

CWD Advisory Group Meeting 2

Determining When CWD Management Actions Should be Taken

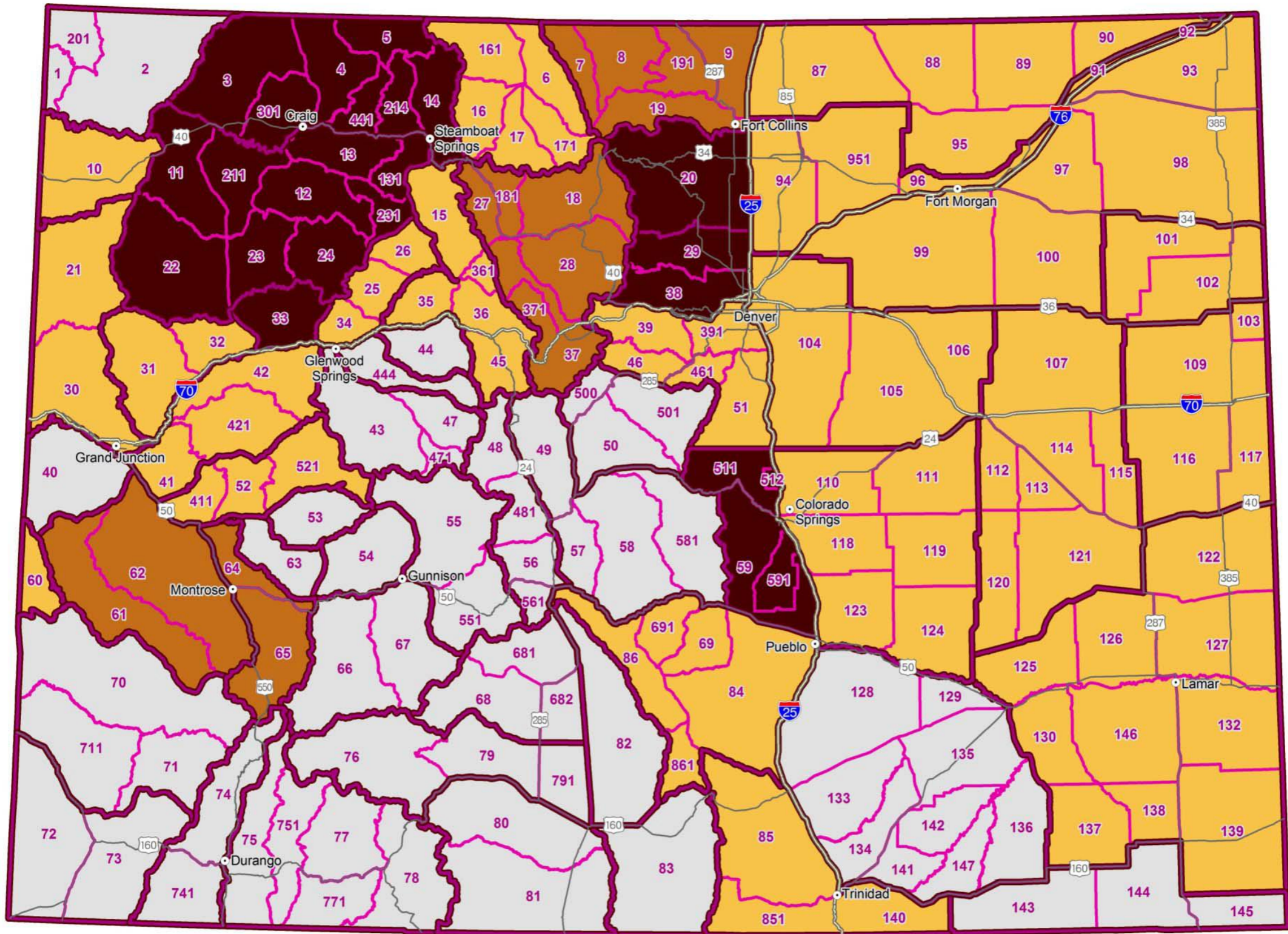


When CWD Management Actions Should be Taken

When should CPW initiate a management response to CWD?

- When a new CWD foci is detected?



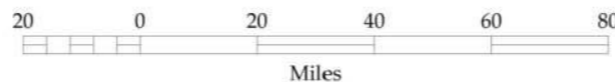


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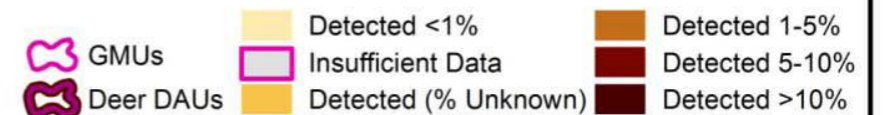
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Detected CWD in Harvested Mule Deer Bucks

January 2018



Estimated CWD Infection Rates Harvest Data for Colorado 2014 - 2017



When CWD Management Actions Should be Taken

When should CPW initiate a management response to CWD?

- ~~When a new CWD foci is detected~~
- When prevalence reaches a specified threshold



When CWD Management Actions Should be Taken

“**High prevalence**”: CWD prevalence is $\geq 10\%$ among adult (≥ 2 -year-old) males or females. Primary goal is to reduce prevalence.

“**Low prevalence**”: CWD prevalence is $< 10\%$ among adult (≥ 2 -year-old) males or females. Primary goal to prevent prevalence from increasing.

(WAFWA Recommendations)



When CWD Management Actions Should be Taken

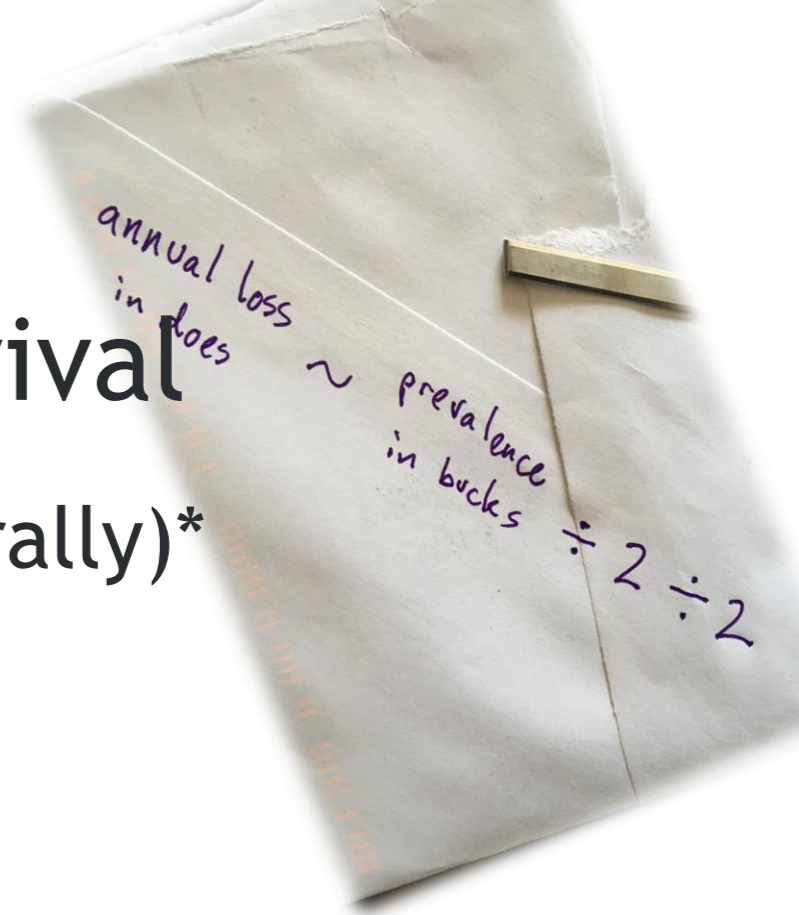
What would be a suitable CWD prevalence threshold for Colorado deer?

Let's look at this in the context of doe survival



Estimating CWD Impacts on Doe Survival

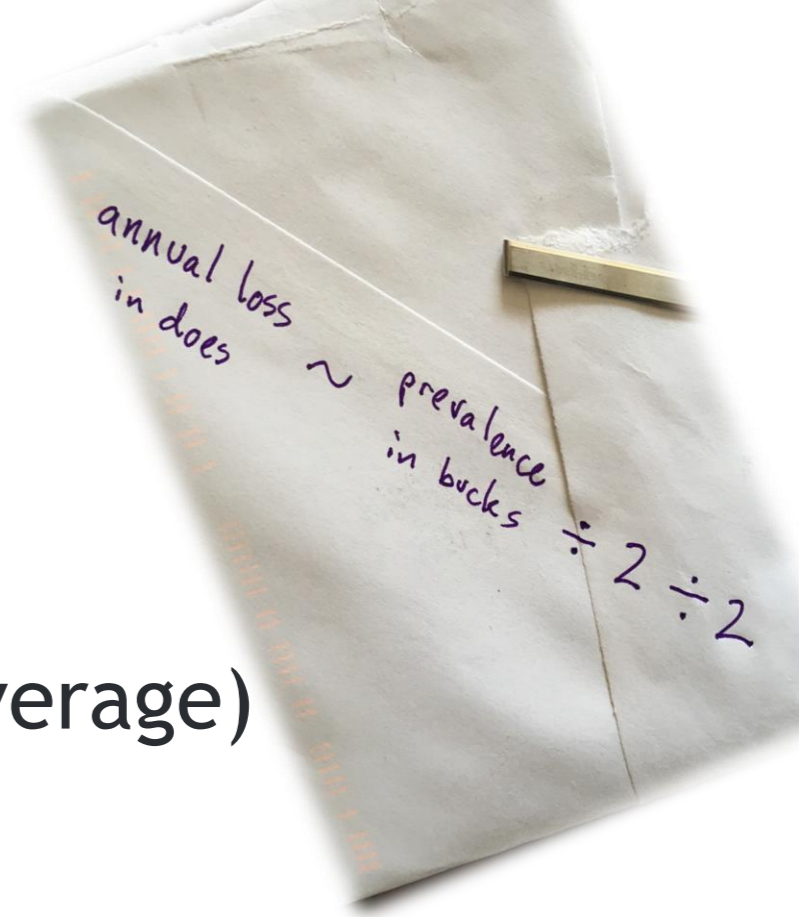
- Simple calculation (back of envelope – literally)*
- Based on Colorado field data
 - doe infection rate $\sim \frac{1}{2}$ buck rate
 - $\sim \frac{1}{2}$ infected individuals die each year (either sex)



*(originally calculated on a bar napkin...)

