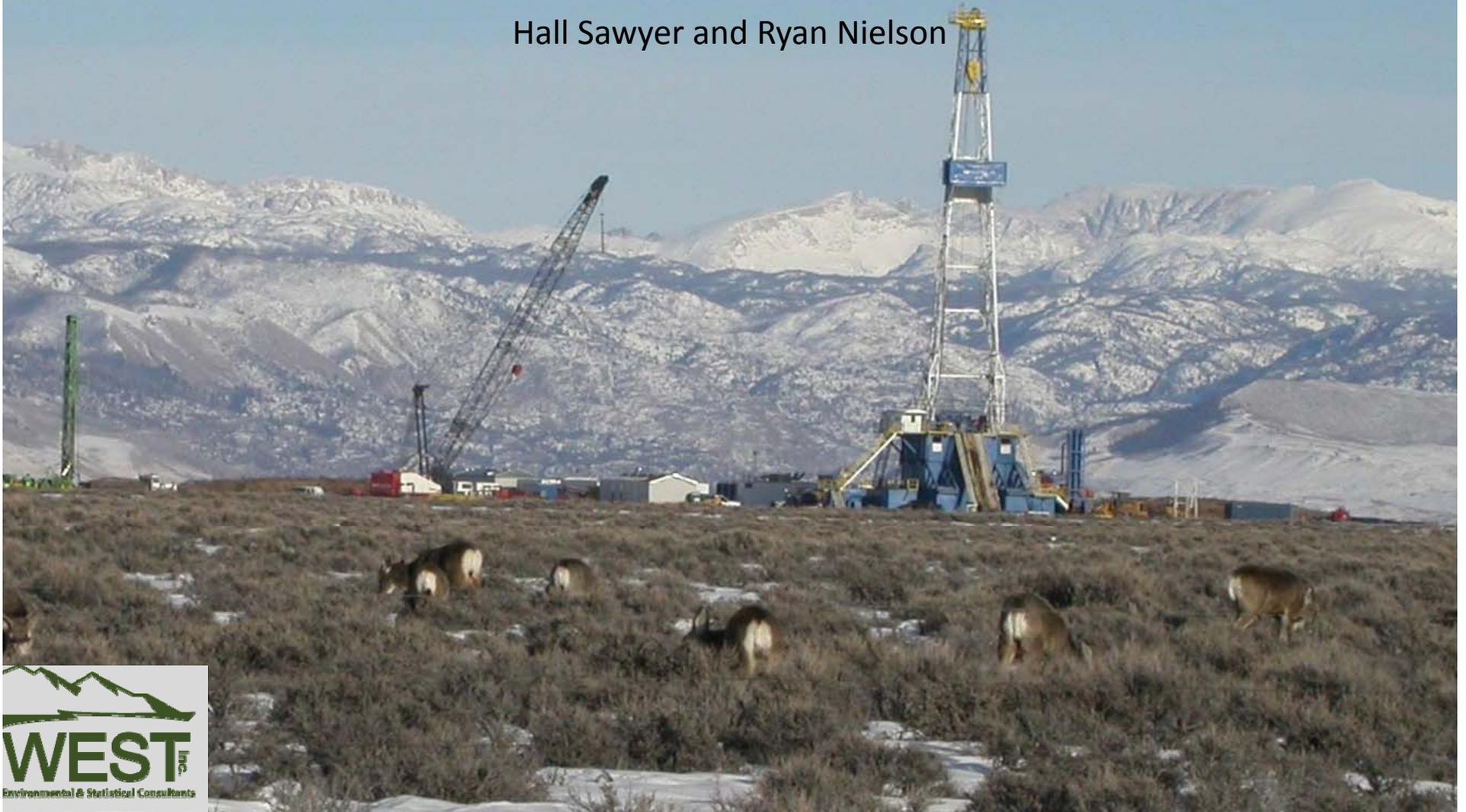


Mule Deer Monitoring in the Pinedale Anticline Project Area:

2010 Annual Report

Hall Sawyer and Ryan Nielson



Background

- Sublette Mule Deer Study (Phase I): 1998 - 2001
- Sublette Mule Deer Study (Phase II): 2001 - 2007
- Transition period: 2008
- Pinedale Anticline Planning Office (PAPO) monitoring: 2009 - present



Wildlife Monitoring and Mitigation Matrix (WMMM)

Table 1. Wildlife monitoring and mitigation matrix (WMMM) developed by the BLM (2008).

Wildlife Monitoring and Mitigation Matrix

SPECIES	CRITERIA	METHOD	CHANGES THAT WILL BE MONITORED	SPECIFIC CHANGE REQUIRING MITIGATION	MITIGATION RESPONSES
Mule Deer	Change in Mesa deer numbers	Current mule deer study, and use of WGFD data	Change in deer numbers in any year, or a cumulative change over all years, initially compared to average of 05/06 numbers (2856 deer)	15% change in any year, or cumulatively over all years, compared to reference area (Sublette mule deer herd unit [average 05/06 herd unit population is 27,254], or other mutually agreeable area).	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Avoidance distances		Average of any 2-year avoidance distance from well pads and roads, and a concurrent change in deer numbers compared to average of 05/06 numbers (2856 deer)	Average of 0.5 km change per year over 2 years, and a concurrent 15% change in deer numbers in any year, compared to reference area (Sublette mule deer herd unit [average 05/06 herd unit population is 27,254], or other mutually agreeable area).	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.

Wildlife Monitoring and Mitigation Matrix (WMMM)

- Change in abundance
 - Low statistical power for detecting 15% change between 2 years
 - Why use 2005 as reference?
- Avoidance distances
 - Unclear methods
 - Unrealistic avoidance assumption?
 - Why tied to abundance trigger?

