

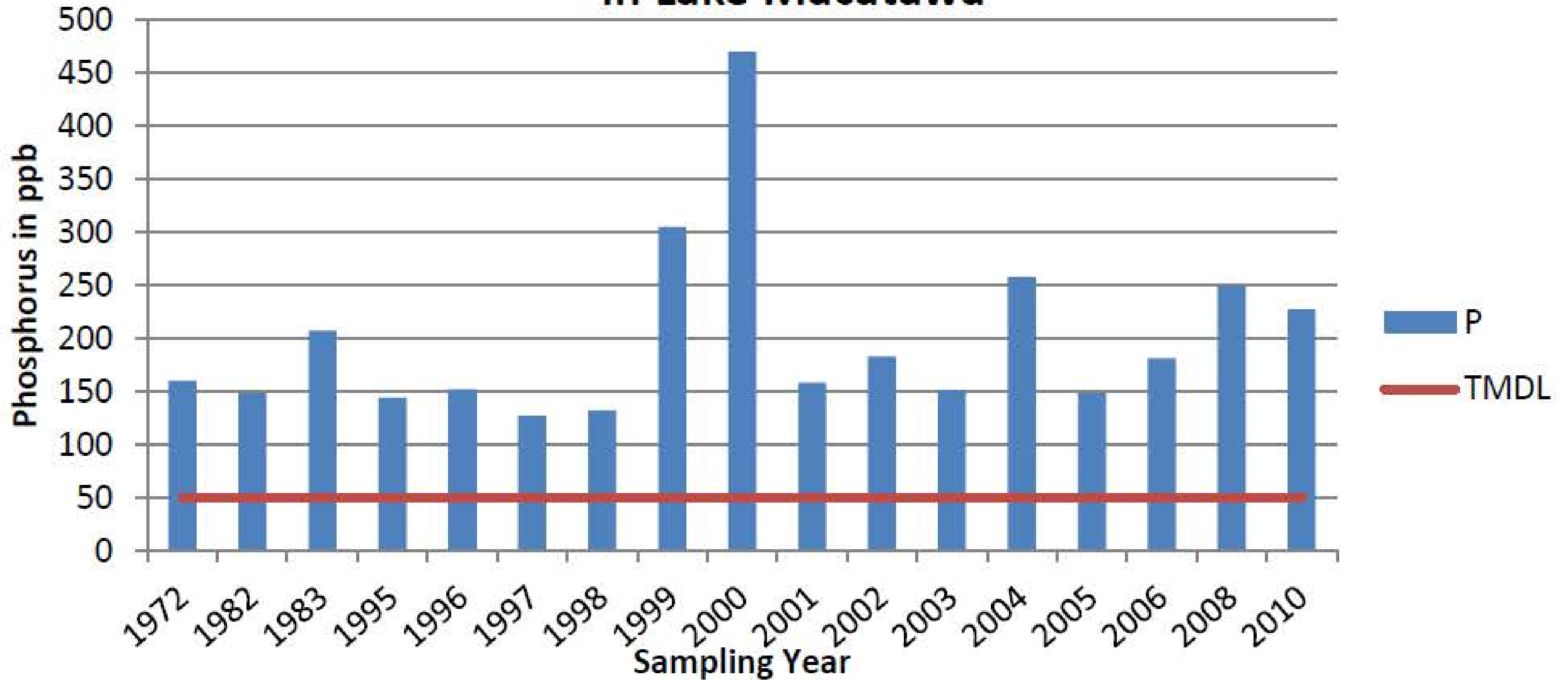
Collective Ripples

**Project Clarity's work to restore the
Macatawa Watershed**

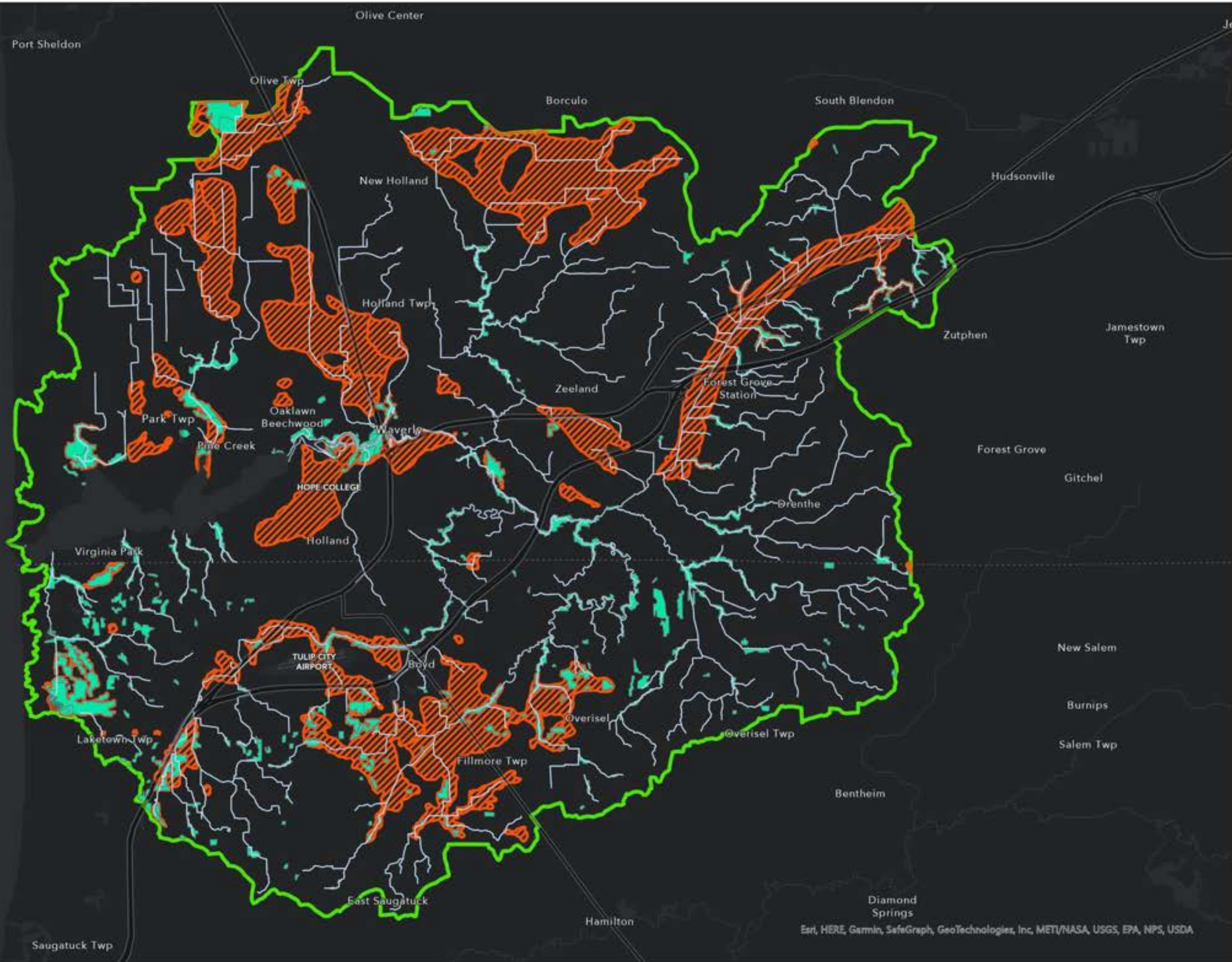


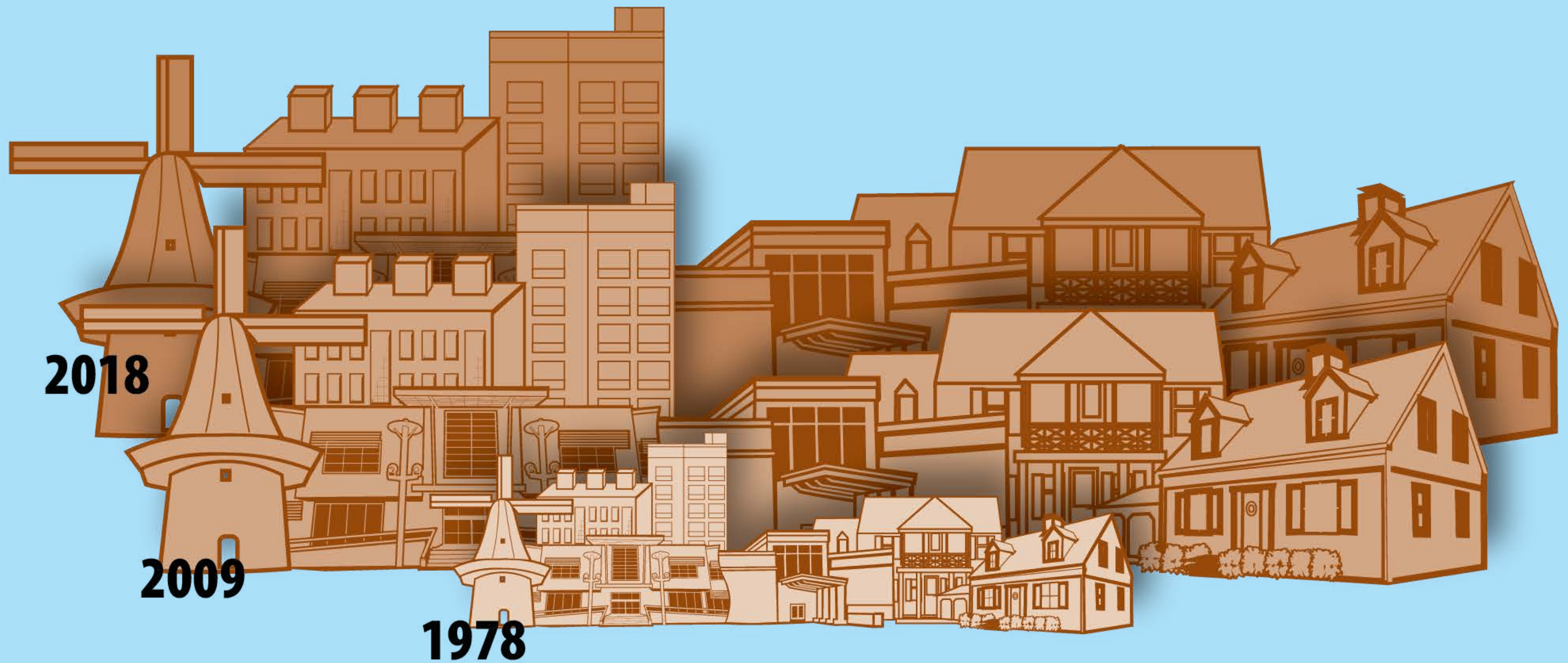
TMDL

Average Spring Phosphorus Levels in Lake Macatawa



- Streams
- Current Wetlands
- ▨ Lost Wetlands
- Macc_Watershed



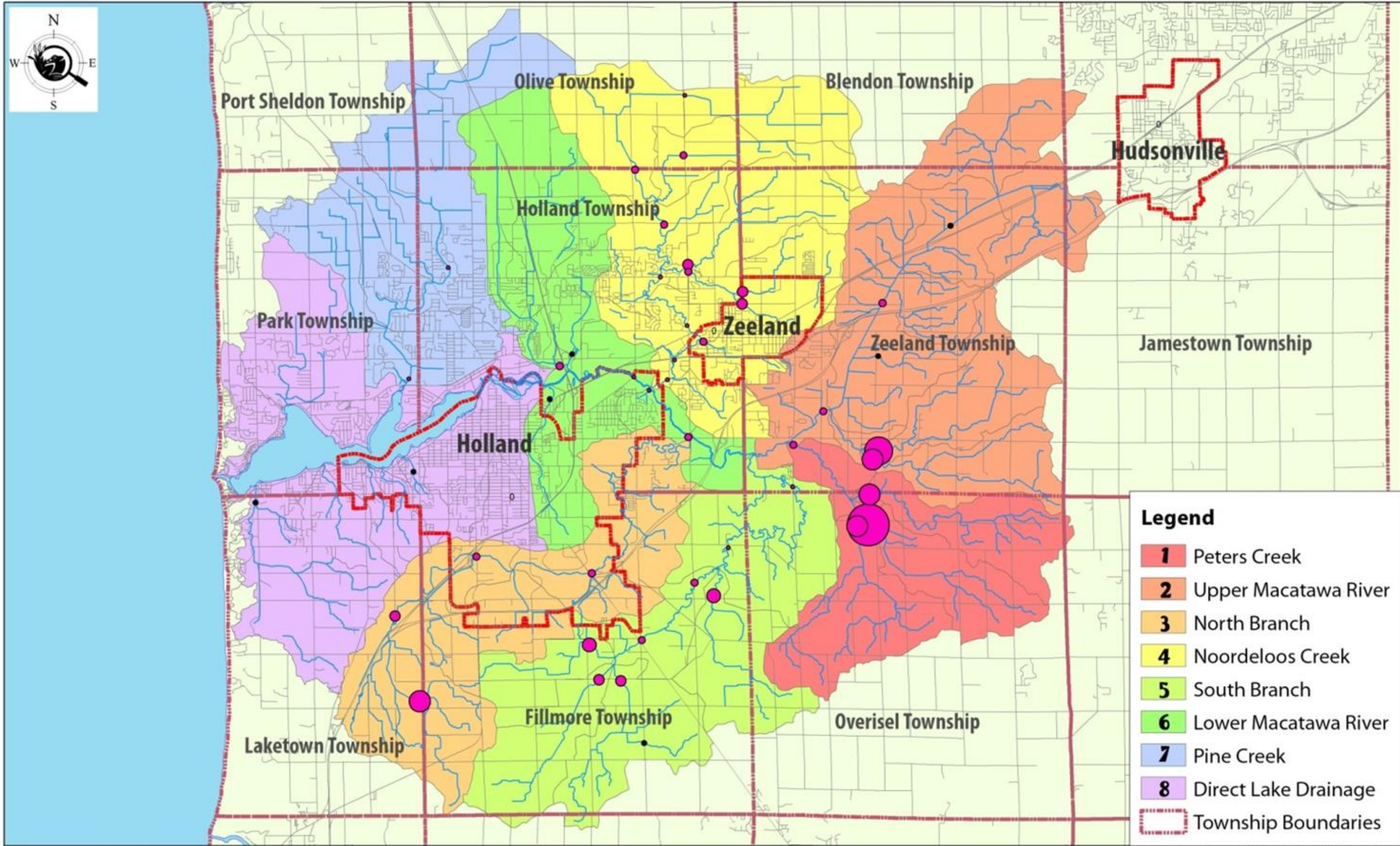


Development pressures infrastructure capacity
Growth of 220% since 1978.





What can we do about this?



- Legend**
- 1** Peters Creek
 - 2** Upper Macatawa River
 - 3** North Branch
 - 4** Noordeloos Creek
 - 5** South Branch
 - 6** Lower Macatawa River
 - 7** Pine Creek
 - 8** Direct Lake Drainage
 - Township Boundaries**

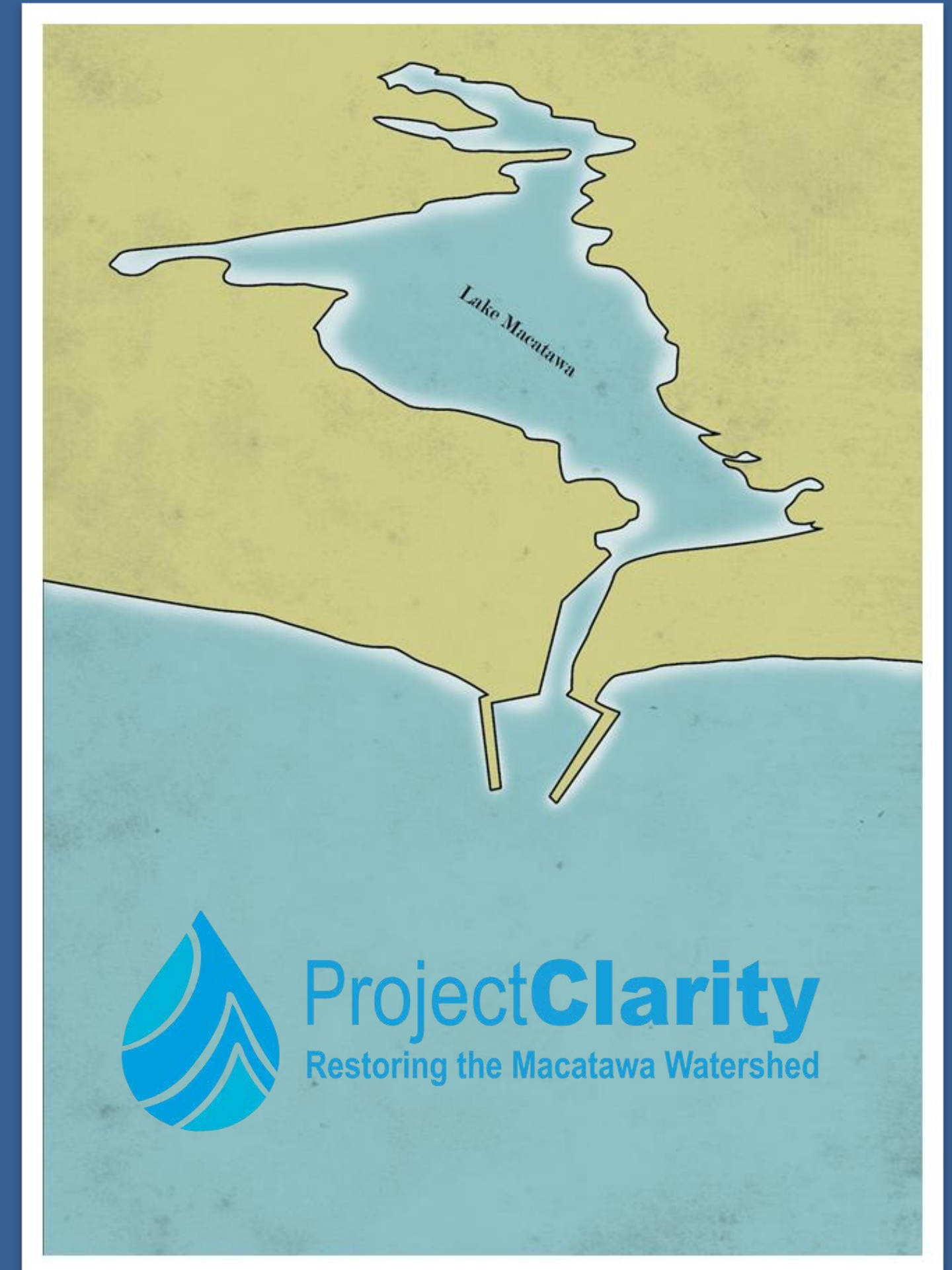
Data Source: Michigan Geographic Data Library

