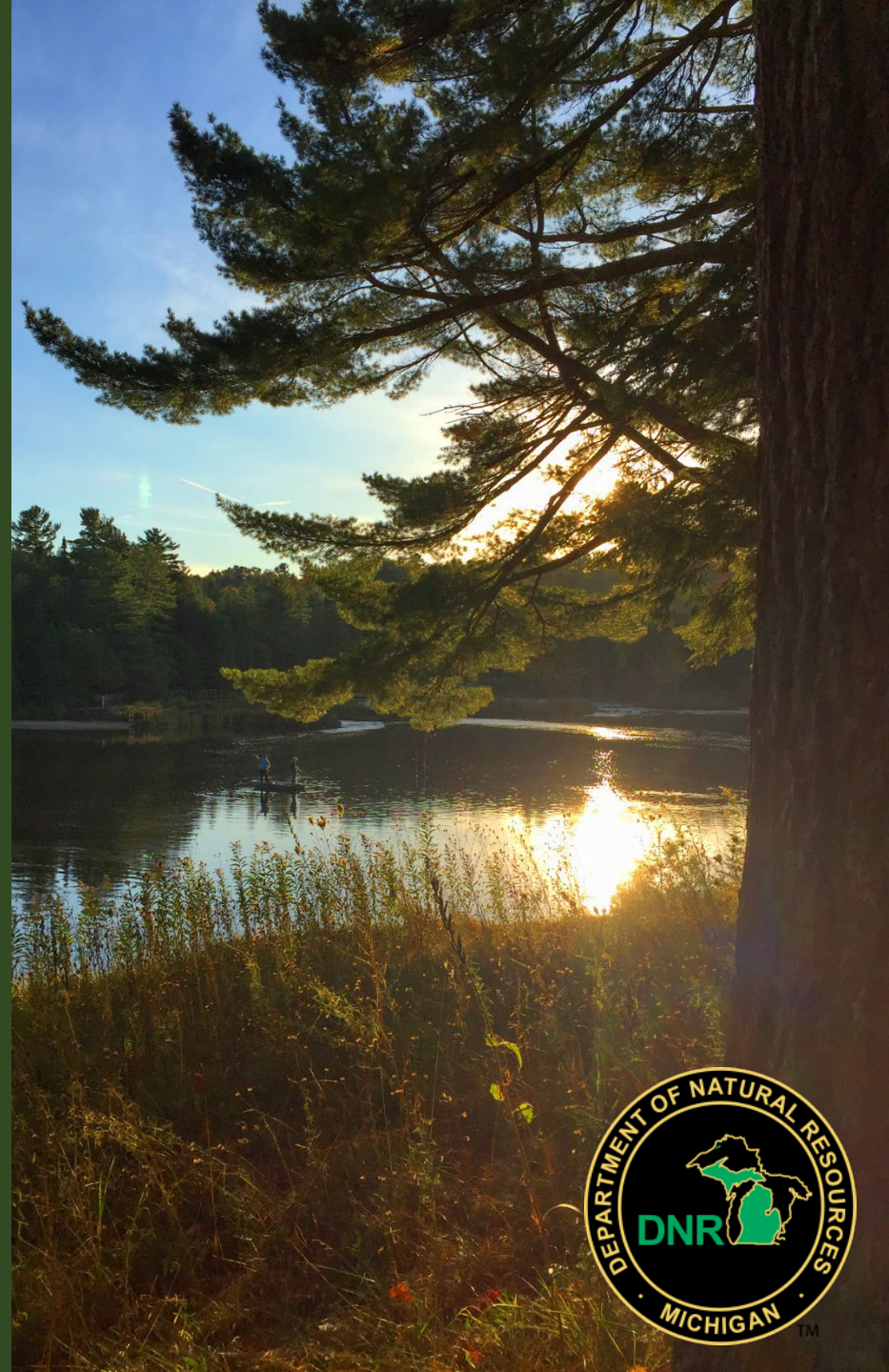


NRC Fish Disease Update

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February 2019



When Do Fish Diseases Show Up in the Public's Eye



Fish Pathogen Backdrop

- Broad range of pathogens – 1000s+
- Water moves pathogens
- Fish pathogens do not affect humans, except parasites
- Vectors – Live infected fish the best
- Each group of species or individual species has their own pathogens
- Intervention sometimes possible - hatcheries
- Effects are economic



