Brucellosis Management in Wyoming

26 January 2012

Brucellosis in Wildlife

- 1917- First report of brucellosis in YNP bison
  - (Mohler, 1917, Annual Reports, USDA 105-106)

Photos from Yellowstone National Park files

Brucellosis in Wildlife

- 1930- First report of brucellosis in elk
  - (Murie, 1951, The Elk of North America)

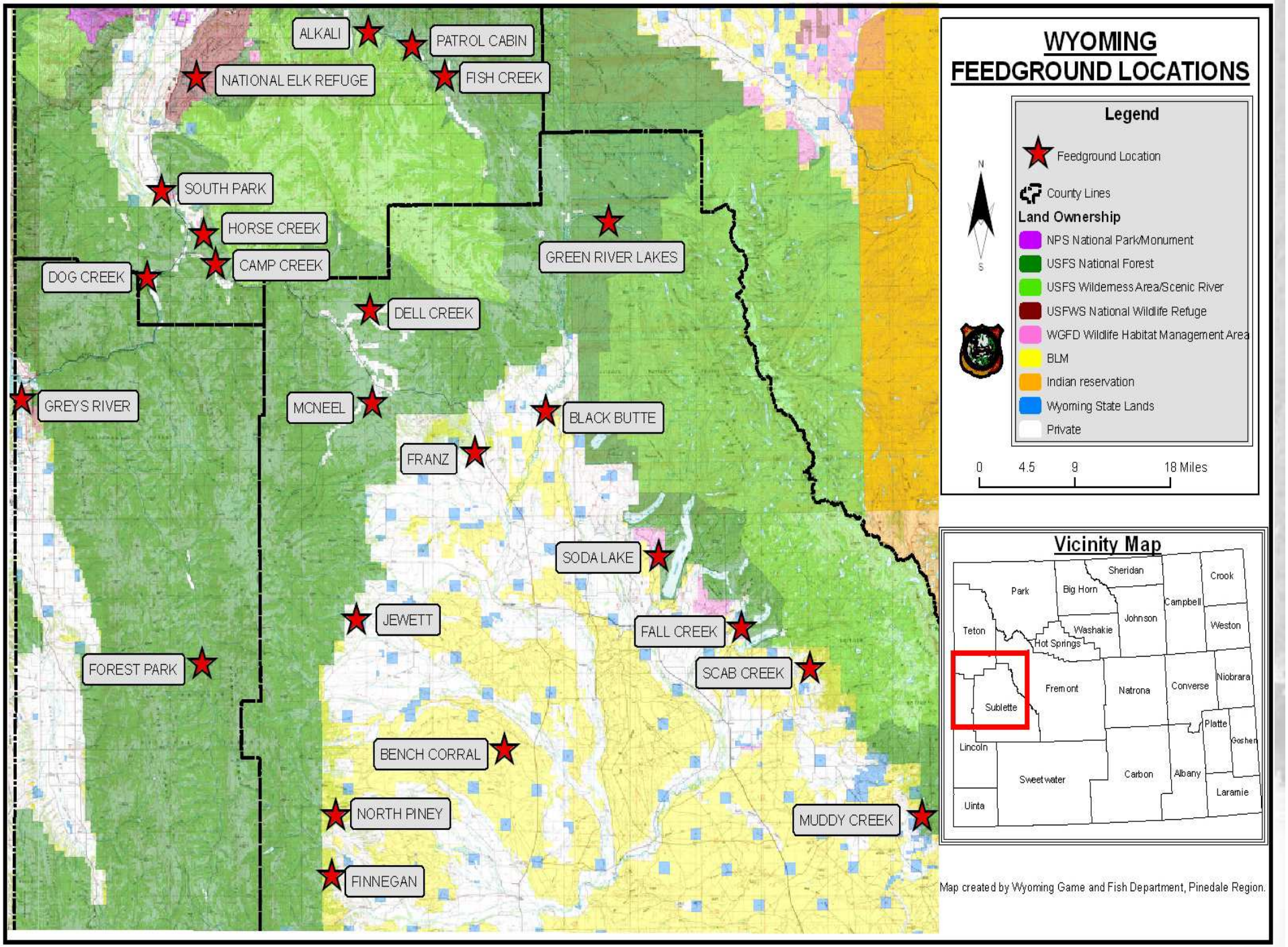
Photo from Yellowstone National Park files

Elk Feeding and Brucellosis

❖Began in 1912 to offset loss of winter range

AND

Photos courtesy of the Jackson Hole Historical Society


WYOMING
FEEDGROUND LOCATIONS
Legend
Feedground Location
County Lines
Land Ownership
NPS National Park/Monument
USFS National Forest
USFS Wilderness Area/Scenic River
USFWS National Wildlife Refuge
WGFD Wildlife Habitat Management Area
BLM
Indian reservation
Wyoming State Lands
Private
N
S
0
4.5
9
18 Miles
ALKALI
PATROL CABIN
NATIONAL ELK REFUGE
FISH CREEK
SOUTH PARK
HORSE CREEK
CAMP CREEK
DOG CREEK
GREEN RIVER LAKES
DELL CREEK
GREYS RIVER
MCNEEL
BLACK BUTTE
FRANZ
SODA LAKE
JEWETT
FALL CREEK
FOREST PARK
SCAB CREEK
BENCH CORRAL
NORTH PINEY
MUDDY CREEK
FINNEGAN
Vicinity Map
Sheridan
Crook
Park
Big Horn
Campbell
Johnson
Teton
Washakie
Weston
Hot Springs
Fremont
Natrona
Converse
Niobrara
Sublette
Platte
Goshen
Lincoln
Sweetwater
Carbon
Albany
Laramie
Uinta
Map created by Wyoming Game and Fish Department, Pinedale Region.

Brucellosis Infections in Cattle

- Increased testing requirements
- Restricted movement
- Potential depopulation
- = Significant financial impact

Brucellosis-Feedground-Habitat Program Overview

- Integrated approach to managing brucellosis in elk and bison in western Wyoming using:
  - Elk/Cattle Separation
  - Vaccination
  - Habitat Enhancement
  - Feedground Management
  - Research – Adaptive Management
  - Surveillance

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Elk/Cattle Separation

- Operate Feedgrounds
- Materials for 200+ elk-proof stackyards delivered to cattle producers with chronic elk damage
- Hunting seasons designed to maintain hunting pressure on private lands
- Haze elk away from conflicts

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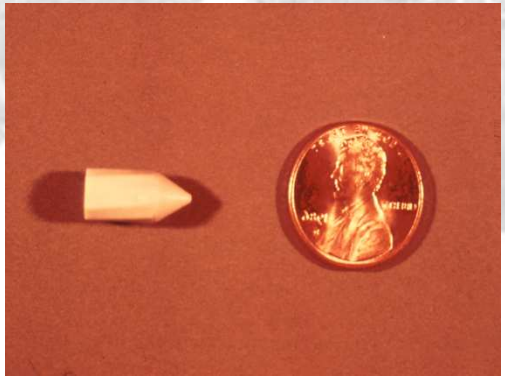
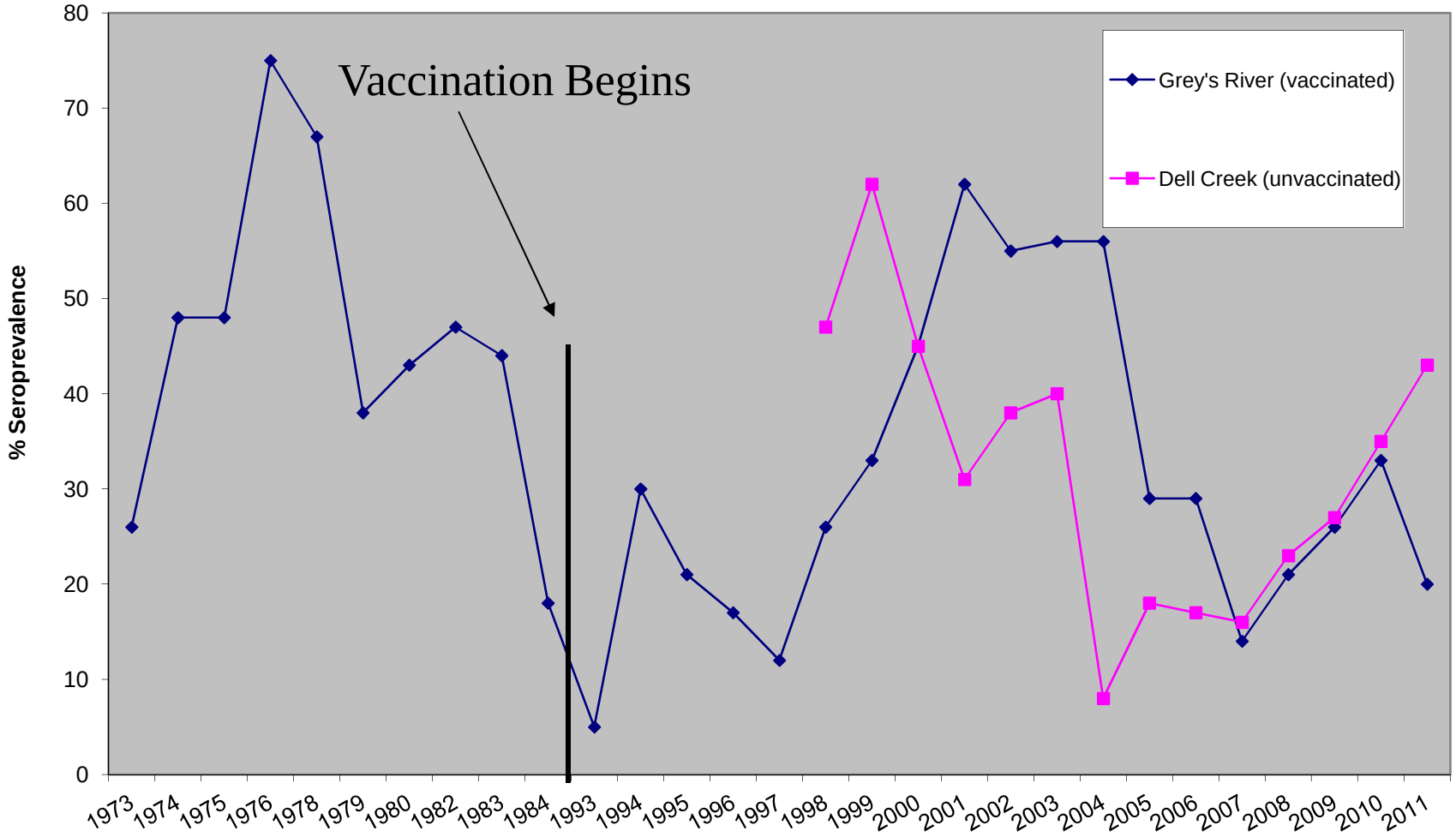
Brucella Strain 19 elk vaccination

