

The Sustainable Rangelands Roundtable: Soil Health and Economics

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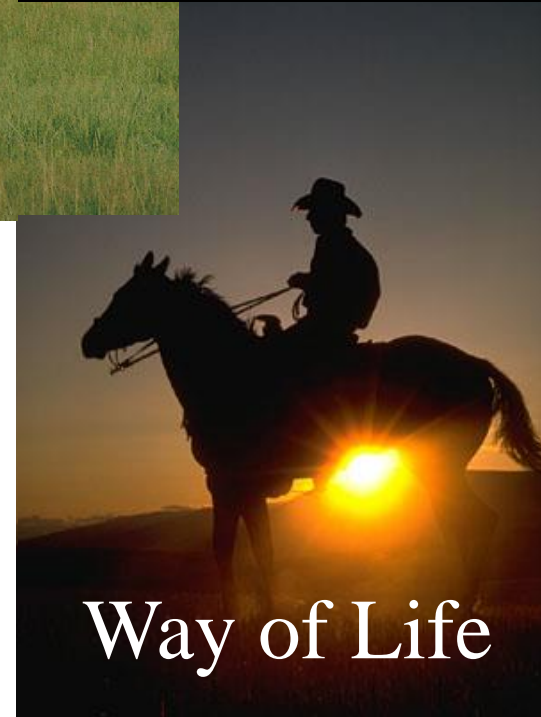
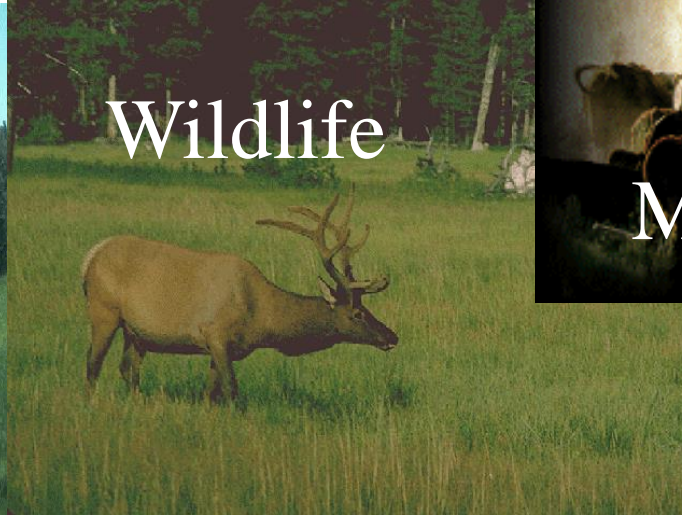
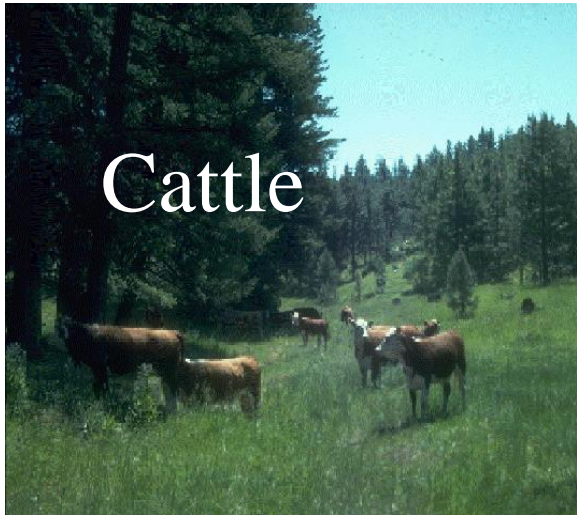


Rangeland Sustainability

- Ensures human well-being while respecting ecosystem well-being and environmental limits and capacities.
- Encompasses environmental and social issues and economic activity.



