

Habitat fragmentation: A challenge to all land managers

Perspectives from The Nature Conservancy

North Central Region Housing Density 1940



Housing Units
per Sq. Km.



North Central Region Housing Density 1980



Housing Units
per Sq. Km.



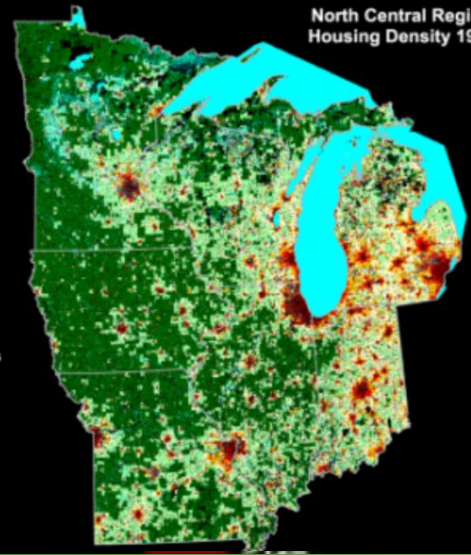
North Central Region
Housing Density 1940



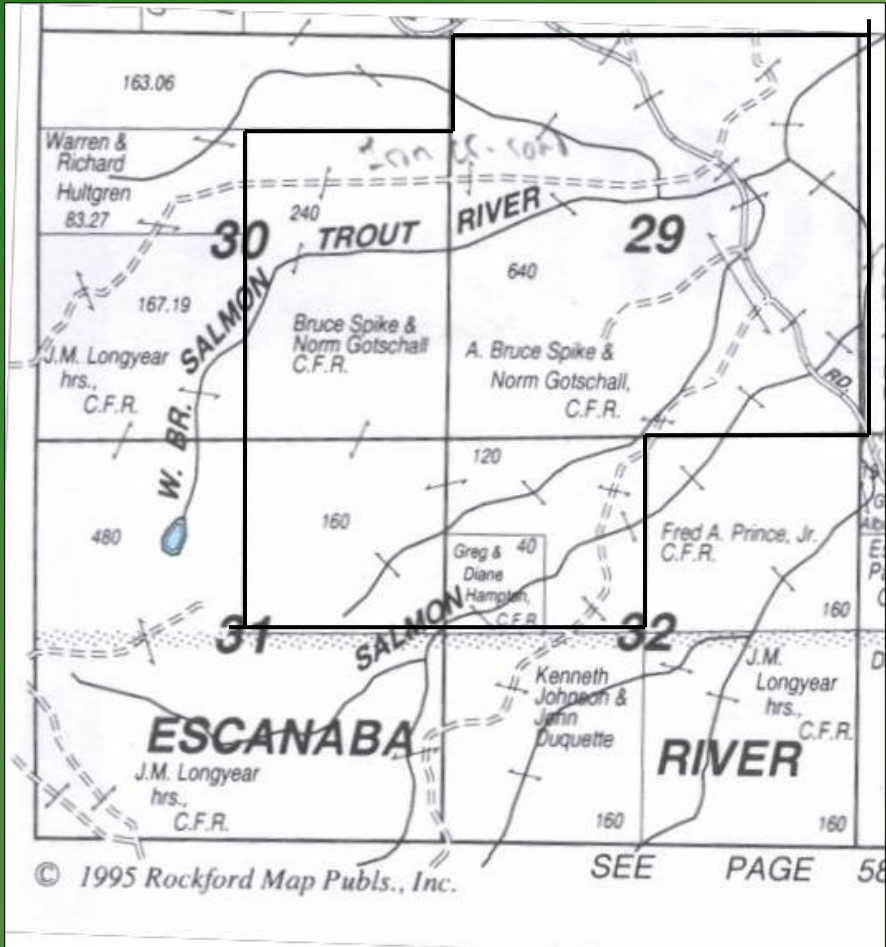
North Central Region
Housing Density 2000



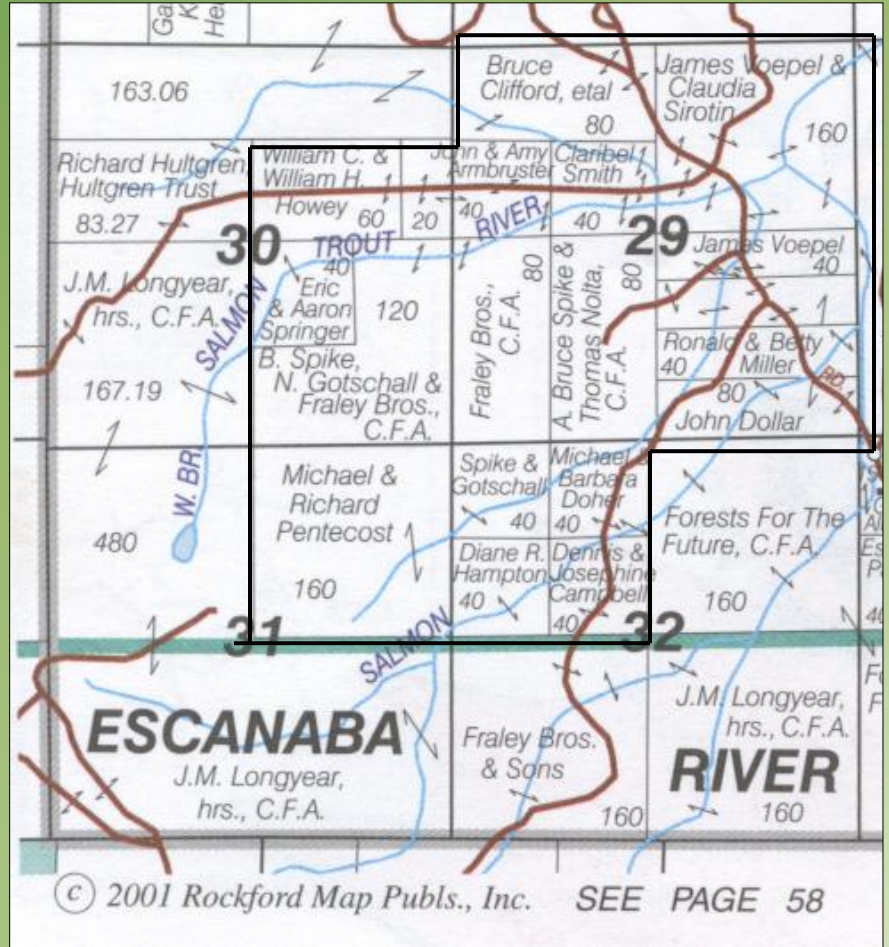
North Central Region
Housing Density 1980



An Example from the UP



1995



2001

Overview of Talk

- Introduction
 - Problem Statement
 - The Nature Conservancy
- Ecological Impacts of Fragmentation
- Implications for Land Managers
- Overcoming the Challenges
- Conclusions/Questions

Protecting Nature. Preserving Life.



