2010 BOVINE TB SURVEILLANCE

Dr. Steve Schmitt
Dr. Dan O'Brien

2010 BOVINE TUBERCULOSIS SURVEILLANCE IN MICHIGAN'S FREE-RANGING WHITE-TAILED DEER

Legend

Deer Management Unit 452

County Lines

I. ACTIVE SURVEILLANCE

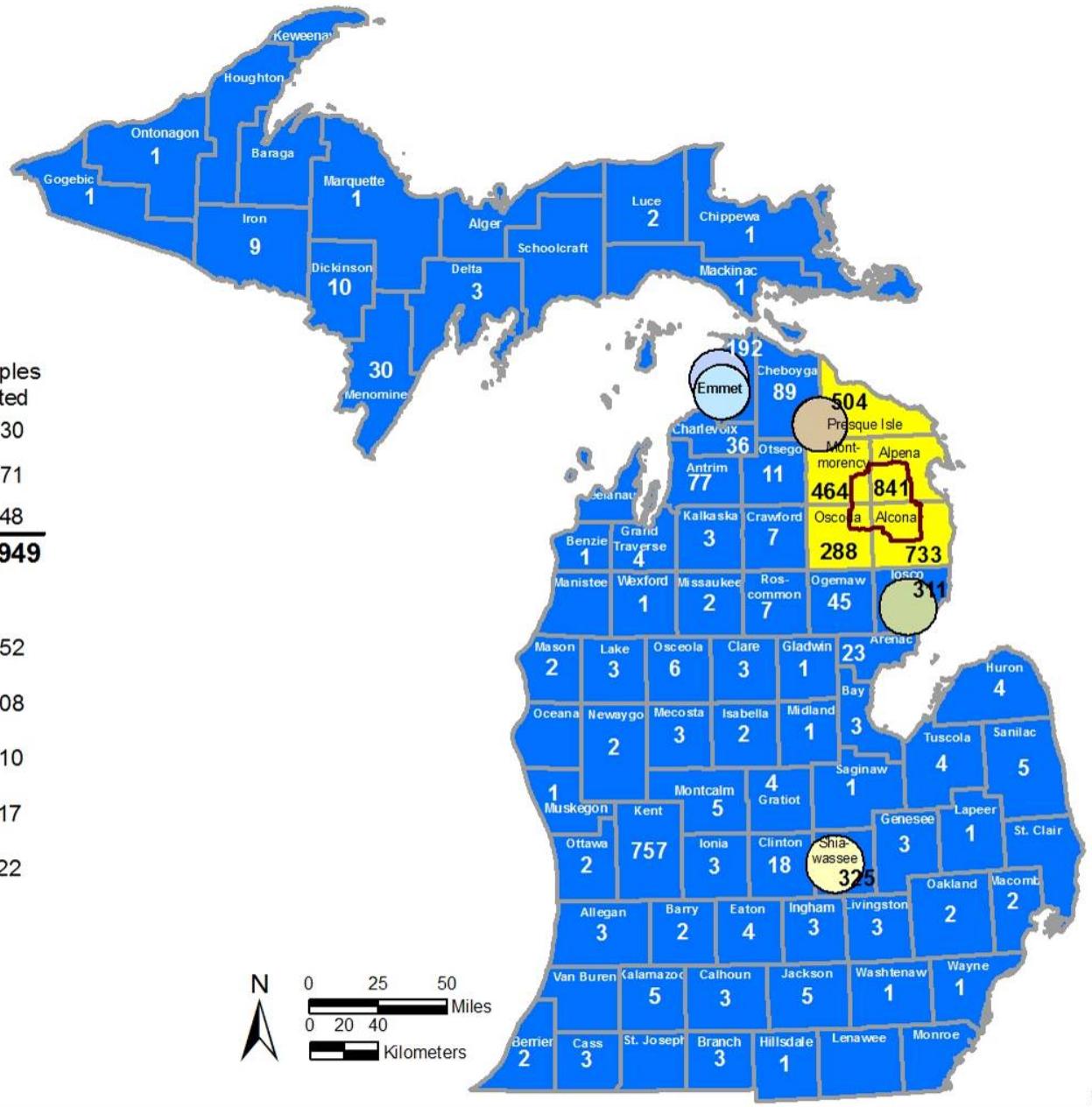
(Hunters voluntarily submit heads for examination)

Zone	Sample Goal	Samples Tested
	3,500	2,830
	0	2,071
Unknown Locations		48
Total	**3,500**	**4,949**

Iosco 10-mile radius circle	300	252
Shiawassee 10-mile radius circle	300	308
Cheboygan 10-mile radius circle	300	210
Emmet 10-mile radius circle	300	117
Emmet 10-mile radius circle	300	122

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.)



Rev. February 25, 2011

Michigan White-tailed Deer Surveillance

Year	Positive	Total Deer Tested
1975 & 1994	2	2
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	37	16,309
2009	31	5,722
2010	**24**	**4,949**
2011 ongoing	1 suspect	93
Grand Total	**687**	**188,980**

2010 Bovine Tuberculosis Survey Results
-Cervids-

Legend

- TB Positive Deer
- DMU 452
- County Line
- Water
- Highway
- County with Positive Deer 1975-2010

Total Positive Deer

24

N

0 10 20 Miles

0 5 10 Kilometers

Rev. February 25, 2011

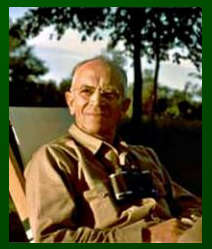
What Drives TB Transmission?

