

# Wildlife Surveillance and Management Update



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# Michigan Elk Surveillance Results



Year	Positive	Grand Total
1996		79
1997		109
1998		228
1999		175
2000	1	270
2001	1	193
2002		130
2003	2	97
2004		109
2005		131
2006	1	161
2007		192
2008		6
<b>Grand Total</b>	<b>5</b>	<b>1,880</b>



# Michigan White-tailed Deer Surveillance Results

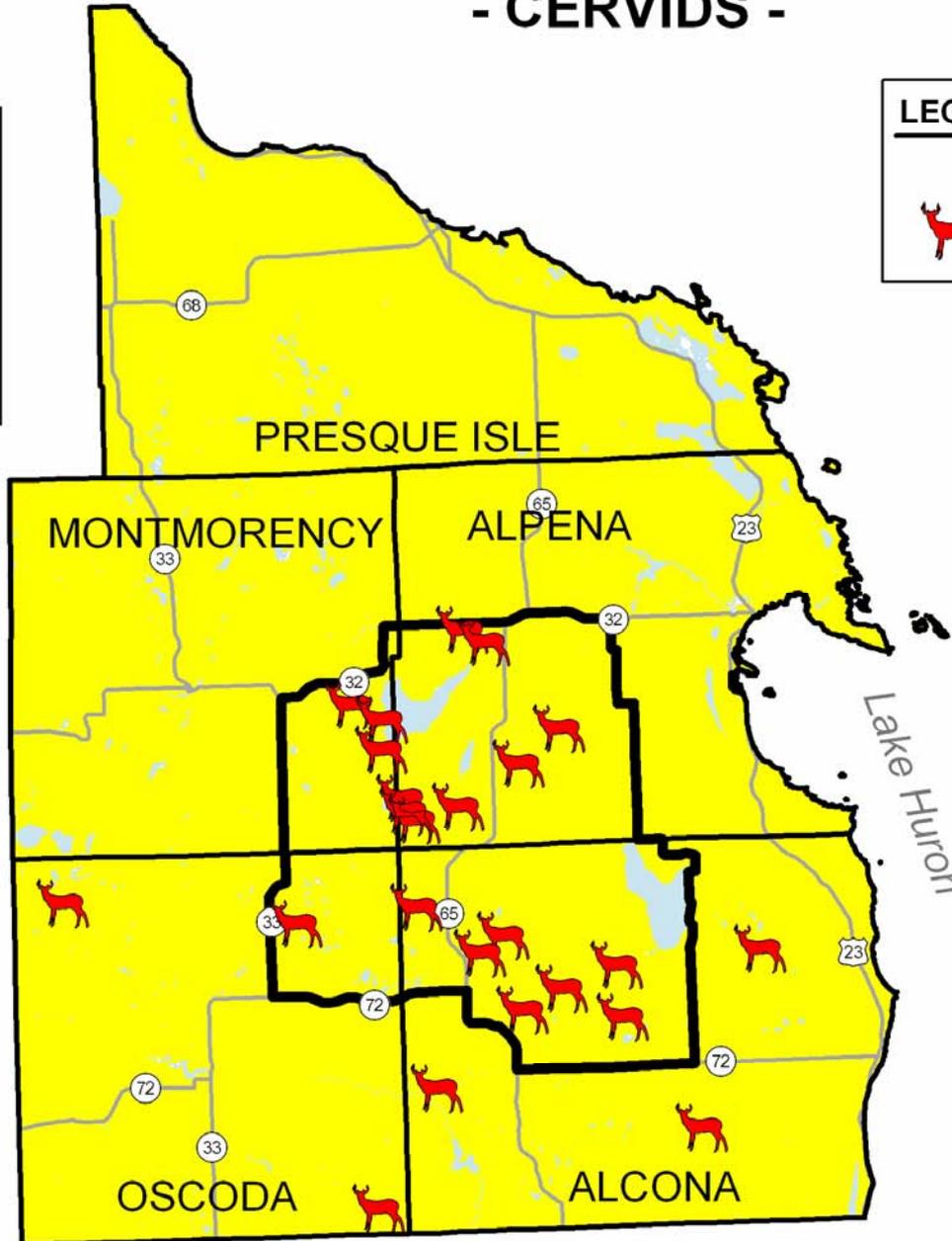


Year	Positive	Grand Total
1975	1	1
1994	1	1
1995	18	403
1996	56	4,966
1997	73	3,720
1998	78	9,057
1999	58	19,496
2000	53	25,858
2001	61	24,278
2002	51	18,100
2003	32	17,302
2004	28	15,131
2005	16	7,364
2006	41	7,914
2007	27	8,316
2008	4	346
<b>Grand Total</b>	<b>598</b>	<b>162,666</b>



# 2007 BOVINE TUBERCULOSIS SURVEY RESULTS

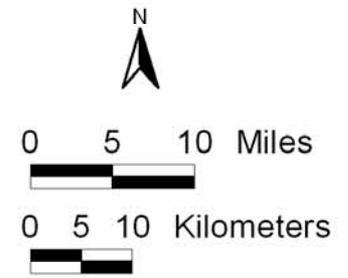
## - CERVIDS -



**LEGEND**

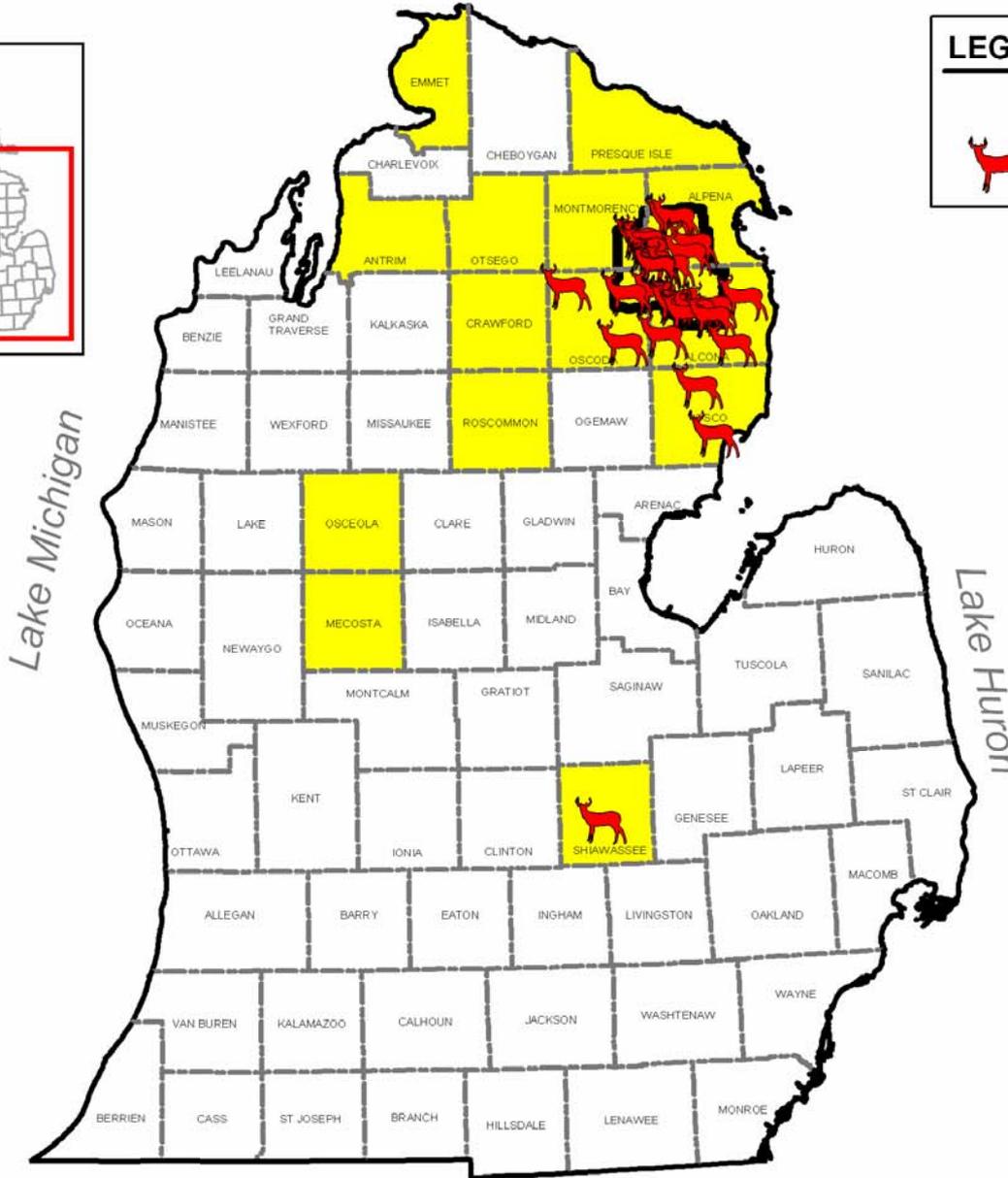
-  TB Positive Deer
-  DMU 452
-  County Lines
-  Water
-  Highways

TOTAL NUMBER
<b>27</b>



# 2007 BOVINE TUBERCULOSIS SURVEY RESULTS

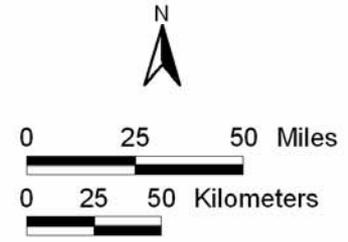
## - CERVIDS -



**LEGEND**

-  TB Positive Deer
-  DMU 452
-  County with at least one case of Bovine TB 1975-2007
-  County Lines

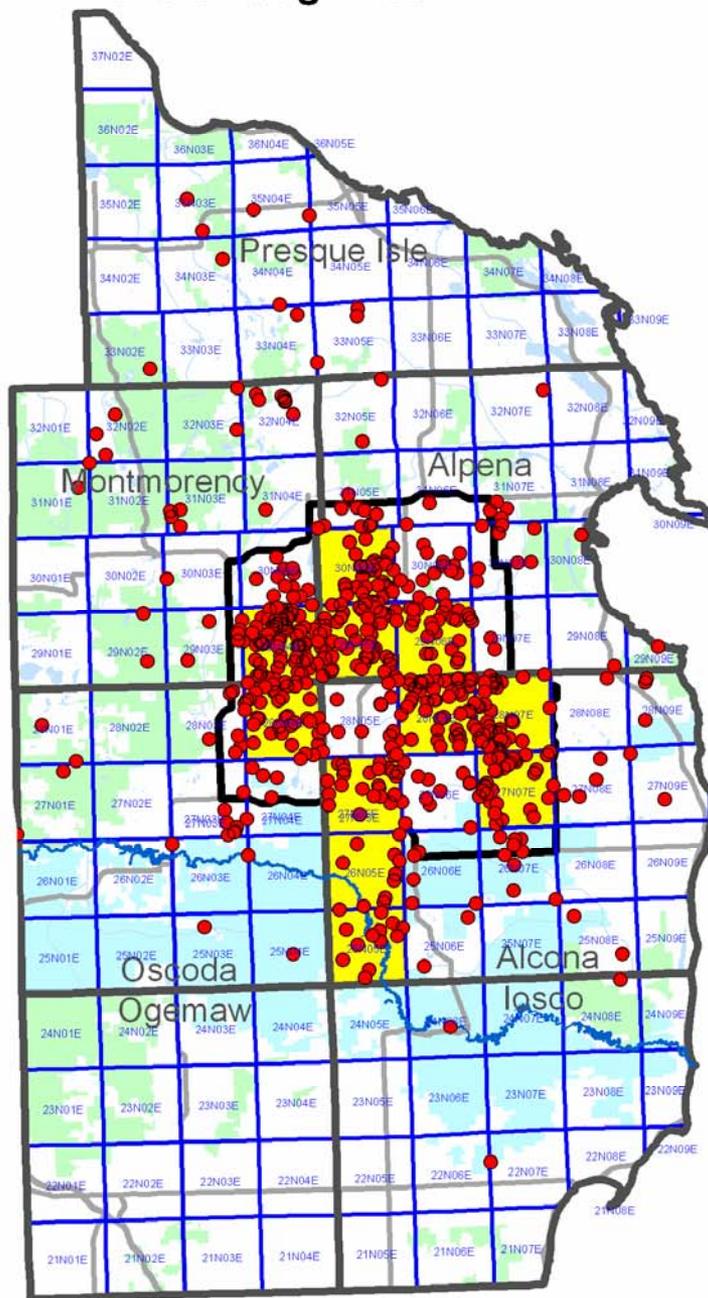
**TOTAL NUMBER**  
**27**



# Bovine Tuberculosis Positive or Suspect White Tailed Deer - 1975 through 2007 -

## Legend

- Bovine TB Positive Deer
  - County Lines
  - Tier/Range Lines
  - Township with Apparent Prevalence  $\geq 2.0\%$
  - DMU 452
  - Roads
  - Water
  - Au Sable River
- LAND OWNERSHIP**
- Federal
  - State
  - Private