Mission:

*“To conserve the lands
and waters on which all
life depends”*




- Great Lakes
 - AIS
 - Climate adaptation
 - Coastal conservation
 - Northern Forests
 - Offshore Fisheries Restoration
 - Ag/watershed conservation
- In Michigan
 - Land and Water Conservation
 - Own 45,000+ acres in MI
 - Protected almost 370,000 acres
 - Restoration
 - Our preserves
 - Forest management
 - Grassland/wetland restoration
 - Invasive species control
 - Partner lands, public and private

THE NATURE CONSERVANCY

Restoring America's Forests

DEMONSTRATION SITES

Legend

-  15 projects that the Conservancy partners with were awarded FY2012 Collaborative Forest Landscape Restoration (CFLR) funding
-  3 landscape projects that the Conservancy partners with received special funding associated with the CFLR program
-  56 Fire Learning Network (FLN) landscapes

Restoring America's Forests Demonstration Sites

(shaded green)

1. Tongass National Forest
2. Tapash Collaborative
3. Oregon Forest Project
4. Northern Sierra Partnership
5. Clearwater Basin Collaborative
6. Four Forest Restoration Initiative
7. Southwest Jemez
8. Front Range Roundtable
9. Shortleaf Pine-Oak Ecosystem Restoration Project
10. Great Lakes Project
11. Central Appalachians
12. Cherokee National Forest Restoration Initiative
13. Panhandle Longleaf Pine Ecosystem

RAF data v. 11 October 2011

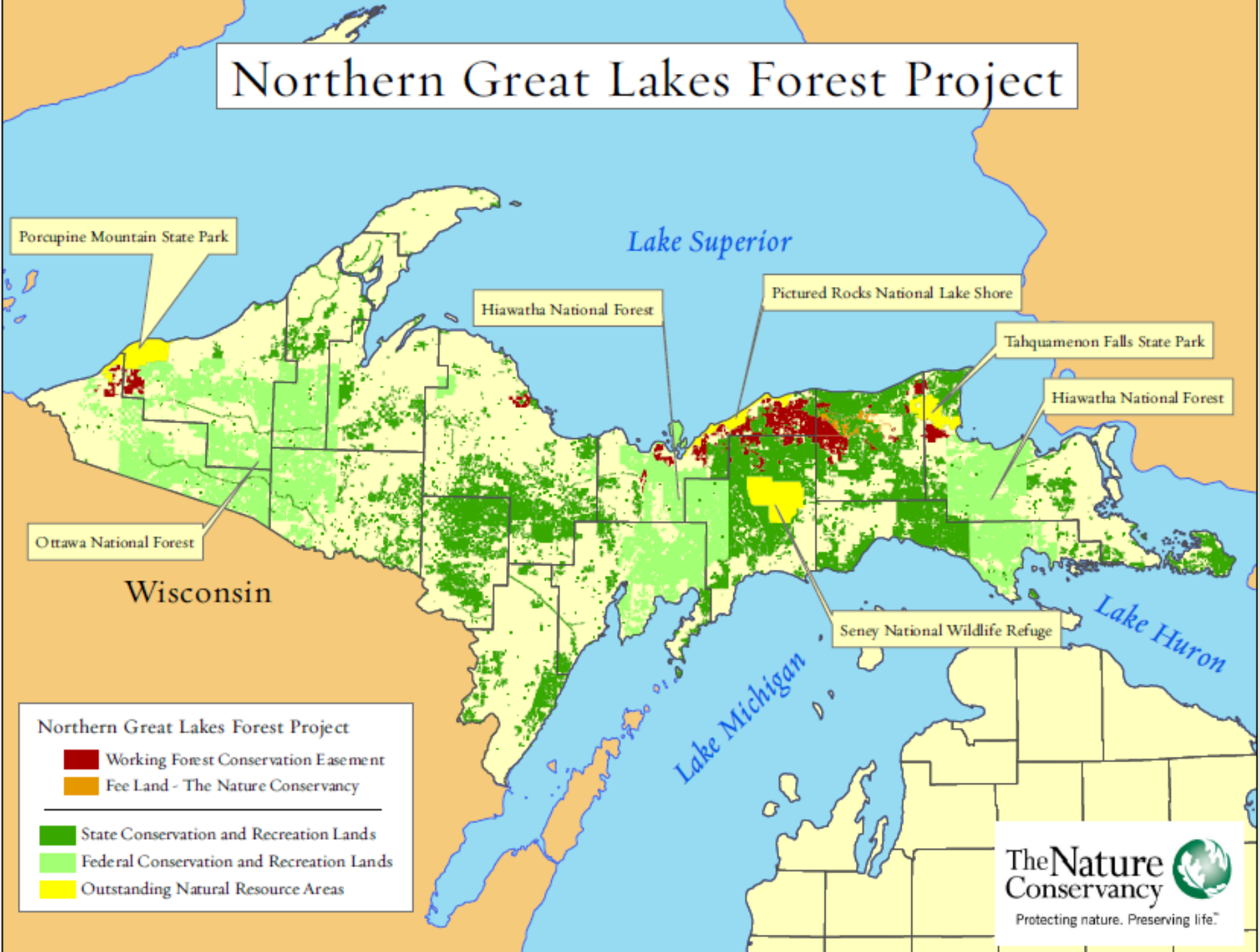
FLN data v. 5 January 2012

CFLRP data v. 9 February 2012

map v. 9 February 2012

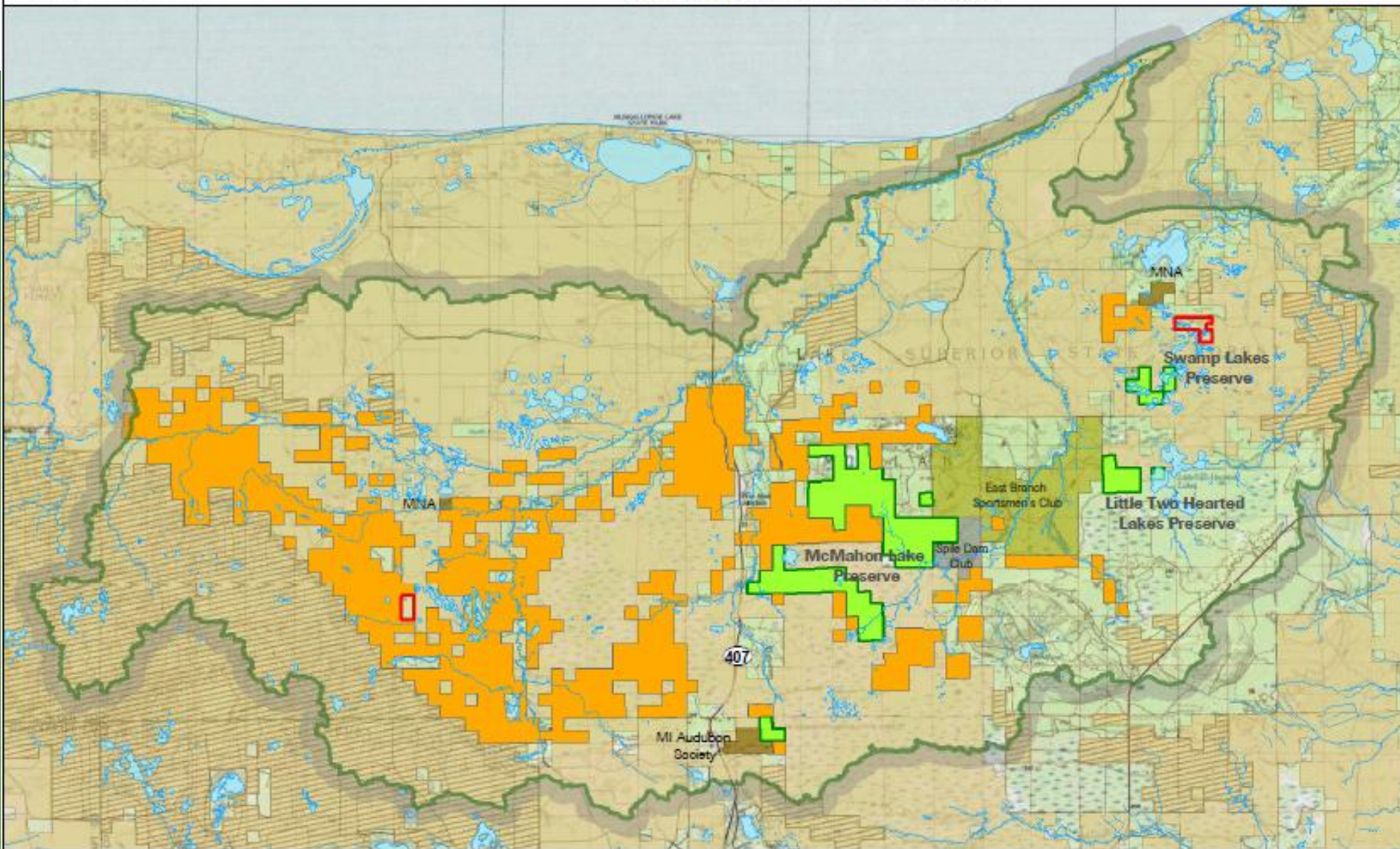
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Northern Great Lakes Forest Project