- Initiated in 1985
- Vaccinated >95,000 calves
  - -22 of 23 elk feedgrounds
  - -90% coverage



Brucellosis Seroprevalence of Vaccinated and Unvaccinated Elk Attending Feedgrounds in Wyoming



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Habitat Enhancement

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Feedground Management: Best Management Practices

- Feed on clean snow when possible
- Report abortions to WGFD
- Minimize feeding season
- Low Density feeding methods
- No harassment/harvest of scavengers on feedgrounds

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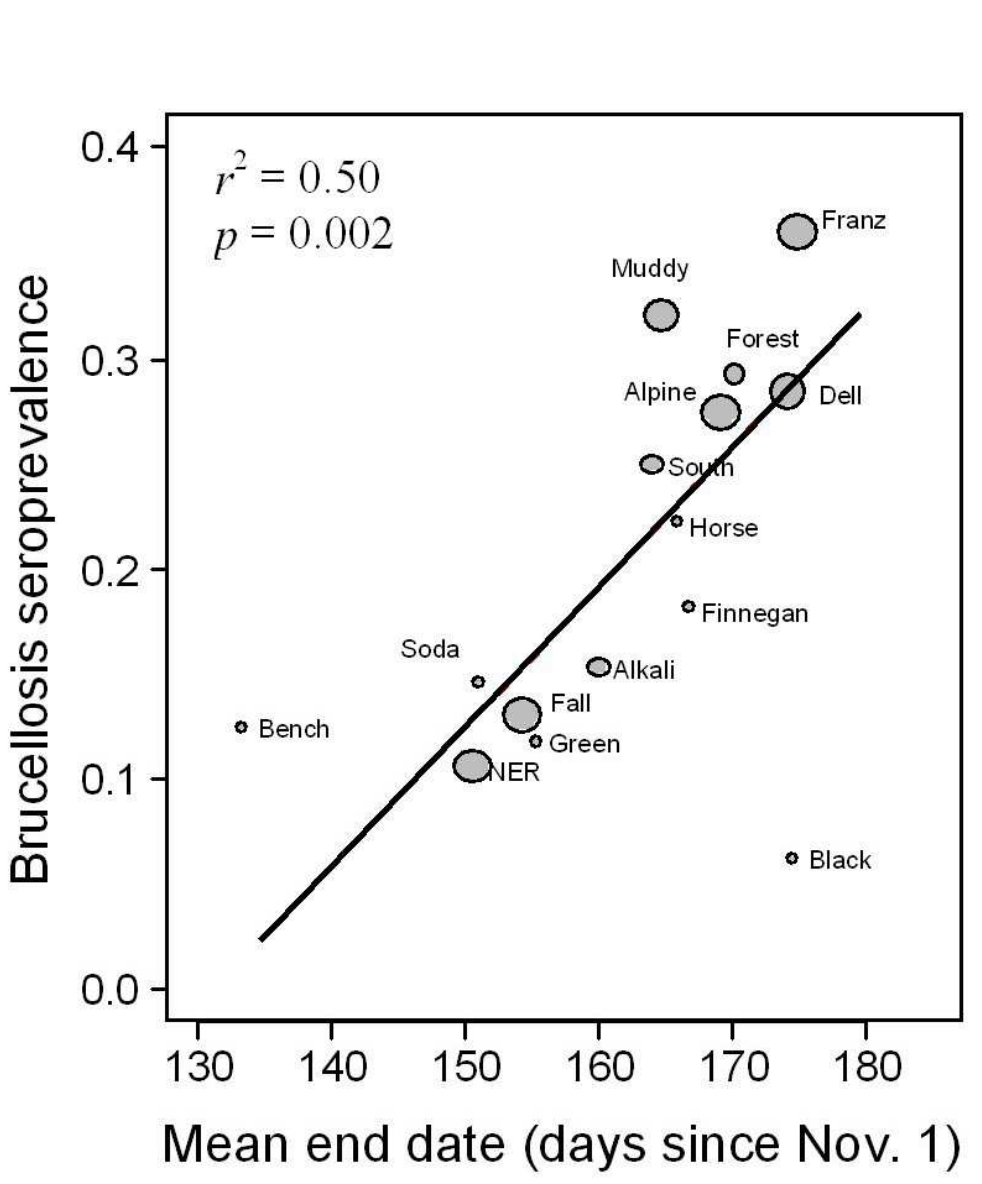
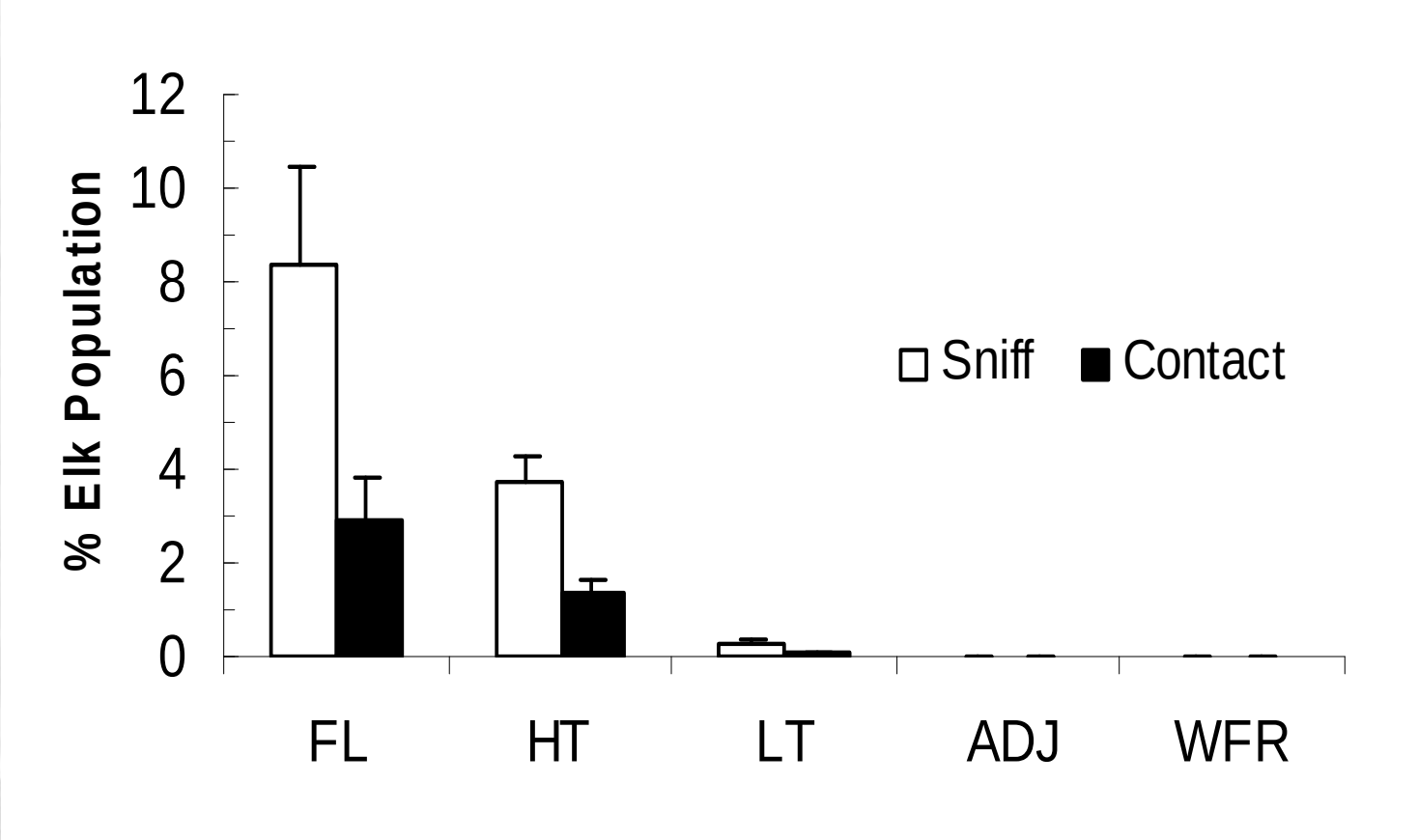


Cross, P. C., W. H. Edwards, B. M. Scurlock, E. J. Maichak, and J. D. Rogerson. 2007. Effects of management and climate on elk brucellosis in the Greater Yellowstone Ecosystem. Ecological Applications 17:957-964.