Macatawa Watershed Priority Areas



5 Step Remediation Plan

- Identify Key Land Areas
- Prioritize Restoration
- Implement Best Management Practices (BMPs)
- Use Education to Increase Awareness
- Long-term Management Plan



"You'll never get farmers on board."

"You won't see any results for decades."

"This is only for the people with the money to live on the lake."

"You should really be concerned with my neighbor."

"This isn't a budget priority for us."

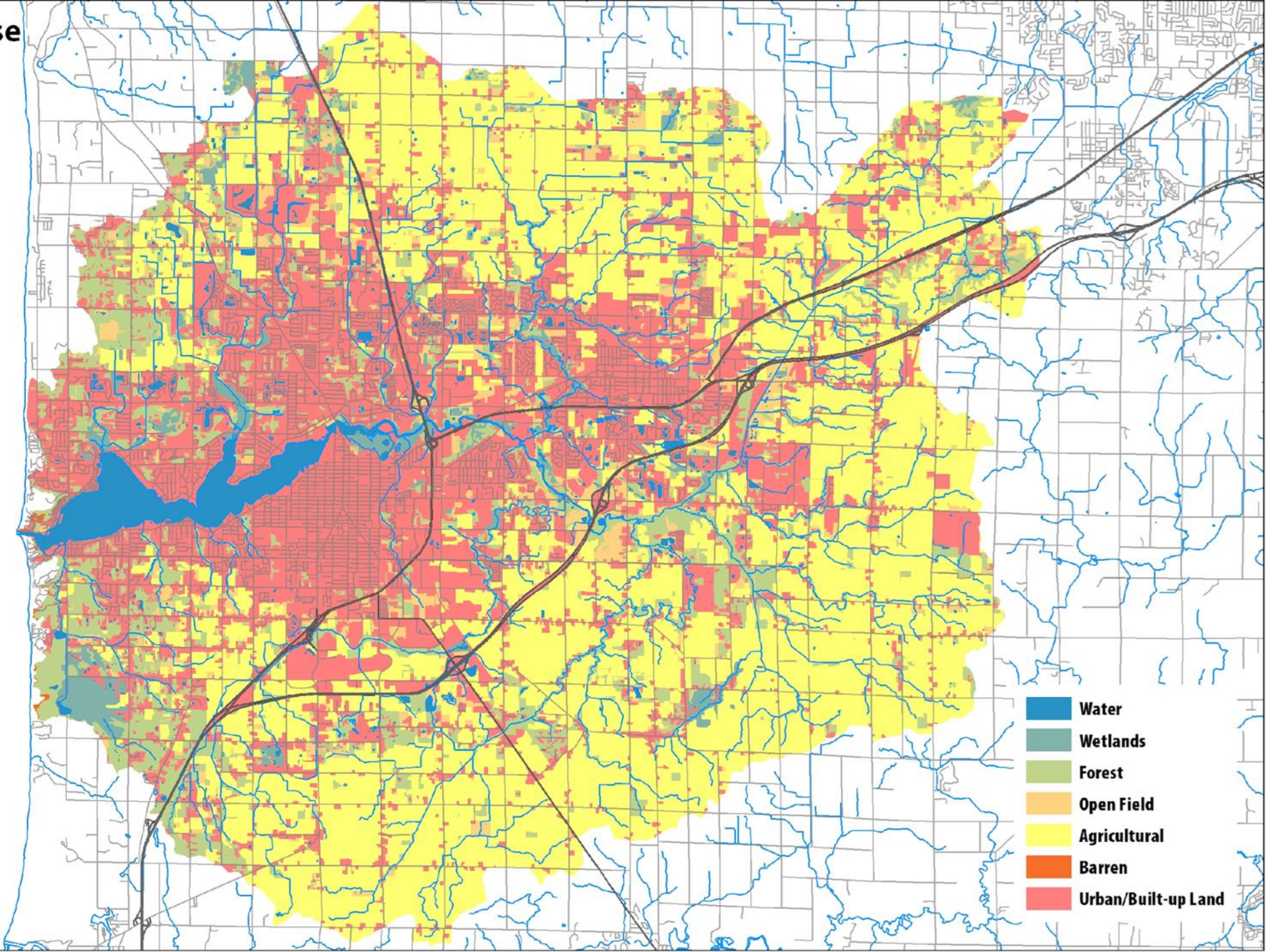
"Impossible!"

An aerial photograph of a lush green forest. In the center, there is a large, irregularly shaped pond with a small island in the middle. The surrounding area is densely wooded with various shades of green. The overall scene is serene and natural.