Estimating CWD Population Impacts

- Driven by impaired doe survival
- “Healthy” doe survival ~85% (statewide average)
- CWD losses further reduce doe survival
 - ~85% – (annual disease loss)
- Sufficiently low doe survival will depress herd trends



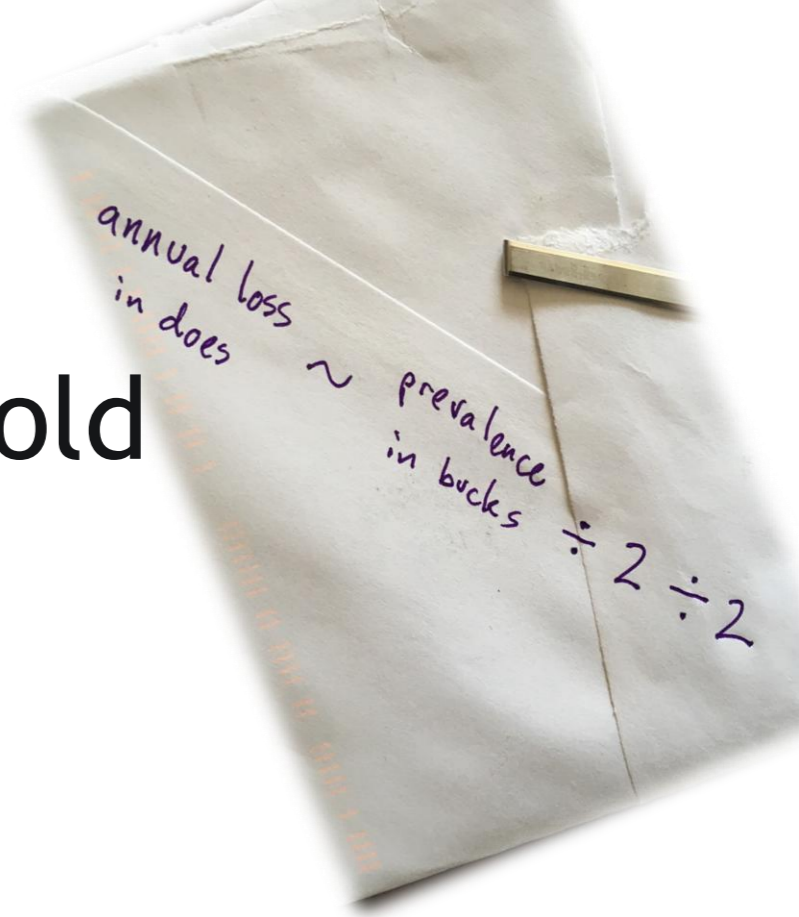
Suggesting a 10% prevalence threshold for adult bucks

➤ Here's the math:

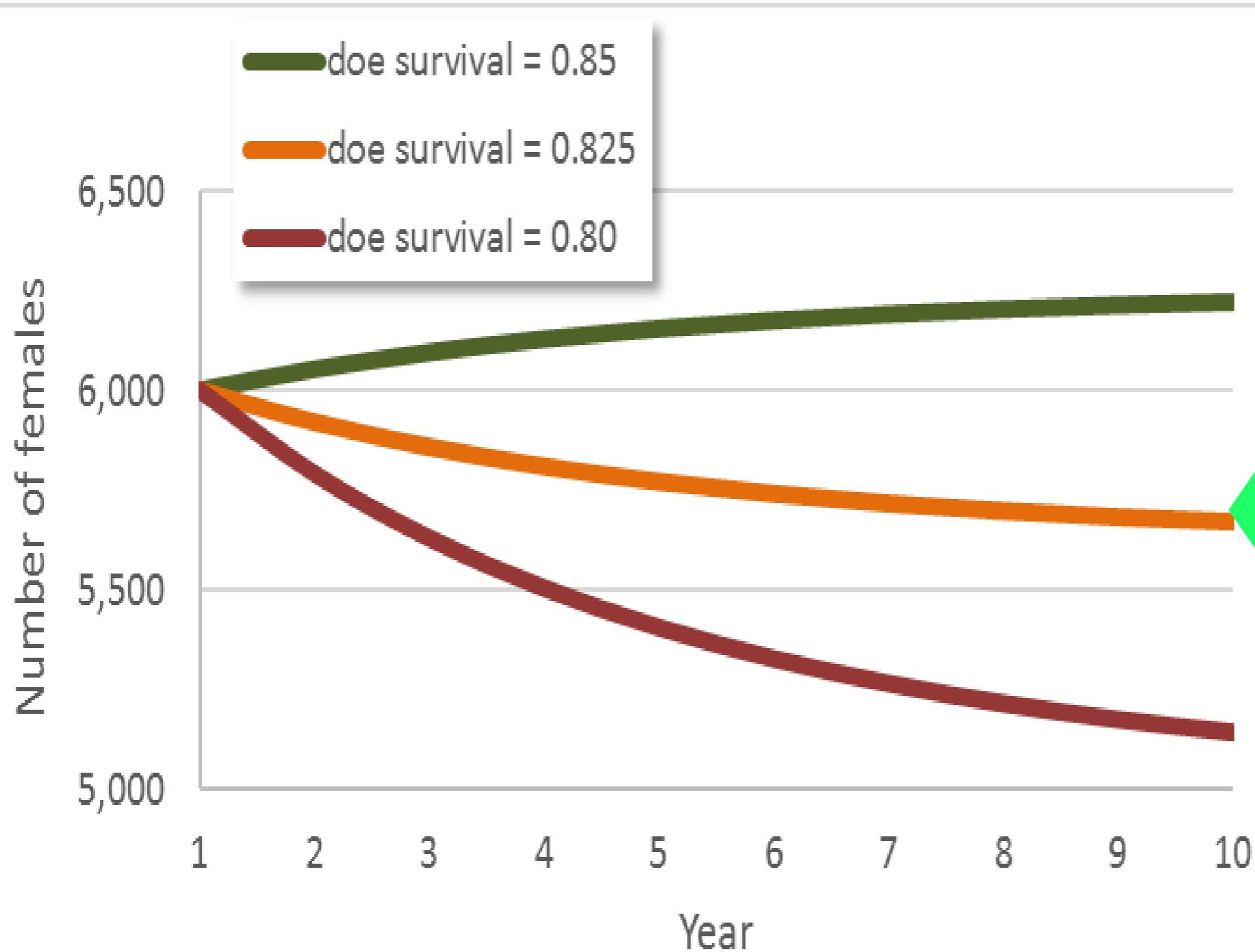
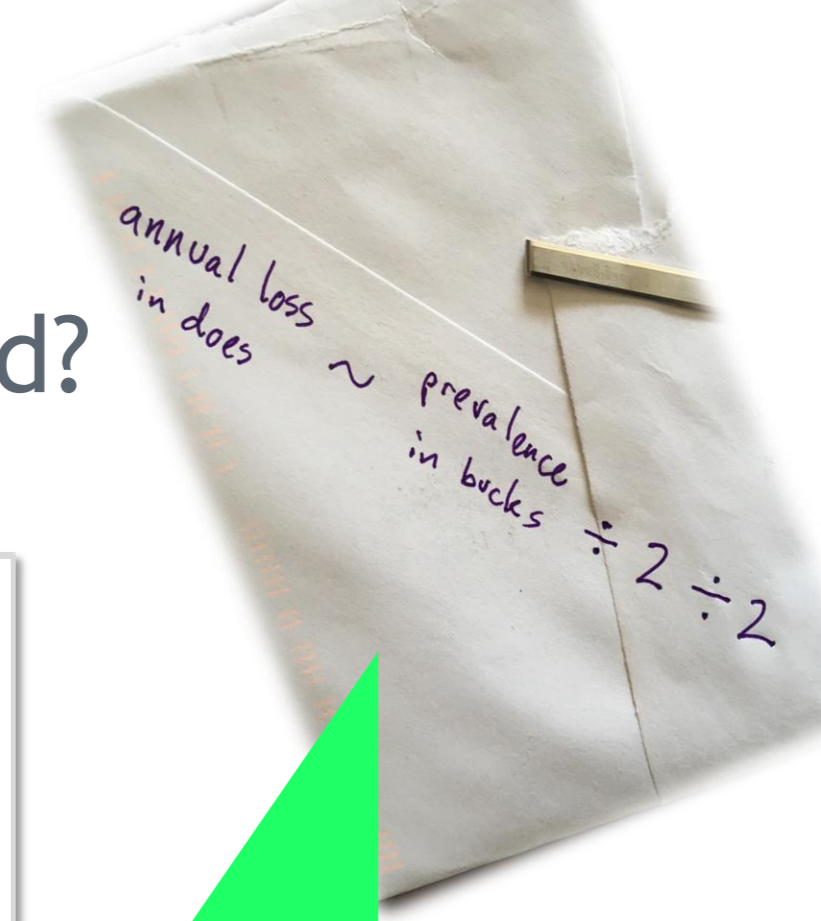
➤ $\text{prev}_{\text{buck}} \div 2 \div 2 = \text{added loss}_{\text{doe}}$