Balance - Making Choices



Sustainable Rangelands Roundtable Timeline and Process

2001 - SRR
Convened

2003 - First
Approximation
Report

2007 -
Conceptual
Framework

Project Based
Activities

Ecosystem Services
Business Planning/Sustainability
Energy
Food Security
Useable Science
Social and Economics of Public Land Ranchers
NRCS Conservation Practices
Soil Health and Economics

SRR Criteria and Indicators

Encompass social values, economic benefits, and ecological factors

- ❖ **Criteria** – Goals, values
- ❖ **Indicators** – Measurements, monitoring

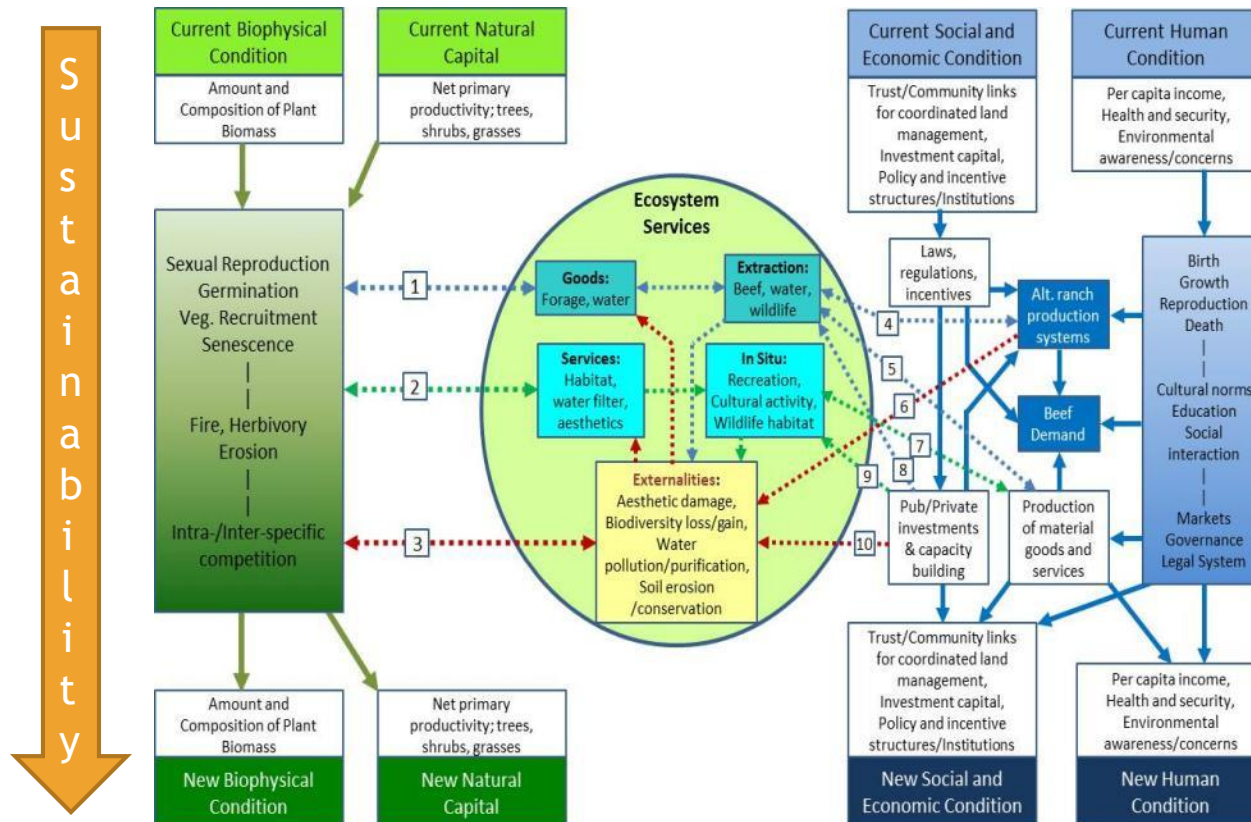