0 5 10 Miles

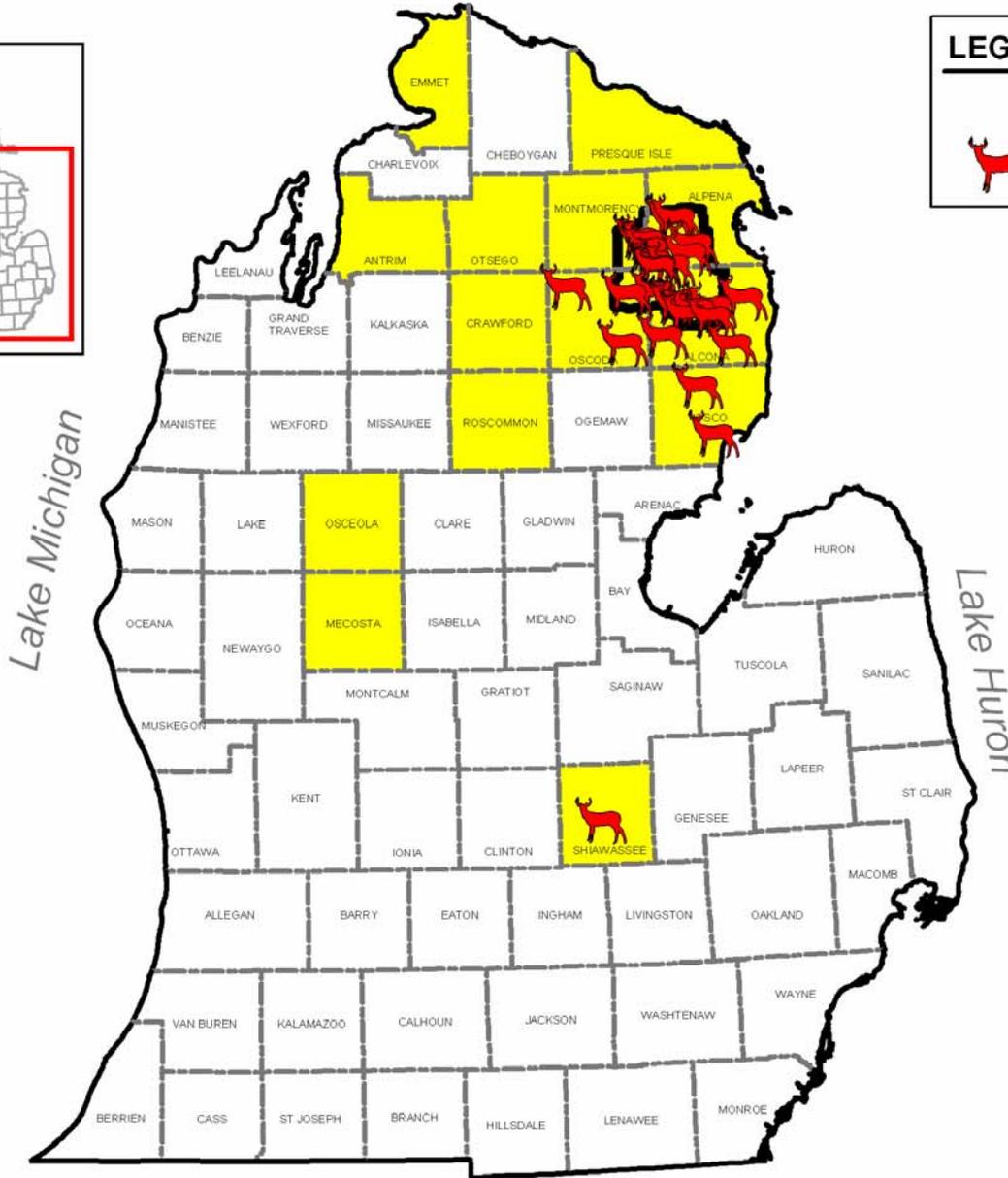


0 5 10 Kilometers



# 2007 BOVINE TUBERCULOSIS SURVEY RESULTS

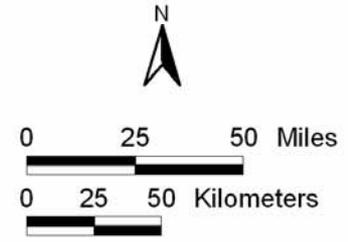
## - CERVIDS -



**LEGEND**

- TB Positive Deer
- DMU 452
- County with at least one case of Bovine TB 1975-2007
- County Lines

**TOTAL NUMBER**  
**27**



**Upper Peninsula**

**360,500 Deer**

**22 deer/sq. mile**

**1959-1960 DEER  
DENSITY IN MICHIGAN  
BY REGION**

**Northern Lower Peninsula**

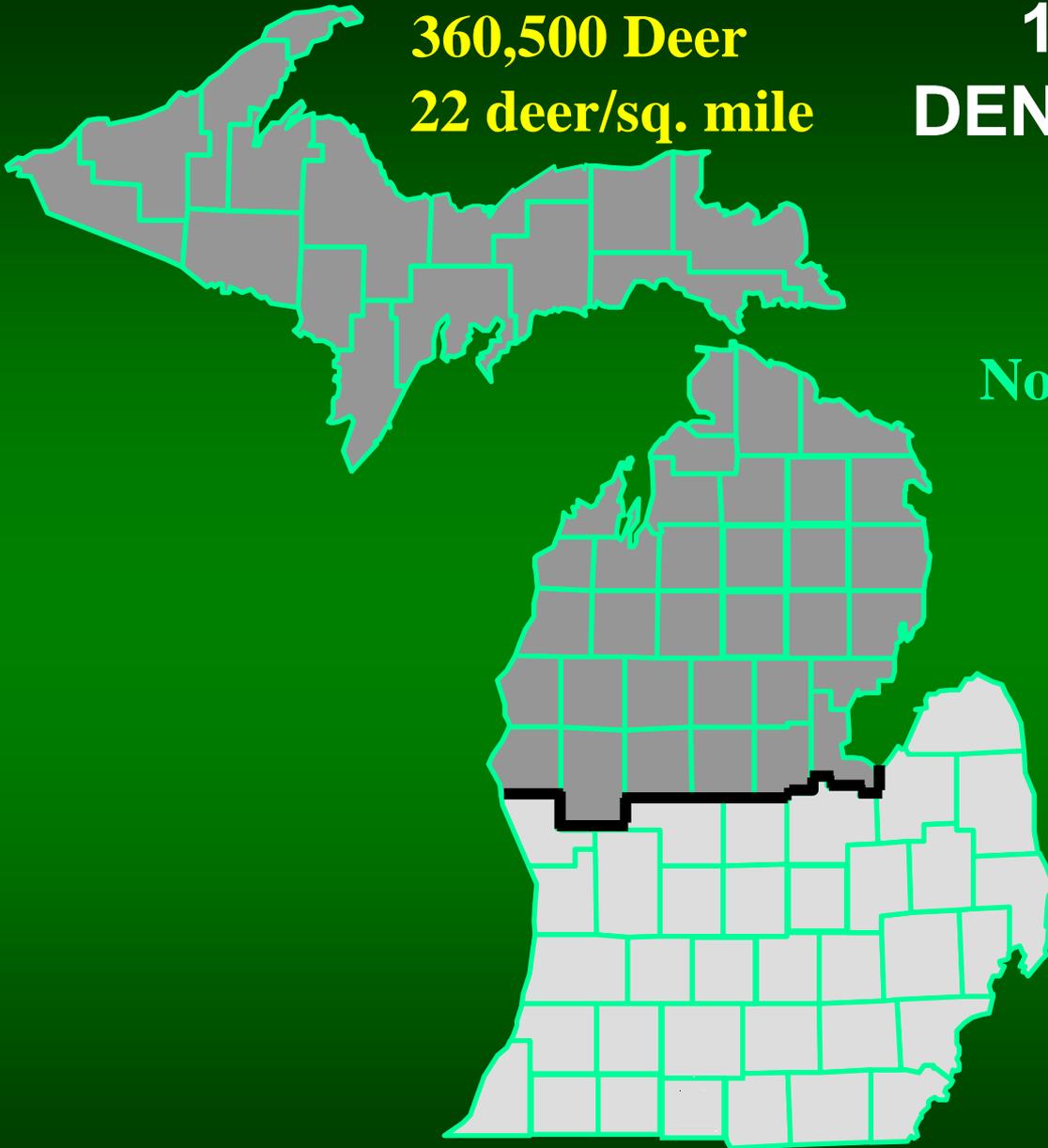
**353,500 Deer**

**19 deer/sq. mile**

**Southern Lower  
Peninsula**

**45,000 Deer**

**2 deer/sq. mile**



# BOVINE TUBERCULOSIS POSITIVE CATTLE HERDS

## Legend

 TB Positive Cattle Herds (n=44)

