Field Notes *from* Michigan

For Members of The Nature Conservancy in Michigan

Fall 2023 Newsletter

The Nature Conservancy

INSIDE:

Science in *Action*

Helen Taylor

At The Nature Conservancy, our work is grounded in science. We tend to say that a lot because it's so fundamental to what we do! Behind every project we take on, there's a driving conservation purpose and the data and knowledge to support it.

Michigan the Beautiful, an initiative which you can read about on page 4 of this issue, is a wonderful example of our science at work. With our partners, we are bringing better data and large-scale spatial planning to help people identify the most important habitats to conserve and restore across the state.

The need for good data is also at the heart of our reef assessment work, which is coordinated with similar efforts across the Great Lakes. Read about what our dive team is up to on page 8. And, on page 10, you can learn how science will inform the management of the 32,500-acre Keweenaw Heartlands property, which we acquired at the end of 2022. We also share our science—and science-driven conservation successes—with many partners across the Great Lakes, as the stories on pages 12 and 13 highlight.

If science matters to you, we need your help! When you give to TNC, you help make our foundation of science stronger—so that we can achieve the most for people and nature. Please consider visiting **nature.org/midonate** to make your next gift today.

Thank you for all you do for nature in Michigan.

Yours in Conservation,

Helen Taylor
State Director

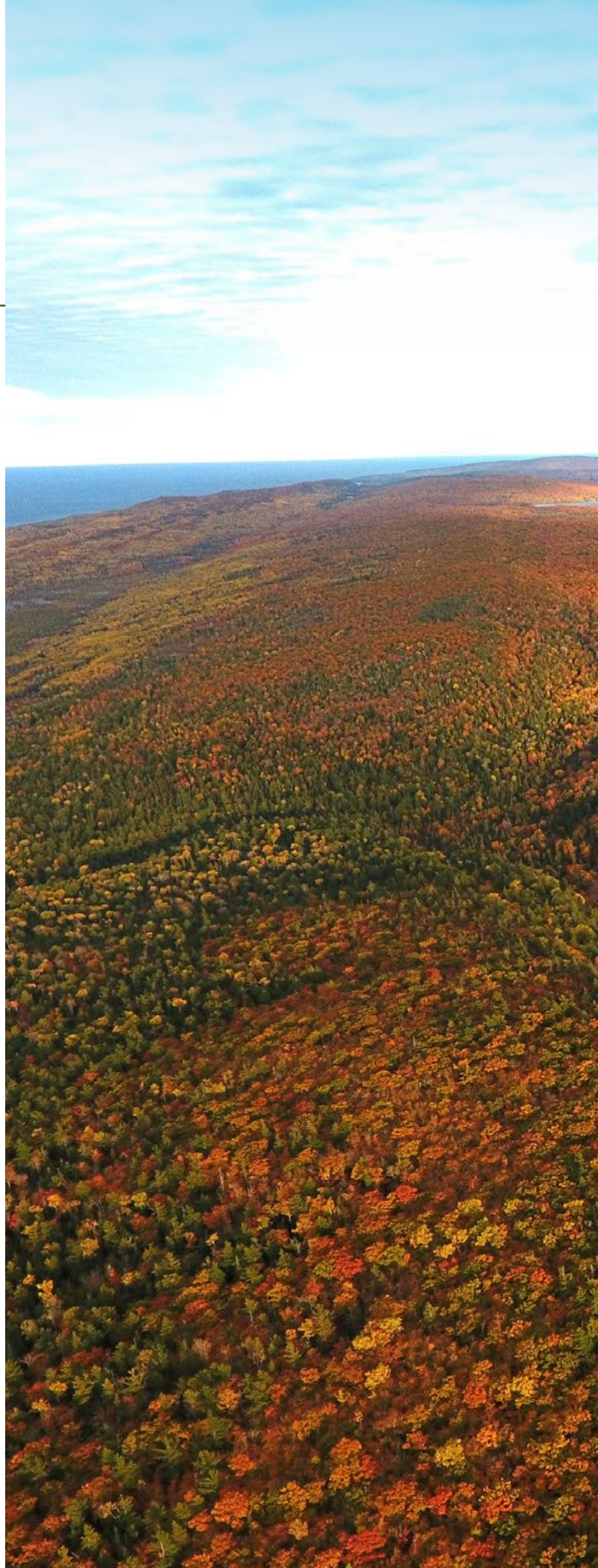


TABLE OF CONTENTS

COVER: Earlier this year, researchers from state and Tribal agencies, as well as TNC, completed an underwater scuba training and certification in Grand Traverse Bay, in preparation for summer research dives. © Fauna Creative

LEFT: Fall in the Keweenaw Peninsula. © Photography by Mark R. Upton

Michigan the *Beautiful*

PURSUING 30x30 IN THE GREAT LAKES STATE

Michigan's natural beauty sets our state apart. These lands and waters also provide recreational access, keep our air and water clean, absorb atmospheric carbon and support Michigan's economy.

All of these benefits, known as ecosystem services, depend on biodiversity. The growing loss of biodiversity around the world undermines the ability of lands and waters to function effectively and provide a healthy environment for people and wildlife—especially in a changing climate. Protecting a variety of habitats, and the biodiversity they support, helps ensure these benefits will continue to flow to future generations. **But how much protection is enough?**

A GLOBAL TARGET

At the end of 2022, the meeting of the United Nations Convention on Biological Diversity in Montreal culminated in the historic adoption of the Kunming-Montreal Global Biodiversity Framework—an international roadmap out of the ecological crisis and toward a more nature-positive world. This includes setting a "30x30" target to secure the effective conservation of 30% of the world's lands, oceans and fresh water by 2030.

"The 30x30 goal provides a way forward for the world to equitably achieve the wildlife and habitat conservation we need to protect biodiversity while also providing for people," says Dr. Doug Pearsall, senior conservation scientist for The Nature Conservancy (TNC) in Michigan. "It's a way of ensuring that we are all working together toward a meaningful goal that will sustain the natural world we depend on."