Current Fish Pathogens in the News

- **Largemouth Bass virus (LMBv)**
- **Epizootic Epitheliotropic Disease virus (EEDv)**
- **Viral Hemorrhagic Septicemia virus (VHSV)**
- Biggest killer of fish are bacterial infections
 - **Flavobacteria** – CWD and BGD
 - **Aeromonids** - Furunculosis



VHSv – RNA Rhabdovirus



- Kills by internal bleeding and immune depression
- Invasive pathogen - Maritime Region of Canada (IVb) – Arrived about 2000 – Bulk shipping?
- Found in the Great Lakes but only in a few inland waters with a broad species range
- Causing nearly annual mortalities in Lake St. Clair
 - Mostly Gizzard Shad



EEDv – DNA Salmonid Herpesvirus 3



- Specific to Lake Trout
- Native virus?
 - Found in Lakes Superior, Michigan and Huron
- Destroys the skin and eye tissue
- Causes large mortalities in hatcheries
 - Stress mediated disease
 - Water temperatures above 50F and turbid
- Epizootic events at MSFH in the 1980s, 2012, and 2017-2019
 - Estimated hatchery losses since 2012 are \$370K



LMBv – DNA Ranavirus

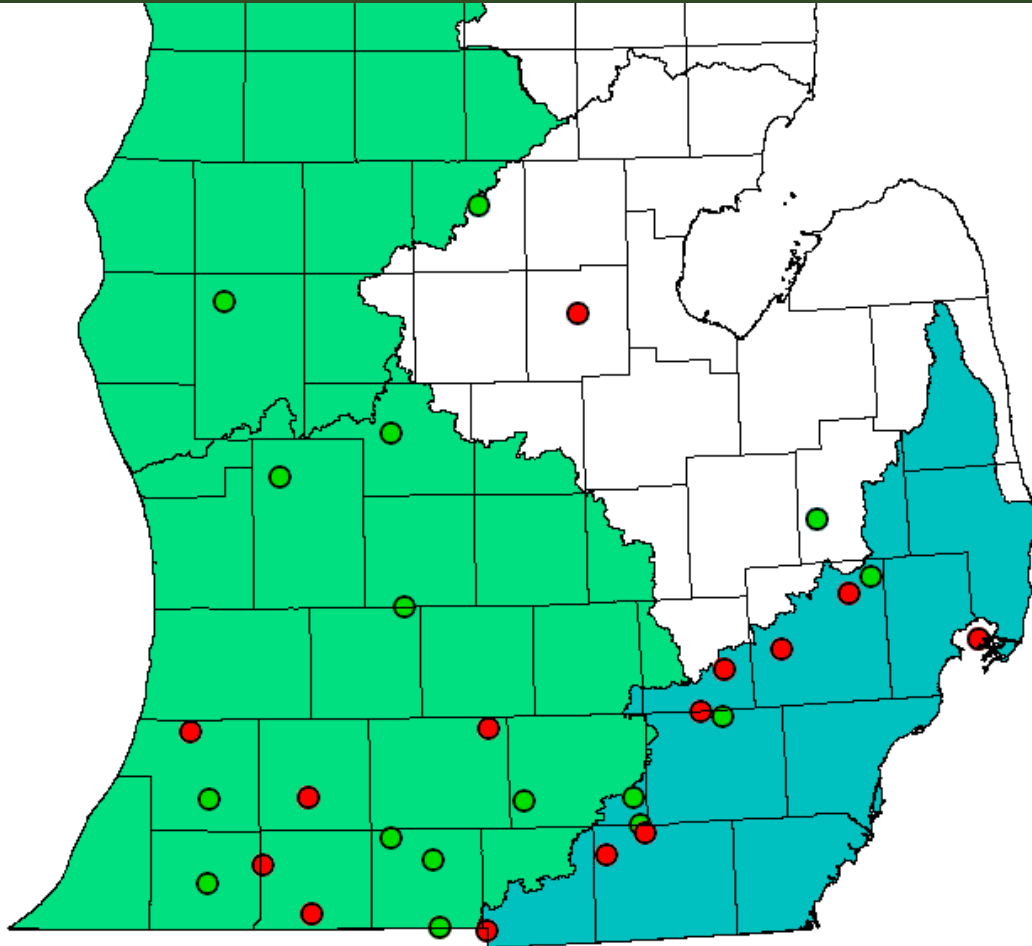


- Invasive virus from the Southern US about 2000
 - Live fish transfer is the likely vector
- Usually kills 10-20% of adult Largemouth Bass by causing internal bleeding with population recovery in a few years
- Largemouth Bass
 - No external signs with lethargic fish on surface
- Nearly all bass and panfish species can be carriers
- Disease triggers
 - Hot, dry conditions
 - Stressor events
 - Heavy angler pressure and tournaments
 - Weed treatments