➤ $10\% \div 2 \div 2 = 2.5\%$

➤ $85\% - 2.5\% = 82.5\%$

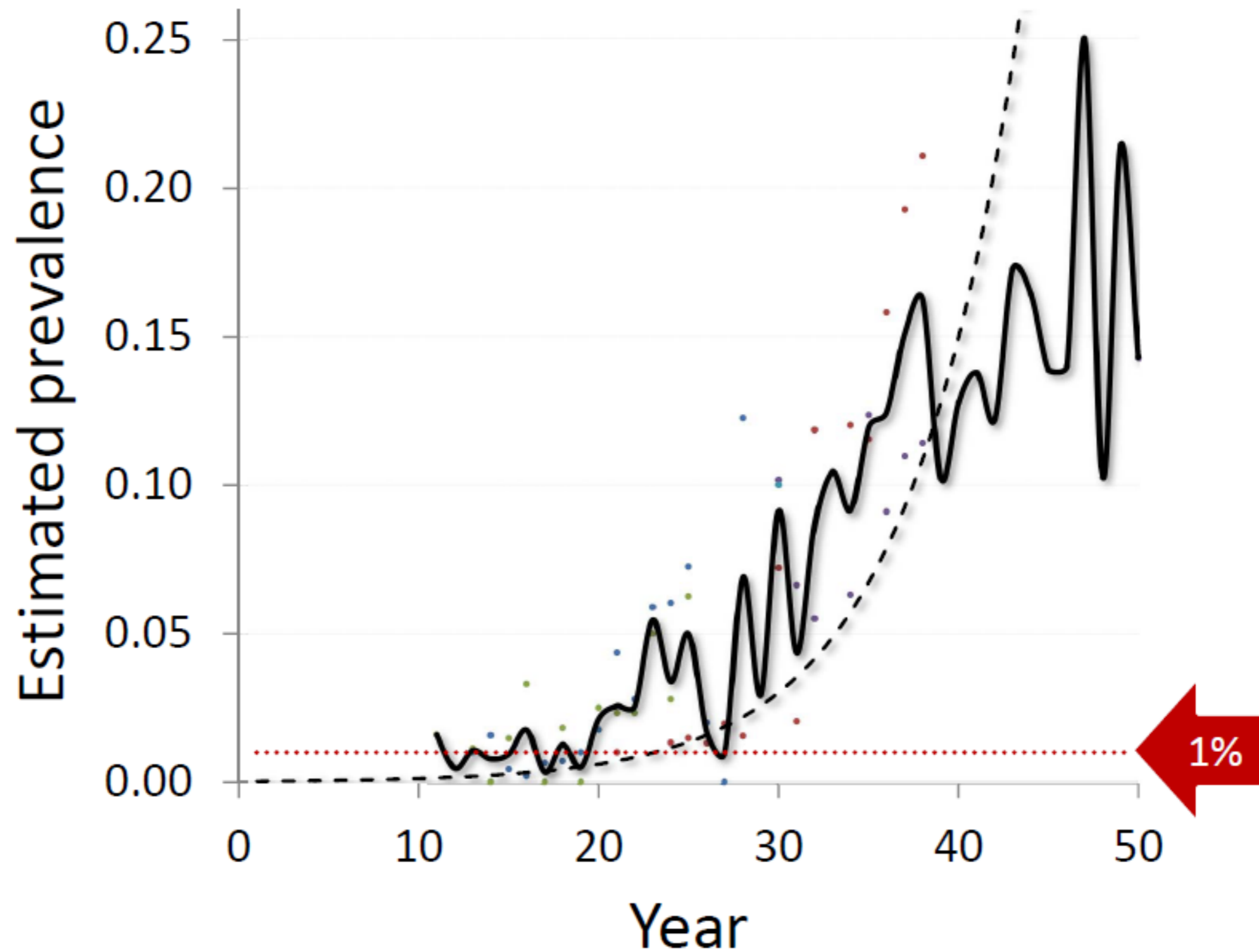


So why use a 10% prevalence threshold?



At the 10% prevalence threshold (adult bucks), affected herds would begin to decline.

Composite epidemic curve (field data vs. model)



When CWD Management Actions Should be Taken

CPW Recommendation

- Upper Prevalence Threshold: recommendation 10% (adult bucks; 2.5% annual doe mortality from CWD)
- Lower Prevalence Threshold: recommendation 5% (adult bucks; 1.25% annual doe mortality from CWD)

WAFWA Recommendations (alternative ideas)

- Baseline treatment where prevalence is 10–20% is to increase buck harvest from <20% to at least 30%.
- Buck harvest level of $\geq 30\%$ may be most effective to reduce prevalence.
- Ideally, buck harvest of 30%, 40%, and 50% or more all should be evaluated.



When CWD Management Actions Should be Taken

Should the threshold be different for deer, elk and moose?

- If 10% for deer, then 5% for elk? (male and female prevalence is about the same for elk)
- CPW to calculate the additive mortality for cow elk and cow moose that would impair population performance



When CWD Management Actions Should be Taken

Over what time period?

- At least throughout the 4-5 year period between mandatory testing efforts, then reassess with new prevalence estimates



Where

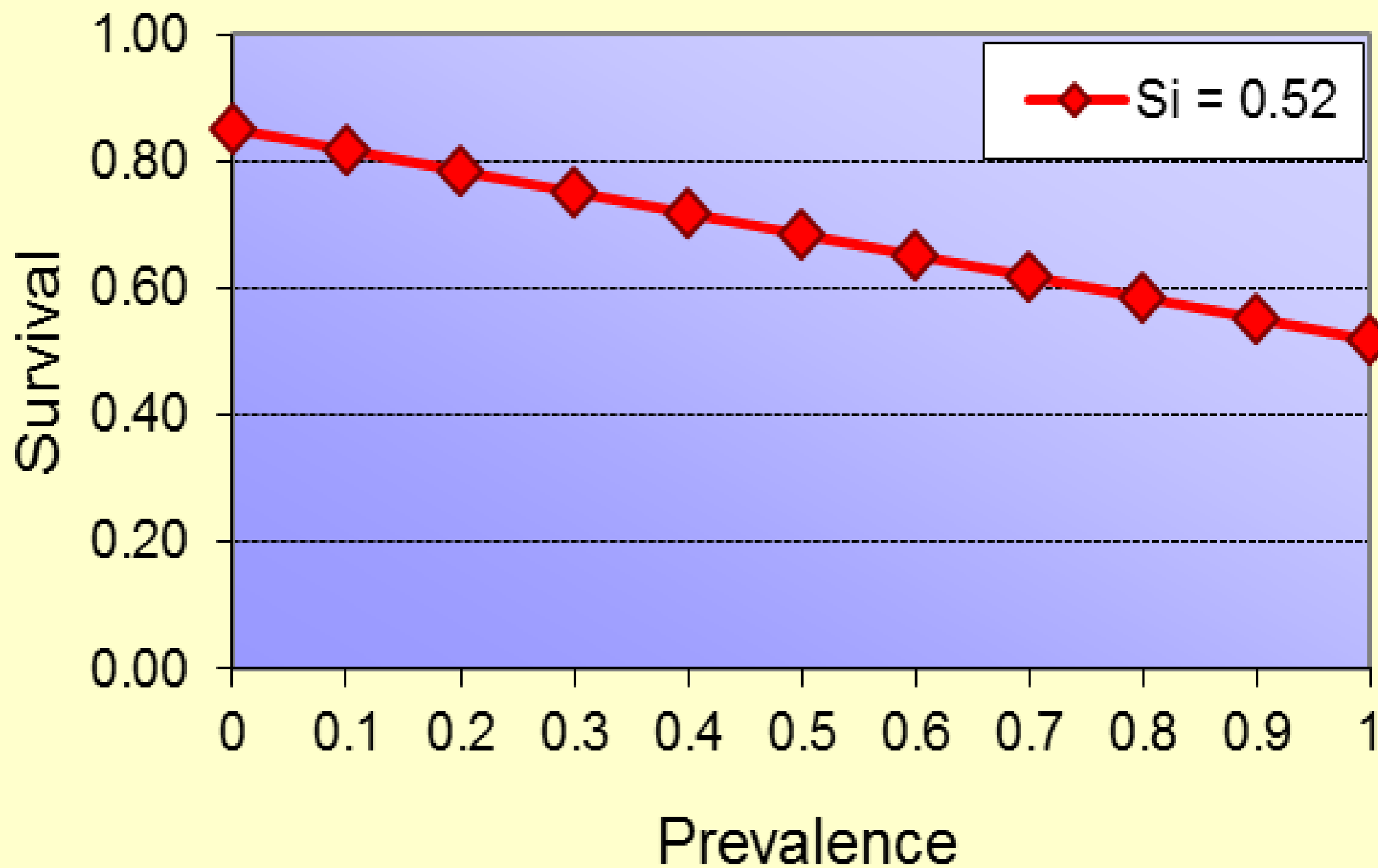
Where should CPW initiate a management response to CWD?

