

National Park Service
U.S. Department of the Interior
Natural Resource Stewardship & Science



100 Years of Elk Management & Research in Rocky Mountain National Park

Ryan Monello
Wildlife Health Branch
National Park Service
Fort Collins, CO

EXPERIENCE YOUR AMERICA



Elk -or- wapiti -or- *Cervus elaphus*

History is critical



History of elk in RMNP



- Prehistoric game drives in park
- First permanent settlers in 1860
- Elk were gone by 1880, wolves and grizzlies by 1900
- Low elevation meadows were grazed and developed

History of elk in RMNP

1900

1930

Present

- 28 elk were reintroduced in 1913-14 and intensively protected
- Public support was considered critical to the agency's survival
- By 1930 there were ~350 elk



NPS Historic Photograph Collection

History of elk in RMNP

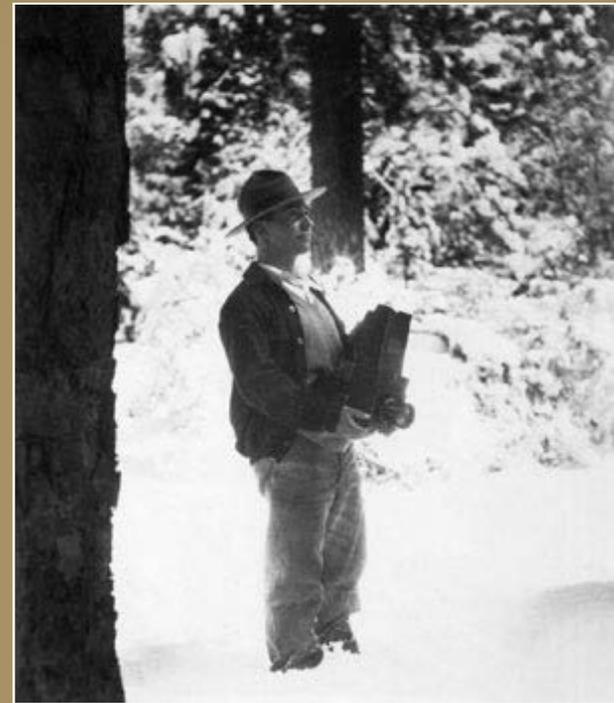
1900

1930

1940

Present

- NPS scientists expressed concerns as early as 1932
- Initially focused on acquiring more winter range
- By 1940 in RMNP:
 - ~1,100 elk
 - ~1,400 mule deer
 - reductions recommended



George Wright 1904-1936

History of elk in RMNP

1900

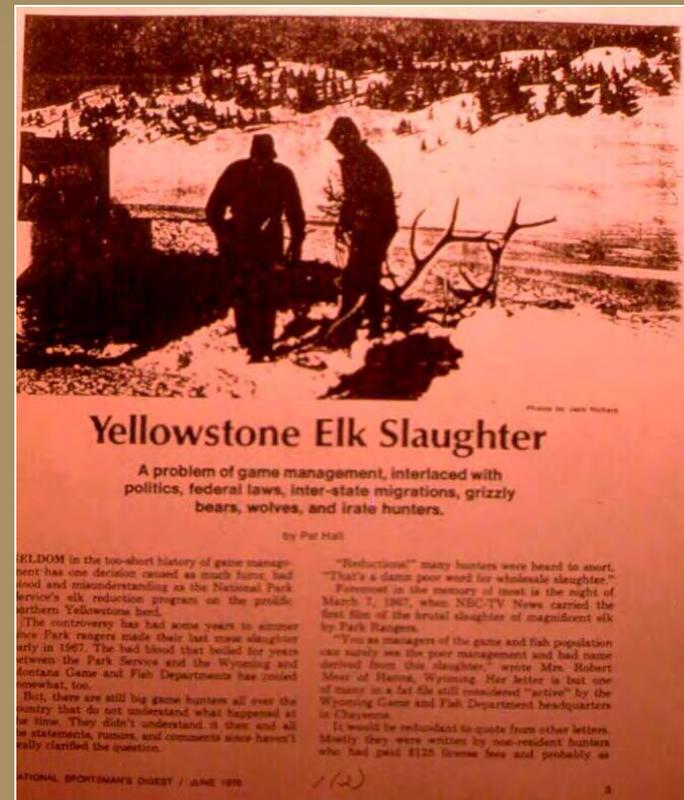
1930

1940

1970

Present

- RMNP controlled deer and elk (to ~400-800 of each)
- Goal was to control with hunting outside RMNP
- The rise of 'natural regulation' in Yellowstone influenced management



History of elk in RMNP

1900

1930

1940

1970

2007



- Natural regulation, public scrutiny, and science
- NPS units generally had a 'hands-off' and monitor approach
- In 1995, RMNP initiated research to inform an elk and vegetation plan



WHY?











NPS Policies



“The NPS will preserve the natural resources, processes, systems, and values . . . in an unimpaired condition, to perpetuate their inherent integrity and to provide present and future generations with the opportunity to enjoy them.”

