

# Manistee County & Little River Band of Ottawa Indians Hazard Mitigation Plan Community Meeting #1

May 19, 2022



**Networks  
Northwest**

Talent / Business / Community

# Introductions

- Networks Northwest - Community Planners
  - Jennifer Neal, AICP
  - Stephanie Loria
- Community Partners
  - Mike Machen, Manistee 911 Deputy  
Director/Emergency Management Coordinator
  - Brandy Martin, LRBOI Tribal Emergency Response  
Team Incident Commander



# Agenda

- Thank you for joining us!
- We will be discussing the following:
  - Purpose of the Natural Hazard Mitigation Plan
  - Your Priority Hazard Concerns
  - Your Community Vulnerabilities
  - Site Specific Hazard Concerns



# Welcome!

**Poll #1** Select the **top 3 natural hazard events/impacts** that concern you in Manistee County/ LRBOI Tribal area

# Potential *Natural* Hazard Events

- **Severe thunderstorms** (*can produce hail, lightning, high winds, flooding, etc.*)
- **Hail**
- **High Winds**
- **Tornado**
- **Lightning**
- **Winter Storm** (*can produce ice, sleet, heavy snowfall, high winds...*)
- **Wildfire**
- **Drought**
- **Coastal hazards** (*erosion, flooding, seiche*)
- **Extreme heat or cold**
- **Excessive Rainfall** causing riverine/urban flooding or erosion
- **Dam Failure**
- **Invasive species** (*can cause damage to forests, crops, native species, etc.*)
- \* **Public health emergency** (*i.e., pandemic; contaminated water supply*)
- \* **Wildlife or zoonotic diseases** (*i.e., Bovine TB, Avian Influenza, Swine Flu*)

*\* These are considered to be biological hazards but will be included in the scope of the plan.*

# Purpose

## Hazard Mitigation Planning

**“The effort to reduce loss of life and property by lessening the impact of disasters”**

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## Billion-Dollar Disasters Shattered U.S. Record in 2020

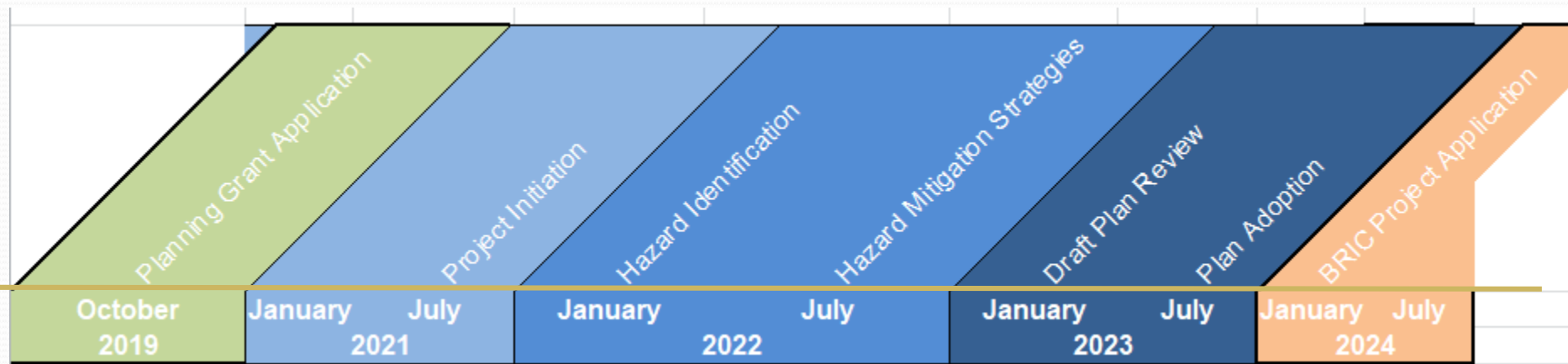
The 22 events that each caused at least \$1 billion in damage show the increasing costs of climate change

By Thomas Frank, E&E News on January 11, 2021



An aerial view of flood waters from Hurricane Delta surrounding structures destroyed by Hurricane Laura on October 10, 2020 in Creole, Louisiana. Credit: Mario Tama Getty Images

# Timeline (2021-2024)

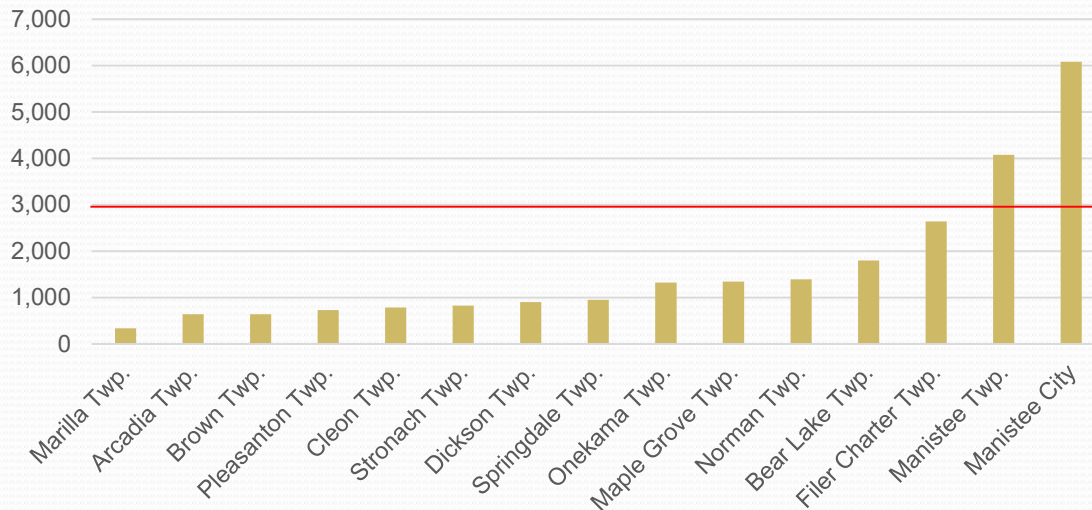


# 2020 FEMA Grant Awards

## Building Resilient Infrastructure & Communities (BRIC) Funding Program

- \$700 million available for FY 2020
- Awards for “economically disadvantaged rural communities”
  - 3,000 or fewer individuals – see local jurisdiction population below