1. Density

2. Concentration

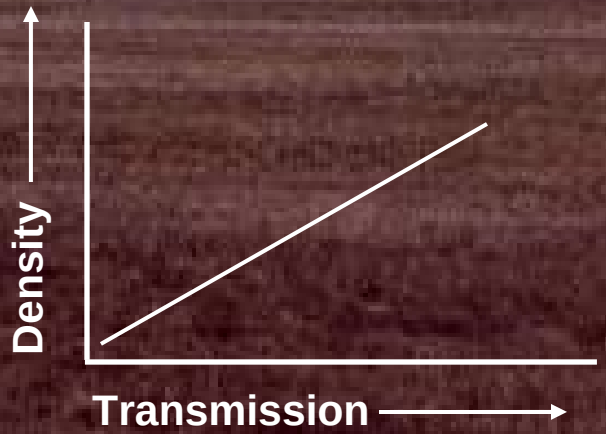
"A high density of population – the very thing the game manager is so far seeking – must be set down as the fundamental condition favorable to disease."

Aldo Leopold, *Game Management*, 1933

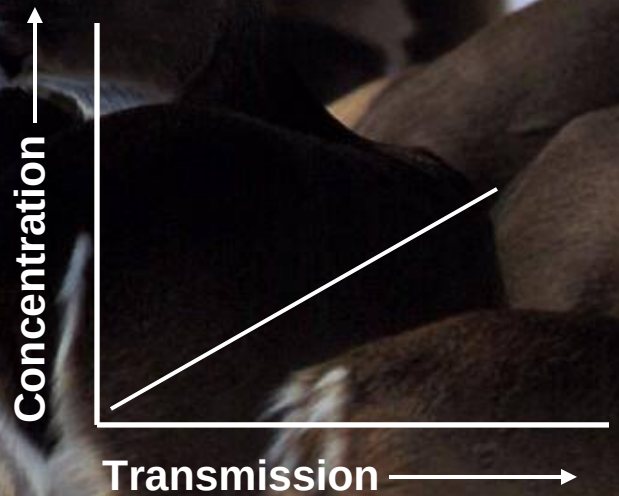


Michigan DNRE

Density



Concentration



Michigan DNRE

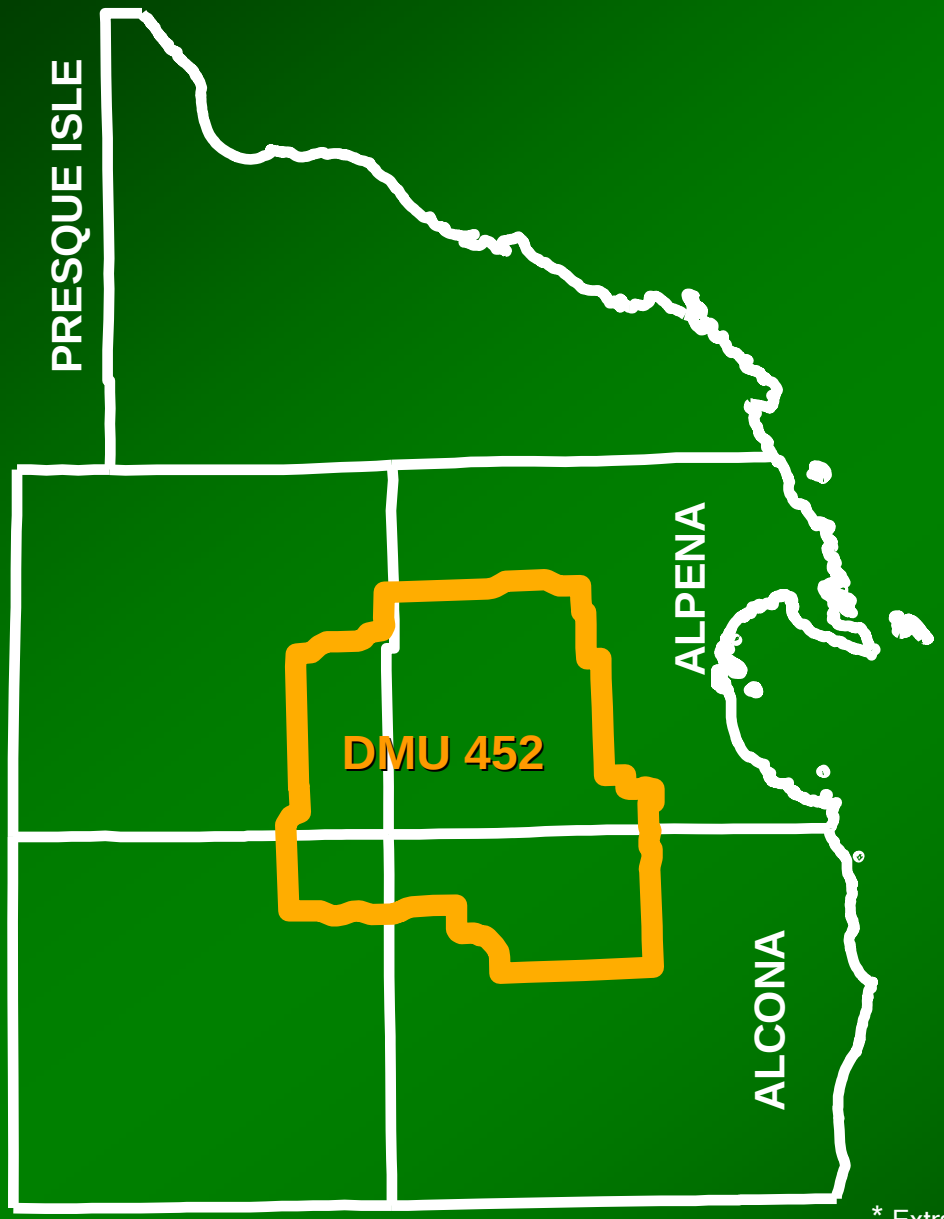
Bovine TB
Eradication Strategies