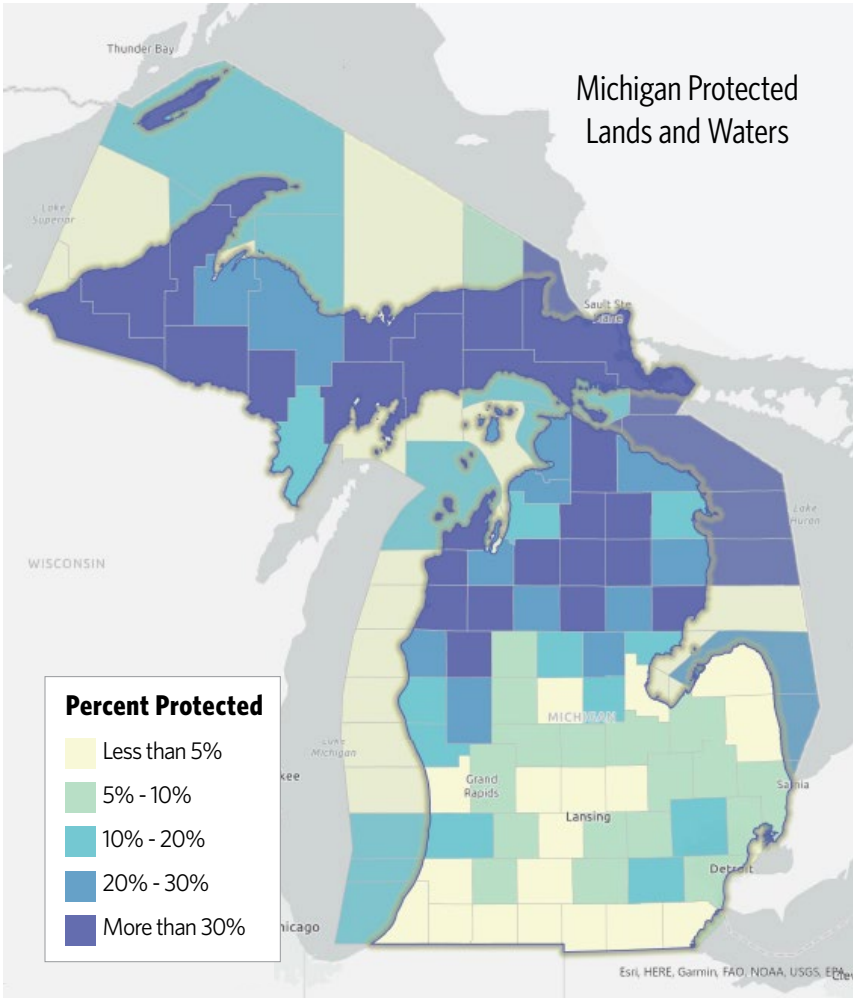
More than 100 countries have committed to this goal, including the United States. Launched by Executive Order in 2021, the national America the Beautiful initiative is a voluntary, state-led effort to conserve 30% of U.S. lands and waters.

A LOCAL NEED

Michigan has responded to the national 30x30 commitment by launching Michigan the Beautiful. In this effort led by the Michigan Department of Natural Resources (DNR), the DNR is working with TNC and Ducks Unlimited to bring together a diverse set of organizations to develop the tools and plans necessary to protect 30% of Michigan's lands and waters by 2030.

Michigan is well on the way to meeting this goal, thanks to a variety of organizations, agencies and Tribal governments already implementing or funding conservation actions. However, there is a great need for consistent and statewide data to help communities, organizations and decision-makers prioritize and design their conservation actions for the greatest impact.

"In the past," Doug says, "site selection has been based on the opportunities that arise rather than guided by strategic biodiversity objectives. We need good data, a common vision, socially inclusive conservation and shared learning to improve how and where each conservation entity acts."



MAPPING MICHIGAN'S PROTECTED LANDS & WATERS

Currently, public and private protected lands represent about **24%** of the total area of Michigan, with the bulk occurring in the Upper Peninsula and Northern Lower Peninsula. Similarly, about **19%** of the Great Lakes within Michigan's jurisdiction has been protected by state or federal designation, such as the Thunder Bay National Marine Sanctuary.

