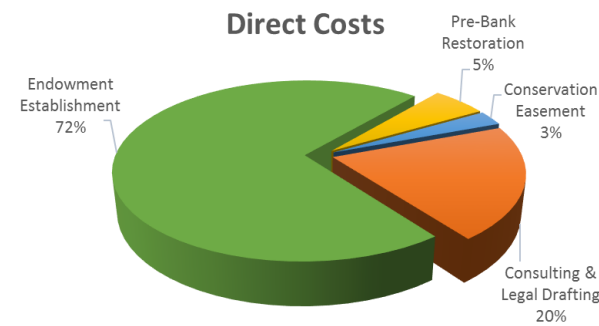


Objective 4: Financial Assessment of Proposed Conservation Bank

After developing a habitat quantification method, and applying it to calculate credit demand, credit supply, American Prairie Reserve's market share and the market price of a credit, we were able to conduct a financial assessment of a proposed conservation bank on White Rock.

Based on the experience of other conservation banks, we estimate that American Prairie Reserve's **total direct costs would be \$1,017,292**, broken down as shown to the right. The largest cost is the establishment of an endowment fund, which must cover the bank's annual operating costs solely by generating interest.



We project that this proposed conservation bank **would be financially profitable**, and would sell out in the second year of operation with a **benefit-cost ratio of 1.25**. We also examined several alternate scenarios, using different habitat quantification methods and demand projections. In all scenarios, we project a profitable benefit-cost ratio between 1.14 and 1.31, and anticipate that American Prairie Reserve would sell out of credits within 1 to 4 years.

Financial Assessment Results

| Component | Amount |
|-----------------------------|-------------|
| Onsite Credits | 5573 |
| Demand for Credits (year 1) | 5191 |
| Demand for Credits (year 2) | 382 |
| Price per Credit | \$236 |
| Total Direct Benefits | \$1,275,522 |
| Break-Even Credit Price | \$188 |
| BC Ratio | 1.25 |

Summary and Recommendation

This analysis concludes that establishing a conservation bank on White Rock would be financially profitable for American Prairie Reserve. We recommend that American Prairie Reserve develops a conservation bank **if the following conditions are met:**

- Montana's final regulatory framework meets the requirements identified in our report
- Montana's final habitat quantification method accurately and consistently captures habitat value
- There is no alternate, more beneficial use of APR funds
- APR uses revenue from the bank to create additional benefits for Sage-grouse beyond their current management activities



Acknowledgments

We would like to extend our sincere thanks to everyone who has helped us through this process, including:

| | |
|-------------------|---|
| Gary Libecap, PhD | Bren School of Environmental Science and Management |
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| Kyran Kunkel, PhD | American Prairie Reserve |
| Sara Brodnax | Environmental Defense Fund |



Group Project Brief

Project Members:
Katie Day | Bradley Bowers
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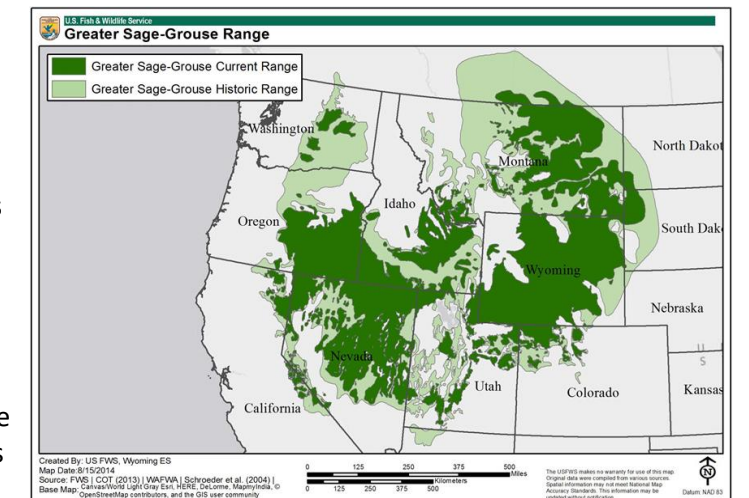
Feasibility of Establishing a Conservation Bank to Benefit Greater Sage-grouse in Montana

Faculty Advisor: Gary Libecap, PhD



Greater Sage-grouse: A Species in Decline

Greater Sage-grouse, an iconic native bird of the North American prairie, once ranged across 12 states and two Canadian provinces. Today, its range has been reduced by more than half due to habitat conversion and fragmentation. The most severe current threat to Sage-grouse in Montana is energy development, but this species also faces pressure from residential development, transportation and communications infrastructure, the conversion of sagebrush steppe into farmland, and climate change. Due to a controversial decision by the US Fish and Wildlife Service in 2015 against listing Sage-grouse under the federal Endangered Species Act, efforts to conserve and rehabilitate Sage-grouse habitat are occurring primarily at the state level.



