

PRE-EVENT SURVEY



Please take a 3-minute survey before the workshop begins, to help us shape the future of this series:

GO TO:

<https://10ktrees.a2gov.org/pre-event-survey>

OR





THE HISTORY OF TREES IN ANN ARBOR

TREEducation Series

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BACKGROUND



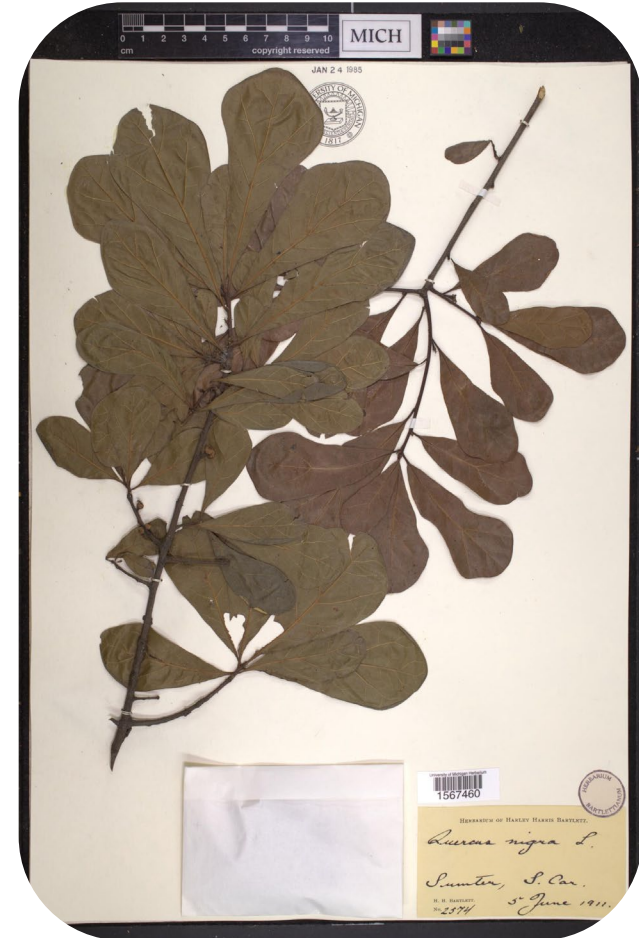
Trees and the A²ZERO Plan



WHY LEARN ABOUT TREE HISTORY?

- Understanding the context of how trees have historically lived in SE Michigan can help inform conservation goals and provide a deeper context for the importance of trees in our communities.
- It's fun and can deepen your connection to nature.

Image credit: University of Michigan Herbarium



TIMELINE OF TREE HISTORY



**Photo credits: Alan
Tepley and Pictoral
History of Ann Arbor**



30,000 B.C.E.: GLACIERS ADVANCE

- As the ice age advanced toward a period known as the Last Glacial Maximum, average global temperatures dropped to around 6°C (or 10.8°F!) lower than they are today.
- Glaciers began to cover Michigan. Over the next few thousand years, the entire state would be covered, wiping out the previous ecology and geography of the area.

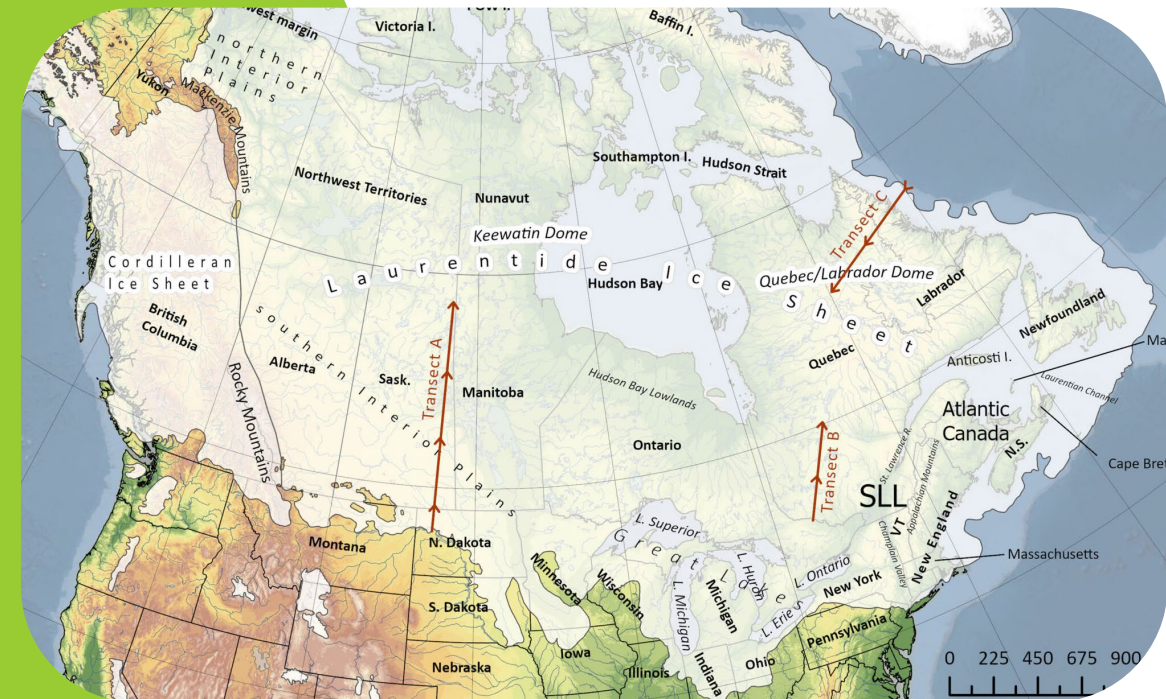


Image source:
antarcticglaciers.org

20,000 B.C.E.: GLACIERS RETREAT

- The Laurentide ice sheet's southern extent covers Michigan in 2km-thick glaciers.
- Over the next few thousand years, the glaciers retreat, carving and reshaping the landscape in the process.
- This glacial period profoundly impacts the geographic features and soils we see today.

