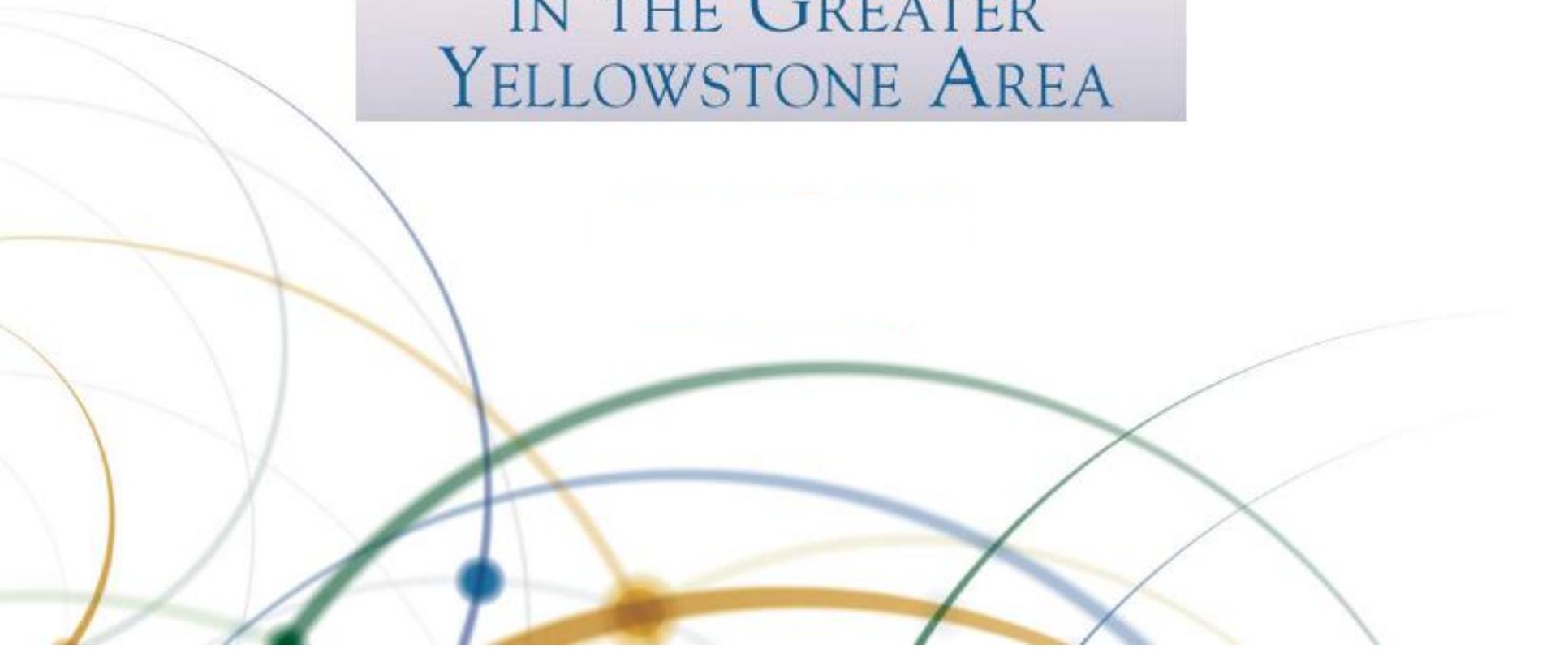


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BOARD ON AGRICULTURE AND NATURAL RESOURCES



REVISITING
BRUCELLOSIS
IN THE GREATER
YELLOWSTONE AREA

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What was the committee asked to do?