Conservation and Maintenance of Soil and Water Resources on Rangelands



ISEEC Framework

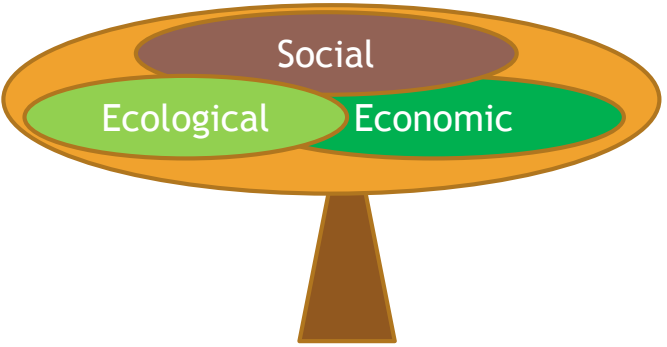
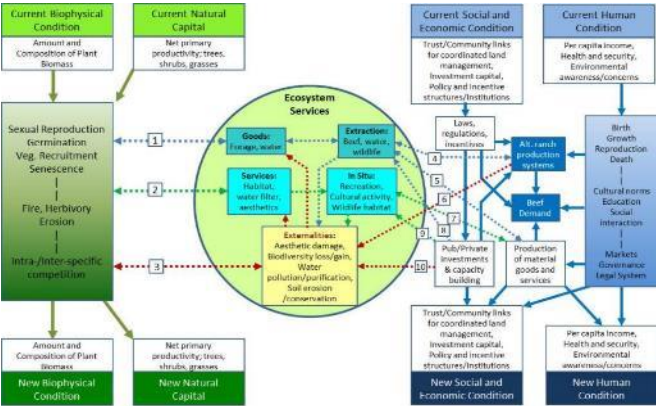
- ▶ Biophysical and Social/Economic over time
- ▶ Nexus is the Ecosystem Services
- ▶ Only things that humans want and need have value



Effects of Soil Health on Sustainability

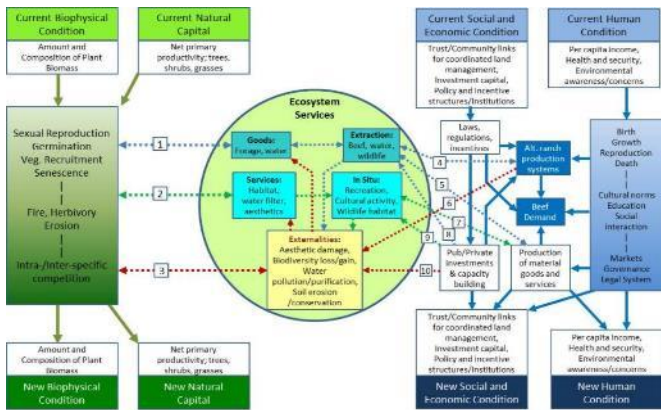
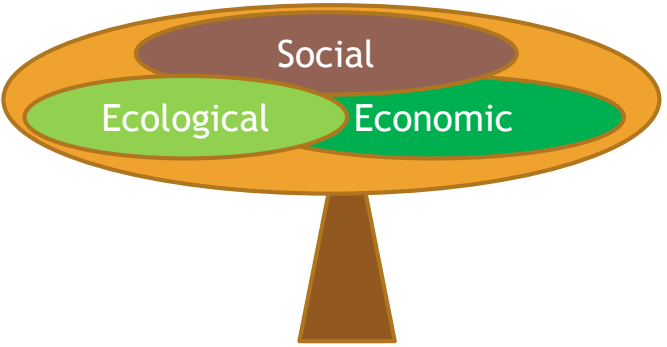
- ▶ In our framework, soil is one of the basic biophysical components
- ▶ Improving soil health leads to a variety of effects on the ecosystem, including forage production

