

# Adaptive Management for Diverse Stakeholder Goals

*Leslie Roche, Lorien Jasny, Mark Lubell, Bethany Cutts, Emily Kachergis, Justin Derner, Valerie Eviner, Kenneth Tate*



# Integrating Science & Practice

## Rangeland Decision-Making Mail Survey

- California Cattlemen's Association
- Wyoming Stock Growers Association

## Stakeholder-Prescribed Adaptive Management Experiment

- Sierra Foothill Research & Extension Center
- Central Plains Experimental Range



# Collaborators and Partners

**Program Leaders:** Leslie Roche, Justin Derner, Valerie Eviner, Mark Lubell, Rick Standiford, Lynn Huntsinger, Mel George, Toby O'Geen, Emily Kachergis, Bethany Cutts, Lorien Jasny, Dave Briske, Maria Fernandez-Gimenez, Ken Tate.

**CA Project Collaborators:** Sheila Barry, Theresa Becchetti, Josh Davy, Julie Fenzel, Larry Forero, Morgan Doran, Dustin Flavell, John Harper, Roger Ingram, Jeremy James, Royce Larsen, Stephanie Larson, David, Lewis, David Lile, Missy Merrill,-Davies, Neil McDougald, Glenn Nader, Scott Oneto, Tracy Schohr.



## Stakeholder Focus Groups



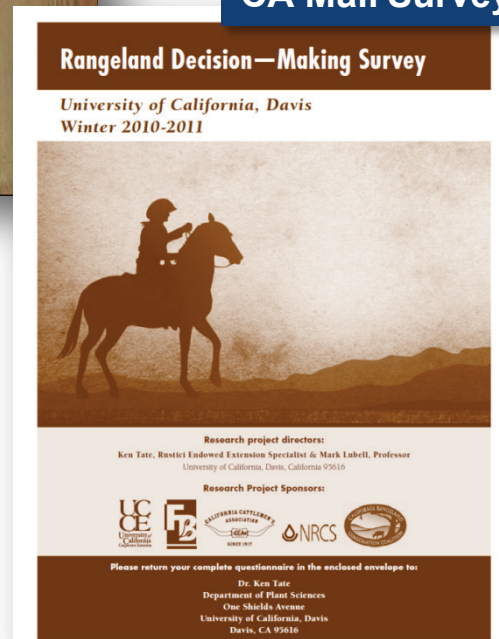


# Rangeland Decision-Making Surveys

## WY Mail Survey



## CA Mail Survey



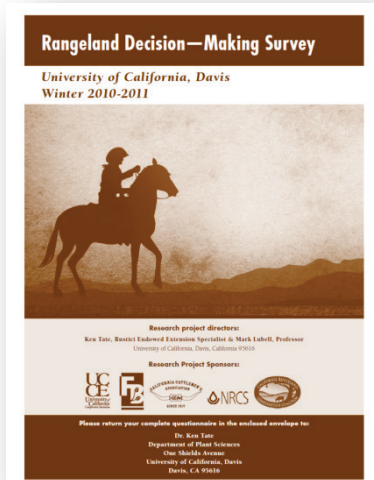
- Determine factors driving grazing management decisions.
- Understand how managers receive, assess, and use information.
- Perspectives on adaptive grazing management for multiple goals.
- 1700 ranchers in California (34% response rate).
- 700 ranchers in Wyoming (50% response rate).



# Rangeland Decision-Making: Goals

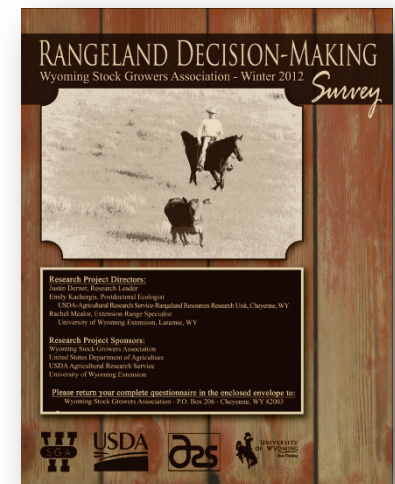
## CALIFORNIA

1. Livestock Production, Forage Production
2. Water Quality, Invasive Weed Management, and Soil Health
3. Riparian/Meadow Health and Wildlife
4. Recreation and Carbon Sequestration