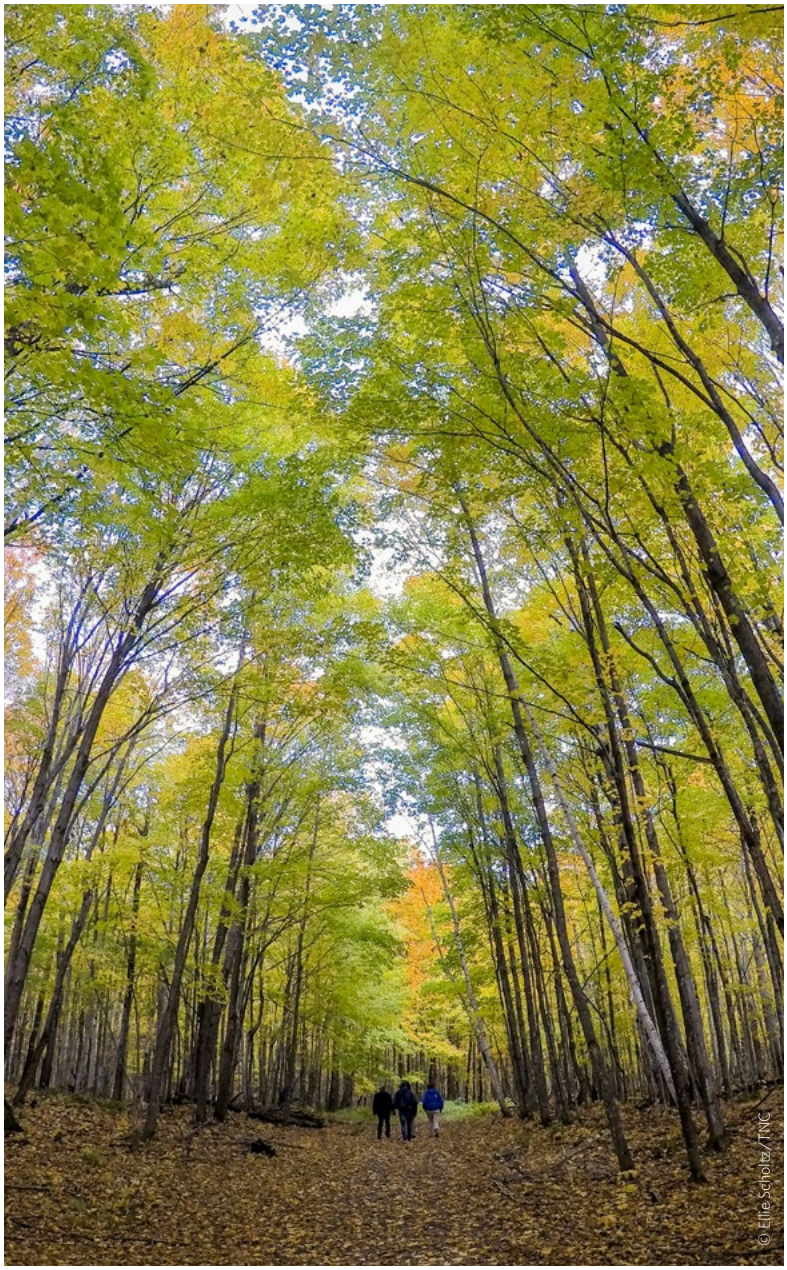
MICHIGAN'S PATH

The statewide 30x30 project team is now compiling data that captures information on "assets" (features that are important to people and nature) as well as ownership, land use and development patterns that can inform decisions. For example, if a local government wanted to focus water infrastructure updates where they are most beneficial, this information could help them identify where water quality and aquatic habitat are most at risk from land use patterns. Or, if a land trust were trying to prioritize a local protection opportunity, data on assets could help guide them toward the project with the most additional benefits.

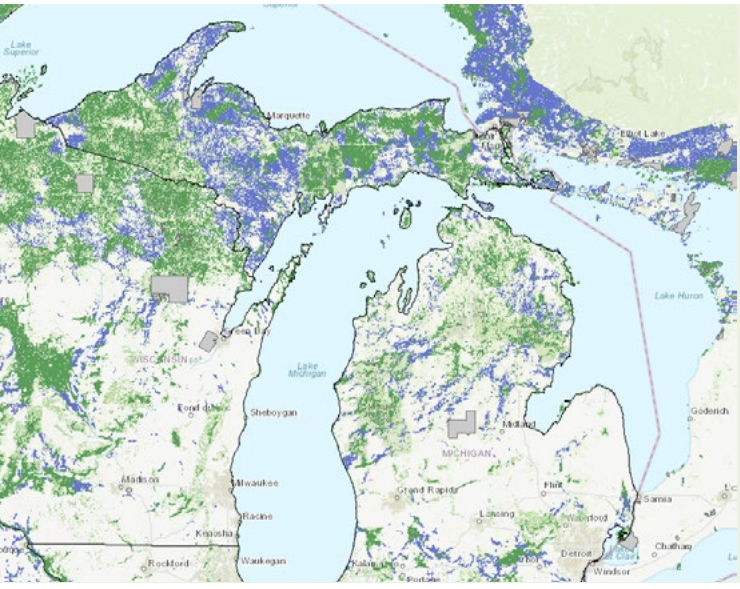
This data will be shared through an online, interactive data viewer paired with a "story map" that provides maps, charts and other visuals to help people understand the implications of this data. With the DNR, TNC will also develop a set of strategies and related action plans designed to advance land and water conservation efforts throughout the state.

This process is supported by an advisory committee of more than 20 representatives from agencies, organizations and other entities operating mostly at a statewide level. Regional and local planning entities, watershed councils, land trusts and more will also have input into the design and content of the products, and help ensure that the results support locally relevant conservation decision-making. And, throughout the project, we will align our work with other America the Beautiful efforts across the country by following shared best practices.

"This process allows us to leverage the wealth of perspectives and information that our partners and communities can provide, and share that wealth widely to support the most meaningful conservation," says Doug. "We'll be providing training opportunities for project partners and other interested parties on these tools and resources to help ensure that they are widely and consistently used."