1

Identify and Secure Land for Key Projects

2018 Land Use



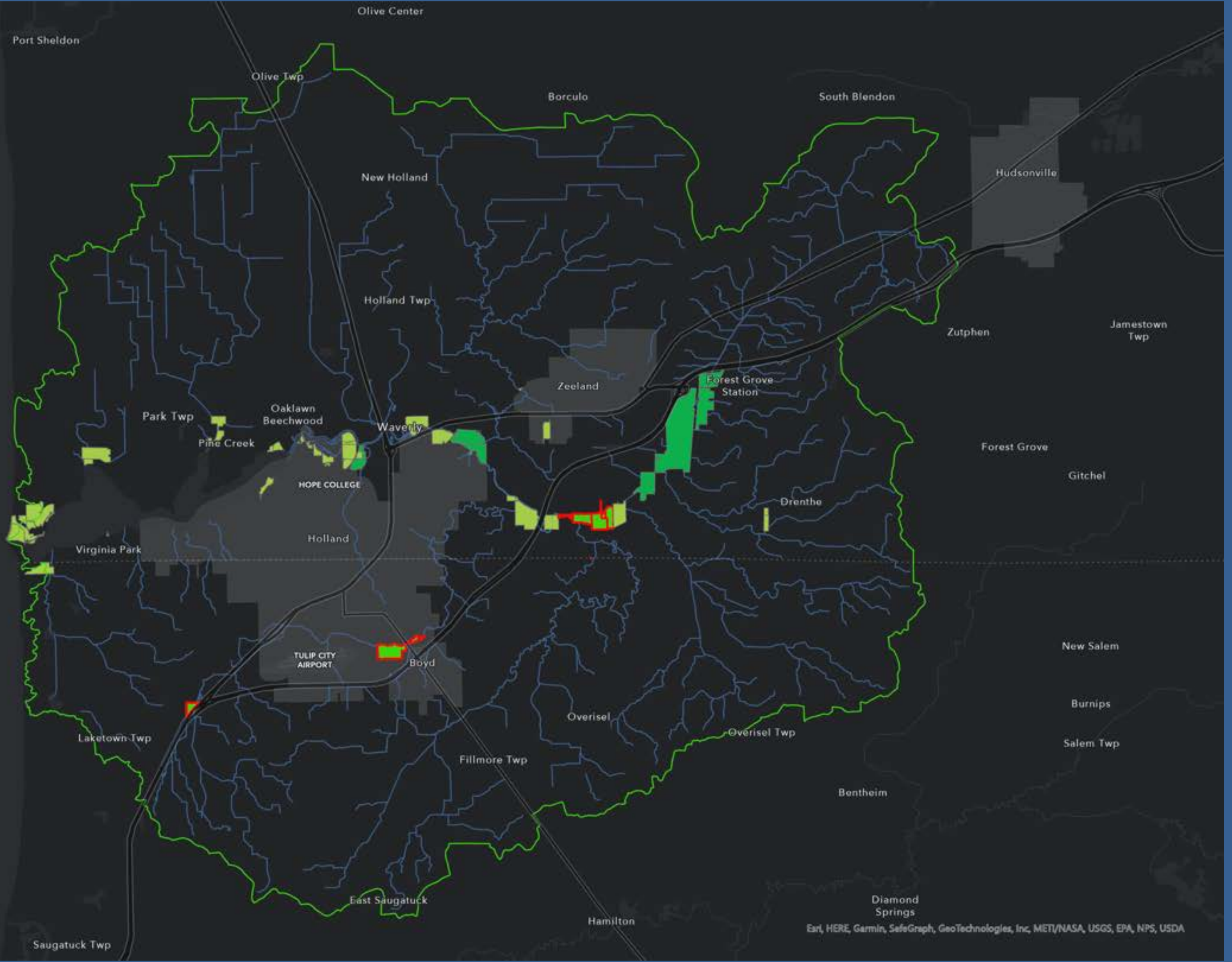
An aerial photograph showing a vast, dense green forest. In the lower-left foreground, there is a small, irregularly shaped pond or wetland area. A dirt road or path winds through the forest in the middle ground. The background shows a hazy horizon with some distant structures and fields.

**290 acres of critical land
added in high priority
subwatersheds.**

Macatawa River Parks

Acquired


- Pre-MRG
- Greenway Parks
- Project Clarity
- city_005v10a
- city_139v10a





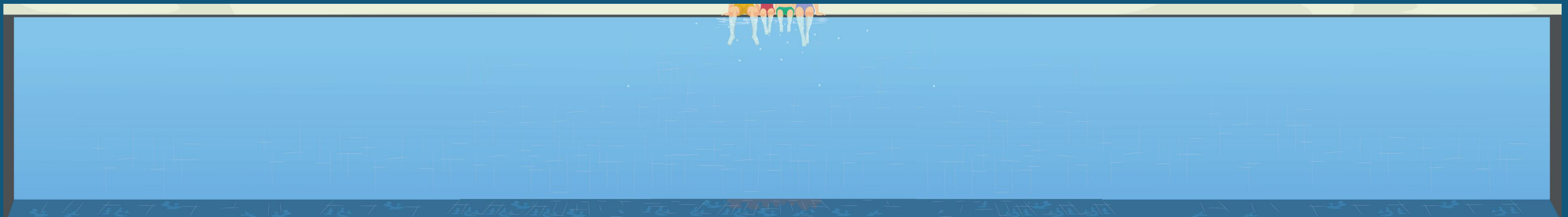
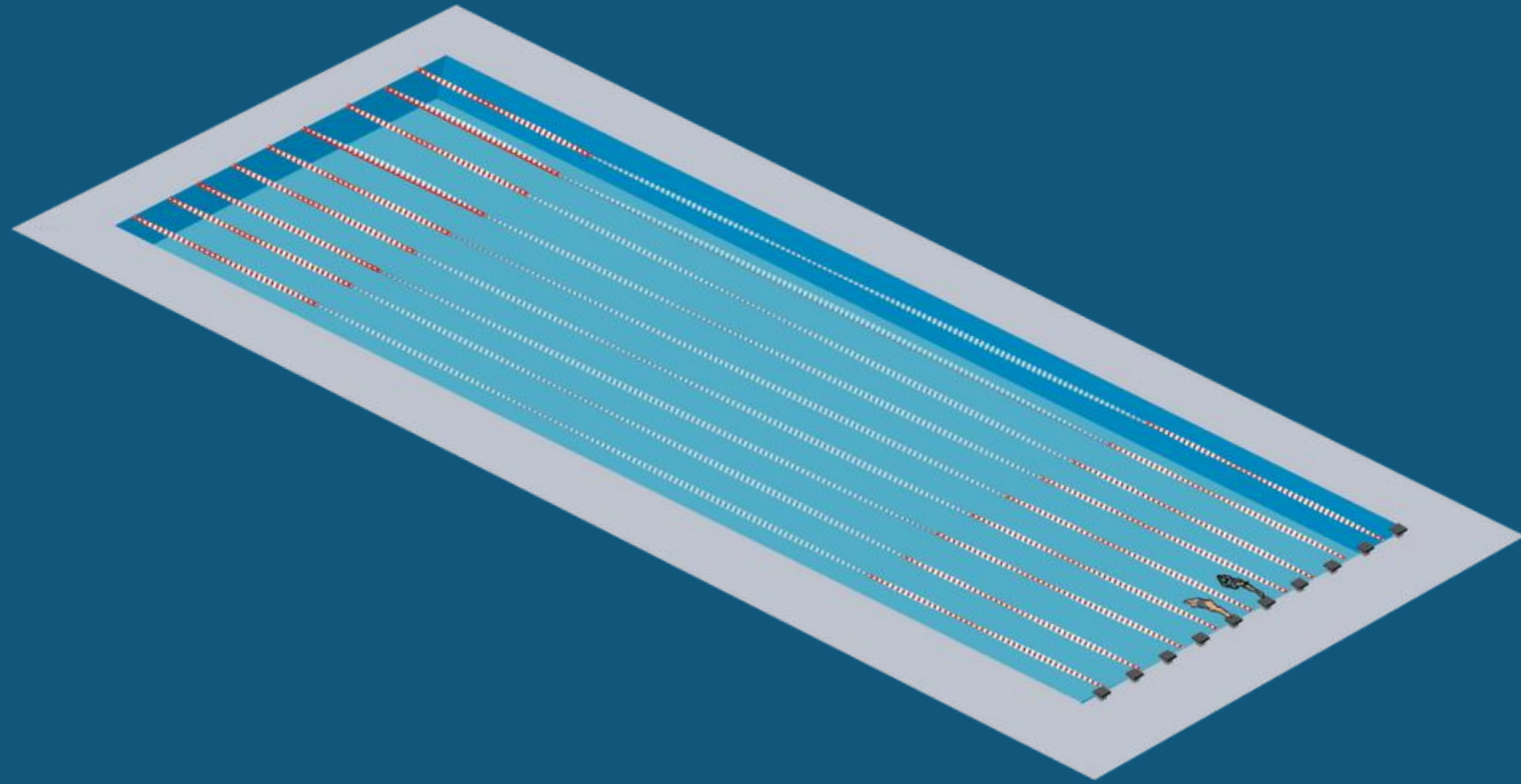
2

Prioritize Restoration



**7 wetland restorations and created
92 acres of new wetland and nearly
200 acre feet of water storage.**

**115 Olympic-
sized swimming
pools!**

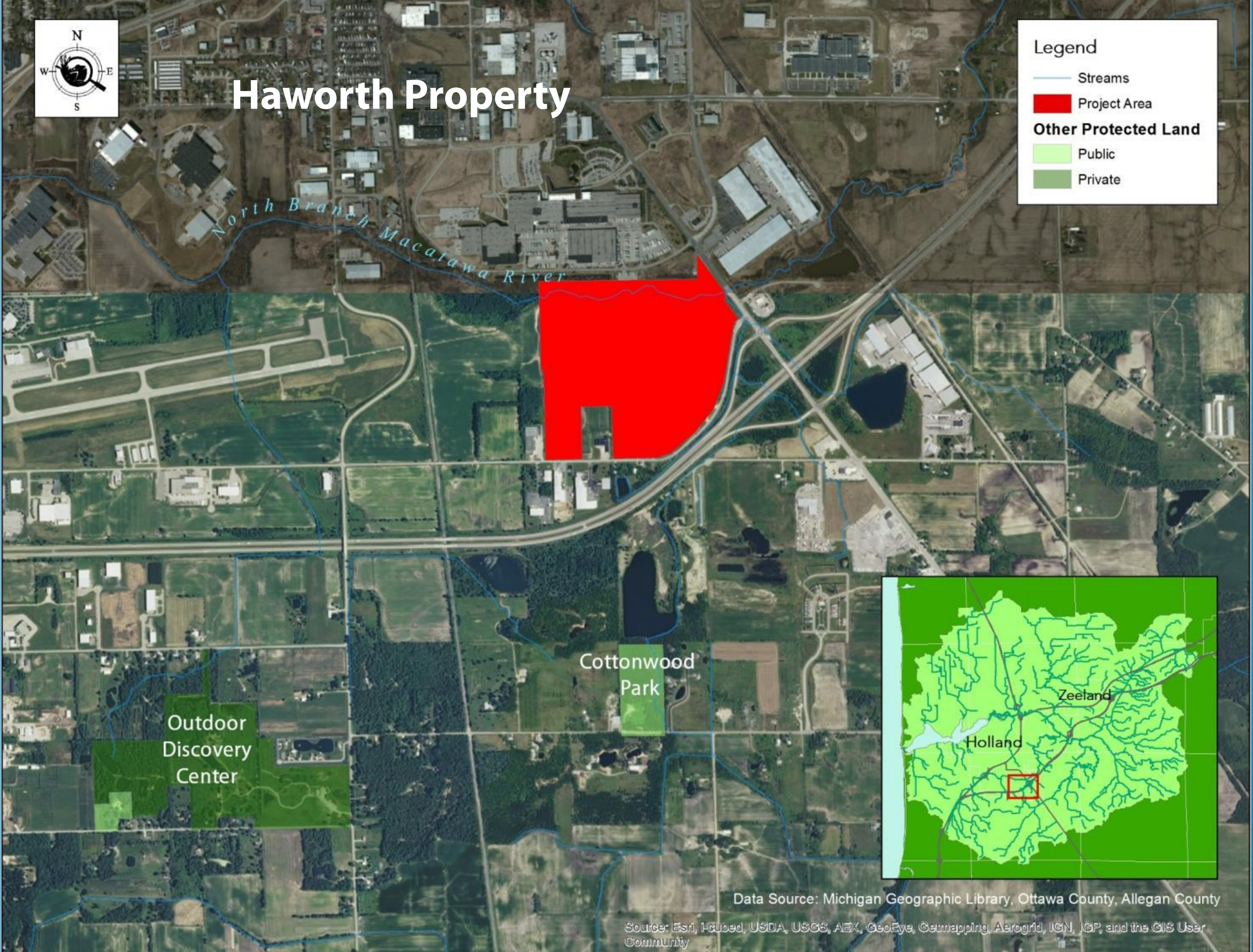




Haworth Property

Legend

- Streams
- Project Area
- Other Protected Land**
 - Public
 - Private



Data Source: Michigan Geographic Library, Ottawa County, Allegan County

Source: Esri, Intel, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community