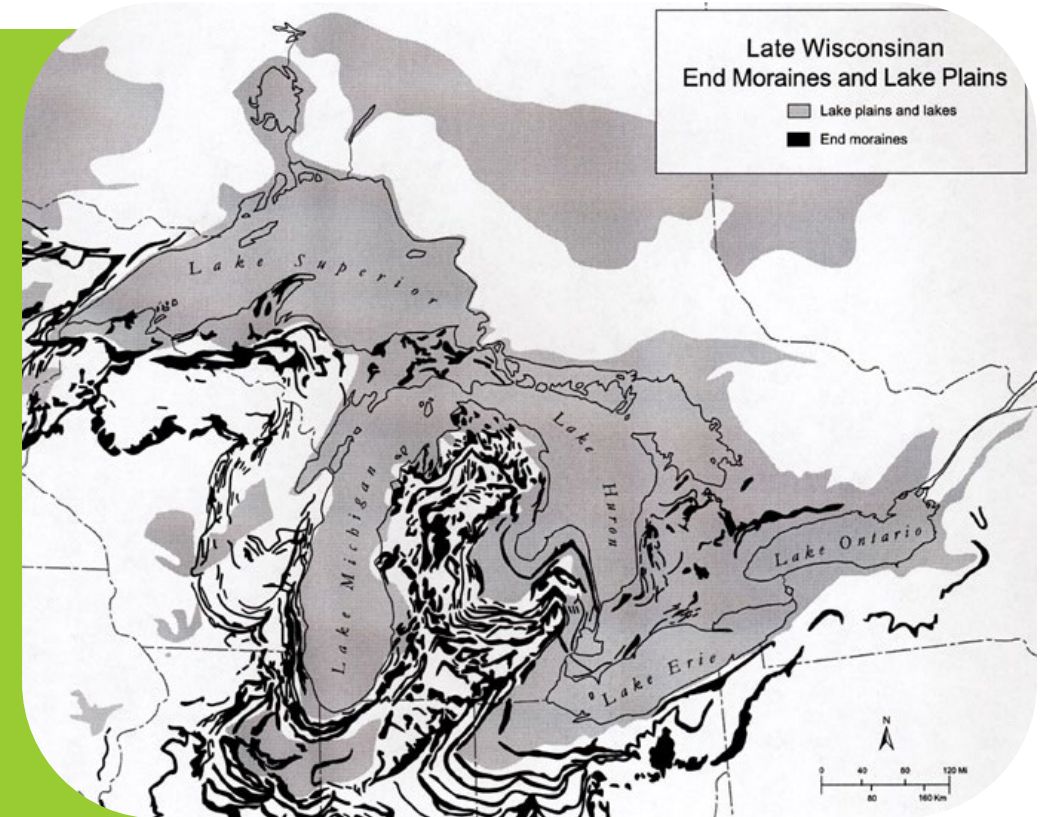


Image source:
project.geo.msu.edu/geogmich/moraines.html

10,000 B.C.E.: HUMANS ARRIVE

- Humans arrive and populate Michigan as the glaciers retreat.
- Human activity plays a large role in the ecosystems that populate the newly-thawed Michigan.

Image credit: Daryl Marshke/Michigan Photography



MICHIGAN'S NATURAL COMMUNITIES

- A natural community is “an assemblage of interacting plants, animals, and other organisms that repeatedly occurs under similar environmental conditions across the landscape and is predominantly structured by natural processes rather than modern anthropogenic disturbances” (Michigan Natural Features Inventory)
- In more simple terms...



Photo credits:
Joshua G. Cohen

TREES AND NATURAL COMMUNITIES

- **Most natural communities in Ann Arbor are shaped and defined by trees**
- **If you've ever heard terms like "oak-hickory forest" or "mixed hardwood swamp", then you are familiar with this!**



**Photo credits:
Bradford S. Slaughter
and Joshua G. Cohen**



HOW DO WE KNOW ABOUT HISTORIC NATURAL COMMUNITIES?

- Between 1815 and 1851, government surveyors transected the entire state, meticulously recording all the natural features they found, in order to prepare what was then called the Northwest Territories for white settlement.
- These surveyors were required to document, among other things, the kinds of trees that lived on the landscape.
- Later, ecologists translated these records into maps of different kinds of natural communities.