Determining characteristics of brucellosis transmission using pseudo-aborted elk fetuses



Maichak, E. J., B. M. Scurlock, J. D. Rogerson, W. H. Edwards, A. E. Barbknecht, and P. C. Cross. 2009. Effects of management, behavior, and scavenging on risk of brucellosis transmission in elk of Western Wyoming. Journal of Wildlife Diseases 45:398-410.

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Target Feedground Project

❖ Long-term, sustainable method to reduce brucellosis in elk combining two practices:

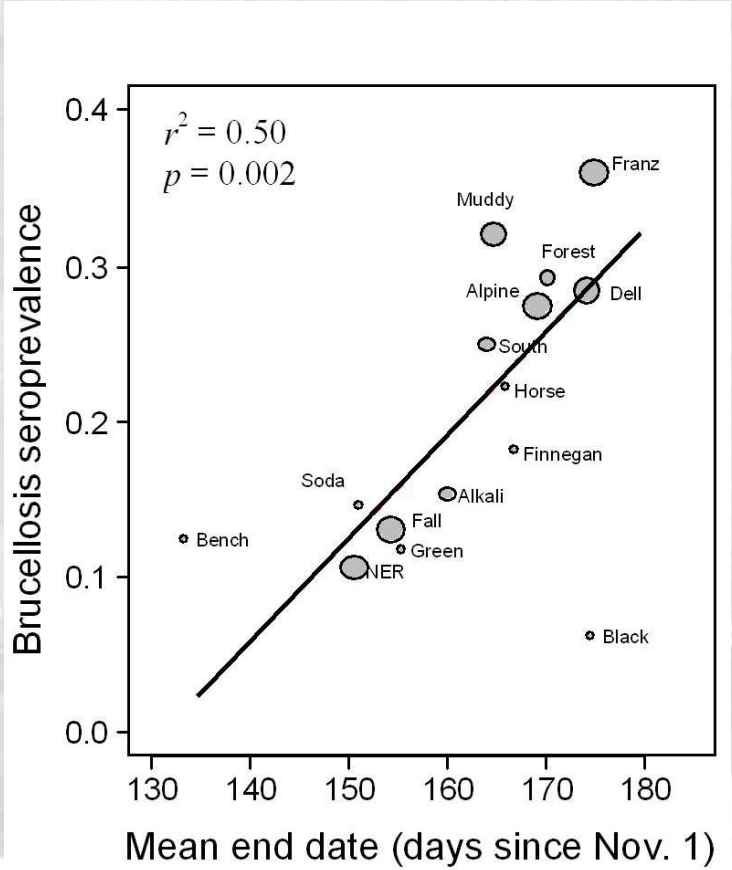
- ➢Disperse elk as much as possible on feedgrounds
  - “Low-Density” feeding to eliminate single path
- ➢Disperse elk from feedgrounds earlier
  - Reduce duration of high concentration

Shorten feeding season in Spring

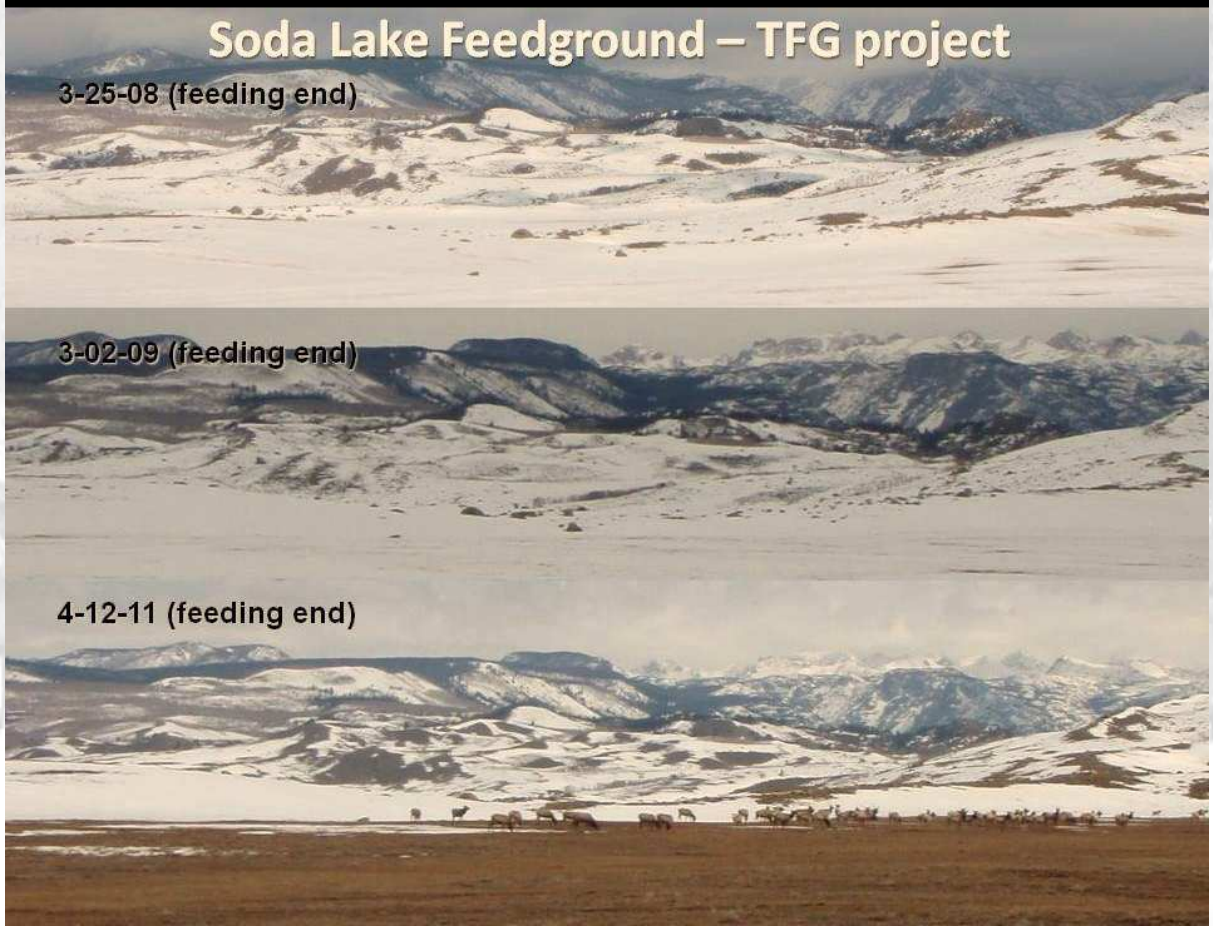
- Systematic reduction of hay as native forage becomes available in late winter/early spring.

- Goal: Truncate feeding season by an avg. of 3 weeks over 10 years

66% reduction in brucellosis if successful



Soda Lake Feedground – pre TFG project
4-02-06 (1 day before feeding end)


Soda Lake Feedground – TFG project
3-25-08 (feeding end)
3-02-09 (feeding end)
4-12-11 (feeding end)

Vaginal Implant Transmitter Study

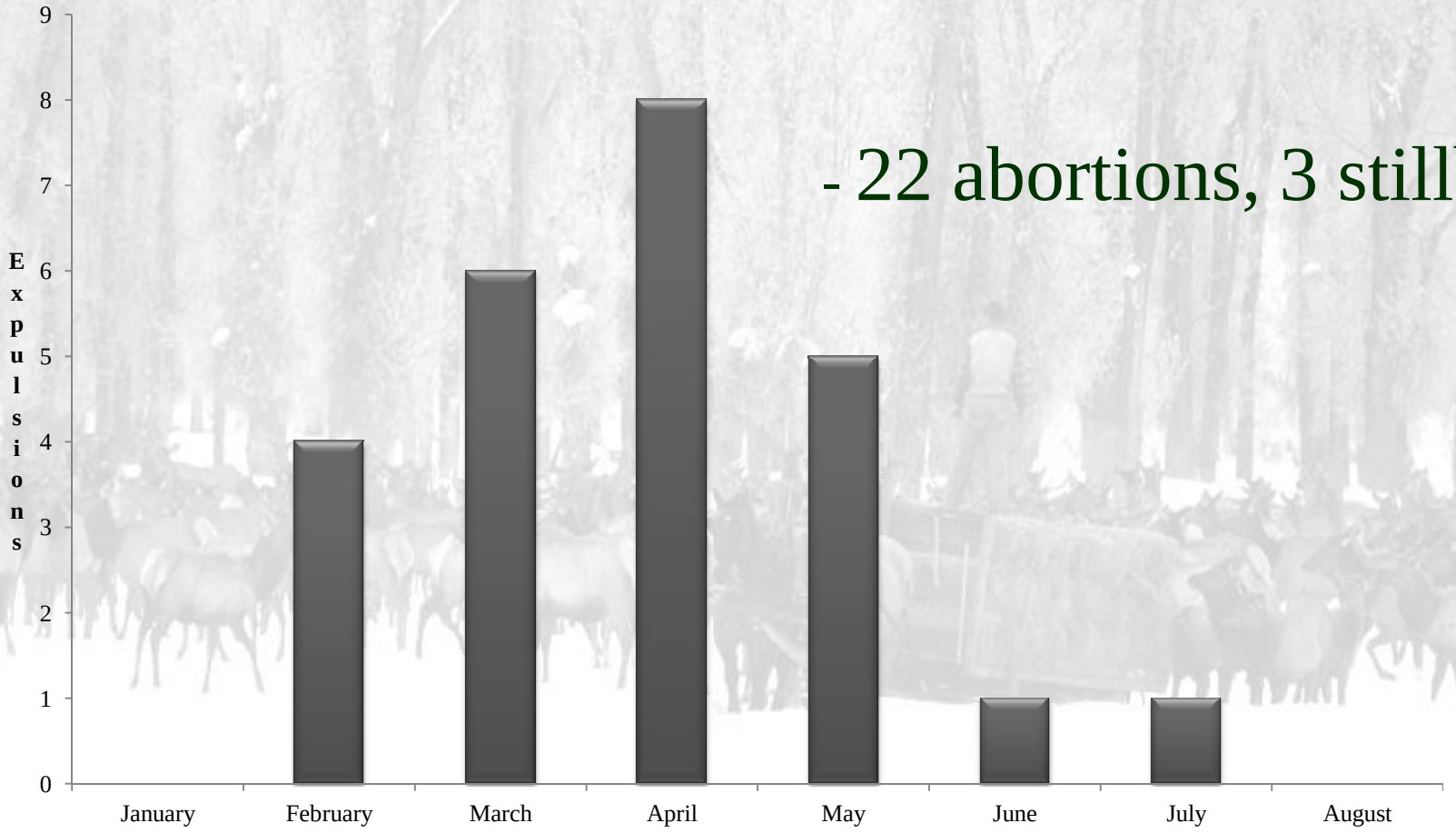
Vaginal Implant Transmitter Study Update