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.

Michigan DNRE

Apparent TB Prevalence in White-tailed Deer

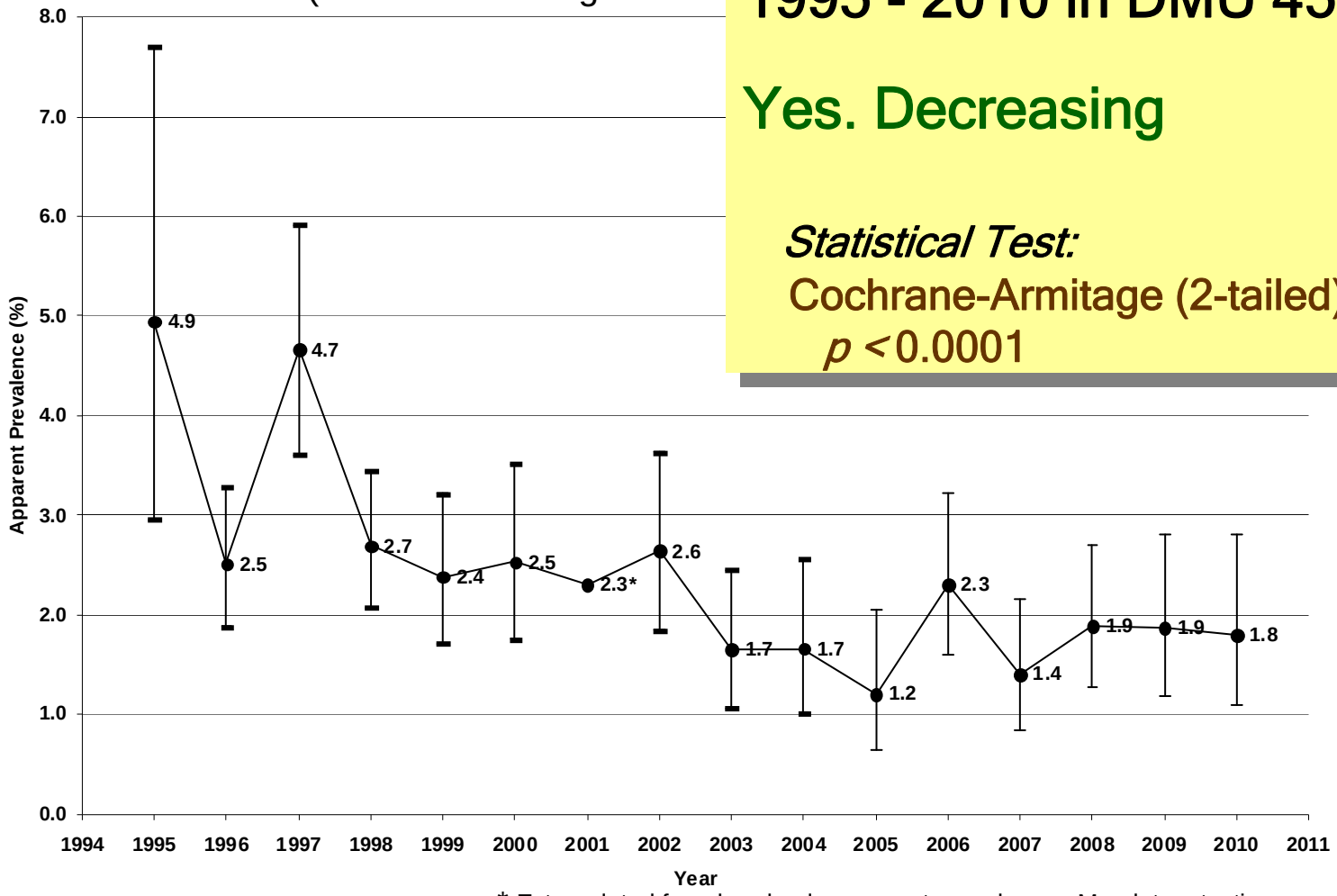


Year	Inside DMU452	5-County Outside DMU452
2010	**1.8 %**	**0.2%**
2009	1.9%	0.4%
2008	1.9 %	0.3 %
2007	1.4%	0.2%
2006	2.3%	0.3%
2005	1.2%	0.1%
2004	1.7%	0.2%
2003	1.7%	0.2%
2002	2.6%	0.5%
2001	2.3%*	0.5%
2000	2.5%	0.4%
1999	2.4%	0.2%
1998	2.7%	0.3%
1997	4.7%	0.4%
1996	2.5%	0.2%
1995	4.9%	(no testing)