Independent Review of WMMM protocols:

REVIEW: MULE DEER MONITORING, PINEDALE ANTICLINE

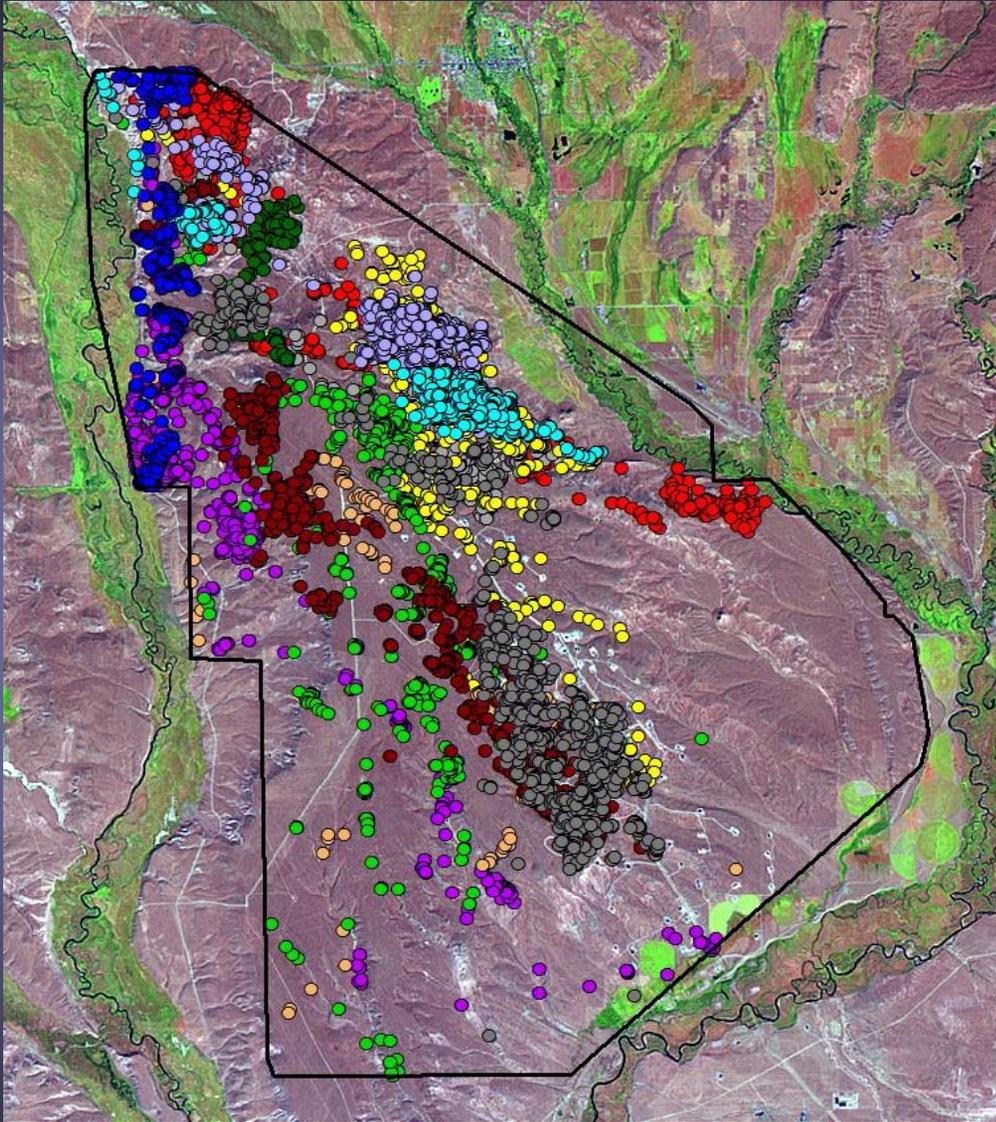
J. A. Bissonette, CWB®, Leader, USGS Utah Cooperative Fish and Wildlife Research Unit, Professor, Department of Wildland Resources, College of Natural Resources, Utah State University, Logan UT 84341

Gary C. White, CWB®, Professor Emeritus, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO 80523

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Submitted by the Mule Deer Monitoring Plan Review Committee 20 May 2010

Approach: Behavioral Avoidance



The goal is to make inference to an project area

Use GPS data collected from individually-marked animals to estimate a resource selection function (RSF).