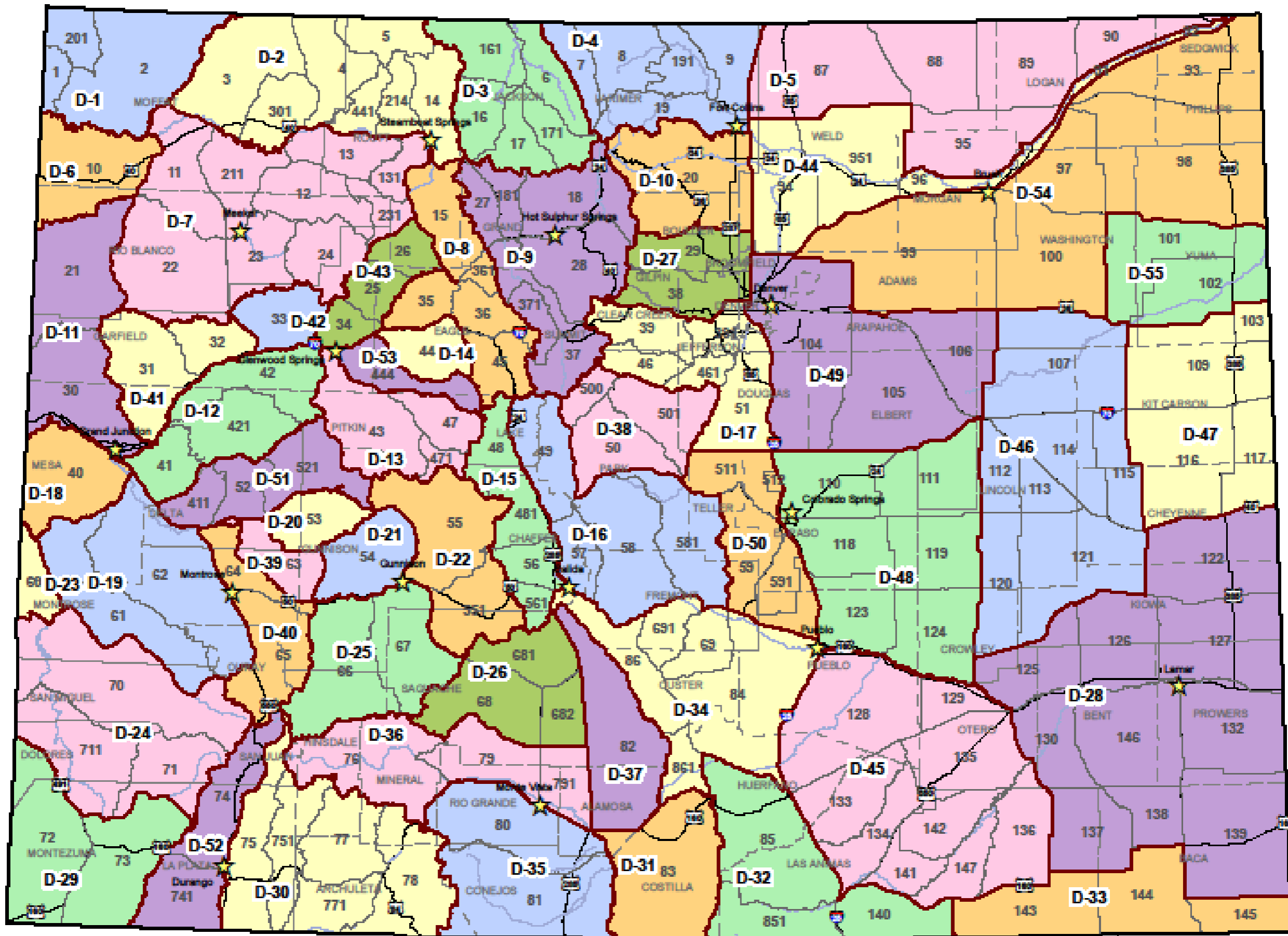
➤ At what scale?