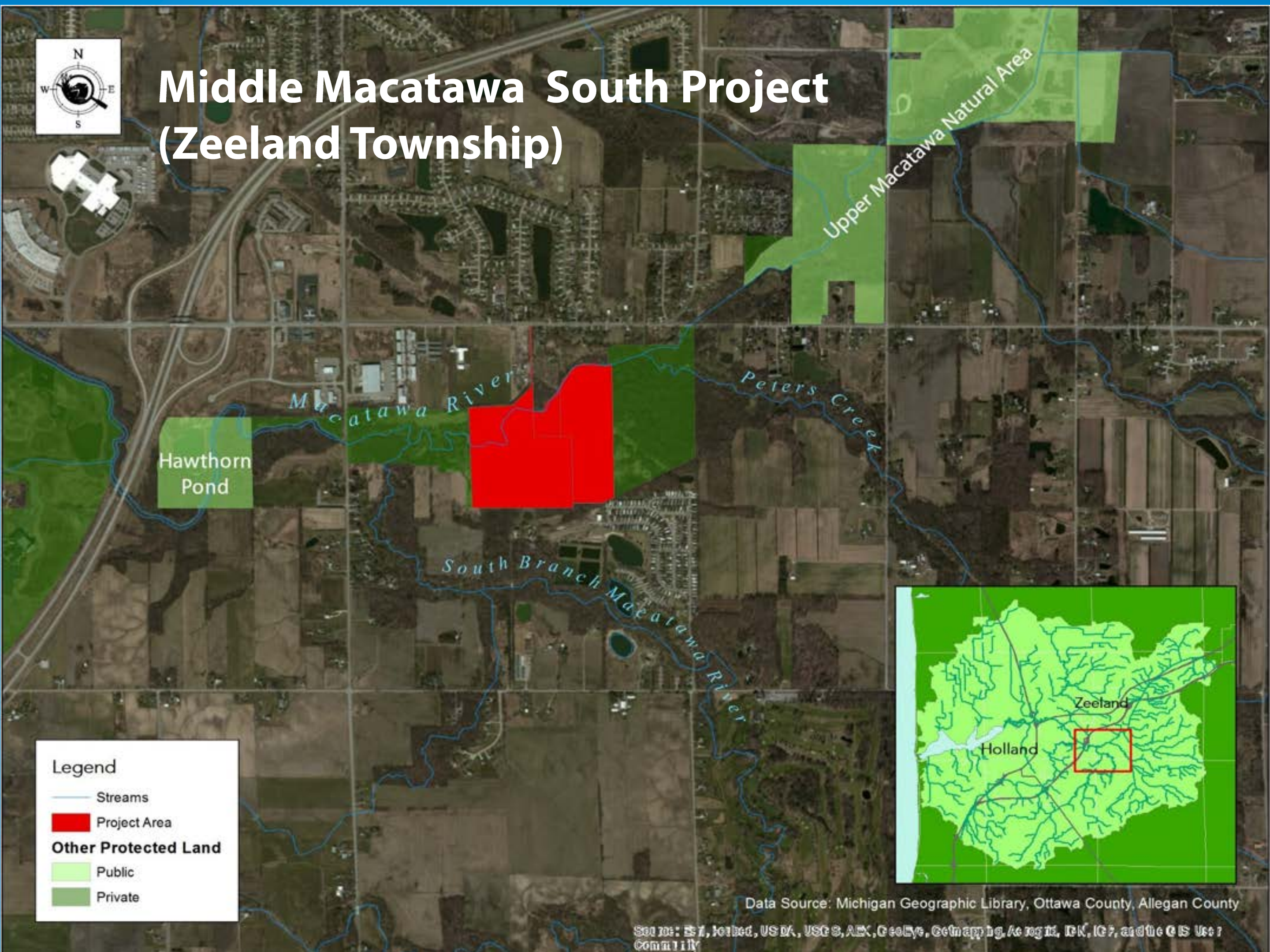
Macatawa Mitigation Bank Established







Middle Macatawa South Project (Zeeland Township)

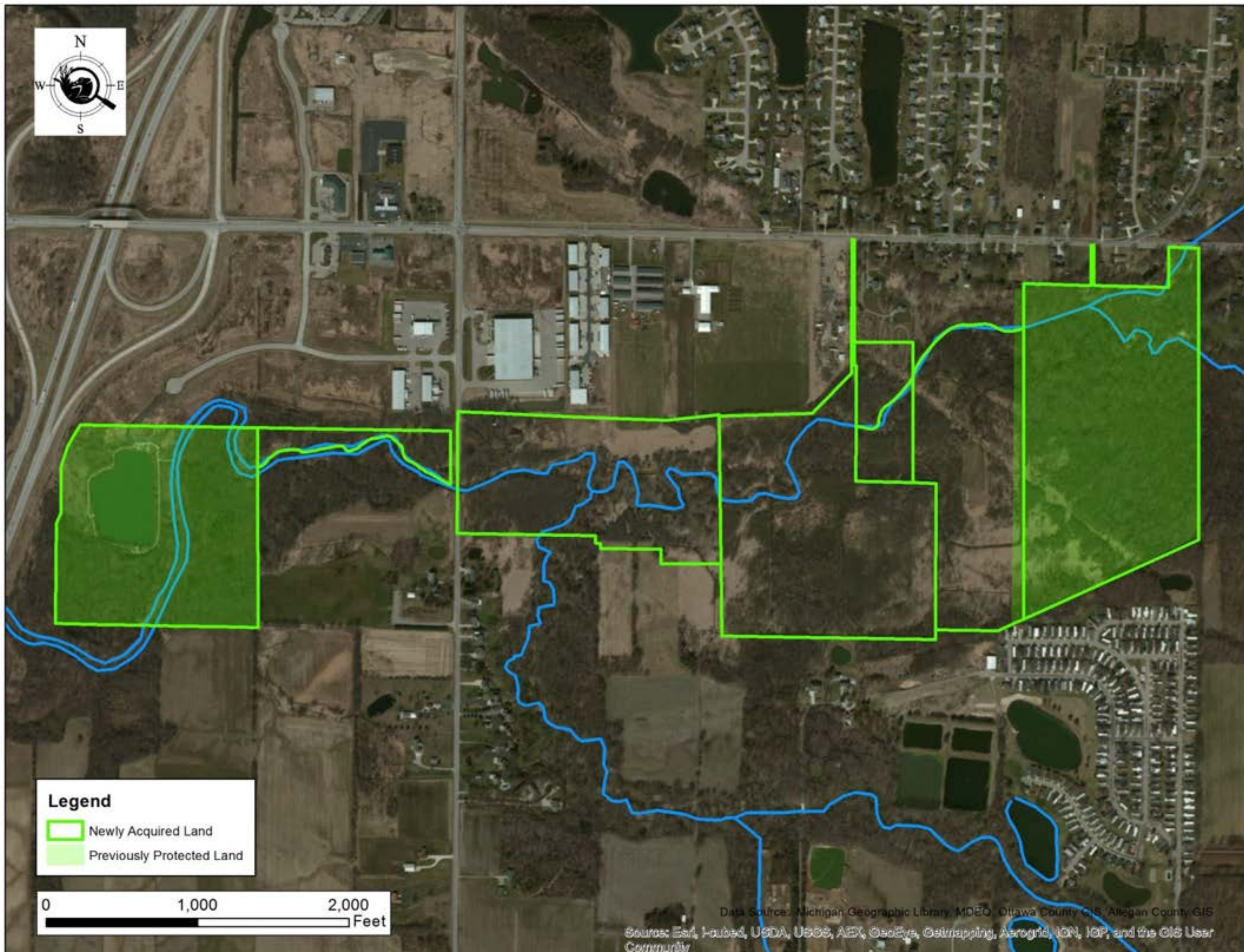


Legend

- Streams
- Project Area
- Other Protected Land**
 - Public
 - Private

Data Source: Michigan Geographic Library, Ottawa County, Allegan County

Source: Esri, Intel, USDA, USDA, AER, GeoEye, Geomatics, AeroGRID, IGN, ICG, and the GIS User Community



Legend

-  Newly Acquired Land
-  Previously Protected Land



Data Source: Michigan Geographic Library, MDEQ, Ottawa County GIS, Allegan County GIS
Source: Esri, Fugro, USDA, USGS, AEX, GeoEye, Getmapping, Aergrid, IGN, IGP, and the GIS User Community

















MDOT Wetland Collaboration



Legend

-  Other Parcels
-  Streams (approx.)

Source: Esri, DeLorme, USGS, USGS, FEX, GeoEye, GeoMapping, AeroGRID, IGN, SCS, and the GIS User Community





3 miles of streams and
waterways restored.

Approx. 1/6 of the River









Constructed
two miles of
2-stage
channels.





A vibrant prairie landscape featuring a wooden fence in the foreground, a field of yellow wildflowers, and purple lupines. The scene is set against a backdrop of rolling green hills under a clear sky.

77 acres of native prairie restoration.