## WYOMING

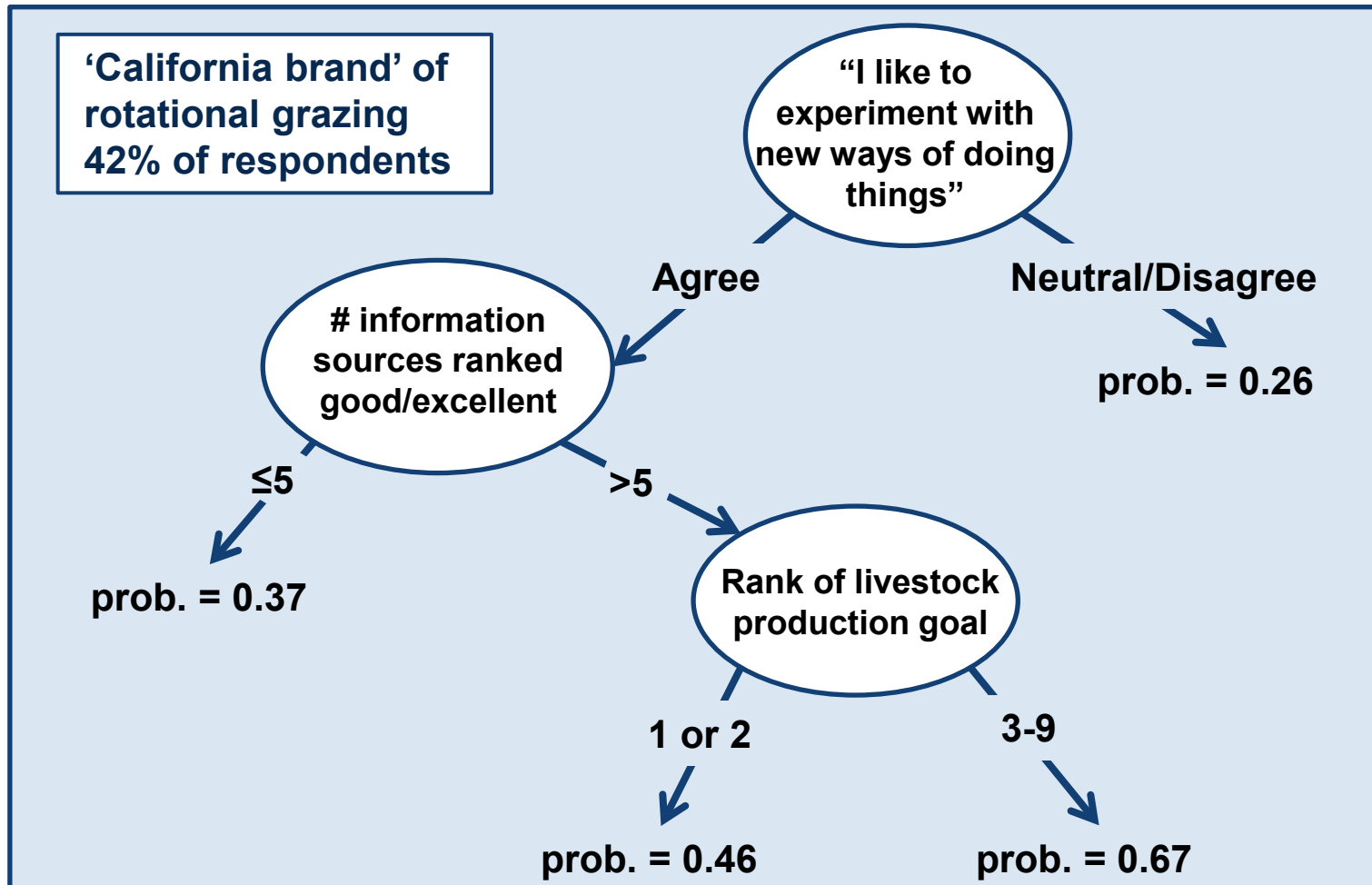
1. Livestock Production, Forage Production
2. Soil Health, Water Quality, Riparian/Meadow Health, Invasive Weed Management
3. Wildlife, Recreation, Carbon Sequestration



# Characterizing On-Ranch Grazing Strategies

## 3 'California Brands' of Strategies

- Rotational Grazing
- Season-Long Continuous Grazing
- Year-Long Continuous Grazing