**ZONES FOR BOVINE TB**  
(Identification, Testing, Permitting, and Movement Requirements)

 Bovine TB Free

 Modified Accredited\*

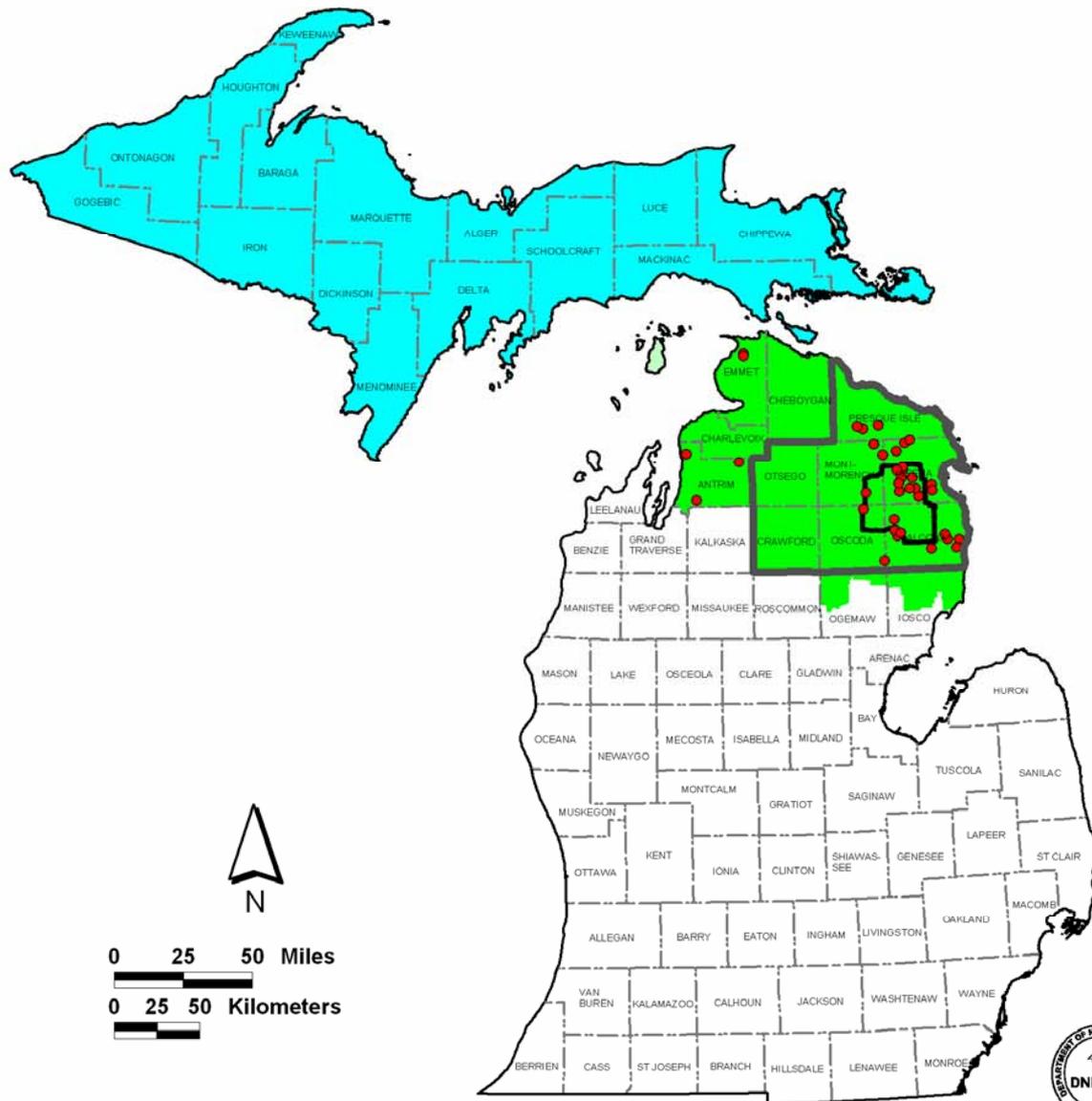
 Modified Accredited Advanced

 Baiting and Feeding Ban

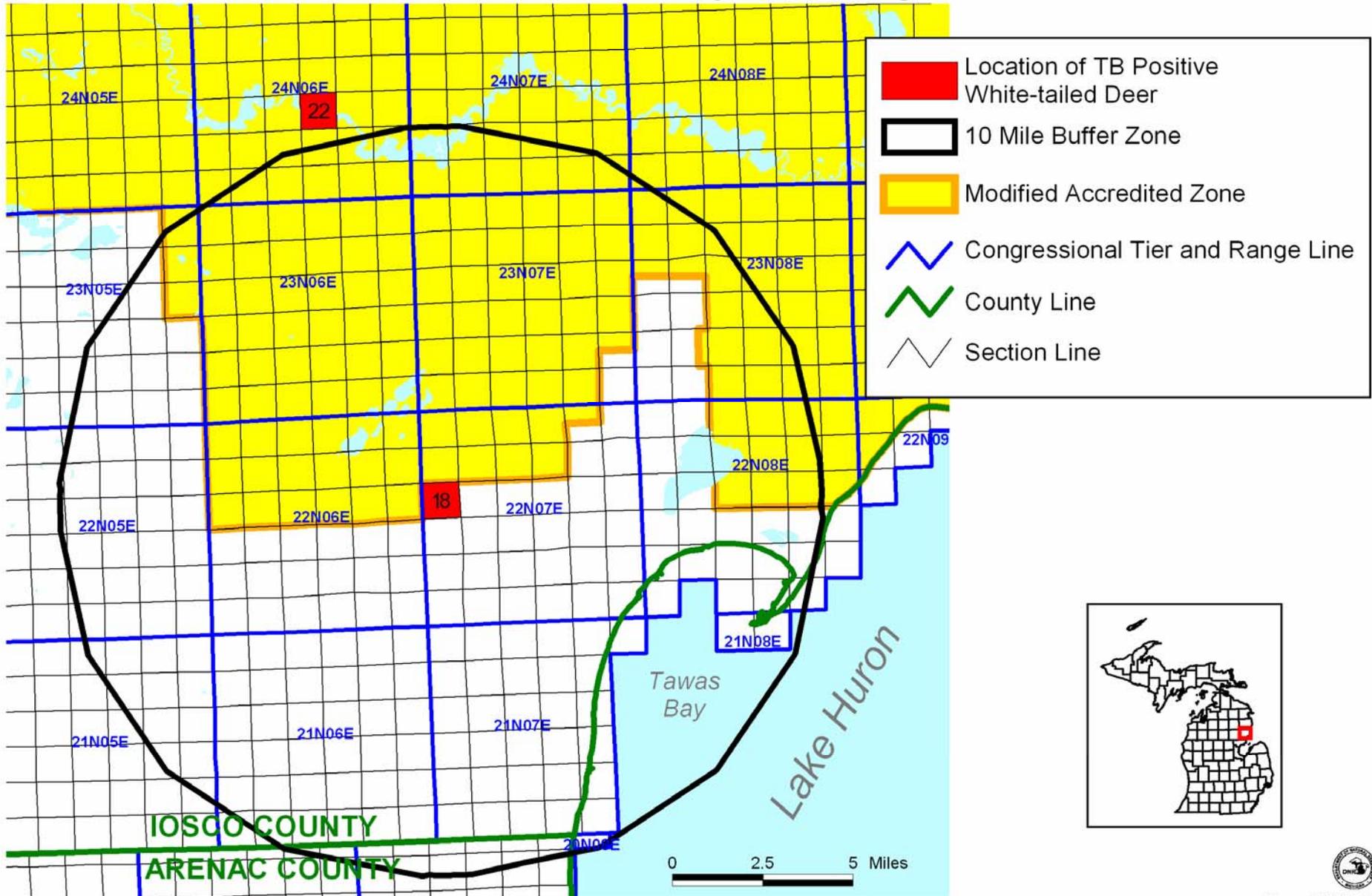
 County Line

 DMU 452

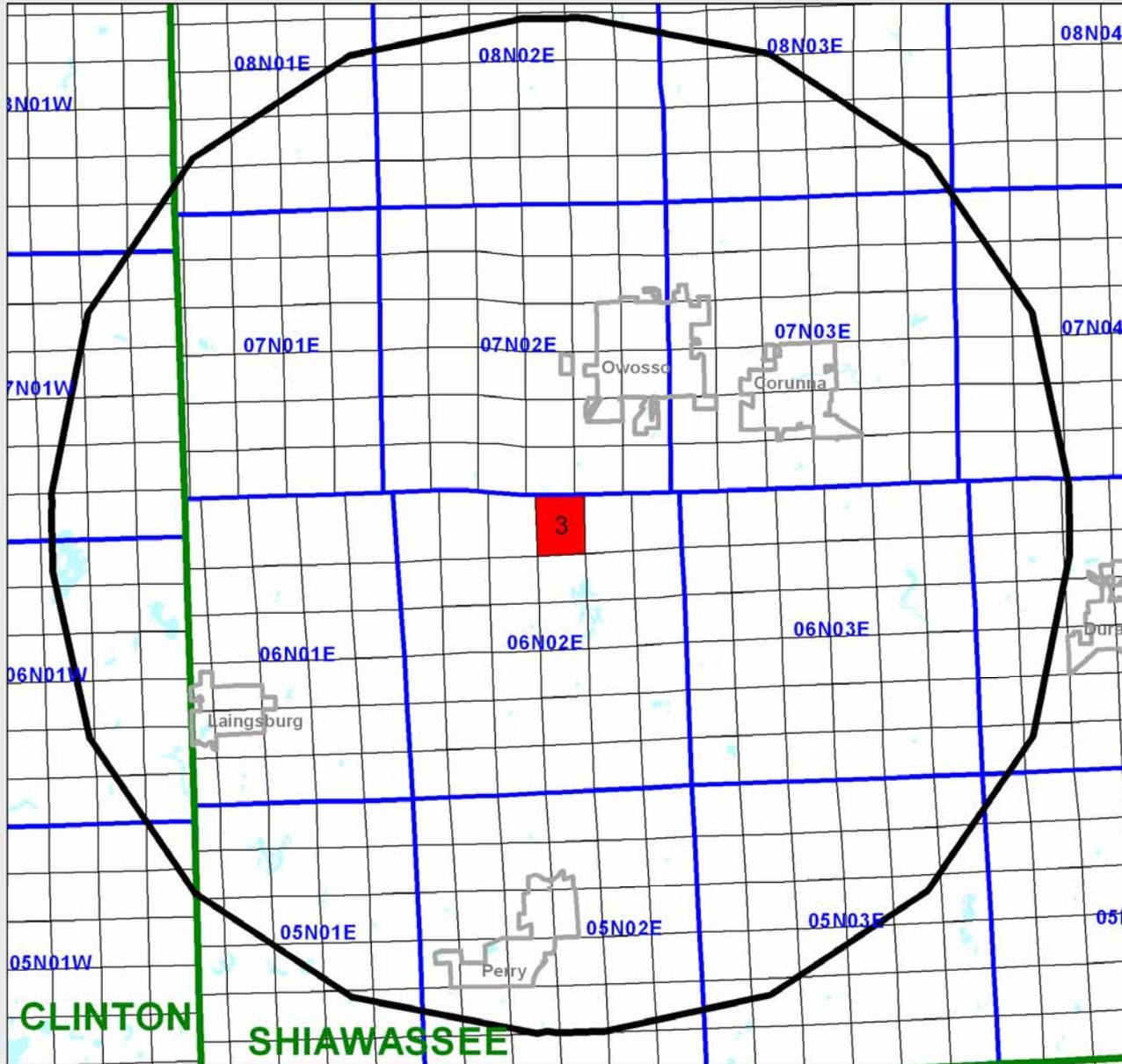
\*The Modified Accredited Zone includes those portions of Iosco and Ogemaw counties that are north of the southernmost boundary of the Huron National Forest and the Au Sable State Forest.



# 10 Mile Buffer Around Acid Fast TB Positive Deer in Iosco County, Michigan - 2007 -



# 10 Mile Buffer Around TB Probe Positive White-tailed Deer in Shiawassee County, Michigan - 2007 -



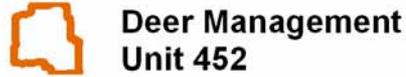
## Legend

- Location of TB Probe Positive White-tailed Deer
- 10 Mile Buffer Zone
- City Boundary
- Congressional Tier and Range Line
- County Line
- Section Line



# 2008 BOVINE TUBERCULOSIS SURVEILLANCE IN MICHIGAN'S FREE-RANGING WHITE-TAILED DEER

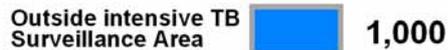
## Legend:



### I. ACTIVE SURVEILLANCE

(Hunters voluntarily submit heads for examination.)