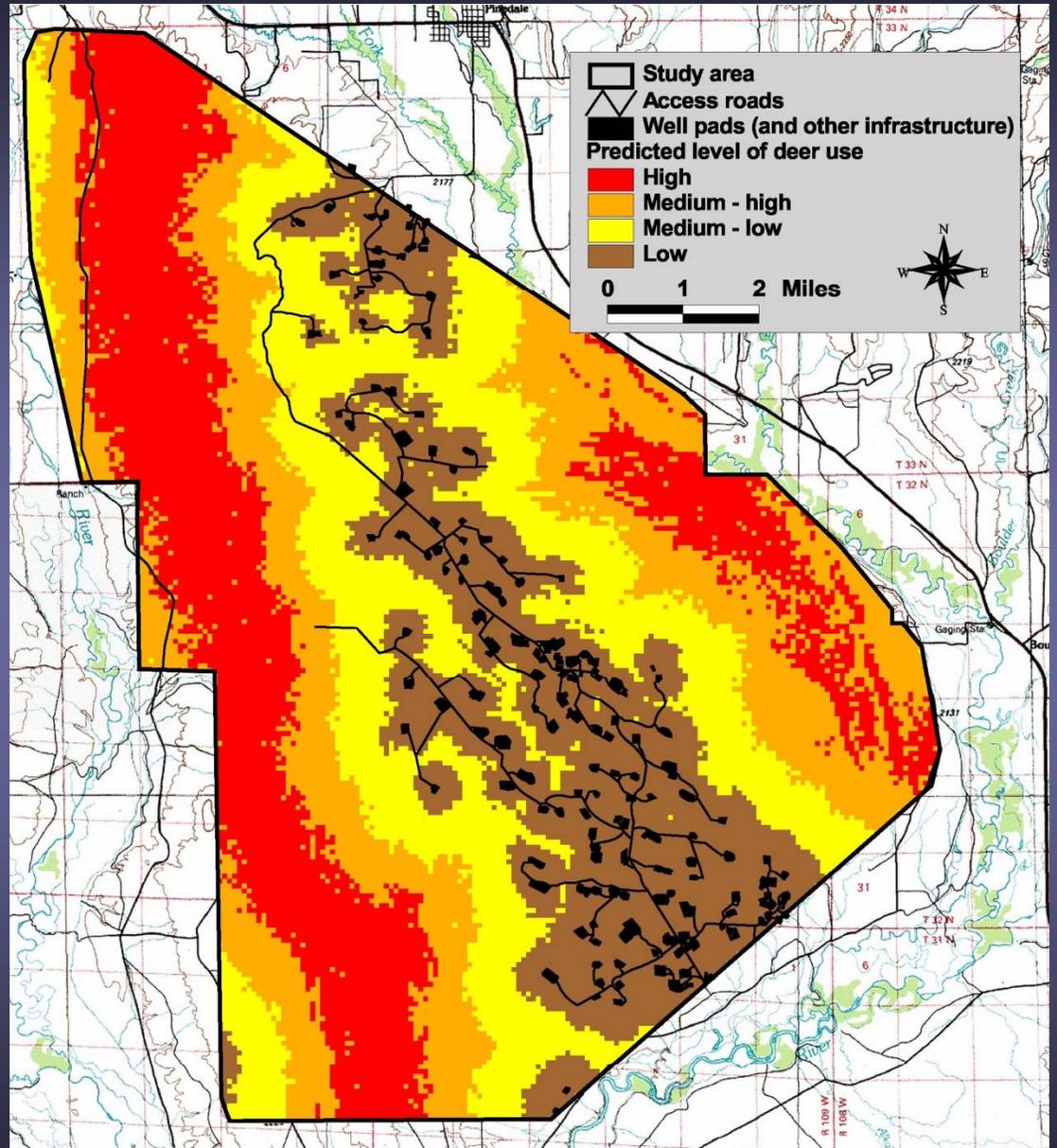
Predicted Deer Use Year 9 of Development (2008-09 winter)

Avg. distance to well pad:
3.36 km

During 2009-10 winter:
Avg. = 2.4 km

Consistently 2.4-3.4 km

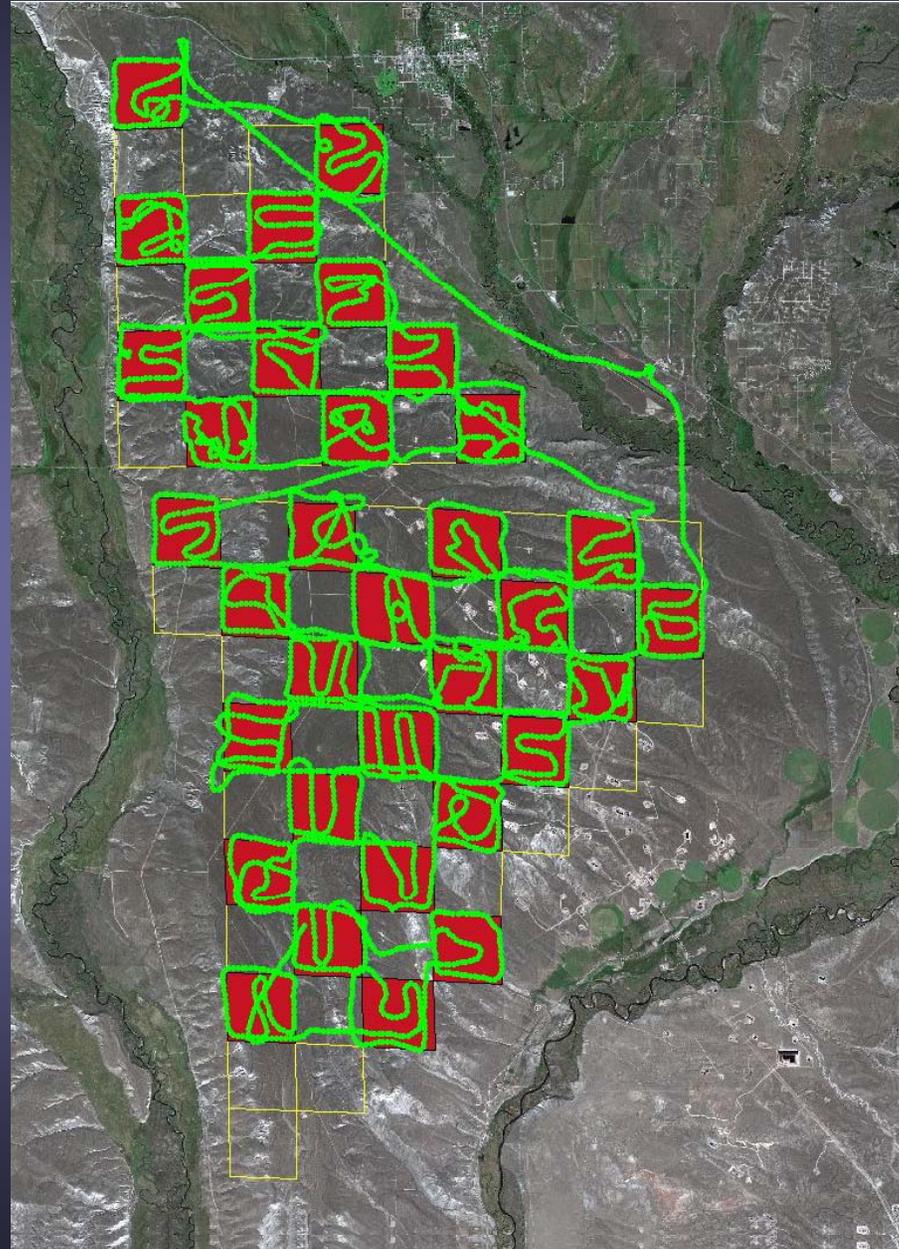
Should we expect avoidance
to increase indefinitely?



