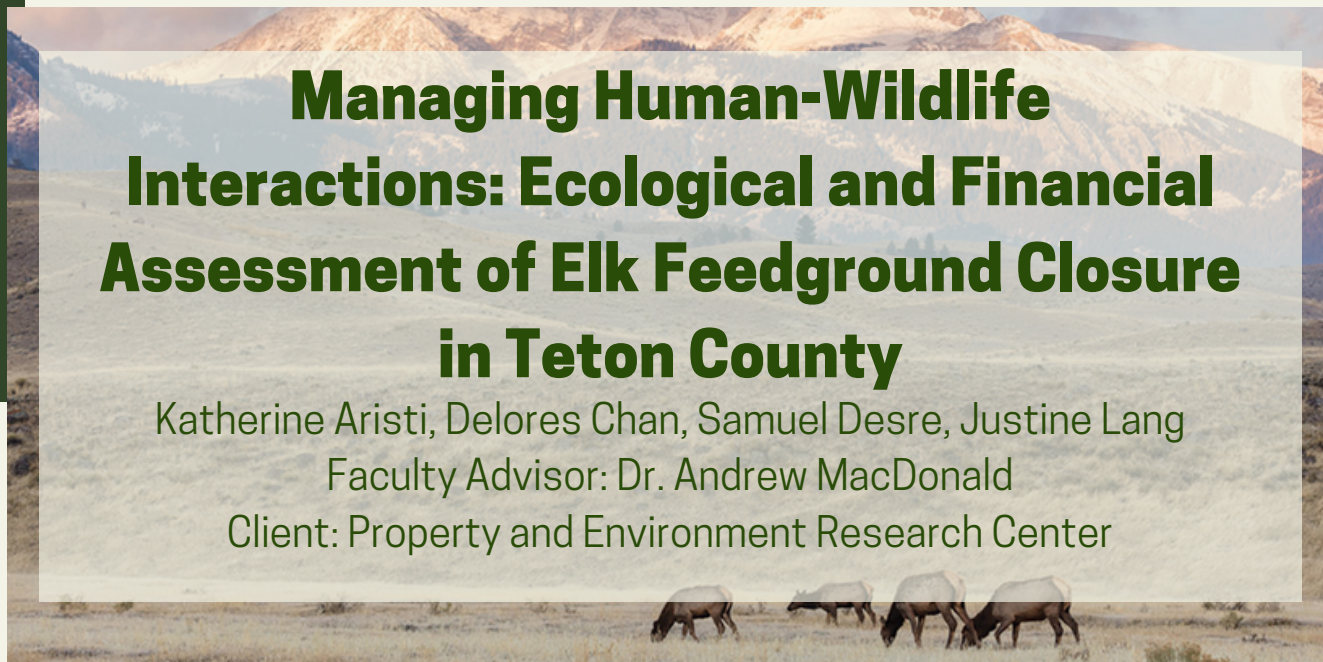


Managing Human-Wildlife Interactions: Ecological and Financial Assessment of Elk Feedground Closure in Teton County