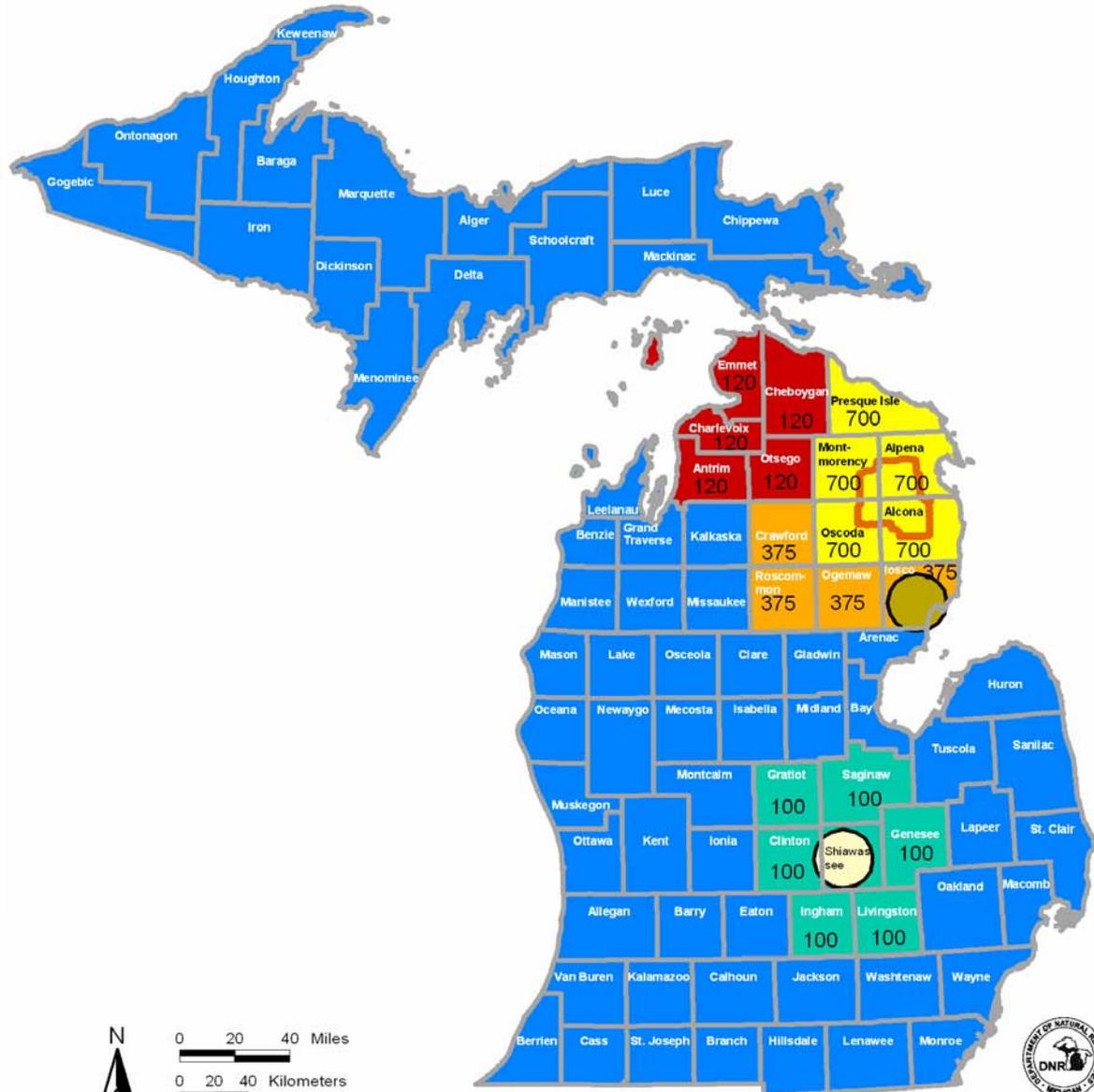
#### ZONE SAMPLE SIZE



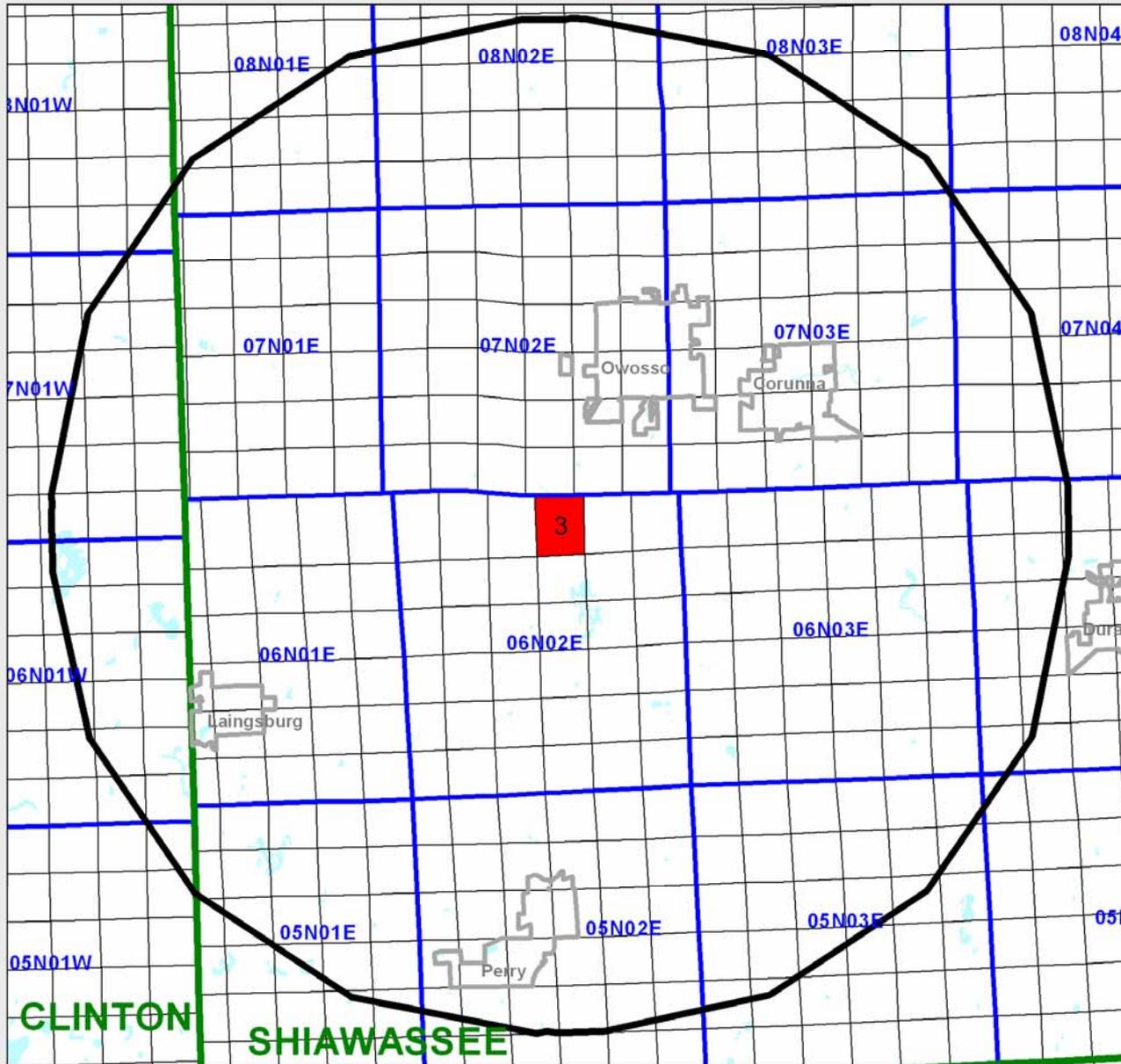
**TOTAL 7,800**

### 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.)



# 10 Mile Buffer Around TB Probe Positive White-tailed Deer in Shiawassee County, Michigan - 2007 -



## Legend

- Location of TB Probe Positive White-tailed Deer
- 10 Mile Buffer Zone
- City Boundary
- Congressional Tier and Range Line
- County Line
- Section Line



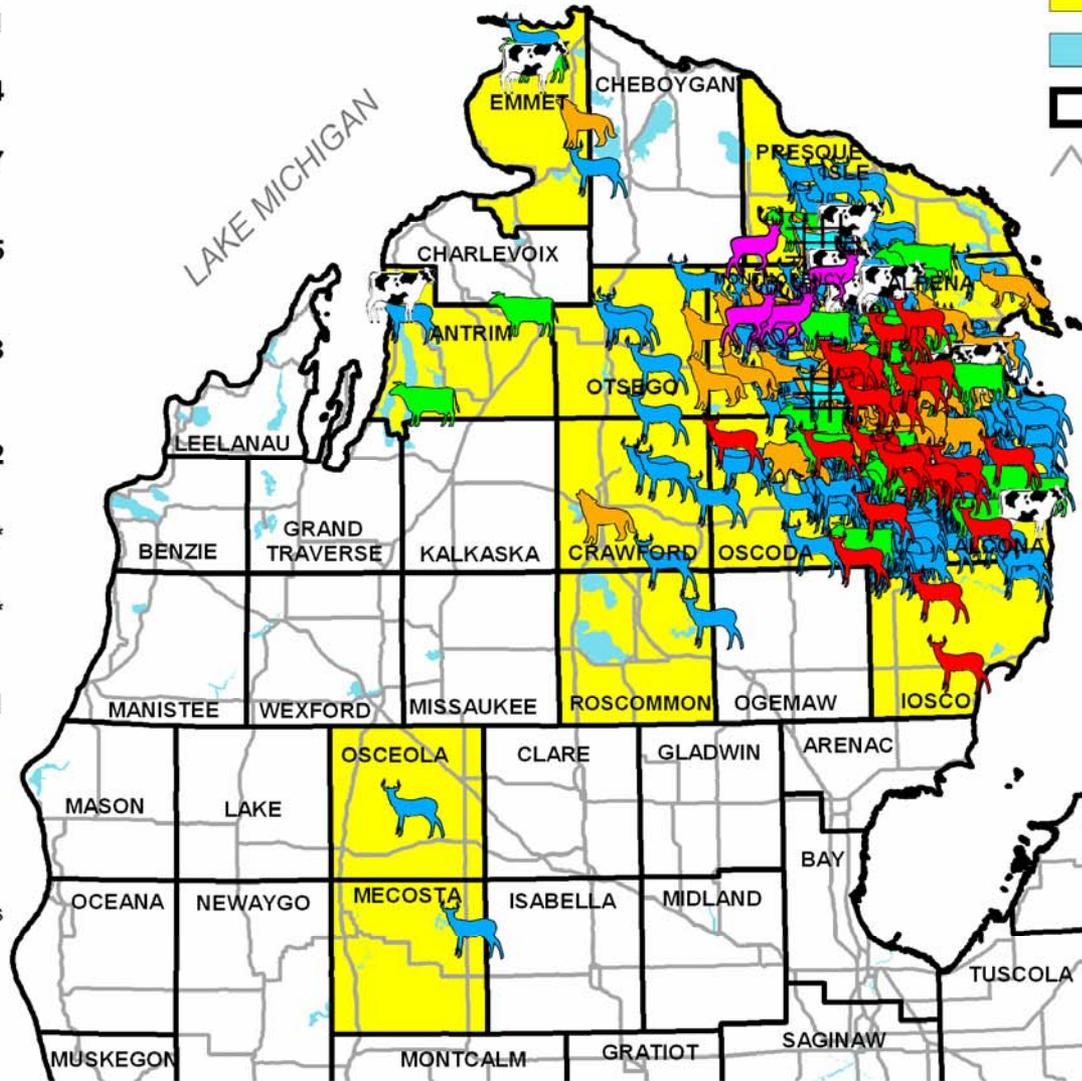
# BOVINE TUBERCULOSIS SURVEY RESULTS

## NUMBER

	1975 POSITIVE TB DEER	1
	1994 POSITIVE TB DEER	1
	1995-2006 POSITIVE TB DEER	564
	2007 POSITIVE TB DEER	27
	2000, 2001, 2003 & 2006 POSITIVE ELK	5
	1996-2005 POSITIVE NON-CERVIDS	43
	1997 & 2006 POSITIVE CAPTIVE DEER HERD	2
	1998-2007 POSITIVE BEEF CATTLE HERD	34*
	2000-2007 POSITIVE DAIRY HERD	10*
	2000 POSITIVE CAT	1