Following the example of other Western states, Montana is currently drafting regulations that will impose restrictions on new developments within designated Sage-grouse habitat, including mitigation requirements for developments that go forward. These mitigation requirements will open the door for increased private landowner participation in market-based conservation mechanisms, including conservation banking.

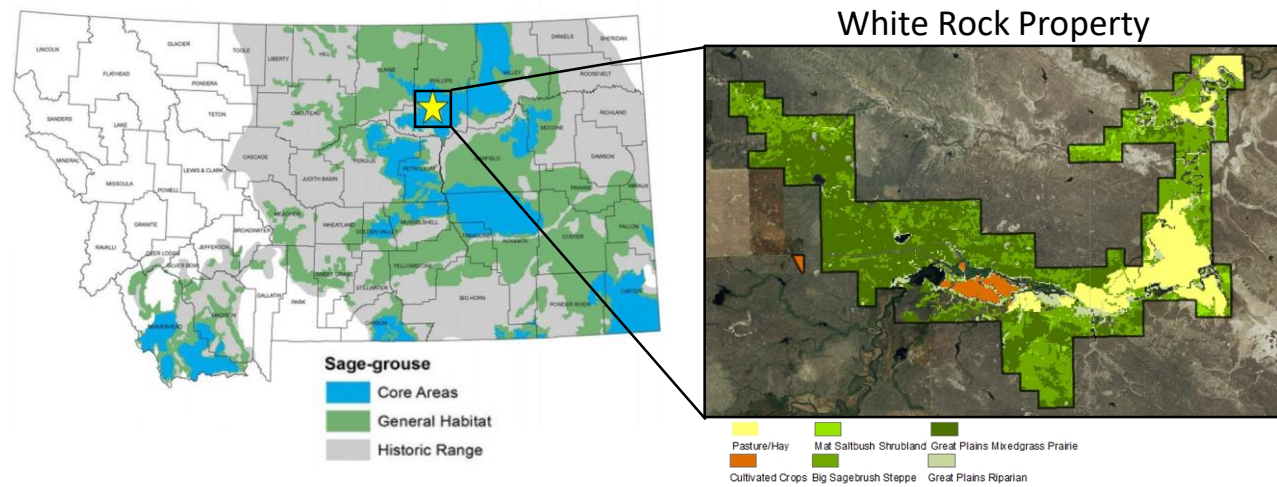
Research Question and Objectives

The American Prairie Reserve, a conservation non-profit and large landowner in North-central Montana, is considering whether to establish a conservation bank on one of their properties for the benefit of Greater Sage-grouse. This project provides guidance for this decision through the following steps:

- 1 Literature review: Is conservation banking effective?
- 2 Translate habitat values into tradable mitigation credits
- 3 Assess the market for mitigation credits
- 4 Financial assessment of a proposed conservation bank



Area of Interest



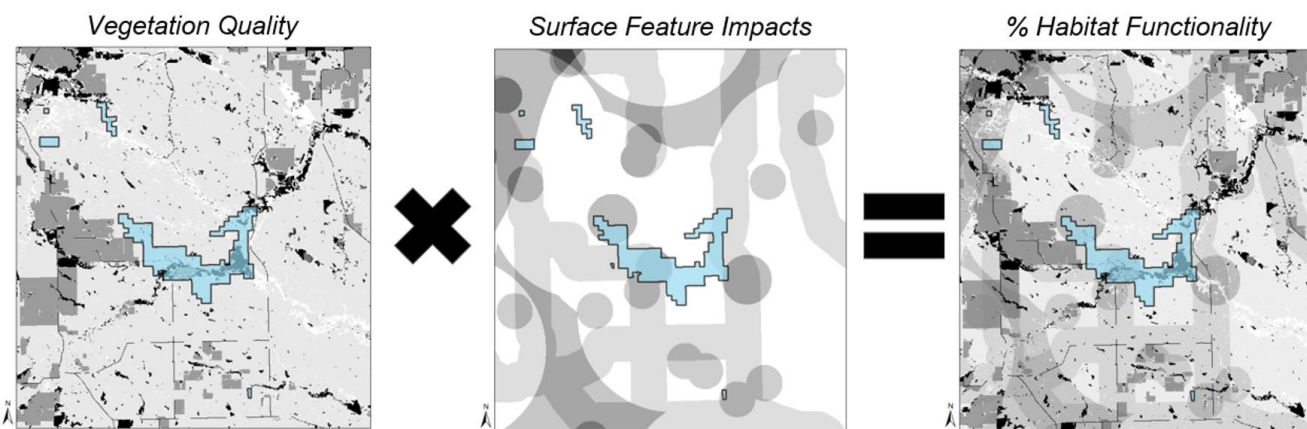
This project analyzes a proposed conservation bank on one of American Prairie Reserve's properties, called White Rock, shown above. White Rock's mix of quality habitat with agricultural land provides long-term opportunities both for habitat preservation and restoration.