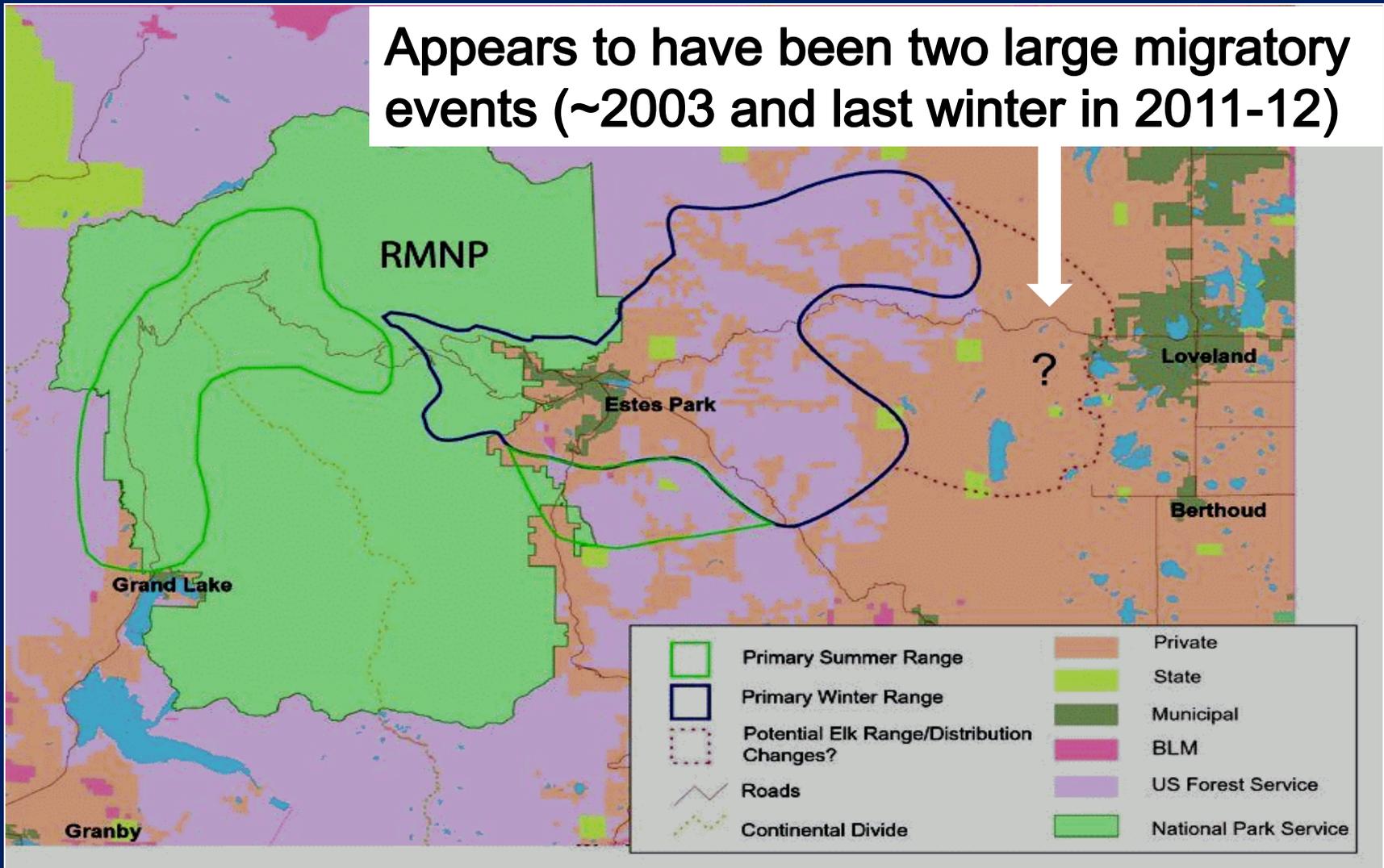
Elk and vegetation research

- Prior monitoring work
- Focused research began 1995
- Final plan in 2007
- Elk surveys ongoing; vegetation monitoring initiated in 2008
- Research continues on specific topics (disease, fertility control)

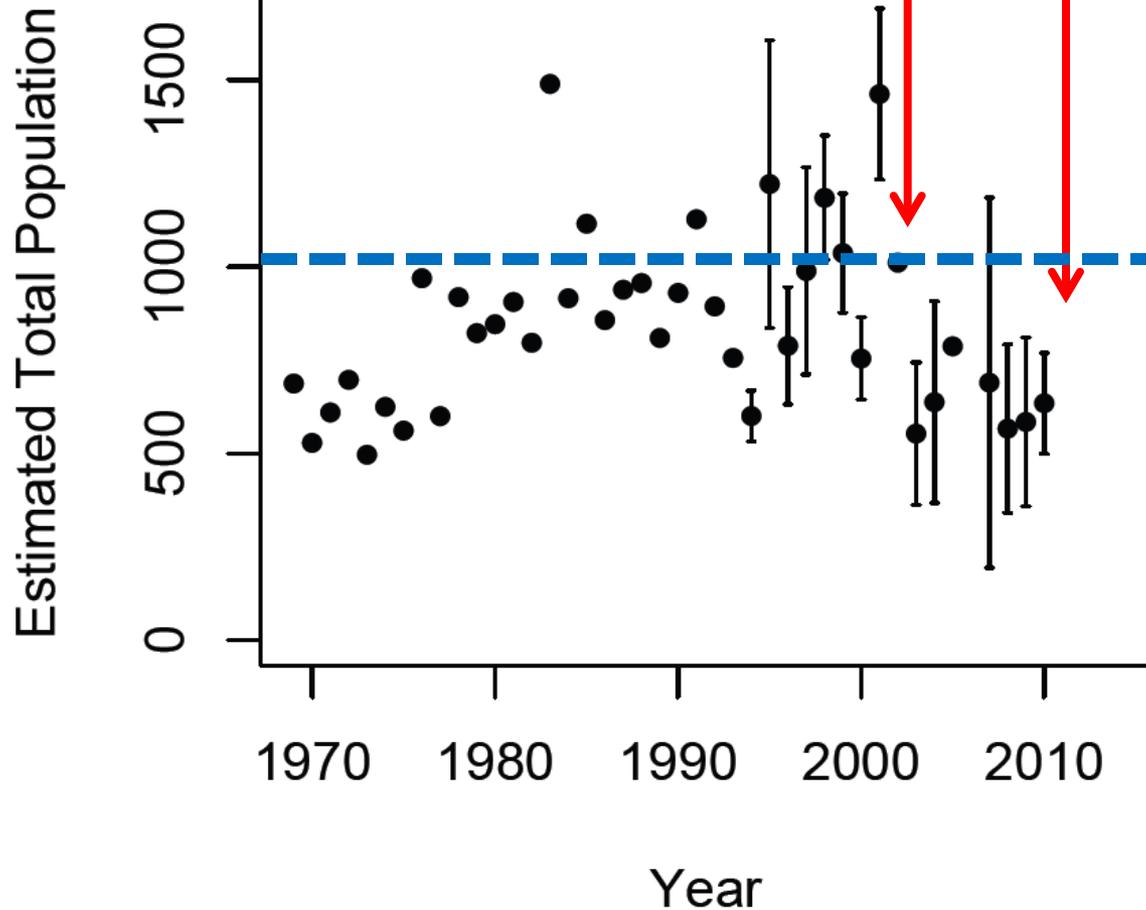


What was found and how was it used?