Smallest scale possible, but not restrict to specified scale



Effects of CWD on overall female survival



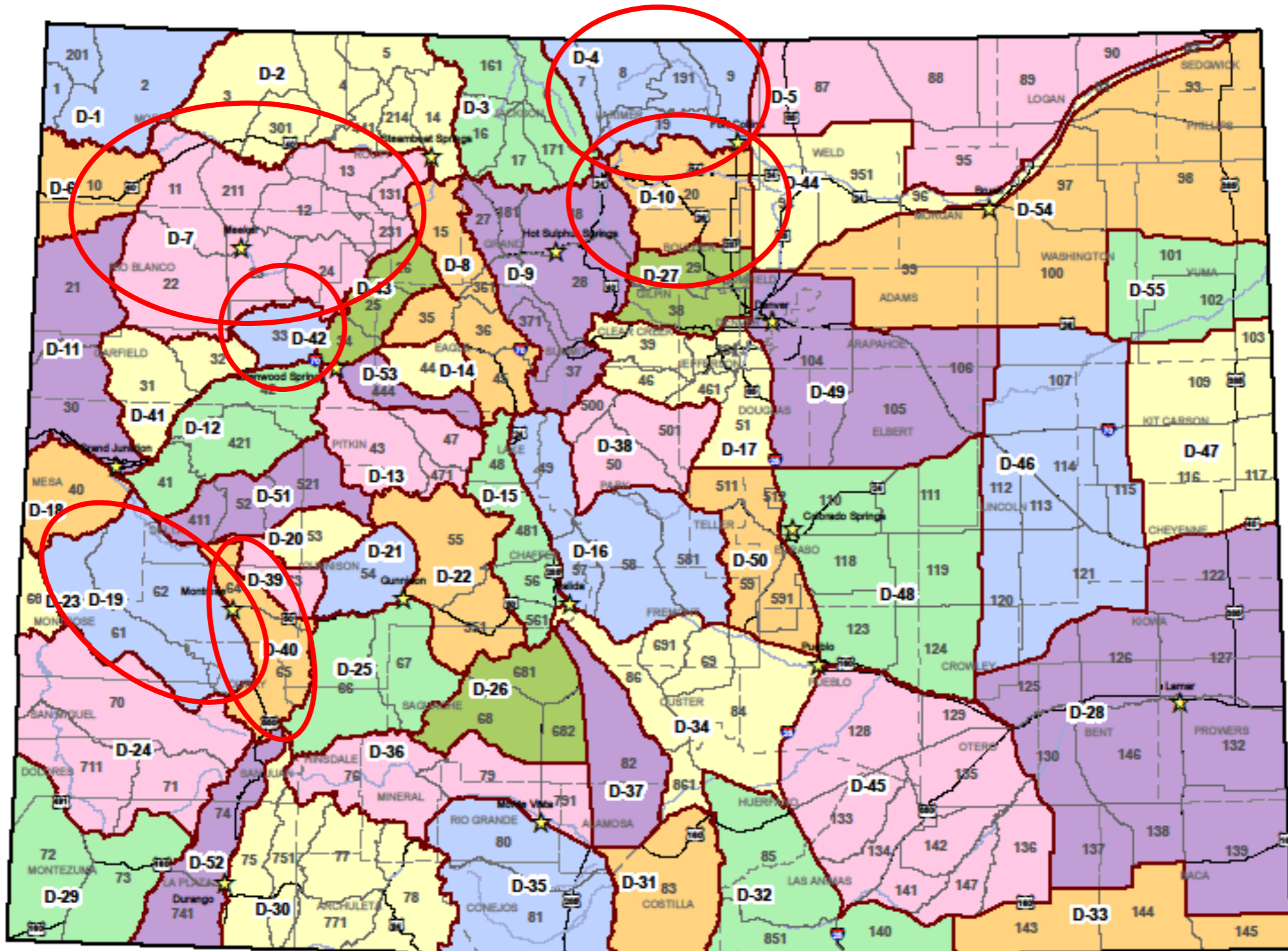


COLORADO PARKS AND WILDLIFE - Deer DAUs

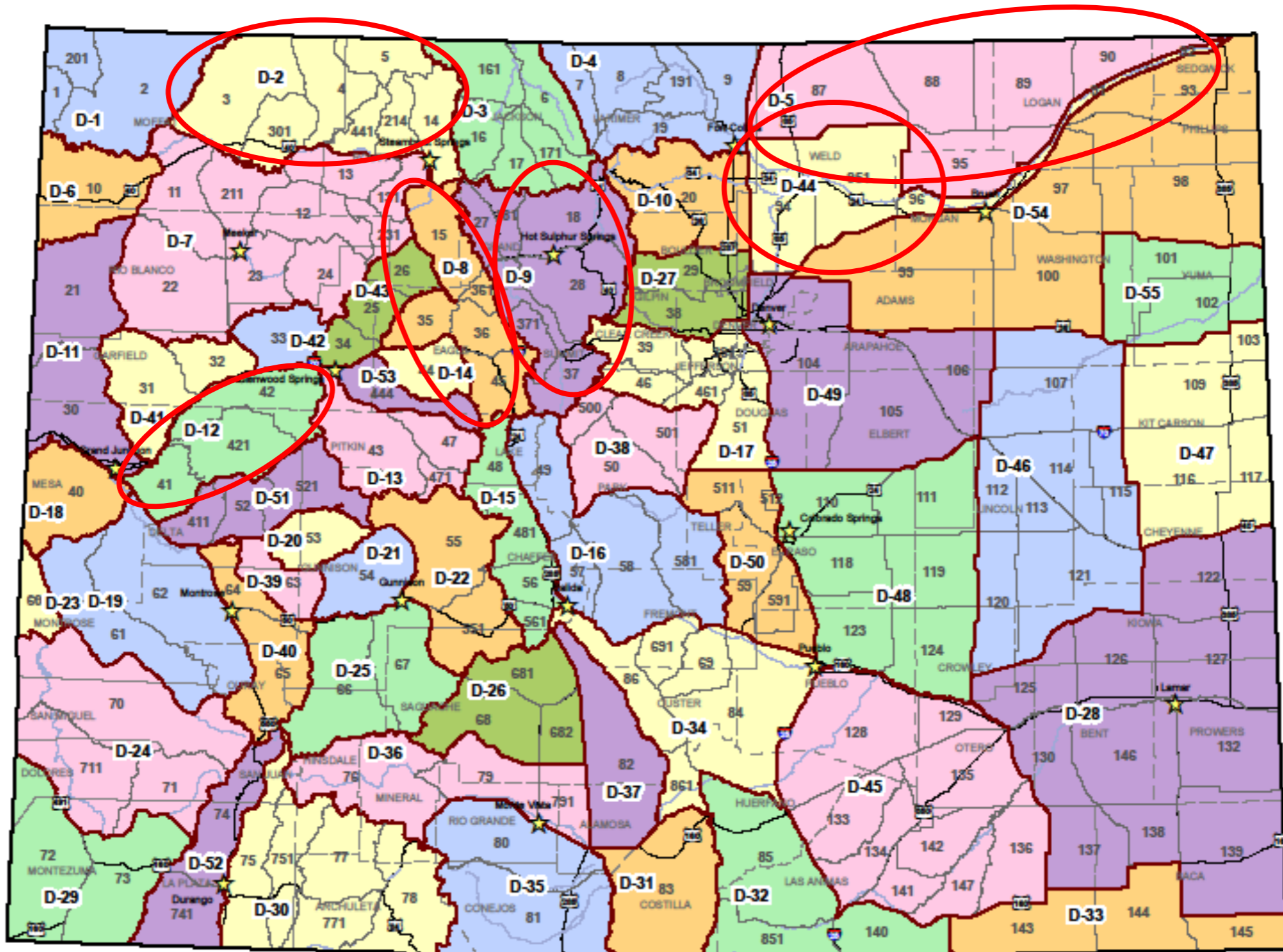
April 2017



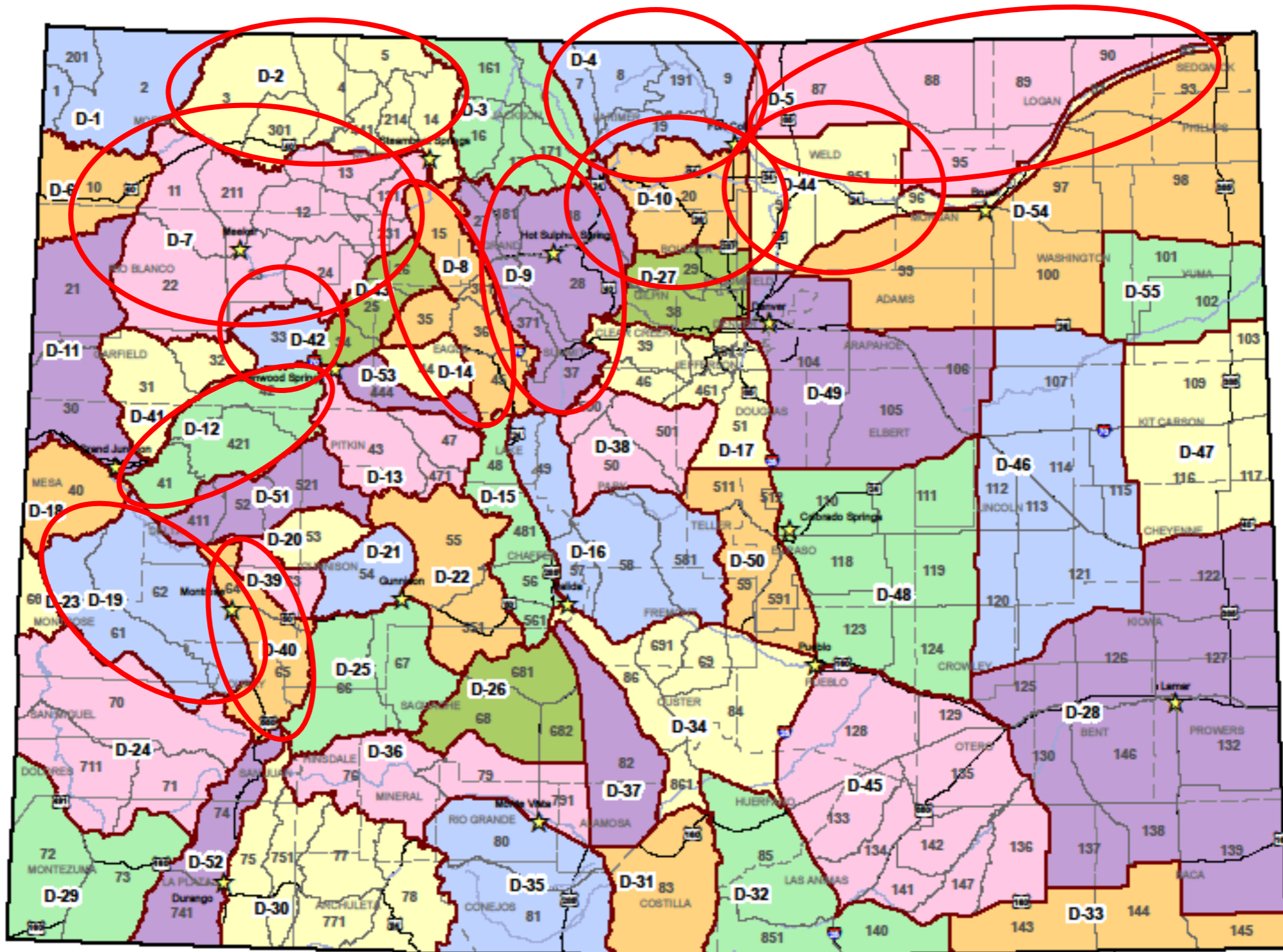
2017 Mandatory Testing Herds



2018 Mandatory Testing Herds



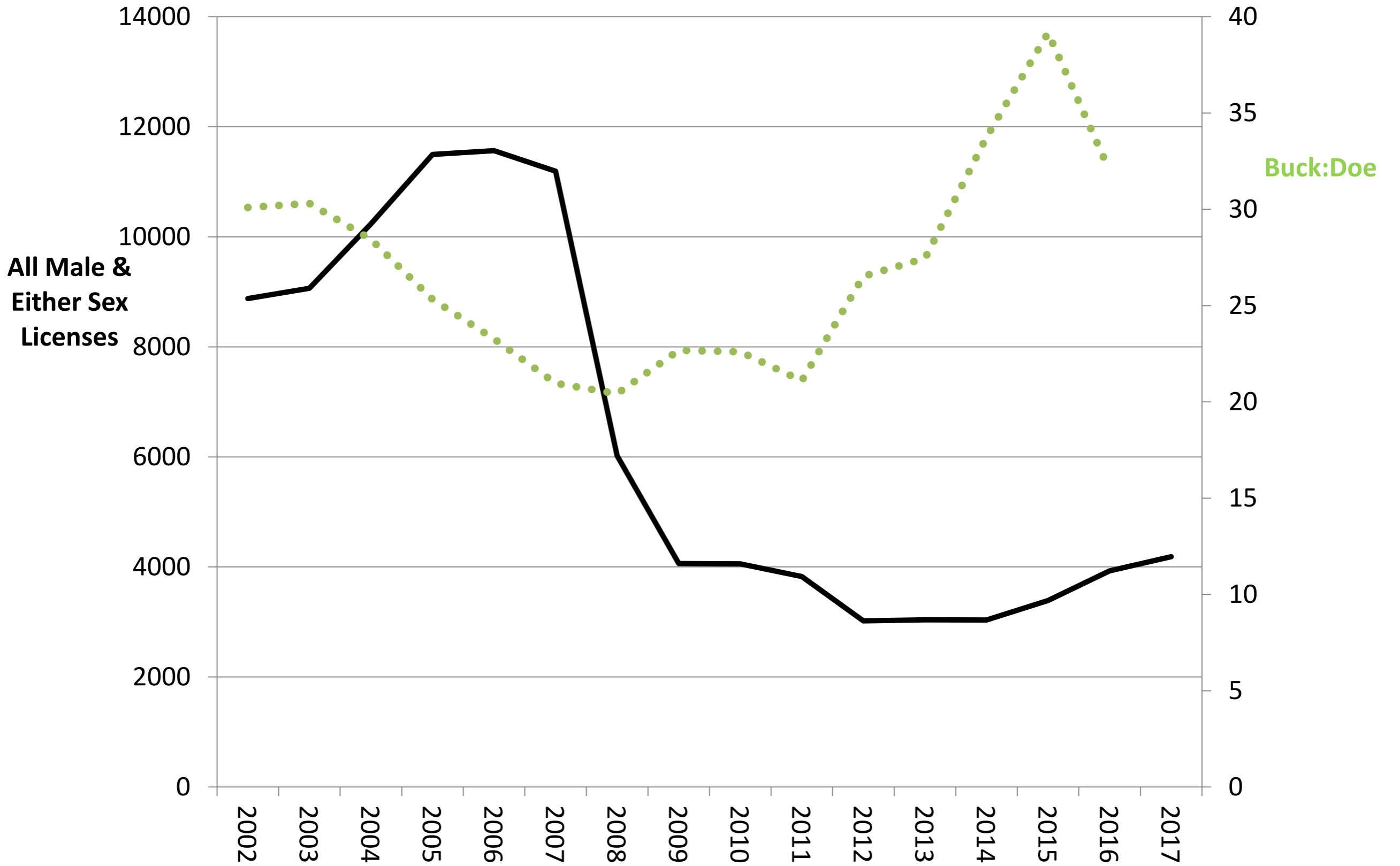
2017+2018 Mandatory Testing Herds



DAU	Adult Buck Prevalence (%)	Sample Size	95% Confidence Interval (%)
D-07	15.3	931	13.3-17.7
D-42	10.0	230	6.4-14.6
D-04	5.6	410	3.6-8.3
D-10	12.0	208	7.9-17.2
D-19	3.9	258	1.9-7.0
D-40	1.5	268	0.4-3.8