Ecological



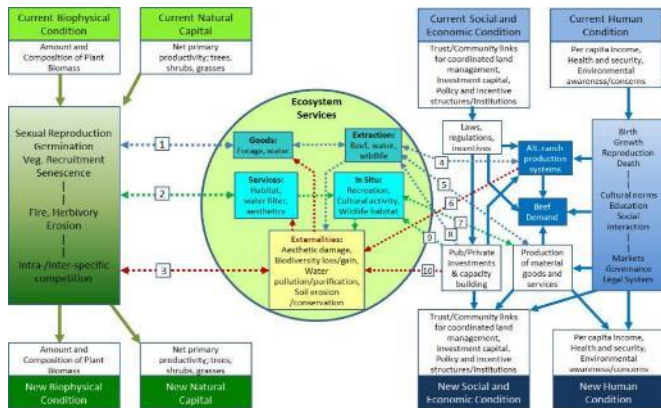
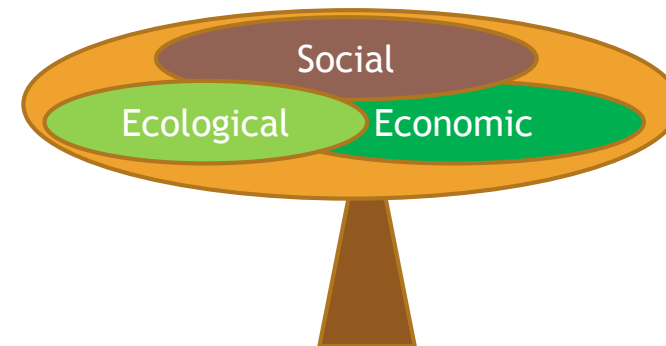
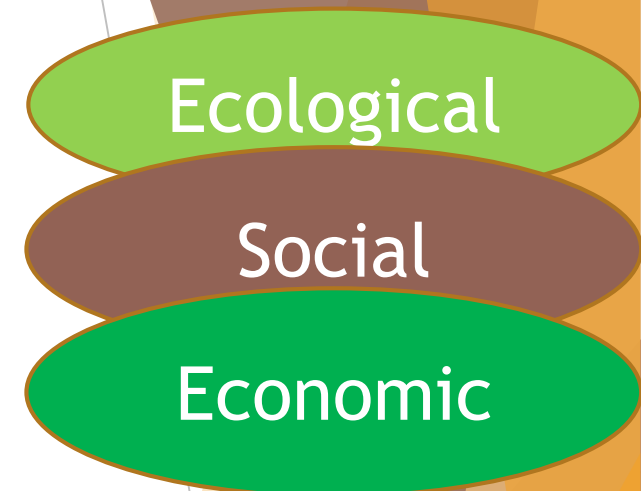
Effects of Soil Health on Sustainability

- ▶ In our framework, soil is one of the basic biophysical components
- ▶ Improving soil health leads to a variety of effects on the ecosystem, including forage production
- ▶ To the extent that society wants more red meat, there is a derived demand for forage (an ecosystem service)



Effects of Soil Health on Sustainability

- ▶ In our framework, soil is one of the basic biophysical components
- ▶ Improving soil health leads to a variety of effects on the ecosystem, including forage production
- ▶ To the extent that society wants more red meat, there is a derived demand for forage (an ecosystem service)
- ▶ If a rancher can produce that red meat at a profit, they will supply that to society



