

# Impacts of adaptive management on southwestern rangelands

Aaron M Lien

School of Natural Resources and the Environment

Udall Center for Studies in Public Policy

University of Arizona



# Overview

- ▶ Background on adaptive management and ecosystem services
- ▶ Study objectives
- ▶ Approach and expected outcomes



# Background

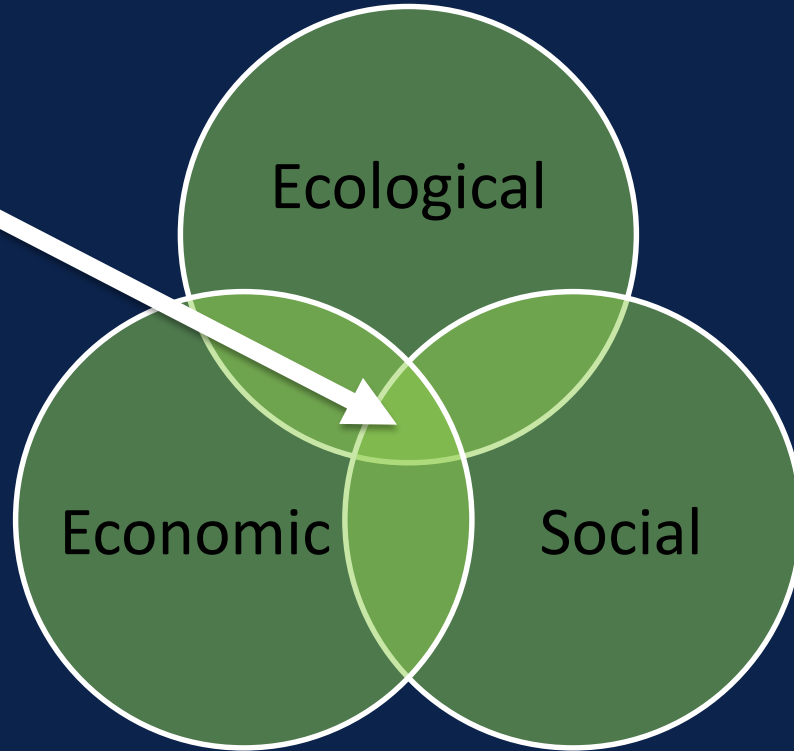
- ▶ In 2007 USFS adopted an adaptive management policy
- ▶ 19 million acres in AZ and NM
- ▶ 1.7 million Animal Unit Months (AUMs)



Photo: USFS

# Background

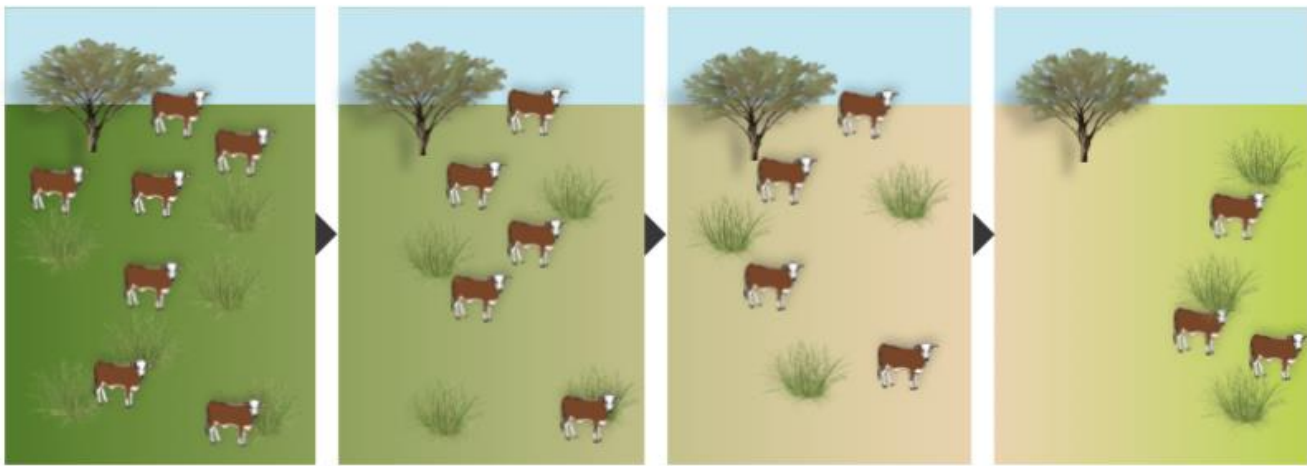
Adaptive  
management  
seeks to  
maximize all  
benefits