LMBv – Presence 2001-2004

15 of 30 lakes positive

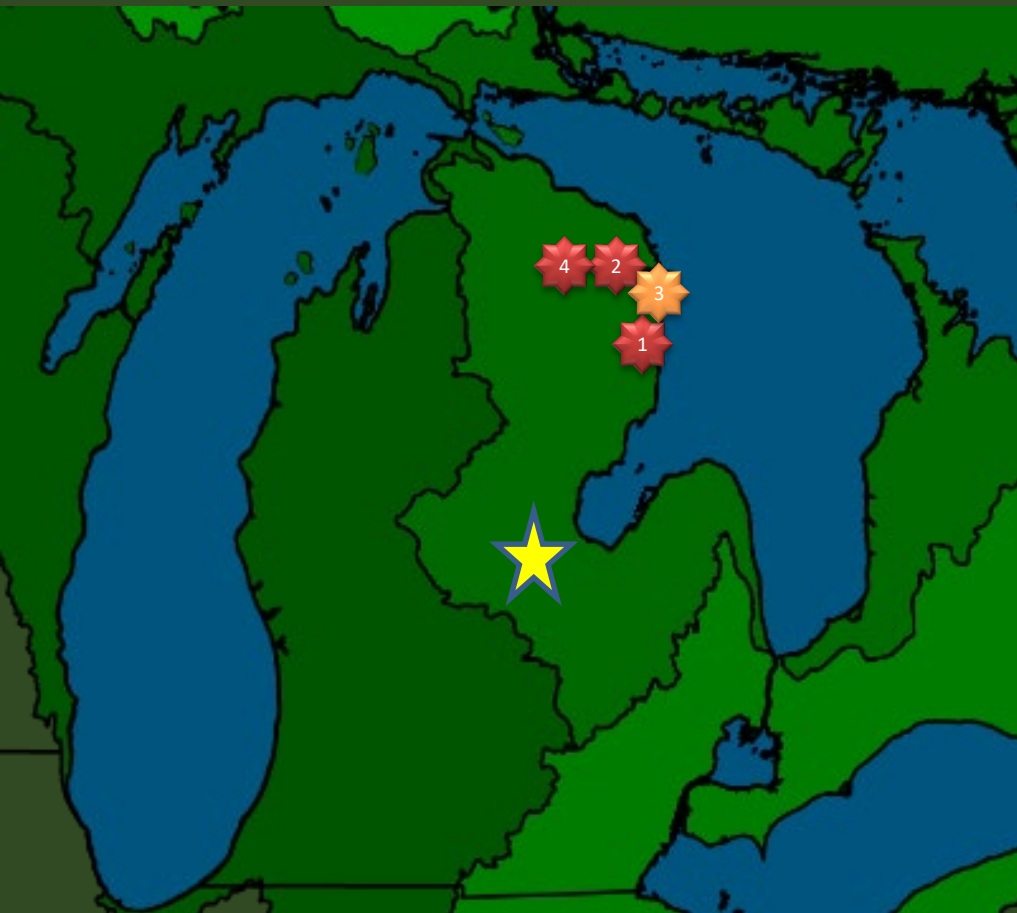


LMBv 2018

- In August – Sept 2018, adult Smallmouth Bass mortalities with large external lesions
 - NE LP – Cedar, Beaver and Avalon Lakes
 - Other work indicates potential recruitment issues



LMBv Infections 2018



LMBv positive

- 1 Cedar Lake - LMB
Iosco/Alcona counties, MI
- 2 Beaver Lake - SMB
Alpena county, MI
- 4 Lake Avalon - SMB
Montmorency county,
MI

LMBv negative

- 3 Lake Huron - SMB
Thunder Bay, MI



Angler and Public Assistance

- Clean your equipment and boats
- **Do not move live fish or water between lakes**
- Reduce fishing during stressful periods
- Do not hold fish for long periods in live wells if they are going to be released
- Report mortalities of over 25 fish
 - Michigan.gov/Eyesinthefield



Questions or Comments

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