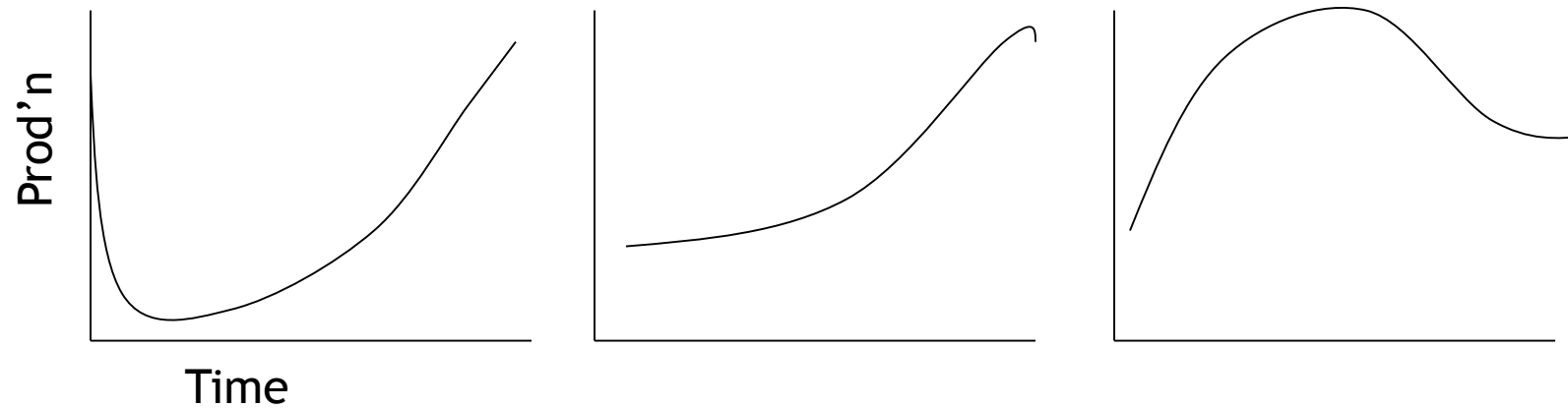
Soil Health and Ranching

- ▶ Forage productivity
- ▶ Soil erosion
- ▶ Translate into ranch effects

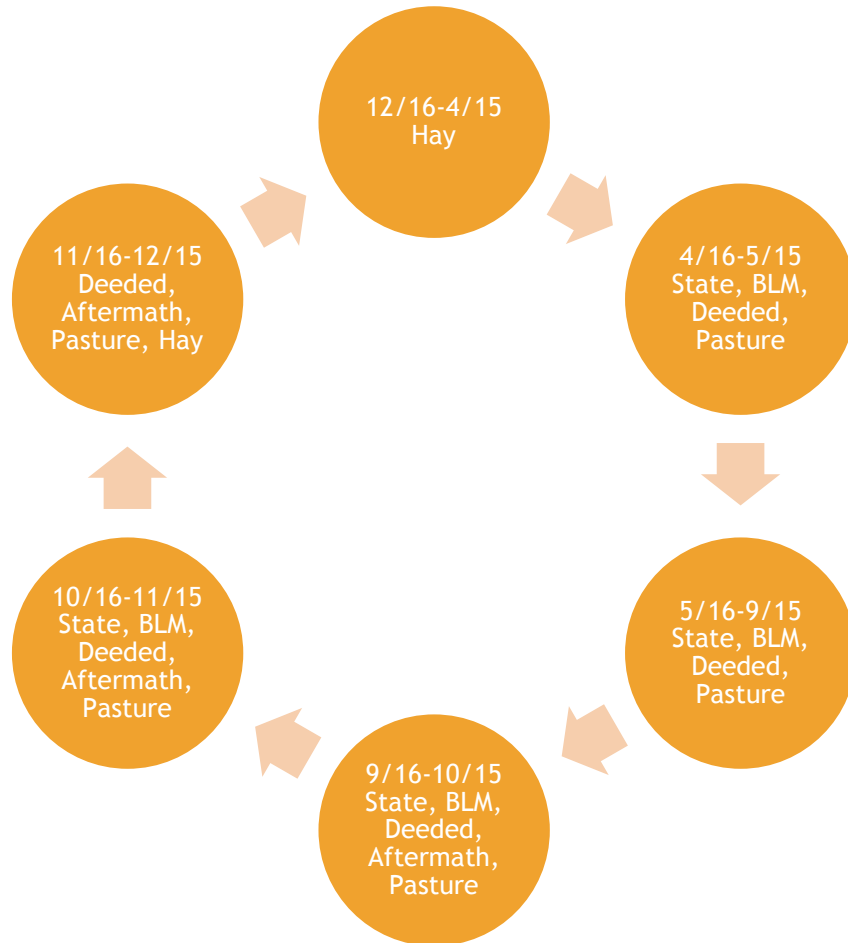


Soil Health and Economics on Rangelands

- ▶ No direct research on this topic for rangelands
- ▶ Likely to be more anecdotal at this point
- ▶ From an economic standpoint, we would like to know responses



