

Temperature-triggered fishing regulations for salmonids – An evaluation for Michigan streams

Gary Whelan
Fisheries Division
March 2023 NRC Meeting



Fisheries Division Staff

- Tracy Claramunt
- Neal Godby
- Jan-Michael Hessenauer
- Seth Herbst
- Heather Hettinger
- Darren Kramer
- Kevin Wehrly
- Todd Wills
- Troy Zorn



Talk Outline

- Issue definition
- Salmonid biology
- How other states are dealing with temperature issues
- Angling effort
- Implications for Michigan waters
- Challenges for implementation



Issue Definition

- Catch and release angling for salmonids is a large component of the angling experience.
 - Concerns with hooking and handling mortality during hot periods.
- Climate change concerns
 - Forecast climate will continue to increase the summer temperatures and stress on salmonid resources.



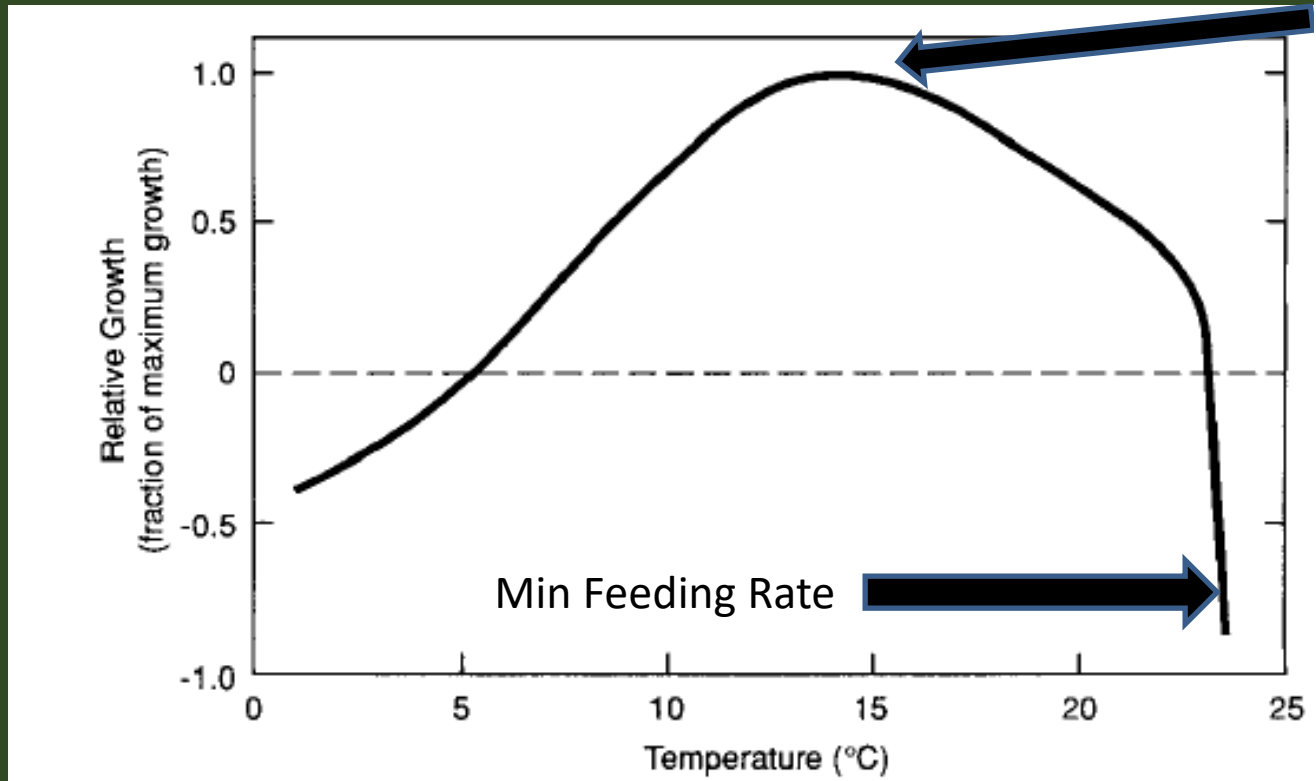
Salmonid Temperature Biology

- Lethal temperatures
 - Brown Trout – 77-86 F
 - Brook Trout – 75-82 F
 - Rainbow Trout – 79-86 F
- Metabolic Activity
 - Optimum Temperature
 - Brown Trout – 54-66 F
 - Brook Trout – 55-61 F
 - Rainbow Trout – 63-66 F

Data from Cherry et al. 1977, Wismer and Christie 1987, and Elliott 2010



Salmonid Growth and Feeding at Temperature



Max Feeding Rate

Min Feeding Rate

Rainbow Trout relative growth at temperature (Railsback and Rose 1999)



Do other states have temperature-triggered regulations?



State Survey

- Surveyed all fisheries chiefs in the US in January 2022
- 10 questions
 - Do you have temperature triggered regulations or restrictions for trout fishing
 - How implemented and what criteria used
 - Whose data used
 - Who handles implementation
 - Are the regulations in code or regulation



State Survey Results

- Received responses from 25 states
 - 3 states have specific temperature regulations
 - MT, OR and CO
 - 3 states have or are considering voluntary angling closures
 - CO, CA and NY
 - CT closes thermal refuges on the Housatonic, Naugatuck, and Salmon Rivers seasonally from June 15-September 15 to protect concentrated salmonids from overharvest and to reduce stress.
 - Fishing regulations/orders for Special Management Areas
 - Very localized



MT Regulation Details

- Regulation – “Hoot Owl Regulations” - Waters closed to fishing from 2 PM to 12 AM
- Criteria
 - 73F maximum temperature for 3 consecutive days for most streams
 - 70F maximum temperature for 3 consecutive days for systems with Bull Trout (*Salvelinus confluentus*)
 - Temperature criteria based on a few published studies
 - We conducted a broad literature search of over 60 publications and no definitive criteria were found

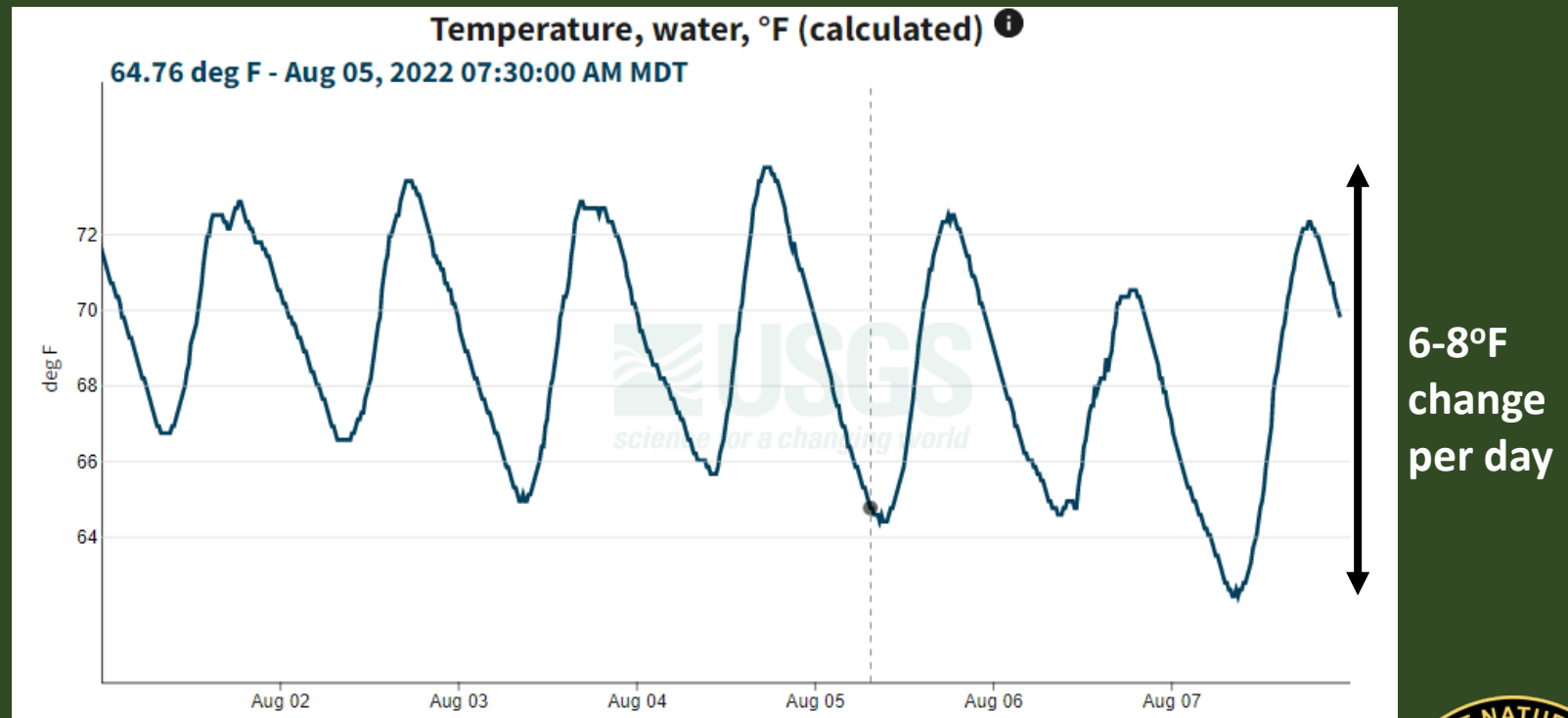


MT Regulation Details

- Where and for how long
 - Usually done for entire river systems or segments
 - Notification online and in press
 - Once implemented, in place until the fall
- Data from USGS, watershed groups, conservation districts and NGOs
- A broad range of staff are involved
- Regulations are currently under review



Bitterroot River near Missoula MT



An example of the diurnal temperature information used to put MT regulations in force.