Manistee County Municipalities - 2019 Population Estimates





# 2020 FEMA Grant Awards

## Building Resilient Infrastructure & Communities (BRIC) Funding Program

- Income not to exceed 80% of the national per capita income
- In 2019, US per capita income was \$34,103. 80% = \$27,282
- Manistee County estimated per capita income in 2019 was \$26,668
- 77% of economically disadvantaged rural community applications were awarded in FY 2020

# 2020 FEMA Grant Awards

## Building Resilient Infrastructure and Communities (BRIC) Funding Program

- Awards for Wildfire Mitigation

- To ensure states, local communities, tribes and territories have what they need to respond wildfires and have capacity to address mitigation, there is a renewed focus on building the capability to take advantage of mitigation funding offered by FEMA.
- One project that FEMA selected represents an innovative systems methodology to reduce the risk of catastrophic wildfires. The methodology works simultaneously at large wildland and neighborhood scales to build more resilient communities.
- The total project cost is \$49.3 million. FEMA estimates that 4,103 structures will opt into the defensible program that provides cost-share to property owners to implement defensible space and ignition resistant construction activities.
- The project would also fund hazardous fuels reduction activities across 5,410 acres within three proposed project areas. The number of structures protected by hazardous fuels reduction activities is estimated to be 6,498.

# Priority Areas from 2015 HM Plan

Table 2: Priority Areas for Manistee County

Natural Hazards Mitigation Priority Areas	
<b>Priority Area 1:</b> Flood prevention and dam infrastructure - Countywide affecting localized areas	
Mitigation Strategies: <i>Flood</i>	
<b>Priority Area 2:</b> Potential wildfire concerns - Countywide	
Mitigation Strategies: <i>Wildfire</i>	
<b>Priority Area 3:</b> Severe Winter Weather (Heavy snow, Extreme temperatures) - Countywide	
Mitigation Strategies: <i>Snow and Ice</i>	
<b>Priority Area 4:</b> Lake Michigan Coastal Erosion Areas – Coastal communities	
Mitigation Strategies: <i>Landslide and Debris Flow</i>	

# Presidential and Governor Declared Emergencies/Disasters

Date	Type of Incident	Affected Area	Type of Declaration/Federal ID #	Notes
March 2020	COVID-19; COVID-19 Pandemic	Statewide & National	State of Emergency, National Emergency (3455), and Governor and Presidential Declared Major Disaster (4494)	
1/29/2019	Extreme Cold	Statewide	Governor Declared Emergency	
7/7/2008, 7/14/2008	Severe Thunderstorms, Winds, Flooding	Allegan, Barry, Eaton, Ingham, Lake, <b>Manistee</b> , Mason, Missaukee, Osceola, Ottawa, and Wexford Counties.	Governor Declared Major Disaster and Presidential Declared Major Disaster (1777)	Damages to roads; per capita impact for Manistee County: \$221.71
6/19/2008	Thunderstorms	Lake, <b>Manistee</b> , Osceola, Ottawa, and Wexford Counties	Governor Declared Emergency	
9/4/2005 and 9/7/2005	Hurricane (Katrina) Evacuation	Statewide	Governor Declared Disaster and Presidential Declared Emergency (3225)	Declared due to the emergency conditions in the State of Michigan, resulting from the influx of evacuees from states impacted by Hurricane Katrina beginning on August 29, 2005.
9/10-19/1986, 10/28/1986	Flooding, heavy rain	<b>Manistee</b> was one of many counties affected	Governor Declared Disaster and Presidential Declared Major Disaster (774)	
1/26-27/1978	Blizzard, Snowstorm	Statewide	Presidential Declared Emergency (3057); Governor Declared Disaster	
3/2/1977	Drought	44 Counties, including Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, <b>Manistee</b> , Missaukee, Otsego, Roscommon and Wexford.	Presidential Declared Emergency (3035)	
4/5/1956	Tornado	Benzie, Leelanau, <b>Manistee</b> and Ottawa Co.	Presidential Declared Major Disaster (53)	

# Historic Natural Hazard Events

- Sources: NOAA Storm Database and FEMA's records of Presidential- and Governor-Declared Emergencies or Disasters

Frequency Rank	Natural Hazard	# of Events	Time Interval/ Year Event Recorded
1	Thunderstorms with Wind / High Wind	46 / 9	1997-2021
2	Extreme Winter Weather (includes extreme cold events)	31	1978; 1997-2019
3	Hail	30	1998-2021
4	Flood/Flash Flood	11	1986; 2000-2019
5	Lakeshore Flood	4	2019-2020
6	Tornado	2	1956, 2008
	Extreme Heat	2	2001, 2018
	Lightning	2	2000, 2016
	Drought	2	1977, 2001
7	Rip Current	1	2007
	Dense Fog	1	2010
	Pandemic	1	2020

# Manistee/LRBOI Community Survey Responses

What type of natural hazard events are likely to have the largest impact on your community, for example fire, flood, drought, illness outbreak, etc.?