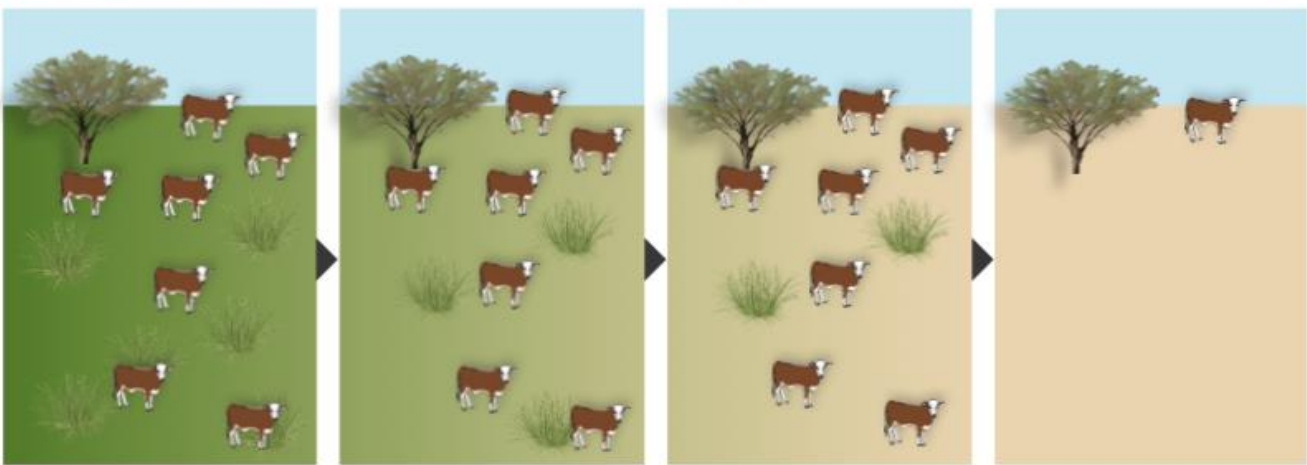
# Background

- ▶ Approaches to adaptive management:
  - ▶ Passive:
    - ▶ Monitoring and implementation of best practices
    - ▶ Adaptation over time based on monitoring/outcomes
  - ▶ Active:
    - ▶ Proactive implementation of management and monitoring protocols to test management changes
  - ▶ Triggers:
    - ▶ Management changes in response to pre-determined events

Ranch A (Adaptive Management)



Ranch B (No Adaptive Management)



ADEQUATE PRECIPITATION

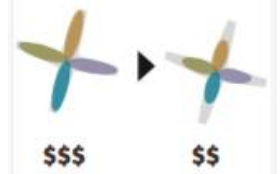
DECLINING PRECIPITATION

DROUGHT

INCREASING PRECIPITATION

**HYPOTHESES ABOUT OUTCOMES**

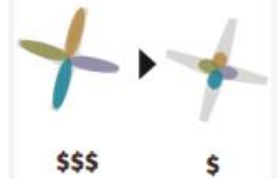
**Ranch A**  
(Adaptive Management)



**ECOSYSTEM SERVICES**

- Forage production
- Beef production
- Plant biodiversity
- Soil health

**Ranch B**  
(No Adaptive Management)



# Background

- ▶ Using ecosystem services to understand adaptive management impacts
  - ▶ Ecosystem services are the benefits people receive from nature, e.g. forage production as a benefit to livestock operations
  - ▶ Provide a framework for understanding how adaptive management has affected people and nature

# Study Objectives

- ▶ Studying adaptive management requires an interdisciplinary approach:
  - ▶ Ecology
  - ▶ Economics
  - ▶ Policy and social sciences





# Objective 1

- ▶ Measure the impact of adaptive management on the production of ecosystem services on southwestern grazing allotments
  - ▶ Forage, plant biodiversity, soil health indicators, beef production

## Objective 2

- ▶ Determine the impact of adaptive management on the economic viability of ranching
  - ▶ Herd size, calving percentage, % breed back, permitted and actual AUMs, average calf weight

# Objective 3

- ▶ Determine if adaptive management results in reduced regulatory transaction costs for by producers and agencies
  - ▶ Attitudes about adaptive management, changes in relationship between USFS and permittees, change in time/burden of NEPA

# Expected Outcomes

- ▶ What level of success do we see in the implementation of adaptive management?
  - ▶ Does ecological data match perceptions?
  - ▶ Are adaptive changes in policy carried out in the field?
  - ▶ Do management plans better reflect dynamic rangeland ecological systems?

# Expected Outcomes

- ▶ Our expectations are:
  - ▶ Ecosystem services (forage, soil health, plant biodiversity, beef production) will increase
  - ▶ Economics of ranches will have improved
  - ▶ Relationships between ranchers and the USFS will have improved
  - ▶ NEPA and related processes are faster

# Expected Outcomes

- ▶ **Overall goal:**
  - ▶ provide new information about how adaptive management has performed to date
  - ▶ Inform more effective implementation of adaptive management going forward

# Approach

- ▶ Ecological:
  - ▶ Field monitoring and review of historical records
- ▶ Economic:
  - ▶ Collection of economic indicators and development of "composite" ranches
- ▶ Social
  - ▶ Interviews, survey, and record evaluation

# Approach

- ▶ A collaborative effort
  - ▶ Working with the USFS to obtain allotment management records (AOIs, AMPs, monitoring data, NEPA records)
  - ▶ Working with ranchers to learn about your experiences with adaptive management
  - ▶ Hoping for strong response to upcoming survey



# Questions?

Project Contacts:

Laura López Hoffman

[lauralh@email.arizona.edu](mailto:lauralh@email.arizona.edu)

520-626-9851

George Ruyle

[gruyle@cals.arizona.edu](mailto:gruyle@cals.arizona.edu)

520-621-1384

Aaron Lien

[amlien@cals.arizona.edu](mailto:amlien@cals.arizona.edu)

520-626-2873