Two Hearted River Watershed - Conservation Ownership

Luce County, MI - Great Lakes Ecoregion



Legend

- Two Hearted River Conservation Area
- TNC Preserve
- Two Hearted River Forest Reserve
- TNC Pending Acquisitions
- Working Forest Conservation Easement
- State of Michigan

May 2012



Ecological Impacts of Fragmentation

- Interrupts or alters natural processes
 - Fire regime
 - Wind
 - Hydrologic regime
 - Dispersal of propagules, individuals
- Reduces connectivity
 - Wide ranging, area-sensitive species
- Stresses on species and natural communities
 - Direct loss of habitat; may eliminate small patch communities
 - Mortality of individuals
 - Invasive species
 - Change in light and thermal conditions
 - Increase in disturbances

Implications for Land Managers

- Fragmented ownership requires dealing with multiple landowners
 - Different landowners may receive diverse, perhaps conflicting recommendations that may result in fragmentation, lack of ability to develop cohesive approaches
- For protection of large working forests: more complicated to achieve protection
 - additional landowners, new access agreements or easements; preventing parcelization will

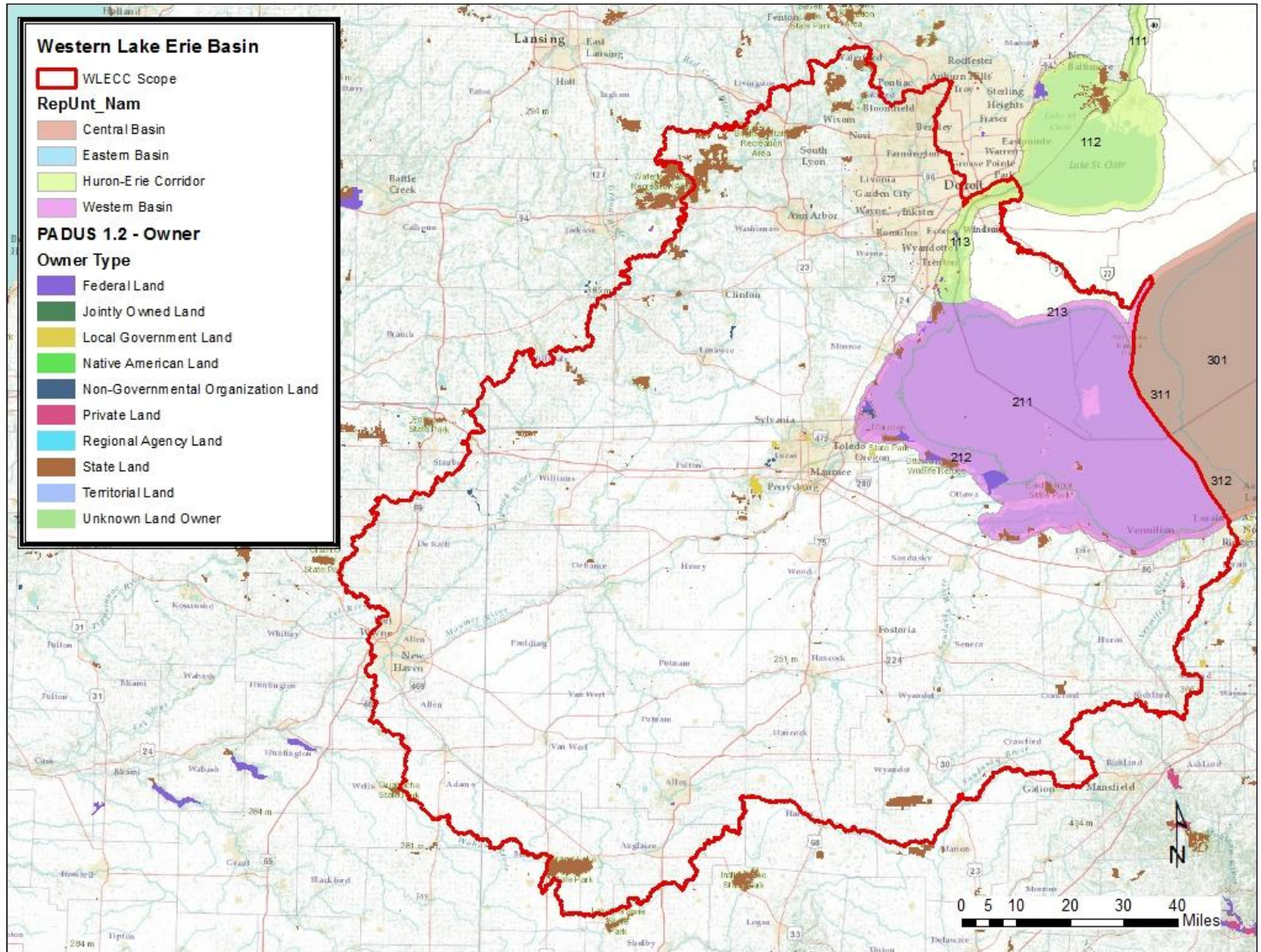
Implications for Land Managers

- Restoration activities become more logistically challenging, and more expensive per acre
 - Heavily altered natural communities are more difficult to restore
 - Controlled burns require similar capacity and capital expenses for smaller acreages
 - Smoke management becomes more challenging
 - Risk of stochastic events becomes greater