OR Regulation Details

- Regulation
- Criteria
 - No set criteria for either specific streams or waters
 - Developing a statewide policy at this time
- Where and for how long
 - Usually done for entire river systems or segments
 - Once implemented, variable length and no reopening criteria
- Data used comes from USGS, state agencies and all other available sources
- Specific staff and management biologists are involved



CO Regulation Details

- Director Closure – Complete angling closure
- Criteria
 - Water temperature above 71F
 - Discharge below or equal to 50% of average
 - Existence of a known stressor event
- Where and for how long
 - Either entire river systems or segments
 - Opened by field and senior biologists
- Data used comes from USGS, Department of Water, direct measurements from staff and anglers
- Also use voluntary closures without Director's order to discourage anglers from fishing



Michigan Analysis



Analysis Components

- Literature review on appropriate trigger temperatures
 - No definitive criteria found in literature
- Are anglers using the trout resource in the mid-summer period
- Amount of resource affected
- Implementation challenges



Michigan Trout Stream Summary

Stream Type	Miles
Gear Restricted	184
Research Area	8
Type 1	28,254
Type 2	196
Type 3	845
Type 4	1,966
TOTAL	31,453



Michigan Trout Stream Summary

Temperature Type	Miles
Cold Stream	9,093
Cold Small River	433
Cold Transitional Stream	3,945
Cold Transitional Small River	496
Cold Transitional Large River	253
Warm Transitional Stream	12,201
Warm Transitional Small River	1,615
Warm Transitional Large River	740

Climate change will force trout in this direction

Currently, salmonids will annually move from warm transitional to cold streams and rivers if connectivity is available



Do anglers fish stream trout in Michigan during the summer?

- Unlike Western rivers which do not become fishable to all until mid-July, Michigan streams are generally fishable by all in May
- Staff observe a large drop in Michigan trout angling within a few weeks of the traditional opening with a larger drop after the *Hexagenia* sp. hatch
- On larger Michigan streams, there is a lot of interactions with floaters starting about July 4 which continues through Labor Day which reduces angler use
- Pressure is much less on Michigan streams than Western rivers during the hot weather periods



Hydrograph Comparison between AuSable River MI and Bitterroot River MT

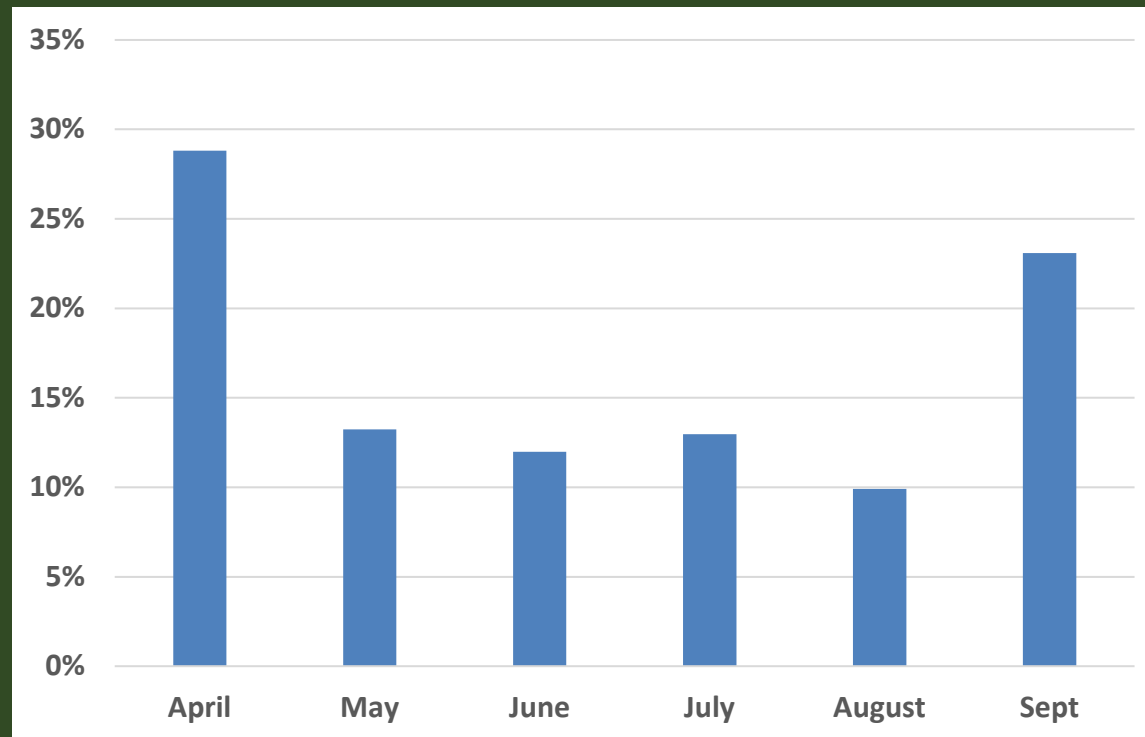
AuSable River at
McKinley 2022



Bitterroot River at
Darby MT 2022



Mean Percent Angler Effort – Muskegon, AuSable, Pere Marquette, and Platte Rivers



Data used - AuSable River Mio – Alcona 2009, Pere Marquette River 2011, Manistee River 2016, Platte River 2014, and Muskegon River 1999-2005



How many streams could be affected?

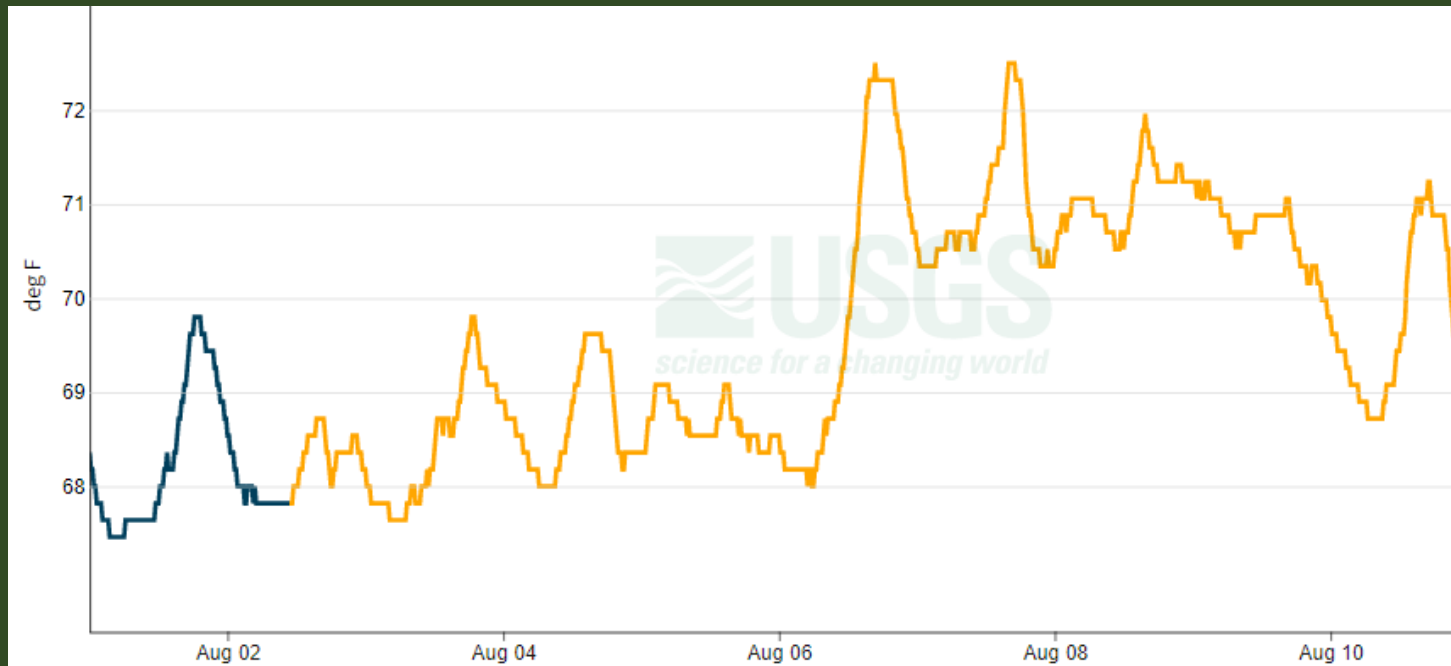
- Examined 124 locations statewide from 2000-2022 using USGS and TU data
 - 12 locations – 23 years – Long record
 - 5 locations – 7-19 years – Long record
 - 107 locations – 4 years or less – Short record

Record Length	Percent Years Triggered - 70F	Percent Years Triggered - 72-73F
Short	82%	68%
Long	71%	52%

In every year, some streams would be triggered and often a high percentage.



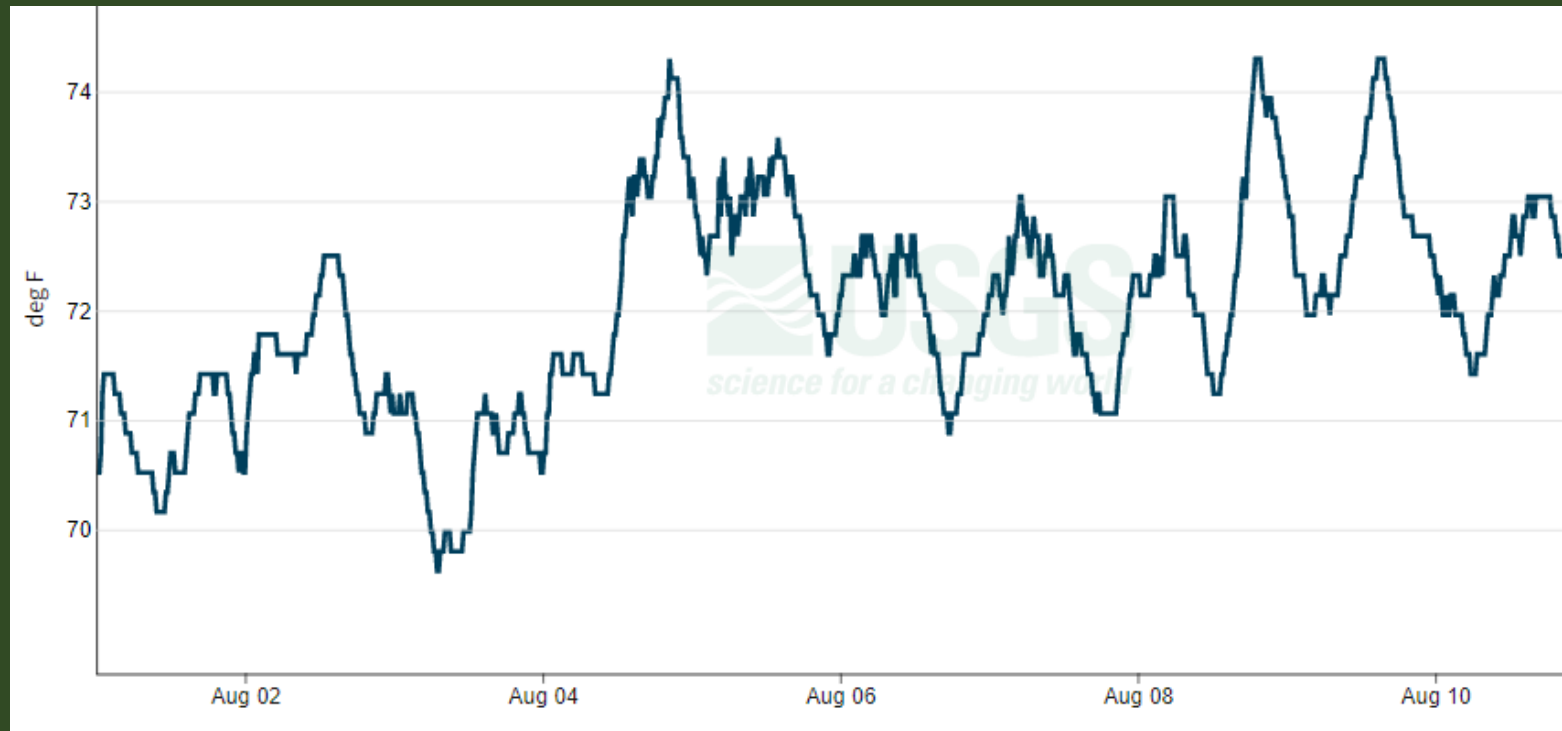
Diurnal Temperature Variation is Required for Regulations to Work