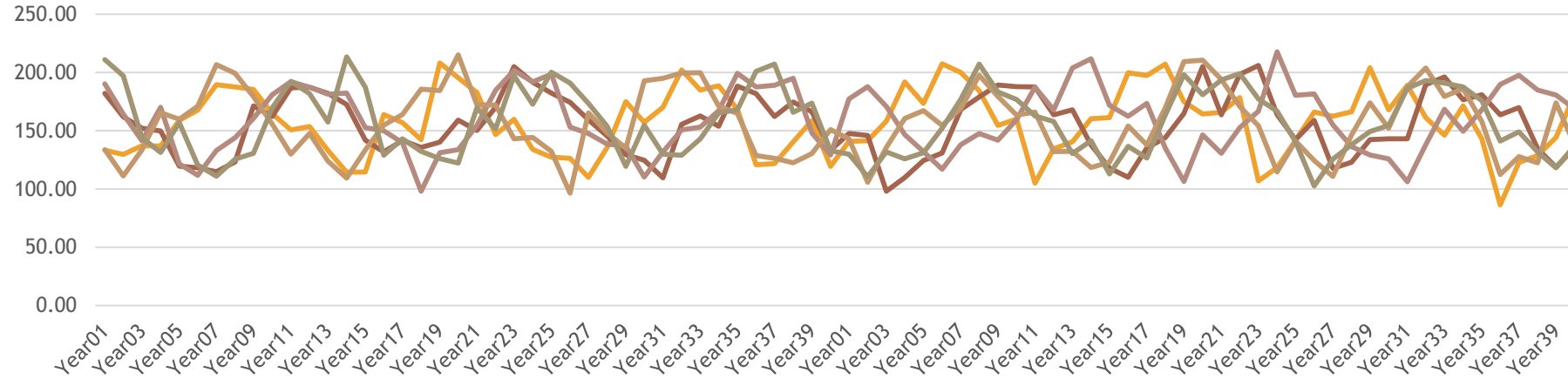
Ranch Models - Systems Approach



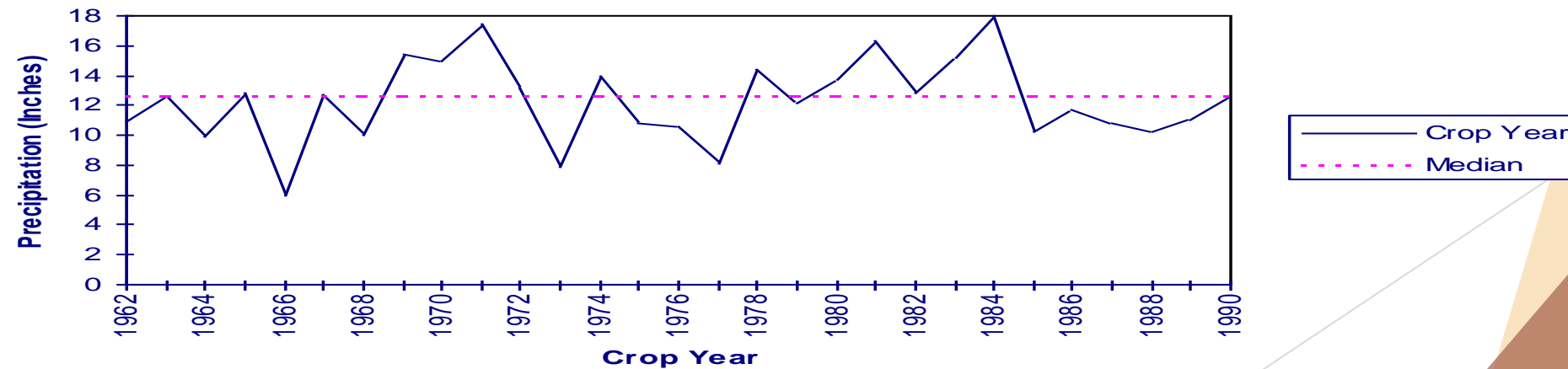
- Basic premises
 - Cattle somewhere every day
 - Yearlong operation
 - Substitute feeds