**200+ acres
treated for
invasive
species.**

**46,000
tons of
sediment
annually
withheld
from local
waterways.**





**6,500 dump
trucks lined-up
back-to-back,
the entire
20-mile length
of the
Macatawa
River!**

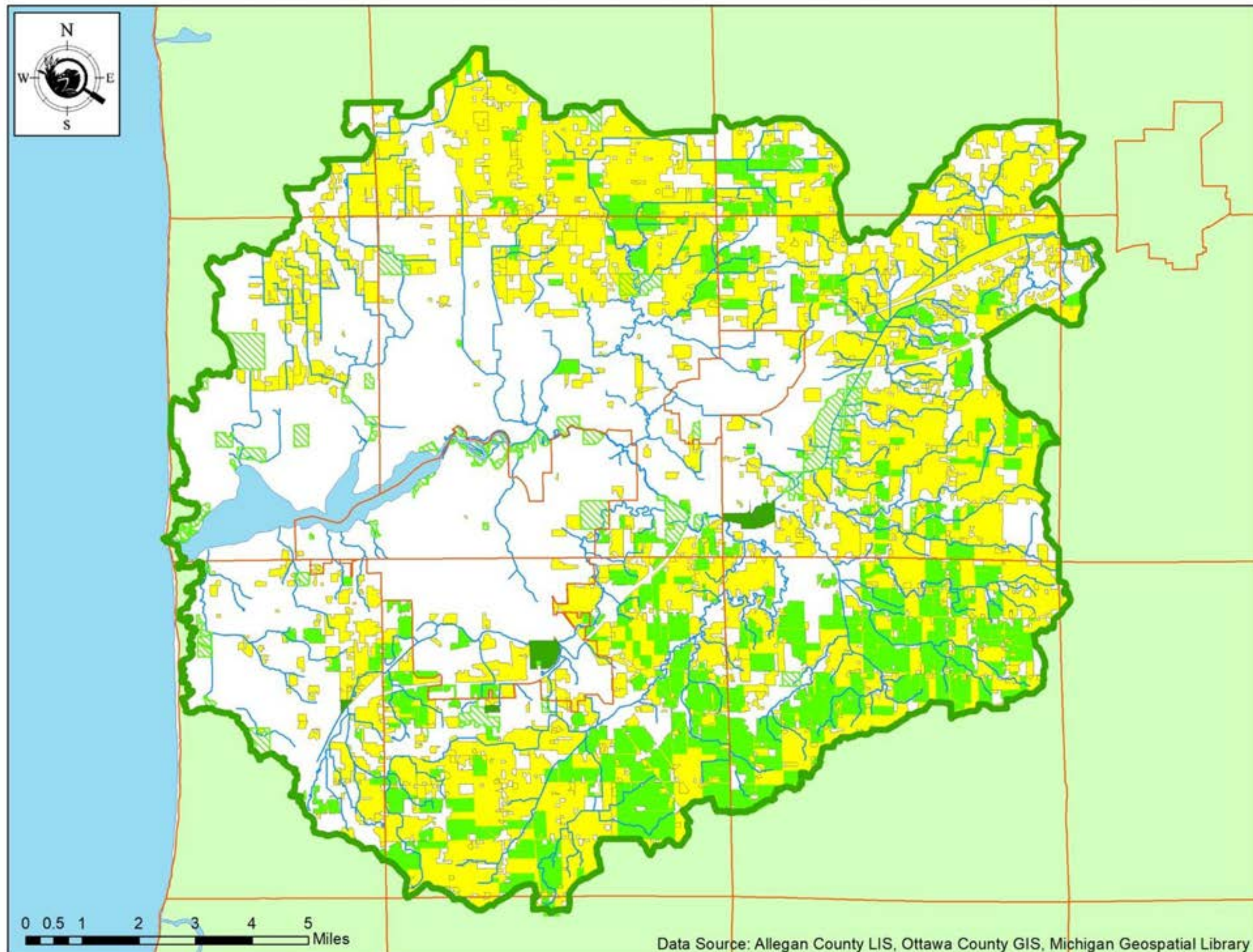
An aerial photograph of a narrow stream flowing through a lush green landscape. The stream is bordered by dense grass and some trees. A large, white, stylized number '3' is overlaid on the left side of the image, partially obscuring the stream and the surrounding vegetation.

3

Implement Best Management Practices (BMPs)



**65 farms
committed to
best
management
practices on
36,000+ acres.**



Best
Management
Practices
cover nearly
45%
of targeted
land.

**65 farms committed to best
management practices on
36,000+ acres.**



**6,000 acres
of no-till.**



20,127 acres of cover crops.

**Installed 5
iron slag
phosphorous
filters at 3
agricultural sites.**







Over 90% reduction in phosphorous & turbidity.



**1 million gallons of
stormwater managed using
rain gardens and bioswales.**



Private Residence Rain Gardens



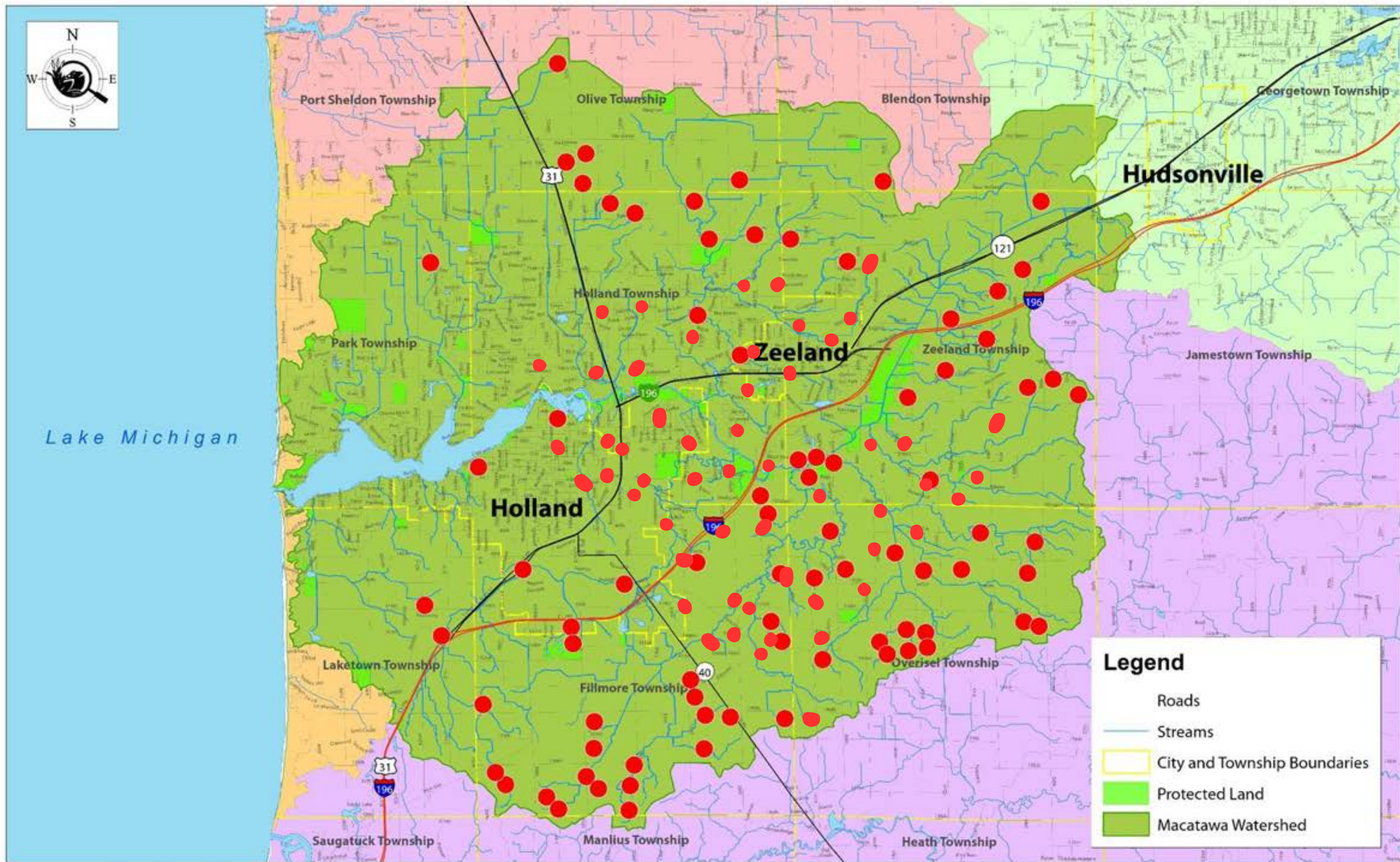
Hope College Rainscaping



City Storm Water Systems



**230 projects keep over 40,000 lbs.
of phosphorous out of Lake
Macatawa each year.**

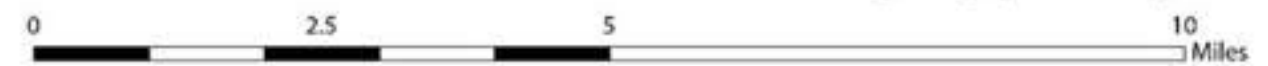


Legend

- Roads
- Streams
- City and Township Boundaries
- Protected Land
- Macatawa Watershed

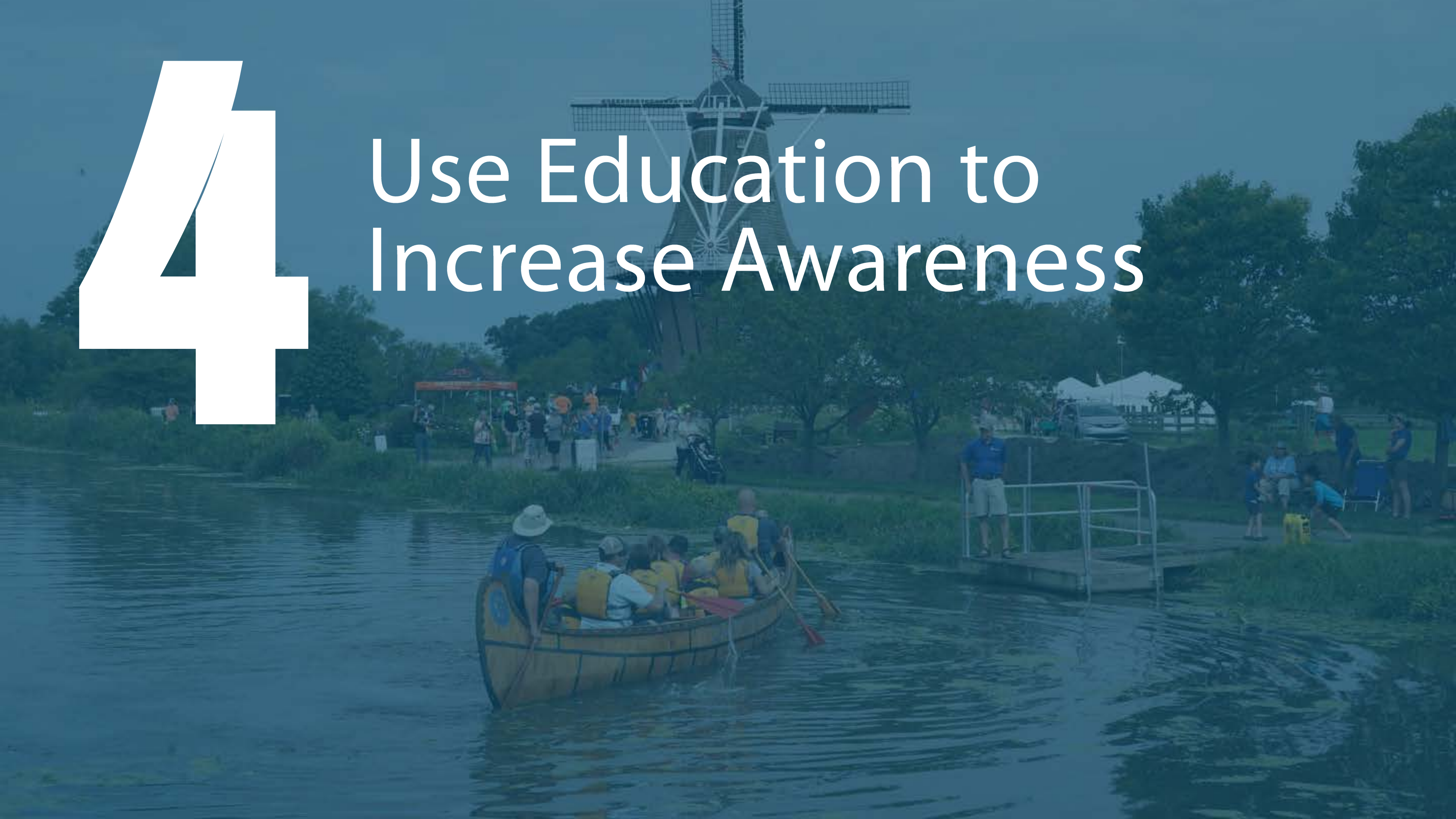
Data Source: Michigan Geographic Data Library, MDEQ