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

Adults

Apparent Prevalence of Bovine Tul
Adult White-tailed Deer, DMU 452,
(Cochran-Armitage test fo



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

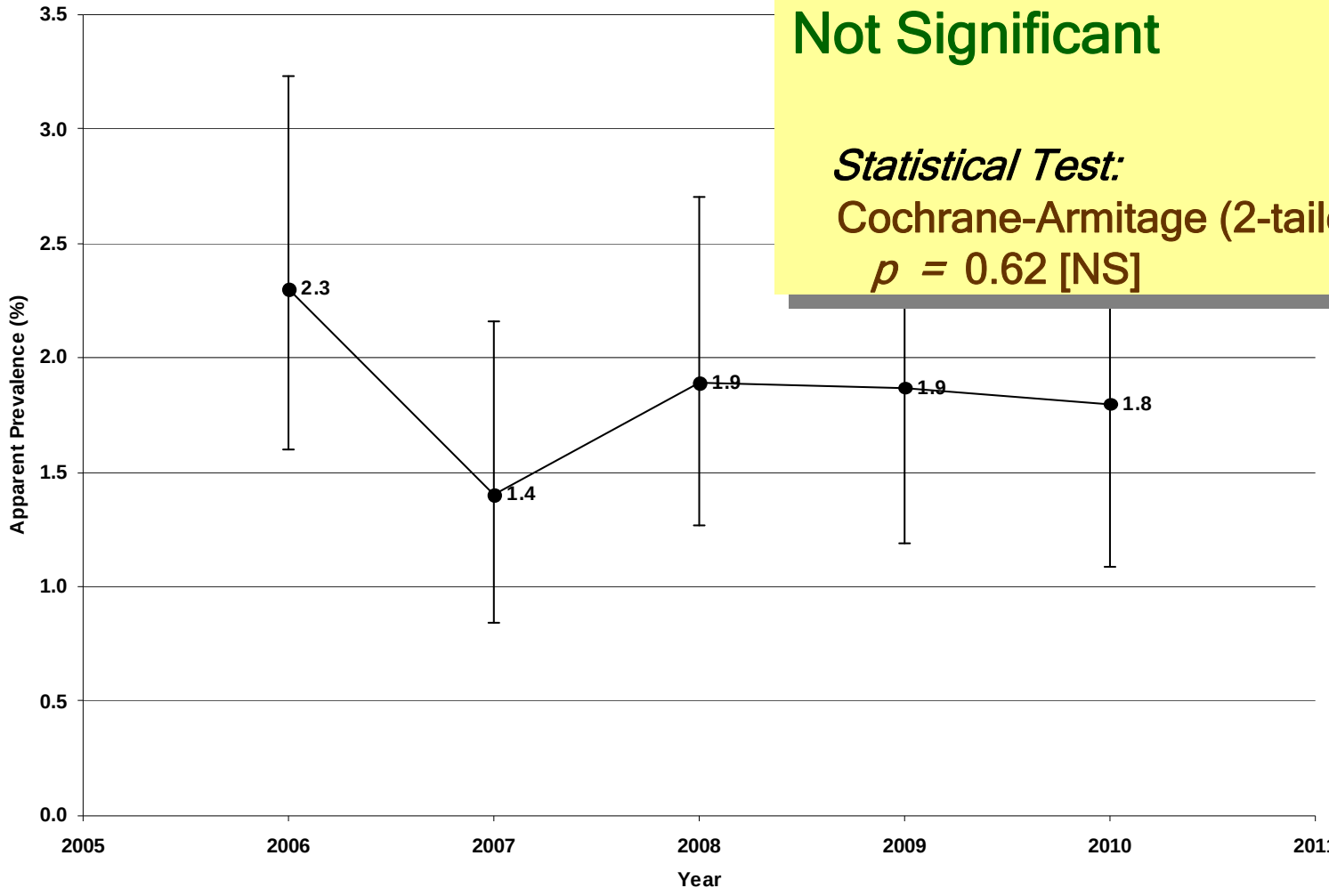
Was there a significant trend in prevalence from 1995 - 2010 in DMU 452?

Yes. Decreasing

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

Adults

Apparent Prevalence of Bovine Tuber
Adult White-tailed Deer, DMU 452, 200
(Cochran-Armitage test for trend,



Was there a significant trend in prevalence from 2006 - 2010 in DMU 452?