Sources of Uncertainty

Wyoming Steer Calf Prices, Adjusted 2012



Precipitation

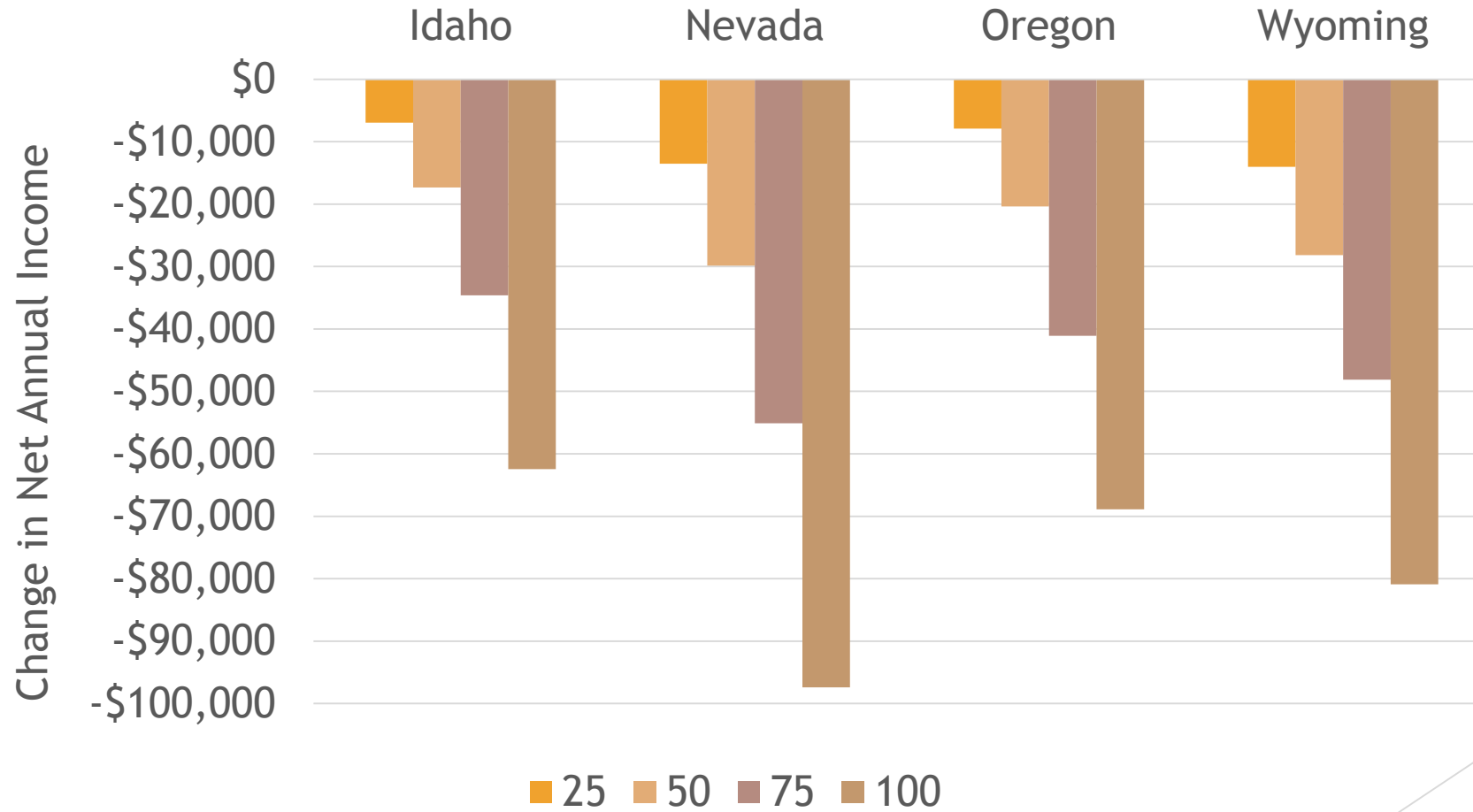


Results - Base Model

- ▶ 590 Cows
- ▶ Gross annual returns = \$369,939
- ▶ Average Net Cash Income = \$112,895
- ▶ Fixed costs = \$40,434
- ▶ Negative net annual income occurred 22% of the time



Percent Reduction in BLM Permit



So what does this mean for soil health?