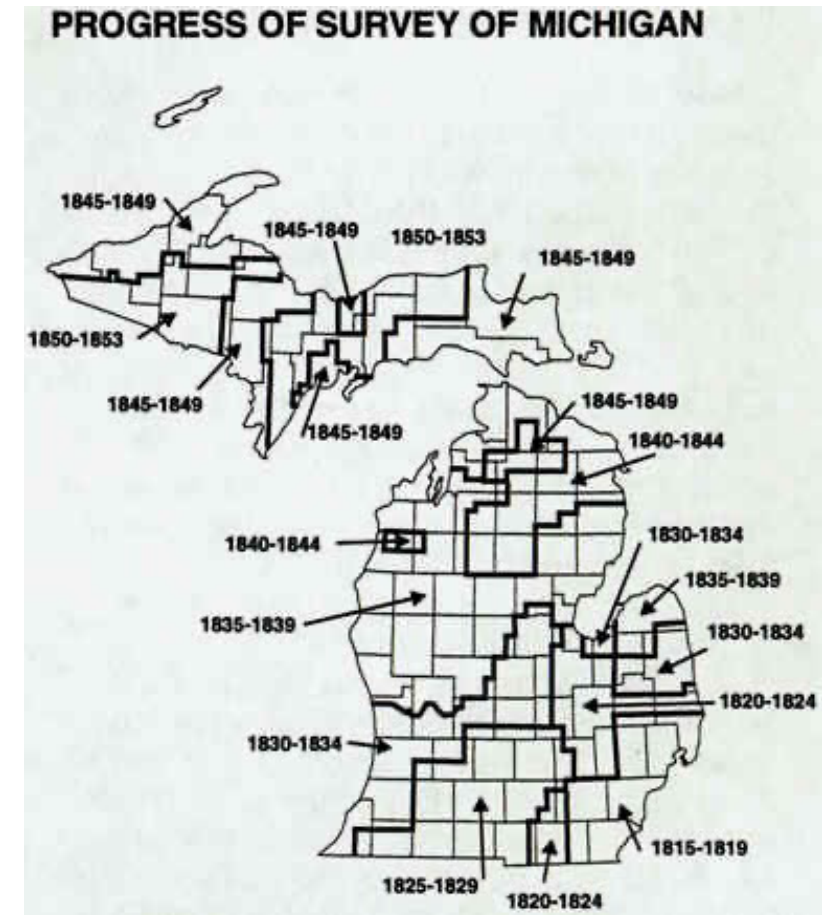


Image from project.geo.msu.edu/geogmich/Survey.html

WHAT CAUSES DIFFERENT NATURAL COMMUNITIES TO OCCUR IN SPECIFIC PLACES?

Natural communities are dependent on many factors, including:

- **Geography**
- **Soils**
- **Keystone Species**



Photo credits: Joshua G. Cohen and Matthew J. Lewis, Michigan Aerospace Corporation



GEOGRAPHY



- In southeast Michigan, moraines and outwash plains are the main terrestrial geographic features that impact natural communities
- These features are direct results of ancient glaciers.
- Rivers and other water features also play a large role in natural community distribution



Image credit: U.S. Geological Survey

SOILS

- Different soil compositions are produced by interactions between ancient glaciers and preexisting geology
- Each species of tree has different soil tolerances, so soil composition is important for determining which trees grow where
- In southeast Michigan, our soils are mainly loamy and clayey