## Manistee County HM Survey

1. High Winds
2. Flooding/Heavy Rain
3. Illness Outbreak/Future Pandemic; Wildfire
4. High Lake Water Levels
5. Heavy Snowfall/Winter Storm/Ice/Blizzard
6. Drought/Loss of Water to Wells
7. Power Outage; Storms/High Intensity Storms
8. Dam Failure
9. Tornado; Pollution of waterways; Storm drain collapse; Extreme heat and cold events; Lightning

## LRBOI HM Survey

1. Pandemic/Illness Outbreak; Lack of outbreak resources; Disease
2. Flooding; Wildfire
3. Snowstorms/Winter storms/Blizzard
4. Large/Major Storm/Severe Weather Storms
5. High Winds; Tornado
6. Drought; Dam Failure; Power Outages
7. Extreme seiche; Thunderstorms; Unintentional destruction of natural medicines and/or endangered plants/trees; Water contamination; Air pollution

# Manistee/LRBOI Community Survey Responses

Does your community have concerns about infrastructure (dams, bridges, utilities, etc.) and the potential for a hazardous event in the future?

## Manistee County

### SHORELINE

- Shoreline erosion; dune erosion that exceeds normal historic dune erosion can impact homes and other structures that are close to Lake Michigan.
- High wind events can result in shoreline flooding and erosion.

### ROADS, BRIDGES AND DAMS

- Aging infrastructure, such as sewers, roads, bridges etc.; road washouts (City of Manistee)
- Hodenpyl Dam or Tippy Dam failure; if the bridges over the Manistee River failed
- Flooding events in combination with erratic weather patterns tied to storms can impact dams and bridges, culverts (particularly those that are improperly sized based on current specifications), and homes.
- Roads and boat ramp areas (Brown Twp.)

### UTILITIES

- High wind events can impact trees, utilities and communication.
- Without electric service, the Blacker Airport can't operate
- The biggest issues would be related to power outages due primarily to high winds, which would affect the operation of our water and sewer infrastructure. (Filer Twp.)
- Would like broadband services. We are greatly underserved. (Marilla Twp.)
- Electric and telephone utilities. (Norman Twp.)
- Flood impacting septic systems surrounding the lake (Onkama Twp.)
- Heavy rainfalls can exceed capacity of storm water systems and our sanitary sewers can be impacted by illicit connections (City of Manistee)

## LRBOI

### ROADS, BRIDGES AND DAMS

- Undersized bridges and culverts. Many of the County's drainage systems have been impacted in recent years with flash flooding.
- Manistee's two draw bridges may be damaged during a severe storm. Traffic needs to flow through those two areas.
- LRBOI is downstream of the Hodenpyl and Tippy dams. They are aging. Failure of these dams would cause widespread flooding.
- Infrastructure in some areas is getting old, is not designed for climate change, and is not as strong as it should be, or updated. Maintenance is occurring in some areas now, but it is an ongoing process.
- Concern about roadways flooding
- Repair of roads and bridges used by vehicles and railcars.

### UTILITIES

- City sewer system is inadequate
- Storms causing loss of power at sewage lift stations – leads to drinking water contamination/disease risk. Back-up generators are a good idea.

### MISC

- County doesn't work with the Tribe to address sewage dumping in the lake, deforestation, and erosion; road dam and bridge repairs
- No annual infrastructure assessments or inspections done on our roofs, windows, etc.
- ❖ The Tribe works with Cons. Energy on [planning/prevention of a] dam failure or flood as most of the community would be flooded should this happen
- ❖ The Tribe has processes in place for utility disasters, vulnerability assessment, water and sewer issues.



# Drought

- Definition: Drought is a consequence of a natural reduction in the amount of expected precipitation over an extended period of time, usually a season or more in length.
- There has been 1 major drought - in 1977 (Presidential Declared Emergency) and 1 recorded as a major weather event with NOAA in 2001. These were both regional events.
- According to the Community Survey results
  - Concerns about drought ranked #6 out (of 7 or 9) types of natural hazards that would have the largest impact on the community



# Historic Drought Monitor

April 2000-March 2021

Manistee County (MI) Percent Area in U.S. Drought Monitor Categories



Export Graph

# Drought – Key Issues

## **Agricultural Production Losses**

The primary direct economic impact of drought in the agricultural sector is crop failure and pasture losses. These costs are often passed on to consumers through increased prices and/or they may be offset through government disaster assistance programs. Indirect impacts of drought in the sector can include reduced supplies to downstream industries, such as food processors, and reduced demand for inputs, such as fertilizer and farm labor. The non-market impacts of production losses include mental health strain on farmers.

## **Pests and Diseases**

Drought, coupled with high temperatures, may expand the distribution and incidence of pests and diseases that affect crops, forage, and livestock.

## **Decreased Water Availability for Agriculture**

The depletion of water availability in soils causes significant declines in crops and livestock productivity. In addition, surface and groundwater supplies may decline during drought, affecting water availability and increasing costs to access water for crop or forage irrigation and watering livestock. With a return to normal precipitation, soil moisture typically recovers long before surface and groundwater supplies are replenished.

## **Specialty Crops**

Most specialty crops (such as fruits, vegetables, tree nuts, and medicinal herbs) are more vulnerable to drought than field crops and have a higher value per unit of land/water. They may therefore represent a higher risk for experiencing economic loss in drought if the crop water demand exceeds water supply.

