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Photo: M. Cosgrove, MDNR

2020 BOVINE TUBERCULOSIS SURVEILLANCE



Natural Resources
Commission Update
April 15, 2021









2020 Bovine Tuberculosis (TB) Surveillance in Free-Ranging White-tailed Deer, Michigan

Legend



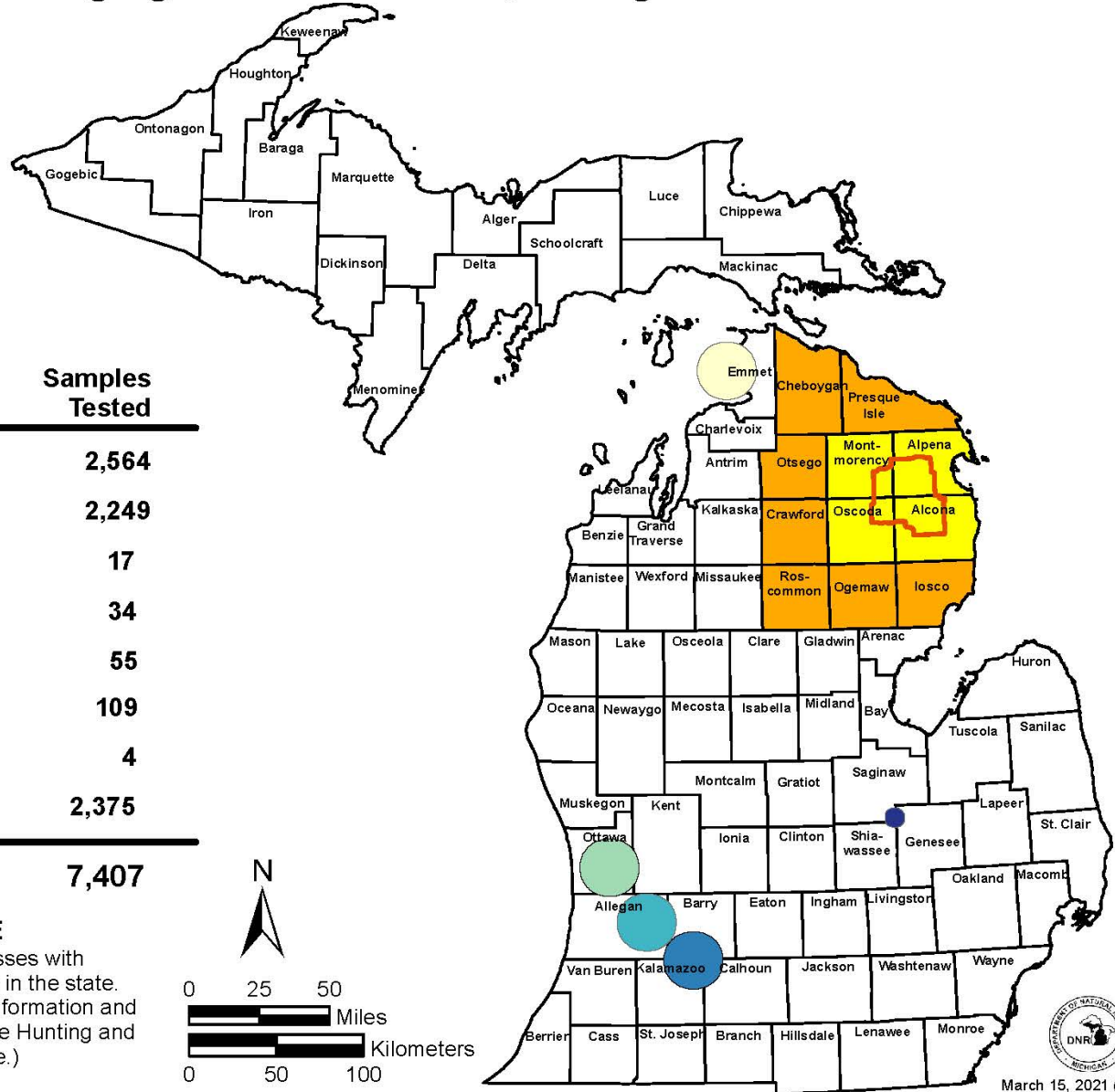
I. ACTIVE SURVEILLANCE

(Hunters voluntarily submit heads for examination)

Testing Zone	Sample Goals	Samples Tested
	2,800	2,564
	2,500	2,249
	100	17
 10-mile radius circles	300	34
	300	55
	300	109
 3-mile radius circle	30	4
	0	2,375
Total	6,330	7,407

II. PASSIVE SURVEILLANCE

(Hunters may submit deer carcasses with TB chest lesions from anywhere in the state. Hunters are educated through information and color pictures of TB lesions in the Hunting and Trapping Guide and TB brochure.)