Approach: Mule Deer Abundance

Survey Area: 68 blocks (1 x 1 mi)

Sample Area: 34 blocks (1 x 1 mi)



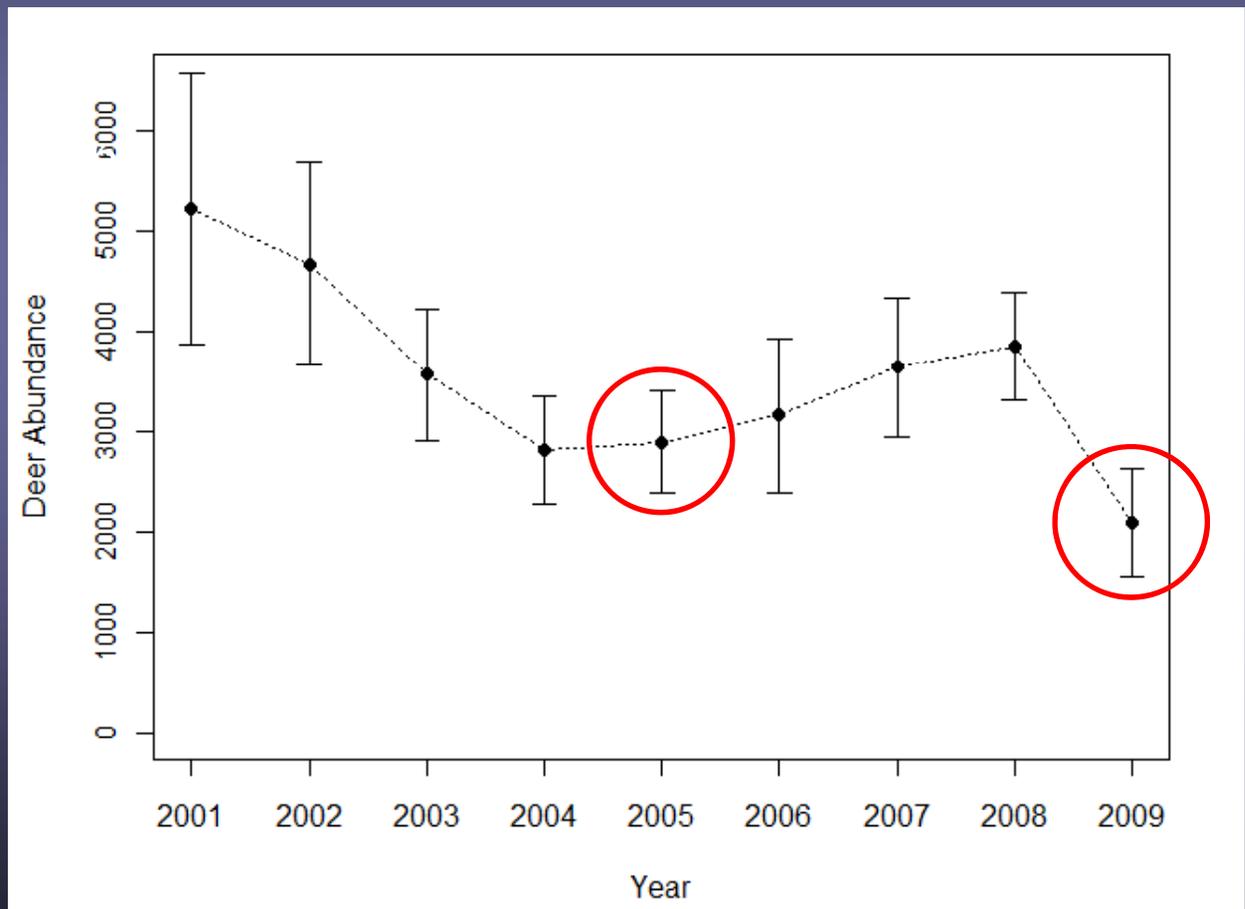
Approach: Mule Deer Abundance

2009-10 winter: 2,088 deer

2004-05 winter: 2,894 deer

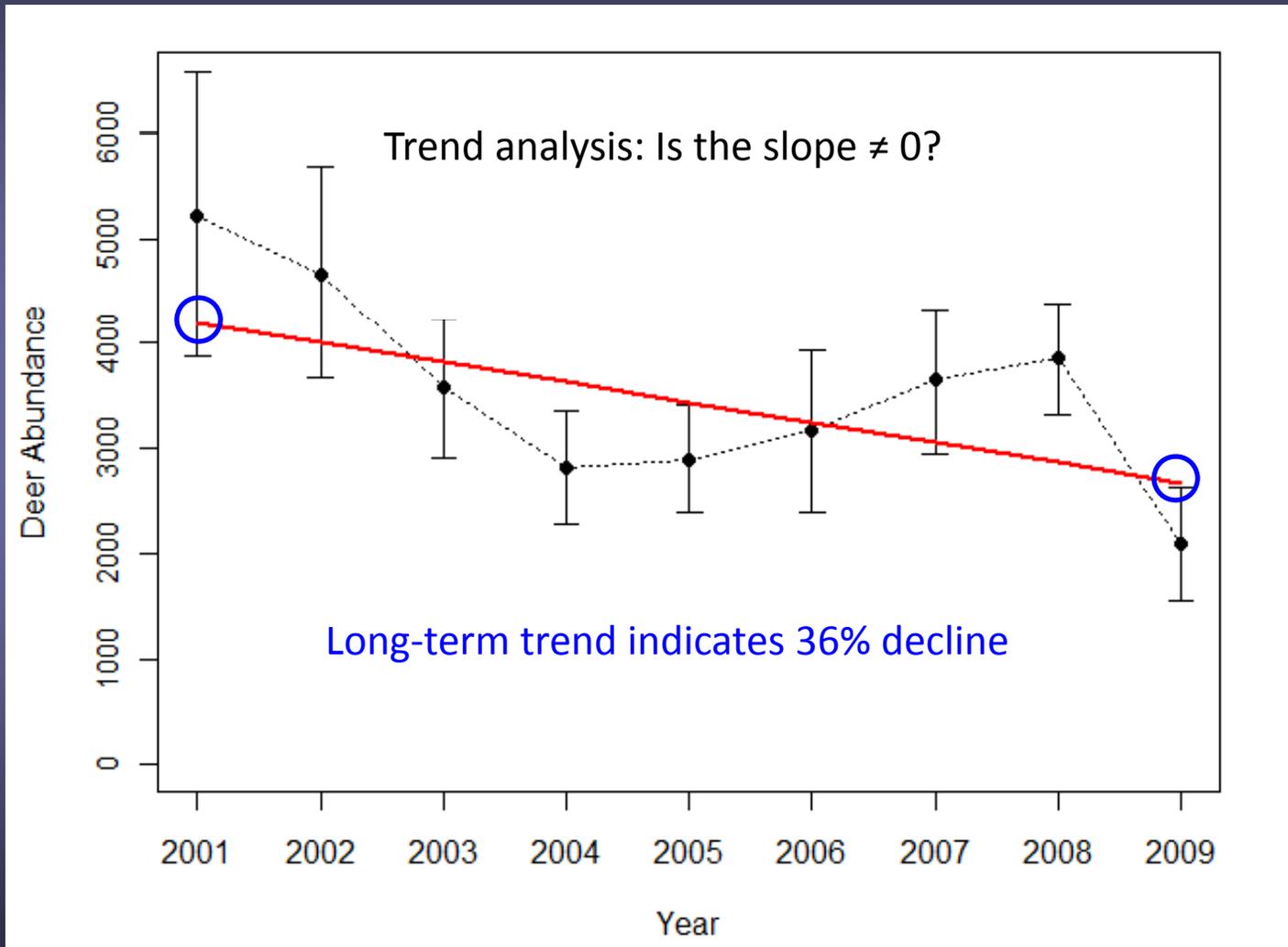
28% reduction