# Wildfire

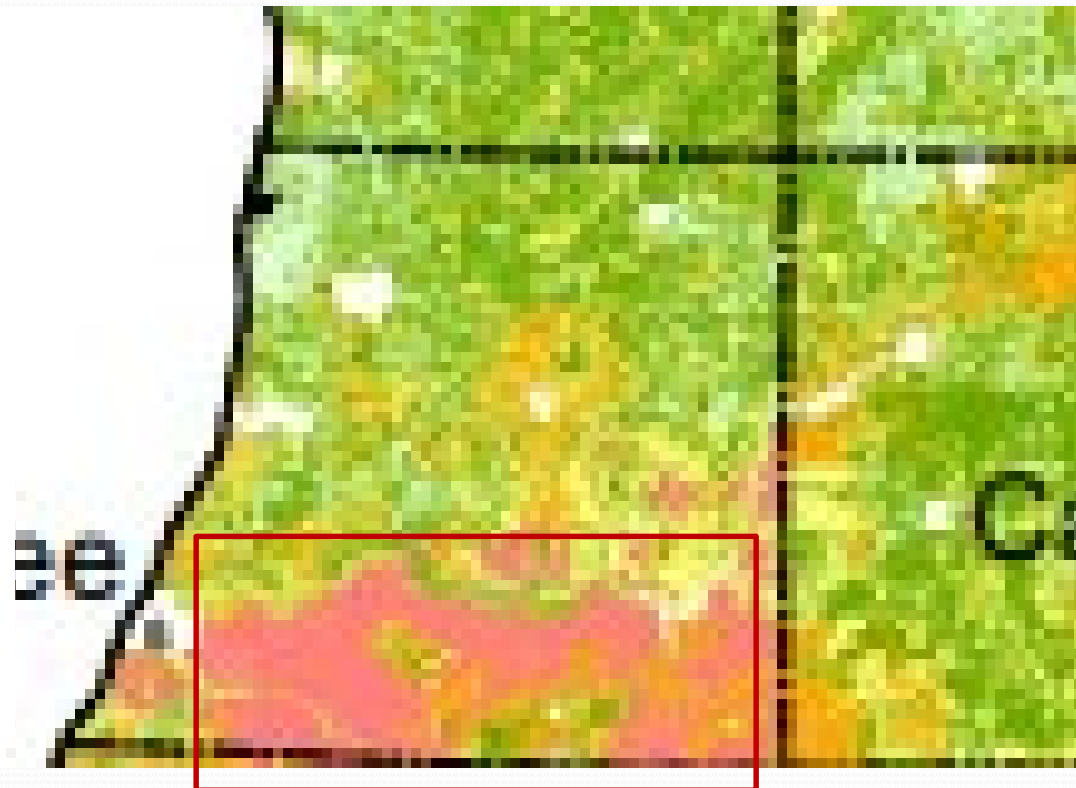
- A wildfire is an **unplanned, uncontrolled fire** in grassland, brushland, or forested areas.
- **54 wildfires** occurred on lands **under MDNR jurisdiction** within Manistee County **from 1981-2018**, resulting in **1,071 acres burned**.
- The Manistee National Forest, managed by the US Forest Service, occupies much of the southern portion of the county.
- According to USFS records of wildfires within Manistee County **between April 30, 1992 and July 3, 2018**, a total of **255 wildfires** occurred on lands classified as either State land/private land or USFS land.
- This equates to an **average of 9.8 fires and 53.48 acres of land burned per year** in the county.
- The largest fire on record was in 2003 on Warfield Road, burning 764 acres.

# Wildfire Risk

## Legend

-  Cities
-  County Boundaries
- Fire Risk w/ Dry Soils**
-  No Risk
-  Low Risk
-  Moderate Risk
-  High Risk
-  Very High Risk
-  Extreme Risk

Data includes Land Cover Type, Canopy Cover, Township Scaled Fire Risk, and Dry Soil types from SSURGO Soils data.



Source: Wildfire Risk Map - MDNR Forest Resources Division

# Small Group Discussions

- What is the potential for each hazard to affect your **population, infrastructure, environment or economy?**
- Please answer this question for the following hazards
  1. **Severe Thunderstorm/ Wind Storm** – wind, tornado, hail, lightning, excessive rainfall, seiche
  2. **Winter Weather** – wind, ice, heavy snow, extreme cold
  3. **Extreme heat and drought**
- Spend **5-7 minutes** discussing each hazard