March 15, 2021 (MC)

Michigan White-tailed Deer

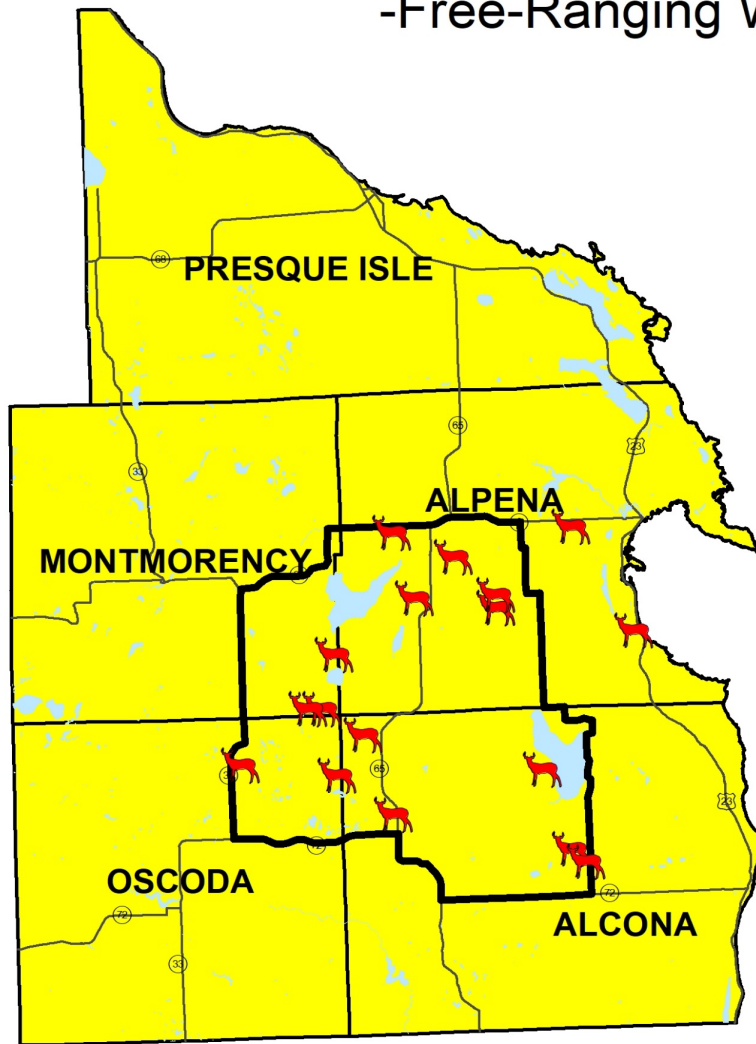
TB Surveillance



Year	Positive	Total Deer Tested
1975 & 1994	2	2
1995	18	403
1996	56	4,966
1997	73	3,720
1998	78	9,058
1999	58	19,497
2000	53	25,855
2001	61	24,278
2002	51	18,101
2003	32	17,306
2004	29	15,134
2005	16	7,365
2006	41	7,918
2007	27	8,316
2008	37	16,312
2009	31	5,723
2010	24	4,974
2011	17	6,026
2012	23	4,725
2013	21	5,903
2014	12	4,266
2015	34	8,461
2016	29	12,031
2017	49	23,070
2018	26	35,618
2019	31	25,096
2020	20	7,407
Grand Total	949	321,535

As of 4/5/2021, 2 suspects likely to culture + to date

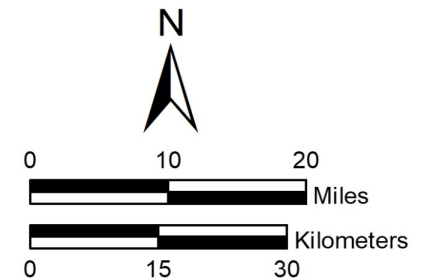
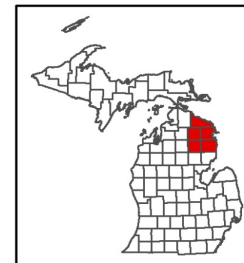
2020 Bovine Tuberculosis Survey Results -Free-Ranging White-tailed Deer-



Legend

- Location of TB Positive Deer*
- DMU 452
- County with Positive Deer 1975-2020
- County Line
- Water
- Highway