Not Significant

Statistical Test:
Cochrane-Armitage (2-tailed)
$p = 0.62$ [NS]

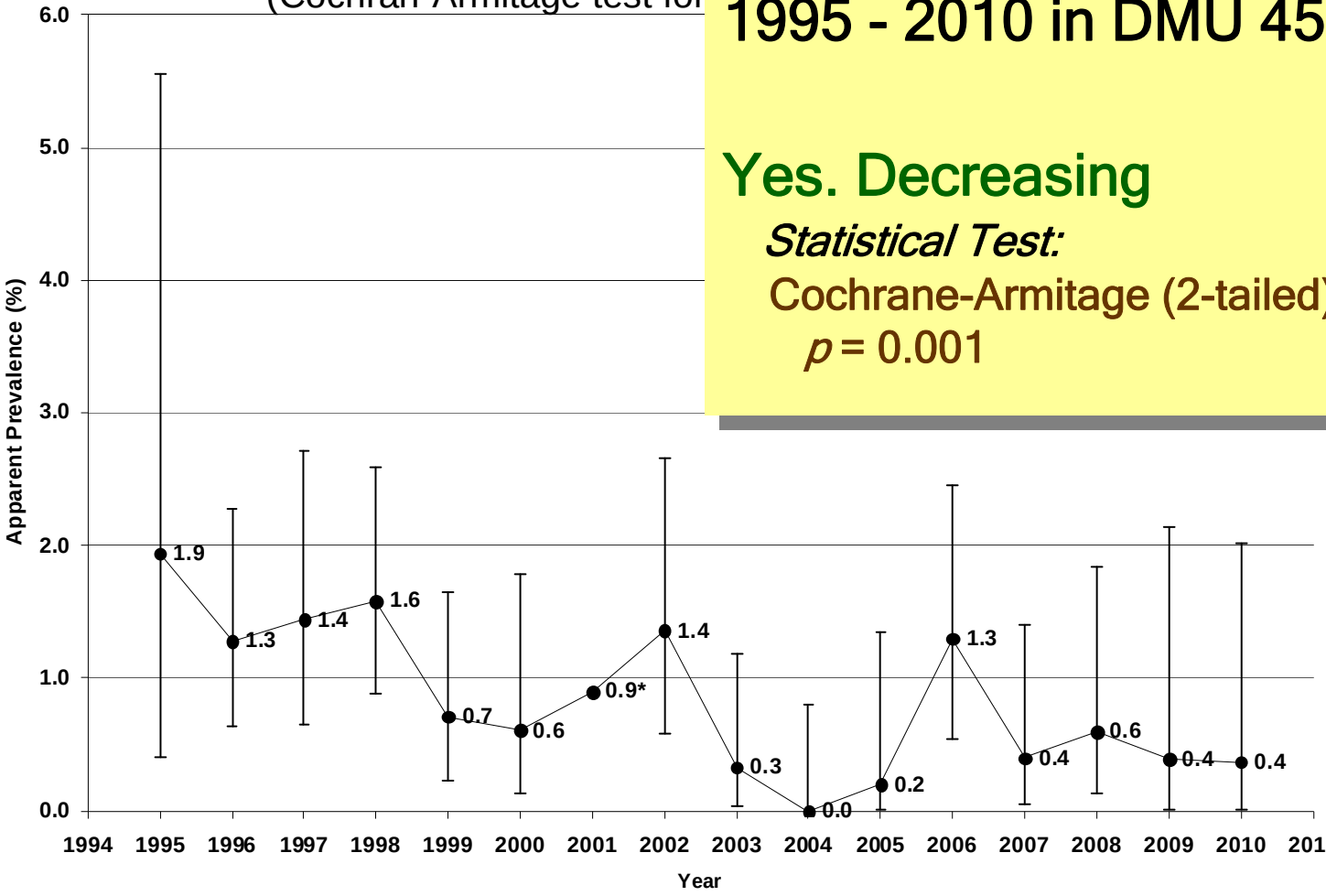
DMU 452 Yearlings

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	612	2	0.3
2004	458	0	0.0
2005	409	1	0.2
2006	638	8	1.3
2007	515	2	0.4
2008	**474**	**3**	0.6
2009	**258**	**1**	0.4
2010	**273**	**1**	0.4

*2001 Mandatory Testing

Yearlings

Apparent Prevalence of Bovine Tu
Yearling White-tailed Deer, DMU 4
(Cochran-Armitage test for



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

Was there a significant trend in prevalence from 1995 - 2010 in DMU 452?