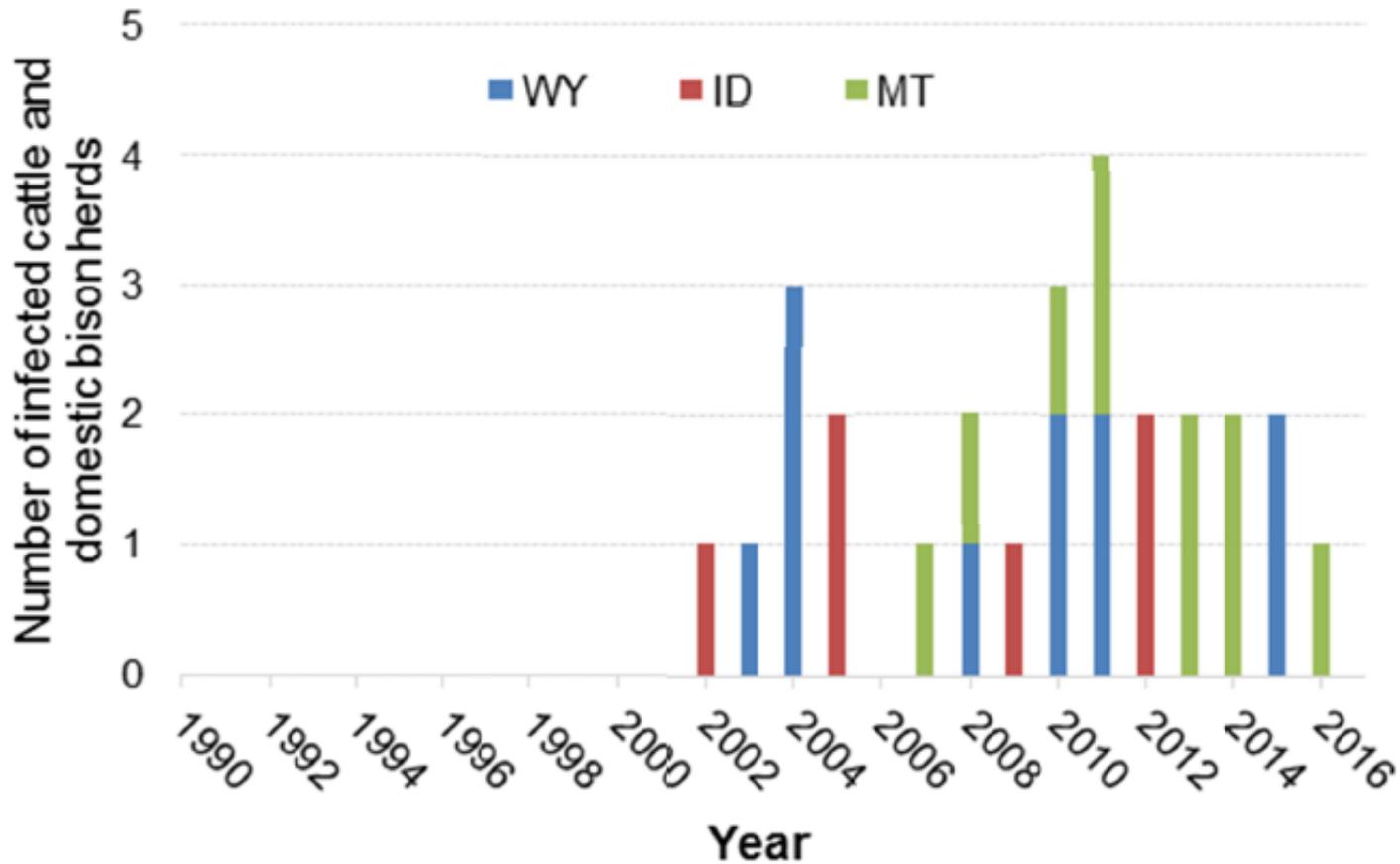
Statement of Task (see Box 1-1, page 16)

Conduct a comprehensive scientific literature review on the prevalence and spread of *B. abortus* in the GYA and evaluate feasibility, time-frame, and cost-effectiveness of options to contain or suppress brucellosis

