conservation, gathers experts and decision-makers to share information on the places, species, and ecosystems in greatest need of protection and the effectiveness of conservation actions.

NatureServe represents a network of more than 80 independent centers, of which MNFI is one. Known also as Natural Heritage Programs, the centers collect and analyze data on plants, animals, and ecological communities. Their role is to disseminate this detailed scientific information regionally, nationally, and internationally.

As the hub of the network, NatureServe was honored with the 2014 MacArthur Foundation Award for Creative and Effective Institutions. The \$1 million award is already in use accelerating and implementing a strategic plan to increase the effectiveness of conservation action.

This year's conference focused on the latest research, conservation efforts, challenges and opportunities presented by the largest collection of freshwater ecosystems in the Western Hemisphere—the Great Lakes.

## **Sharing the Latest Knowledge about the Great Lakes**

The beautiful Traverse City bay area drew participants from around the world not only to learn, share and network, but to enjoy its biological bounty. As co-hosts of the event, MNFI was active in all phases of the conference from logistics to pre-conference Core Methodology Training. Working with the Ontario Conservation Data Centre and Michigan State University Extension, MNFI developed and conducted the Great Lakes Symposium which featured a plenary speaker and 36 presentations over four days.

Speaker John Riley traced the history of Great Lakes country from the ice age through tribal habitation to the arrival of European settlers and their drastic impacts on the land and water. He also gave a sobering, but optimistic assessment of the future with these words, “Today there is more forest cover, cleaner water, more recovered species, and a better quality of life—even as the human footprint deepens. There may be little left of the original place, but there are new ambitions afoot. Arguably, restoration is taking hold.”

MNFI staff coordinated two field trips to Sleeping Bear Dunes National Lakeshore to experience and discuss dune ecology and one to the Pere Marquette State Forest to explore vernal pools.

The conference featured MNFI presentations in three symposia on: the Great Lakes, Landscape Conservation Cooperatives, and Corporate Biodiversity Conservation Efforts in Michigan. Staff also shared expertise on topics ranging from conservation assessment to citizen science, conservation planning, and data management.

## **Scientific Collaboration across Borders to Protect the Future**

NatureServe recognizes that biodiversity issues do not fit neatly within the borders humans create. As they say, “Conservation and protection of the Earth's land, natural resources, and biodiversity is a messy, complex business. Political boundaries and ecosystems don't easily align with the interests of conservationists, governments, businesses, and communities. As a result, measuring conservation progress can be difficult and collaborating on common goals can be hard to sustain without a network.”

The 2015 conference brought representatives from around the world and the Great Lakes to do just that—collaborate on common goals, and share information and expertise to address conservation challenges.

# THE PEOPLE

of Michigan Natural Features Inventory



**Peter J. Badra**  
*Aquatic Zoologist*



**Kraig M. Korroch**  
*Information Technologist*



**Michael A. Sanders**  
*Zoologist and Environmental Review Specialist*



**Joshua G. Cohen**  
*Lead Ecologist*



**Aaron Kortenhoven**  
*Wildlife Ecologist*



**Edward H. Schools**  
*GIS and IT Manager*



**David L. Cuthrell**  
*Lead Zoologist*



**Yu Man Lee**  
*Wildlife Ecologist and Herpetologist*



**Bradford S. Slaughter**  
*Botanist and Plant Ecologist*



**Helen D. Enander**  
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**NOT PICTURED**



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We thank recently retired Sue Ridge for her many years of hard work and dedication to MNFI.



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**Emily Vermeersch**  
*Student Assistant—MSU Finance Undergrad*  
We thank Emily for all her hard work at MNFI during her student years.



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