Katherine Aristi, Delores Chan, Samuel Desre, Justine Lang

Faculty Advisor: Dr. Andrew MacDonald

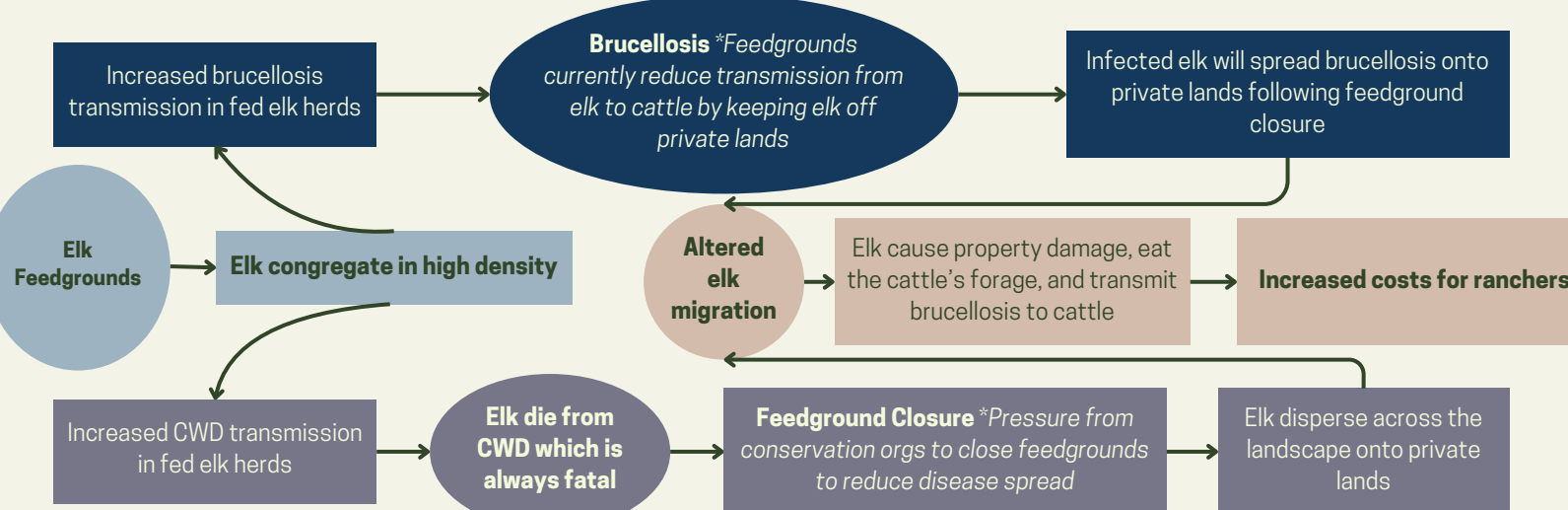
Client: Property and Environment Research Center



Environmental Problem

Elk (*Cervus canadensis*) feedgrounds are one of the earliest wildlife management techniques in the Greater Yellowstone Ecosystem (GYE), dating back to the early 20th century. One of the purposes of feedgrounds is to ensure that elk avoid private lands when they come down to lower elevations to feed. To achieve this, elk are being fed on public lands by wildlife managers over the winter months. This reduces conflicts with local ranching communities as elk are less likely to feed on ranchland haystacks and spread diseases, such as brucellosis, to livestock. At feedgrounds, elk are extremely concentrated, allowing for diseases to spread rapidly through the herds. Conservation groups are worried about the spread of Chronic Wasting Disease (CWD) in particular, which is highly contagious, spreads to all ungulate species, and is always fatal. To slow the spread of CWD, they advocate for the closure of feedgrounds, including the feedground at the National Elk Refuge (NER), which supports the largest elk herd in the GYE, the Jackson herd. A closure would create significant financial burdens on ranching operations in Teton County, as the elk will likely disperse to private lands (Figure 1). If no adequate financial support is provided to address this issue, tension between various stakeholders in the region will be exacerbated, making it more challenging to coexist with wildlife.

Figure 1.



Public Comment Sentiment Analysis

A wide spectrum of opinions on feedground management identified that ranchers were primarily concerned with disease transmission and property damage, and revealed an openness from stakeholder groups to compensate ranchers for the consequences of sharing their land with elk.

Jackson Herd Habitat Connectivity Model

If feeding on the NER were to cease, then it would result in a shift in winter range habitat, increasing the overlap of elk and cattle within low elevation private ranchlands (Figure 2). The change in elk's winter range would create a yearly additional cost of **~\$100,000.00 USD** to the ranching community in Teton County. These costs can be mitigated with the implementation of an elk rent program.