❖Goals

- Temporal/spatial characteristics of elk abortions
- Develop management strategies to reduce risk of elk-elk and elk-cattle brucellosis transmission

Results

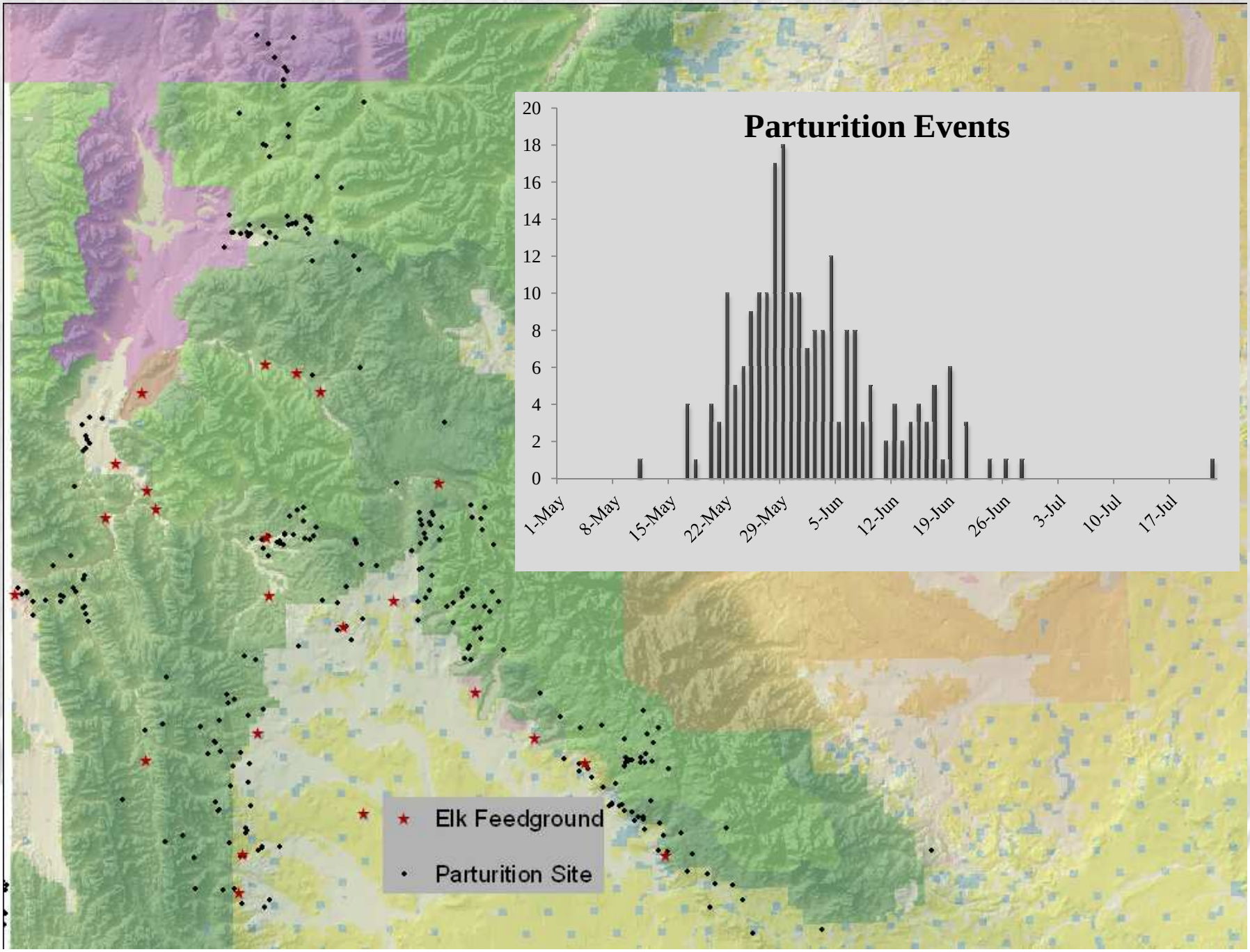
❖ 422 VIT's deployed 2006-2011 on 21 feedgrounds and 3 native winter range locations



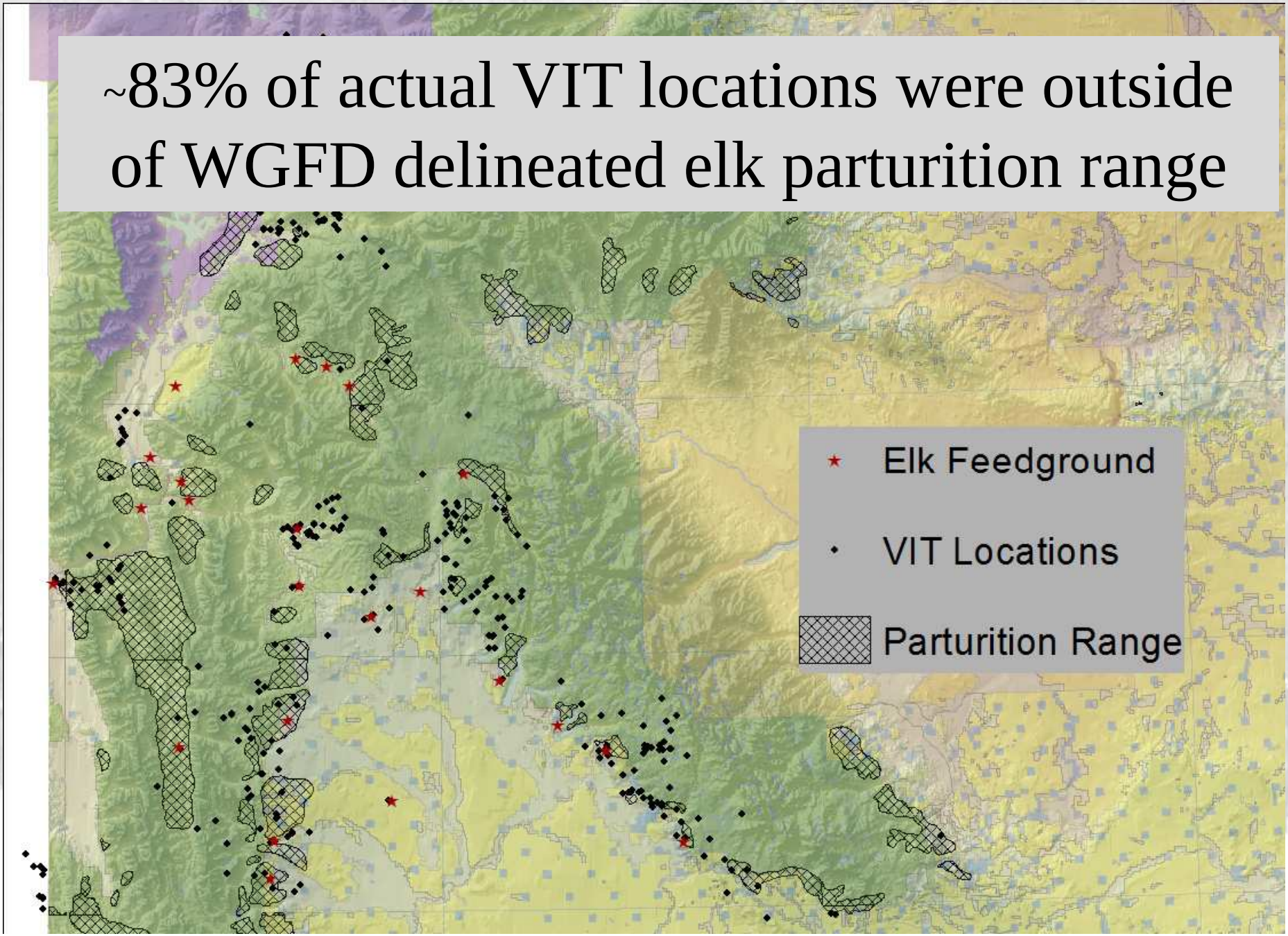
- 22 abortions, 3 stillbirths

Reproductive failures:

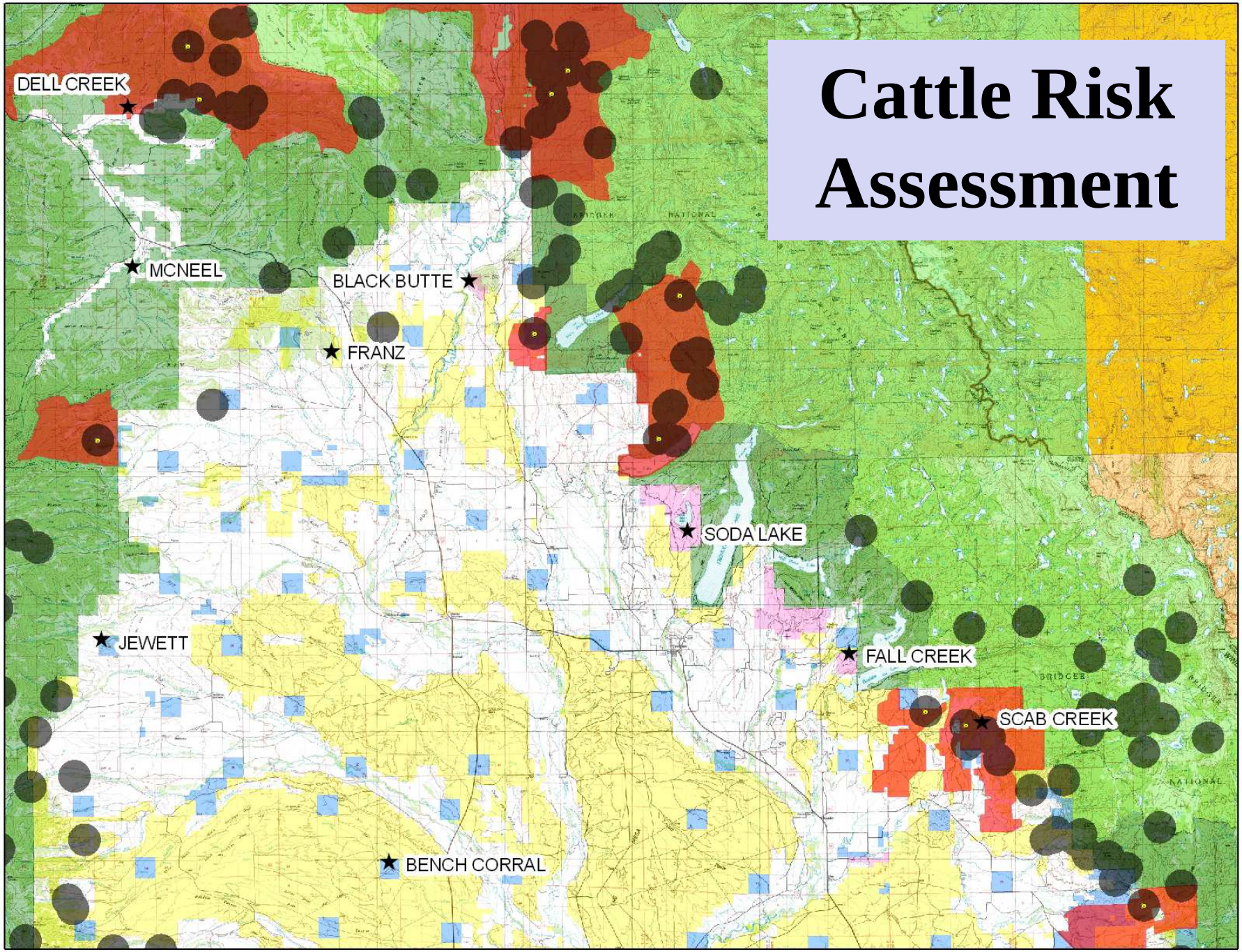
- 21% (21/98) sero+ cows 2006-2011
- 1.5% (4/275) sero- cows 2006-2011

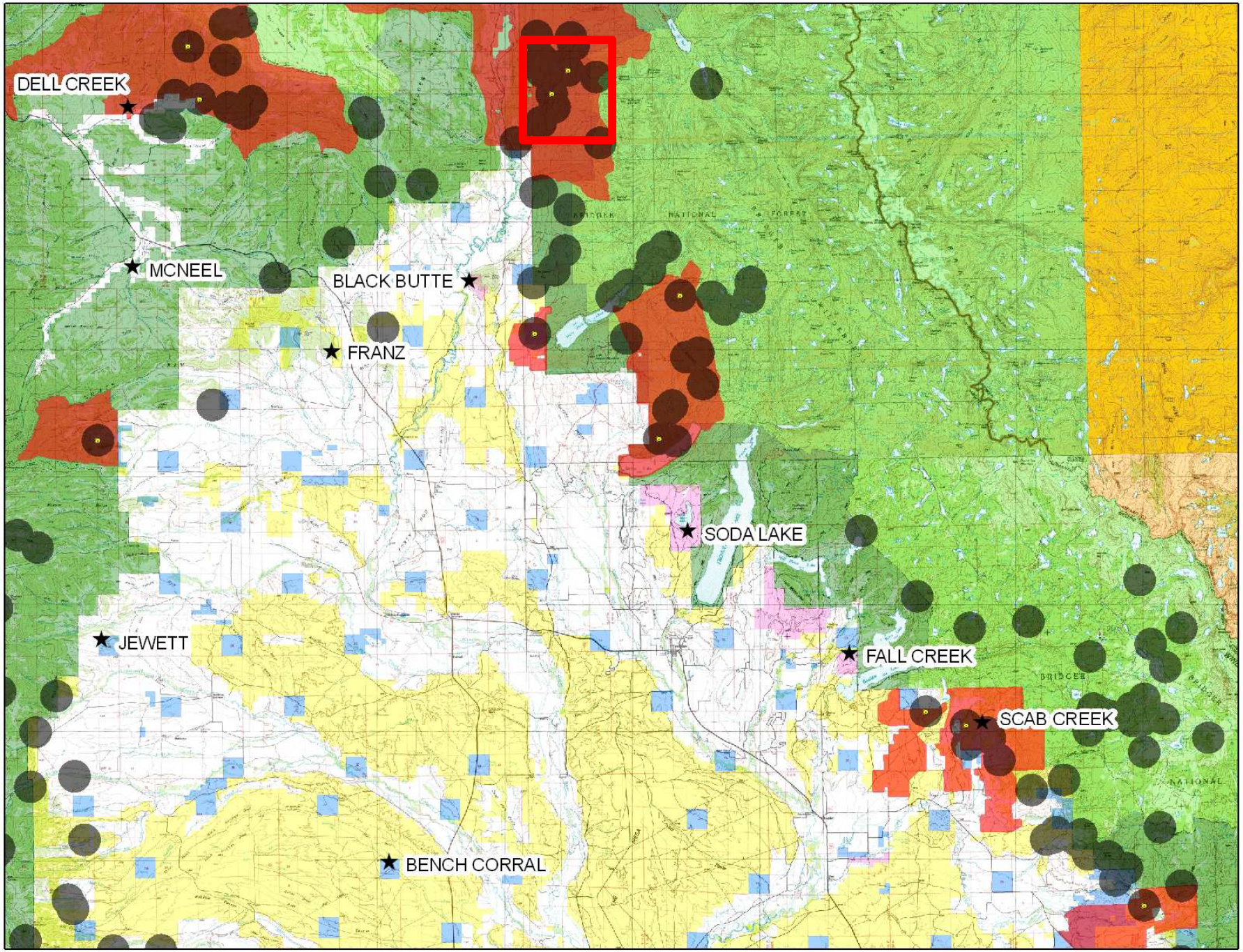

Parturition Events
20
18
16
14
12
10
8
6
4
2
0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
Elk Feedground
Parturition Site

~83% of actual VIT locations were outside of WGFD delineated elk parturition range



Cattle Risk Assessment




DELL CREEK
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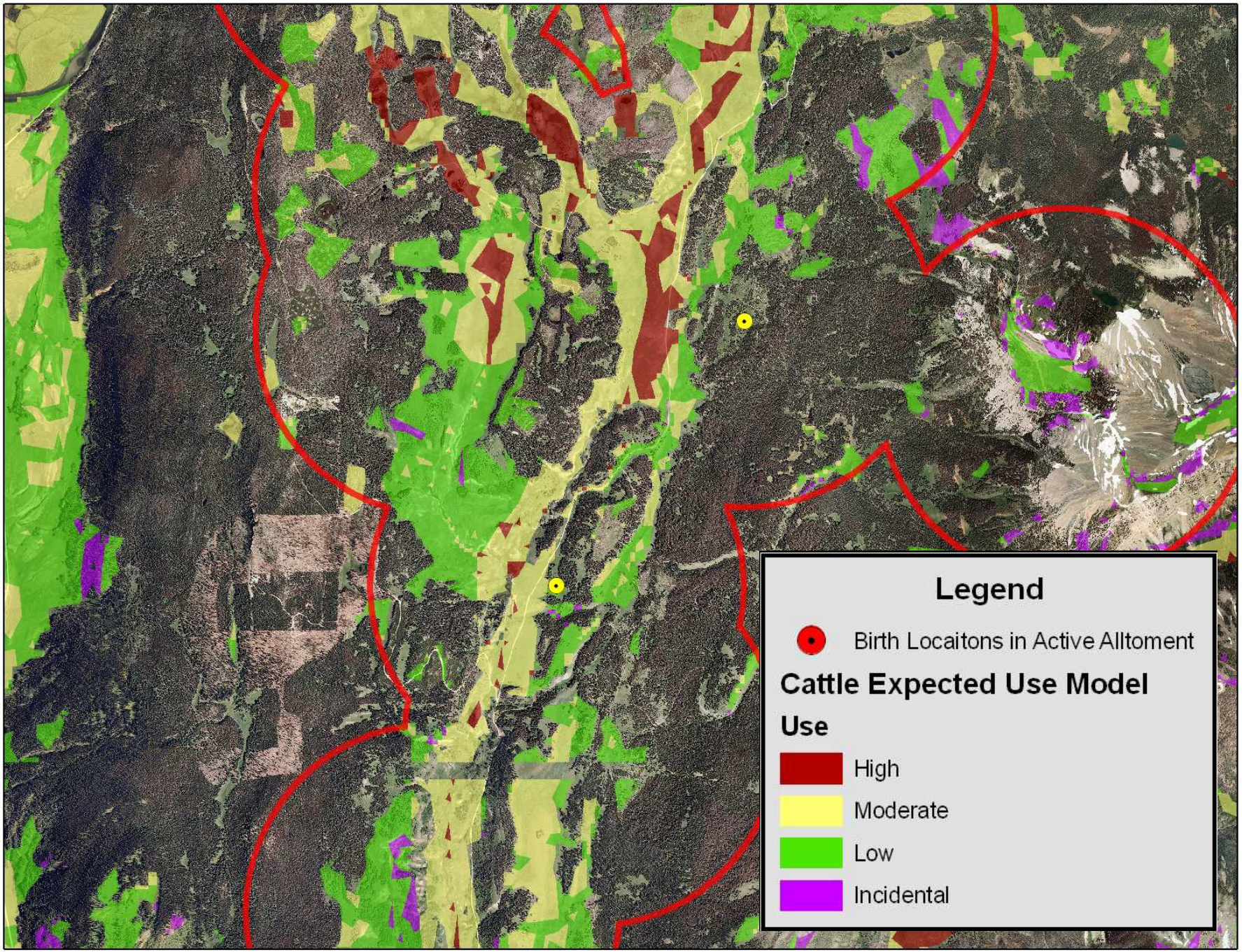
BENCH CORRAL