© Ellie Scholtz/TNC

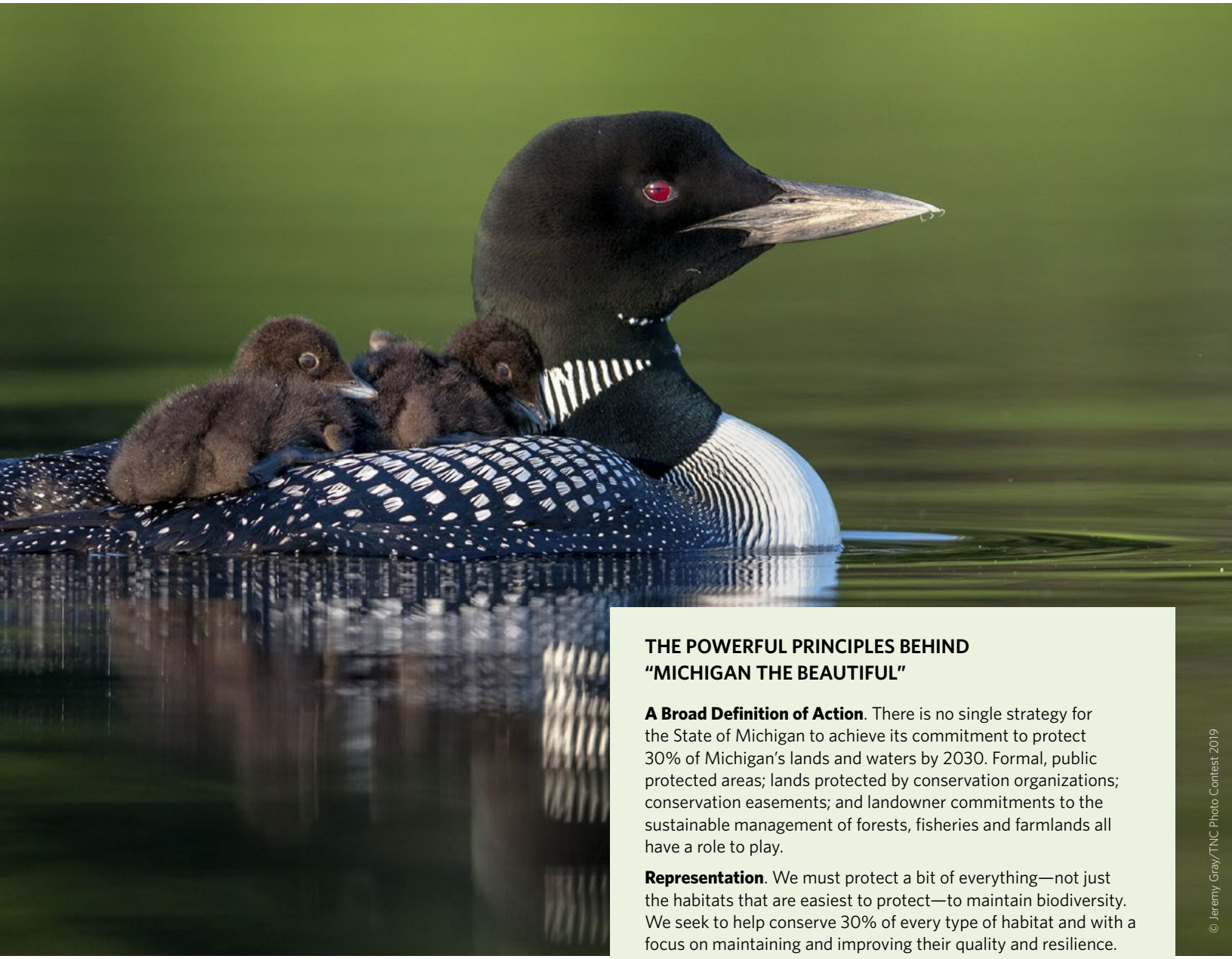


CLIMATE-RESILIENT CORRIDORS

A portion of Michigan's 30x30 goal will be met with investments in the lands and waters that are most resilient to climate change and allow plant and animal species to find new places to thrive and adapt to growing climate threats.

TNC—working for over a decade with more than 150 scientists from the public and private sectors—has mapped a network of connected lands across the country. This network, which covers a third of the continental U.S., encompasses lands with unique topographies, geologies and other characteristics that make them resilient to climate change.

The Resilient Land Mapping Tool (**maps.tnc.org/resilientland**), where you can explore this network, is one example of the kind of information that will be folded into the Michigan the Beautiful resources. The data shared via this tool are already being used by land trusts and government agencies to develop local conservation plans.



© Jeremy Gray/TNC Photo Contest 2019

WHAT'S NEXT

In short, Michigan the Beautiful is an opportunity to help all conservation initiatives focus on the work most important to healthy lands, waters and communities, at all scales. It goes beyond state-owned lands to look across the entire landscape, so that Michigan's natural resources are managed and protected as the interconnected system they are.

The 30x30 goal is vital to the future of all life on Earth. It's bold and unprecedented in scale, but also achievable—through coordinated and collaborative efforts that build off of best practices. Through Michigan the Beautiful, TNC aims to ensure that we and our partners—and anyone committed to a thriving future for our lands, waters, wildlife and communities—is empowered to make durable, science-based and equitable decisions that can make the ambitious 30x30 goal a reality.

THE POWERFUL PRINCIPLES BEHIND "MICHIGAN THE BEAUTIFUL"

A Broad Definition of Action. There is no single strategy for the State of Michigan to achieve its commitment to protect 30% of Michigan's lands and waters by 2030. Formal, public protected areas; lands protected by conservation organizations; conservation easements; and landowner commitments to the sustainable management of forests, fisheries and farmlands all have a role to play.

Representation. We must protect a bit of everything—not just the habitats that are easiest to protect—to maintain biodiversity. We seek to help conserve 30% of every type of habitat and with a focus on maintaining and improving their quality and resilience.

Durability. A protected area that has lost its biodiversity cannot fully contribute the ecosystem services on which people and nature depend. Durable practices must be put in place to ensure areas that are already protected continue to thrive, backed by robust public policies and sustainable financing.

Effective Management. Improving efficiencies in sustainable agriculture, fisheries and forestry, as well as reducing the footprint of our energy and industrial activities are also essential to making 30x30 possible. In other words, we also need to manage "the other 70%" in ways that benefit nature and people.

Collaboration. Success will take working with federal, state, Tribal and local entities to increase the effectiveness of management strategies and land use decisions across all of Michigan, ensuring that we are collaborative, connected and aligned on shared goals.

Equity. Inclusive, equitable conservation strategies are a must for accomplishing 30x30 in Michigan—and around the world. Data show that, no matter the project or place, conservation efforts in which Indigenous and local community representatives hold leadership roles have more successful outcomes.

Reef Recon

Photos © Fauna Creative

In the Great Lakes, reefs are usually large piles of rock or gravel left behind by ancient glaciers. Such deposits can also be seen on Michigan's dry land, in the form of moraines or eskers.

The shining blue waters of Lake Michigan are a familiar sight for many Michiganders. Beneath the surface, however, it's a different story—even for scientists.

"You might think we know everything there is to know about our Great Lakes—scientists have been studying them for many years—but these are huge, complex systems," says Matt Herbert, senior conservation scientist for The Nature Conservancy in Michigan. "We still have a lot to learn."

This includes Great Lakes reefs. These rocky reefs are comprised of cobbles, gravel and other stony outcrops. They are incredibly important to the health of Great Lakes fisheries because they provide habitat for fish eggs and young fish, protecting them from predators. At least, they do when they're in good condition.

"Many reefs can be hard to get to, and underwater habitats are difficult to assess without divers or a lot of technology," says Matt. "Most Great Lakes reefs have never been explored by researchers. As a result, we know very little about these reefs, including what condition they are in or what species are using them."

There are a few exceptions, such as the reef near Elk Rapids that TNC worked to restore in 2015, with the Michigan Department of Natural Resources (DNR) and Central Michigan University (CMU) . This project rebuilt the limestone rock cover along damaged spawning grounds that support native lake trout, cisco and whitefish. More importantly, it helped inform and inspire similar projects in other parts of the Great Lakes. These early successes suggest that closer attention to the health of reefs across the Great Lakes—and a scaled-up approach to their restoration—could make a big difference for healthy fisheries.

"We know there are other degraded reefs in the Great Lakes," says Matt. "Excessive sediment build-up or algae growth, or impacts from invasive species like quagga mussels and rusty crayfish, are common problems. What we don't know is how pervasive these impacts are."

That's where TNC's dive team comes in.

Earlier this year, researchers from state and Tribal agencies, as well as TNC, completed an underwater scuba training and certification in Grand Traverse Bay, in preparation for summer research dives. In addition to standard dive safety skills, they brushed up on underwater science techniques for identifying aquatic invasive species, setting nets and more.