Water temperature – AuSable River at Mio from August 1-10, 2022



Diurnal Temperature Variation is Required for Regulations to Work



Water temperature – Muskegon River at Croton
from August 1-10, 2022



Implementation Challenges

- Geography
 - Drainages can be different to determine when compared to Western rivers
- Very incomplete real-time temperature network
 - How and where to measure
- Determining what streams are affected
 - Dams flatline the diurnal temperature changes
- Angler notification
- Multi-species fisheries
- Developing enforceable regulations



Analysis Conclusions

- Few states have temperature-triggered regulations.
- Little evidence was found supporting the trigger temperatures or the effectiveness of these regulations to protect trout populations.
- Fishing pressure is different in MI due to differences in the hydrograph, food resources, and competing river uses.
- Feeding activity is much lower in the hot periods thus fish are less vulnerable.



Analysis Conclusions

- Rivers that are of concern do not have the correct diurnal temperature pattern for these regulations.
- Climate change
 - Division has a strategy and a Climate Change Committee
 - Some current trout waters are not likely to be in the future
 - Focus is on connectivity – Resist strategy
- Encourage voluntary efforts that reduce angling when temperatures are above 70F.



Thanks much for the
opportunity to discuss
temperature-triggered trout
regulations!!!!

Questions and Comments

whelang@michigan.gov



Urban Deer Management



Chad Stewart, Deer, Elk, and Moose Management Specialist
Michigan Natural Resources Commission
March 9, 2023

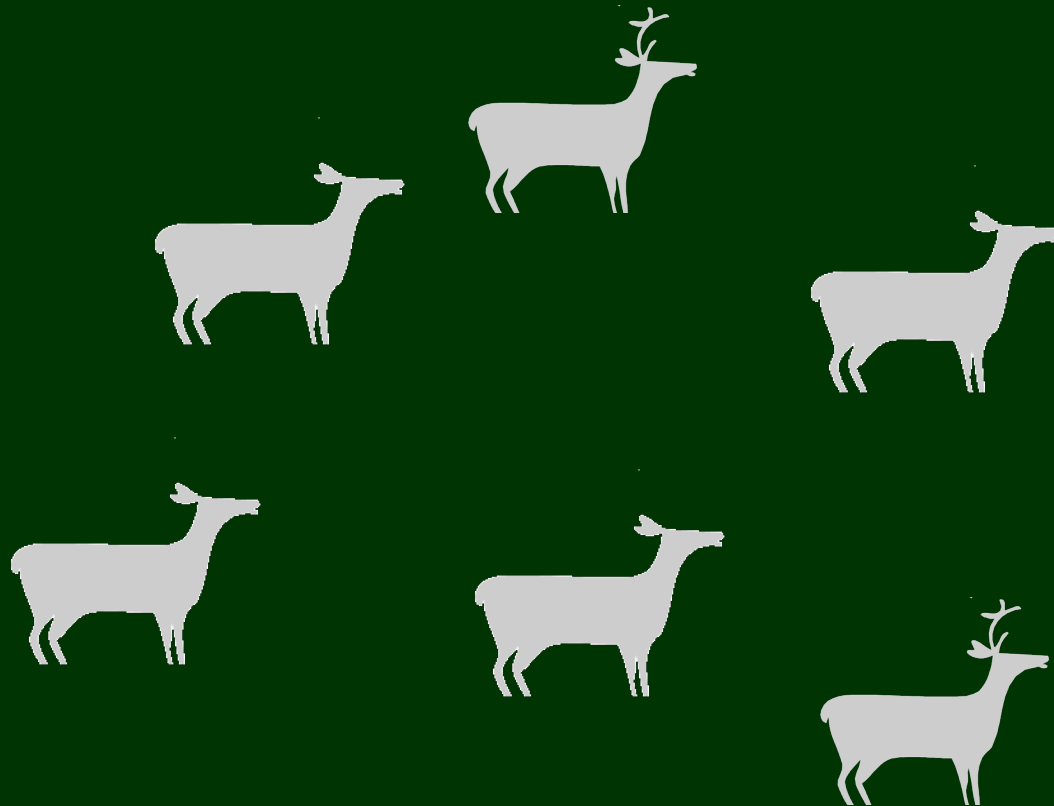


Characteristics of Urban Deer

- Typically see high survival rates
 - 87% in Carbondale, IL (Storm et al 2010), 82% in Chicago, IL (Etter et al 2002), >72% in Bloomington, MN (Grund 2011)
- Typically see smaller home ranges in suburban and urban locales
 - Resource needs being met across a smaller area
- Maintenance of high reproductivity
 - Reported as high as 1.8 fawns/adult doe
 - No reproductive senescence