Appears to have been two large migratory events (~2003 and last winter in 2011-12)



Elk population in RMNP during winter



- 250-400 observed in park last winter
- Plan: 600-800 elk in park (*basis...*)
- Reductions took place from 2008-2010, but not last winter (too few)

But what about those 'town elk'?



- Elk appeared in town in late 1970s
- Town population peaked ~2,400
- Recent declines attributed to the two out-migration events, larger harvests
- Only 200-400 during last winter

Elk population summary

- Elk population in park stabilized at ~1,000
 - Until last winter, the park population had been ~600
 - The park's goal is 600-800 in RMNP during winter
-
- Elk population in town peaked at ~2,400 in 2003
 - Appear to be far fewer elk recently
-
- Fewer elk in both areas during winter is due to migration, increased harvest, and management actions
 - Future population size will be affected by a variety of factors

Vegetation

~ 1900



1997

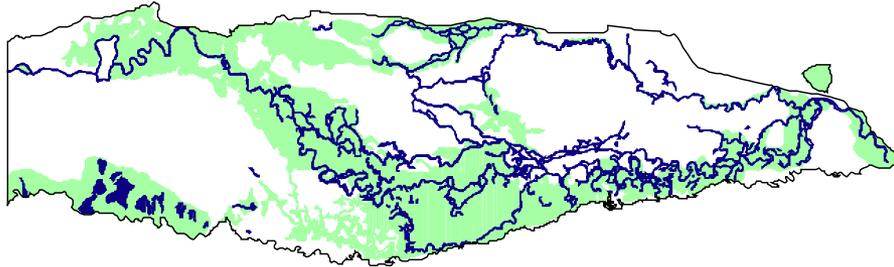


Photo by Todd Jirsa

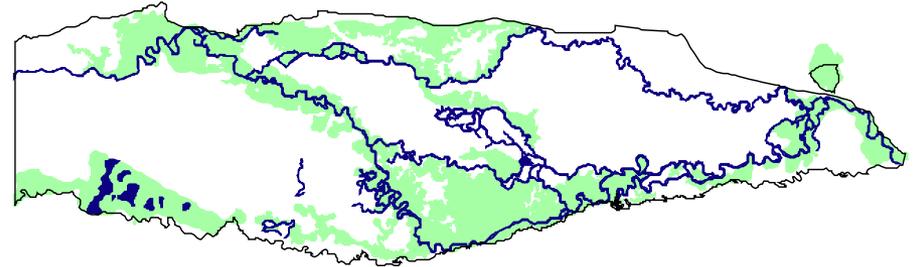
- Land use changes
- Elk numbers
- Wolves and grizzly bears