The rocky reefs of the Great Lakes are far less colorful than tropical coral reefs—but they are just as important to local wildlife. Highly productive reefs can produce tens of millions of fish, and many of the most important Great Lakes fishes, including lake whitefish, walleye, perch and lake trout, use reefs for spawning.

TNC now has a Great Lakes dive team focused on reef assessment, and improvements in technology and diving capacity are increasing among Great Lakes agency scientists, as well.

"Having this capacity for reef research is huge," Matt says. "With more divers, we can help meet the growing interest in reef restoration, and significantly expand the number of reefs that have been studied."

In Michigan, TNC is working closely with the DNR, the Grand Traverse Band of Ottawa and Chippewa Indians, the U.S. Geological Survey (USGS) and CMU to assess the status of underwater reefs in eastern Lake Michigan. We started with 15 reefs in the eastern part of the lake in 2022, and expanded that to include northern Lake Michigan reefs this year.

Potential reefs are identified using existing data, including historical maps and navigation charts assembled and digitized by TNC. After we create maps of their likely footprint, our project partners at USGS use multi-beam sonar mapping to produce a detailed map of elevations at each site. Then, we use underwater drop cameras to photograph the reef and determine what the lake floor is made of in this spot, how deep the rock layer is and whether invasive plants or animals are present.

Finally, divers swim down to collect additional data in person. This includes counting invasive species and measuring their density, and collecting samples of invertebrates they find.

And that's just the summer activities. The project team returns in late fall and winter to determine if the reefs are used for spawning by key fish species, and then again in spring to see if the young fish are hatching. This time-intensive approach means that they can't survey every reef—but they will be able to draw better generalizations about reef conditions based on factors such as their geology, depth, exposure to waves and more.

"What we learn from these assessments will give us valuable insights into how Great Lakes reefs work and what their status is, not just on the sites we survey, but broadly across the watershed," says Matt. "It will go a long way toward guiding future restoration and protection efforts, as well."

This work isn't limited to eastern Lake Michigan, either. TNC is also involved in similar projects in Green Bay and Lake Erie, bringing together multiple partners including state, Tribal and federal agencies around a Great Lakes-wide reef assessment effort. With an active presence in each state, as well as staff who focus on fisheries at the Great Lakes scale, we are helping facilitate learning across different regions and partners, ensuring that we are using comparable methods and developing shared reef restoration priorities.

This research also will help inform and drive the state and federal funding that goes to fisheries restoration, and we continue to advocate for increased federal investment in coastal reef restoration.

"Reef restoration is important, but we have to be strategic about it," says Matt. "This project will ensure that we are focusing where restoration would have the most benefit and avoid harm to functioning habitats. It will get us all on the same page when it comes to making the right decisions for healthy Great Lakes."

A GREAT LAKES REEF RESTORATION

Three species, 450 tons of rocks and one chance for a comeback. Watch our award-winning video to learn how TNC and our partners are working to restore spawning habitat for Great Lakes fish: **bit.ly/greatlakesreef**

GREAT LAKES REEF RESTORATION PARTNERS

U.S. Fish and Wildlife Service | U.S. Geological Survey | Michigan Department of Natural Resources
Wisconsin Department of Natural Resources | Ohio Department of Natural Resources
Illinois Department of Natural Resources | New York State Department of Environmental Conservation
Grand Traverse Band of Ottawa and Chippewa Indians | Central Michigan University
University of Toledo | University of Wisconsin - Green Bay | University of Wisconsin - Milwaukee

Surveying the *Keweenaw Heartlands*

The trail system crisscrossing the Keweenaw Peninsula includes popular mountain biking and ATV routes. Some of those trails cross the Keweenaw Heartlands property as well. These trails are included in the inventory as existing infrastructure. © Devin Leonarduzzi/Quincy Aerial, LLC

The Heartlands are largely an intact forested landscape and their protection offers the opportunity to sequester significant amounts of atmospheric carbon, an important natural solution to climate change. © Tyler Bassett/MNFI and TNC

The landscape of the Keweenaw Peninsula tells a rich and complicated story. Here, pockets of history hide within dense forests and along ridges of ancient volcanic bedrock, worn down by wind, rain and time. It's a history of the people who have lived and worked here, stretching back thousands of years. It's also a history of the unique plants and wildlife that have thrived here.

Since 1975, The Nature Conservancy has worked with partners to conserve this dynamic place, culminating with the recent purchase of 32,500+ acres—known as the Keweenaw Heartlands—in October of 2022. As temporary owners and stewards of the property, we took on not just the opportunity to help protect the future of these lands for people and nature, but also the responsibility to understand its past. This led to the creation of the Keweenaw Heartlands Ecological and Cultural Inventory Project.

"Our project's goal is to have a baseline understanding of the ecological and cultural assets throughout the Keweenaw Heartlands and surrounding areas," says Stephanie Kyriakakis, conservation scientist for TNC. "Understanding the cultural and ecological significance of any protected land is useful to inform management decisions, but it is especially significant in this case, given the size and importance of the Keweenaw Heartlands to the community."

TNC has committed to partnering with and being a contributing member of the Keweenaw community as it builds a future around the sustainable use and management of the rivers, lakes and forests of this globally unique landscape and the benefits its offers, such as outdoor recreation, environmental services (including sustainably produced timber and carbon sequestration), economic opportunities and an outstanding quality of life. The Keweenaw Heartlands, which occupy much of the tip of the peninsula, are central to that future.

The inventory is one project that will help make this future possible. Another important contributor to this work is the Keweenaw Heartlands Planning Committee, a cross-section of local leaders of various interested groups and constituencies. The committee's input into a long-term management blueprint for the Heartlands will help future land managers better align inventory findings with the community's desired outcomes.

"We want to develop a comprehensive inventory of the property to ensure the long-term owners of the Keweenaw Heartlands—whether that's the township, the county, the state or a combination of these entities—make the best management decisions for the future of the land and the community," Stephanie says.

The project team is using several different approaches to collect that information. First, they are tracking down existing data and information on cultural, ecological, timber and infrastructure features, such as roads and culverts. They are also using remote sensing technology such as LiDAR (a laser-based approach that has a finer resolution than radar) to map the extent and condition of various habitats. And, they're gathering information on the historical and cultural uses of these lands and waters.