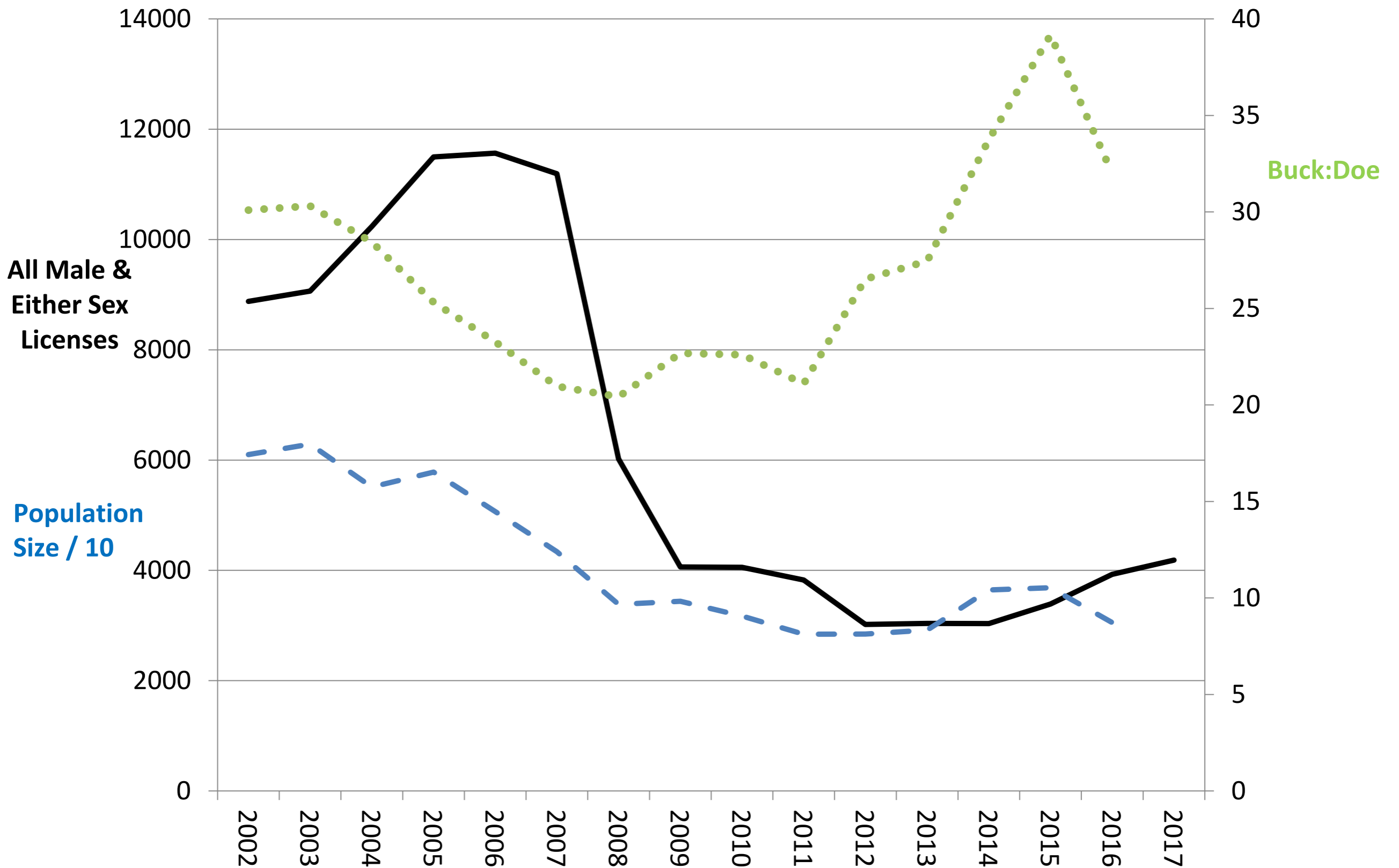
D-07

License, Buck:Doe Ratio and Prevalence Trends



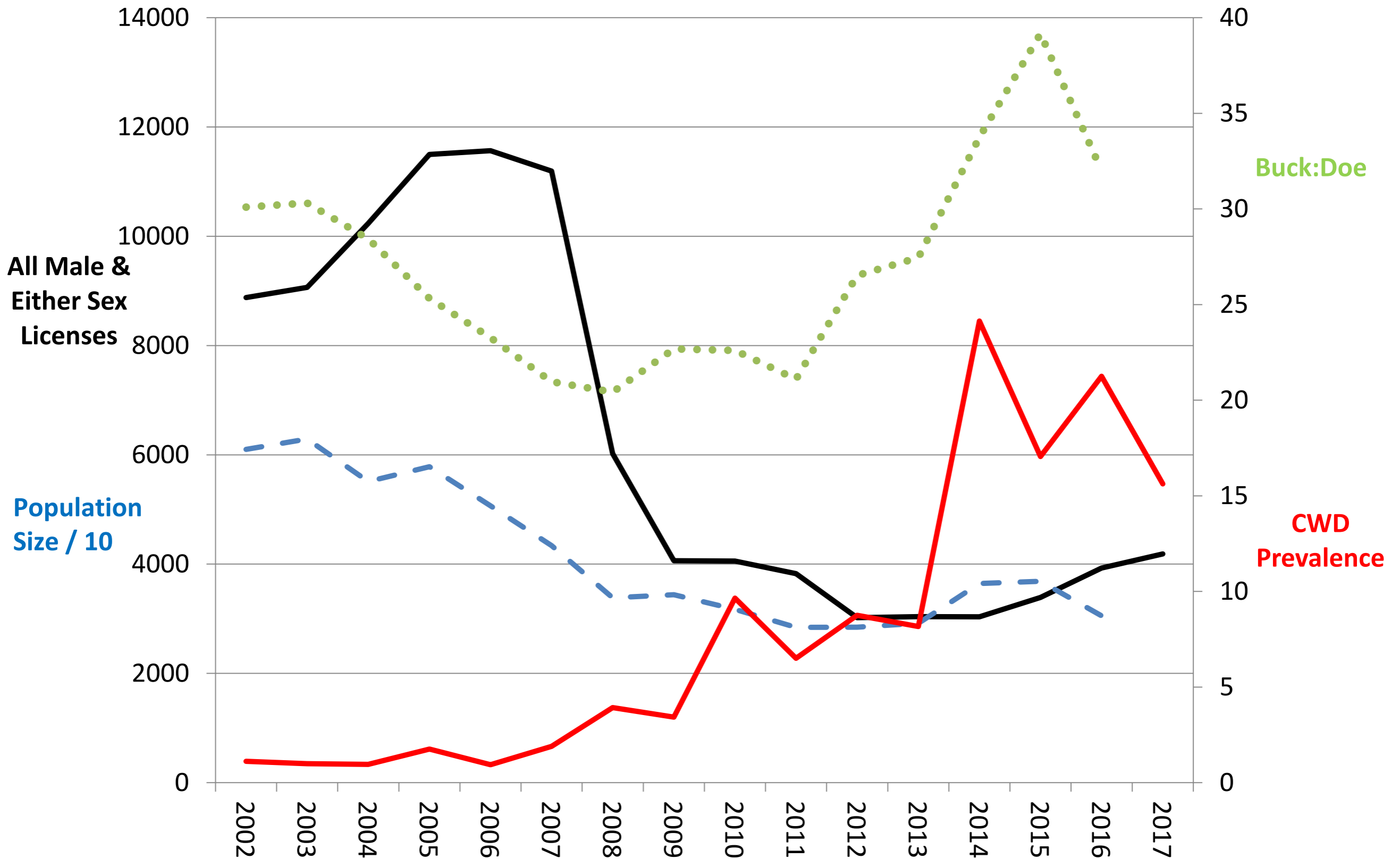
D-07

License, Buck:Doe Ratio and Prevalence Trends



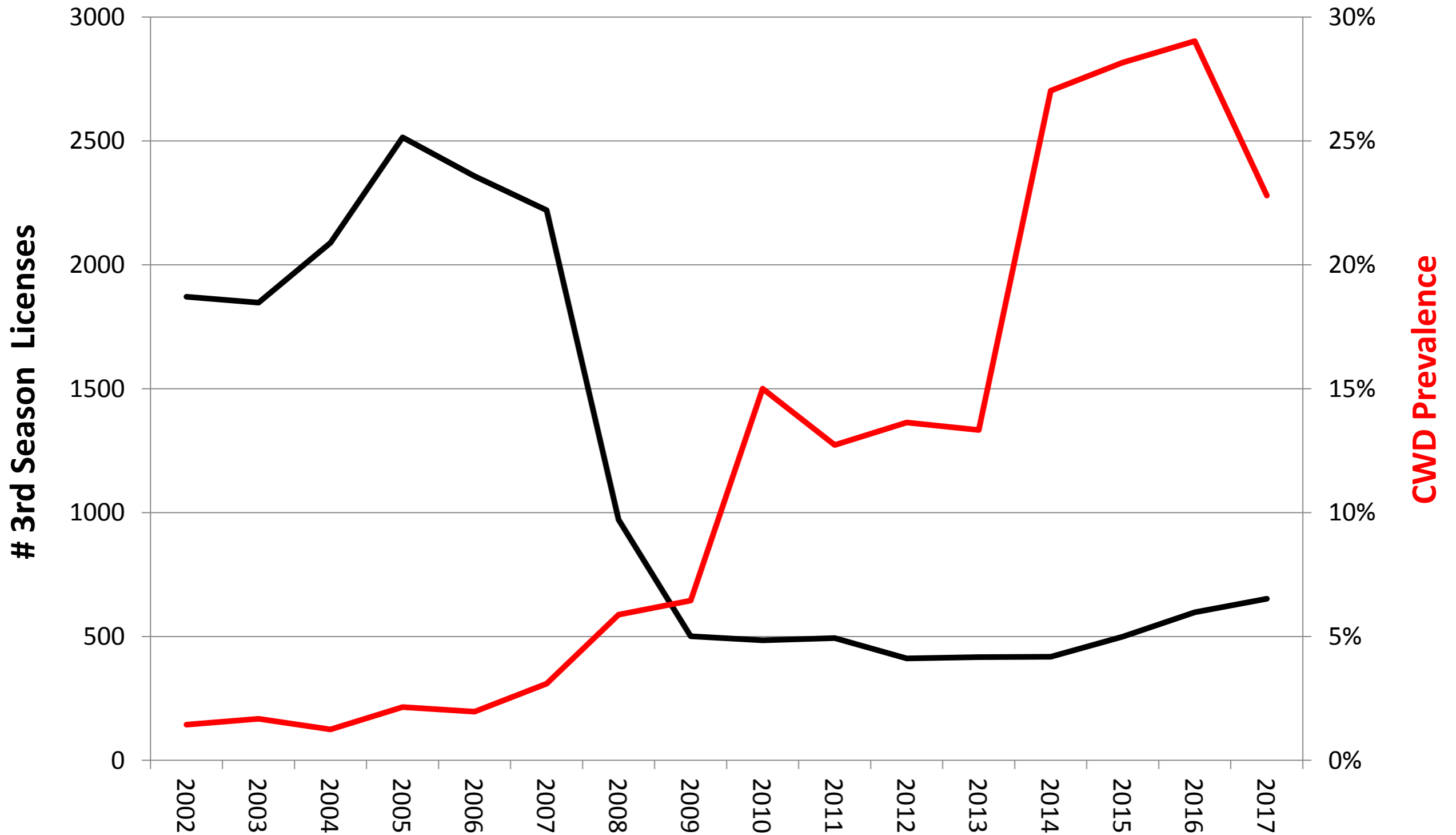
D-07

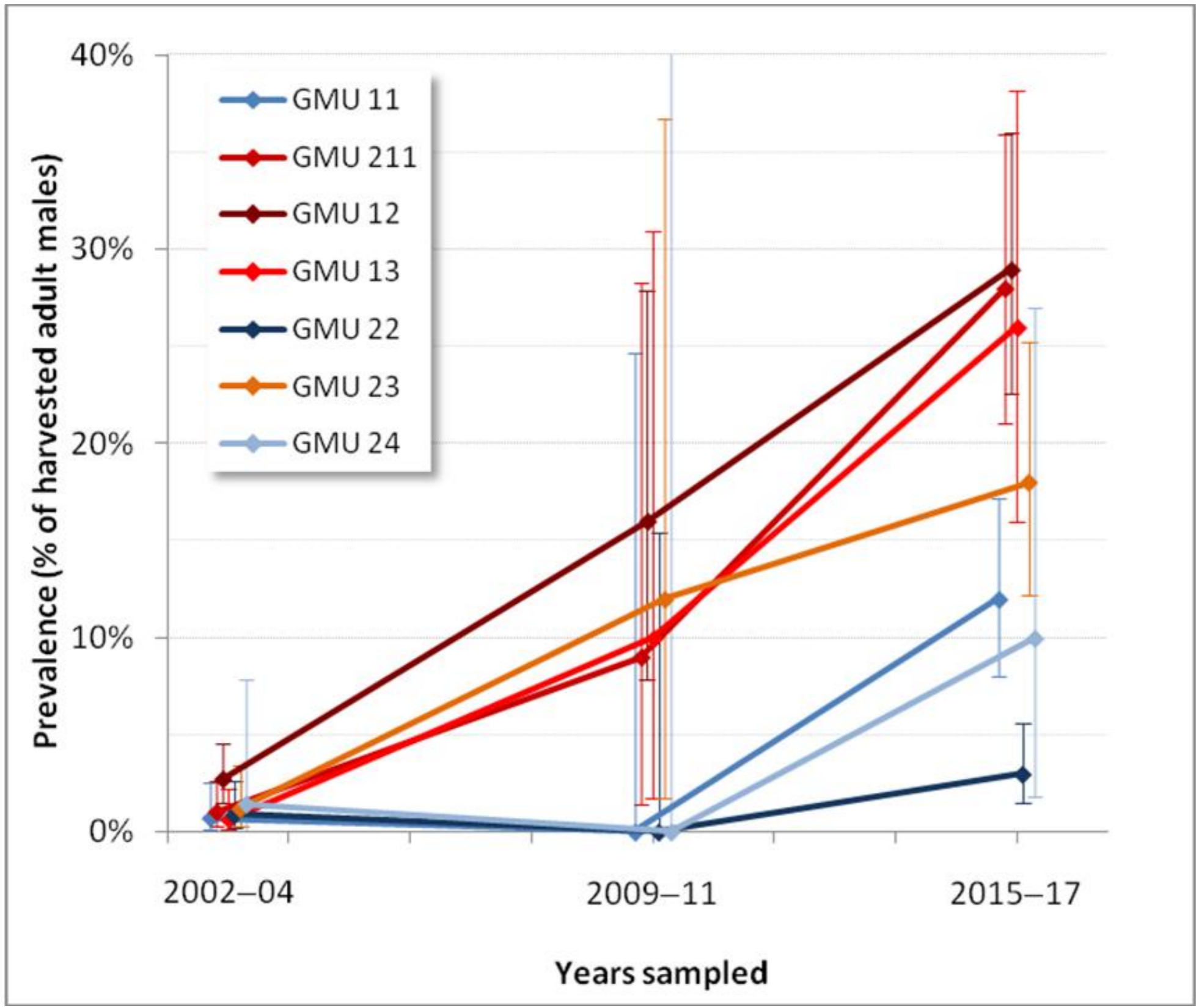
License, Buck:Doe Ratio and Prevalence Trends