Project Clarity Projects



4

Use Education to
Increase Awareness



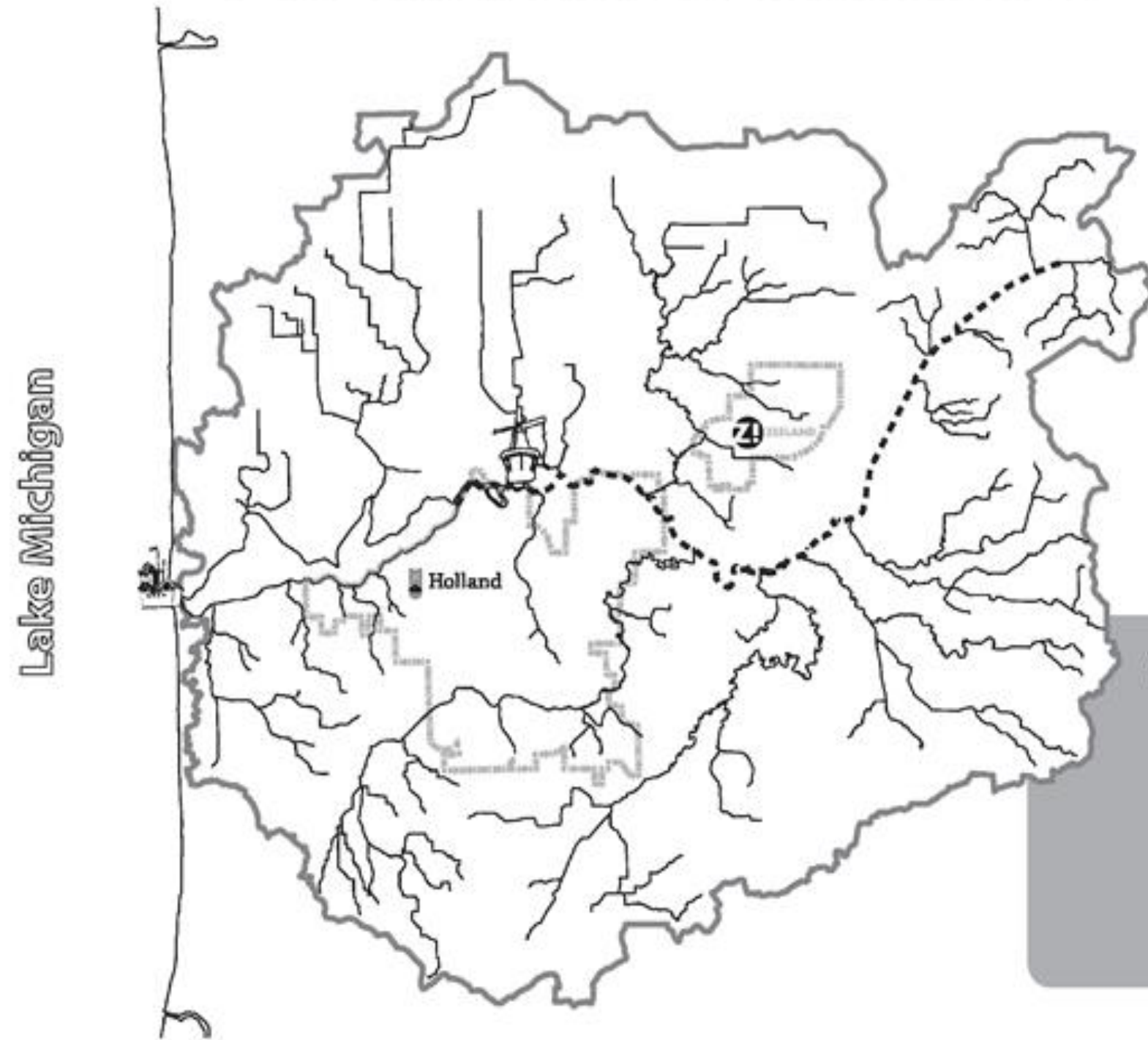


**300 + farmers have
attended Annual
Agricultural Lunches.**

A group of people, including some in safety vests and backpacks, are gathered in a field, likely for a community education presentation. The scene is outdoors with trees in the background. The image has a blue tint.

Hundreds of community education presentations provided to our local stakeholders.

Color the Macatawa Watershed



Trace the Macatawa River

Hint: It looks like this:

Color Lake Macatawa BLUE

Hint: It looks like this:

Color Zeeland ORANGE

Hint: Look for this:

Color Holland RED

Hint: Look for this:

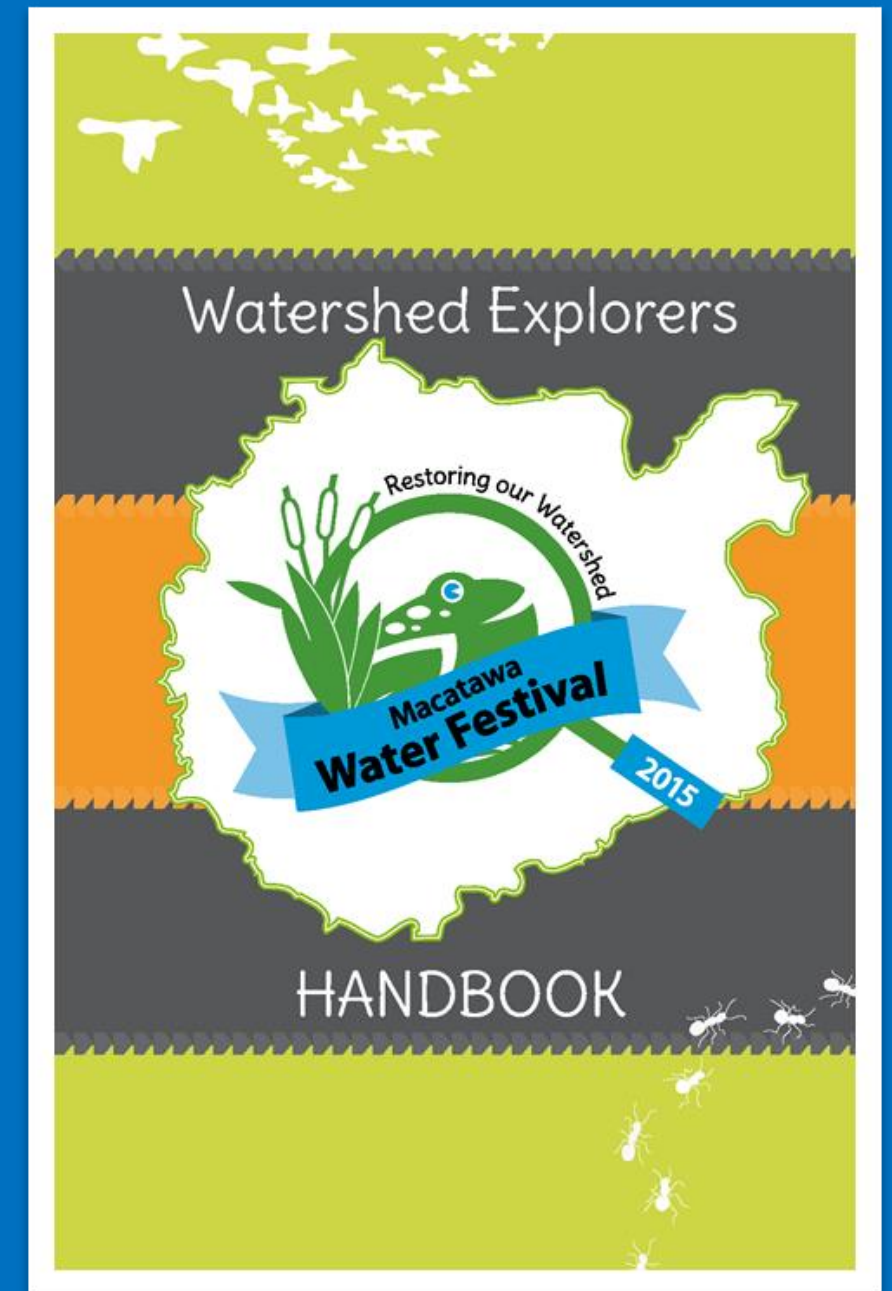
Color all other land inside the Macatawa Watershed GREEN

Hint: It looks like this:

Draw a fish in Lake Michigan

TEN THINGS TO DO OUTSIDE AS A FAMILY

- Go for a walk
- Ride bikes
- Fly kites
- Blow bubbles
- Play a game like Freeze Tag or Red Light Green Light
- Host a scavenger hunt
- Hula Hoop
- Roller skate
- Hopscotch board with chalk
- Take anything you do inside outside: paint, read, eat, play board games



Yearly promotion of companies following lawn care and landscaping best practices.

Kiosks throughout the Watershed with water condition information including species of fish, clarity, and phosphorous load.



Lawn Care & Landscaping Companies are awarded the Watershed Seal of Approval for meeting the following criteria:

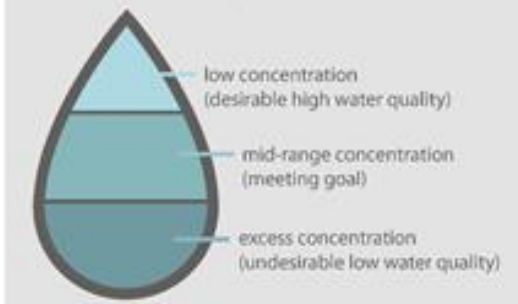
1. The use of phosphorus fertilizer is limited to cases of starting a new lawn from seed, patching a lawn with seed, or after a soil test shows a phosphorus deficiency.
2. Property is measured and drawn into a diagram to ensure that the correct amount of fertilizer is applied.
3. Grass is cut no shorter than three inches.
4. Next to bodies of water, a three foot buffer strip is left adjacent to the water that receives no fertilizer.
5. All grass clippings are swept back onto lawns to prevent runoff into storm drains.
6. If taken offsite, grass clippings are stored properly and aren't susceptible to runoff.
7. Company makes customers aware of best management practices for water quality.
8. A watering and mowing schedule is provided to customers who want to maintain their own lawn.

MA
CC

Macatawa Area Coordinating Council
301 Douglas Avenue,
Holland, MI 49424
Phone: 616-395-2688
www.the-macc.org

WATER CONDITIONS

How healthy is our water?




low concentration (desirable high water quality)
mid-range concentration (meeting goal)
excess concentration (undesirable low water quality)

Macatawa Watershed Land Use

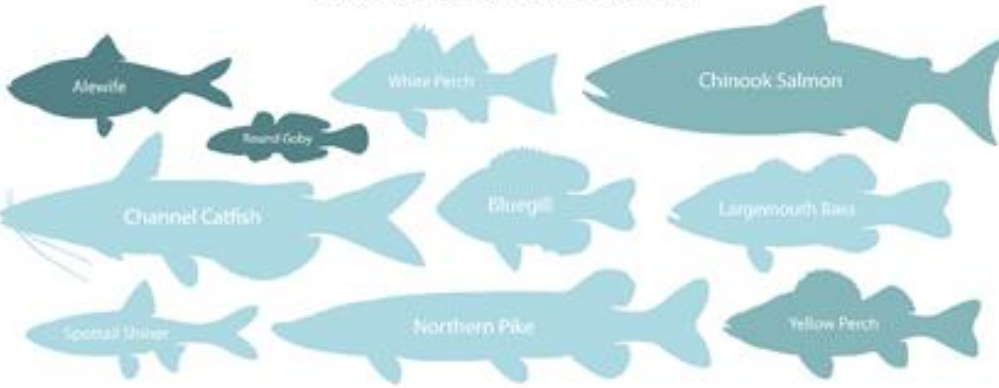
Where does the water in Lake Mac come from?