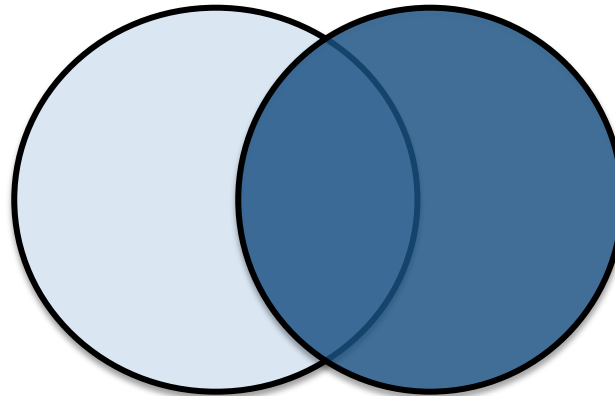
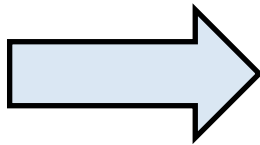


# Participatory Research to Restore Ecosystem Services

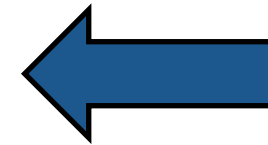


## Stakeholder-Prescribed Adaptive Management Experiment

**Research**



**Application**



***GOAL: Integrate research and management to develop cost-effective strategies for multiple goals.***



# Stakeholder Advisory Teams



**California - UC Sierra Foothill Research & Extension Center**  
**Colorado - USDA-ARS Central Plains Experimental Range**

- **Rancher, range professionals, and conservation professionals.**
- **Prescribe goals and management strategies ( a.k.a. treatments).**
- **We implement, monitor, adapt with stakeholder input.**

# Diverse Project Partners

## **SFREC Adaptive Grazing Management Advisory Team (California)**

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Ranchers & Ranch Managers  
Audubon California  
Beale Air Force Base  
CA Department of Fish and Wildlife  
Center for Natural Lands Management  
City of Fairfield  
Contra Costa Water District  
Defenders of Wildlife  
Department of Fish & Game  
East Bay Municipal Utility District  
East Bay Regional Parks  
Environmental Consultants

Hedgerow Farms  
Natural Resource Conservation Service  
Nevada Irrigation District  
Placer Land Trust  
Point Reyes National Park  
PRBO Conservation Science  
The Nature Conservancy  
UC Cooperative Extension  
UC Davis Natural Reserve System  
US Fish & Wildlife Service  
US Forest Service

## **CPER Adaptive Grazing Management Advisory Team (Colorado)**

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Crow Valley Livestock Cooperative  
Colorado State University Extension  
Environmental Consultants  
Environmental Defense Fund

Natural Resource Conservation Service  
Rocky Mountain Bird Observatory  
The Nature Conservancy  
US Forest Service