# Vulnerabilities in Your Community

**People**

**Economy**

**Built  
Environment**

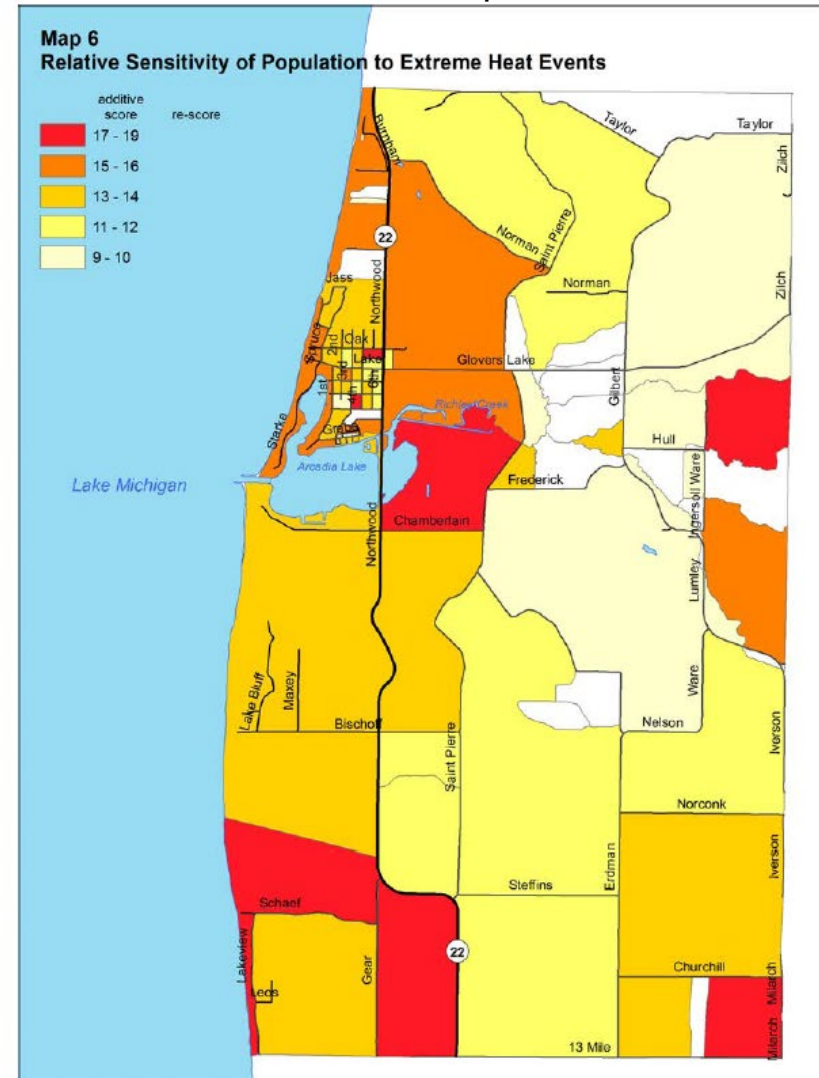
**Natural  
Environment**

# Vulnerable Populations

## LIAA's NW MI Coastal Resilience Atlas – Heat Vulnerability Assessment

- Vulnerability = Exposure to the hazard (tree canopy and impervious surface) + Sensitivity
- Population Characteristics of Sensitivity:
  - Persons > age 65
  - Persons living alone
  - Minority (non-white) persons
  - Persons living below the poverty threshold
  - People > age 25 with less than a high school education
  - Disability status (i.e., ambulatory difficulty, mental disability)

Arcadia Twp.





# Vulnerable Populations

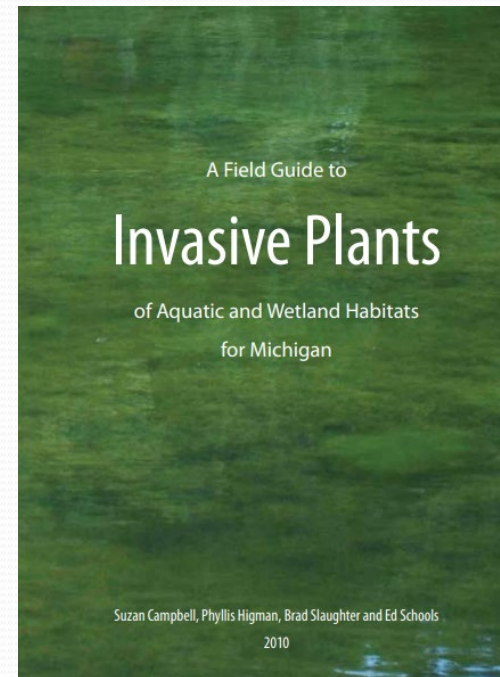
## Full Group Discussion

- Who are your primary vulnerable populations?
- Where are they located?
- What mechanisms are in place to aid these populations in the event of a natural hazard?



# Invasive Species

- An invasive is a species that is **non-native to the ecosystem** under consideration AND whose introduction causes or is likely to **cause economic or environmental harm, or harm to human health**.
- Invasive species can be **plants, animals and other organisms (e.g., microbes)**, and be categorized as **aquatic or terrestrial**
- Only a small fraction of non-native plants are invasive



# Invasive Species



Baby's breath



Japanese and common barberry



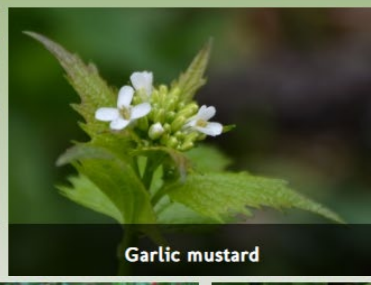
Blue lyme grass



Glossy and common buckthorn



Callery/Bradford/Cleveland Pear



Garlic mustard



Invasive honeysuckles



\*Knotweeds



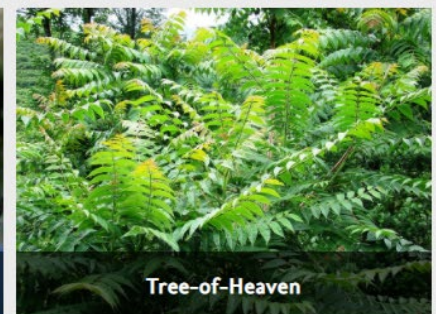
Invasive bittersweet



\*Invasive Phragmites



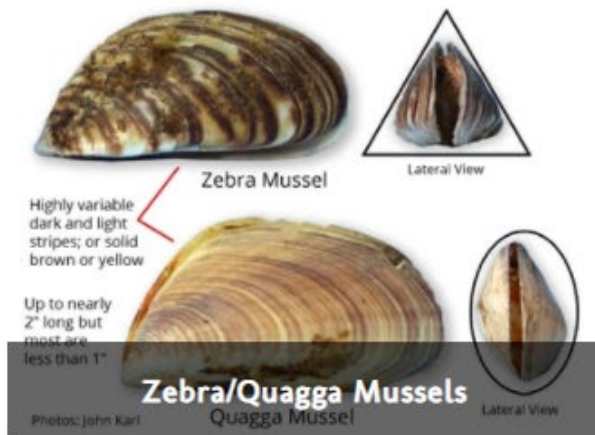
\*Purple loosestrife



Tree-of-Heaven



# Invasive Species





# Invasive Species – Full Group Discussion

- What are your **greatest concerns** pertaining to **invasive species**?
  - Impacts to forests, rivers, inland lakes, agriculture, etc.

# Pandemic Experiences – Full Group

- From a hazard mitigation perspective, what **lessons did the community learn** from the pandemic?
- What **shortcomings** did the community experience in its ability to mitigate the effects of the pandemic?
- What **successes** did the community have?