Willow

Moraine Park 1937



Moraine Park 1996



 Riparian Shrubs

 Water

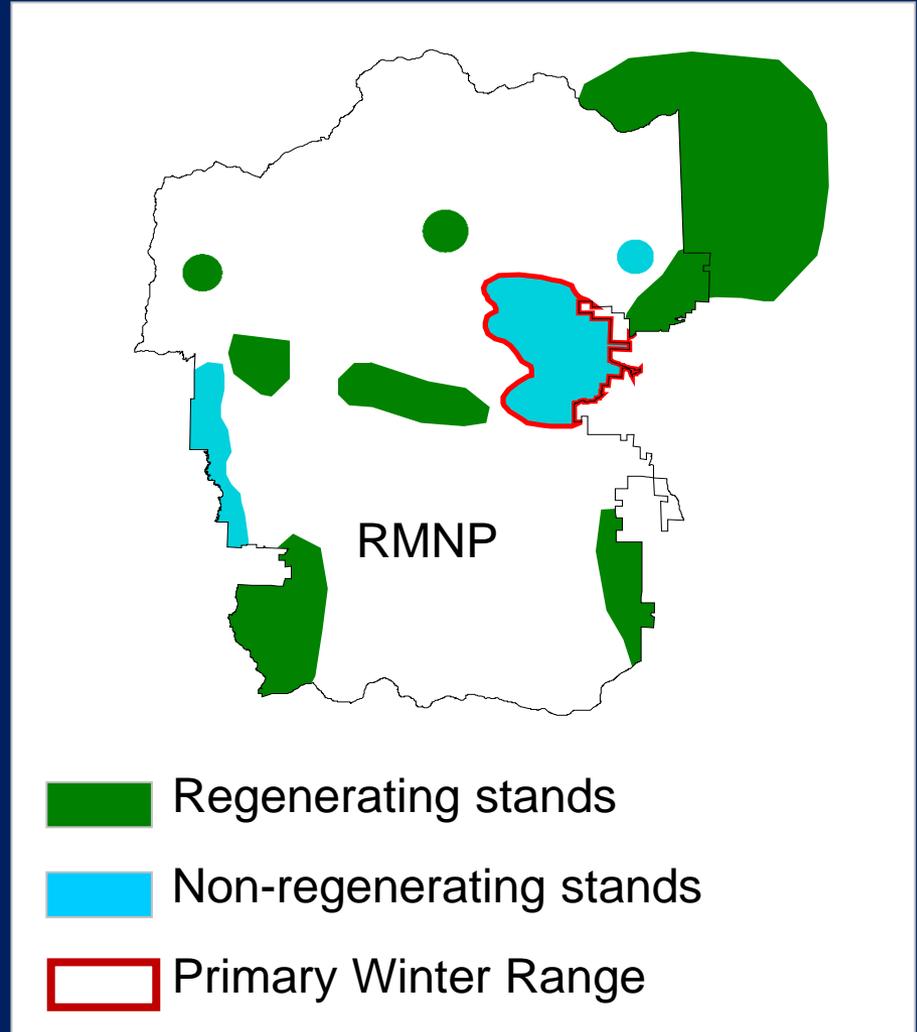
1 km

2 km

↑ N



Aspen



Vegetation Management

Fencing

- Temporary fencing will allow restoration while providing target elk population size
- EVMP identified need for **up to 600 acres** fenced

Vegetation Restoration Methods





1995 Research Exclosure

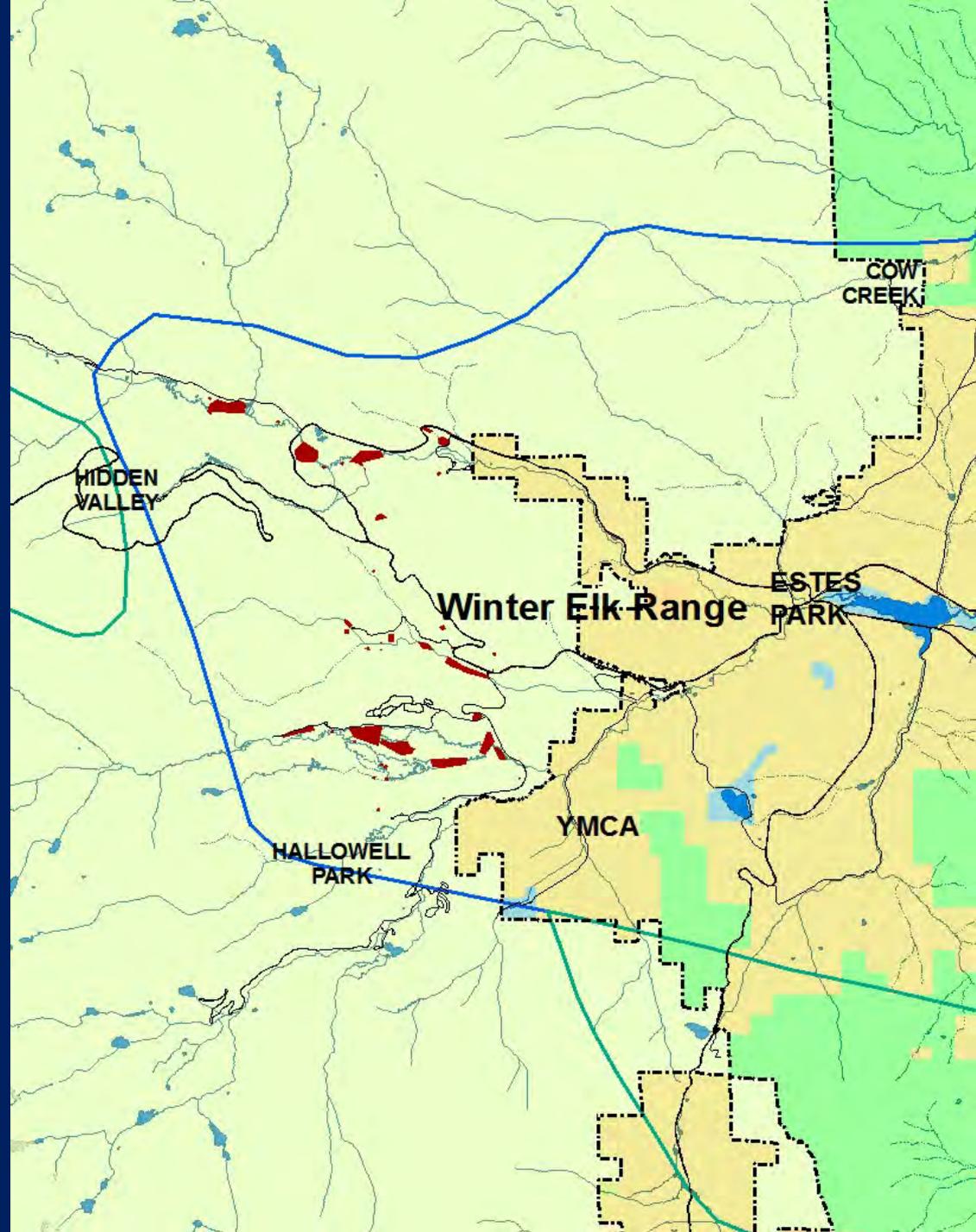


11/10/2009

Fencing (2008-2011)

Total ~ 206 acres fenced

- ~190 acres on winter range; open habitat types on winter range = 3400 acres (~5% fenced)
- 16 acres fenced in Kawuneeche Valley
- 2012 ~ 20 acres planned in Upper Beaver Meadows



Selection of Locations and Sizes

- Input from recognized experts on aspen & willow to target ecologically effective sizes and locations of fences
- Beaver family requires >10 acres of tall willow
- Areas most needing restoration coincide with high visitor use areas