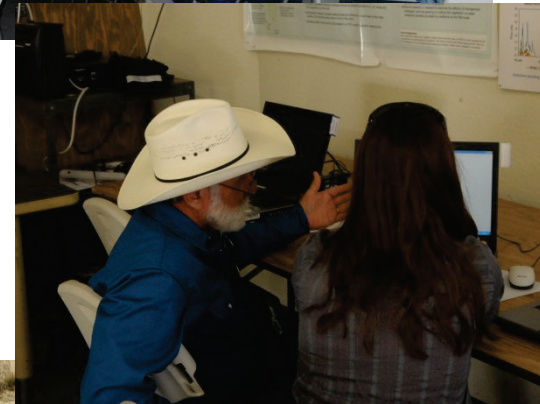
# Stakeholder Advisory Teams

## California Approach – UC SFREC

**8 pastures, 500 hectares**

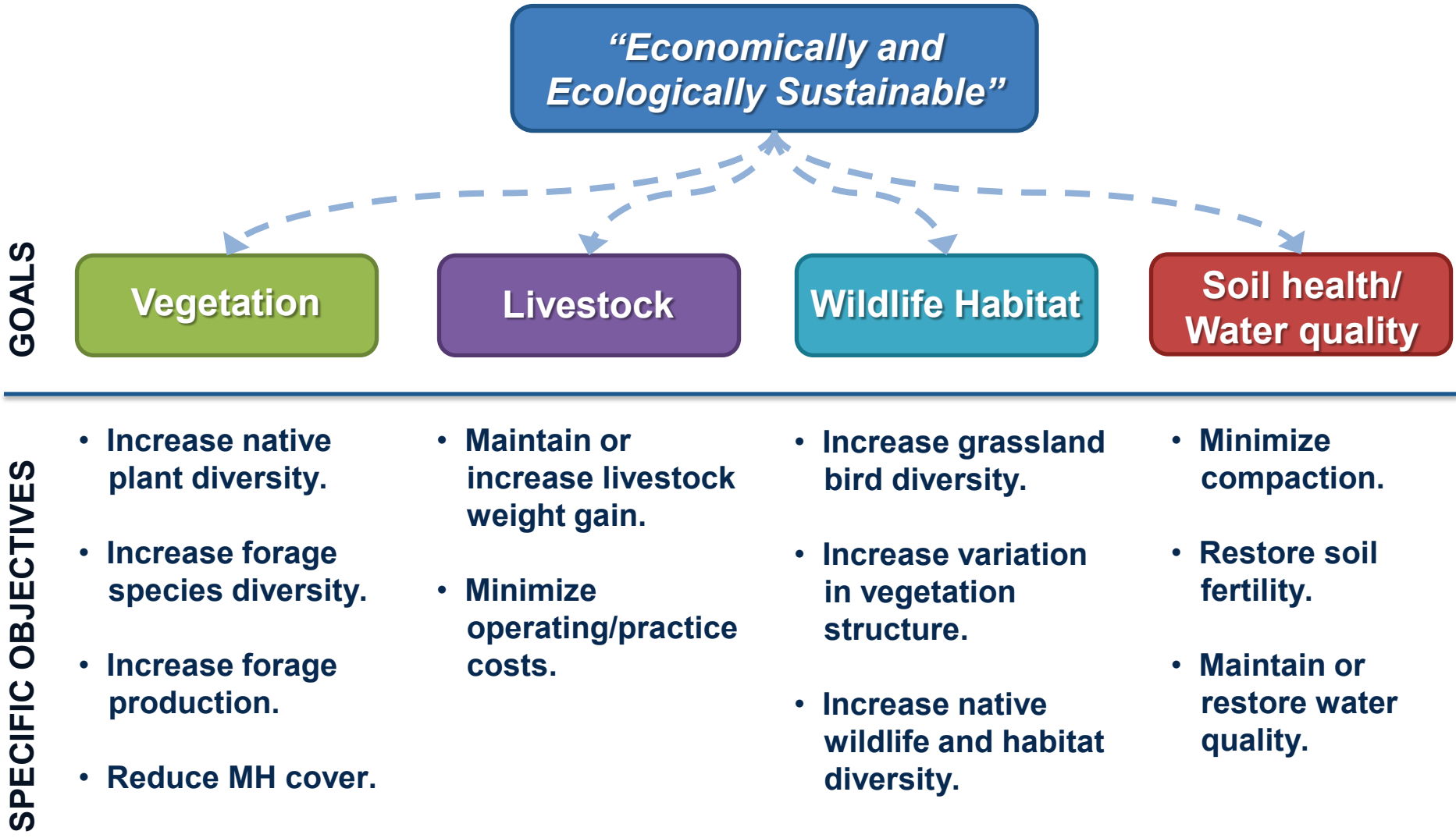
- 1) Primary natural resource and agricultural goals.
- 2) Potential challenges and opportunities for goals.
- 3) Adaptive management strategies to achieve goals.