Licenses and Prevalence Trends for D-07

All Third Season Hunt Codes for GMUs 12, 13, 23, 24

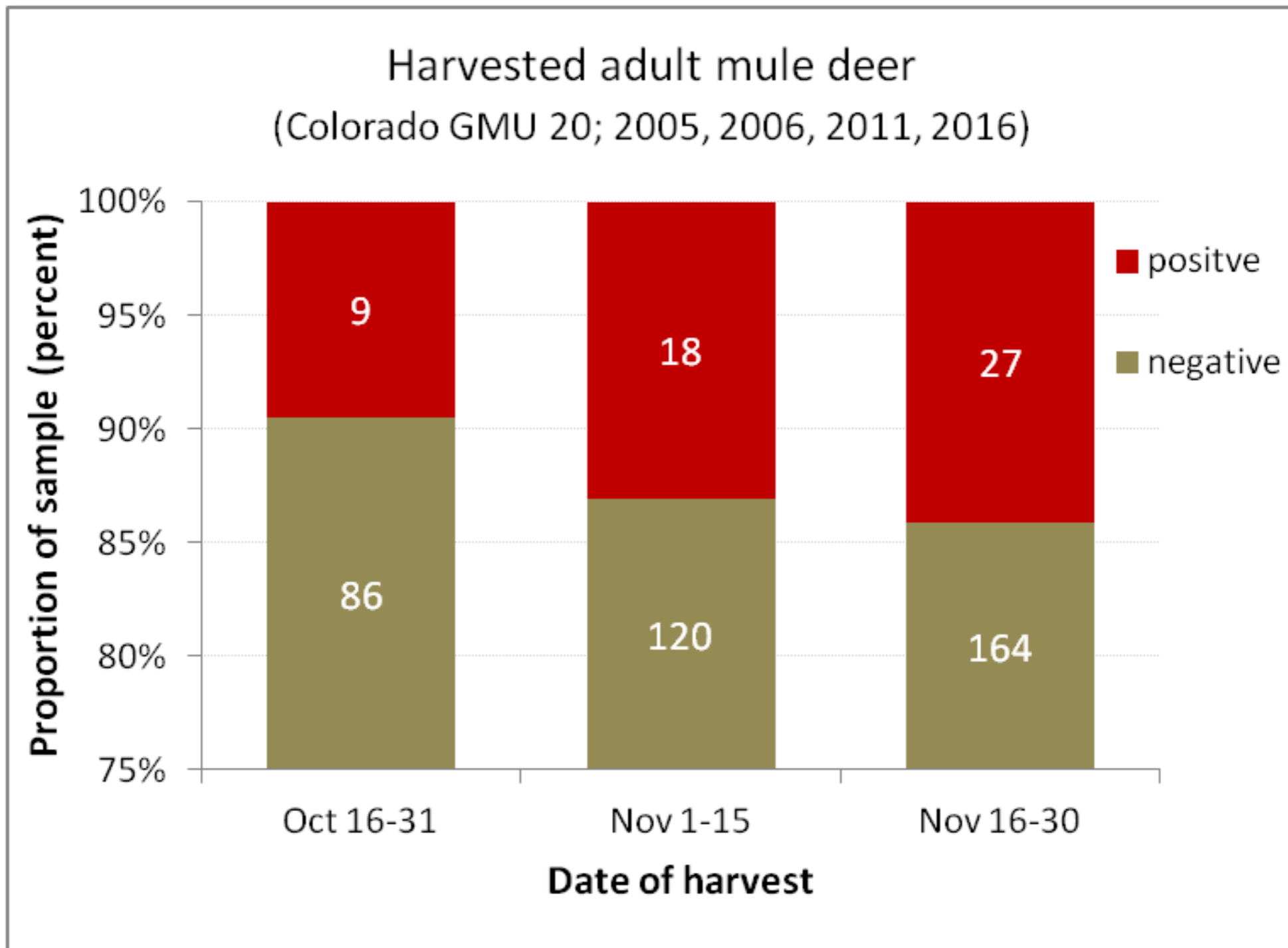




COLORADO

Parks and Wildlife

Department of Natural Resources



Proportionally more infected deer may be removed via harvest in later seasons.