The George Reserve, Year 1



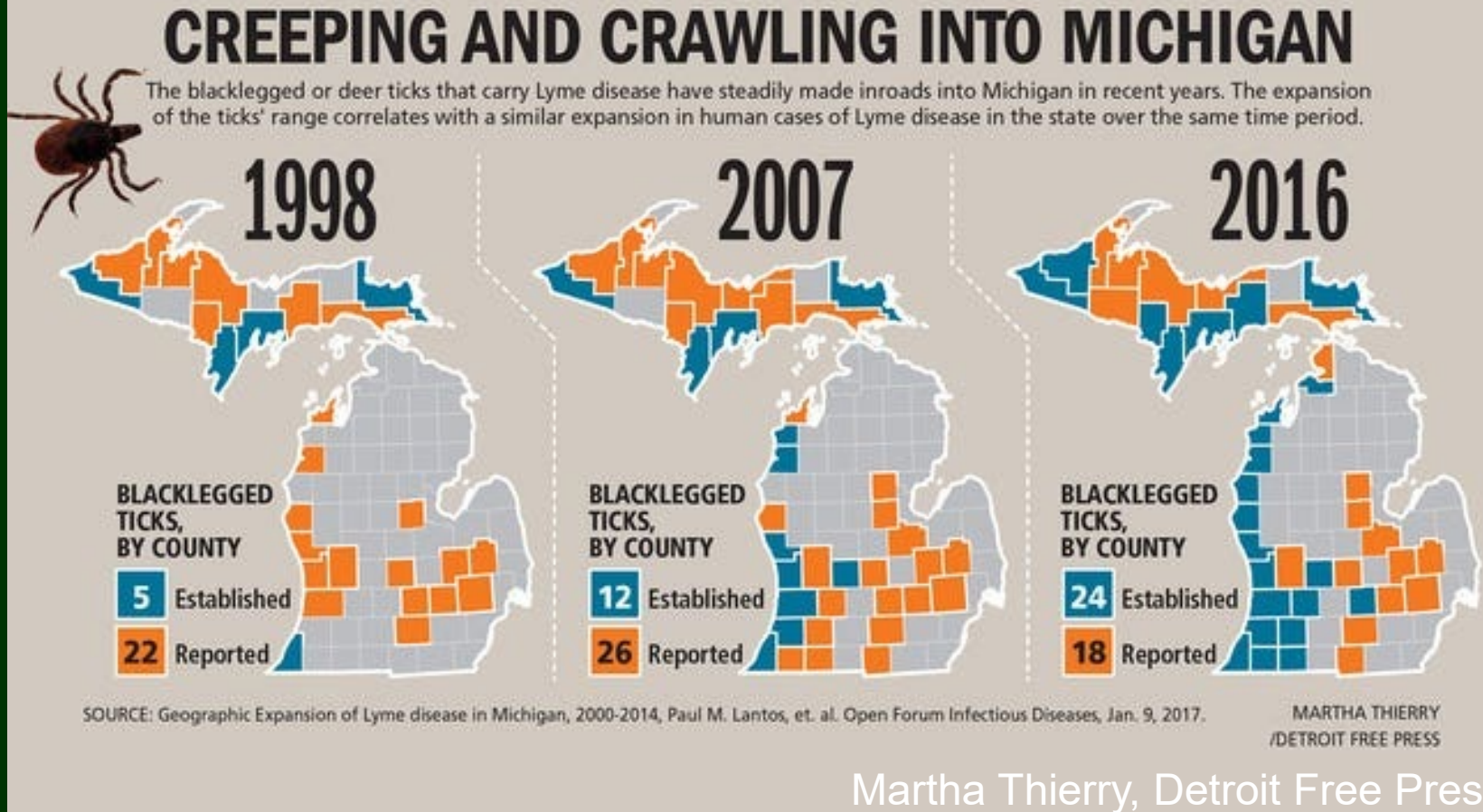
The George Reserve, Year 7



Urban Deer Management IS Conflict Management

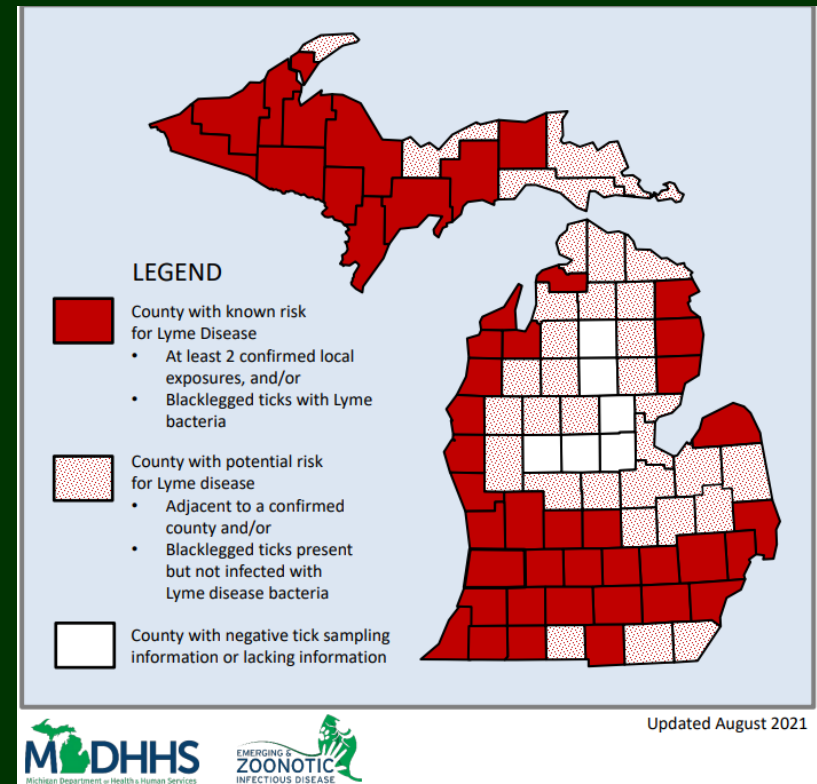


Lyme Disease Distribution in Michigan

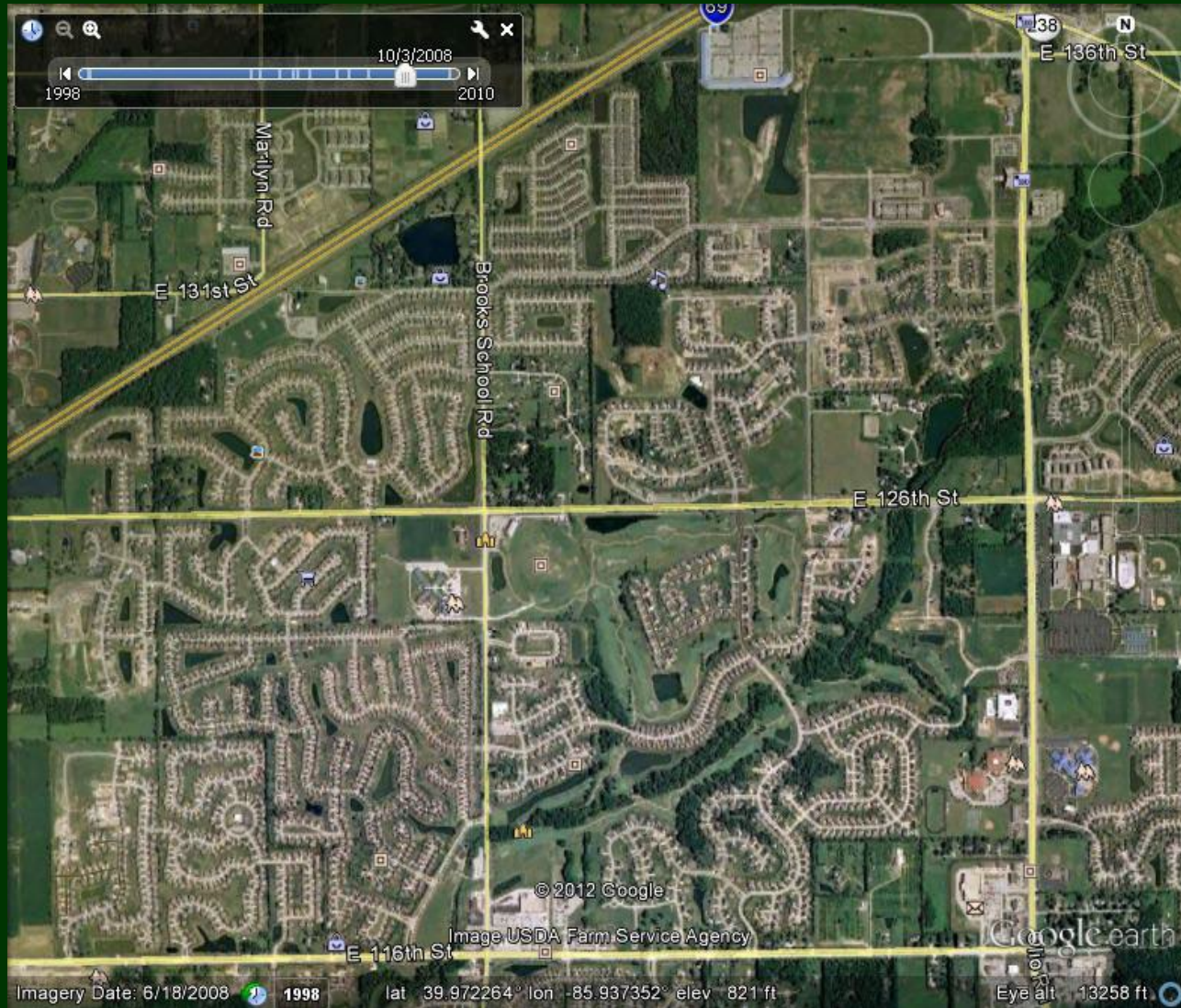


Lyme Disease

- Inverse relationship between Lyme disease and small mammal predators (Levi et al 2012)
- Human cases declined with reduction in deer density (Kilpatrick et al 2014)