\*Total includes twice affected farms

-  NEW (2001) DMU 452
-  TB INFECTED COUNTY
-  HYDROLOGY
-  COUNTY LINES
-  HIGHWAYS



# BOVINE TUBERCULOSIS POSITIVE CATTLE HERDS

## Legend

 TB Positive Cattle Herds (n=44)

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(Identification, Testing, Permitting, and Movement Requirements)

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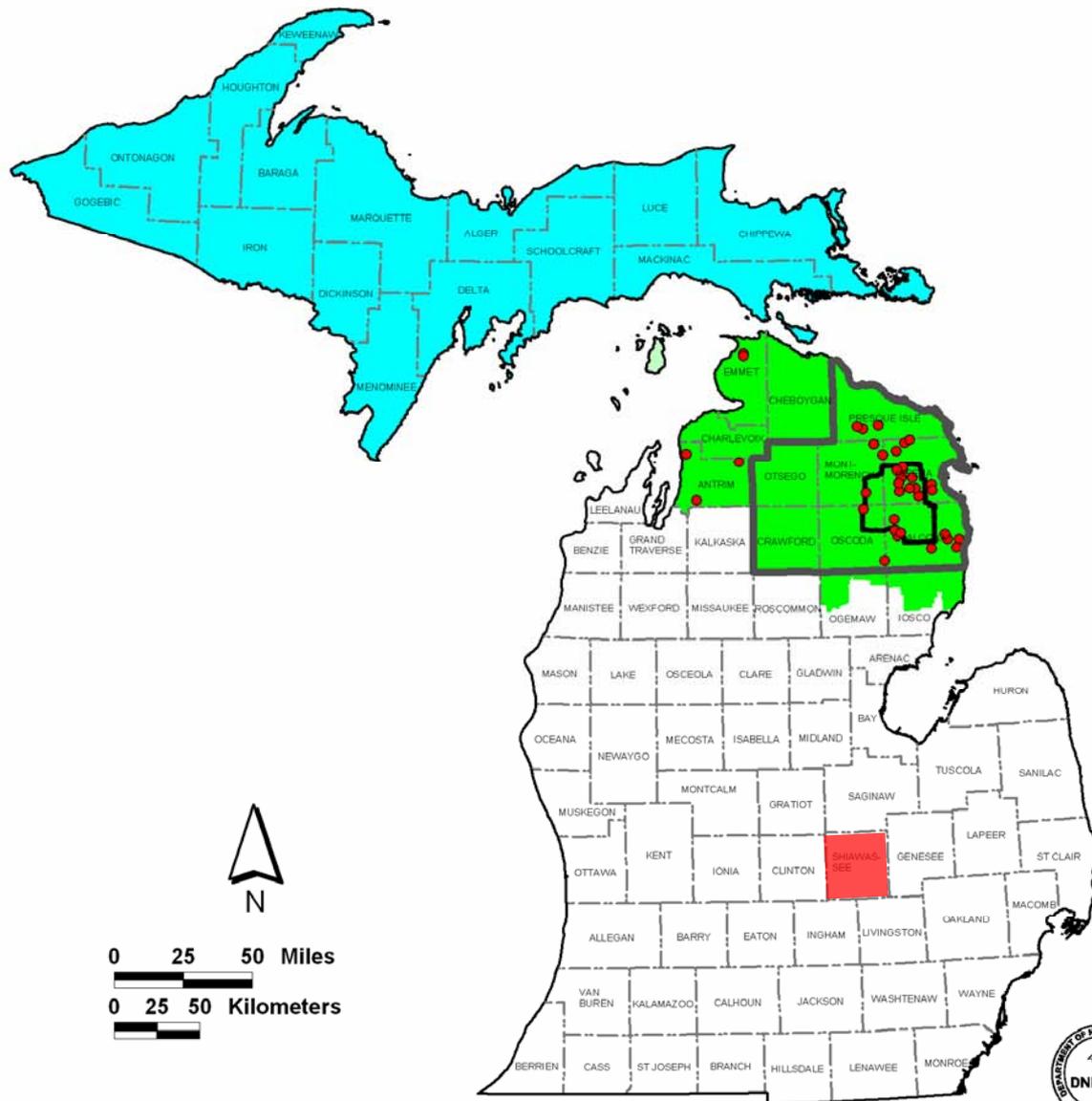
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 Baiting and Feeding Ban

 County Line

 DMU 452

\*The Modified Accredited Zone includes those portions of Iosco and Ogemaw counties that are north of the southernmost boundary of the Huron National Forest and the Au Sable State Forest.





# Bovine TB Eradication Strategies

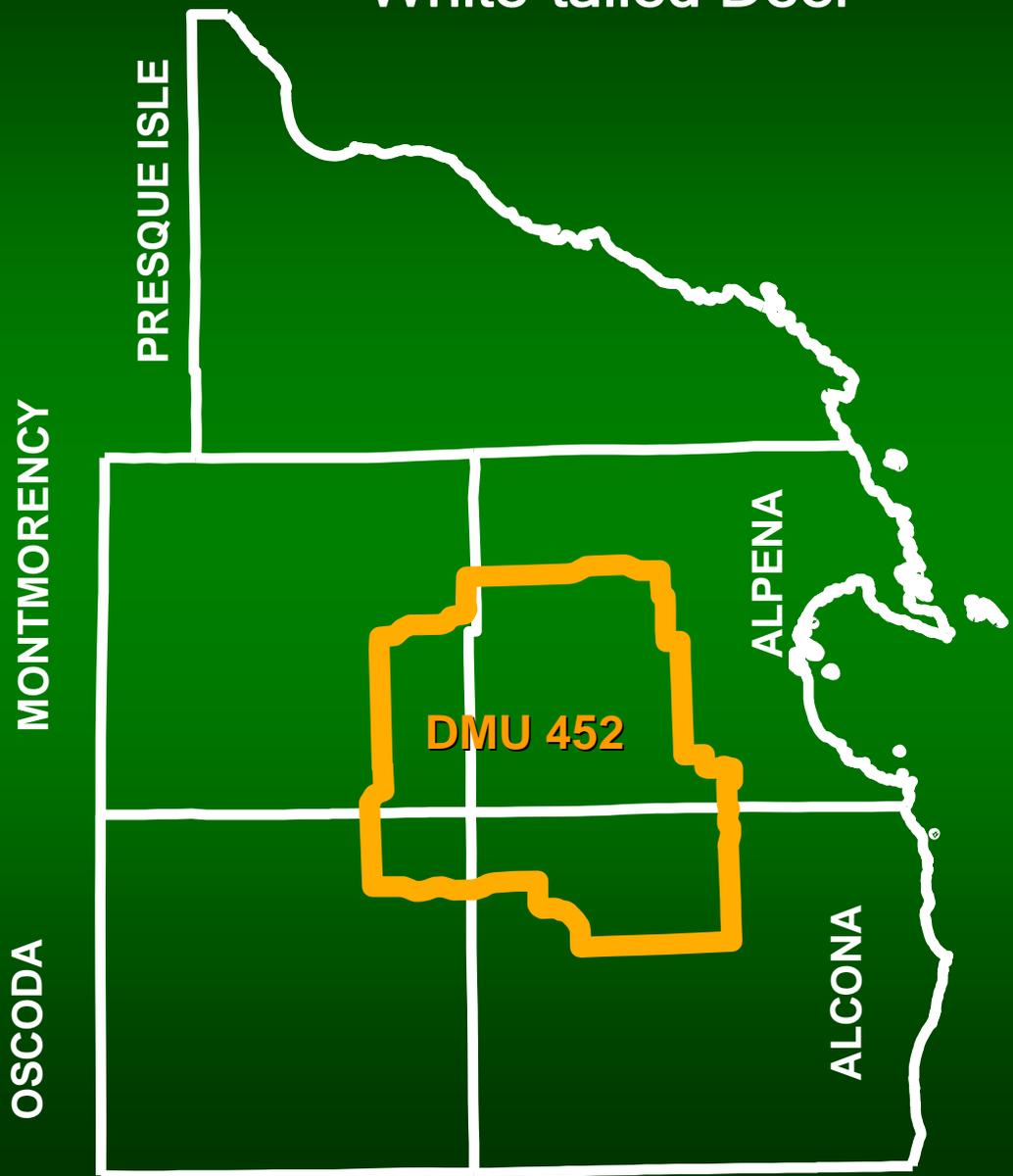
1. Keep deer from concentrating by eliminating supplemental feeding and baiting



2. Reduce deer numbers through hunting to a level supported by the natural vegetation.



# Apparent TB Prevalence in White-tailed Deer



Year	Inside DMU452	5-County Outside DMU452
<b>2007</b>	<b>1.4 %</b>	<b>0.2 %</b>
2006	2.3%	0.3%
2005	1.2%	0.1%
2004	1.7%	0.2%
2003	1.7%	0.2%
2002	2.6%	0.5%
2001	2.3%*	0.5%
2000	2.5%	0.4%
1999	2.4%	0.2%
1998	2.7%	0.3%
1997	4.7%	0.4%
1996	2.5%	0.2%
1995	4.9%	(no testing)

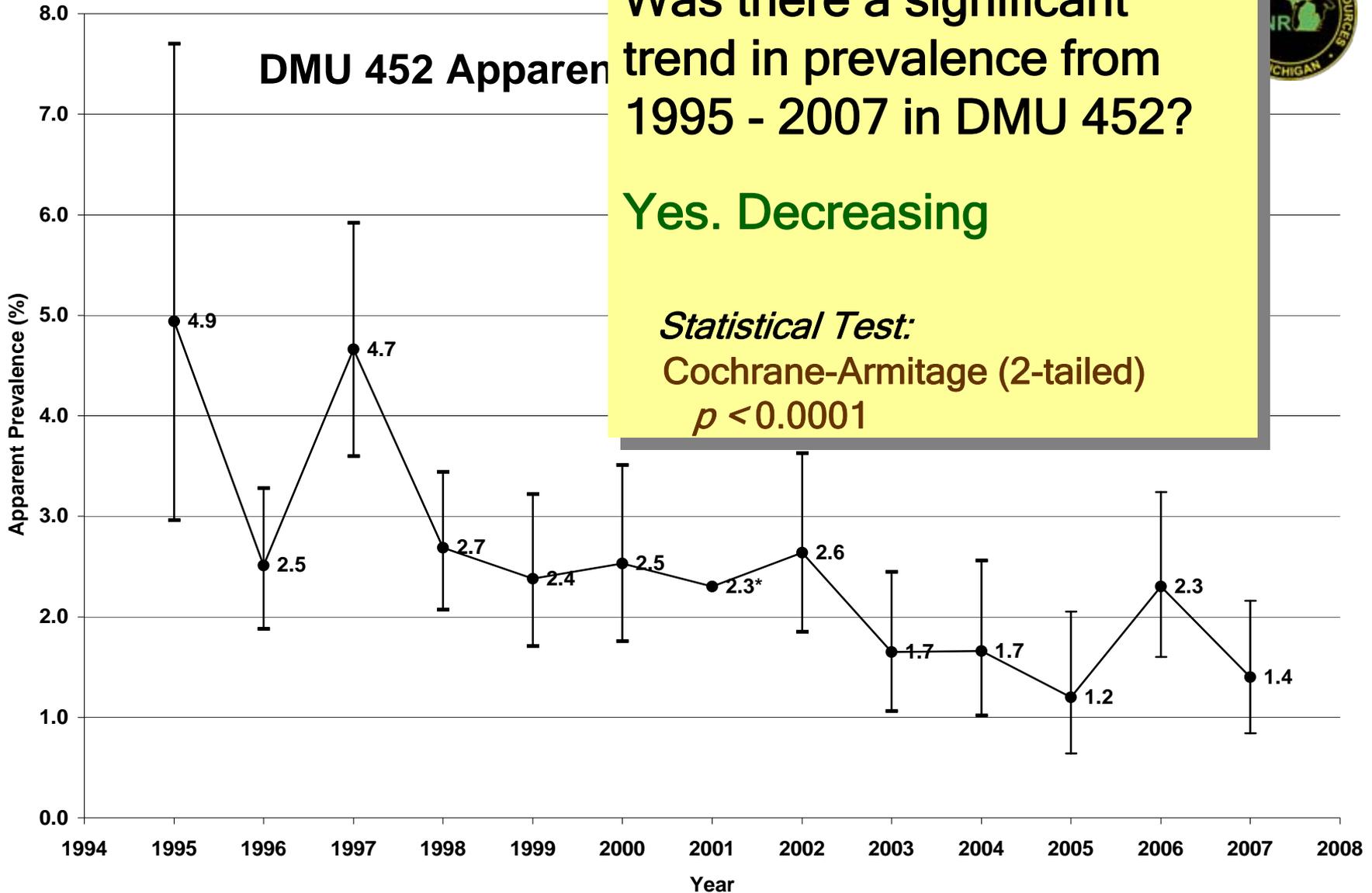
\* Extrapolated from head-only apparent prevalence; Mandatory head testing.