Overcoming Challenges

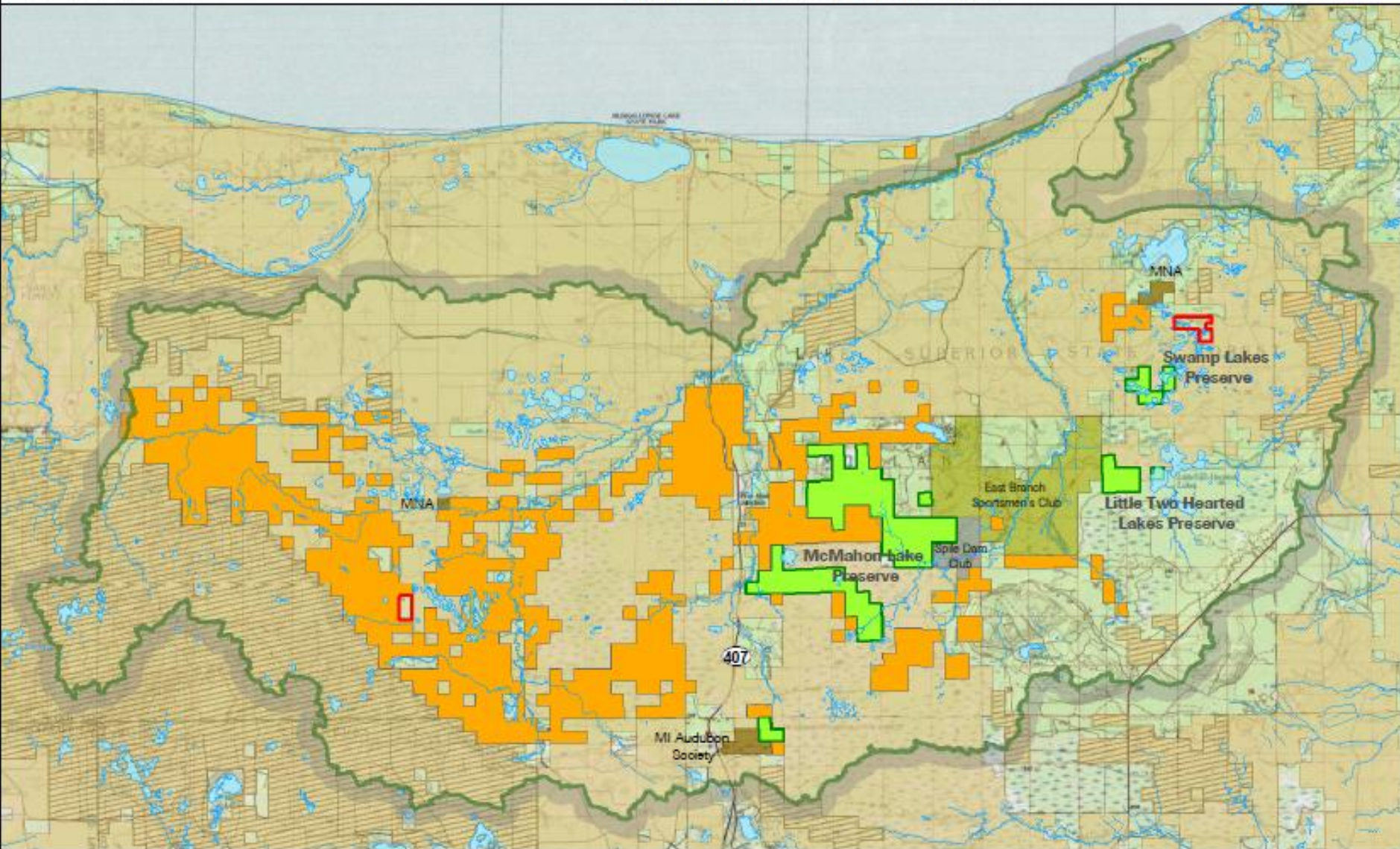
- Whole-systems approach
 - Shared goals across a landscape: ecological, social, economic
 - Western Lake Erie Coastal Conservation

Western Lake Erie Coastal Conservation



Overcoming Challenges

- Conservation and restoration actions:
 - In less fragmented landscapes
 - Two Hearted River Watershed
 - In highly fragmented landscapes
 - Southeast Michigan Headwaters
 - Grand River Fen and Skiff Lake



Legend

- Two Hearted River Conservation Area
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May 2012



Two Hearted River Forest Reserve

Goals:

- Restore Key Ecological Attributes of Northern Hardwood Forest
 - Forest structure and composition
 - Groundcover vegetation
 - Breeding birds
- Produce economically sustainable timber
- Restore and maintain high quality and connectivity of Two Hearted River system
- Provide local jobs to help support local economy

Approach:

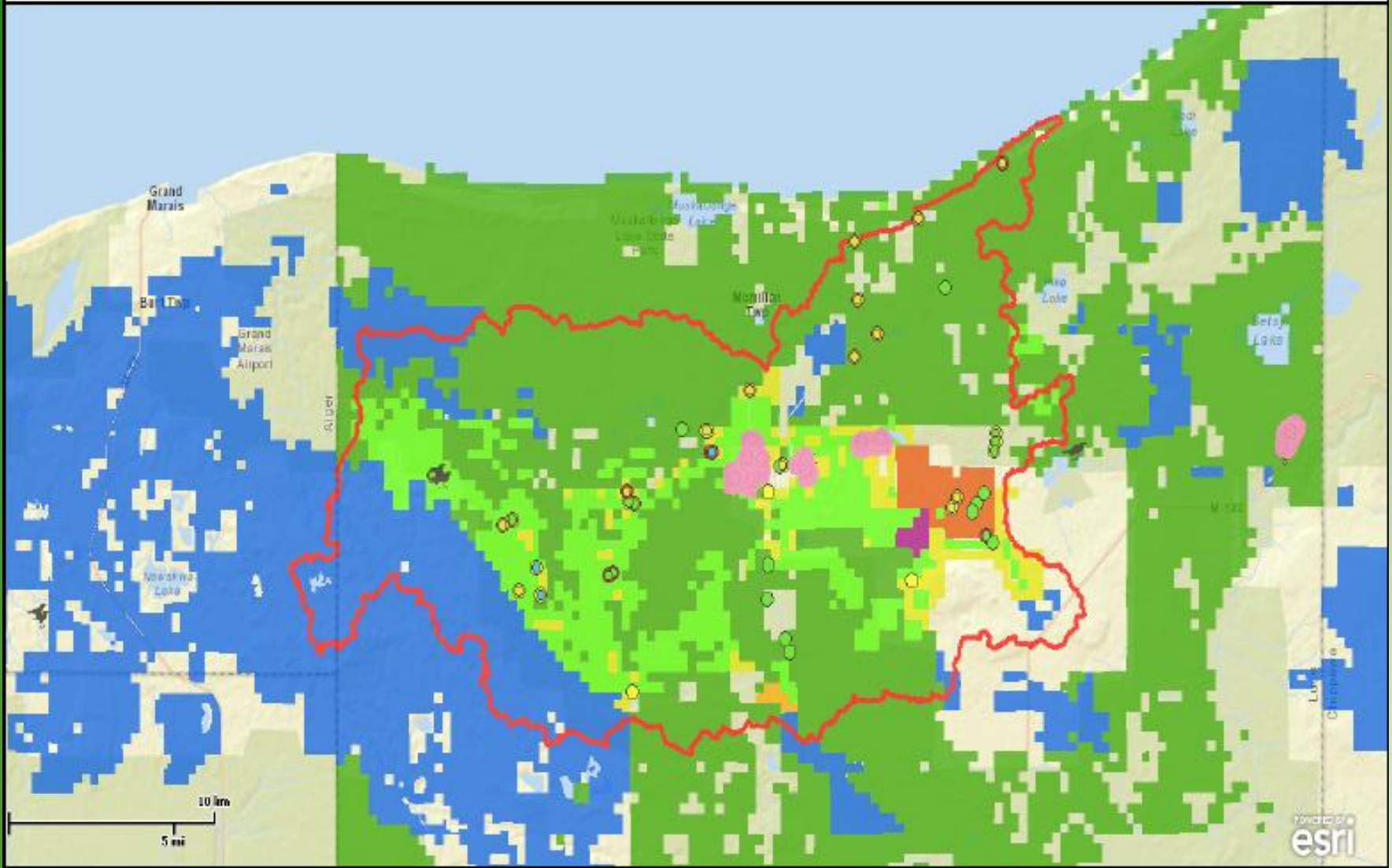
- Test forest harvest practices
 - Traditional harvest
 - Group Selection
 - Restoration harvest
 - Control (deferred harvest)
- Monitoring
 - Birds, plants, trees
- Land conservation to reduce fragmentation
- Road/stream crossing improvements