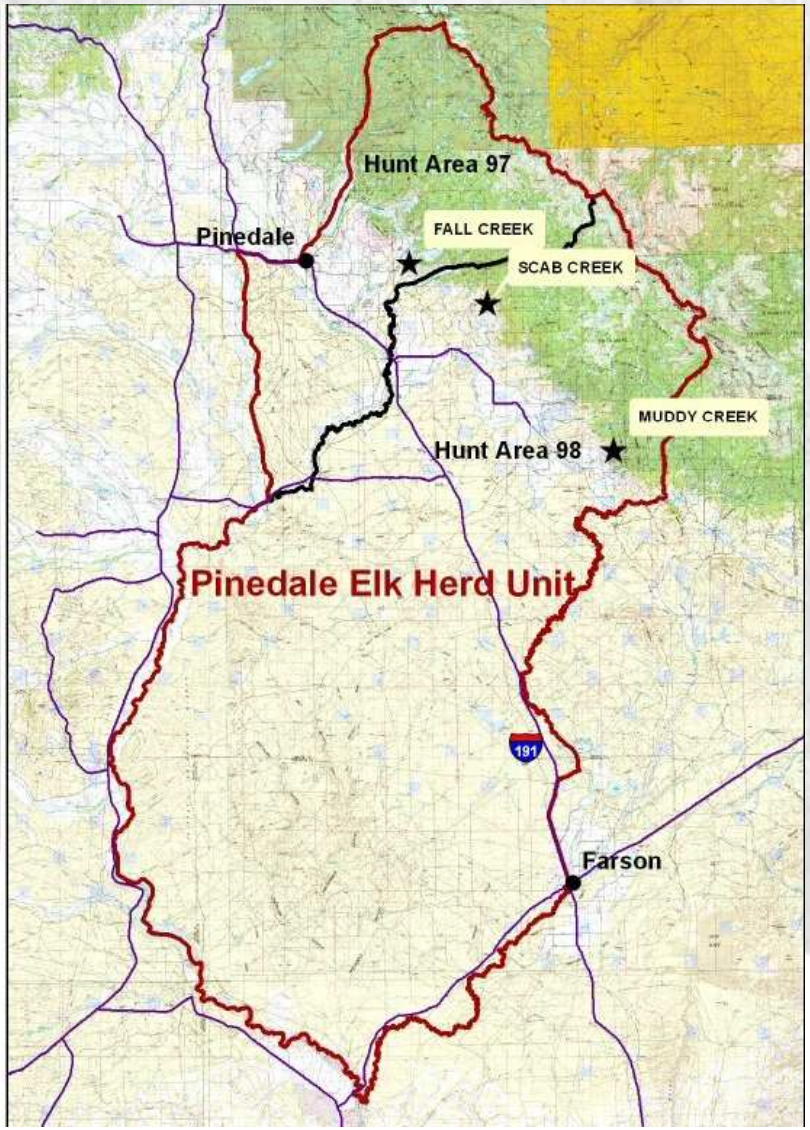

Legend
Birth Locaitons in Active Alltoment
Cattle Expected Use Model
Use
High
Moderate
Low
Incidental

Effect of *Brucella* S19 vaccination on abortion rates in elk: a field trial, 2008-2011

- **Dell Creek**; *n*=40
  - 24/40 tested + at Lab
  - 33% (8/24) aborted (5 culture +)

- **Grey's River**; *n*=28
  - 17/28 tested + at Lab
  - 6% (1/17) aborted (culture +)

Pilot Test & Slaughter Project 2006-2010



Test and Slaughter Summary

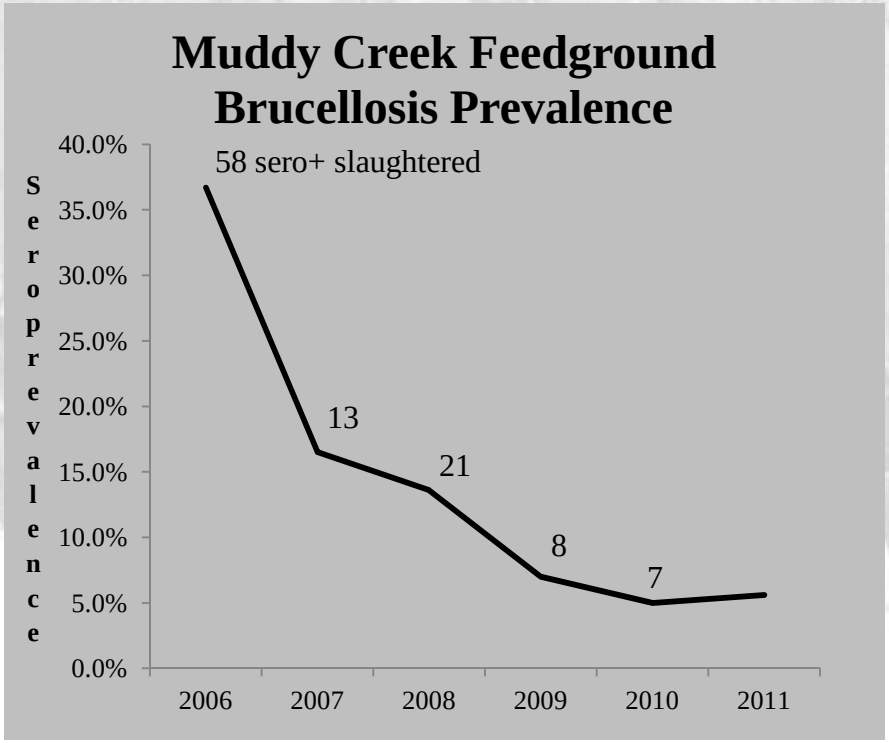
Feedground	Total Captured	Cows Bled	Sero+ Killed
Muddy Creek	1191	646	107
Scab Creek	509	290	58
Fall Creek	526	347	32
TOTAL	**2226**	**1283**	**197**

TOTAL SPENT: $1,302,401

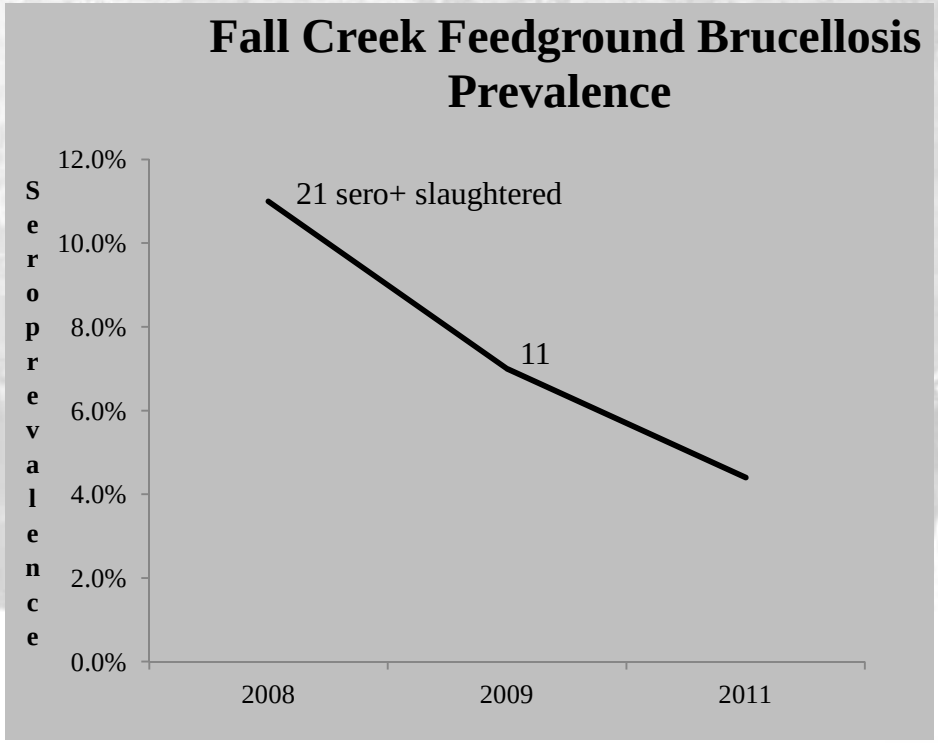
Test and Slaughter

Post-slaughter brucellosis prevalence surveillance

2011: 5.6% (4/72)