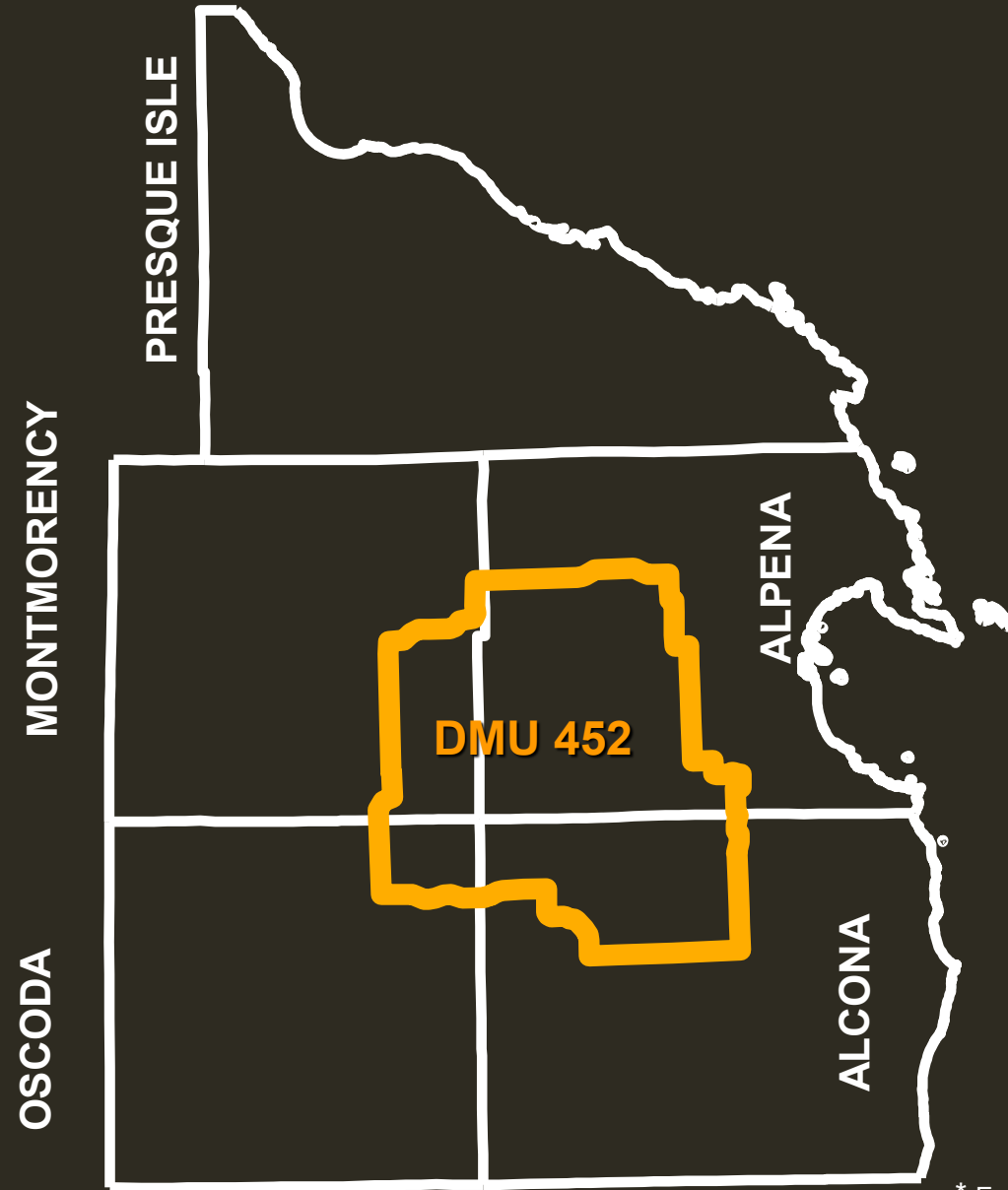
Positive Deer 2020 = 20
Positive Deer 1975-2020 = 949



March 12, 2021 (MC)