Landscape Changes



1999

2008

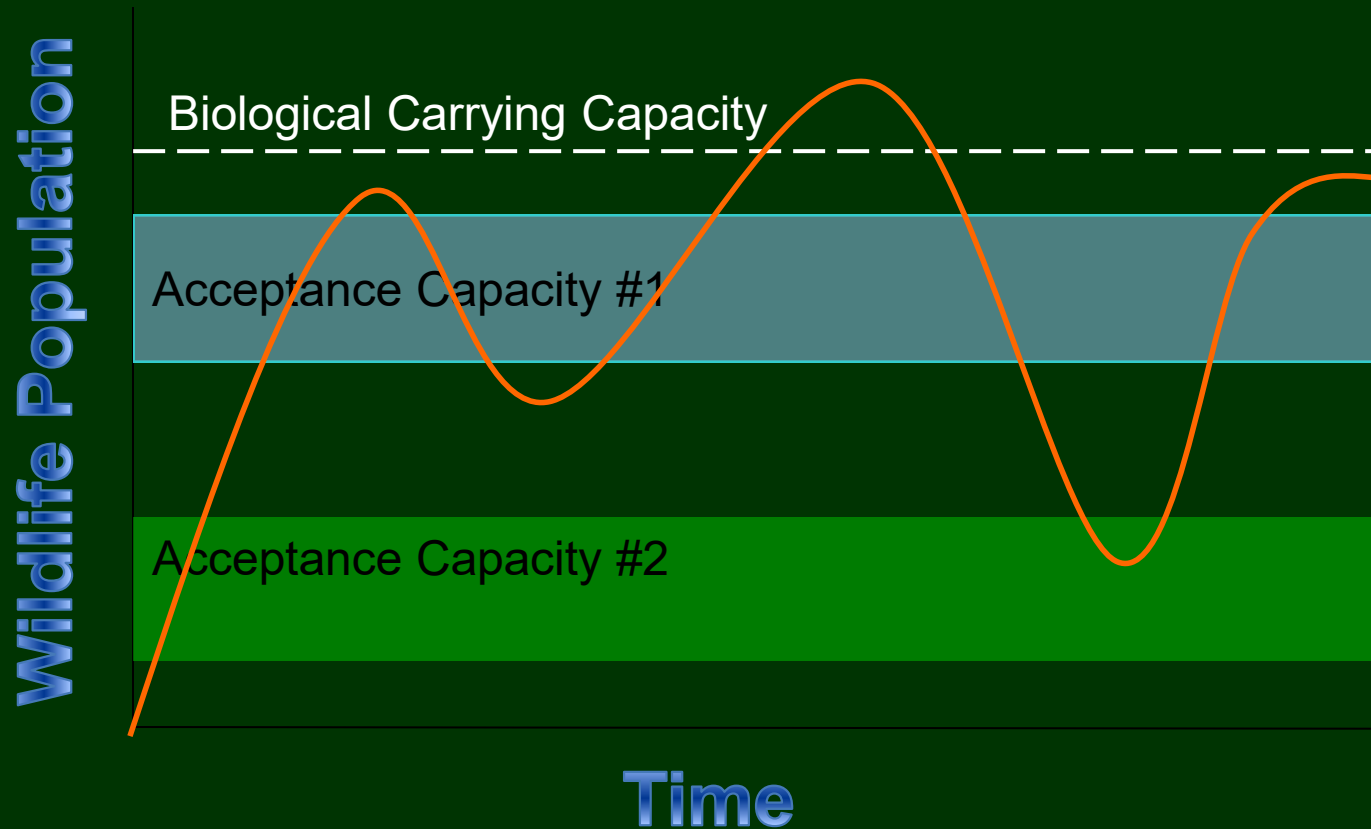


Carrying Capacity

- Biological
- Social



Measures of Capacity for Wildlife

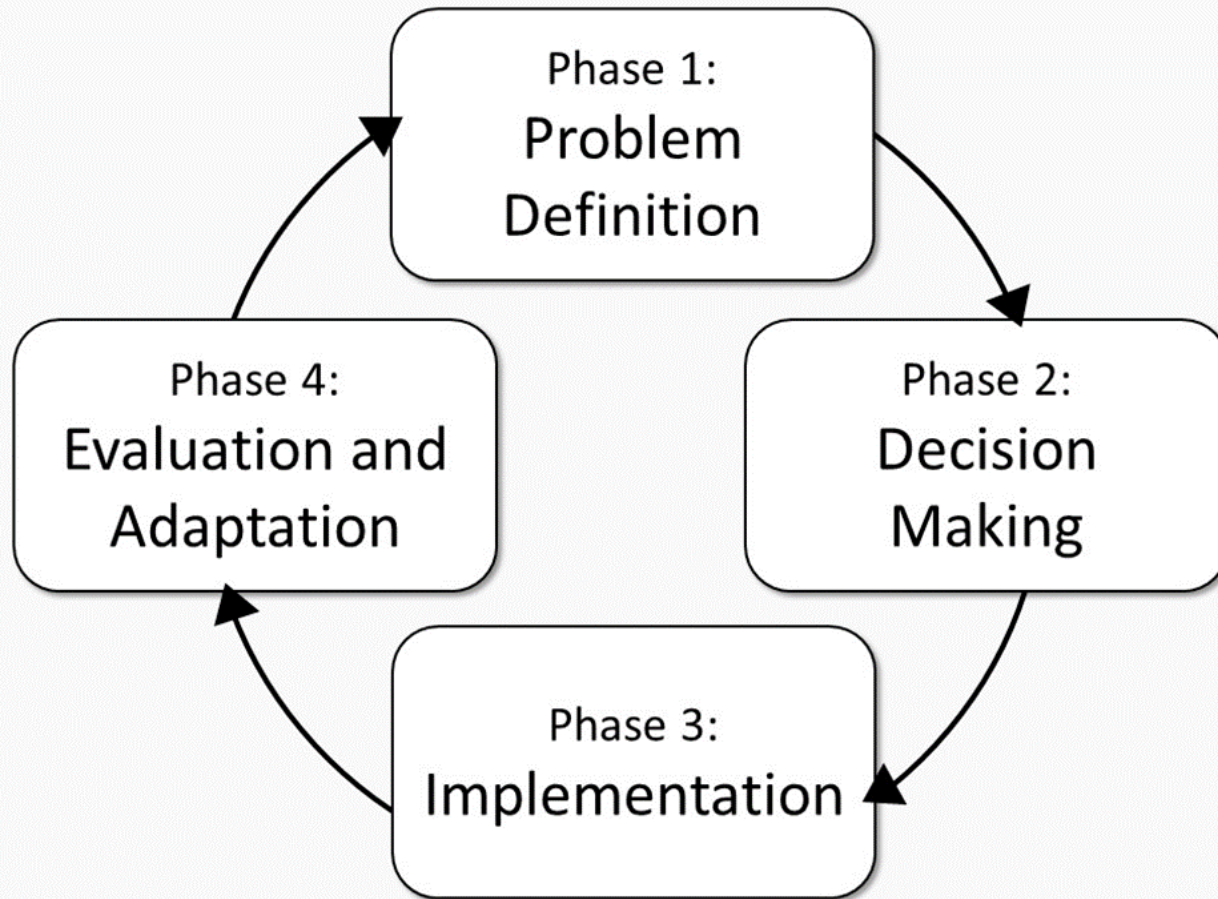


Urban Deer Conflict Policy and Procedures

- Emphasize the harvest of deer during existing hunting seasons using legal methods
- Provide assistance and information with the use of lethal and non-lethal methods to reduce conflicts
- Maintain a permitting system to quickly resolve hazardous situations
- Provide guidance to landowners to resolve conflicts through a clearly defined process

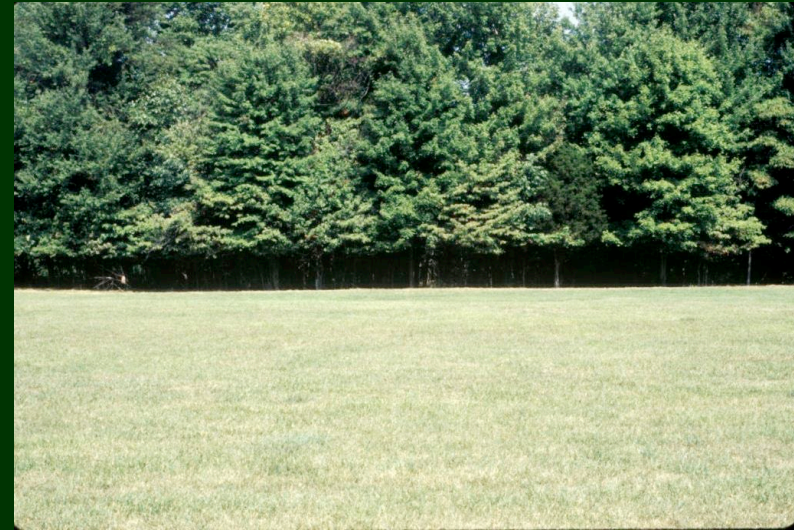


Community Based Deer Management



Management Options

- No Action or Response
 - Pros
 - A compromise?
 - Inexpensive
 - Cons
 - Some will view as “inaction”
 - Continued degradation of habitat and conflicts



Management Options

- Nonlethal Options
 - Pros
 - Can exclude deer from problem areas
 - Relatively inexpensive
 - Cons
 - Requires maintenance
 - No guarantees
 - Does not solve community wide problem



Management Options

- Hunting
 - Pros
 - Inexpensive to communities
 - Can provide economic stimulus
 - Supported by most individuals
 - Cons
 - Some types of hunting (i.e. trophy) not supported
 - Local concerns regarding hunting in a community
 - Access issues



Management Options

- Sharpshooting
 - Pros
 - Reduces deer population quickly
 - Safe
 - Cons
 - Expensive
 - Controversial



Management Options

- Trap and Relocate/Remove
 - Pros
 - No projectile fired
 - Removes deer from difficult areas
 - Cons
 - High stress to deer
 - Expensive
 - Relocation not allowed in Michigan



Management Options

- Reintroduce Predators
 - Pros
 - Opportunity to return historical species
 - Cons
 - Socially unacceptable
 - Expensive
 - Complicated interactions requires study



Management Options

- Contraception

- Pros

- Doesn't fire lethal projectile
 - Prevents future fawns from being born

- Cons

- Expensive
 - Doesn't remove deer which may be the problem
 - Nearly impossible to achieve results in free-ranging deer herds



Contraceptive Drugs

- Gonacon and Zonastat
 - Both federally registered pesticides through the EPA
- Both require boosters
- Neither registered for use in Michigan (MDARD)

United States
Environmental Protection Agency
Office of Prevention, Pesticides and Toxic Substances
(7505P)

EPA

Pesticide Fact Sheet

Name of Chemical: Mammalian Gonadotropin Releasing Hormone (GnRH)
Reason for Issuance: New Chemical
Date Issued: September 2009

1. Description of Chemical

Peptide Chain:
Common Name:
EPA PC Code:
Chemical Abstract Service (CAS) No.:
Chemical Name:

Ser4-Tyr25-Gly6-Leu7-Arg8.
Releasing Hormone (GnRH)

RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision of the following organizations and their designated wildlife management personnel and only for those uses covered by the Certified Applicator's certification:

- Department of Interior and all its designated agents
- National Park Service, US Fish & Wildlife Service, Bureau of Land Management
- USDA and all its designated agents
- Health Inspection Service
- State Agencies for agriculture/livestock & wildlife
- Federally recognized Indian Tribes
- Department of Defense
- Humane Society of the United States

Each Responsible Authority for deer intended to be treated with Zonastat-D must sign a certification of use prior to the administration of the vaccine to any animals. The certification statement is attached to this label.

ZONASTAT-D

Sublabel B

Zonastat-D is a porcine zona pellucida immunocontraceptive vaccine indicated for use in limiting the populations of white tailed deer (*Odocoileus virginianus*) and other members of the family Cervidae.

Active Ingredients:	0.0711%
Porcine zona pellucida (ZP3)(0.1%)	0.0299%
Porcine zona pellucida (ZP1, ZP2, ZP4)(0.1%)	99.9000%
Other Ingredients:	100.0000%
Total	

This product contains 100 µg of PZP per 0.04 oz (0.5 mL)


Net Contents: 0.5 mL

EPA Reg. No. 86833-x
EPA Est. No. 090192-MT-001

Humane Society of the United States
700 Professional Drive
Gaithersburg, MD 20879

Expiration date: XX-XX-XXXX

DBU 8140828A.3



Management Options

- Sterilization
 - Pros
 - Doesn't fire a lethal projectile
 - Prevents fawns from being born permanently
 - Cons
 - Expensive
 - Doesn't remove deer which may be problem
 - Difficult to achieve results



Ann Arbor Deer Management



YEAR FOUR SUMMARY REPORT

2019-20 Deer Research Program

Ann Arbor, Michigan

26 May 2020

Submitted by

Dr. Anthony J. DeNicola
White Buffalo Inc.

From 2017-2020:
78 deer sterilized
432 deer lethally removed

Estimated 47% reduction in South Study Area
Estimated 60% reduction in North Study Area



Melanie Maxwell, The Ann Arbor News



Individual Deer in Distress

- Most instances resolve themselves
- Section 324.40111c of NREPA:
 - A person other than the department shall not take game using a tranquilizer propelled from a bow or firearm



Meridian Township

- Deer hunt history
 - Began an archery hunt in 2011
 - Supplemented with police cull in 2020
 - Currently have >80% community support for deer management
 - Declining deer-vehicle collision trends
- Last year ~8,000lbs venison donated



Oakland County Community Deer Coalition

- Goal is to develop a regional deer management plan
- Working collaboratively with SEMCOG
- Survey administered to citizens of Oakland County to gauge attitudes towards deer

Oakland County communities addressing deer overpopulation with new survey



Photo by: SCRPIS

By: Jenn Schanz

Posted at 5:56 AM, Sep 30, 2022 and last updated 10:00 AM, Sep 30, 2022

(WXYZ) — Up through November 11, leaders in several Oakland County communities are asking for the public's input; about deer.

OAKLAND COUNTY

Community input sought on Oakland County deer population



Mark Hicks

The Detroit News

Published 11:15 p.m. ET Sept. 13, 2022



Think close encounters with deer have become too much of a problem lately in Oakland County? Officials want to hear from you.