(p-value = 0.07)

What about the concern
low statistical power for
detecting 15% change
between 2 years?



Mule Deer Abundance

What's the best approach for assessing change in abundance?

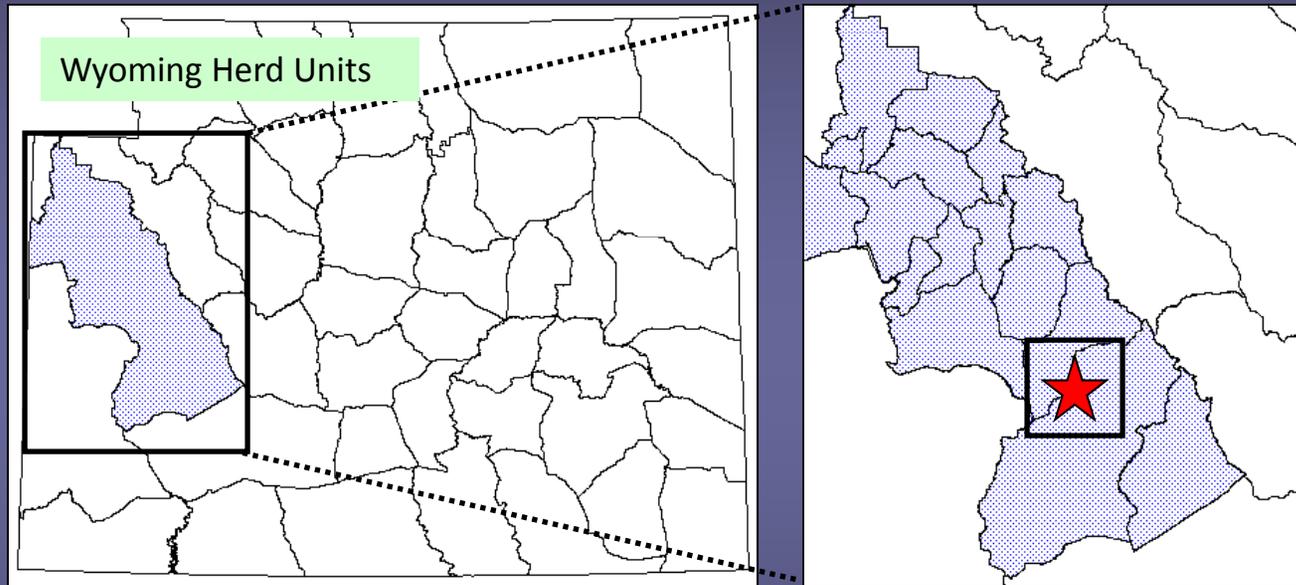


Did mule deer decline at a similar rate in other areas?