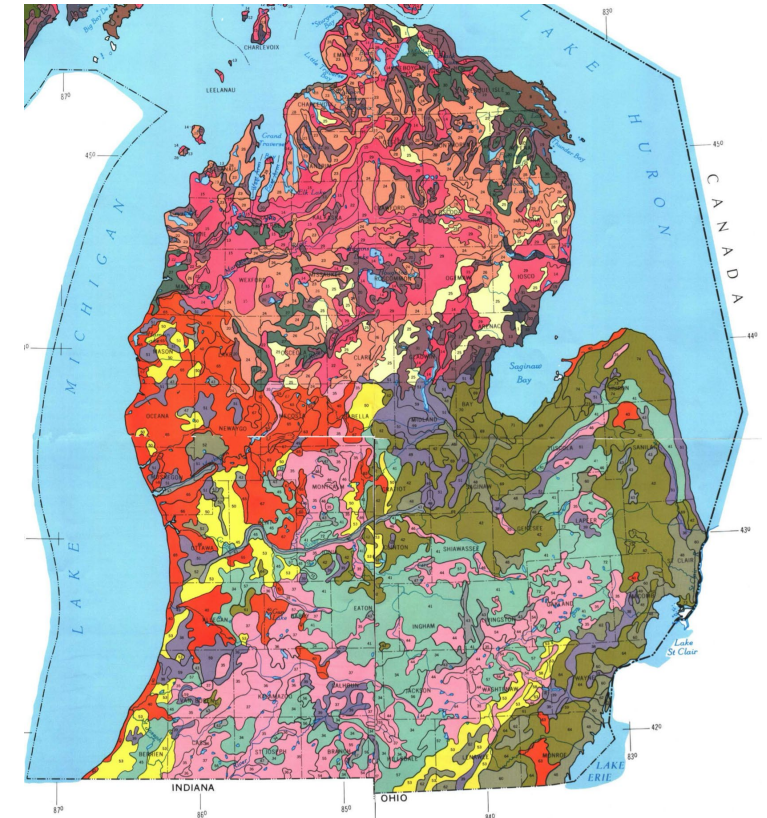


Image credit: Michigan State University and U.S. Department of Agriculture

KEYSTONE SPECIES

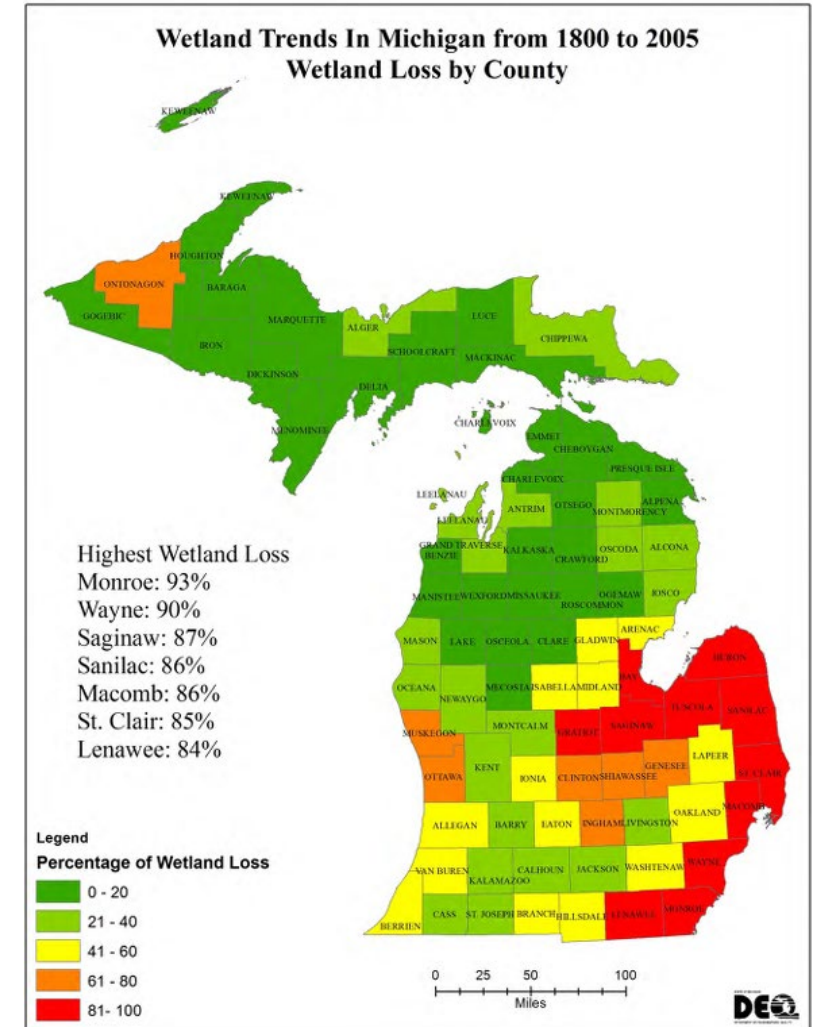
- **Keystone species are organisms that have an outsized influence on the landscape.**
- **The actions of keystone species are necessary for many of Michigan's natural communities to exist.**
- **Important keystone species in Michigan include:**
 - **Beavers!**
 - **Humans!**



Image credit: Bedardar

BEAVERS BRING WATER

- Historically, beaver activity throughout Michigan created wetland habitat in areas that would otherwise be dry
- Because each tree species has different water needs, beavers have a profound impact on which trees can live where
- Wetlands are among the most threatened types of ecosystems in Michigan, due to many factors - including declines in beaver populations



HUMANS BRING FIRE



- Because humans populated Michigan almost immediately once the glaciers receded, they had a huge role in the evolution of organisms and natural communities.
- Humans used prescribed fire for millennia to create open habitat that attracted game and promoted desirable plants
- Many native species and natural communities are fire-dependent and can only thrive with regular fire



Photo credit: Michigan Natural Features
Inventory and Michigan DNR Wildlife Division

HUMANS BRING FIRE

- Fire-dependent natural communities in Michigan are among the most endangered
- Without frequent fire, formerly open habitat becomes more densely forested, and trees and other organisms that need open space and sunlight decline.
- Over 99% of Michigan's historical barrens, savannas, and prairies have been lost since 1800 due in part to fire suppression