Early Results



Aspen after 2 growing seasons



Willow after 3 growing seasons

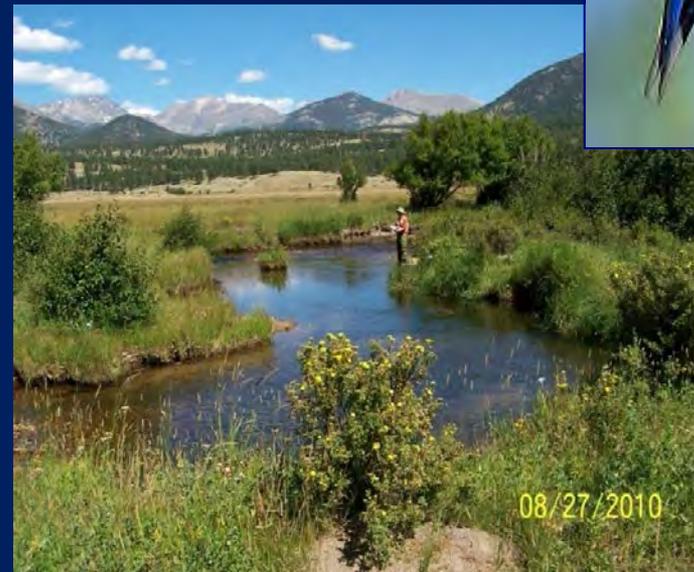
Vegetation Monitoring

- Monitoring plan for aspen, willow and upland habitats
- 212 permanent plots
- Annual measurements
- In depth review every 5 yrs



Public Expectations and Perceptions

- Education/Involvement
- Trade-Offs:
 - intensive management vs. positive results
- Appreciation for:
 - Ecosystem balance
 - Habitat improvement supporting biodiversity
 - Improved recreational opportunities



Work in Progress

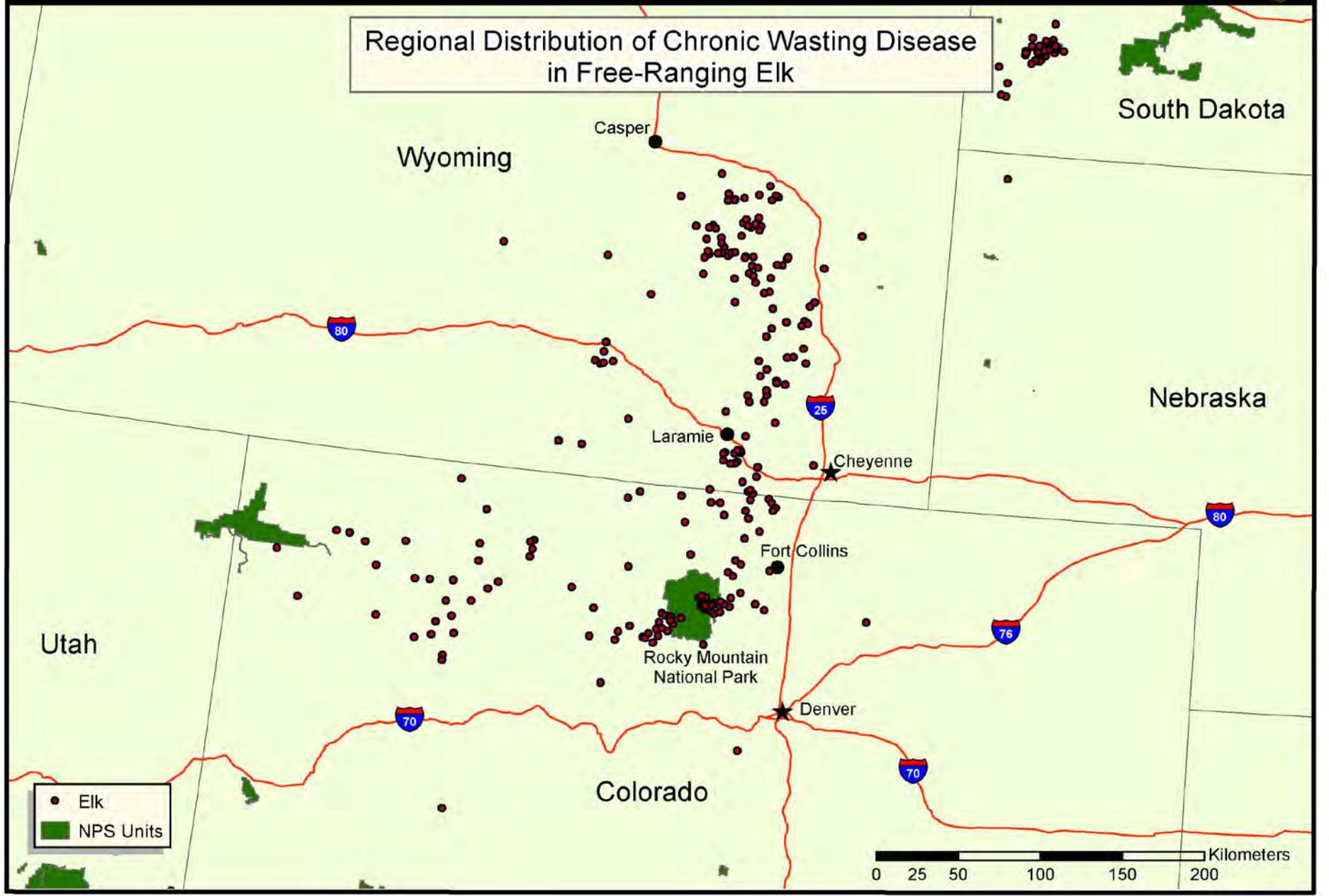
- Uncertainties
 - Significant ecosystem changes
 - How will ~~resources/system~~ respond to management?
 - Role of Chronic Wasting Disease
- Persistence
- Adaptability