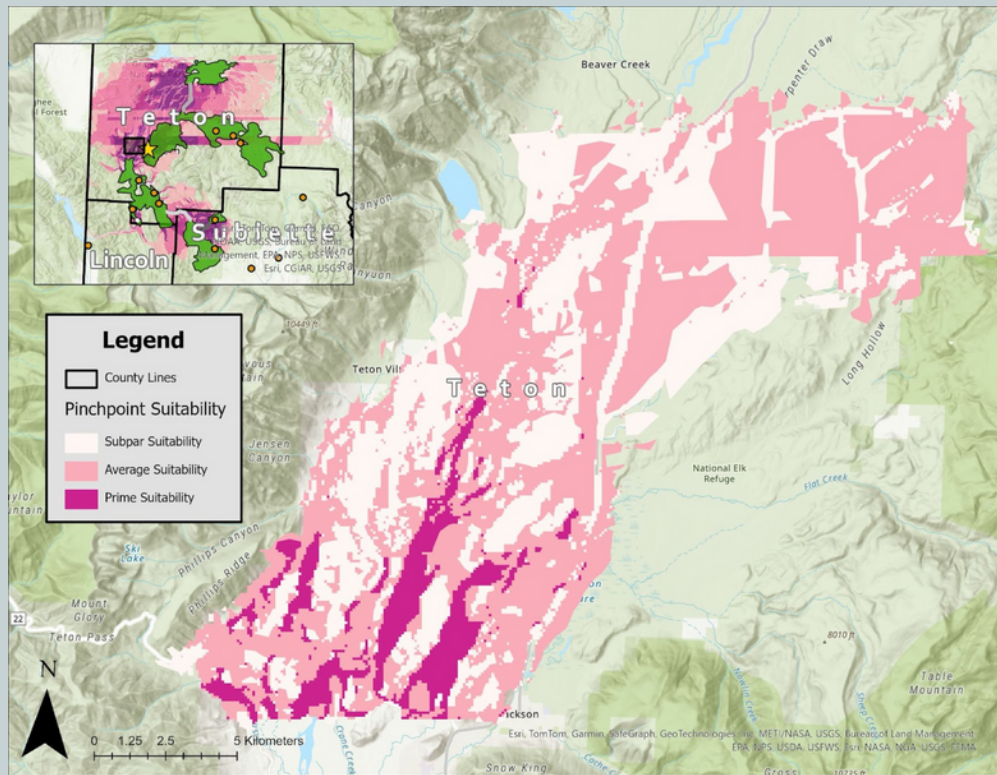


Figure 2. Winter habitat suitability within Teton County based on forage competition classifications and habitat suitability model. According to the results from our Jackson Elk Herd Habitat Connectivity Model, the most suitable winter elk habitat (if the NER were to cease feeding) is located in the southern part of the valley where most of the private lands in Teton County are located, as defined by the dark pink. This could lead to increased costs for the ranching community. Subpar habitat is primarily found where there are buttes and land development.