Yes. Decreasing

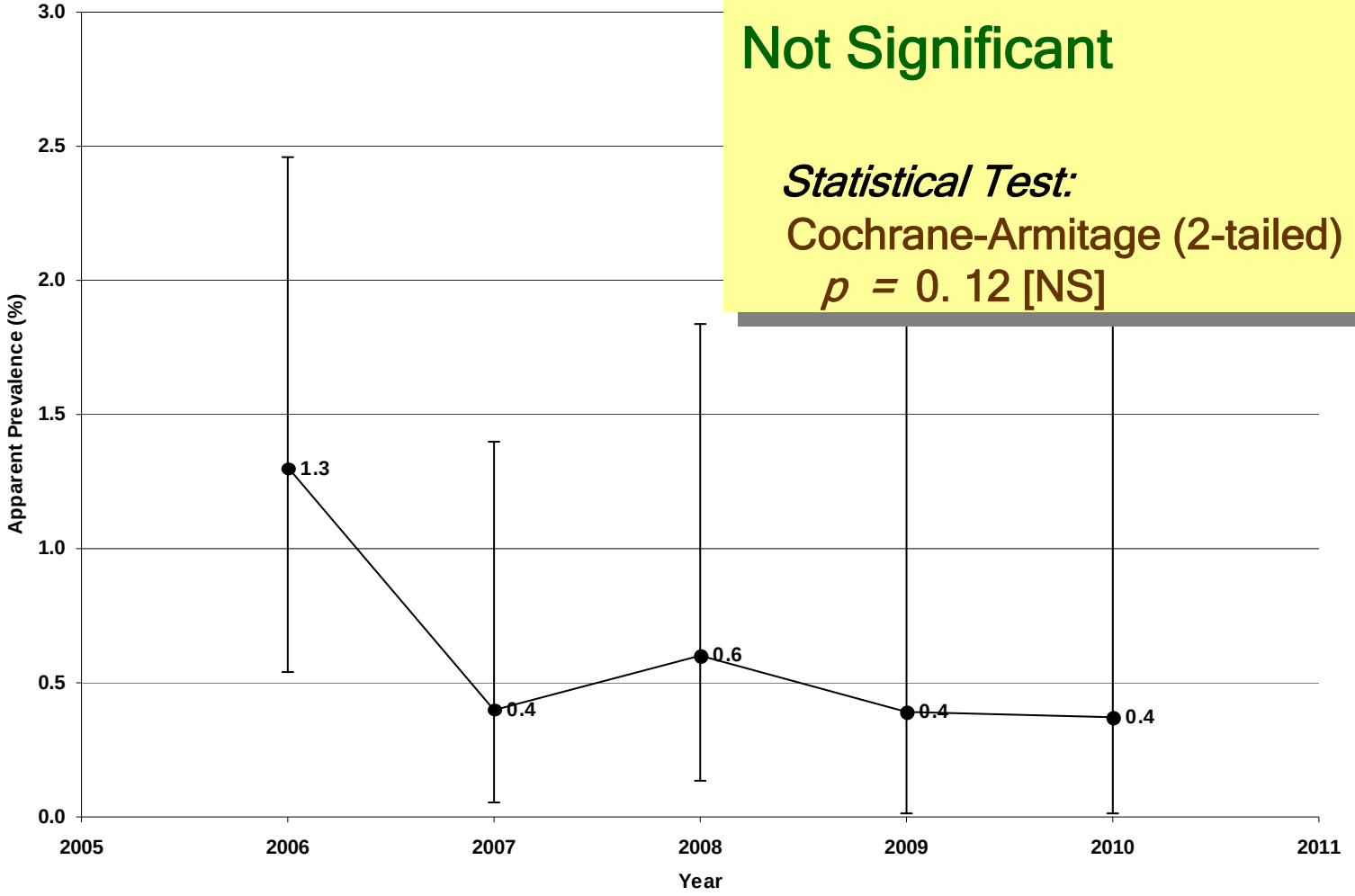
Statistical Test:

Cochrane-Armitage (2-tailed)

$p = 0.001$

Yearlings

Apparent Prevalence of Bovine Tub
Yearling White-tailed Deer, DMU 45
(Cochran-Armitage test for tren



Was there a significant trend in prevalence from 2006 - 2010 in DMU 452?