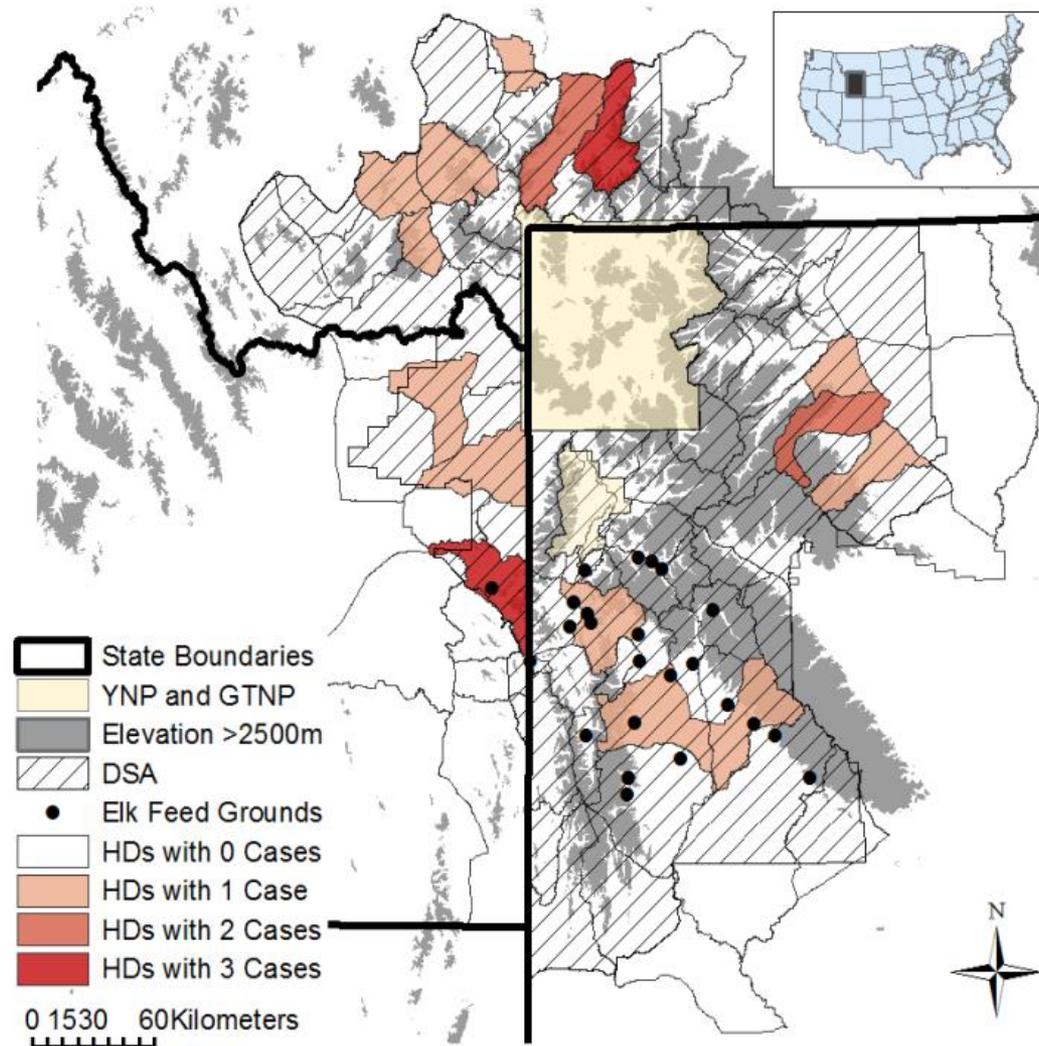
Specifically examining:

- factors associated with increased occurrence of transmission (role of feedgrounds, predators, population size, etc.)
- disease management activities and vaccination strategies
- current state of science on vaccines and diagnostics for cattle, bison, elk
- further research needed to reduce uncertainties and advance knowledge base

What's new since 1998?