*Two deer (1-Alcona, 1-Alpena) not shown due to incomplete harvest locations

Apparent TB Prevalence in White-tailed Deer

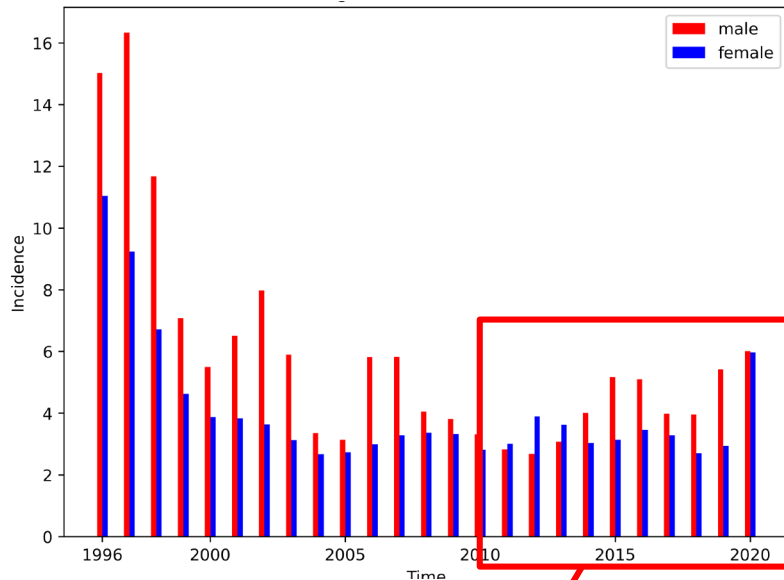


Year	DMU452	5-Co.Outside DMU452
1995	4.9%	(no testing)
1996	2.5%	0.2%
1997	4.7%	0.4%
1998	2.7%	0.3%
1999	2.4%	0.2%
2000	2.5%	0.4%
2001	2.3%*	0.5%
2002	2.6%	0.5%
2003	1.7%	0.2%
2004	1.7%	0.2%
2005	1.2%	0.1%
2006	2.3%	0.3%
2007	1.4%	0.2%
2008	1.9%	0.3%
2009	1.9%	0.4%
2010	1.8%	0.2%
2011	1.2%	0.1%
2012	1.7%	0.3%
2013	1.7%	0.2%
2014	1.0%	0.2%
2015	2.7%	0.3%
2016	2.0%	0.3%
2017	2.3%	0.6%
2018	2.1%	0.1%
2019	2.1%	0.4%
2020	2.1%	0.1%

* Extrapolated from head only apparent prevalence; Mandatory head testing.

NEW TOOLS: FORCE OF INFECTION (FOI)

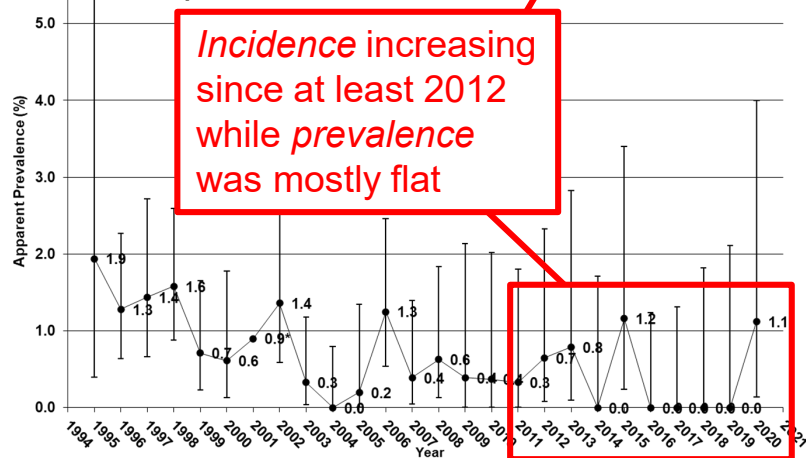
TB incidence, DMU 452, 1996-2020



INCIDENCE VS. PREVALENCE IN YEARLING DEER OVER TIME

- ❖ # new cases/1000 deer vs. % of tested that are +
- ❖ Better portrays TB transmission rate at a given time
- ❖ Reduces time lag between increased transmission and us knowing it's happening
- ❖ Overcomes some sampling biases (e.g. few yearlings tested)