Two Hearted River Forest Reserve

The Nature Conservancy's Two Hearted River Watershed Conservation Viewer

<http://maps.tnc.org/>

<http://maps.tnc.org/twoheartedwatershedconservation/>

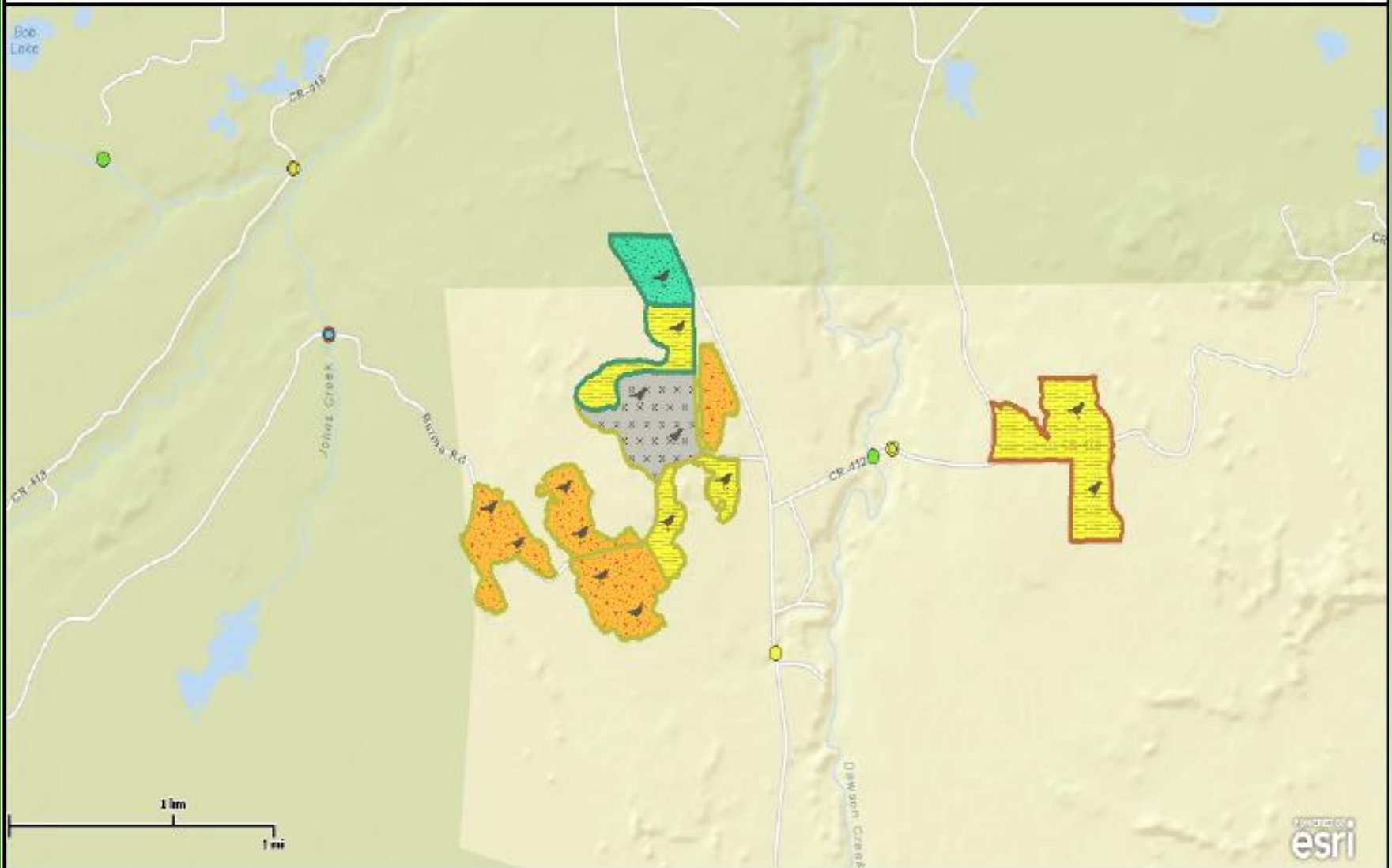


Two Hearted River Forest Reserve

The Nature Conservancy's Two Hearted River Watershed Conservation Viewer

<http://maps.tnc.org/>

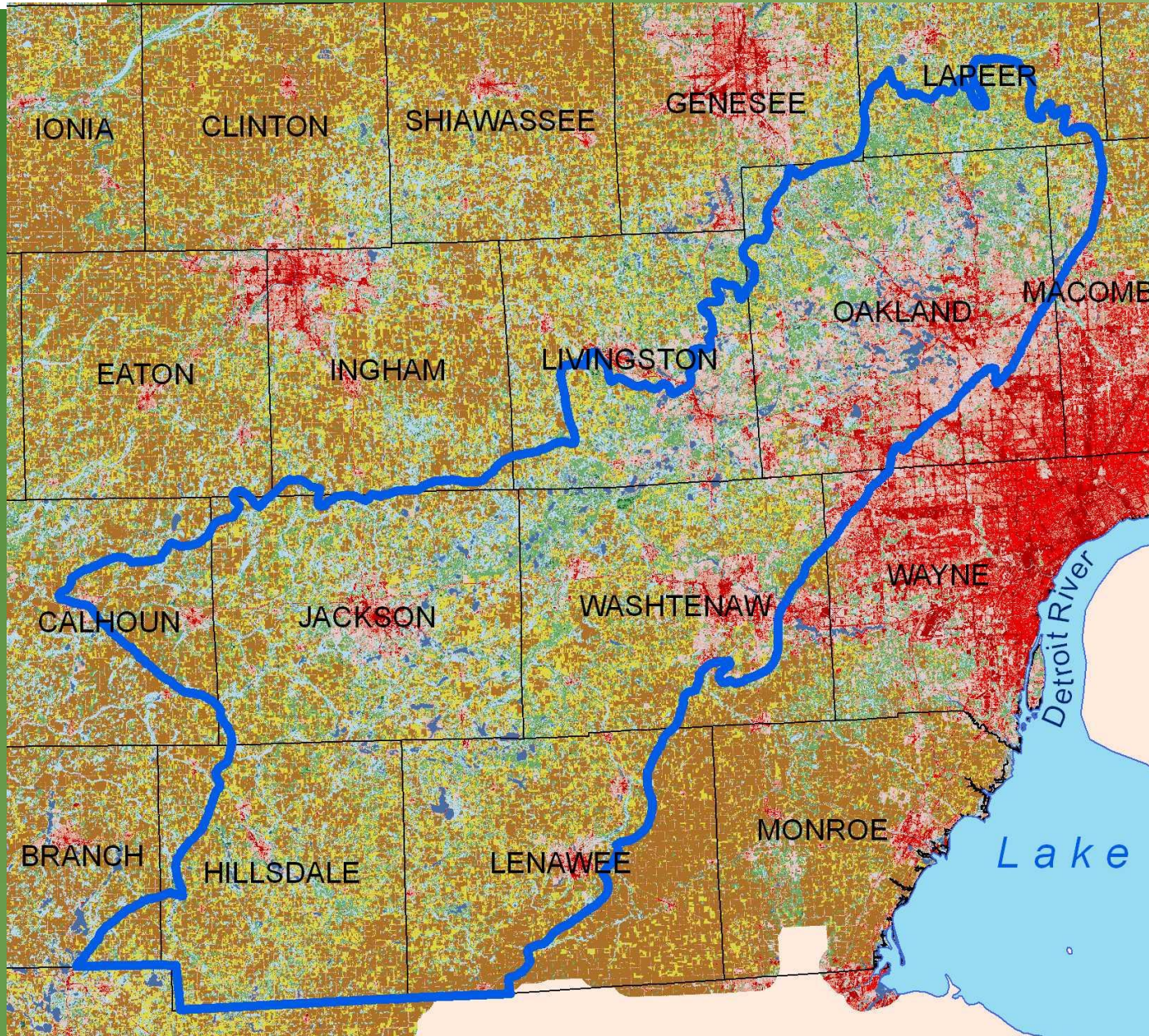
<http://maps.tnc.org/twoheartedwatershedconservation/>