Livestock cases 2002-2015



Cattle shipments from affected herds

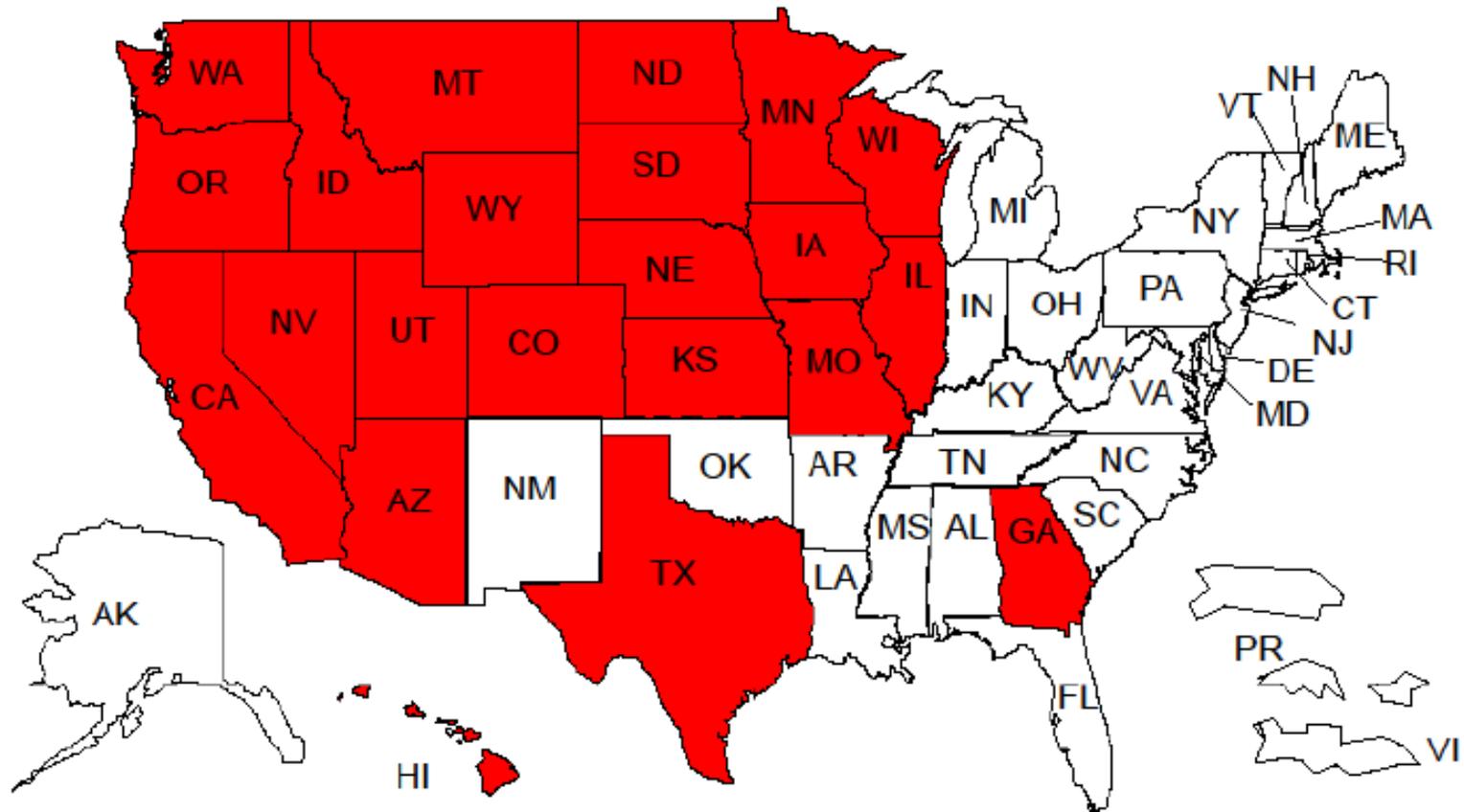
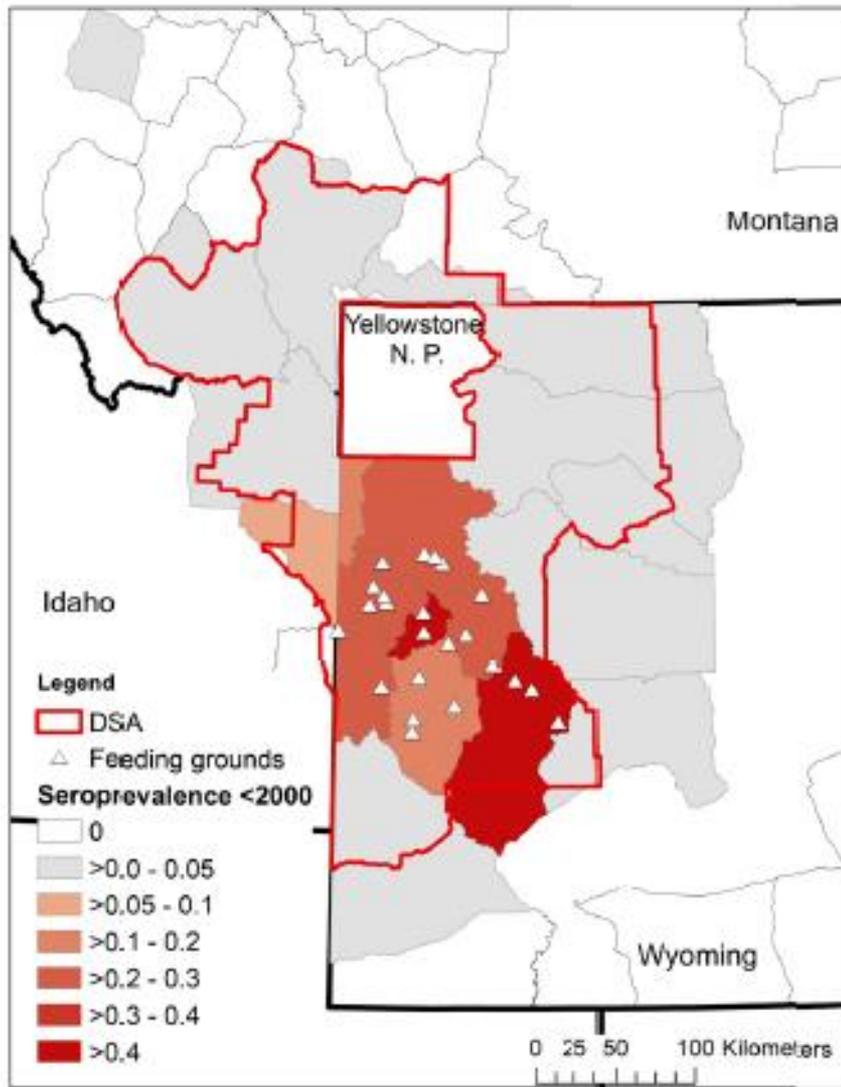