Land Use	Percentage
Agriculture	46%
Urban	35%
Forests	18%
Water & Wetlands	1%



WATER CLARITY (Depth in Meters)
CHLOROPHYLL CONCENTRATION (µg/L)
PHOSPHORUS CONCENTRATIONS (µg/L)

Fish of the Watershed



Native
these fish have lived in the Great Lakes for thousands of years

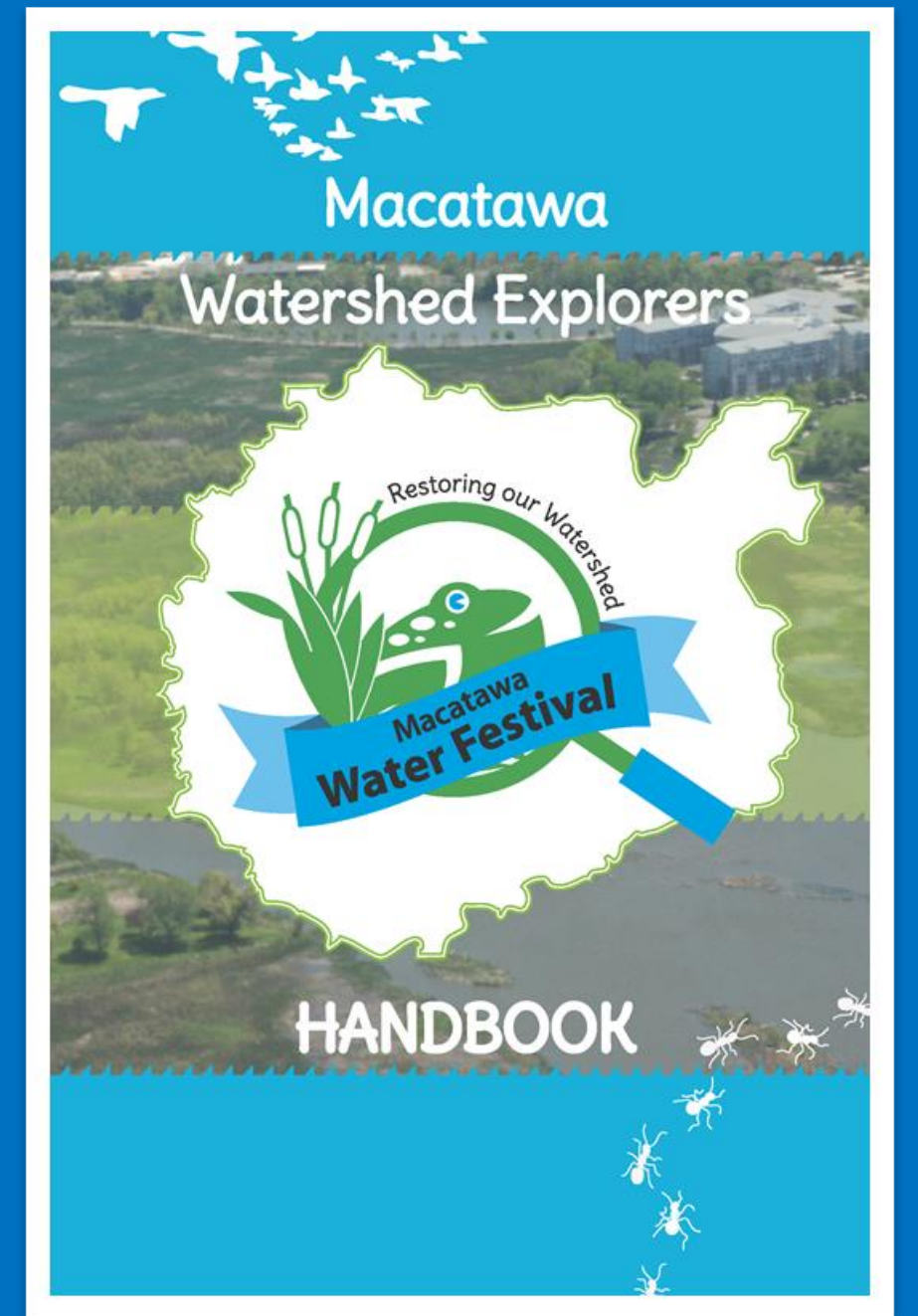
Naturalized
non-native fish that do not take over habitats

Invasive
non-native fish that reproduce prolifically and disrupt ecosystems

While Lake Macatawa was an excellent fishery when the area was being settled, deteriorating lake conditions have led to a decrease in the number and variety of fish that can be found here. Lake Macatawa's fish population is being monitored annually, as changes in fish populations can be an indicator of water quality. The fish shown above represent some of the more common fish that can be found in the Macatawa Watershed.

Macatawa River Greenway

PROJECTclarity





"Clarity: Restoring the Macatawa Watershed," was added to local science curriculum, creating impact for schools, students, and teachers.

A large, bold, white number '5' is positioned on the left side of the image. The background is a photograph of a beach with a concrete walkway in the foreground and a blue ocean extending to the horizon under a clear blue sky.

5

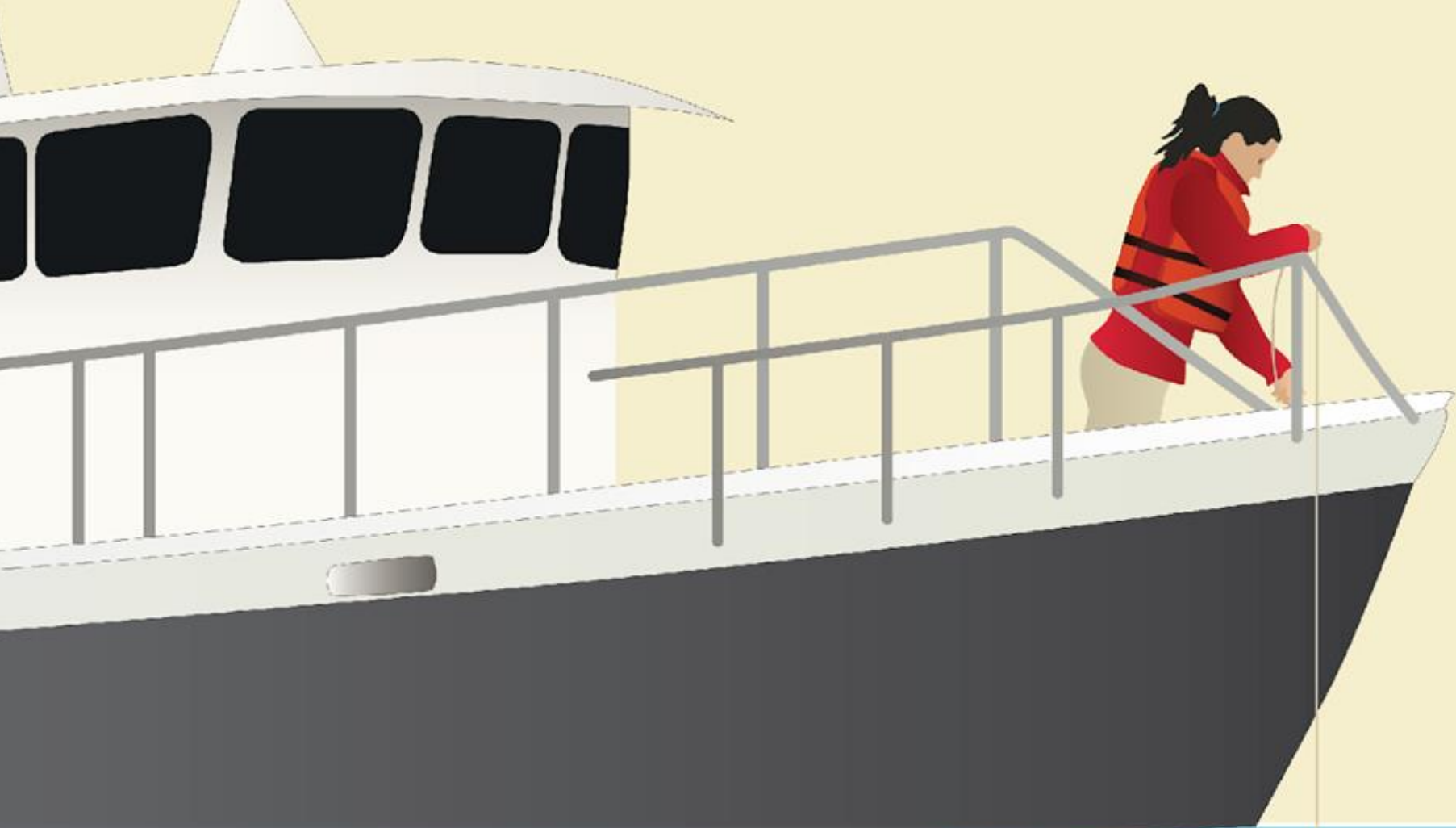
Long-term Management Plan

Long-term Management Planning

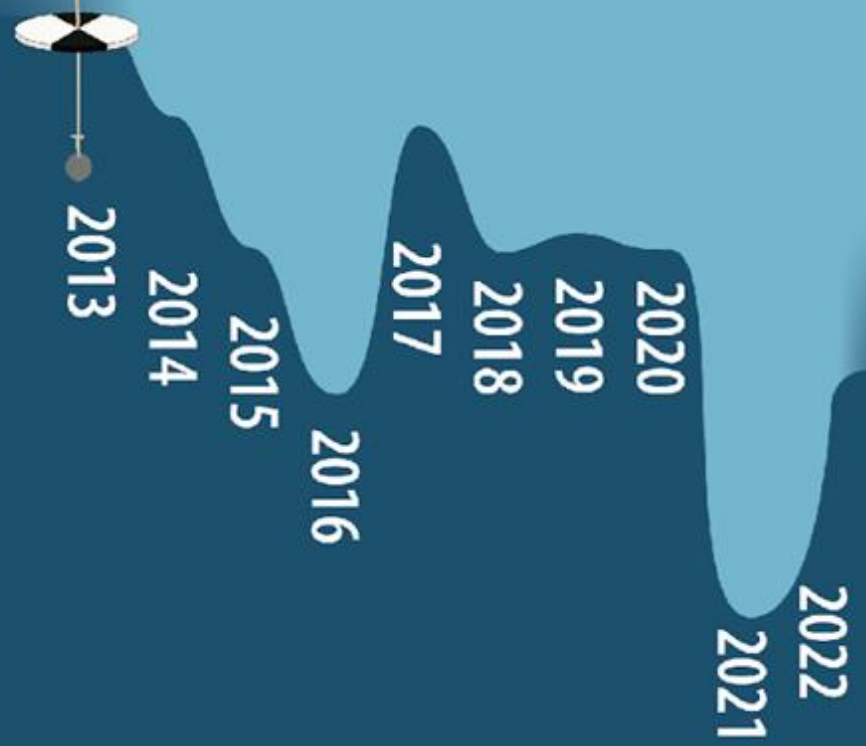
- Over \$500K in long-term management funds
- Wetland Mitigation Bank sales and expansion
- Watershed Project & PC merger

An aerial photograph of a marina filled with numerous sailboats docked at various piers. The water is a deep blue, and the surrounding land is covered in lush green trees. The sky is clear and blue. The text 'The Results of Our Work to Date' is overlaid in white, bold font across the center of the image.