Sublette Herd Unit

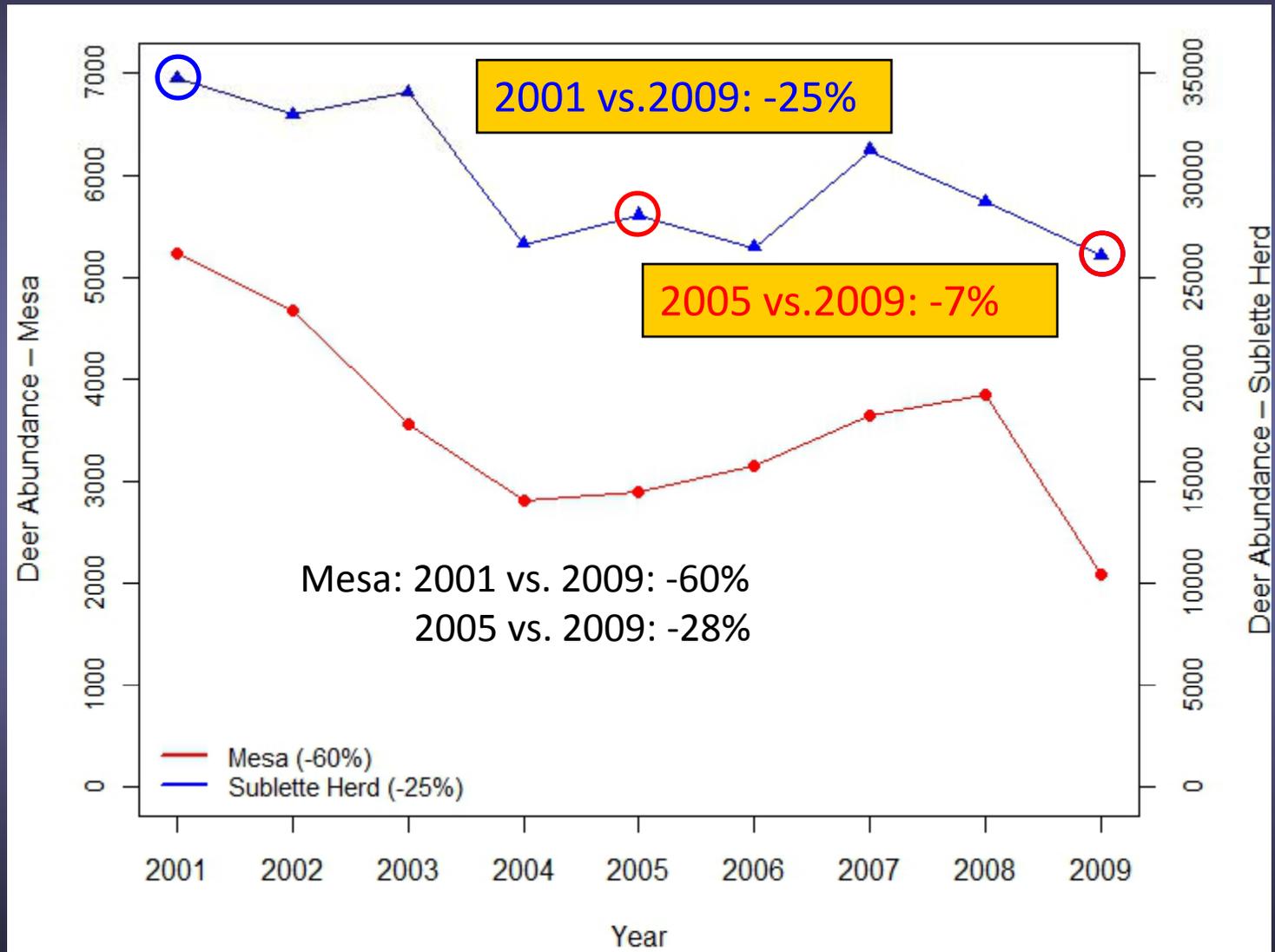


WGFD estimates based on POPII models



Did mule deer decline at a similar rate in other areas?