Regional Distribution of Chronic Wasting Disease
in Free-Ranging Elk

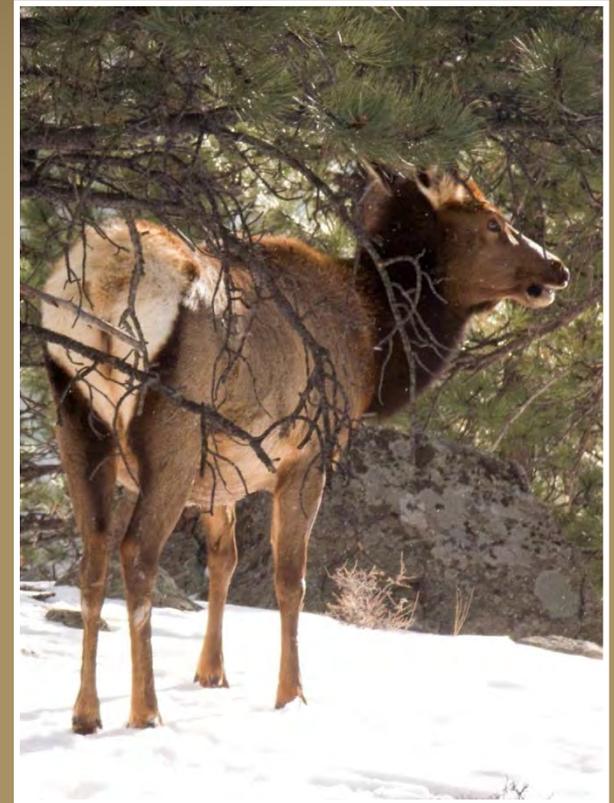


- Elk
- NPS Units

0 25 50 100 150 200 Kilometers

CWD objectives 2008-2011

- Efficacy of live-test (rectal biopsies)
- Prevalence (% infected)
- Mortality & annual survival
- Effects on population growth



Methods

- Sampled & collared 136 adult female elk
- Removed infected elk
- Monitored remaining elk
- Resampled, euthanized 20-34 elk per year