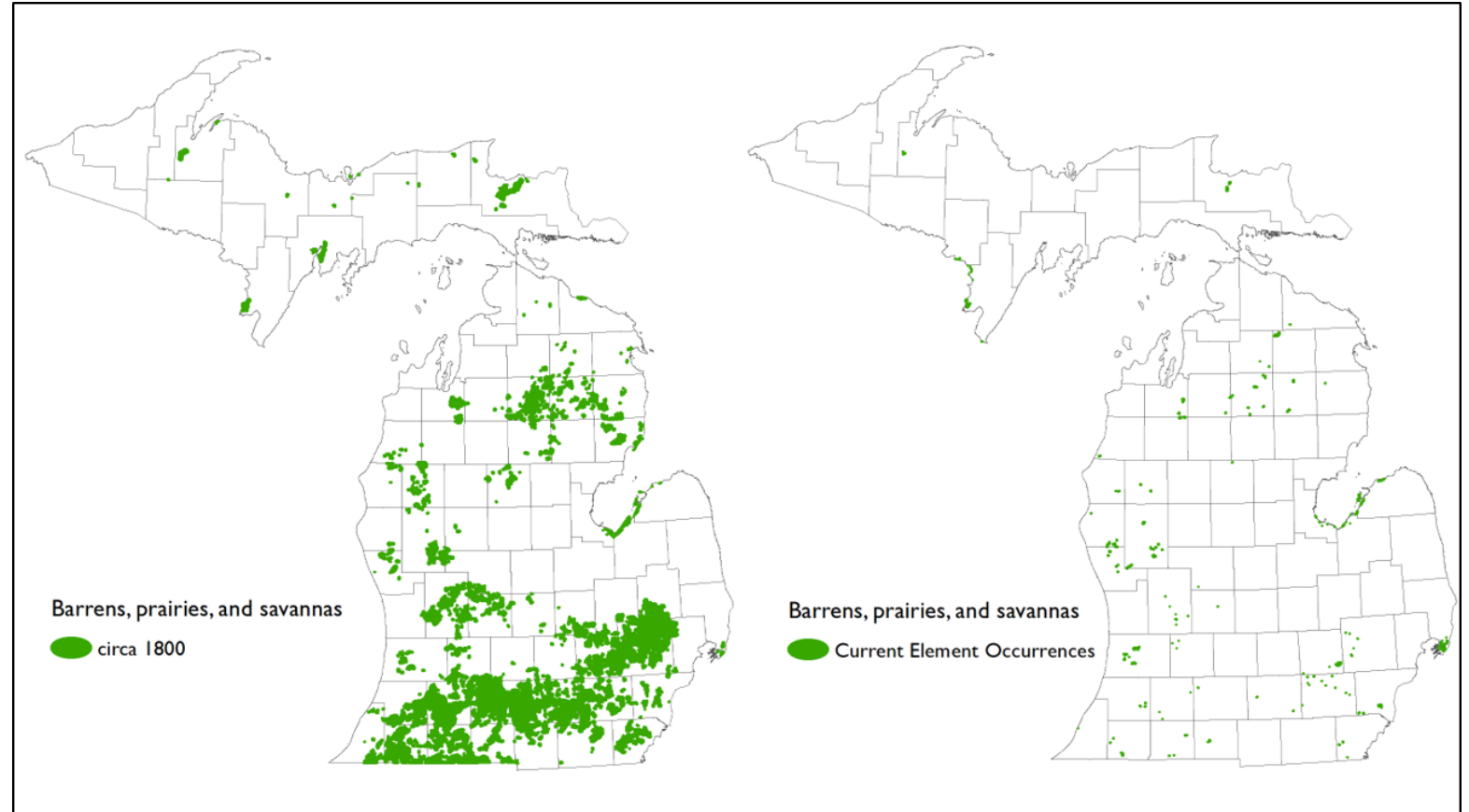
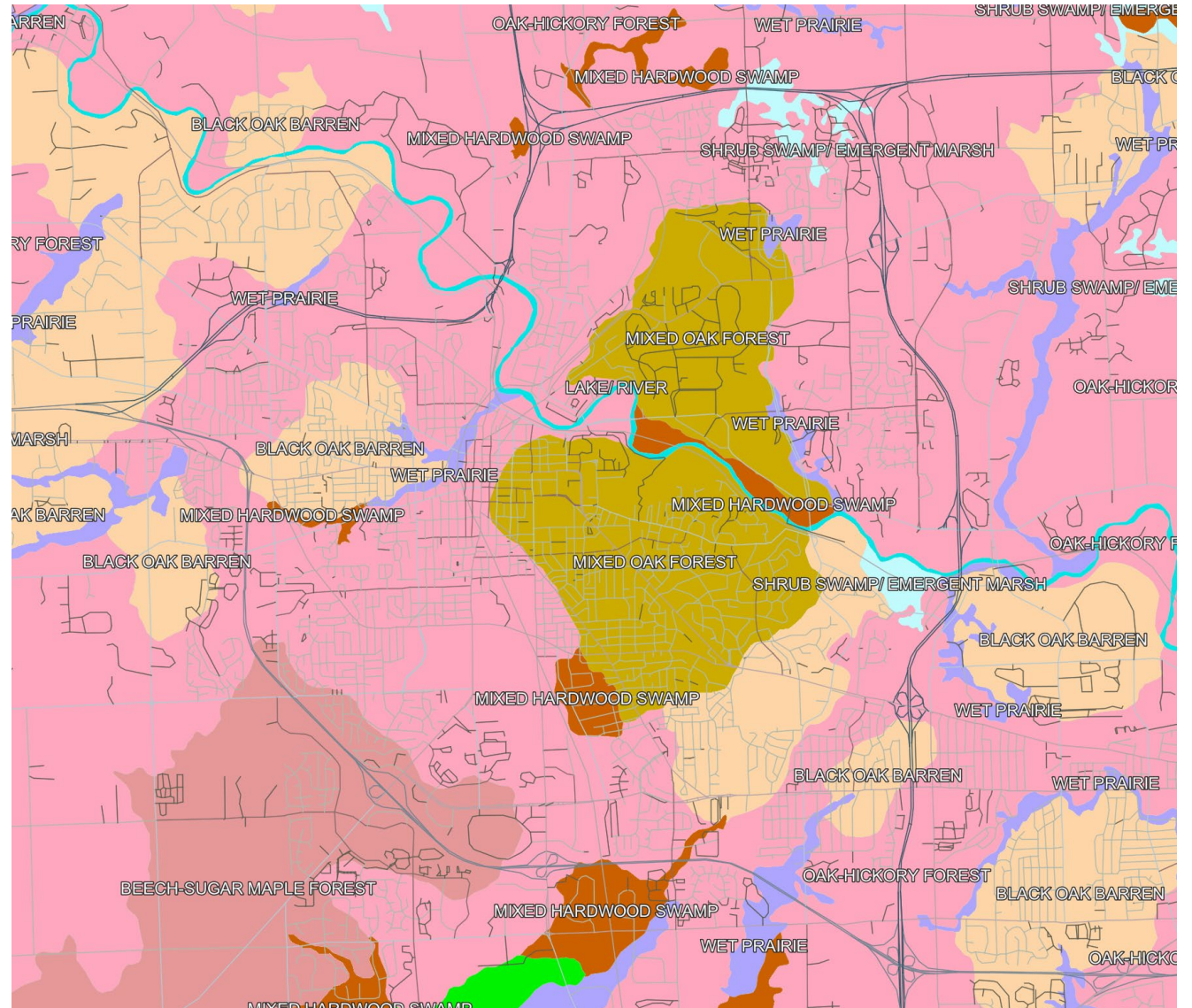


Image credit: Michigan Natural Features Inventory and Michigan DNR Wildlife Division

Material for this section is based on work by the
Michigan Natural Features Inventory

NATURAL COMMUNITIES IN ANN ARBOR

-  Oak-hickory forest
-  Mixed oak forest
-  Black oak barren
-  Mixed hardwood swamp
-  Wet prairie
-  Shrub swamp
-  Beech-sugar maple forest



OAK FORESTS

- Defined by canopy dominance of oaks with high canopy cover
- Thrive on glacial outwash and moraines - both very common in our area!
- In Ann Arbor, the oak forest served as the matrix wherein smaller islands of other natural communities would exist