Sublette Herd Unit

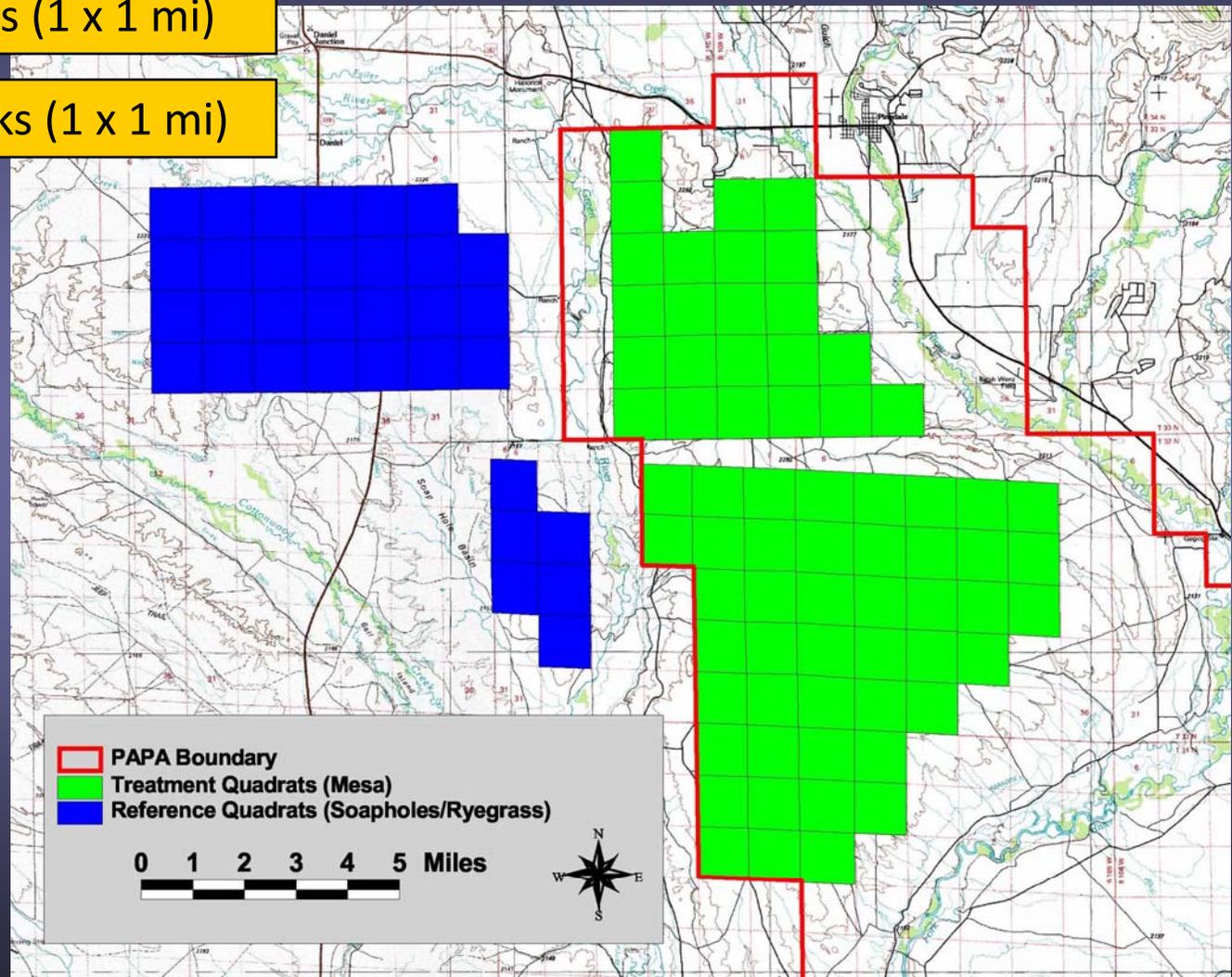


Did mule deer decline at a similar rate in other areas?

Ryegrass/Soapholes

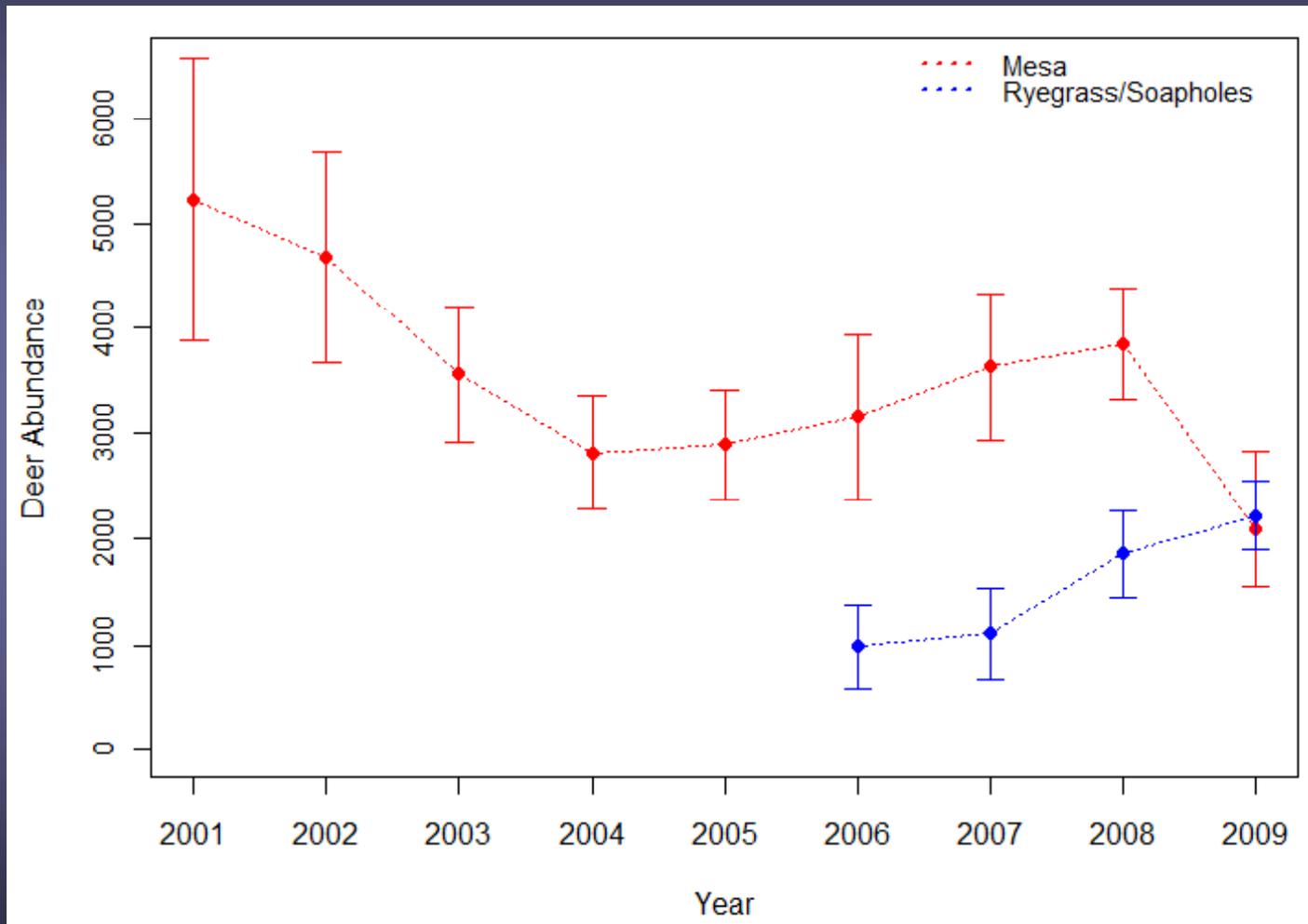
Survey Area: 33 blocks (1 x 1 mi)