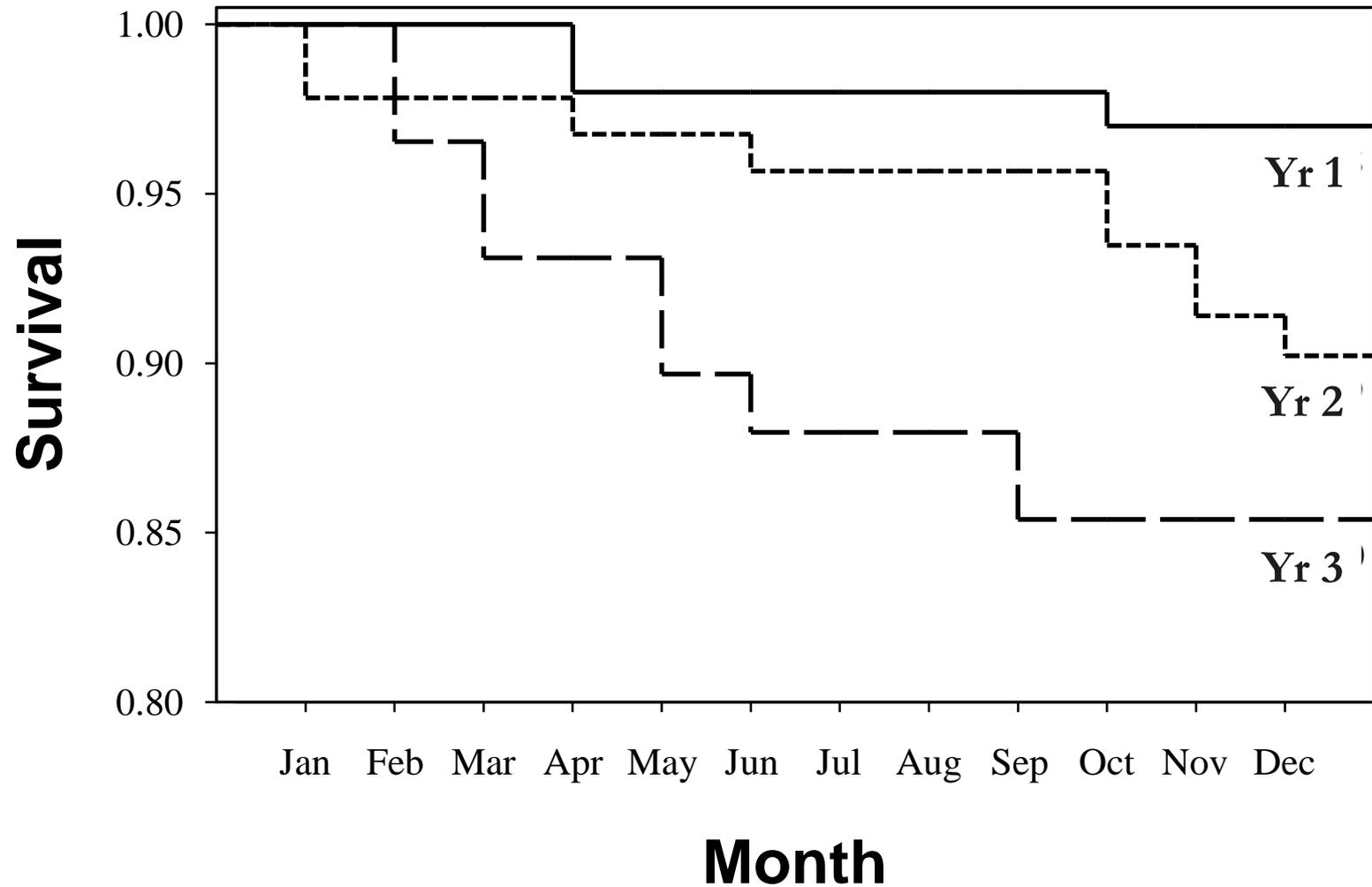
Efficacy of rectal biopsies

- Missed earliest cases (~20% in elk from RMNP)
- 13% of female elk infected





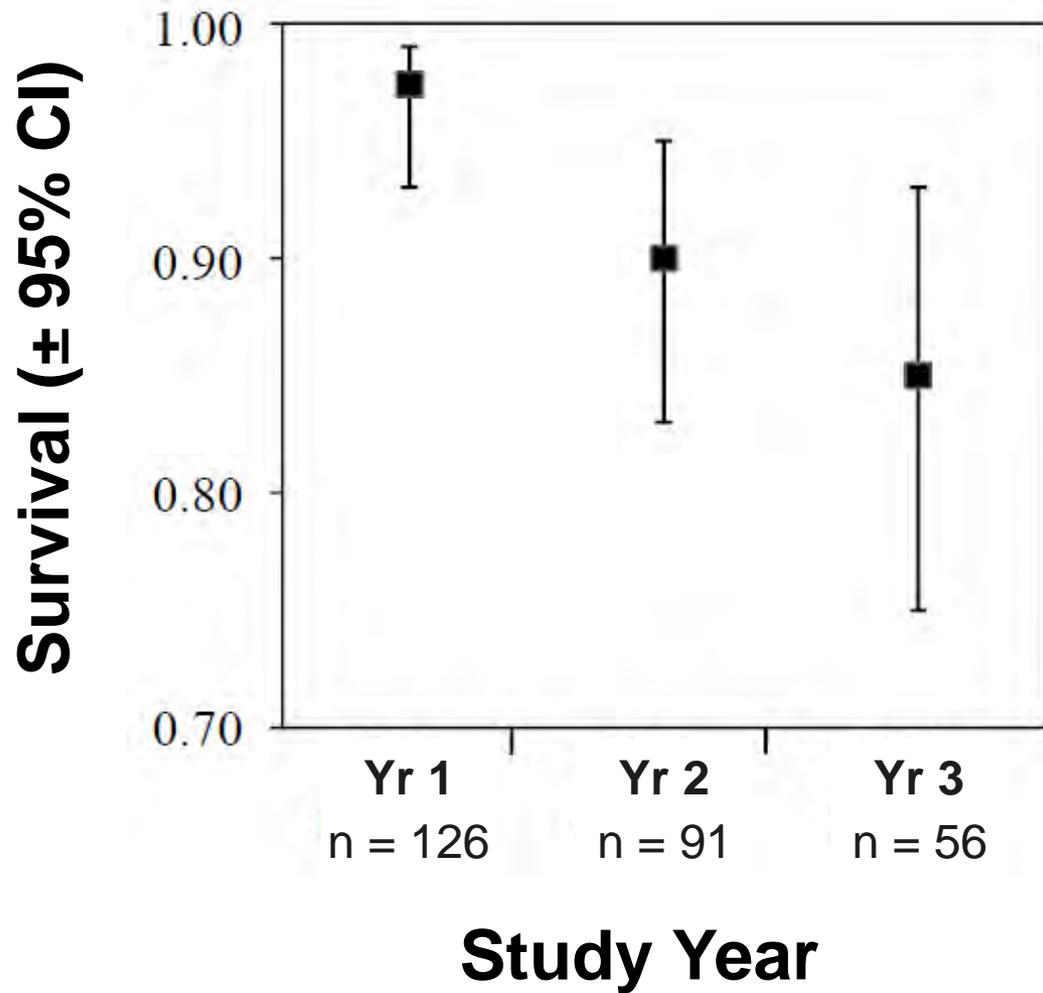
Survival of test-negative elk, 1-3 yrs post sampling