# County Wetlands

Map View [Search Tools](#) [Share](#)

Map Legend [Base Maps](#) [About](#)

## Map Legend

Change what items you see on the map by using the checkboxes

### Wetland Data

☐ Wetland (Hydric) Soils

☐ National Wetlands Inventory 2005

### Potential Wetland Restoration

☐ Highest Potential - Hydric and

Presettlement Wetland Overlay

☐ High Potential - Hydric Soils Only

☐ Moderate Potential - Presettlement

Wetlands Only

### Part 303 Final Wetlands Inventory



☐ Wetlands as identified on NWI and

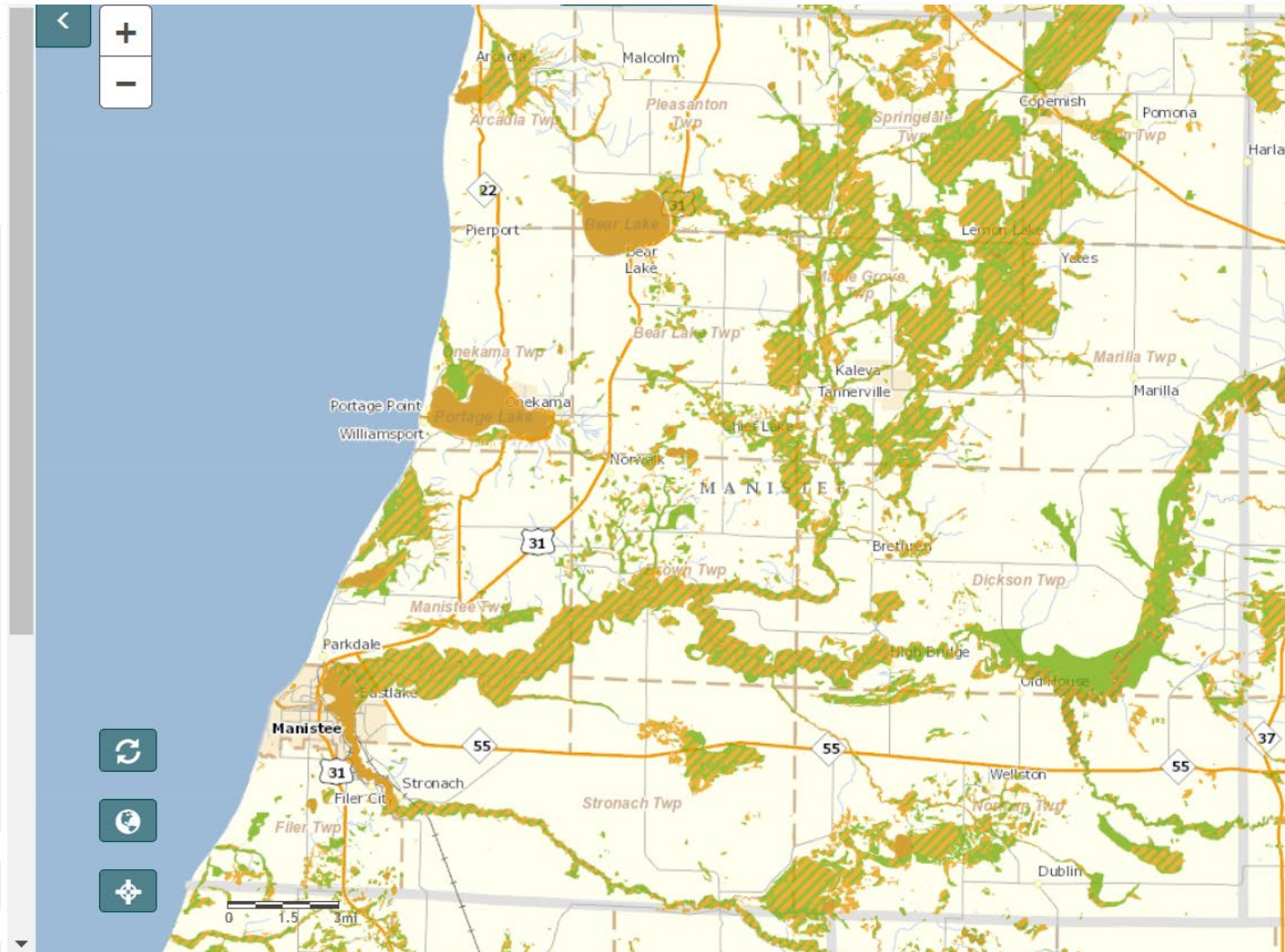
MIRIS maps

☐ Soil areas which include wetland soils

☐ Wetlands as identified on NWI and

MIRIS maps and soil areas which include wetland soils

### Stream Data



# Manistee County Dams –

Listed on the National Inventory of Dams

## 5 Dam(s) Found

### Tippy

Hazard Potential Classification: High  
Emergency Action Plan: Yes  
Owner Name: Consumers Energy Company  
Primary Purpose: Recreation

### Stronach Dam

Hazard Potential Classification: Low  
Emergency Action Plan: Not Required  
Owner Name: Consumers Energy  
Primary Purpose: Recreation

### Peters Bayou Dam

Hazard Potential Classification: Low  
Emergency Action Plan: Not Required  
Owner Name: MDNR Wildlife  
Primary Purpose: Other