Sex & Age & CWD

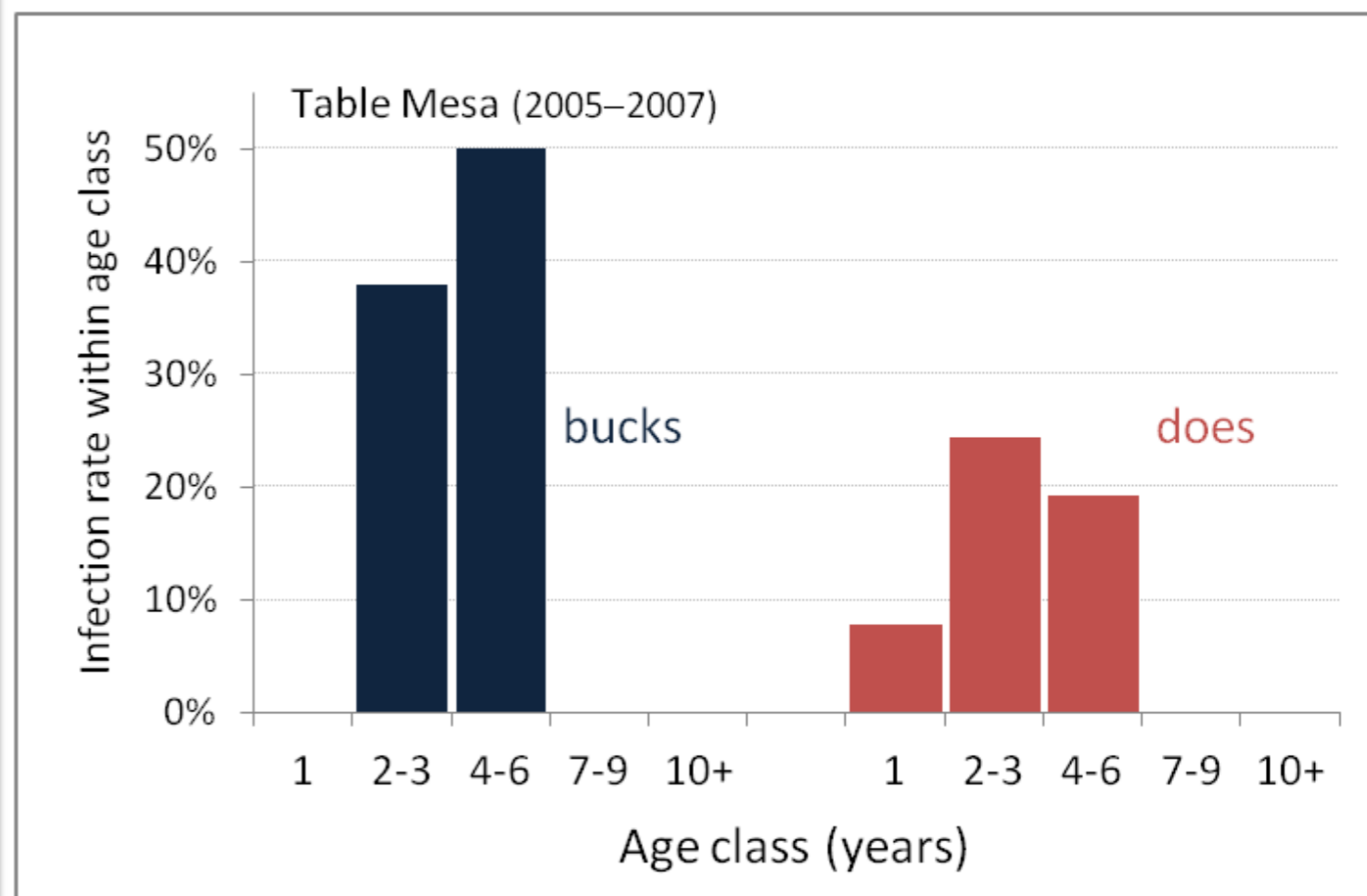
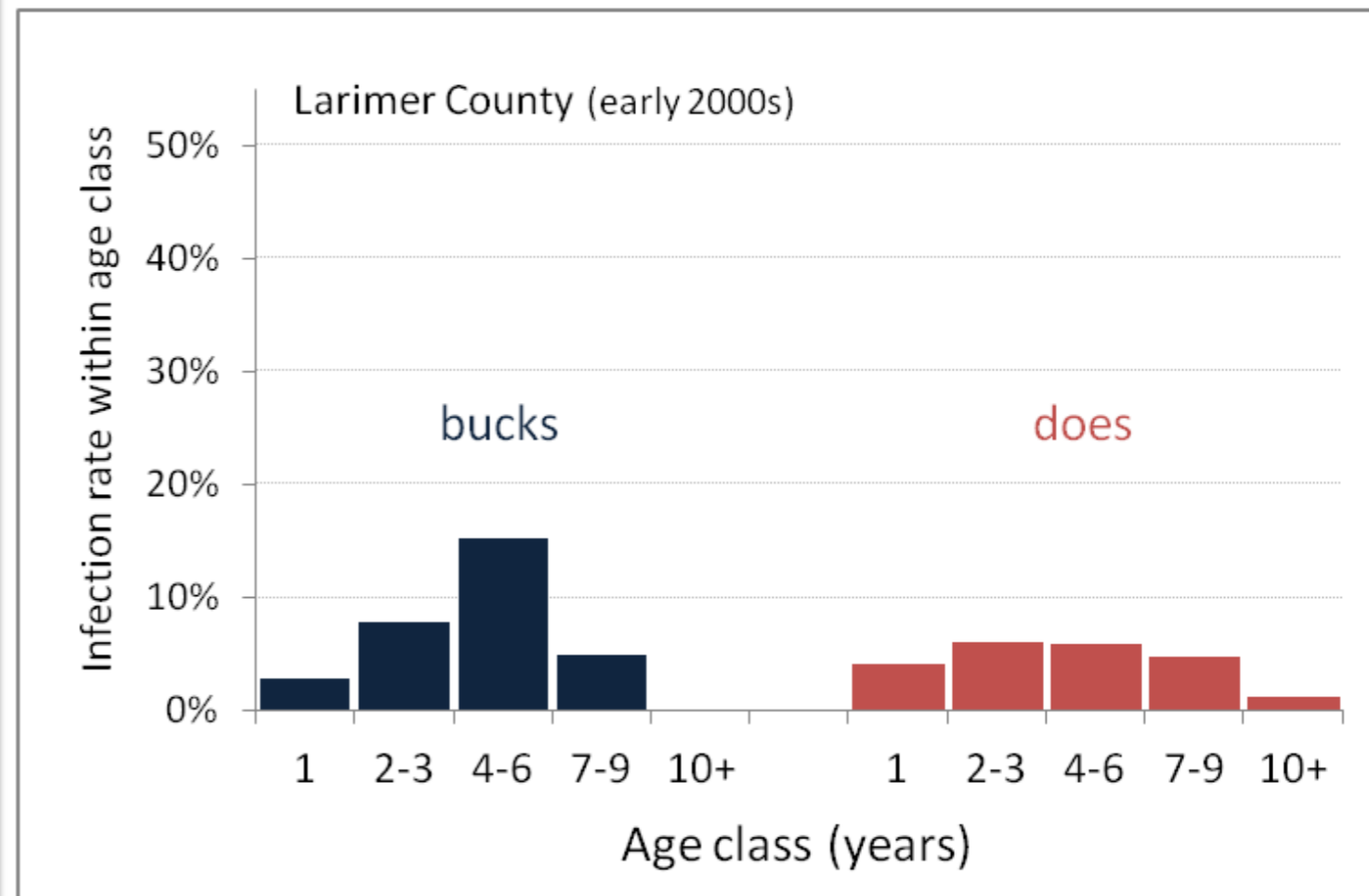
Chronic wasting disease infection rates tend to be about twice as high in mule deer bucks as in does from the same herd. (Not so for elk.)

“Prime aged” adult mule deer tend to show higher infection rates than very young or very old deer.

As the overall rate of infection in a herd increases, mule deer are infected & succumb at younger ages. Older aged deer become rare.

Examples shown at right:

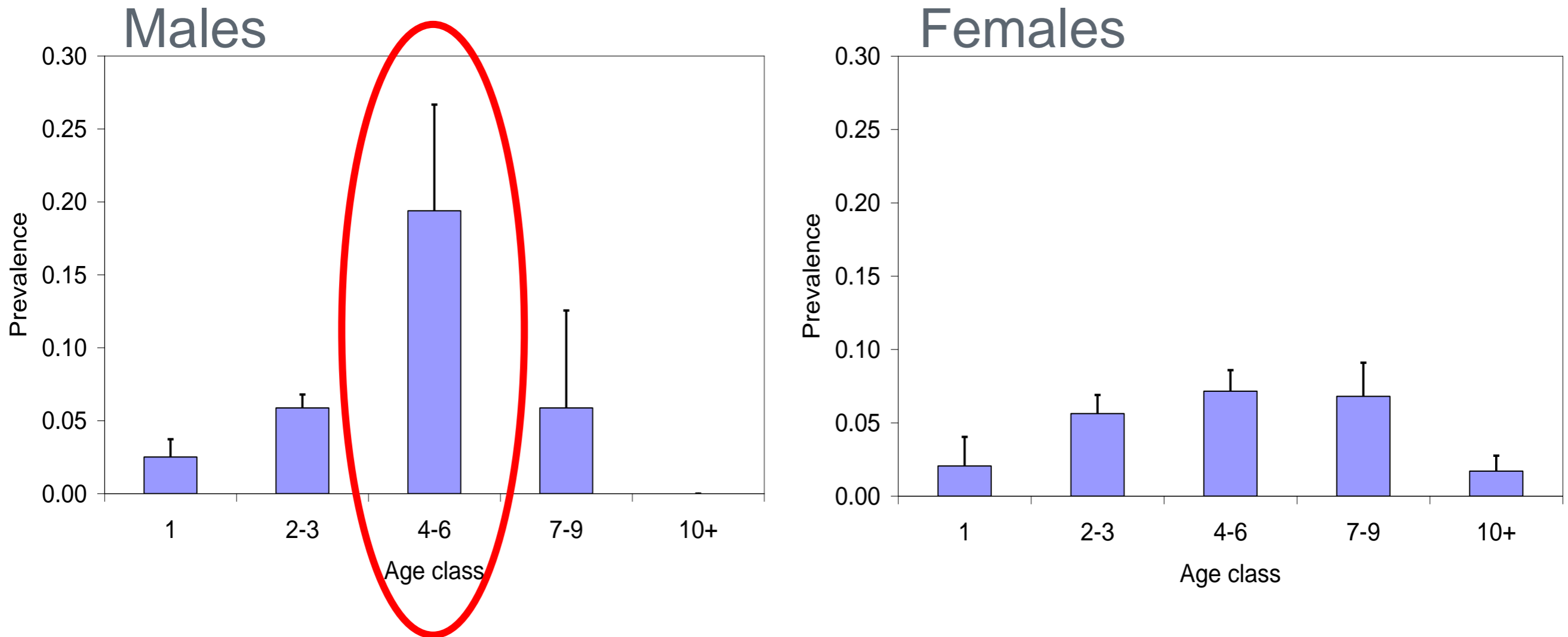
In heavily hunted Larimer County herds, 25% of does & 4% of bucks were over 6 years old.



Demographic influences on prion infection

Prevalence by age-class in mule deer

(1997–2002; Larimer County GMUs)



Much higher prevalence in "prime-age" males

Chronic wasting disease prevalence trends in Colorado

(harvest-based estimates)