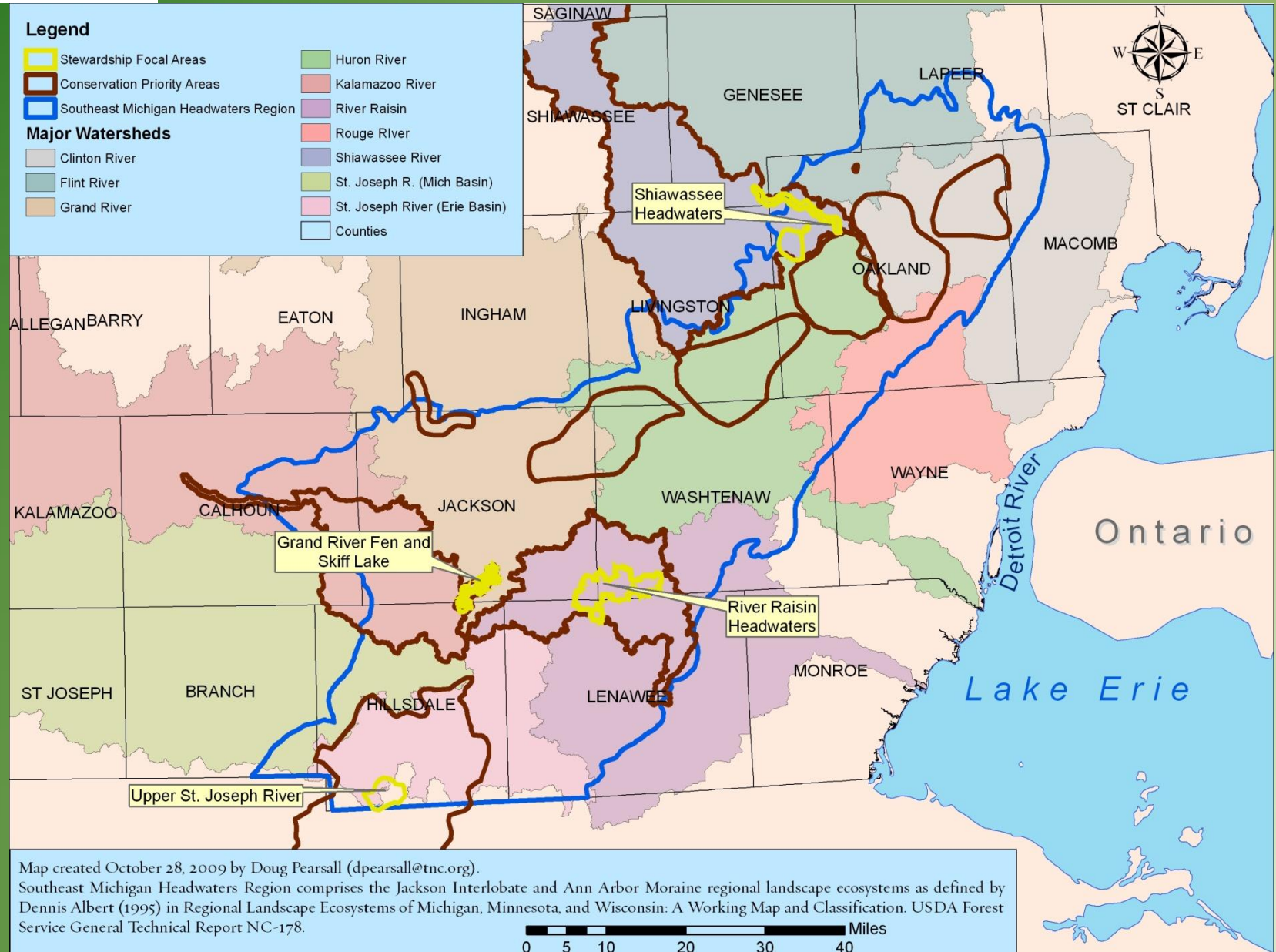
Overcoming Challenges

- Conservation and restoration in highly fragmented landscapes
 - Develop shared goals and collaborative partnerships
 - Work closely with neighboring landowners
 - Natural area conservation, restoration and stewardship
 - Easements and management agreements
 - Forest management
 - Forest banking and co-ops