Thank You

www.michigan.gov/deer



2023-24 Migratory Game Bird Hunting Seasons



Barbara Avers, Waterfowl and Wetland Specialist



Schedule

- Dec. 14, 2022 = Waterfowl Workgroup
- Jan. 14, 2023 = CWAC
- Jan. 30, 2023 = Proposed Frameworks
- Mar. 9, 2023 = NRC for Information
- *Early spring, 2023 = Final Frameworks
- April 13, 2023 = NRC for Action
- April 30, 2023 = Season Selections Due



Canada Goose Population Status

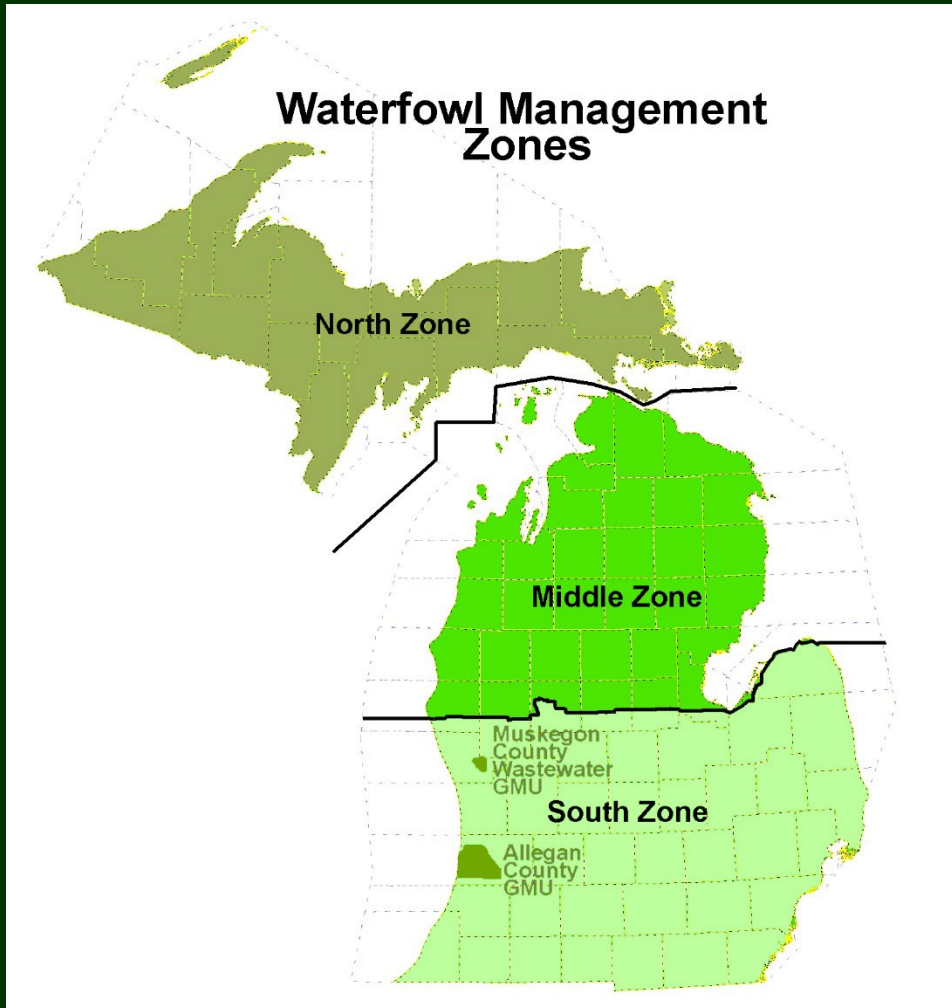
- Mississippi Flyway temperate-breeding geese long-term increasing trend
- Subarctic-nesting geese stable but variable
- Michigan temperate-breeding geese near goal range but still increasing trend



2023 Goose Season Federal Framework



2023 Goose Season Federal Framework



- Season length and outside dates
 - Maximum 107 days
 - Between Sept. 1 - Feb. 15
- 4 segments allowed



2023 Goose Federal Frameworks – Bag Limits

- Canada daily limits:



- Maximum 5 birds

- White-fronted daily limits:



- Maximum 5 birds in aggregate with dark geese

- Brant daily limits:



- Maximum 1 bird in aggregate with dark geese

- Snow, blue, Ross' daily limits:



- Maximum 20 birds

Possession limits 3X daily limit

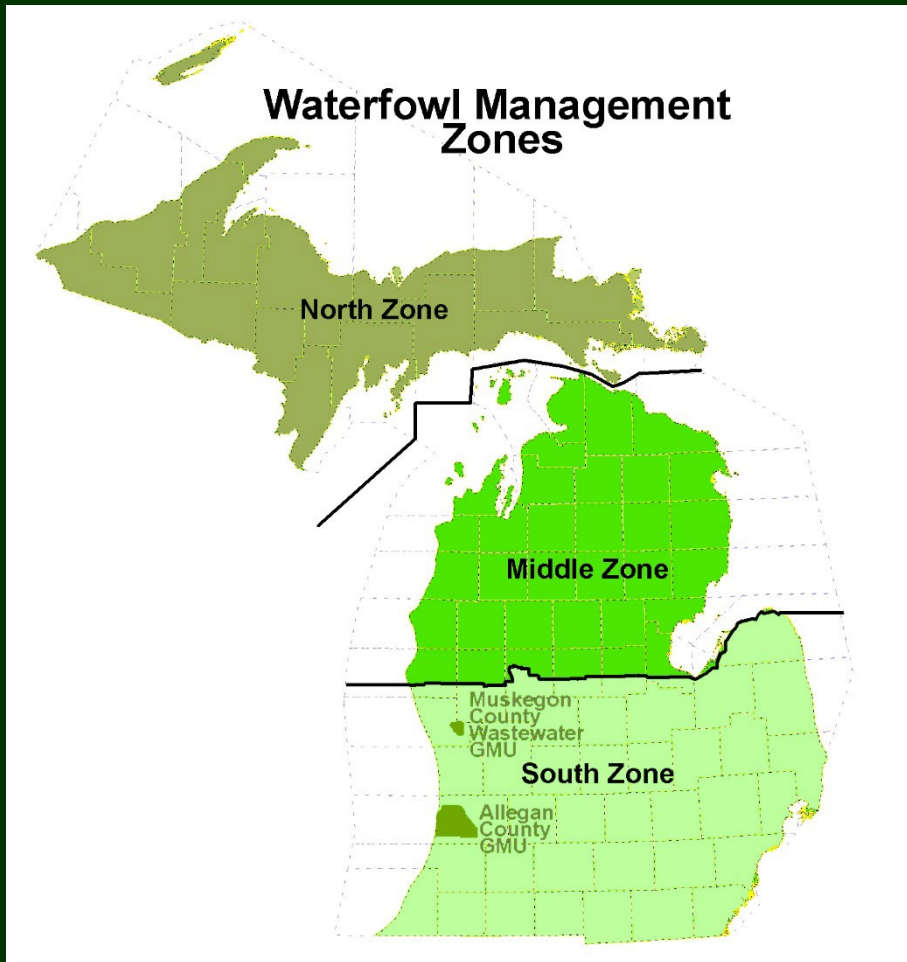


2023 Michigan Goose Season Recommendations



2023 Goose Season

Recommendations Season Dates and Bag Limits – North Zone

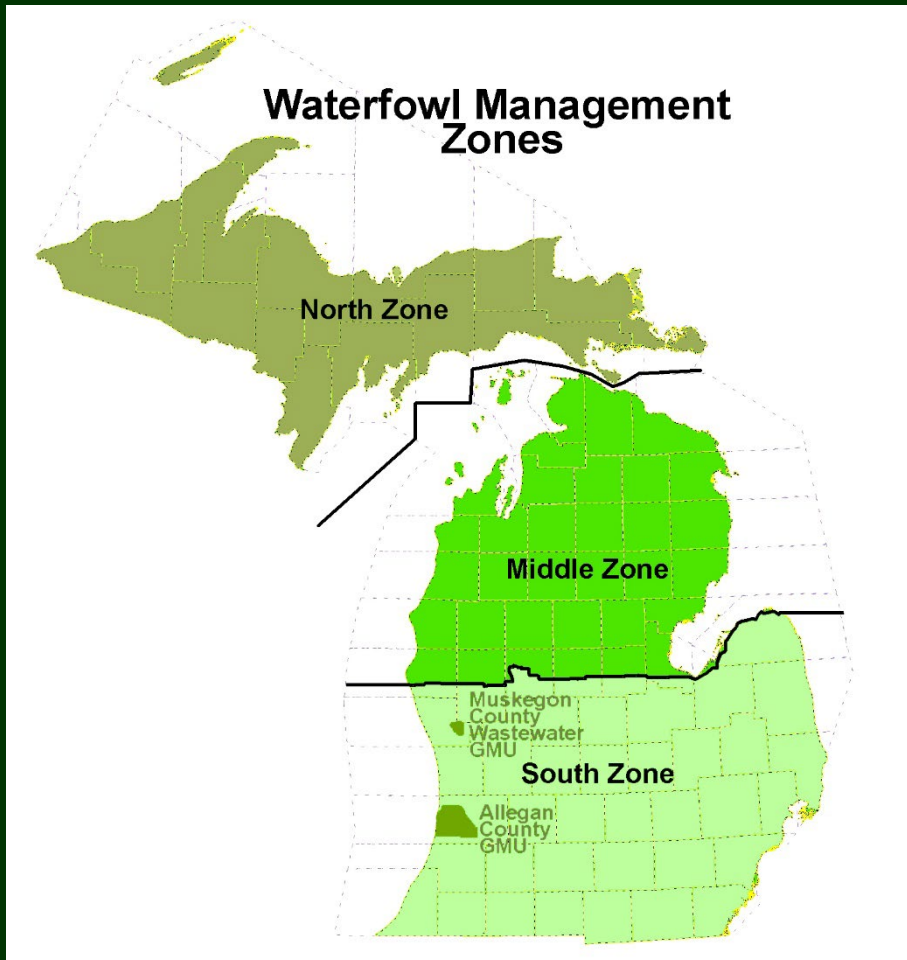


- Sept. 1 – Dec. 16
- Dark goose aggregate daily limit = 5, only 1 of which can be a brant
- Light goose daily limit = 20