Was there a significant trend in prevalence from 1995 - 2007 in DMU 452?

Yes. Decreasing

Statistical Test:  
Cochrane-Armitage (2-tailed)  
 $p < 0.0001$



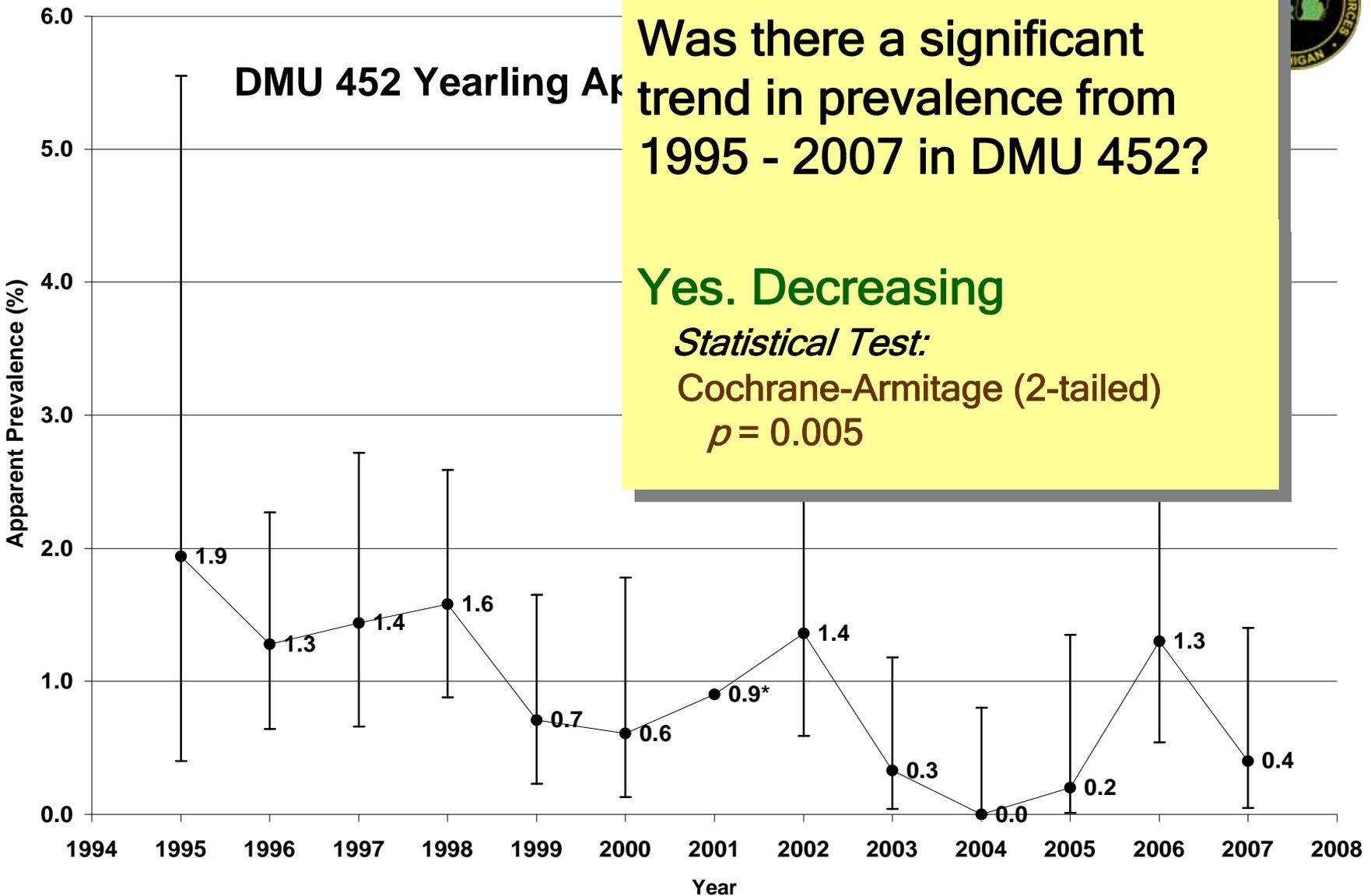
\* Extrapolated from head-only apparent prevalence: Mandatory testing.

# DMU 452 Yearlings



Year	Tested	Positive	Apparent Prevalence (%)
1995	155	3	1.9
1996	862	11	1.3
1997	624	9	1.4
1998	952	15	1.6
1999	702	5	0.7
2000	491	3	0.6
2001	882	8	* 0.9
2002	588	8	1.4
2003	610	2	0.3
2004	459	0	0
2005	409	1	0.2
2006	638	8	1.3
2007	502	2	0.4

\* 2001 Mandatory Testing



Was there a significant trend in prevalence from 1995 - 2007 in DMU 452?

**Yes. Decreasing**

*Statistical Test:*

Cochrane-Armitage (2-tailed)

$p = 0.005$

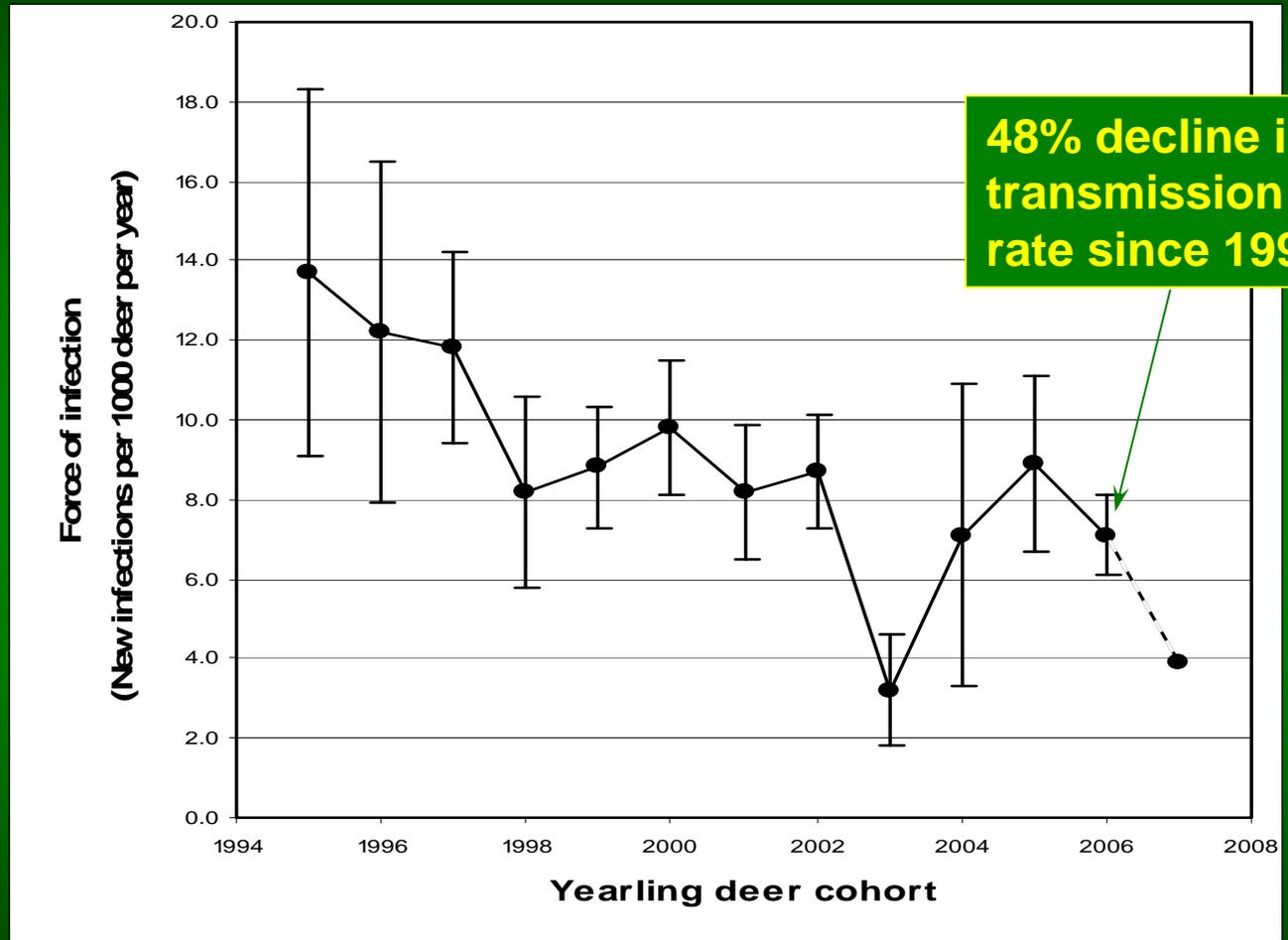
\* 2001 Mandatory Testing

# Disease transmission has declined significantly within DMU452

## TB transmission

( New infections per 1000 deer per year)