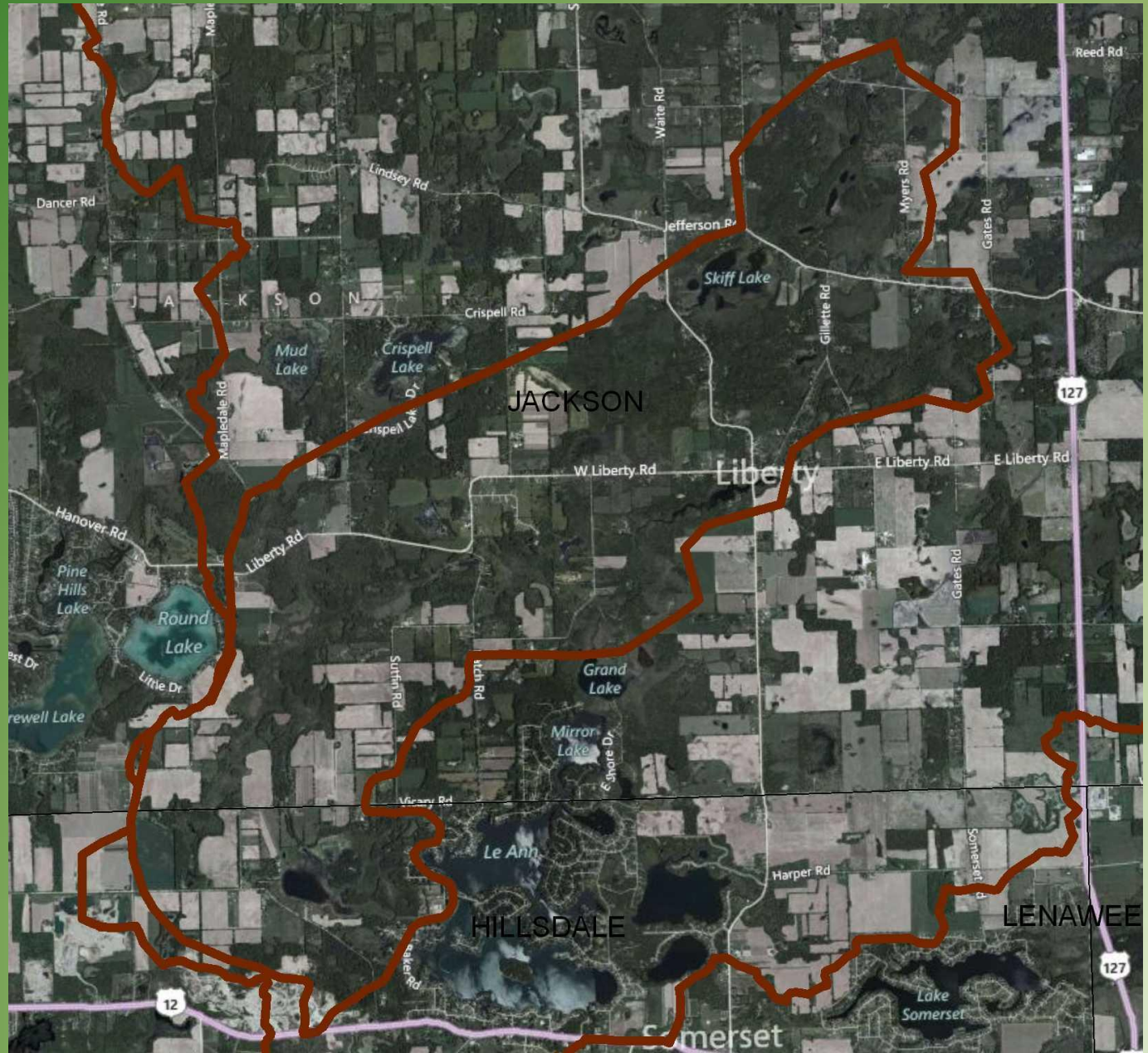
Southeast Michigan Headwaters



Southeast Michigan Headwaters



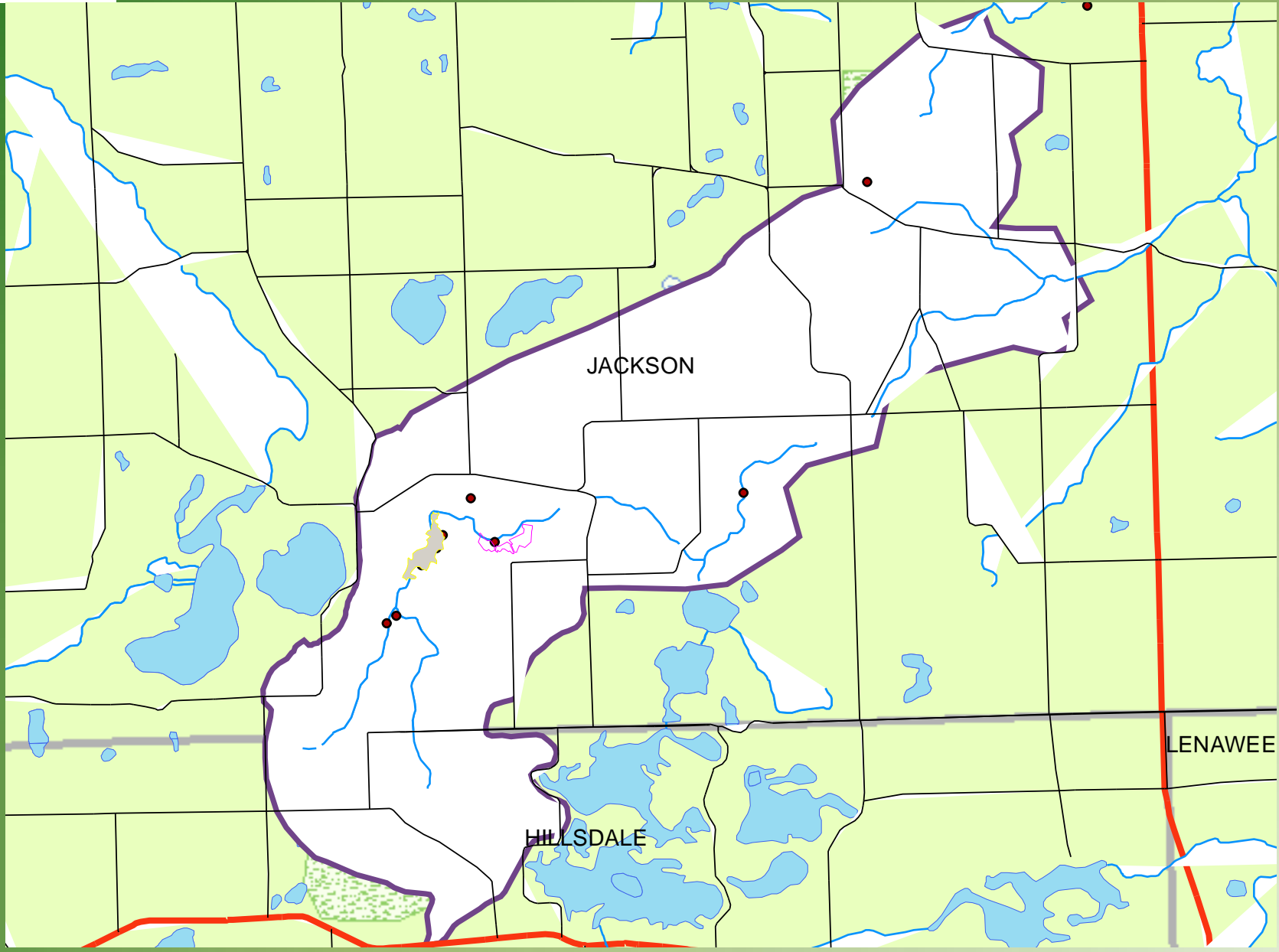
Grand River Fen and Skiff Lake



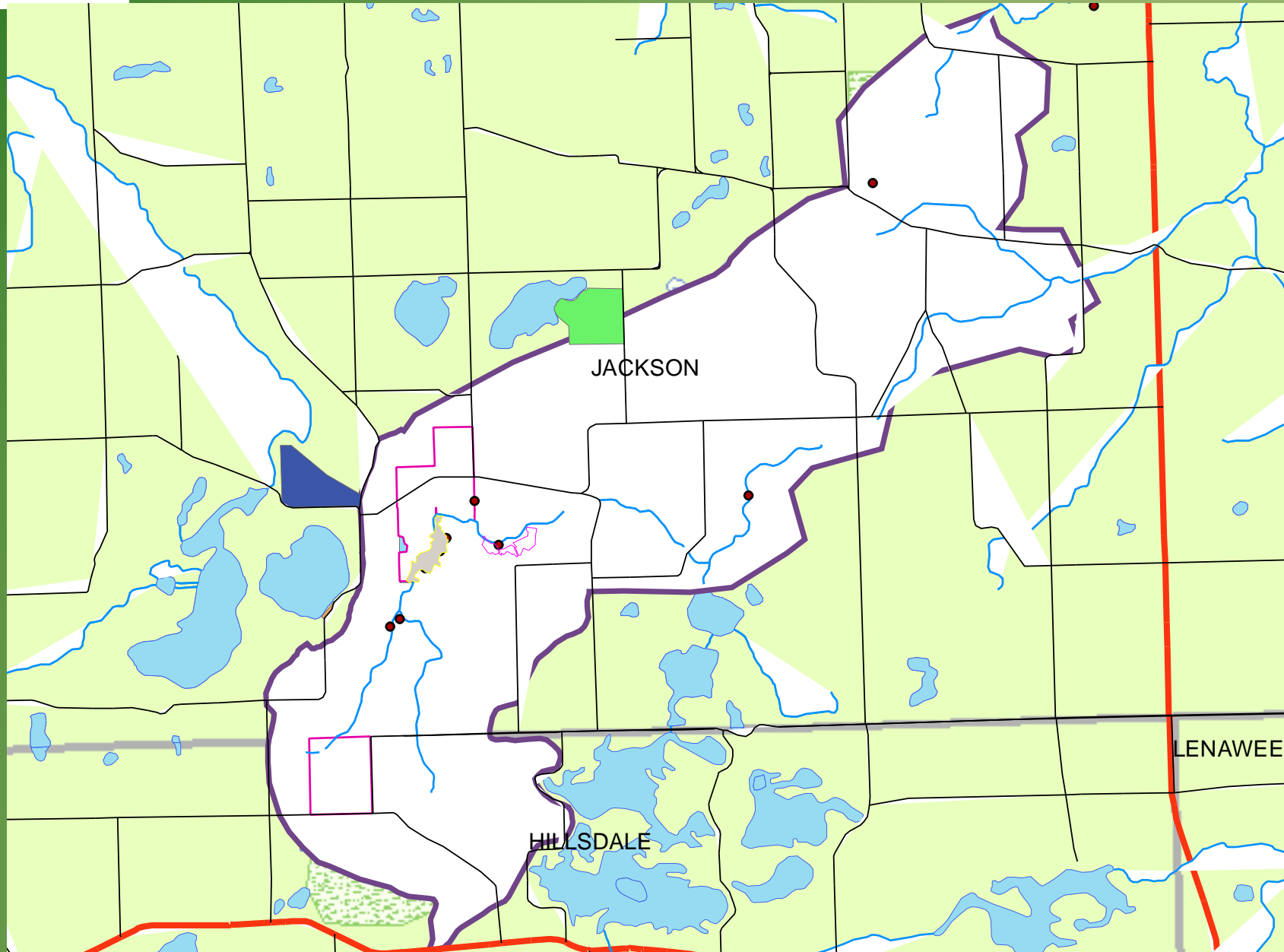
Grand River Fen and Skiff Lake

Target #1	Wetland complex
Nested Target #1	Rare insects, including tamarack tree cricket, Duke's skipper, and swamp metalmark, pinetree cricket, silphium borer, and regal fern borer
Nested Target #2	Eastern massasauga
Nested Target #3	Rare turtles: Blanding's turtle, spotted turtle, and box turtle
Nested Target #4	Rare plants, including bog bluegrass, small white ladyslipper, and mat muhly
Target #2	Angular Spittlebug
Nested Target #1	
Target #3	Mitchell's Satyr
Nested Target #1	
Target #4	Blazing Star Stem Borer
Nested Target #1	
Target #5	Poweshiek Skipperling
Nested Target #1	
Target #6	Kitten Tails
Nested Target #1	
Target #7	Oak Barrens
Nested Target #1	False boneset (<i>Kuhnia eupatorioides</i>)

Grand River Fen and Skiff Lake



Grand River Fen and Skiff Lake