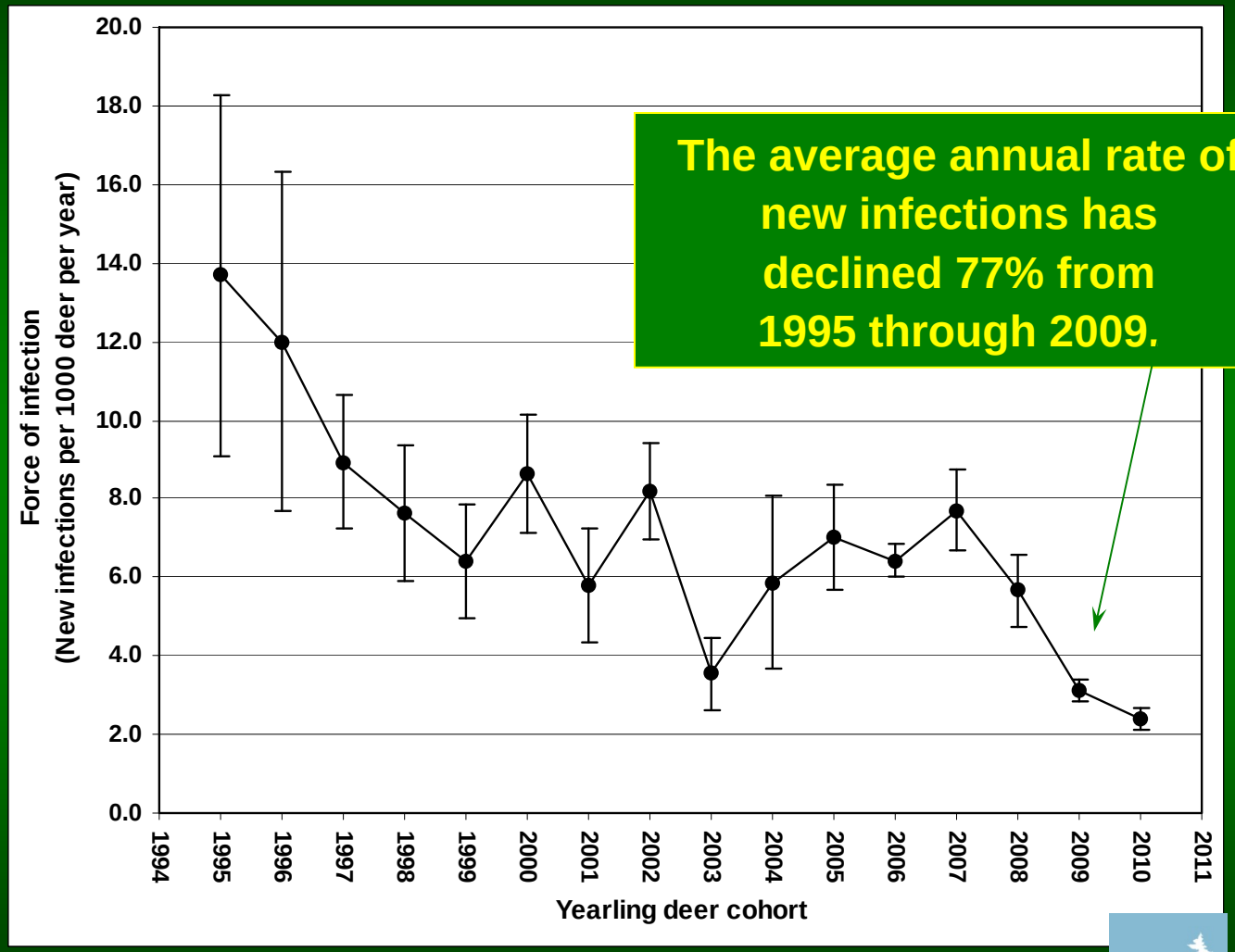
Not Significant

Statistical Test:
Cochrane-Armitage (2-tailed)
$p = 0.12$ [NS]

Disease transmission has declined significantly within DMU452

TB transmission

(New infections per 1000 deer per year)



Note: The 2010 data are for yearlings only. Yearlings are at reduced risk of infection vs. older deer, so this point is <u>not</u> directly comparable to the other cohorts.