Harvested & euthanized elk were censored

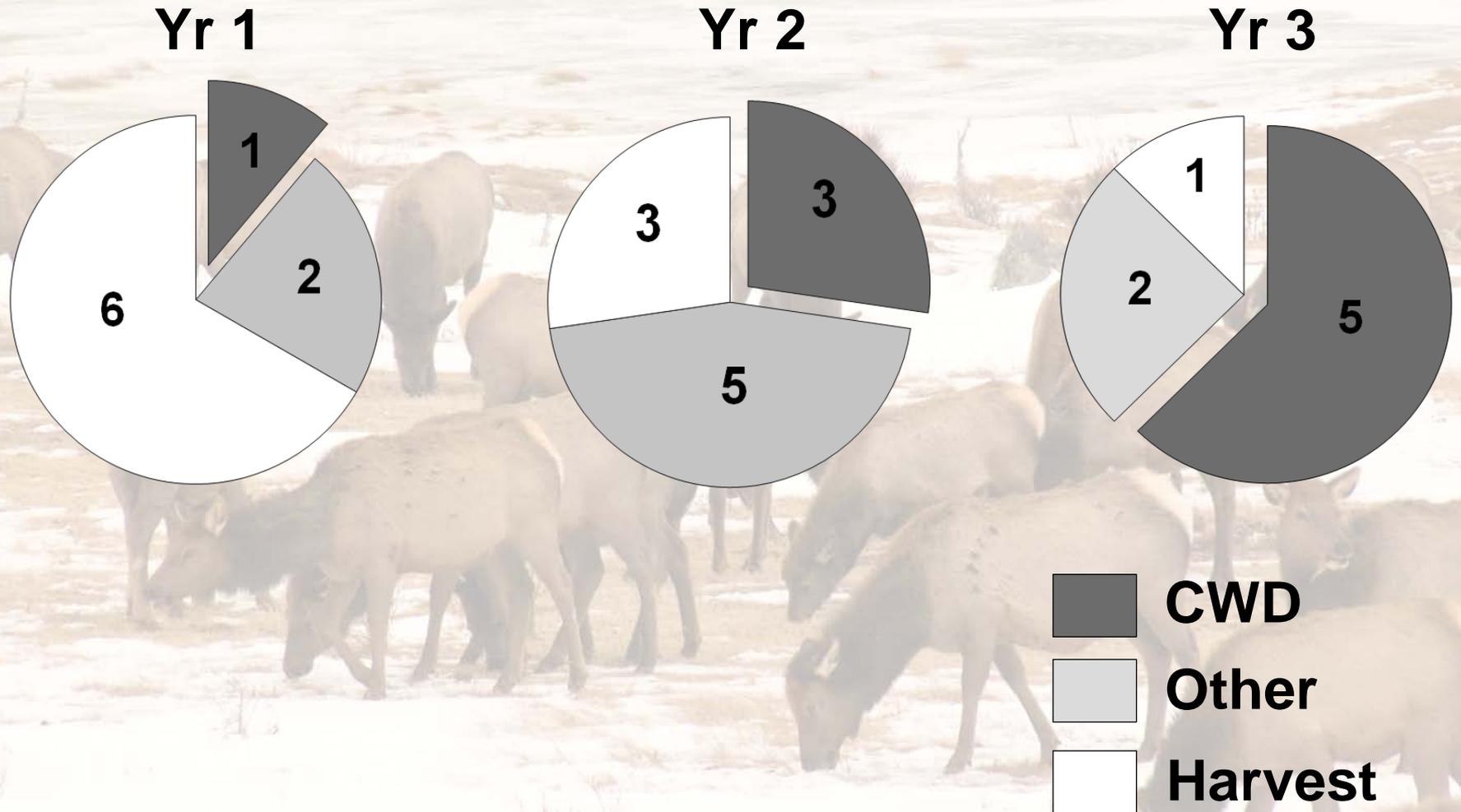


Survival of test-negative elk, 1-3 yrs post sampling



Harvested & euthanized elk were censored

Sources of mortality for test-negative elk, 1-3 yrs post sampling



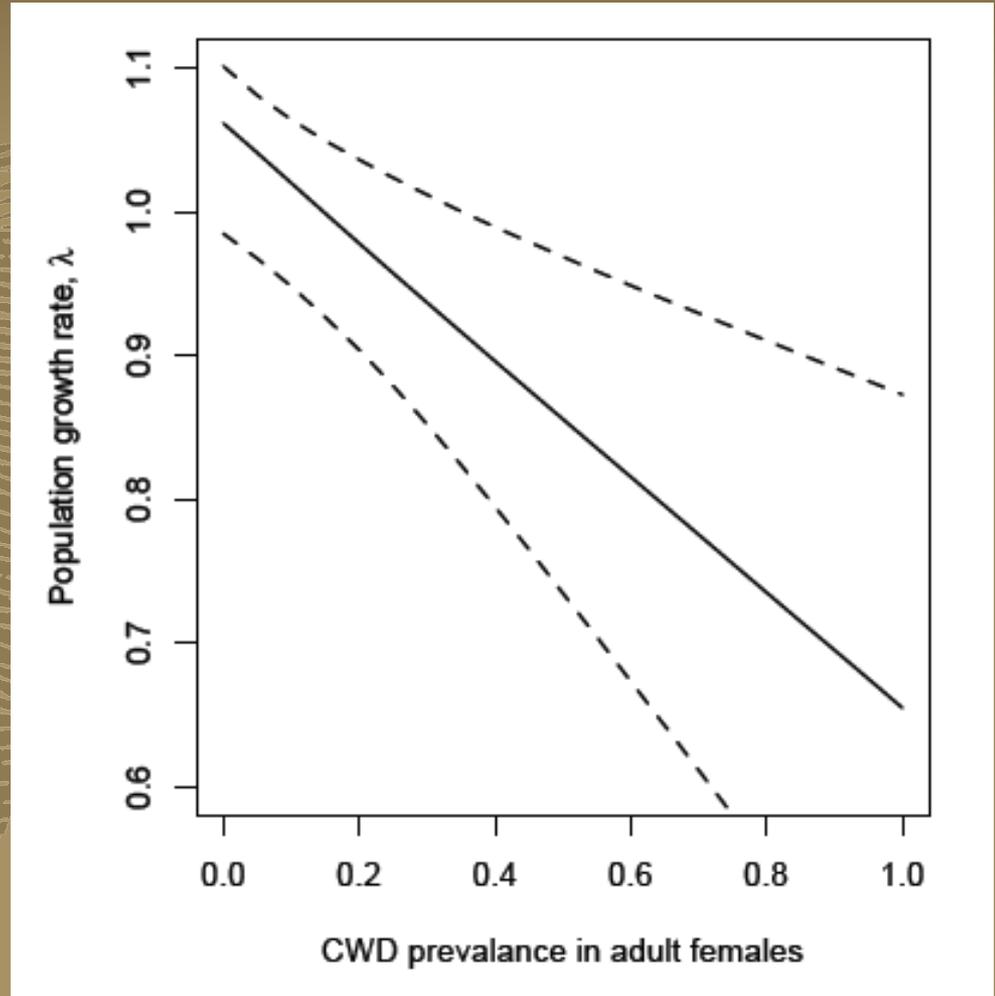
• **Carcass collections,
2001-2009 (no collars):**
16% (4/25) of males had
CWD
45% (24/53) of females
had CWD



Bruce Gill

Survival & Population growth

- CWD will cause declines when 5-35% of elk are infected (in absence of hunting)





Implications for elk

- Rectal biopsies can provide a useful research & monitoring tool (but misdiagnose earliest cases)
- Prevalence can reach >10% in elk herds with a long history of exposure
- CWD can negatively impact cow survival
- CWD is predicted to cause population declines in this herd when prevalence reaches 5-35%

Acknowledgements

- **National Park Service**
 - **Rocky Mountain National Park, Wildlife Health Branch**
- **Partners**
 - **Colorado Parks and Wildlife**
 - **Colorado State University (College of Veterinary Medicine, Natural Resource Ecology Lab, Graduate Degree Program in Ecology)**
 - **U.S. Geological Survey (Biological Resource Division)**
 - **USDA (Forest Service and Wildlife Services)**
 - **Many dedicated volunteers**