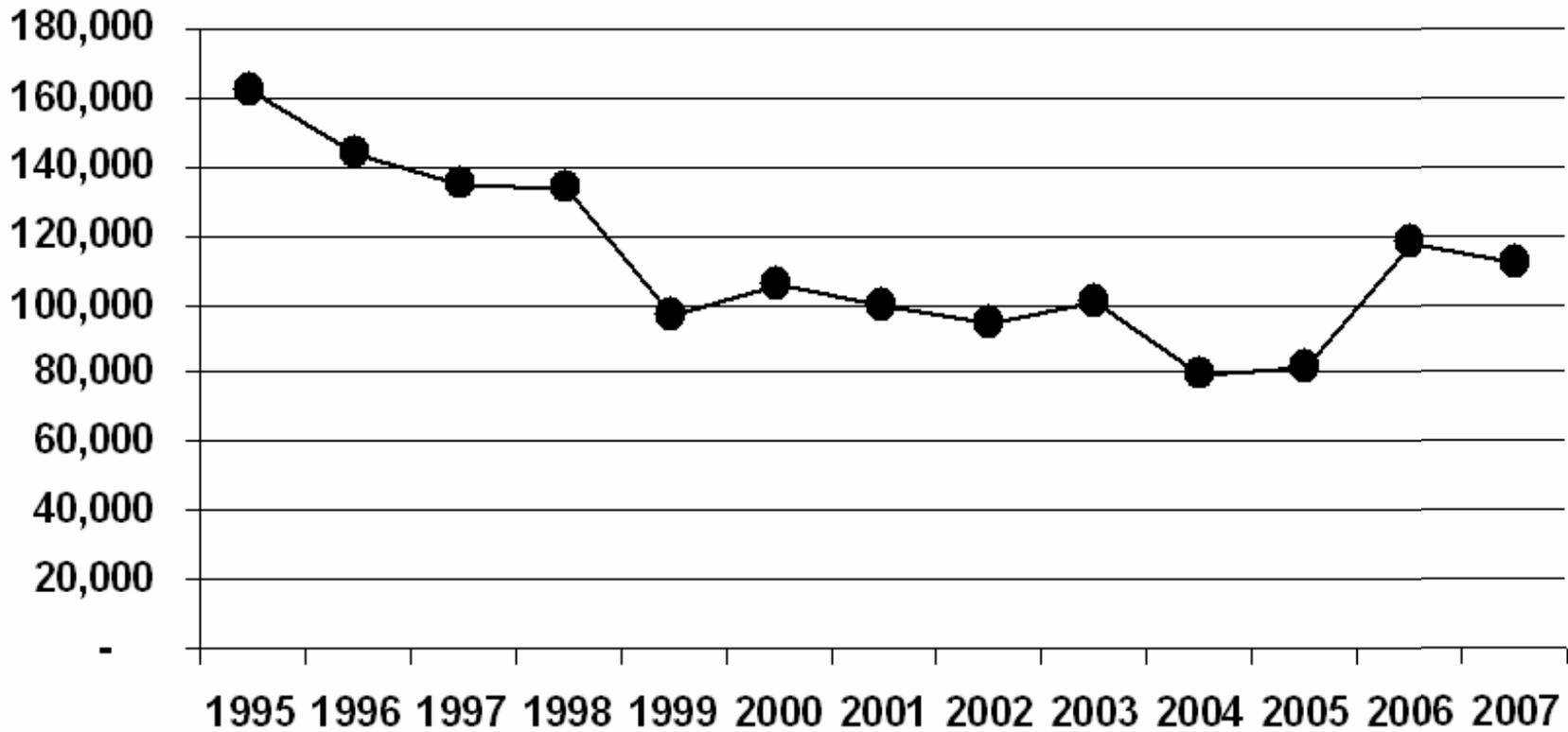
The average annual rate of new infections has declined 48% from 1995 through 2006.



Note: The 2007 data are for yearlings only. Yearlings are at reduced risk of infection vs. older deer, so this point is not directly comparable to the other cohorts.

# Deer Population Estimates \*

*1995-2007, 5-County TB Area*



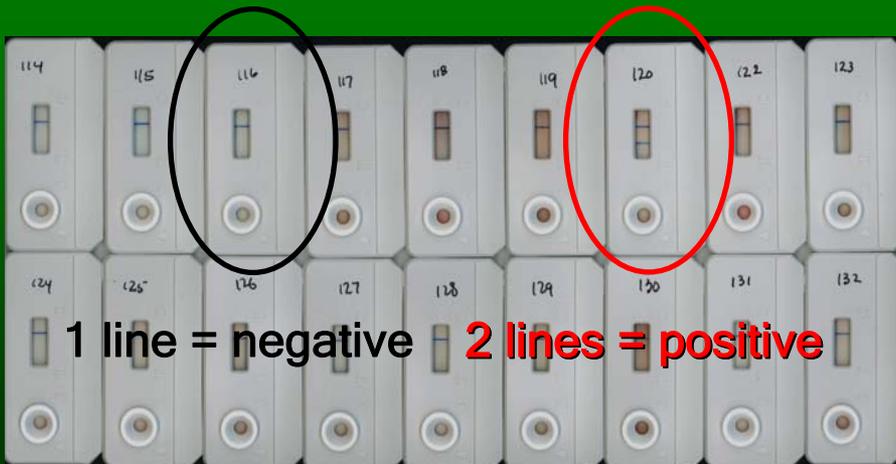
\* These are the annual population estimates generated for DMU 452 using our Sex-Age-Kill reconstruction technique. We generally use estimates at this level as more of a multiple-year trend index than as a strict estimate of change from one year to the next.

# Increase in Baiting?





# Trap, Test & Cull Pilot Project



1 line = negative    2 lines = positive

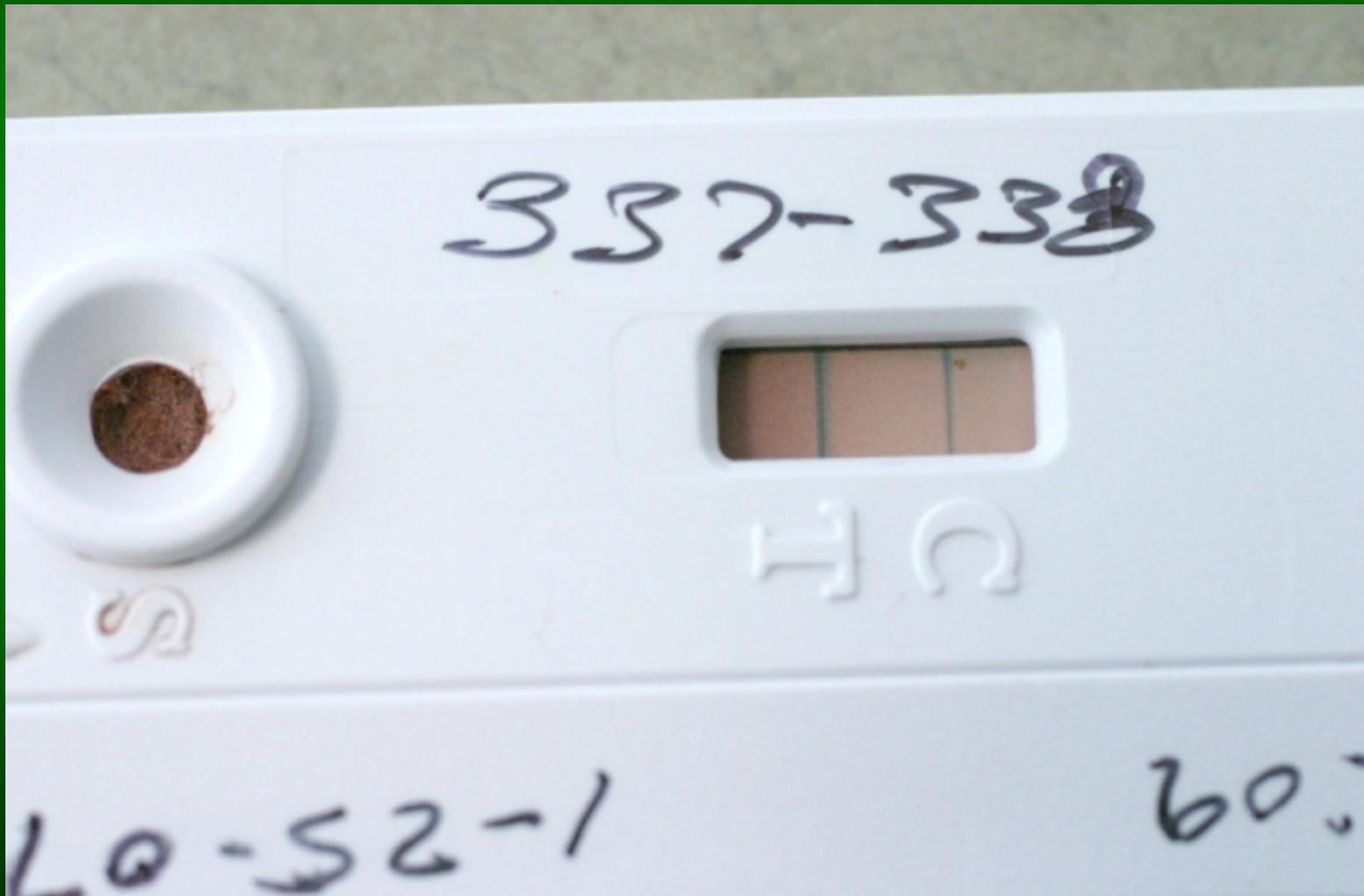
A cooperative effort  
between DNR and USDA-  
Wildlife Services



1 ½ year old female, eartags 337 & 338



Rapid Test Cassette with positive results



1 ½ year old female, eartags 337 & 338



We have demonstrated success in capturing and field testing deer, and detecting TB Positive deer.





**Vaccinate negative deer before release if an effective vaccine can be developed. Because a vaccination program would significantly aid our efforts in eradicating TB from Michigan.**

But, before a vaccine would be allowed to be used, three questions need to be answered and that is where the current vaccine research is being concentrated.



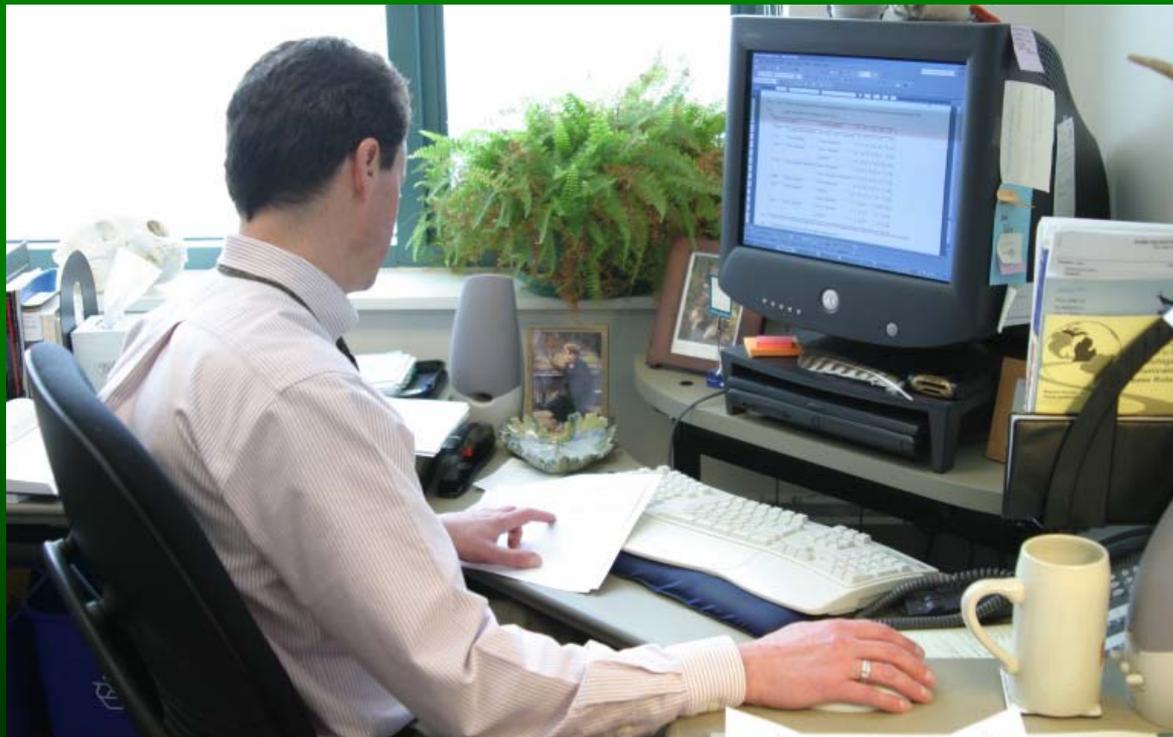
1. Is the vaccine efficacious?
2. Is the vaccine safe?
3. Will the vaccine cause problems with cattle testing?