Photo credit: Steve A. Thomas

OAK FORESTS

Tree species supported by this natural community include:

- **White, black, and red oaks**
- **Pignut, shagbark, and bitternut hickories**
- **Red maple**
- **White ash**
- **Black cherry**
- **Basswood**
- **Sassafrass**
- **Dogwoods**



Photo credit: Steve A. Thomas

BLACK OAK BARRENS

- Defined by low canopy cover (5-60%) with lots of black oaks
- Thrive on flat glacial outwash areas with dry soils and regular fire
- Ann Arbor's black oak barrens existed in a few pockets (around 1,000 acres each) in the forest matrix



Photo credit: Joshua G. Cohen

BLACK OAK BARRENS

Tree species supported by this natural community include:

- **Black oak**
- **Red maple**
- **Black cherry**
- **Aspens**
- **Northern pin oak**
- **Hickories**
- **Dogwoods**
- **Sassafras**



Photo credit: Joshua G. Cohen

OAK GRUBS!

- In fire-dependent “barren” communities, many oak trees spend their entire lives as “grubs”: small, shrublike sprouts which are top-killed by fire frequently, but with large, extensive root systems that can be over one hundred years old!
- When fire is removed from the landscape, these grubs are quick to become trees, transitioning the community from a savannah into a forest.



MIXED-HARDWOOD SWAMPS

- Defined by canopy coverage of hardwood trees over a wetland
- Thrive on stream drainage areas
- In Ann Arbor, these swamps were found mostly along the Huron River



Photo credit: Michael A. Kost

MIXED-HARDWOOD SWAMPS

Tree species supported by this natural community include:

- Silver, sugar, and red maples
- Green, white, and black ashes
- Pin, swamp white, bur, and northern red oaks
- Hackberry
- Sycamore
- Cottonwood
- Tuliptree
- Quaking aspen
- Elm
- Basswood



Photo credit: Michael A. Kost

WET PRAIRIES

- Defined by few or no trees on a grass-dominated wetland
- Thrive on river floodplains and depressions
- In Ann Arbor, these prairies were found in veins branching off of the Huron River, including along the historic route of Allen's Creek



Photo credit: Ryan P. O'Connor

WET PRAIRIES

Tree species supported by this natural community include:

- **Willows**
- **Dogwoods**



Photo credit: Ryan P. O'Connor

SHRUB SWAMPS

- Defined by shrub dominance on an inundated wetland
- Thrive on isolated depressions surrounded by drier forests
- In Ann Arbor, these existed in small wet pockets surrounded by oak forests



Photo credit: Joshua G. Cohen

SHRUB SWAMPS

Tree species supported by this natural community include:

- **Willows**
- **Dogwoods**
- **Maples**
- **Yellow birch**
- **Musclewood**
- **Ashes**
- **Black walnut**
- **Oaks**
- **Elms**



Photo credit: Joshua G. Cohen

BEECH-SUGAR MAPLE FORESTS

- Defined by canopy dominance of beeches and maples with high canopy cover
- Thrive on flatter areas with loamy soil
- Beech-maple forests historically formed the matrix community in the metro Detroit area, with some localized pockets also existing near Ann Arbor



Photo credit: Bradford S. Slaughter

BEECH-SUGAR MAPLE FORESTS

Tree species supported by this natural community include:

- **Beech**
- **Sugar maple**
- **Bitternut hickory**
- **White ash**
- **Tulip tree**
- **White and northern red oaks**
- **Basswood**
- **Elm**
- **Ironwood**
- **Pawpaw**
- **Musclewood**
- **Dogwoods**



Photo credit: Bradford S. Slaughter

TREES AND HUMANS



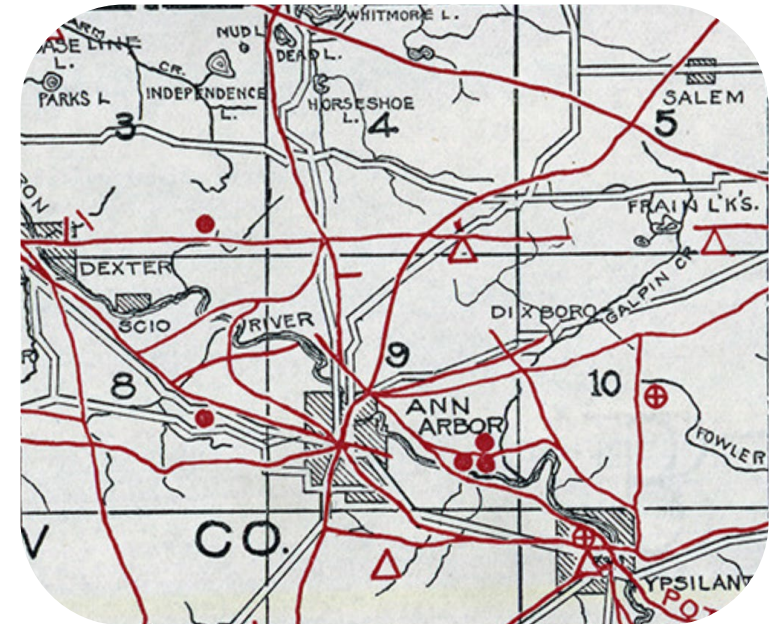
- **As discussed earlier, humans have been a keystone species in Michigan shaping the landscape since the last ice age.**
- **In this next section we'll look at the relationship between trees and humans in Michigan and how it has changed through time.**

Some material for this section is based on "20,000 Years of the Huron River Watershed" by Melina Pakey-Rodriguez with the Huron River Watershed Council

PRE-EUROPEAN COLONIZATION

- In precolonial times, the indigenous people of Michigan used trees for agriculture, medicine, and building material.
- They also controlled where trees and forests could grow through prescribed fire and logging.