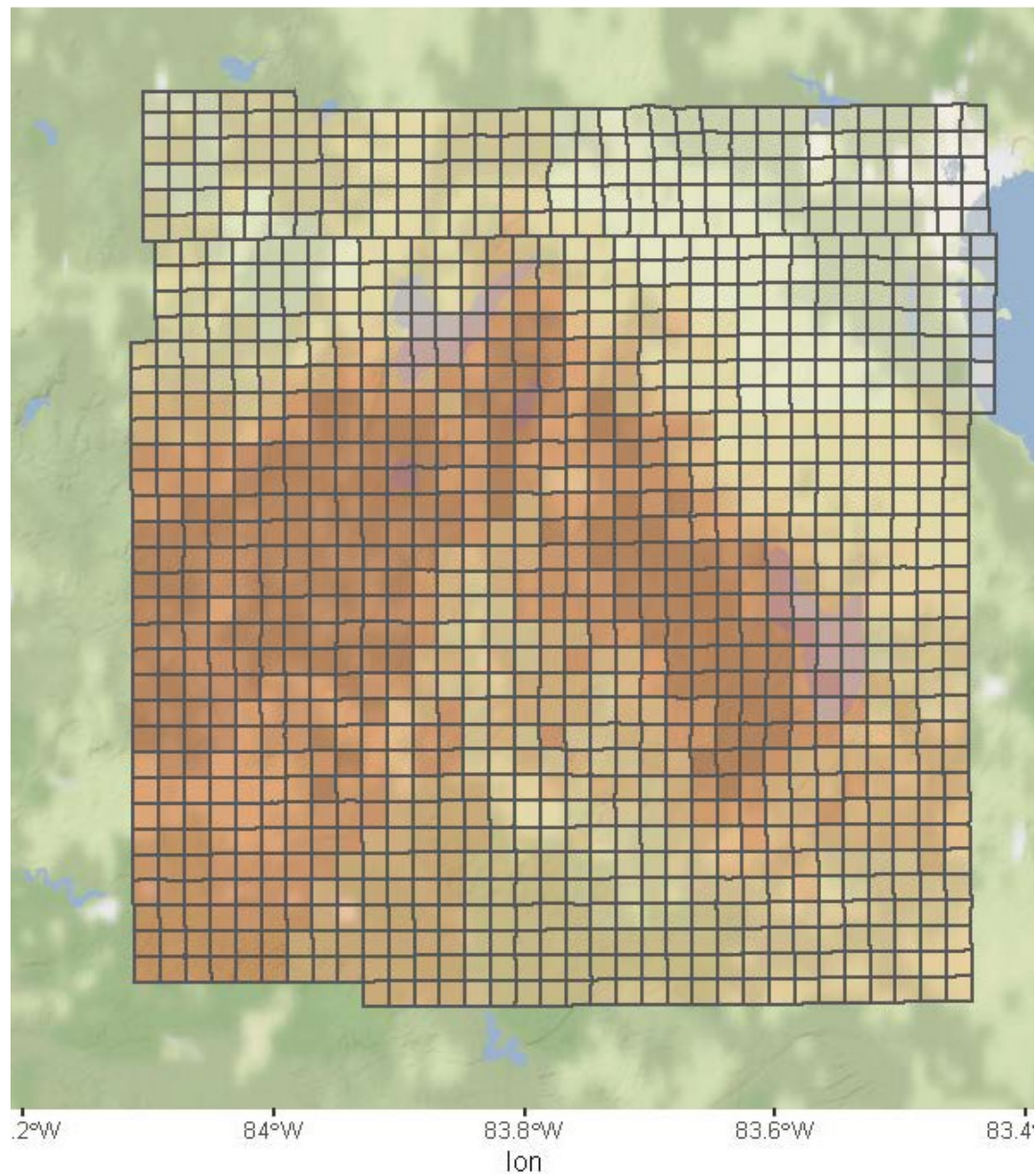
TB prevalence, DMU 452, 1995-2020



NEW TOOLS: FORCE OF INFECTION (FOI)



TB Hazard, all ages, core outbreak area, 1996-2020



REMINDER: BOVINE TB IS ZOO NOTIC!

HUMAN CASES OF DISEASE DUE TO *M. BOVIS* ASSOCIATED WITH DEER CONTACT IN MICHIGAN

YEAR	AGE/ GENDER	SITE of DISEASE	HISTORY	WHOLE GENOME SEQUENCING COMMENTS
2002	74 male	Lung	Deer hunter; autopsy finding	
2004	29 male	Finger	Deer hunter; cut himself while gutting deer	Identical genotype to his deer
2017	77 male	Lung	Deer hunter	
2019	42 male	Finger	Taxidermist	
2020	19 female	Lung	Non-hunter; exposure as child to deer being rehabilitated illegally	Identical genotype to deer harvested in 2015

2020: NOTES AND TAKE HOMES

- ❖ Apparent prevalence in the core area 2.1% for the third straight year; sixth straight year of ↑ prevalence above low of 1% (2014)
- ❖ Measured prevalence in DMU 452 is likely an *underestimate*
 - ❖ ↓ # bucks tested (285); 54% of 5 yr. avg. (526); lowest since 1995 (191)
 - ❖ Bucks more likely to be TB+ than does (~3 - 9X depending on age)
- ❖ Positive fawn; first since 2001 and only the third ever
- ❖ FOI as improved surveillance tool; suggests:
 - ❖ Incidence (rate of new infections) of TB in DMU 452 has been increasing since at least 2012 in both sexes
 - ❖ Geographic areas of highest transmission over time



THANK YOU. QUESTIONS?

www.michigan.gov/emergingdiseases