- ▶ NRCS practices aimed at improving conservation use of rangelands
- ▶ Practices that potentially increase forage production
- ▶ Practices that potentially improve grazing distribution
- ▶ If these simultaneously improve soil health (C transformation, nutrient cycling, soil structure, microbial health), then it is possible to conduct an economic analysis



Caveats

- ▶ Improving forage quality or quantity in any given season does not mean it is useful to the yearlong operation
- ▶ Have to balance supply of forage with demand for forage

Supply of Forage by Season
of Use

?

=

Demand for Forage by
Season of Use by livestock,
wildlife, soil protection,
etc.

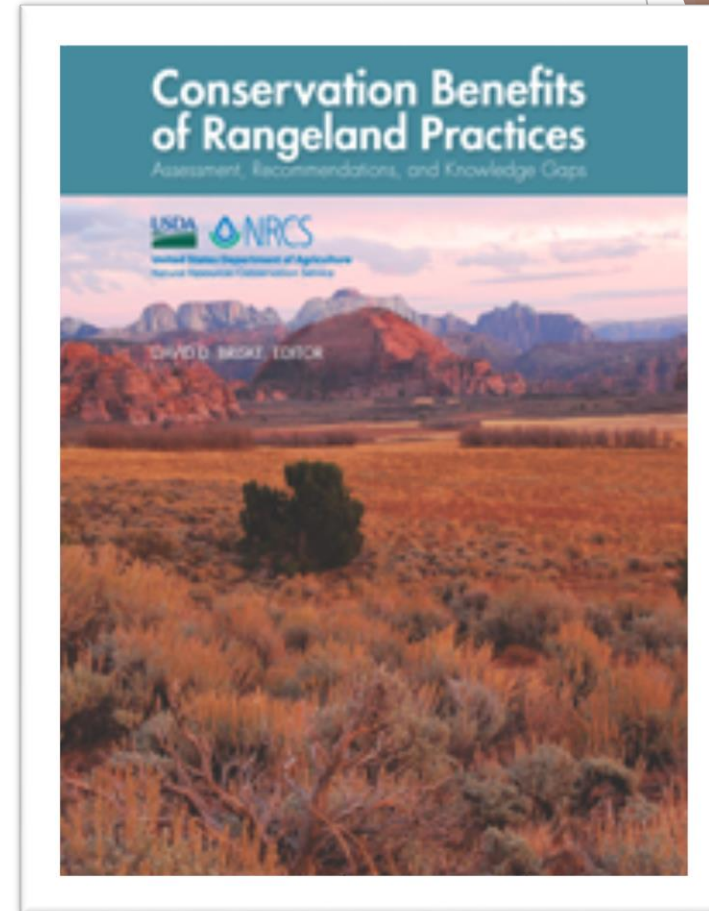
Caveats

- ▶ This only looks at the private benefit from improving forage production.
- ▶ What other values does society gain?
- ▶ Can we place values on those?
 - ▶ What is more wildlife habitat worth?
 - ▶ What is the value of less soil erosion?
 - ▶ What is the value of a soil microbe?
 - ▶ What is the value of society “knowing” rangelands are being properly managed?



Soil Health and Economics

- ▶ New project at University of Wyoming
 - ▶ Dr. John Ritten, Agricultural and Applied Economics
 - ▶ Holly Dyer, M.S. Student
- ▶ *Objectives:*
 - ▶ *A literature review*
 - ▶ *Quantification and valuation*
 - ▶ *Ranch case studies*



Questions?