Image credit: *Archaeological Atlas of Michigan* by Wilbert B. Hinsdale



EXPLANATION OF CARTOGRAPHIC SYMBOLS

The numbers upon the maps indicate townships, which are listed in Chapter X, "Notes Upon the Archaeological Features of the Counties." The word "vague" beside a symbol indicates that the location was not determined nearer than a section of land.

● Mound	Irregular earthwork
4 Figures indicate exact number of mounds in a group	△ Village
N Letter N indicates that the number of mounds in group is undetermined	⊕ Burying ground
○ Circular inclosure	▨ Garden bed
○ Incomplete circular inclosure	Trail
□ Rectangular inclosure	Trail, location not accurately determined
□ Incomplete rectangular inclosure	× Ancient excavation for copper

USES FOR TREES IN PRECOLONIAL MICHIGAN

- Construction
- Dugout canoes
- Maple sugar
- Paw paw fruits



Image credits: Algonquins
of Greater Golden Lake
First Nation, Jim Moss,
elPadawan and R.W. Smith



1800 C.E.: WHITE SETTLERS

- White settlers moving into Michigan evict native people, often forcefully
- Beavers are trapped and nearly extirpated from the state, contributing to a steep decline in wetlands
- Between 1850 and 1910, most of the lower peninsula is clearcut, leaving only pockets of old-growth
- European-style agriculture becomes a primary land use in Southeast Michigan

Image credit: Detroit Publishing Co.



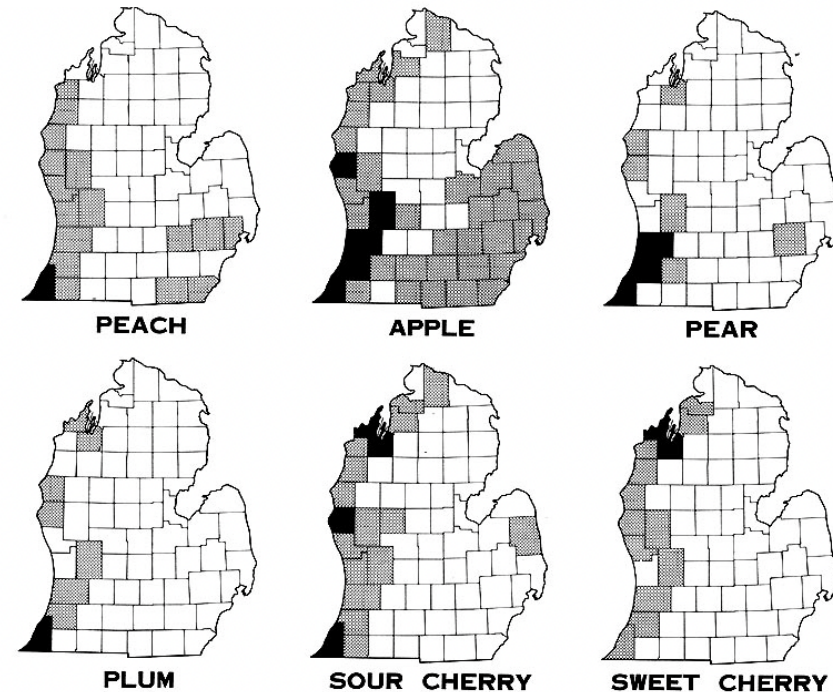
POST-COLONIZATION: TREES IN AGRICULTURE

- White settlers introduced large-scale cultivation of fruit trees native to Eurasia
- To this day, Michigan is an important fruit-producing state, particularly along the Lake Michigan coast
- Some of Ann Arbor's parks stand on land that was home to fruit orchards in the nineteenth and twentieth centuries—including Burns Park