***Connecting social network and decision-making analyses with field ecology.***



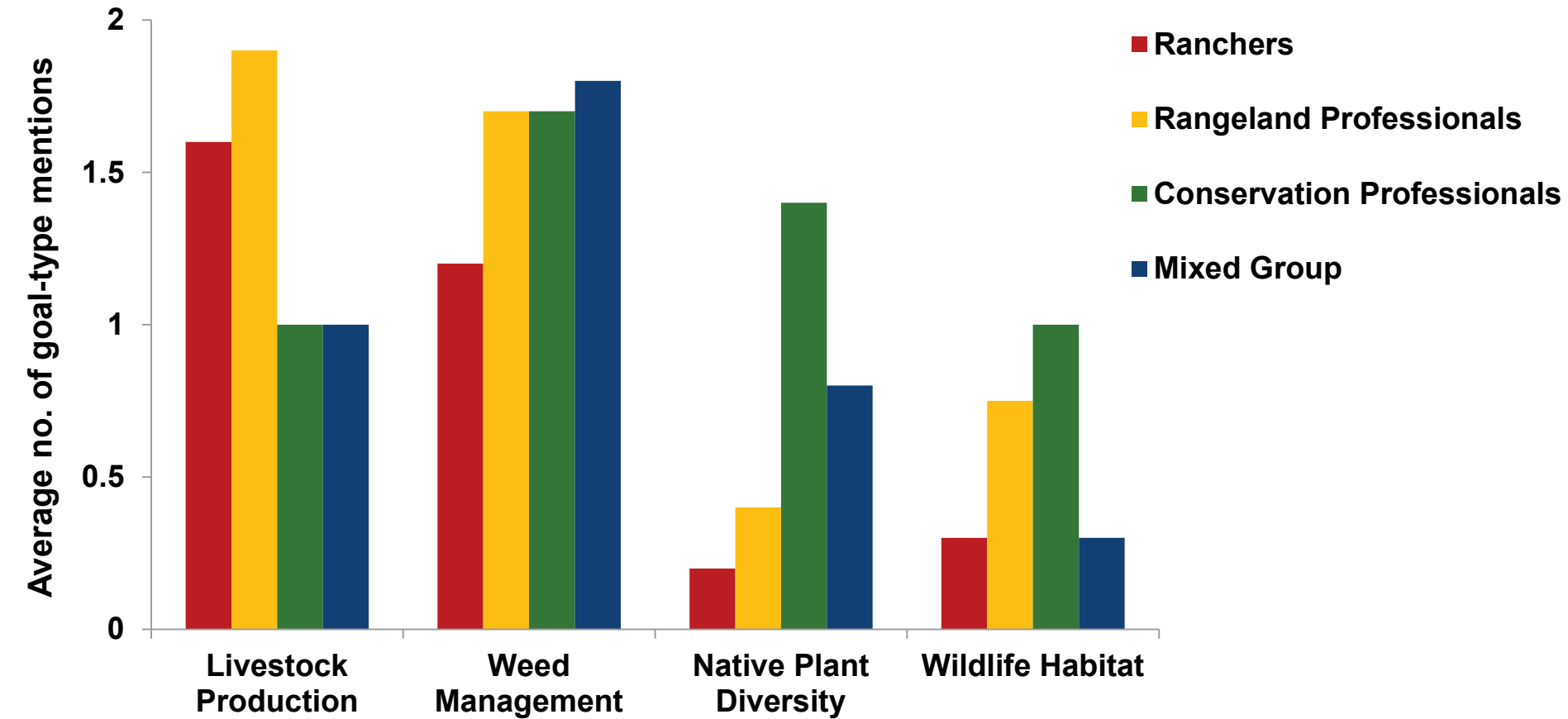


# Stakeholder Goals and Objectives



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## *Diversity in goals among stakeholder groups*