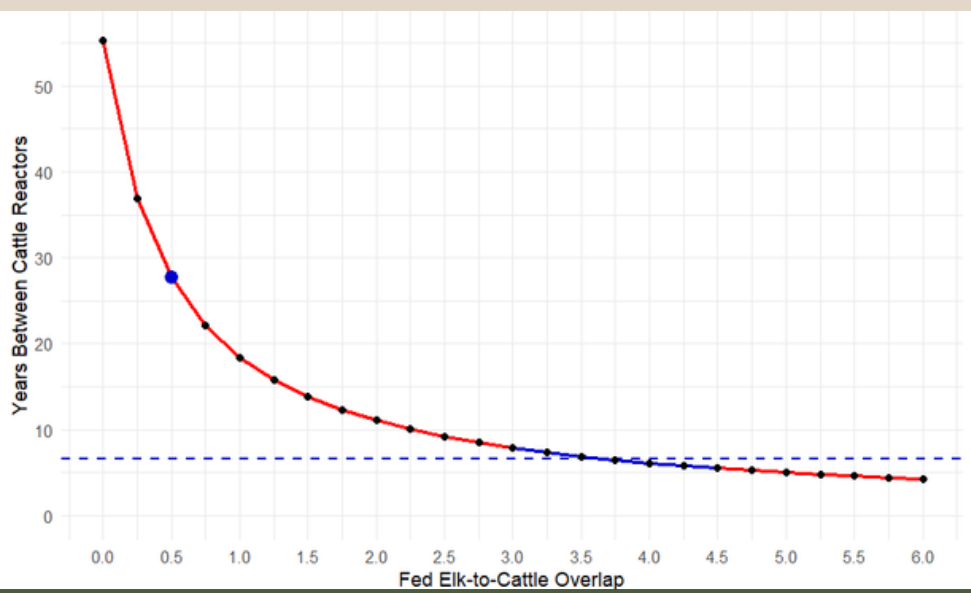


Figure 3. Fed elk-to-cattle overlap scenarios. Elk-to-cattle overlap is the average number of elk coming into contact with cattle (per ranch). Shown are the number of years until at least one head of cattle tests positive for brucellosis within the Jackson elk herd unit, based on a range of fed elk-to-cattle overlap scenarios between 0.0 and 6.0 elk per cattle. The leftmost blue point, based on current predicted Jackson elk-to-cattle overlap, indicates a likely frequency of cattle brucellosis cases if the NER were to remain in operation. The solid blue line indicates a likely range of scenarios if the NER were to close. The dashed blue line is the average cattle case frequency of that range (6.60 years between cases).

Brucellosis Transmission Risk

Brucellosis risk to cattle is predicted to increase in the first few years after feeding on the NER ceases. Teton County could see an increase from at least 1 cattle case every 28 years to at least 1 cattle case every 7 years (Figure 3). Ranchers may have to quarantine their cattle more often, increasing the costs of their operation.

Financial Repercussions

A Brucellosis Compensation Fund is both feasible and recommended under a simulated closure of the NER. Using the most likely elk-to-cattle overlap scenarios, we expect a Brucellosis of Compensation Fund of **\$151,000.00 USD** to be sufficient to support the ranching community in Teton County for five years, which is comparable in cost and duration to PERC's other brucellosis programs.



Impacts



PERC's work with private landowners throughout the GYE has resulted in solutions that promote the conservation of lands critical to the biodiversity and ecosystem of the region. With the Paradise Valley Brucellosis Compensation Fund in Montana and the upcoming Park County, Wyoming Fund, there is no doubt that there is interest from the ranching community in collaborating with PERC to develop and strengthen relationships in Teton County, which would ultimately result in reduced human-wildlife conflict. If both the Brucellosis Compensation Fund and Forage Competition programs are implemented, then tensions between wildlife and ranchers will hopefully be alleviated and these vast private lands can serve as critical migratory areas for large mammals like elk. While there were many components to this project, which tackles a complex system of (sometimes conflicting) social, ecological, and financial factors, the overall goal of managing human-wildlife interactions threads throughout. It is unknown when, or even if, any feedgrounds may cease operation, but if they do, then this project has helped lay the groundwork to assess and mitigate the costs ranchers may face from brucellosis risk, forage competition, and other stressors.

Photo by Lars Nelson



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Limitations

It is important to note that the feedgrounds and disease dynamics of the GYE are in many ways unprecedented. The NER and other GYE feedgrounds have been in place for over a hundred years, so while there are a lot of data about current conditions, future elk movement and disease dynamics are difficult to accurately predict. We modeled a range of scenarios to account for this uncertainty, and certain parts of this multistep project addressed the limitations of other parts.

These results serve as a starting point for more in-depth modeling of disease risk. Since our modeling did not account for yearly fluctuations in brucellosis transmission, a future model may incorporate climate change projections, particularly since warming temperatures have the potential to reduce brucellosis persistence in the environment and cause additional shifts in elk migration. Furthermore, climate change makes severe droughts more likely, which could impact the price of hay production and drastically change our financial predictions.