2011: 4.4% (3/69)



Brucellosis Management Action Plans

- Top recommendation of the WY Governor's Brucellosis Coordination Team
- Completed plans for all 7 elk herds with feedgrounds during 2006-2007; Cody ehu currently being drafted
- BCT recommended to review/update every 5 years; Updated feedground herds April, 2011

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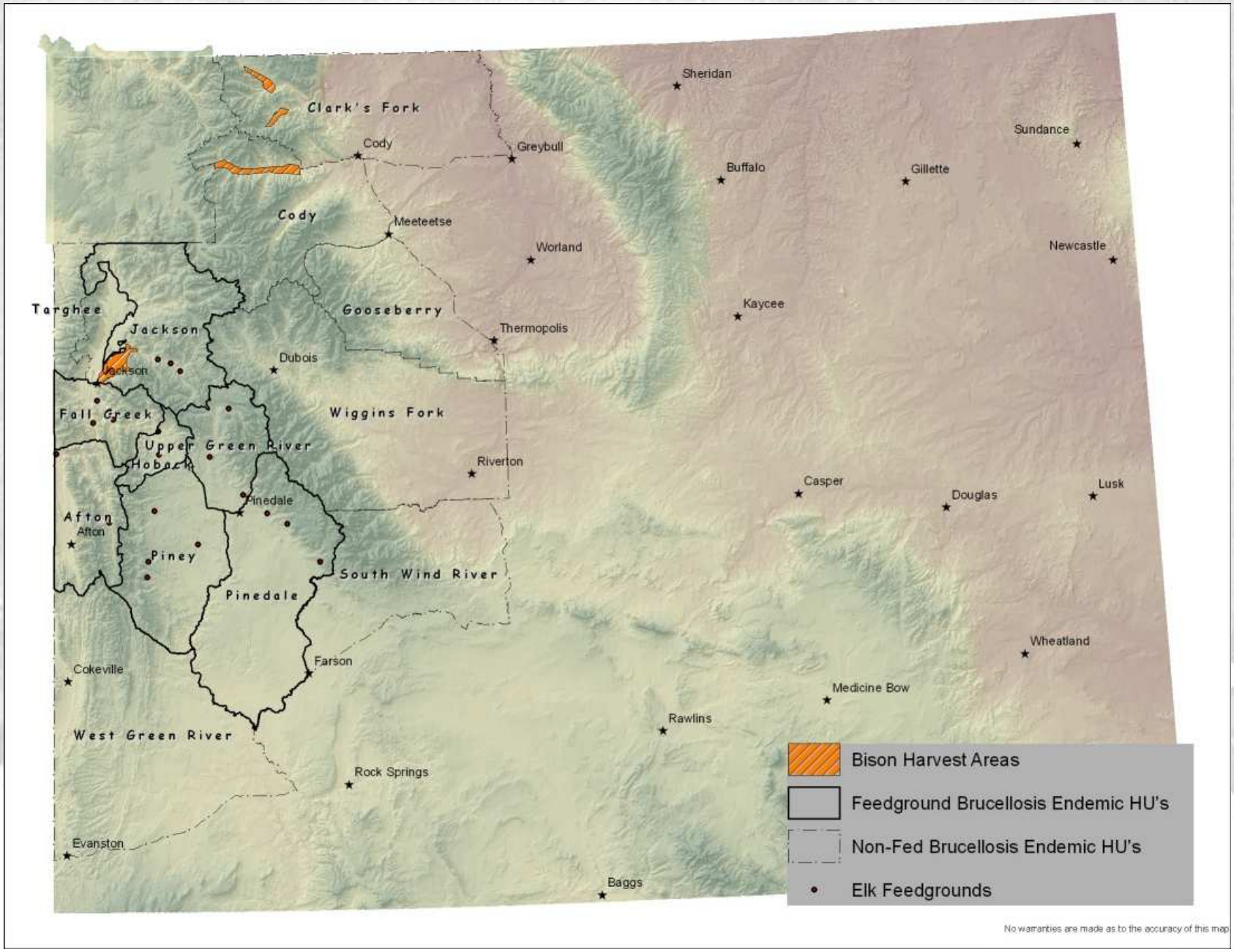
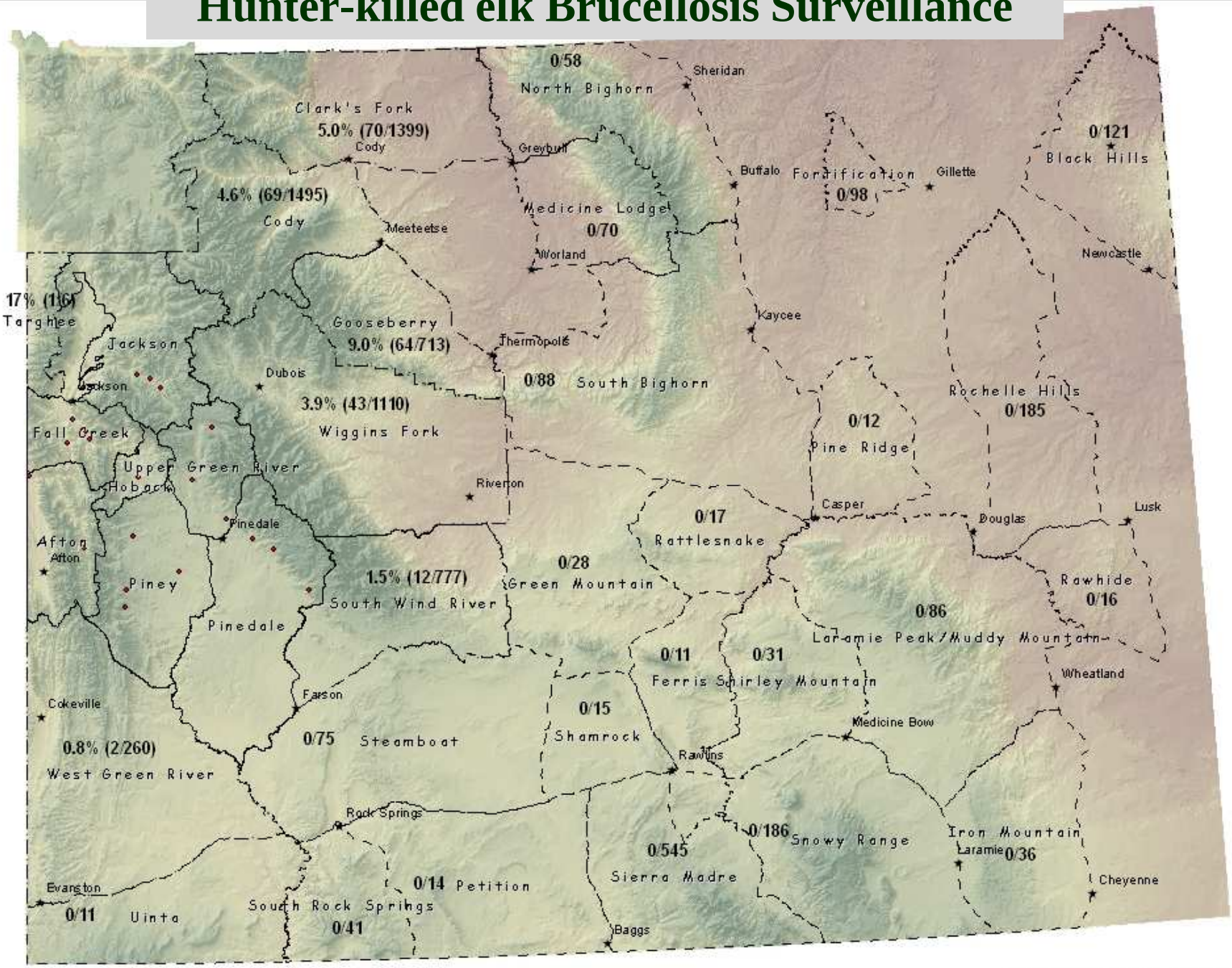
Distribution of Brucellosis in WY