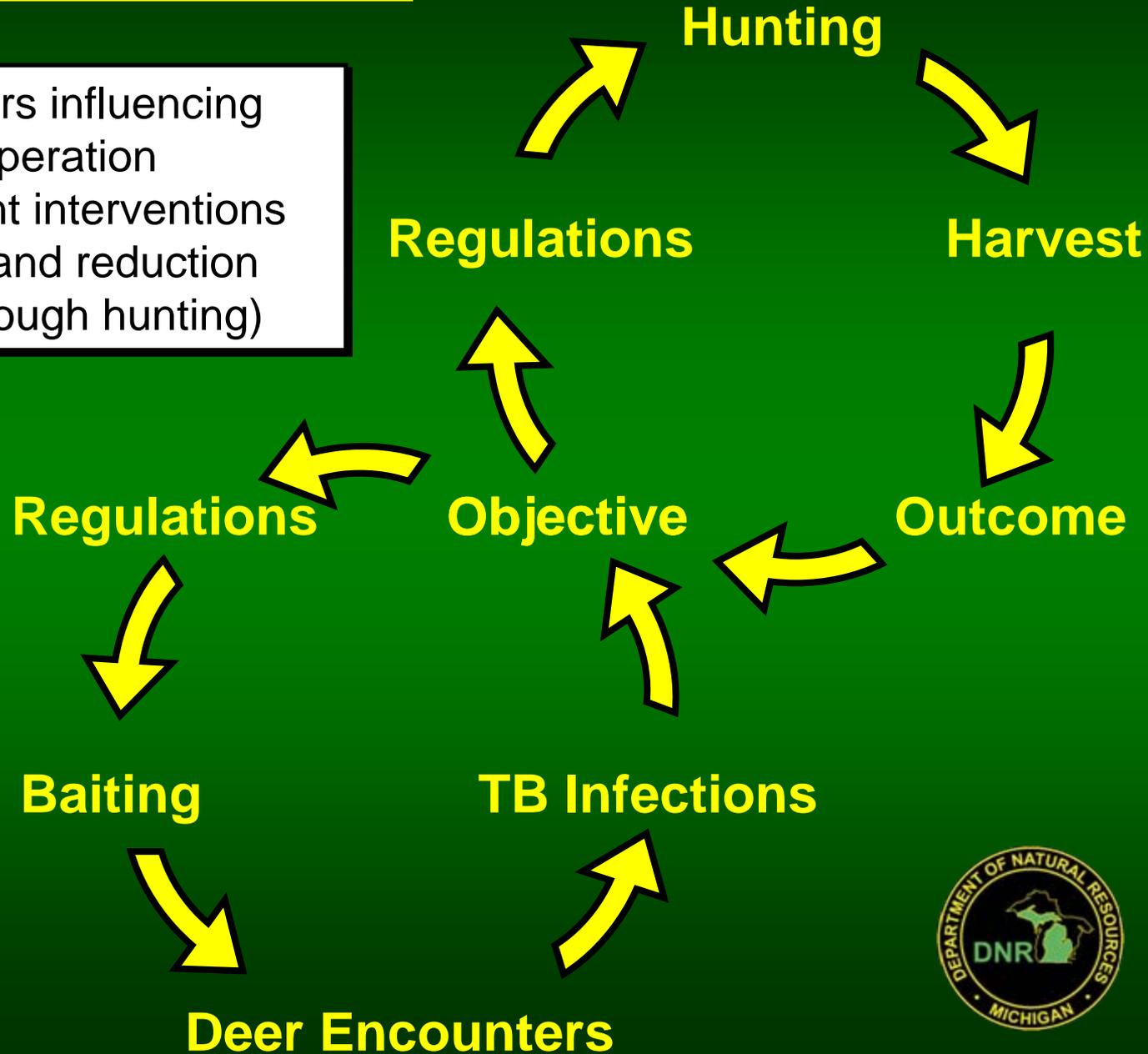
# A spatial model of TB in Michigan

- Objective: to develop a spatially-explicit computer simulation of TB transmission in MI white-tailed deer & use it to:
  - simulate TB on a computer so that we can evaluate different management scenarios



# ***TB regulation model - Brent Rudolph***

Assessment of factors influencing compliance and cooperation with TB management interventions (baiting regulations and reduction of deer densities through hunting)



# 2008 DISEASE CONTROL PERMIT PROGRAM



## SUMMARY OF ACTIVITIES IN NE MICHIGAN as of 6/30/08

### 5-county livestock producers:

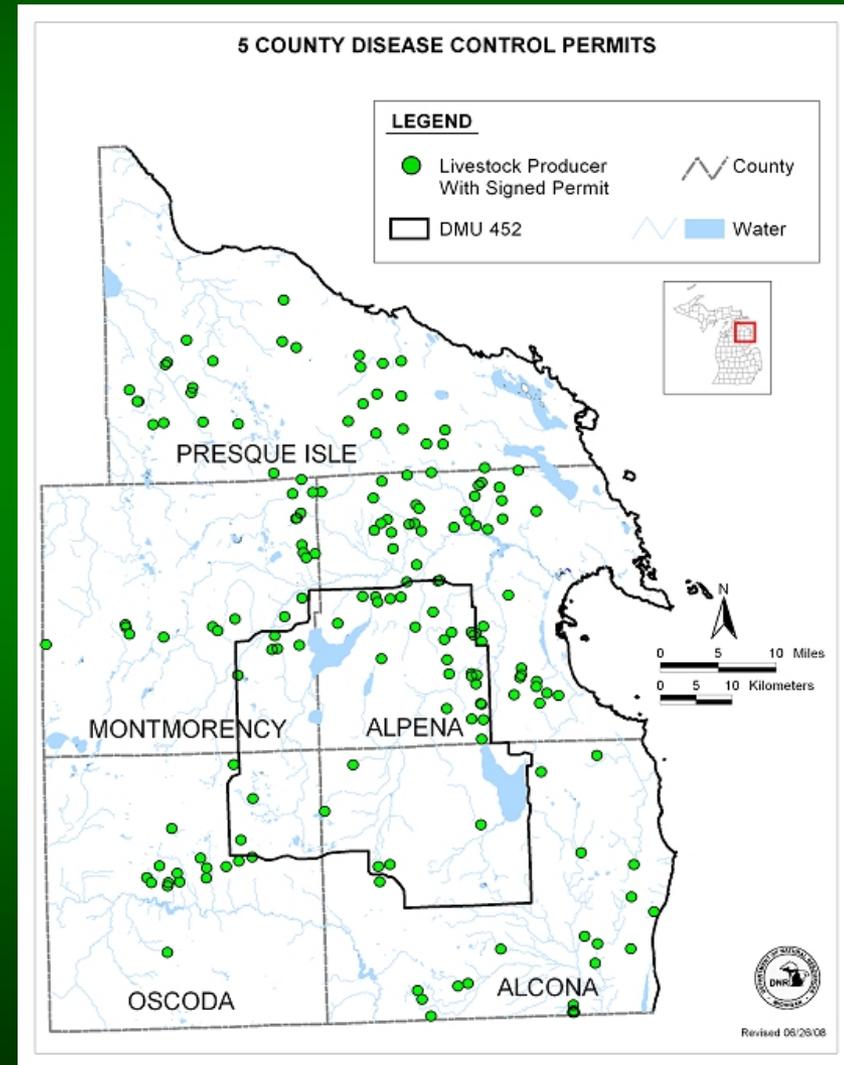
- 223 deer have been taken by 56 livestock producers.
- 654 permits and 3,479 permit tags have been mailed.
- 170 signed permits have been received.
- 15 producers have requested more tags.

### Livestock producers outside the 5-county area; but in the Modified Accredited Zone.

- 131 deer have been taken.
- 30 permits have been issued.

### Non-agricultural landowners in DMU 452 :

- 101 deer have been taken by 12 landowners.
- 23 have requested and were mailed a total of 280 tags.
- 19 signed permits have been received (all non-ag permits expired 4/30/2008).
- 5 have requested more tags.

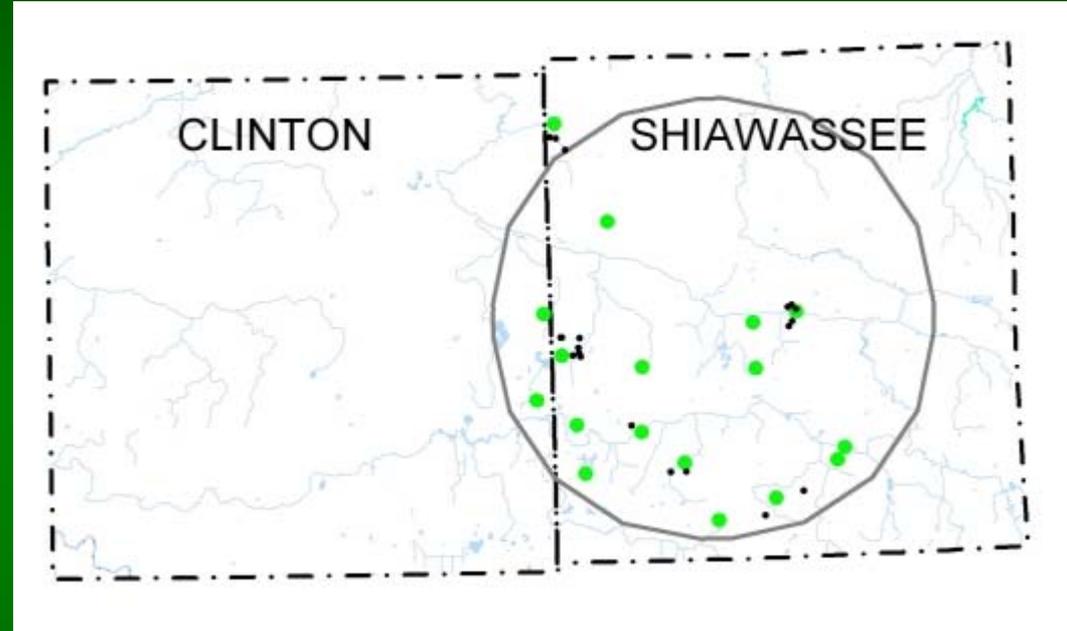


# 2008 DISEASE CONTROL PERMIT PROGRAM



## SUMMARY OF ACTIVITIES SHIAWASSEE / CLINTON as of 6/30/08

- 22 deer have been taken by 7 livestock producers.
- 150 letters of invitation were mailed.
- 40 permits and 215 tags have been mailed.
- 17 signed permits have been received.
- 2 producers has requested more tags.



### LEGEND

- |                                       |   |
|---------------------------------------|---|
| Livestock Producer With Signed Permit | 10 Mile Buffer Around 2007 TB Positive Deer |
| TB Negative Deer                      | County                                      |
|                                       | Water                                       |



## *IN SUMMARY*

We are making progress in eradicating bovine TB from our deer herd.

However, we can't back off on our eradication strategies.

We are developing more tools to help with our goal of eradicating bovine TB.



Stephen M. Schmitt, Wildlife Veterinarian  
Michigan Department of Natural Resources



*[www.michigan.gov/dnr](http://www.michigan.gov/dnr)*  
*[www.michigan.gov/bovinetb](http://www.michigan.gov/bovinetb)*