### Copemish Dam

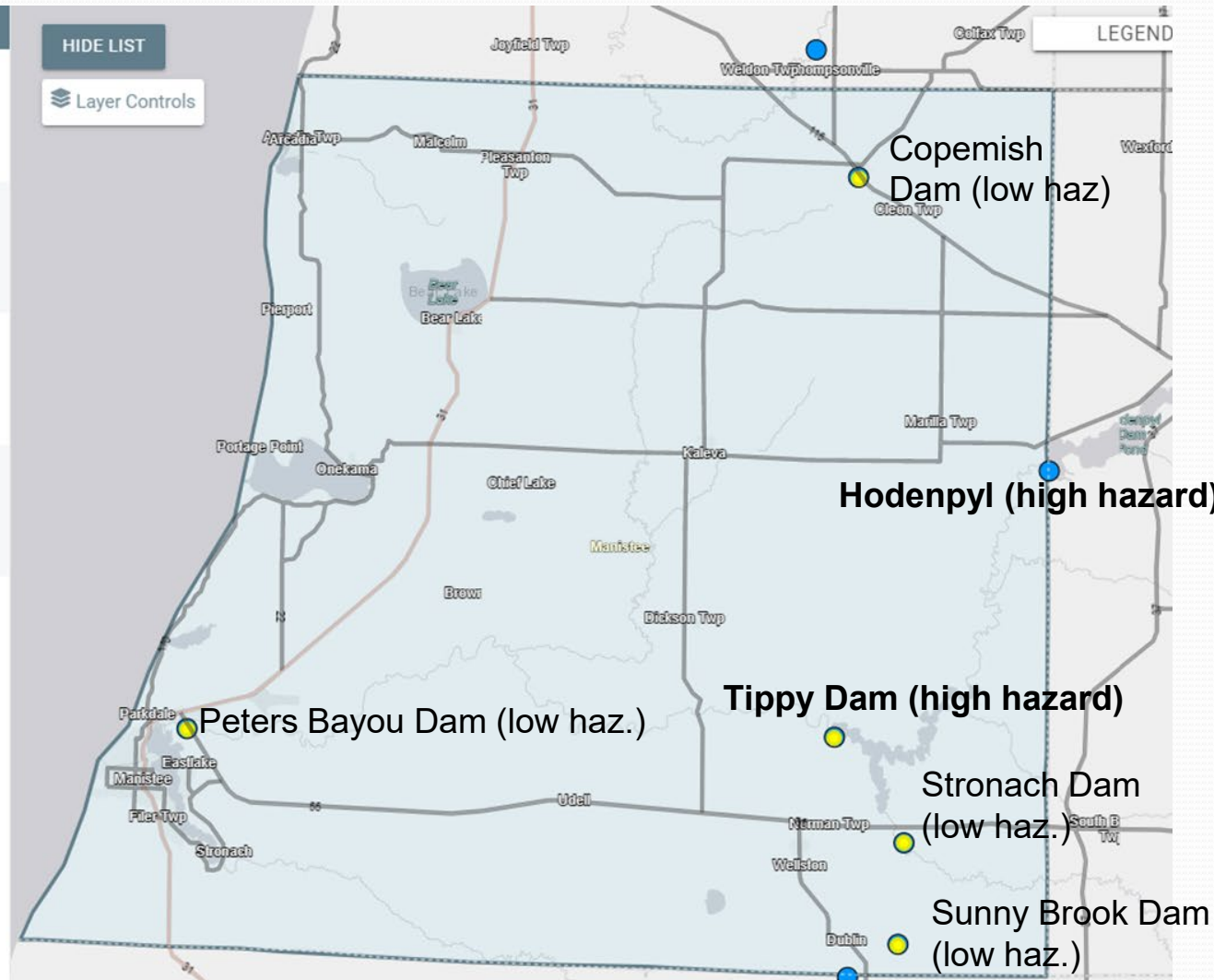
Hazard Potential Classification: Low  
Emergency Action Plan: Not Required  
Owner Name: Village of Copemish  
Primary Purpose: Recreation

### Sunny Brook Dam

Hazard Potential Classification: Low  
Emergency Action Plan: Not Required  
Owner Name: Patrick F. Kelley  
Primary Purpose: Other

HIDE LIST

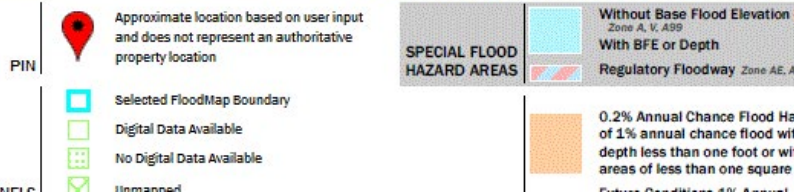
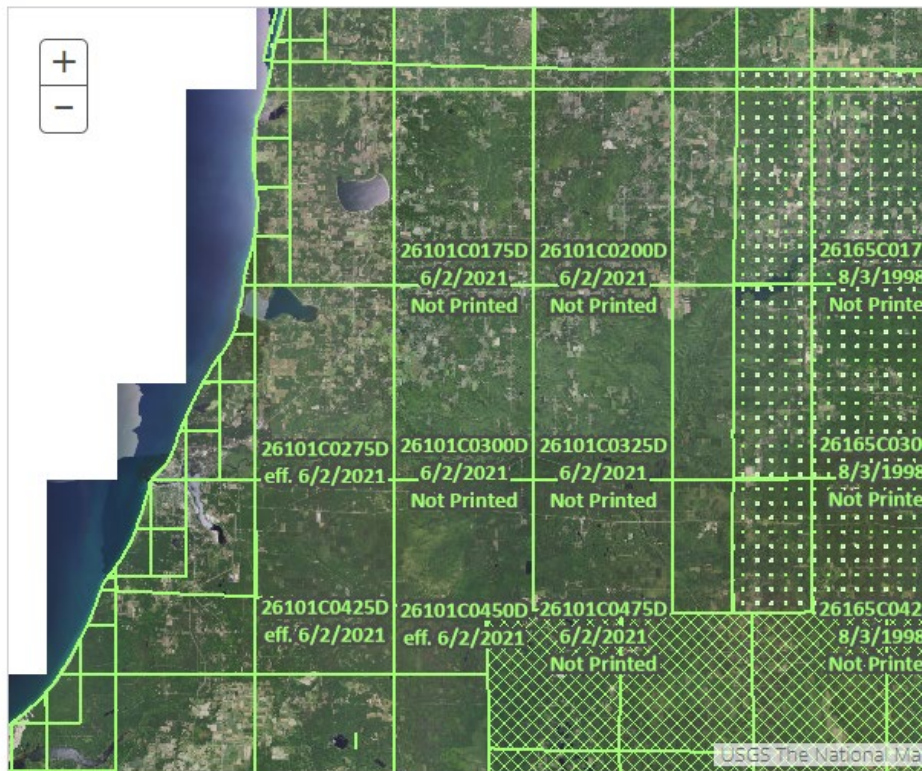
Layer Controls