Hunter-killed elk Brucellosis Surveillance



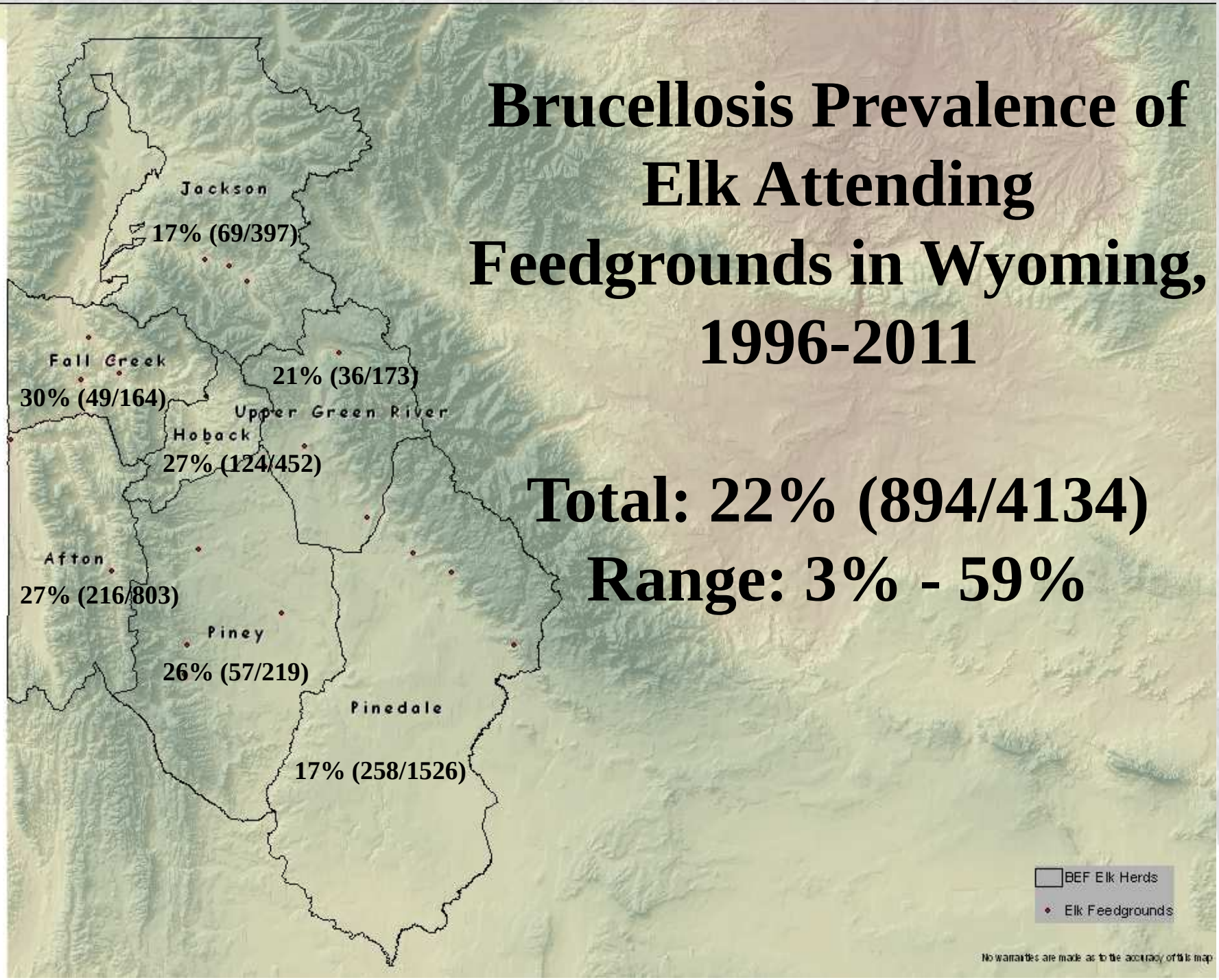
Wyoming Game and Fish Dept. Data, December 2010
No warranties are made as to the accuracy of this map

Brucellosis Surveillance in WY

- **Feedground Elk Surveillance**
  - **only sample yearling and adult females**
  - **corral traps and chemical immobilization**
  - **if capturing for brucellosis surveillance, continue until *n* met for 95% confidence/10% error using equation:**

$$n = \frac{N * \hat{p}(1-\hat{p})}{(N-1) * \frac{e^2}{4} + \hat{p}(1-\hat{p})}$$

Brucellosis Prevalence of Elk Attending Feedgrounds in Wyoming, 1996-2011



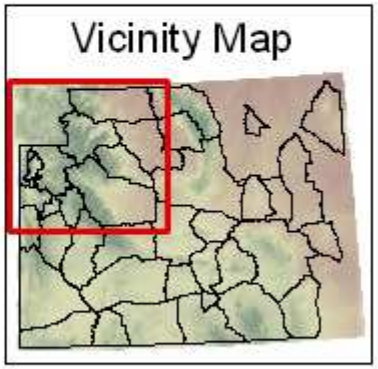
Total: 22% (894/4134)

Range: 3% - 59%

2011 Feedground Elk Captures

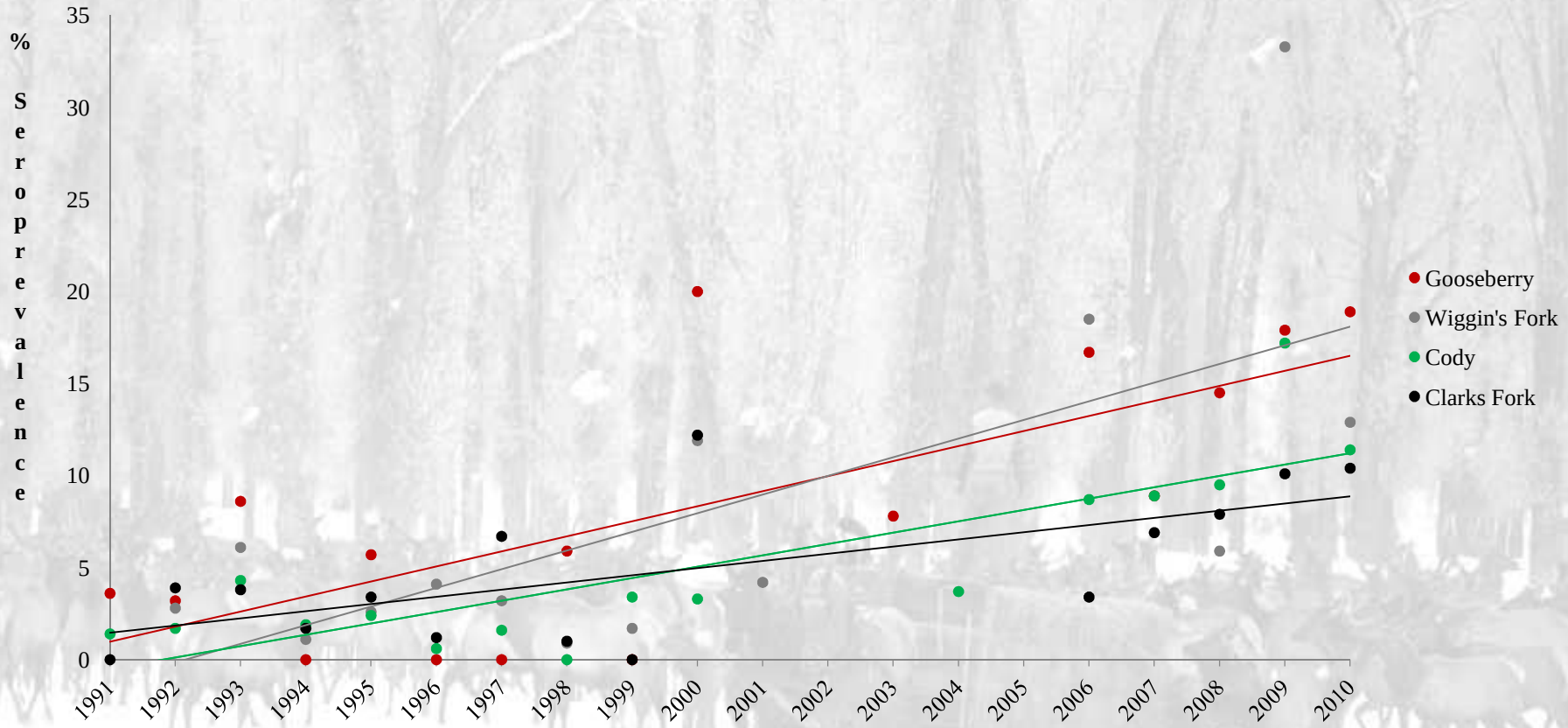
Feedground	Capture Method	Elk Caught	Elk Tagged	Females Bled	Trap Days	Seroprevalence	Equipment Deployed/Comments
Dell	Trap	103	68	46	2	43% (20/46)	15 VHF collars and VITs
Alpine	Trap	174	143	51	1	20% (10/51)	4 GPS and 1 VHF collars, 5 VITs
Fall Cr.	Trap	155	124	69	5	4% (3/69)	Year 1 post T&S; 30 prox, 5 GPS, 5 VITs
Muddy Cr.	Trap	173	143	72	4	6% (4/72)	Year 1 post T&S, 4 GPS and 1 VHF collars, 5 VITs
Jewett	Trap	154	154	35	6	23% (8/35)	2 GPS collars, 2 VITs
South Park	Trap	112	109	42	1	36% (16/45)	Does not include 50 female calves sent to Sybille
Forest Park	Trap	168	167	31	1	19% (6/31)	5 GPS collars, 5 VITs
Patrol Cabin	Chemical	4	4	4	1	0% (0/4)	4 GPS collars, 4 VITs
Horse Cr.	Chemical	4	4	4	1	75% (3/4)	4 GPS collars, 4 VITs
Franz	Chemical	4	2	4	1	100% (4/4)	2 GPS and 2 VHF collars, 2 VITs
McNeel	Chemical	7	7	7	2	71% (5/7)	6 GPS and 1 VHF collars, 7 VITs
Soda Lake	Chemical	23	1	23	5	27% (6/22)	2 GPS and 5 VHF collars, 7 VITs; 19 prox removed
Upper GRL's	Chemical	5	3	5	1	0% (0/5)	4 GPS collars, 5 VITs
NER	Chemical	12	12	12	3	42% (5/12)	GPS collars- Eric Cole
Totals	14	**1098**	**941**	**405**	**34**		**42 GPS, 25 VHF and 30 Prox collars, 66 VITs**

Brucellosis Seroprevalence of Hunter-Killed Elk in the Brucellosis Endemic Area of Northwest Wyoming, 2010



Wyoming Game and Fish Department Data
March 2011

Brucellosis seroprevalence trend of hunter-killed elk sampled from the brucellosis endemic, winter free ranging area of NW Wyoming



Questions?