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TB transmission

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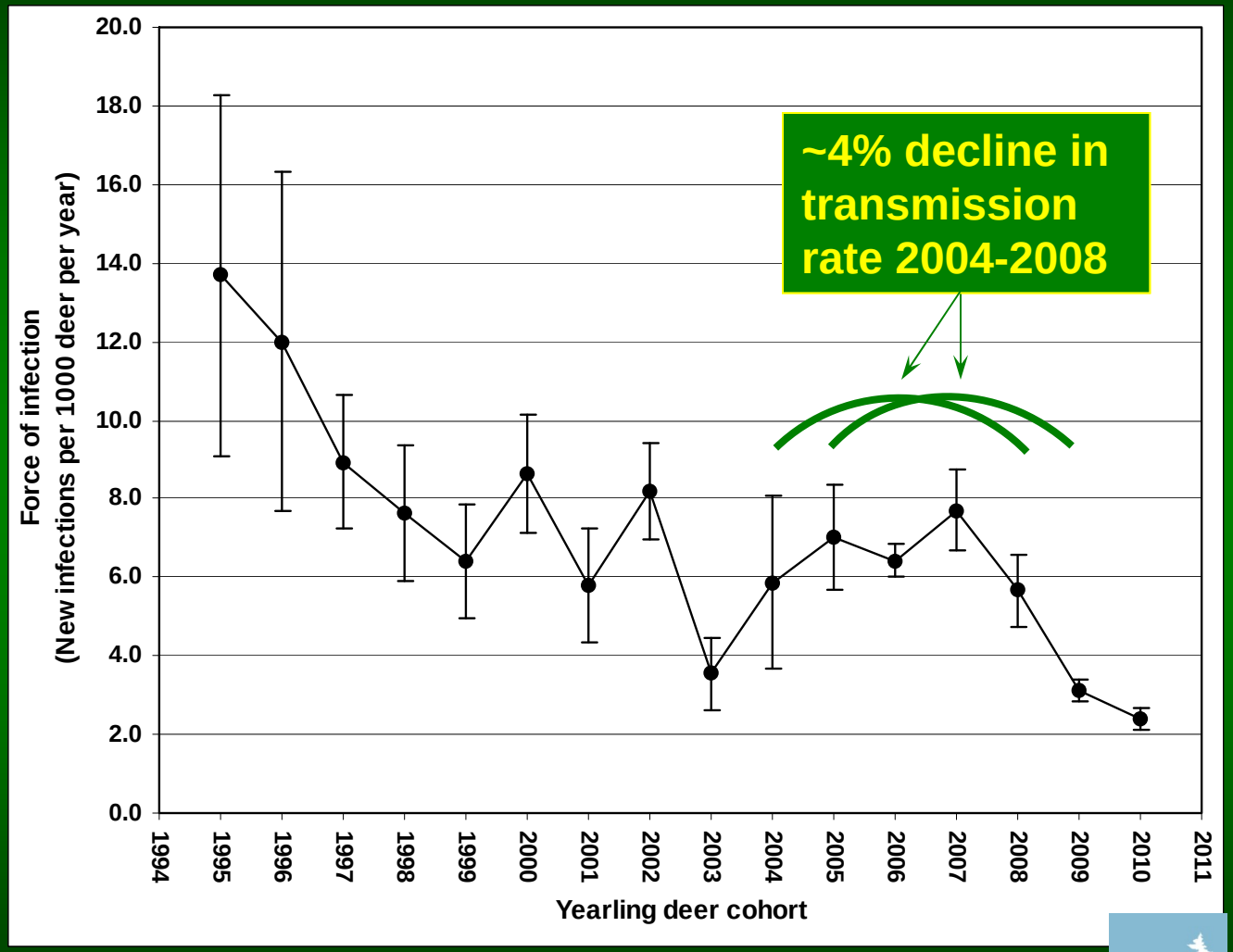
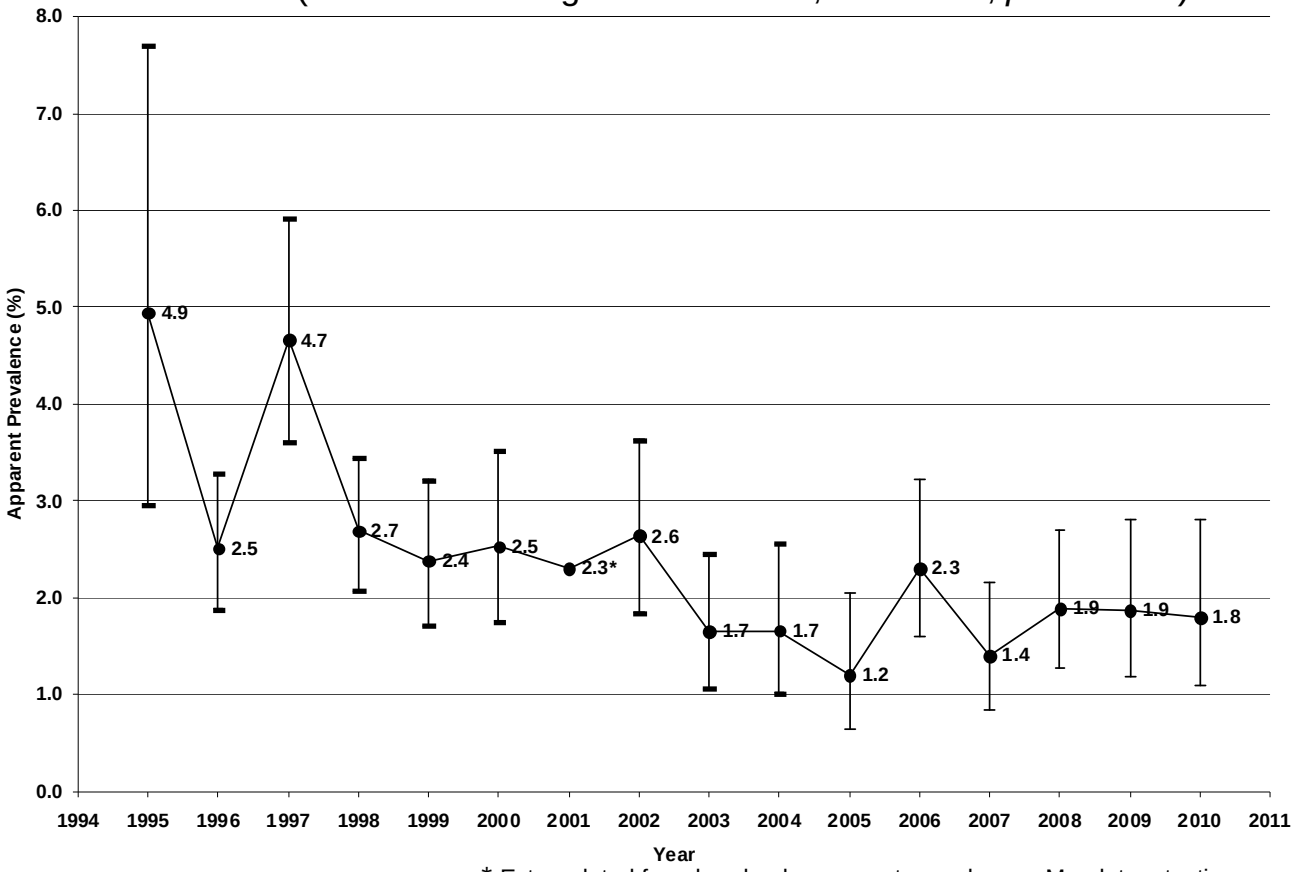


Note: The 2010 data are for yearlings only. Yearlings are at reduced risk of infection vs. older deer, so this point is <u>not</u> directly comparable to the other cohorts.

Evidence suggests that eradication of TB, if it can be achieved, will take decades.

Apparent Prevalence of Bovine Tuberculosis (^{w}/95% Confid. Limits), Adult White-tailed Deer, DMU 452, 1995-2010

(Cochran-Armitage test for trend, two-tailed, $p < 0.0001$)



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

Continued development of tools to help manage Bovine TB
Oral TB Vaccine

- Efficacy
- Safety
- Delivery
- Percentage of deer population vaccinated
- Approval to use vaccine in field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