# NFIP Participating Communities

- National Flood Insurance Program



Community Name	NFIP Participant?	Effective Date
<b>ARCADIA TOWNSHIP</b>	Y	06/02/21
BEAR LAKE TOWNSHIP	N	
BROWN TOWNSHIP	N	
CLEON TOWNSHIP	N	
DICKSON TOWNSHIP	N	
<b>FILER TOWNSHIP</b>	Y	06/02/21
<b>MANISTEE TOWNSHIP</b>	Y	06/02/21
MAPLE GROVE TOWNSHIP	N	
MARILLA TOWNSHIP	N	
NORMAN TOWNSHIP	N	
<b>ONEKAMA TOWNSHIP</b>	Y	06/02/21
PLEASANTON TOWNSHIP	N	
SPRINGDALE TOWNSHIP	N	
<b>STRONACH TOWNSHIP</b>	Y	06/02/21
<b>CITY OF MANISTEE</b>	Y	06/02/21
VILLAGE OF BEAR LAKE	N	
VILLAGE OF COPEMISH	N	
<b>VILLAGE OF EASTLAKE</b>	Y	06/02/21
VILLAGE OF KALEVA	N	
<b>VILLAGE OF ONEKAMA</b>	Y	06/02/21



# NFIP & CRS Participating Communities

- The National Flood Insurance Program
- The NFIP provides flood insurance to property owners, renters and businesses, and having this coverage helps them recover faster when floodwaters recede. The NFIP works with communities required to adopt and enforce floodplain management regulations that help mitigate flooding effects.
- The Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP

# Coastal Flooding & Shoreline Erosion



NORTHWEST  
LOWER MICHIGAN

COASTAL  
RESILIENCE  
ATLAS

- **Land Information Access Association (LIAA)** – Traverse City-Based Non-Profit
- **Northwest Lower Michigan Coastal Resilience Atlas**  
[http://www.resilientmichigan.org/nw\\_atlas.asp](http://www.resilientmichigan.org/nw_atlas.asp)
- **MTU Shoreline Mapping**  
<https://portal-geo.sabu.mtu.edu/mtuarcs/apps/webappviewer/index.html?id=d75880obb18e460ab39aa66631051156>

# Coastal Dynamics

- Decadal variability of lake water levels – Record highs in 2020 and 1986
- Wave Energy and Height
  - Erosion
  - Changing conditions
- Climate change on the Great Lakes
  - Increased precipitation events and storminess
  - Water temperature increasing

# Coastal Dynamics

## Manistee County





# Coastal Recession

[http://www.resilientmichigan.org/nw\\_atlas.asp](http://www.resilientmichigan.org/nw_atlas.asp)

## BLUFF RECESSION DETAIL

At least one "zoomed in" detail example of historic bluffline recession and future projections is provided at the beginning of each county section of this chapter. Shoreline and bluffline recession data can be viewed in greater detail online at <http://geospatialresearch.mtu.edu/czmp>.



Bluff Detail, Panel 200, Onkama Twp.



Shoreline  
1938

Bluffline 1938

Bluffline 2016

Predicted 30  
yr bluff

# Coastal Flooding



- Lucky Flooding Scenario
- Expected Flooding Scenario
- Perfect Storm Flooding Scenario



# Pros and Cons of Short-Term Coastal Mitigation Options

	<b>Armor</b>	<b>Nourish</b>	<b>Relocate</b>
<b>Pros</b>	Slows erosional processes	Slows erosional processes	Conserve natural Public Trust beach and shoreline
<b>Cons</b>	Loss of natural shoreline and Public Trust beach; damage to neighboring shoreline	Short-term solution (e.g. one storm may destroy the investment)	Cost of relocation, loss of land
<b>Owner's Interest</b>	Safeguarding infrastructure prioritized over the cost of armor, loss of Public Trust beach, and damage elsewhere	Safeguarding property and structures prioritized over cost and feasibility	Preservation of infrastructure and natural shoreline prioritized over cost of relocation
<b>Public Interest</b>	Owner's interest prioritized over loss of natural beach and potential future public cost of cleanup when armor fails	Safeguarding property and structures prioritized over cost and feasibility	Preservation of natural beach prioritized over cost of relocation and loss of land

# Mapping Activity

- We will screen-share a map of the county and mark the following based on your input:
  - **Shoreline hazards (purple marker)**
    - Coastal erosion/subsidence
    - Seiche impact locations
    - Rip currents, fog
  - **Riverine and urban flooding (blue marker)**
    - Potential for dam failure
    - Locations where floods have occurred in the past
    - Locations where floods have a higher probability of occurring
  - **Wildfires (red marker)**
    - Locations where wildfires have occurred in the past
    - Locations where wildfires have a higher probability of occurring



# Before you go!

- **Complete the Short Survey and In-Kind Form!**

- See link in the Chat Box.

<https://www.surveymonkey.com/r/MVKQ38M>

- Complete the *two questions* and then download, fill out and then upload the *in-kind form* through the survey link!

- **NEXT STEPS:**

- Hazard Analysis / Prioritization
- Mitigation Goals
- Mitigation Strategies