2023 Goose Season

Recommendations Season Dates and Bag Limits – Middle Zone

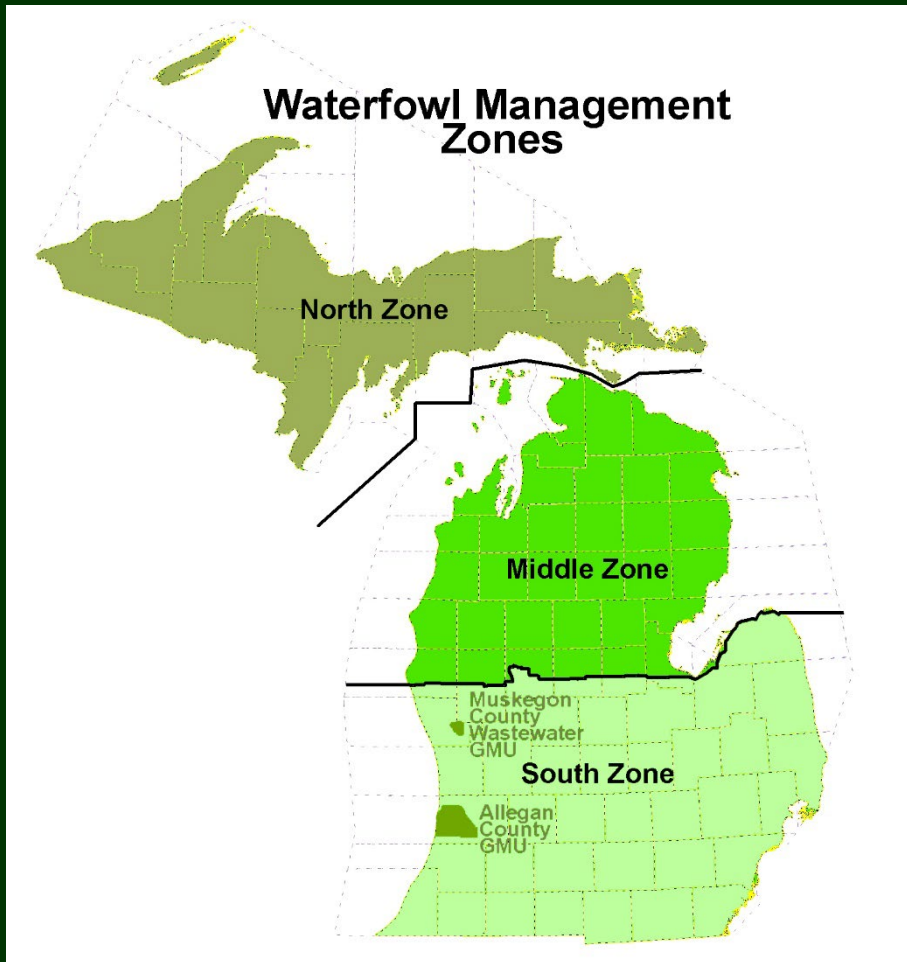


- Sept. 1 – 30 and Oct. 7 – Dec. 22
- Dark goose aggregate daily limit = 5, only 1 of which can be a brant
- Light goose daily limit = 20



2023 Goose Season

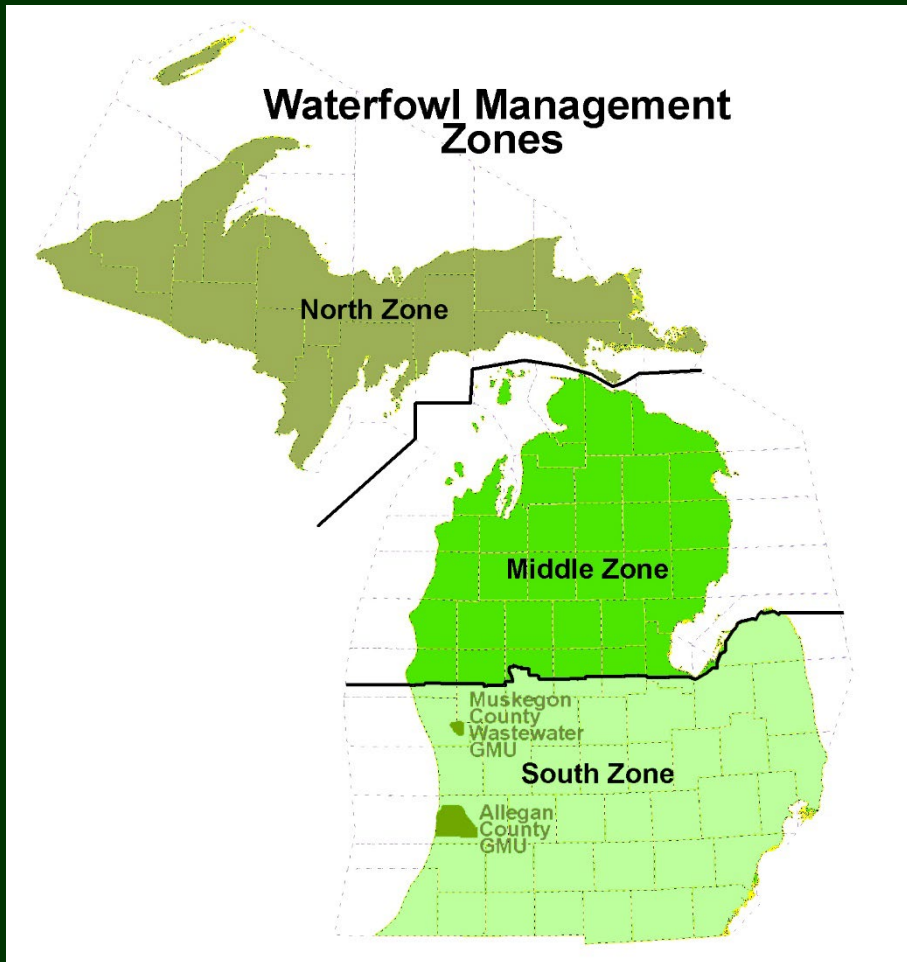
Recommendations Season Dates and Bag Limits – South Zone



- Sept. 1-30; Oct. 14 – Dec. 10; Dec. 30 – Jan. 7, 2024; and Feb. 3 – 12, 2024
- Dark goose aggregate daily limit = 5, only 1 of which can be a brant
- Light goose daily limit = 20



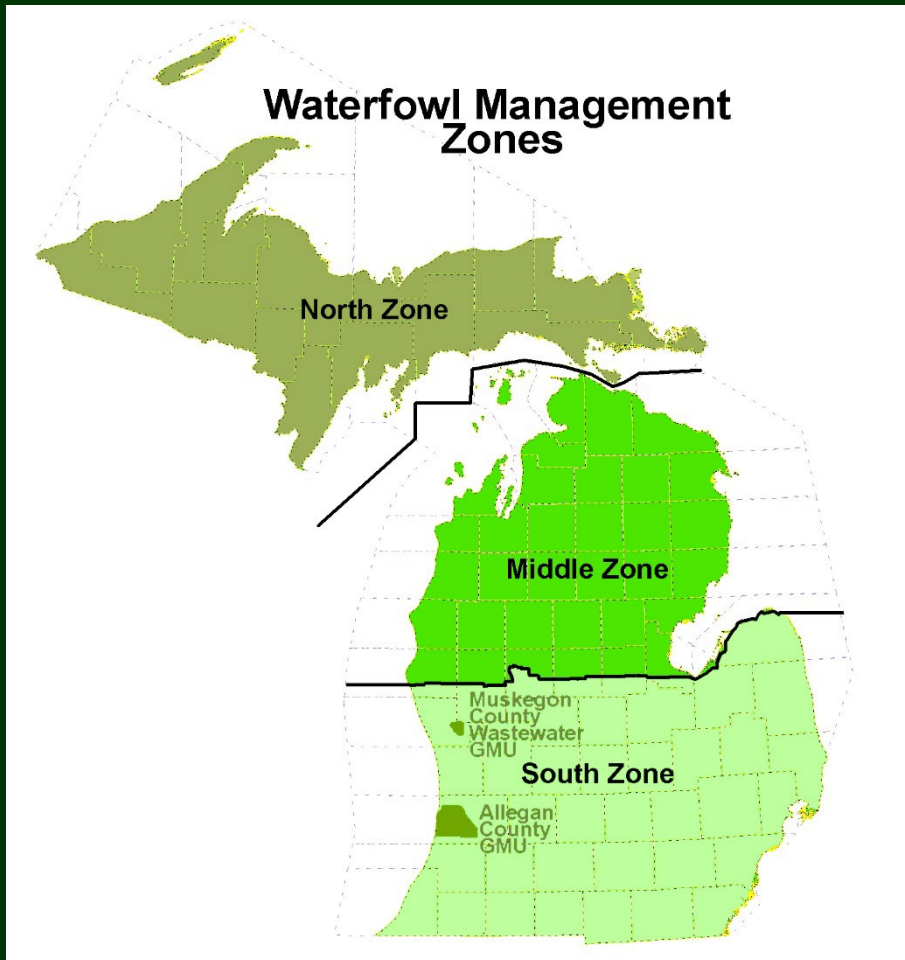
2023 Goose Season Recommendations – GMUs



- Allegan County
 - Sept. 1-30; Nov. 4-12; Nov. 25-Dec. 3; and Dec. 16-Feb. 12, 2024
- Dark goose aggregate daily limit = 5, only 1 of which can be a brant
- Light goose daily limit = 20



2023 Goose Season Recommendations – GMUs



- Muskegon County Wastewater
– Oct. 17 – Dec. 23
- Dark goose aggregate daily limit = 5, only 1 of which can be a brant
- Light goose daily limit = 20