"Once we analyze existing data and model natural communities, the next step is to survey priority areas to ground-truth the data we have," says Stephanie. "That's been a big focus this summer."

WHAT WE'RE MAPPING:

Infrastructure

Roads, trails (ATV, mountain bike, hiking), culverts, historic mines and other developed areas.

Timber and Carbon

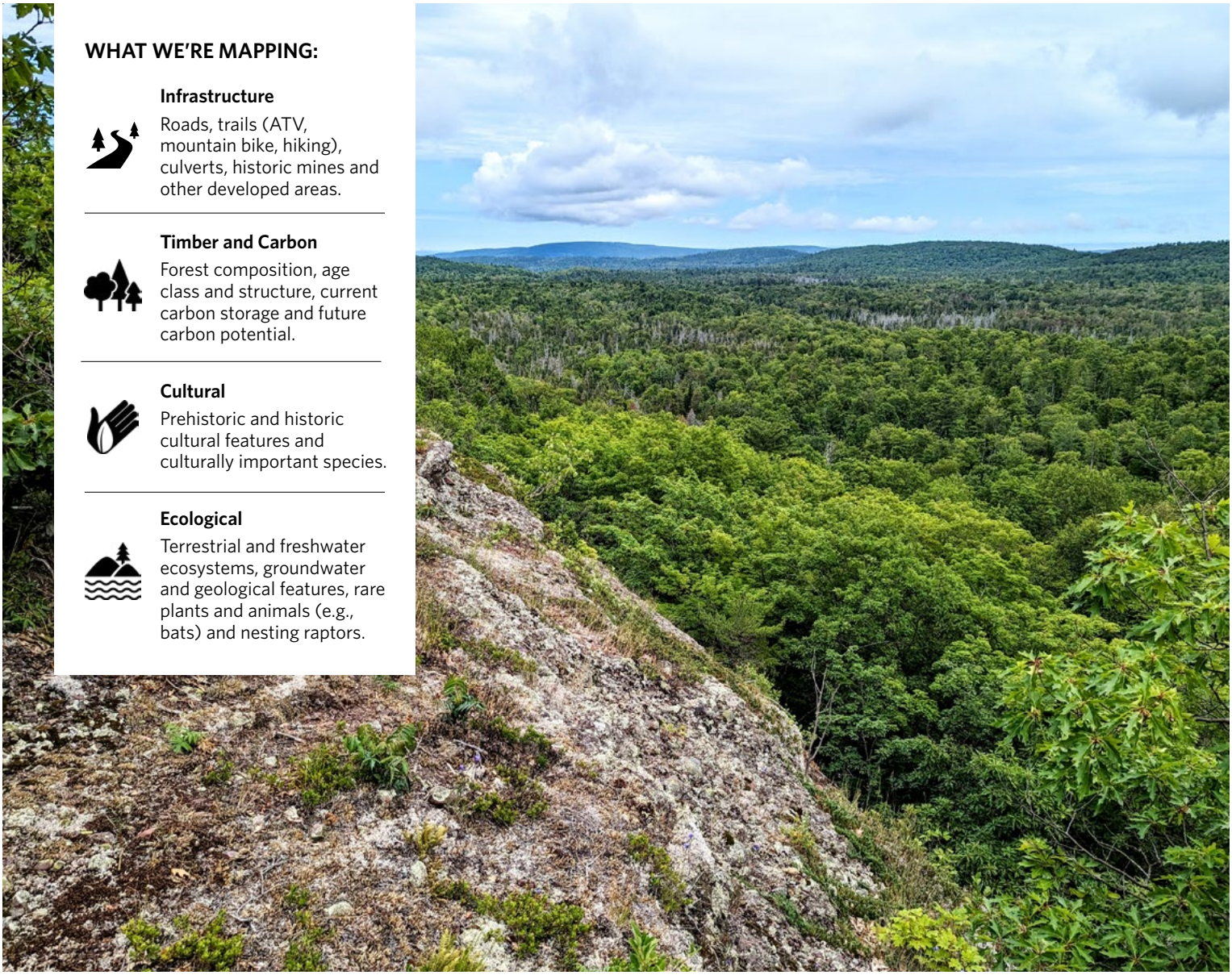
Forest composition, age class and structure, current carbon storage and future carbon potential.

Cultural

Prehistoric and historic cultural features and culturally important species.

Ecological

Terrestrial and freshwater ecosystems, groundwater and geological features, rare plants and animals (e.g., bats) and nesting raptors.



Michigan is home to nine species of bats, which either migrate to warmer locations or seek out places such as caves and old mine shafts to hibernate through the winter. During the survey, TNC looked for and identified potential bat "hibernacula" as important conservation features, since populations are in decline due to white-nose syndrome. © John Den Uyl/TNC

TNC staff and partners from the DNR, Michigan Natural Features Inventory and Michigan Tech University have conducted several field surveys during this time, confirming locations identified in existing records and analyses to fill in any data gaps. We have also completed a forest inventory to assess the health of the forest as well as its carbon sequestration potential for the future. TNC has also reached out to local residents so we can ensure their first-hand knowledge of the area is incorporated as well, creating a richer, better-informed inventory.

Gathering as much information as possible now, before transferring the property to its permanent owners, will help TNC ensure that the most special places of the Keweenaw Heartlands have the right protections in place to guarantee their long-term conservation.

"This process serves TNC's goal to conserve lands and waters long-term for people and nature, and it's also important to help meet the community's desire to understand and protect a variety of land uses," says Stephanie. "By enabling current and future managers of the Keweenaw Heartlands to make more informed decisions, we will help ensure that the land can be enjoyed by future generations, while also protecting its natural and cultural resources."

For more on this project, including a link to recent updates, visit nature.org/keweenaw.

Nature Needs YOU

Inspired by TNC's work in the Keweenaw? Your support is critical to its success. There are three ways you can give to this exciting conservation effort:

1. Support TNC's work in Michigan, which includes the Keweenaw Heartlands project, with an online donation at: nature.org/midonate
2. Mail a check to:
   The Nature Conservancy in Michigan
   101 E. César E. Chávez Ave.
   Lansing, MI 48906
   Memo Line: Keweenaw Project
3. Call TNC's Development team at **(517) 316-0300** to learn about other giving options.