FIGURE 3-2 States to which animals leaving Brucellosis-affected herds in the GYA were traced, 2002-2016.

Prior to 2000



2010 - 2015

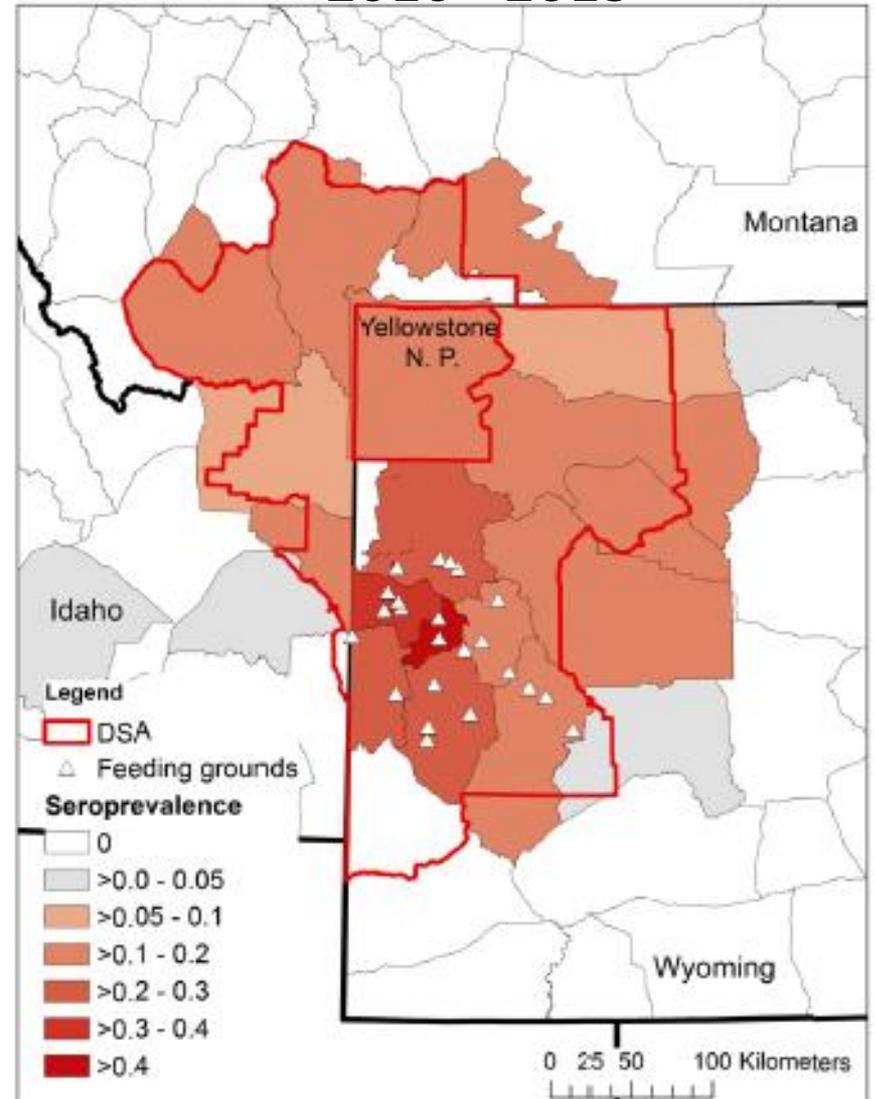


FIGURE 3-3 Maps of seroprevalence in elk using data prior to 2000 (left) and from 2010 to 2015 (right). The designated surveillance area is represented by the red line while the polygons show elk management units. **SOURCE:** Data provided by the state and federal wildlife agencies of Idaho, Montana, and Wyoming.

Conclusion 1: With elk now viewed as the primary source for new cases of brucellosis in cattle and domestic bison, the committee concludes that brucellosis control efforts in the GYA will need to sharply focus on approaches that reduce transmission from elk to cattle and domestic bison.

What's New Since 1998?

Recommendation 1:

To address brucellosis in the GYA, federal and state agencies should prioritize efforts on preventing *B. abortus* transmission by elk.

- Modeling should be used to *characterize and quantify the risk* of disease transmission and spread from and among elk.
- Requires an understanding of:
 - the *spatial and temporal processes* involved in the epidemiology of the disease and,
 - *economic impacts* across the GYA.
- Models should include modern, statistically rigorous estimates of uncertainty.

Bison

“the threat of transmission from bison to elk remains and could represent a long-term problem if elk were cleared of the disease. The committee identified the highest priority to be a focus on controlling *B. abortus* transmission from elk to cattle and domestic bison. Further reducing the prevalence of brucellosis in bison may be desirable in the future if efforts are successful in reducing prevalence in elk.” pg. 172

“control efforts implemented in bison within YNP are unlikely to have any effect on [these] unrelated lineages in elk populations outside of YNP.” pg 52.

Methods

- Removal of infected bison
- Quarantine & relocation
- Targeted removal
- Bison genetics
- Contraception

Adopting an Active Management Approach

Recommendation 2:

- In making timely and data-based decisions for reducing the risk of *B. abortus* transmission from elk, federal and state agencies should use an *active adaptive management approach* that would include *iterative hypothesis testing* and mandated periodic scientific assessments.
- Management actions should include *multiple, complementary strategies* over a long period of time, and should set goals demonstrating incremental progress toward reducing the risk of transmission from and among elk.