Image
source:
project.geo.msu.edu/geogmich/fruit.html

INDIVIDUAL FRUIT CROPS

MAJOR COUNTY SECONDARY COUNTY



TWENTIETH CENTURY: URBANIZATION

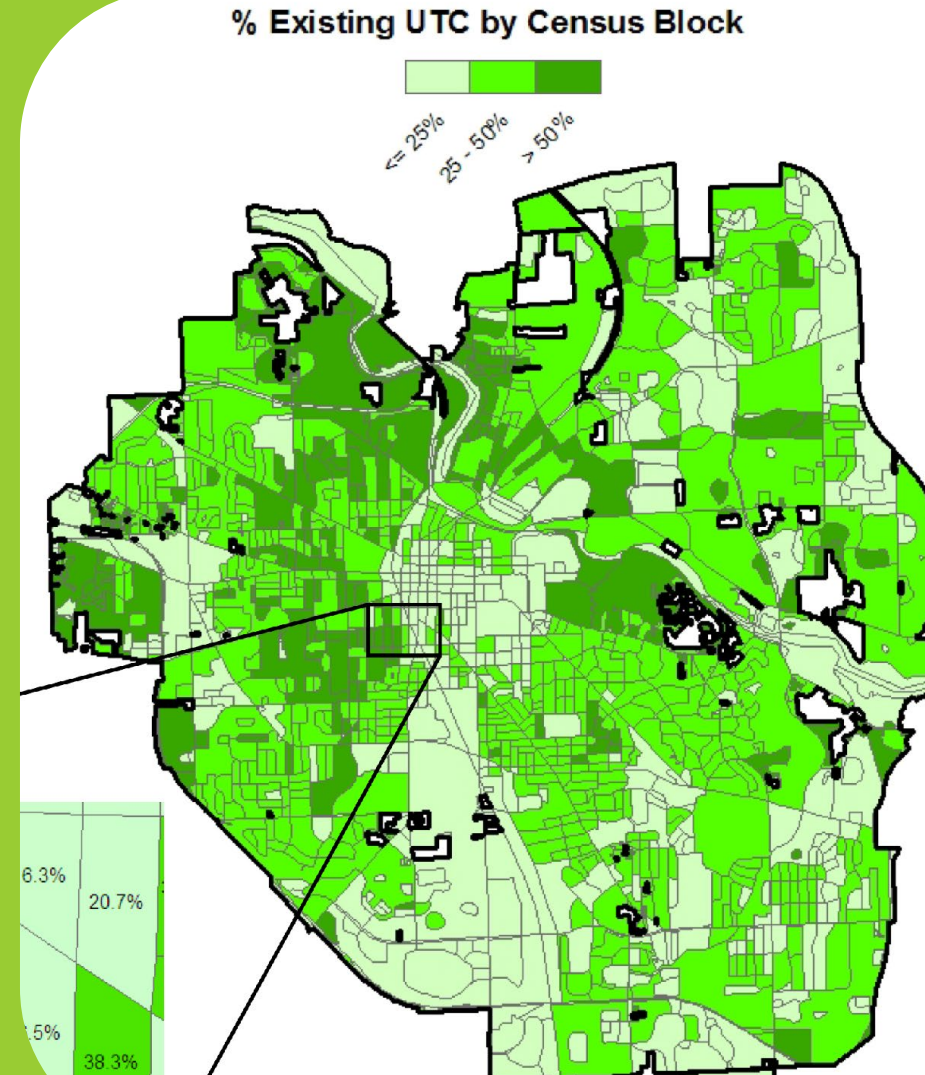
- Near the beginning of the twentieth century, much of Ann Arbor's land, including most of the land outside of the downtown area, is farmland.
- Over the next few decades, almost all agricultural land within the city is converted to neighborhoods and parks



**Photo
credits:
Ann Arbor
News**

1940s-2020s: TREE INEQUITY

- As new neighborhoods are developed in Ann Arbor, practices such as redlining result in some having more tree canopy than others
- An urban tree canopy provides many health and economic benefits to residents
- Ann Arbor suffers from tree inequity, where some residents and areas have less access to these benefits than others



Urban tree
canopy by
census block
Ann Arbor
UTC
Assessment,
2010

WHY DOES TREE EQUITY MATTER?

Trees:

- Provide air and water quality benefits
- Reduce summertime temperature in urban areas
- Mitigate flooding risk
- Create habitat for insects, birds, and other beneficial organisms
- Provide human health benefits
- Reduce energy costs for communities



2020: THE A²ZERO PLAN



- Adopted on June 1, 2020, A²ZERO is the City of Ann Arbor's plan for achieving a just transition to community-wide carbon neutrality by 2030
- Strategy 6: "Enhance the Resilience of Our People and Our Place", sets a goal of planting 10,000 new trees on private property by 2030
 - This goal was reached in 2024!



TODAY



- The City is continuing to grow and support our urban tree canopy and to care for our natural spaces
- Fall Coupon Codes Program - we provide discounts for city residents to purchase native trees from Washtenaw County Conservation District. Visit the 10K trees website for more details.
- Annual FreeTree Giveaway in April
- Park and Nature Areas stewardship
- If you would like to get involved and volunteer to help trees, please email Sean Reynolds at sreynolds@a2gov.org



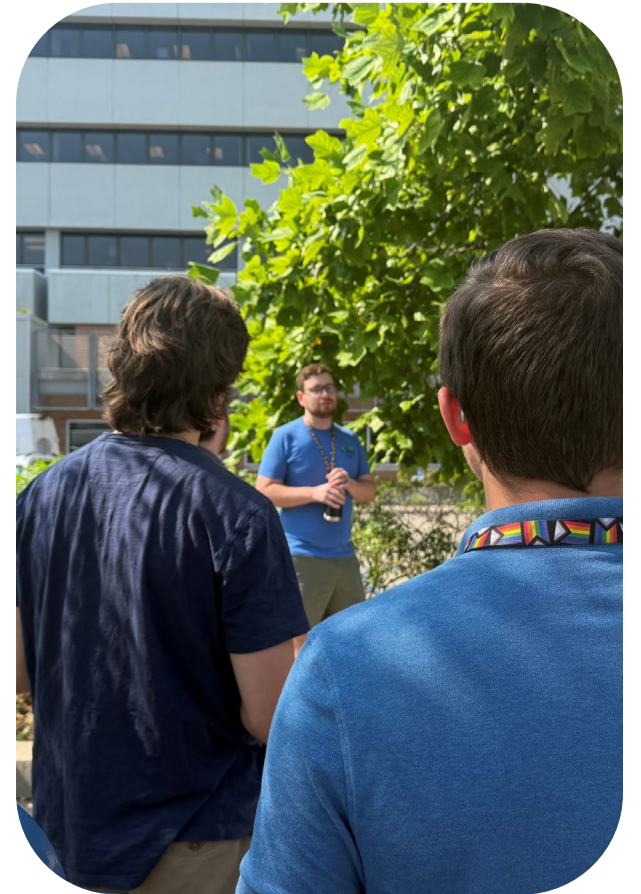


THANK YOU!

Sean Reynolds, Senior Analyst
Annika Moran, AmeriCorps
member

UPCOMING EVENTS

- **October | Threats to Trees + Fall Colors**
 - 10/23, 6-7:30pm, LSNC
- **November | Trees & Art**
 - 11/20, 6-7:30pm, LSNC



POST-EVENT SURVEY



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