Thank you to everyone who has contributed!

Partnerships with Impact

Protecting North Point

In June, The Nature Conservancy was proud to celebrate the transfer of 1,384 acres on North Point Peninsula, near Alpena, to a local partner, Huron Pines. More than 130 friends and supporters attended this sold-out event, which featured field trips hosted by staff from TNC and Huron Pines. These field trips, which allowed many community members to see the new North Point Nature Preserve for the first time, were followed up by a celebration event for donors, partners and community leaders at the Great Lakes Maritime Heritage Center.

TNC acquired this North Point property in 2018 after decades of seeking to protect it, working with Huron Pines, the National Oceanic and Atmospheric Administration (NOAA) and the Friends of Thunder Bay National Marine Sanctuary. Huron Pines took over the management and protection of the North Point Nature Preserve at the end of 2022, ensuring its protection into the future. TNC also holds a conservation easement that strictly limits any future development on the land.

The protected property features cedar forests, unique wetlands and meadows, and four miles of Lake Huron shoreline, which harbor diverse plants and wildlife and provide critical habitat for migratory birds. The fertile nearshore waters are a critical spawning area for Great Lakes whitefish and perch and feature underwater limestone sinkholes that support unique microscopic organisms of great interest to the scientific community.

> "North Point is truly a special place, and we're so glad to see it in good hands for the future."
>
> HELEN TAYLOR, STATE DIRECTOR

"North Point Peninsula is a hidden gem in the northeast lower peninsula, and we are thrilled to be taking ownership and assuming management of this unique landscape to ensure it remains a place for nature to thrive," said Huron Pines Executive Director Brad Jensen in a press release. "At Huron Pines, we understand that the connections between land, water and people are what make this corner of Michigan so special, and I want to thank TNC for entrusting us to protect North Point's ecological values forever."

Along with its ecological importance, the property comes with a rich maritime history and an abundance of both recreational and educational opportunities. Providing such opportunities for school groups is a priority for NOAA's Thunder Bay National Marine Sanctuary, which will include the North Point Nature Preserve in future field trips.

TNC worked together with our partners to develop a restoration and management plan for North Point that benefits both people and nature. As part of an advisory group of partners, we will continue to support Huron Pines in the implementation of this plan in the years to come.

"The staff at Huron Pines has put so much time and effort into this project, and their organization was a natural choice to take over management of the North Point Nature Preserve," says Helen Taylor, TNC state director. "North Point is truly a special place, and we're so glad to see it in good hands for the future."

Photos © Rebecca McNitt/TNC

Bay to Basin: Knowledge Exchange

For over a decade, TNC has been working in the Saginaw Bay watershed to support on-farm conservation practices that help keep our Great Lakes clean. These are practices such as nutrient management, reduced tillage and cover crops that have a demonstrated ability to reduce high levels of nutrient runoff in our lakes and rivers, where it can cause algal blooms. But Saginaw Bay is not the only part of Michigan that stands to benefit from these practices and what we've learned from implementing them.

"The Western Lake Erie basin, which extends into Indiana and Ohio, is another important agriculture area for the region," says Ben Wickerham, TNC's agriculture program director in Michigan. "About 70% of it is in agricultural production. And, Lake Erie is the shallowest and warmest of the Great Lakes. These factors mean that it is particularly susceptible to nutrient pollution—but also that farmers can play a big role in keeping the lake healthy."

That's why TNC set out to convene a three-part Watershed Knowledge Exchange Series to break down barriers and bring together resource professionals from both priority watersheds. In October 2022, March 2023 and May 2023, TNC hosted three workshops that allowed conservation practitioners to share successful (and unsuccessful) strategies, and to brainstorm future approaches that could work in either geography.

> "Resource managers in both watersheds are facing a lot of the same challenges, and we believe that these opportunities to collaborate and problem-solve together will be immensely important..."
>
> BEN WICKERHAM, AGRICULTURE PROGRAM DIRECTOR

"Resource managers in both watersheds are facing a lot of the same challenges, and we believe that these opportunities to collaborate and problem-solve together will be immensely important to scaling up important solutions across the watershed," says Ben.

About 30 conservation practitioners, representing 20+ different organizations, attended each workshop. Projects that were discussed include the Saginaw Bay Monitoring Consortium, which will provide long-term data on water quality in the Saginaw Bay watershed. A similar monitoring project in Michigan's portion of the Western Lake Erie basin, led by partners at Michigan State University's Institute of Water Research, is also expanding the number of water quality monitoring sites in that watershed.

"There was a lot of interest in the consortium and the dashboard that will be produced as part of that project for Saginaw Bay," says Ben. "Much of how we prioritize monitoring sites, for example, is transferable between projects."

In the long-term, expanded collaboration between similar geographies, such as the Saginaw Bay watershed and Western Lake Erie basin, is critical for taking what we've learned to scale and achieving necessary nutrient reductions and water quality improvements in the Great Lakes.

"We're really excited about the conversation we've opened up," says Ben. "There's so much energy behind this work, and this adds a good deal of momentum."

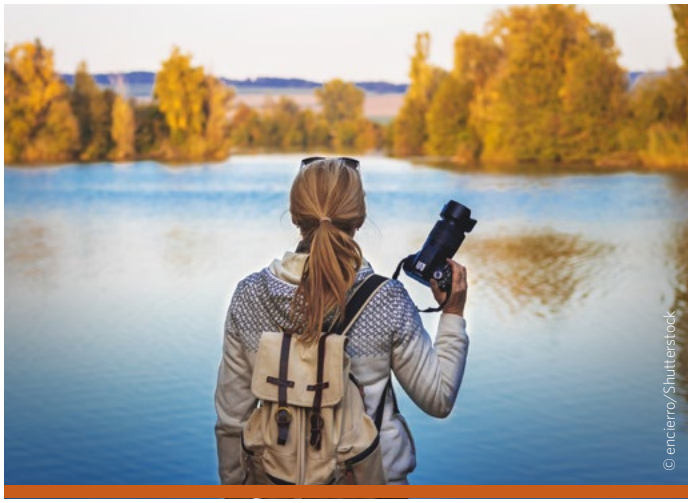
Upcoming Events

© John Keuvelaar/TNC Photo Contest 2022

LET'S CONNECT

Don't miss an event notice; subscribe online at **nature.org/naturenews** to receive special invitations and timely alerts.