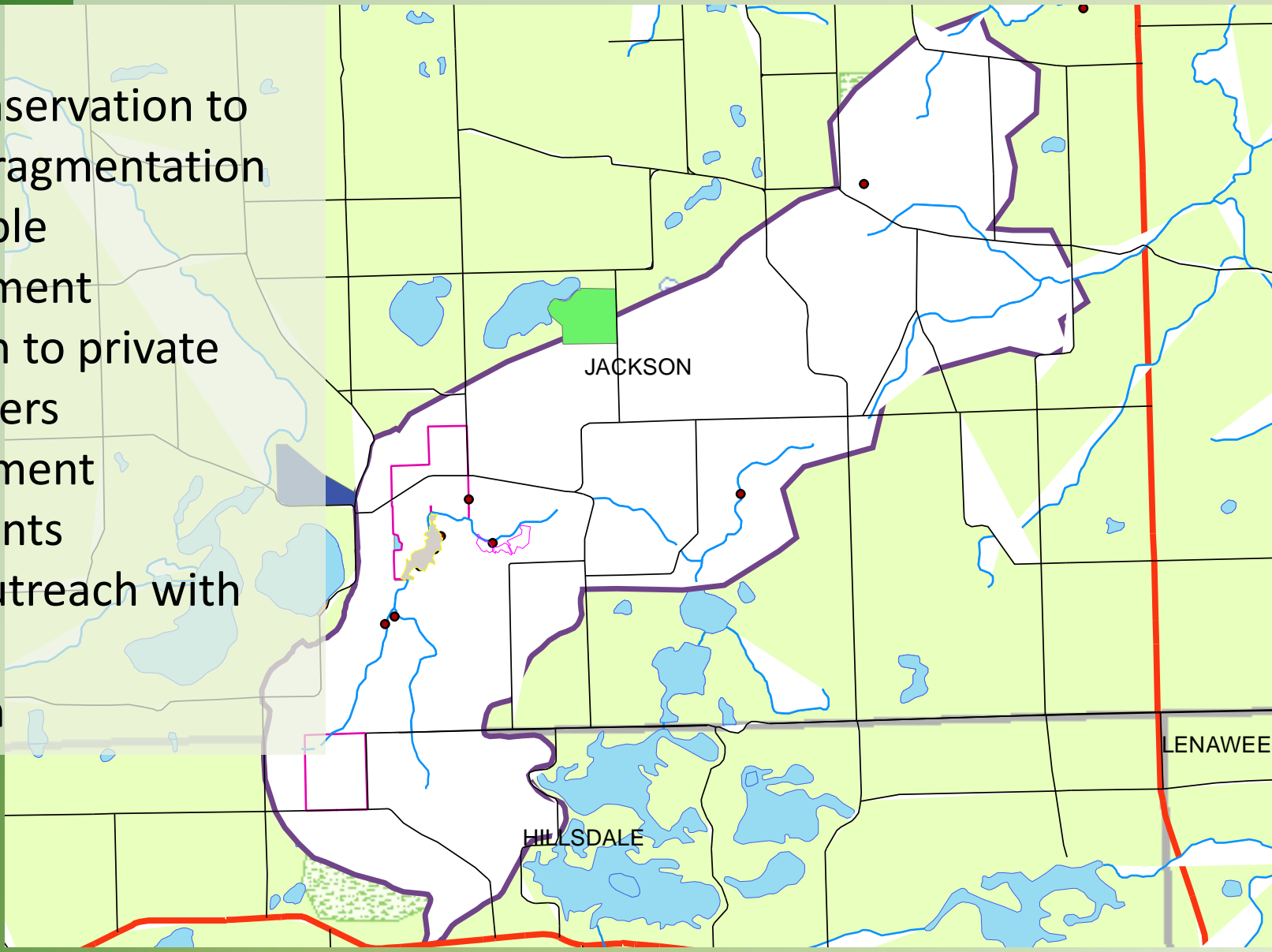
Grand River Fen and Skiff Lake

- Conservation and Restoration Objectives
 - Connect wetlands along corridor between TNC and MSU lands for Mitchell's satyr
 - Restore barrens to enable movement and gene flow between TNC and MSU lands
 - Protect groundwater recharge areas
 - Control invasive species
 - Restore fire regimes

Grand River Fen and Skiff Lake

Approach:

- Land conservation to reduce fragmentation and enable management
- Outreach to private landowners
- Management agreements
- Public outreach with MSU
- Research



Conclusions

- Fragmentation causes negative ecological impacts;
 - parcelization increases the likelihood and severity of fragmentation impacts
- Implications for land managers:
 - Increases difficulty of achieving management goals
 - Logistics, expense, complexity
- Challenges can be overcome by:
 - Working across ownerships
 - Developing relationships/partnerships with neighbors
 - Developing shared goals and assessing results

Questions?



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