Sample Area: 17 blocks (1 x 1 mi)



Did mule deer decline at a similar rate in other areas?

Ryegrass/Soapholes



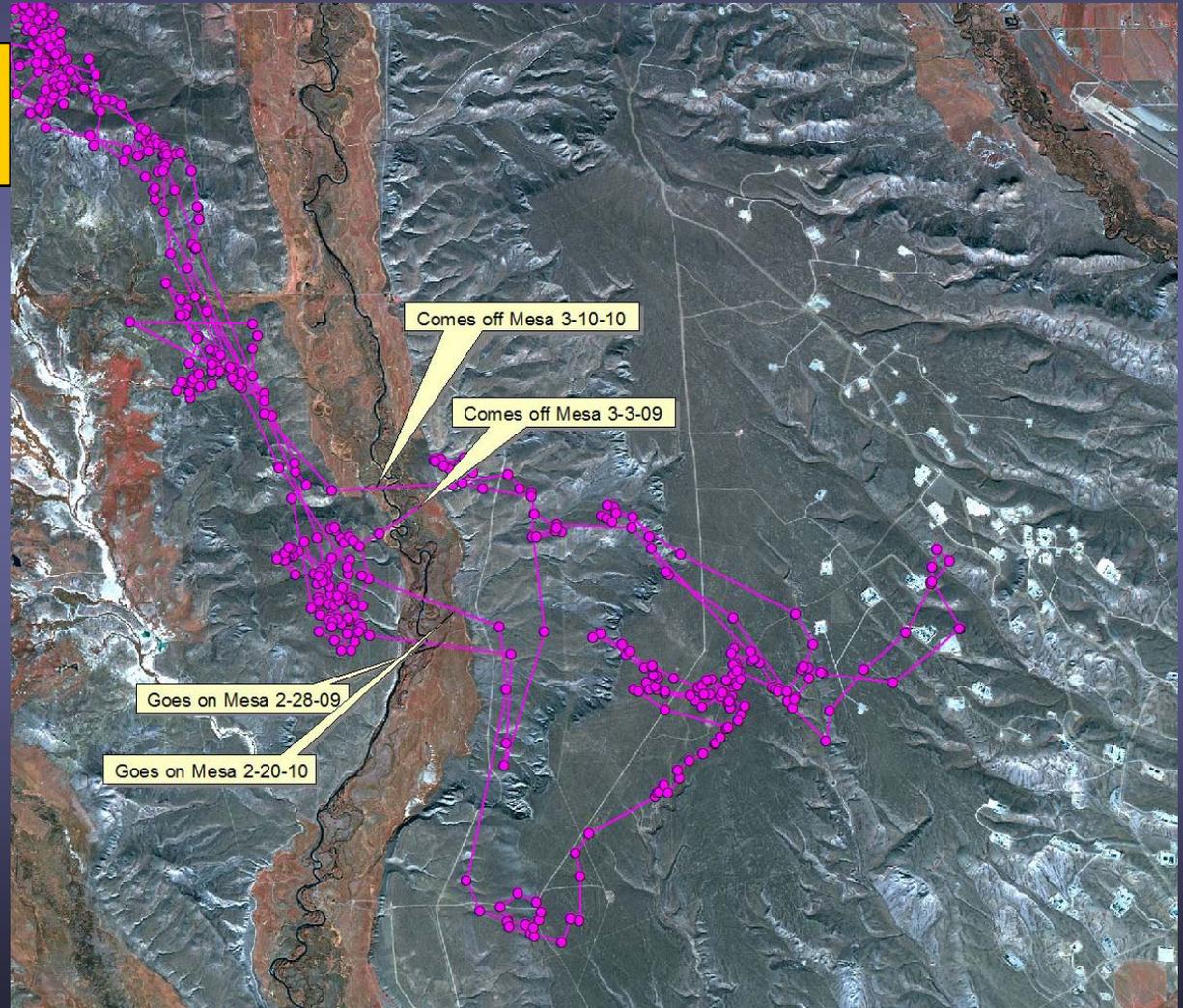
Why the sharp decline in deer numbers from 2009 to 2010?

Unusually mild winter?

Restrictions on motorized use in Ryegrass?

Increased levels of drilling/development?

All the above?



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