Can't make it to one of our events in person? Connect with TNC online, including audio tours, lectures, virtual field trips and more, at **nature.org/miexplore**.



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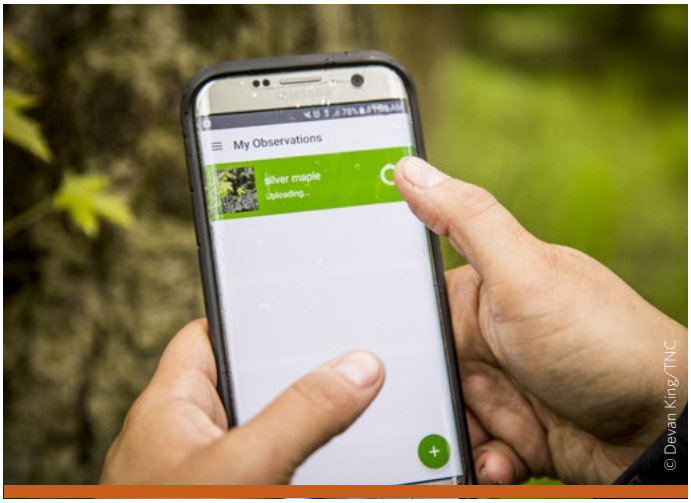
WEBINAR: NATURE IN FOCUS

Tips for Photographing the World Around You

October 26 | Zoom Webinar

Hear from Jason Whalen, photographer and co-owner of Fauna Creative, as he shares wildlife photography tips to apply on your next outdoor adventure. We'll also hear from Shaun Howard, TNC's preserve infrastructure and outreach manager, on where and when to find unique flora and fauna in the Midwest. At the conclusion of the presentation, we'll also share some of the Michigan contenders in TNC's Global Photo Contest. We guarantee they're stunning!

Register at **nature.org/mievents**.



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JOIN TNC ON INATURALIST

inaturalist.org

In the last year, **56** observers made **696** observations of **118** species on TNC preserves and reserves. *Thanks for your help!*

Have you checked out iNaturalist yet? If not, we could use *your* help, too! When you record a species thriving on the lands TNC protects, you're helping us gather the information we need to be the best possible stewards of our preserves.

Go to inaturalist.org to learn more, create an account and download the (optional) app. Then, next time you visit a TNC preserve, take some photos of the species you come across and upload your finds! Go to **nature.org/miexplore** to find a TNC preserve near you.

Explore our iNaturalist project page:
inaturalist.org/projects/tnc-michigan-preserves-and-reserves

HOW DIRT WORKS

Grade Levels 3-8

Adapted for print. Find full guidance at nature.org/naturelab.

What do we use every day that requires soil? The answer may surprise you—most things in your life, in fact, wouldn't exist without it! You can trace the origins of practically any product, food or other resource to soil—from cotton t-shirts to cheeseburgers. Learn more about the importance of soil in this Nature Lab.

NATURE LAB Educator Resources

Nature Lab is The Nature Conservancy's youth curriculum platform.

Visit **nature.org/naturelab** to access lesson plans with interactive worksheets, videos and hands-on projects.


© Devan King/TNC

WATCH

How does dirt work? Why is healthy soil important? How can people help keep soil healthy? Watch this video to get the answers: **vimeo.com/77792712**.

EXPLORE

It's your turn! Follow the suggested activities and links below to answer some important questions about the soil that sustains us.

1 | SOIL IS A HABITAT

Many animals depend on soil. Some we can see, like earthworms, but there are also billions of microscopic organisms, such as bacteria, fungi and algae, that inhabit and enrich the soil.

It's your turn! Fold a vertical piece of printer paper into thirds. Then, fold the top section down to create a fourth section about an inch wide. Each section represents a layer, also known as a horizon, of the soil. Draw what you imagine could be found in each horizon.

Some hints:

- The thin surface layer at the top is mostly dead plants and leaves.
- The next layer is the topsoil, where most organisms can be found.
- The subsoil layer is rich in minerals and has some deep plant roots.
- The layer below that has larger rocks that contribute to the developing soil.

2 | SOIL STORES WATER FOR PLANTS

Soil helps regulate the flow of water from rain. Some water will flow over the surface, some will be retained by the soil and some will flow through to deeper layers below. But not all soils act the same.

It's your turn! Punch two holes in the bottom of three paper cups. Fill each cup with the same amount (about 100mL) of different soil materials such as sand, peat moss or gravel. Place each cup over a container to catch the water, then pour about 100mL (a little less than a half cup) of water into each one.

Observe the differences. Which container fills the fastest? Which has the most water at the end of 5 minutes? Can you calculate how much water remained in the cup? Which material was the best at holding water?

3 | SOIL KEEPS OUR WATER CLEAN

Pollutants are substances that are introduced into the environment, like chemicals or waste. They can contaminate the water, soil and atmosphere.

It's your turn! You'll need another paper cup with two holes in the bottom. Fill it with a layer of sand about a half-inch thick, then add soil until the cup is half-full. Place it over a container to catch the liquid, then pour in some grape Kool-Aid (or use plain water with food coloring).

What color is the liquid that goes in? What color is the liquid that collects in the container? What do you think the soil is doing? What do you think would happen when polluted water runs into soil like this?

GO BEYOND

What would life be like without soil? Share your thoughts with a friend or family member, write a story or draw a picture!

ADDITIONAL RESOURCES

Watch the following videos to learn more about soil:

- "Why is soil a valuable resource?": vimeo.com/78368785
- "How do humans rely on soil?": vimeo.com/78368784
- "Why is it important to monitor the health of soil?": vimeo.com/78368788
- "What are some of the strategies used to improve and maintain the health of soil?" vimeo.com/78368782
- Meet the Scientist: Sophie Parker: vimeo.com/77788834

The Nature Conservancy
101 E. César E. Chávez Ave.
Lansing, MI 48906
517-316-0300

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To learn more about the Legacy Club, or if you are a Legacy Club member and have a question, please contact Paul Beczkiewicz at **517-316-2269** or **pbeczkiewicz@tnc.org**.

Or visit nature.org/legacyclub.

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