Adaptive Management Options to Reduce Risk

Conclusion 2: No single management approach can independently result in reducing risk to a level that will prevent transmission of *B. abortus* among wildlife and domestic species.

- No “silver bullet”
- “...*multiple, complementary strategies* over a long period of time.” (Recommendation 2)

Management Option: Spatial and Temporal Separation

- Spatial and temporal separation is a fundamental disease control method.
- The IBMP has been successful in preventing transmission to cattle, and is based in part on maintaining separation of bison and cattle outside YNP.

Recommendation 4:

Agencies involved in implementing the IBMP should continue to maintain a separation of bison from cattle when bison are outside Yellowstone National Park boundaries.

A Call to Strategic Action (cont'd)

Recommendation 6:

- All federal, state, and tribal agencies with jurisdiction in wildlife management and in cattle and domestic bison disease control should work in a *coordinated, transparent* manner to address brucellosis in multiple areas and across multiple jurisdictions.
- Effectiveness is dependent on *political will, a respected leader* who can guide the process with goals, timelines, measured outcomes, *and a sufficient budget* for quantifiable success. Therefore,
- *Participation of leadership at the highest federal (Secretary) and state (Governor) levels* for initiating and coordinating agency and stakeholder discussions and actions, and in *sharing information* is critical.

A Call to Strategic Action (cont'd)

Critical considerations when developing a mandate for high level coordination:

- Establish goals and objectives on an *ecosystem wide basis*, with performance based measures and *outcome assessment tied to funding decisions*.
- Focus on the *long term* with short term incremental progress
- Acknowledge interrelationships of all elements of ecosystem that require a *regional* solution
 - Shared costs and possible redistribution of funds among agencies and states that have a stake in outcome.
- Risk based, *standardized methods and rules* for DSA (borders, testing protocols, et al.
- Transparent sharing of information across tri-state area is critical.

Thank You

Questions?

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REPORT

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