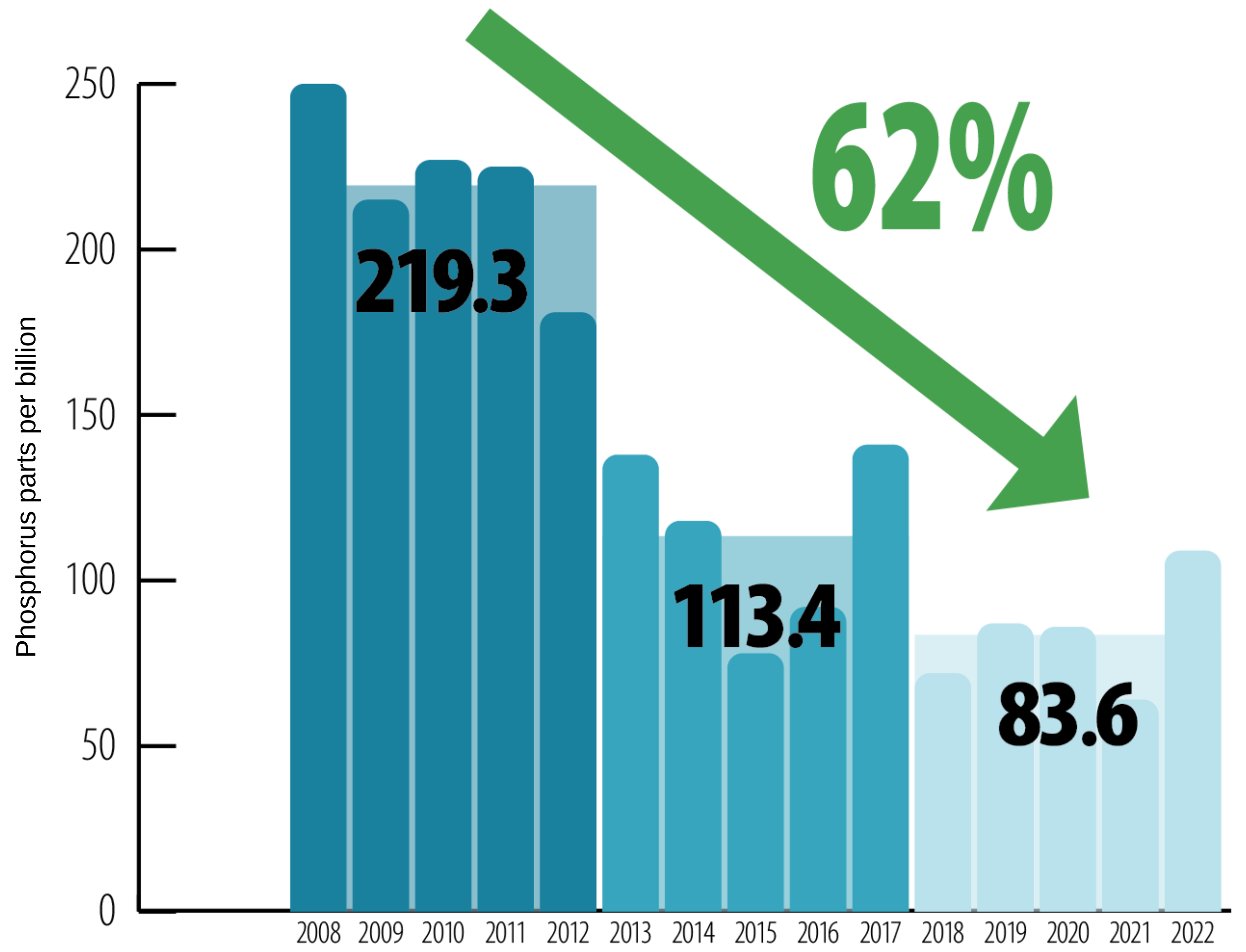
The Results of Our Work to Date



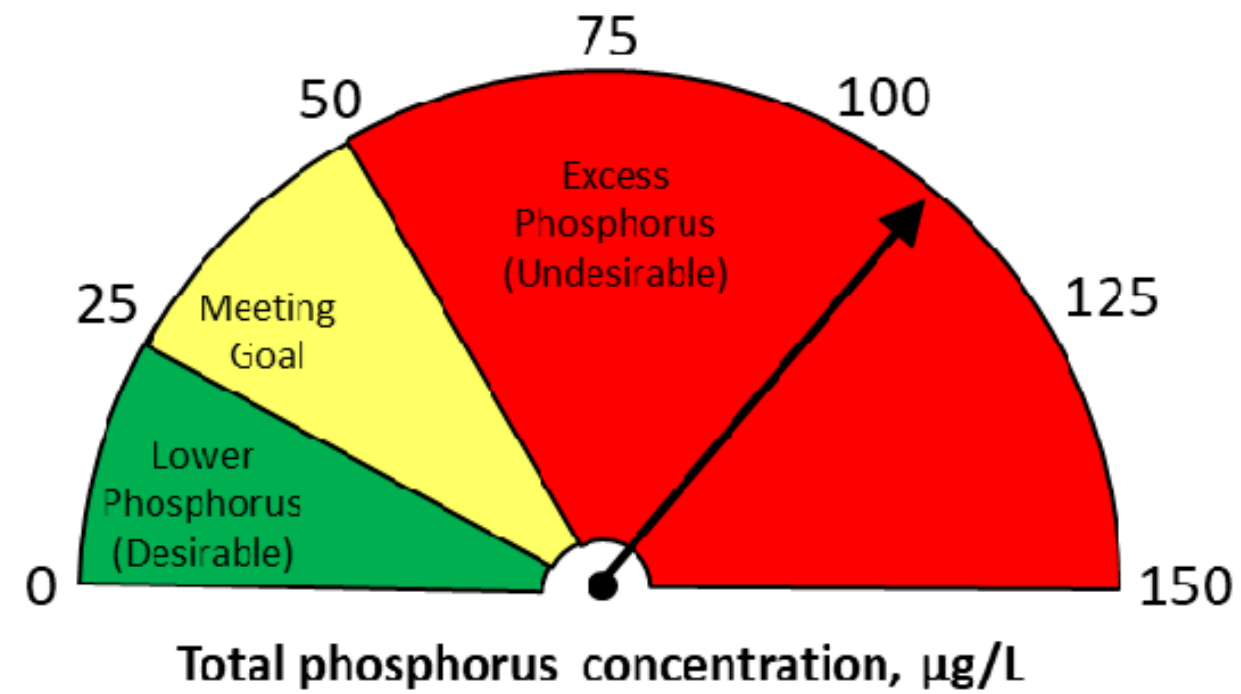
We have a clearer
Lake Macatawa!



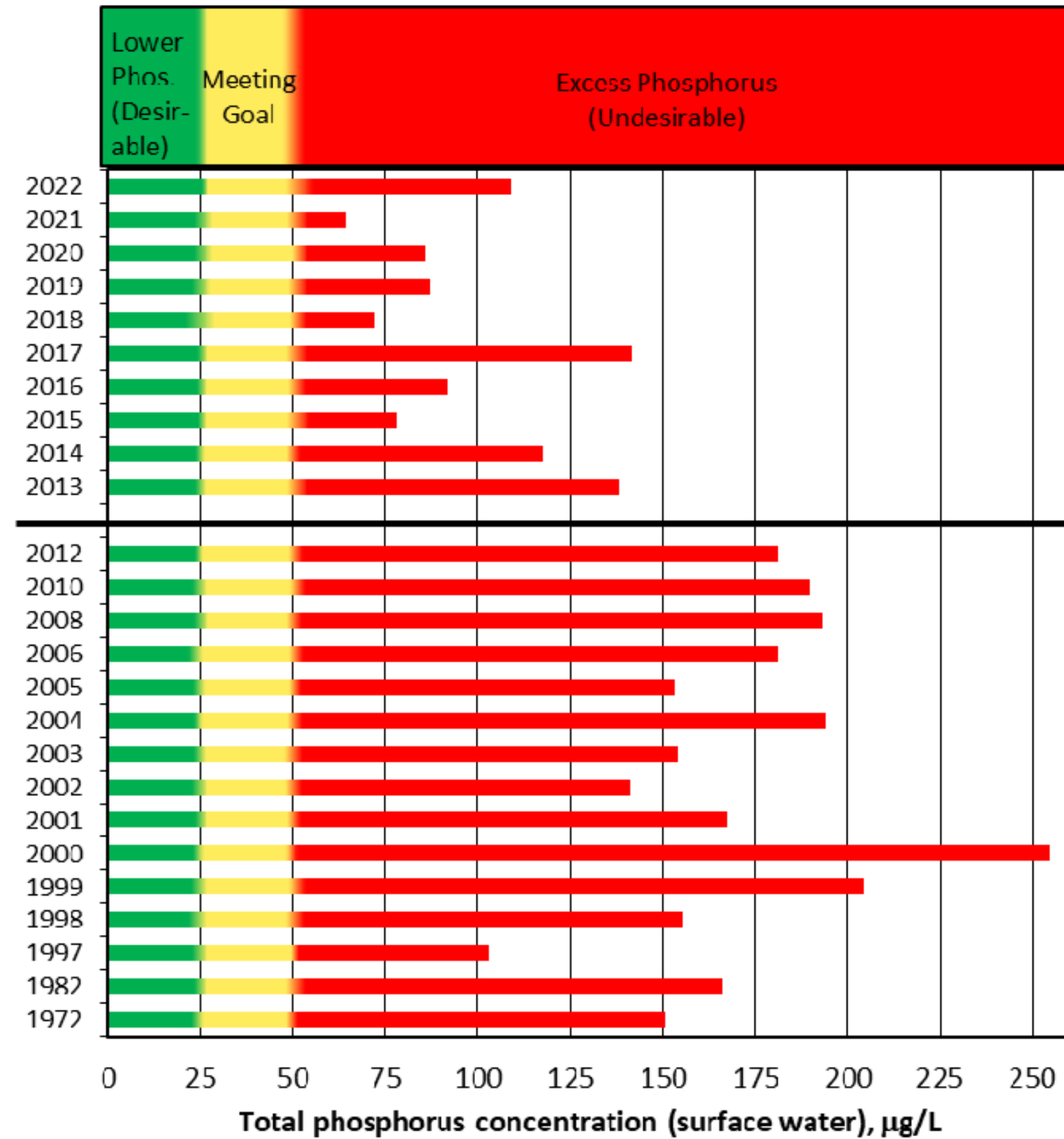
Goal:
70%



Current status (2022)



Historical Status (1972^{*}; 1982-2012[†]; 2013-2022[‡])



^{*}U.S. EPA; [†]EGLE; [‡]AWRI

A landscape photograph showing a flooded field. In the foreground, there is a grassy bank with small yellow flowers. The middle ground is dominated by a large, calm body of water that reflects the sky and the surrounding trees. On the right side, a large, leafy tree stands prominently, its reflection clearly visible in the water. In the background, more trees and a distant building are visible under a clear, light blue sky. The overall scene conveys a sense of a natural environment affected by water, possibly due to flooding or a change in water levels.

What's to Come?

Changes in rainfall frequency and quantity

STORM TEAM 8 TURNING THE TABLES

THIS YEAR THROUGH APRIL 5

WETTEST EVER

SINCE APRIL 6

DRIEST EVER



Long-term Management Planning

- **Modernizing Chapter 22 Drain Code**
- **Sustainable Watershed Funding Initiative**
- **Stormwater Development Rules and Standards**

Who Helped?

- **Donors and community leaders**
- **Local research institutions – GVSU, Hope College**
- **Businesses – financial support and services**
- **State and regional experts**
- **Local units of government**
- **Ottawa & Allegan Drain Offices**
- **MDOT**
- **MDNRE/DEQ/EGLE**
- **EPA**

Leveraged \$6.7 million of grant funding at the local, state, and federal level.

Challenges Overcome

- **Low (and high) expectations**
- **Costs**
- **Slow timelines**
- **Wildlife**
- **Permitting**
- **Culture of doing things the way they've always been done**





Thank you!