Objective 1: What is Conservation Banking, and is it Effective?

A conservation bank is a large, continuous block of land that is legally protected and managed for the benefit of a particular species. This land generates 'mitigation credits' based on the quality and extent of habitat which can be sold to developers who are legally required to offset, or mitigate, their impacts. As a relatively new conservation tool, banking has little empirical evidence to support species benefits. In theory, however, it can be an effective tool to promote conservation of at-risk species on private land if certain conditions are met. Regulations must be conservative and designed to promote conservation over development. Most importantly, the method of translating habitat values into credits must be accurate and consistent.

Objective 2: Translating Habitat Values into Tradable Mitigation Credits

We adapted a habitat quantification methodology currently employed in Wyoming to our data limitations and timeline. The adapted methodology uses GIS analysis to account for vegetation quality and the impact to Sage-grouse from anthropogenic surface features such as roads, residential areas, energy development, and communications infrastructure. As shown below, these components can be used to estimate the number of mitigation credits that could be generated by preserving any given area of the landscape.



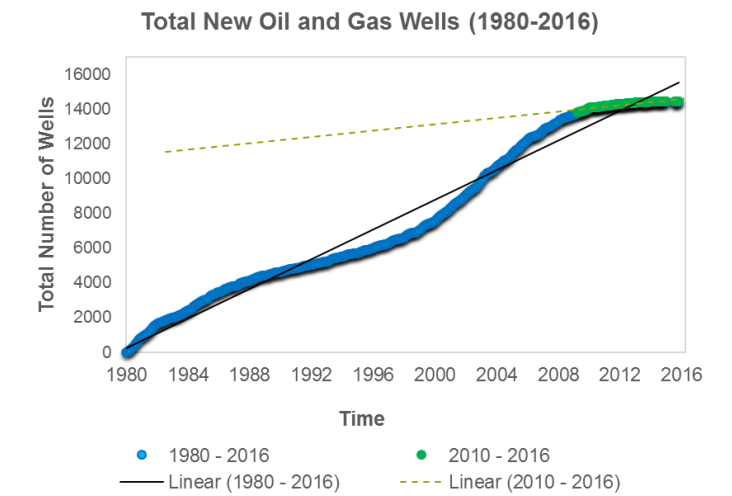
$$\% \text{ Habitat Functionality} * \text{Number of Acres} = \text{Mitigation Credits}$$

Objective 3: Assess the Market for Mitigation Credits

Statewide Credit Demand

To estimate demand for mitigation credits, we assessed past trends of oil and gas development within designated Sage-grouse core habitat in Montana. Using linear regression based on the period of 2010 – 2016, we project that **6.7 new oil and gas wells will be drilled each year.**

Applying the habitat quantification methodology developed for Objective 2 to known oil and gas fields in Montana, we calculate that each new well will require approximately 2,458 mitigation credits for a **total of 16,615 credits demanded each year.**



American Prairie Reserve Credit Supply

Applying the habitat quantification methodology to the White Rock property, we found an average habitat functionality of 63%. Accounting for 8,803 acres, we project that **American Prairie Reserve could generate 5,573 mitigation credits** by establishing a conservation bank on White Rock, with the potential for additional credit generation from future restoration efforts.

Statewide Credit Supply

To assess supply in the broader marketplace, we examined a state grant program that offers landowners funding for the establishment of conservation easements for the stated purpose of generating mitigation credits. Applying the habitat quantification methodology to properties that have received grants through this program, we project that the **statewide mitigation market will initially produce 17,837 credits**, giving American Prairie Reserve a **market share of approximately 31%**. This grant program also allowed us to estimate the price per credit, since the State of Montana expects to recoup its expenses through credit sales from these same properties. We therefore project a minimum **credit price of \$236.**