# Stakeholder Goals and Objectives

## Challenge

- **Medusahead infestation.**
- **Lacking diverse forage base.**

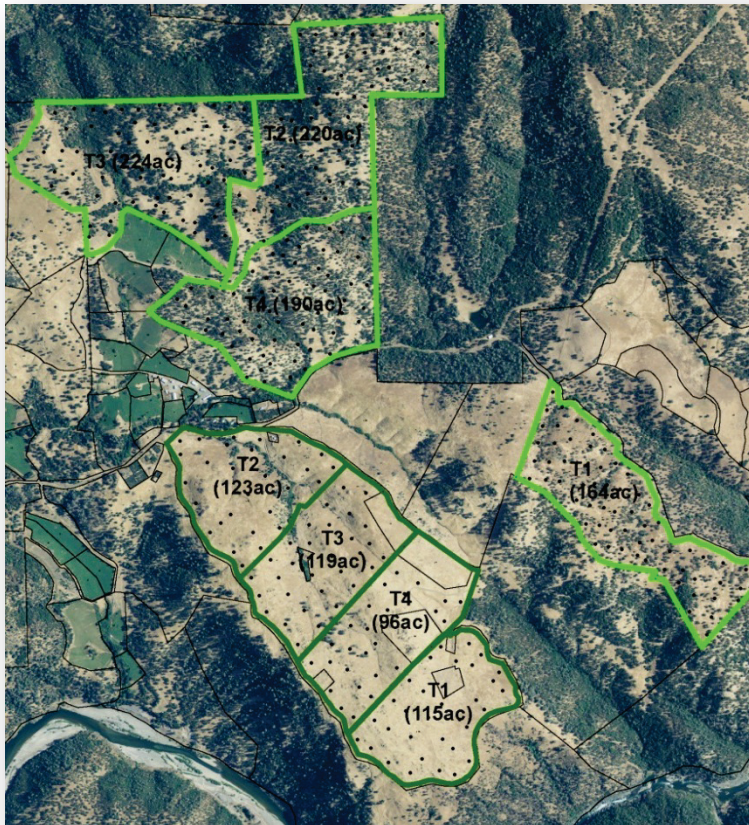
UCD  
University of California Davis



# Stakeholder Prescribed Adaptive Grazing Experiment – Year 1

## Restoration Treatments

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**T1** Fall-Spring grazing

**T2** Fall-Spring targeted grazing

**T3** Season-long grazing

**T4** Winter grazing

*Adaptively implemented and monitored with stakeholder participation*

# Research & Outreach Activities



Workshops

Range Science Symposium

Advisory group

Advisory group

Field day and tour

May

Nov

Dec

Jan

Apr

May

Jun

Baseline data collection

Grazing treatments and data collection

*Monitoring*

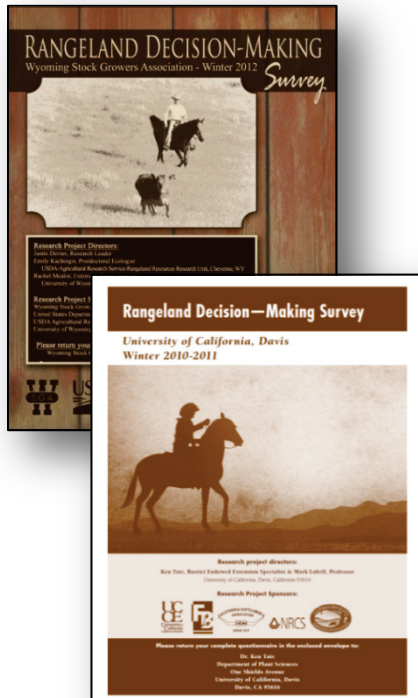
Cattle gains, herbaceous forage production, plant functional group cover, grassland bird cover, fecal/pollutant loading



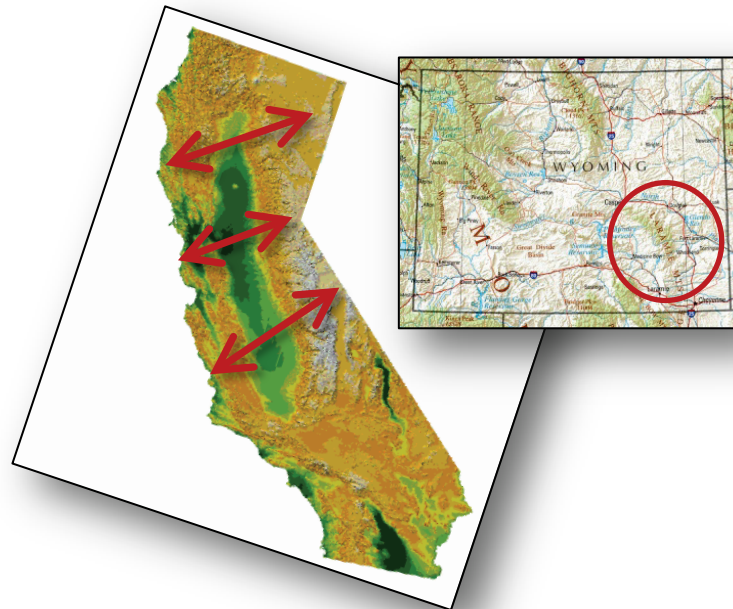
# Adaptive Management for Multiple Goals on Working Rangelands



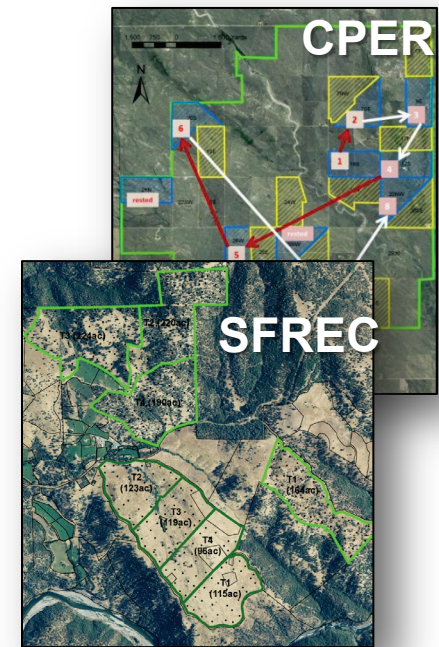
## Mail Surveys



## On-Ranch Interviews



## Stakeholder-prescribed experiments



## Multi-Pronged Approach



# California Rangeland Watershed Laboratory

<http://rangelandwatersheds.ucdavis.edu>



***Partnerships among scientists, managers, and conservationists are providing the most relevant knowledge for managing rangeland systems.***