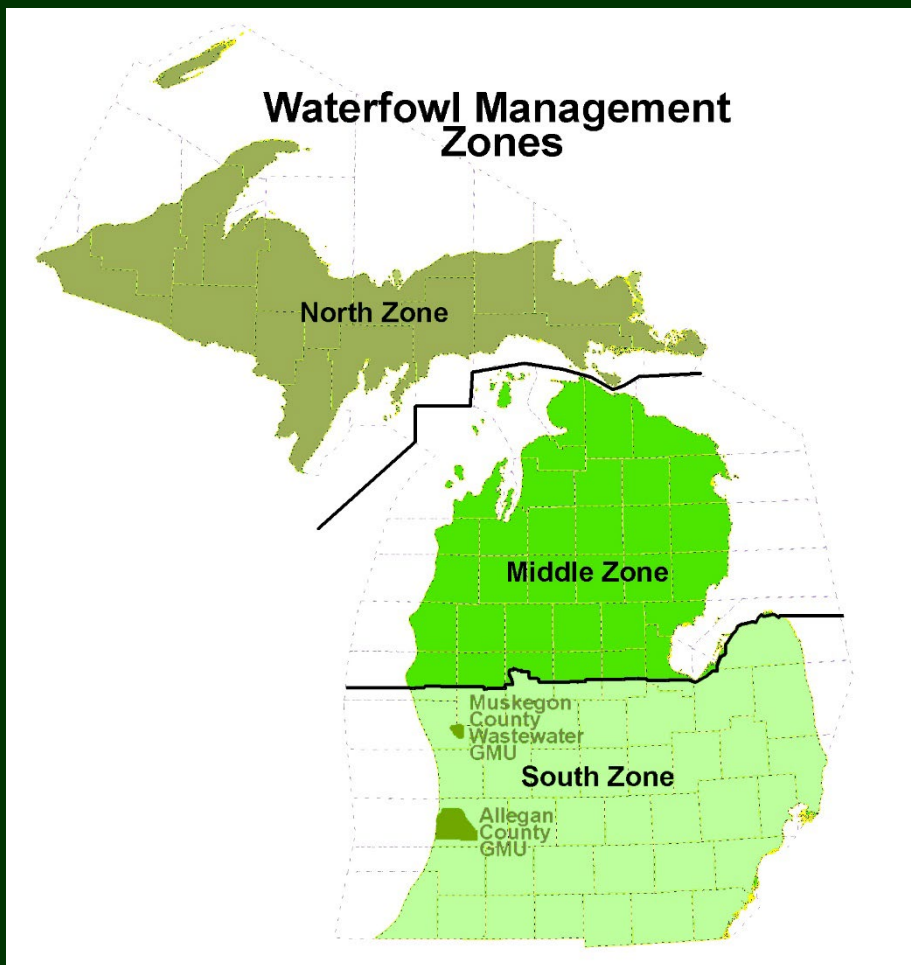


2022 Duck Population Status

- Continental duck populations mostly down from 2019
- Michigan total duck and mallard estimates down from 2021



2023 Duck Season Federal Framework

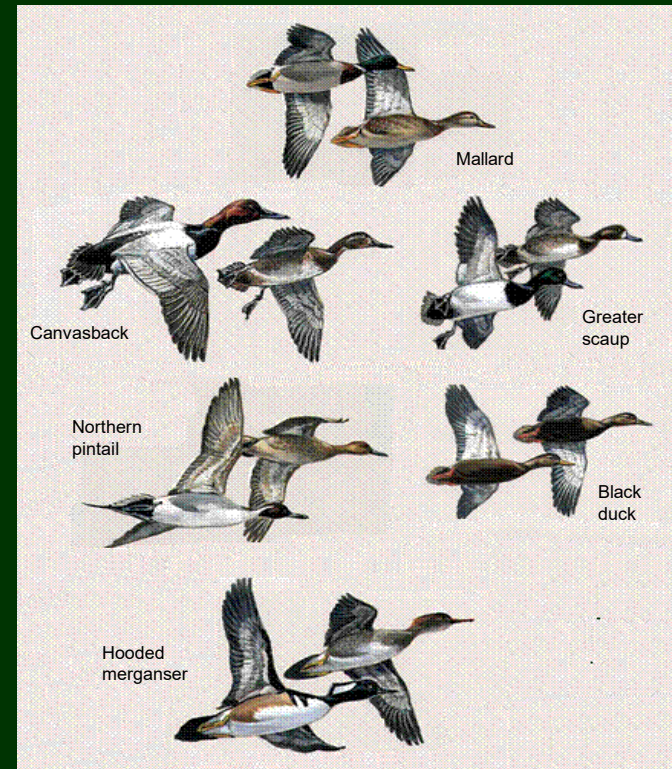


- Liberal season
 - Maximum 60 days
 - Between Saturday nearest Sept. 24 and January 31
 - Maximum 6 birds per day
- Possession limit 3X daily limit
- Seasons set by Zone
- One split per Zone

2023 Duck Season

Federal Framework – Daily Limits

- 6 ducks combined
 - Mallard
 - Maximum 4 birds (maximum 2 hens)
 - Wood duck
 - Maximum 3 birds
 - Redhead, Canvasback, & American black duck
 - Maximum 2 birds
 - Scaup
 - 2 for 45 days and 1 for 15 days
 - Northern pintail
 - Maximum 1 bird
 - All other ducks
 - 6 birds
- 5 mergansers combined
 - Maximum 2 hooded mergansers



2023 Michigan Duck Season Recommendations



2023 Early Teal Season Recommendations

- Sept. 1 – 15 Statewide
- Avoids overlap with the Youth and Veterans/Active-Duty days
- Daily limit 6 teal
- Possession 3X
- Hunting hours begin at sunrise



2023 Youth Season Recommendations

- Remain 3rd weekend in September (Sept. 16-17)
- Daily and possession limits same as regular waterfowl seasons





Veterans and Active-Duty Waterfowl Hunt Recommendations

- Hold concurrently with Youth Season (September 16-17)
- Bag limits for Youth Season apply

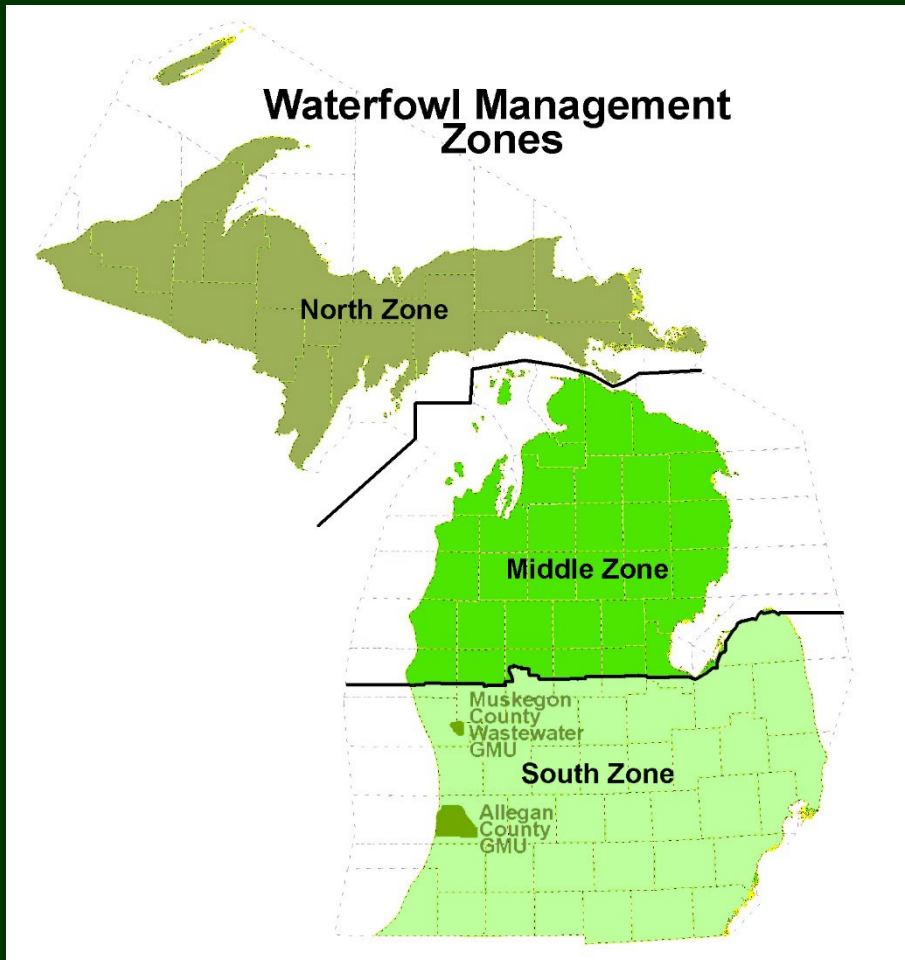


3-Year Stable Duck Season Opening Dates

- North Zone:
 - 2022 = Sept. 24
 - 2023 = Sept. 30
 - 2024 = Sept. 28
- Middle Zone:
 - 2022 = Oct. 8
 - 2023 = Oct. 7
 - 2024 = Oct. 5
- South Zone:
 - 2022 = Oct. 15
 - 2023 = Oct. 14
 - 2024 = Oct. 12



2023 Duck Season Recommendations – Dates



- North Zone
 - Sept. 30 – Nov. 26
 - Dec. 2 – 3
- Middle Zone
 - Oct. 7 – Dec. 3
 - Dec. 16 – 17
- South Zone
 - Oct. 14 – Dec. 10
 - Dec. 30 – 31



2023 Duck Season Recommendations – Daily Limits

- Maximum allowed under Federal Frameworks
- Scaup:
 - 2-bird limit for first 45 days in North Zone
 - 2-bird limit for the last 44 days in Middle and South Zones
 - No bag limit change over a weekend
 - Maximize scaup harvest opportunity in each zone





2023-24 Falconry Season Recommendations

- Same dates as gun hunting
- Additional days for ducks, mergansers, coots, and moorhens:
 - Jan. 1 – Jan. 14, 2024
 - Feb. 24 – Mar. 10, 2024
- No change to daily bag limits
- Possession limits 3X daily limit



Pure Michigan Hunt

- Allow PMH winners to select a reserved waterfowl hunt or a first pick of any hunt at a managed waterfowl area
- Minimum of 24 hours notice



Thank You



Blood Tracking Big Game with Dogs



Law Enforcement Division

Acting F/Lt. Jeff Rabbers



Blood Tracking Big Game with Dogs

Current Approval Process

- Handler must have dog complete a tracking test by a department approved organization (United Blood Trackers).
- Carry a valid Concealed Pistol License.
- Receive written authorization from DNR-LED.



Certified Trackers

2022 – 33

2021 – 30

2020 – 22

2019 – 21

2018 – 17

2017 – 19

2016 – 17

2015 – 19

2014 – 15



Blood Tracking Big Game with Dogs

Current Process

- Tracker's information and accompanying hunter's license information must be provided to the DNR's Communications Section prior to each tracking activity.
- **Dogs must be on a leash.**
- Only the licensed hunter may dispatch and tag the wounded deer, elk, or bear.



Proposed Changes

Dog must be on a leash, or the tracker can demonstrate control of the dog.

- Tracker has control of the dog off leash when the tracker can demonstrate knowledge of the dog's global positioning system coordinates and method to control dog.



Comparison

	MI	WI	IL	IN	OH
Dog must be on a leash.	X	X	X	X	X



Blood Tracking Big Game with Dogs

Thank you!

