

# **WINTERFAT IN THE CATLOW VALLEY: ECOLOGICAL RESILIENCE AND STATE-AND-TRANSITION MODELING**

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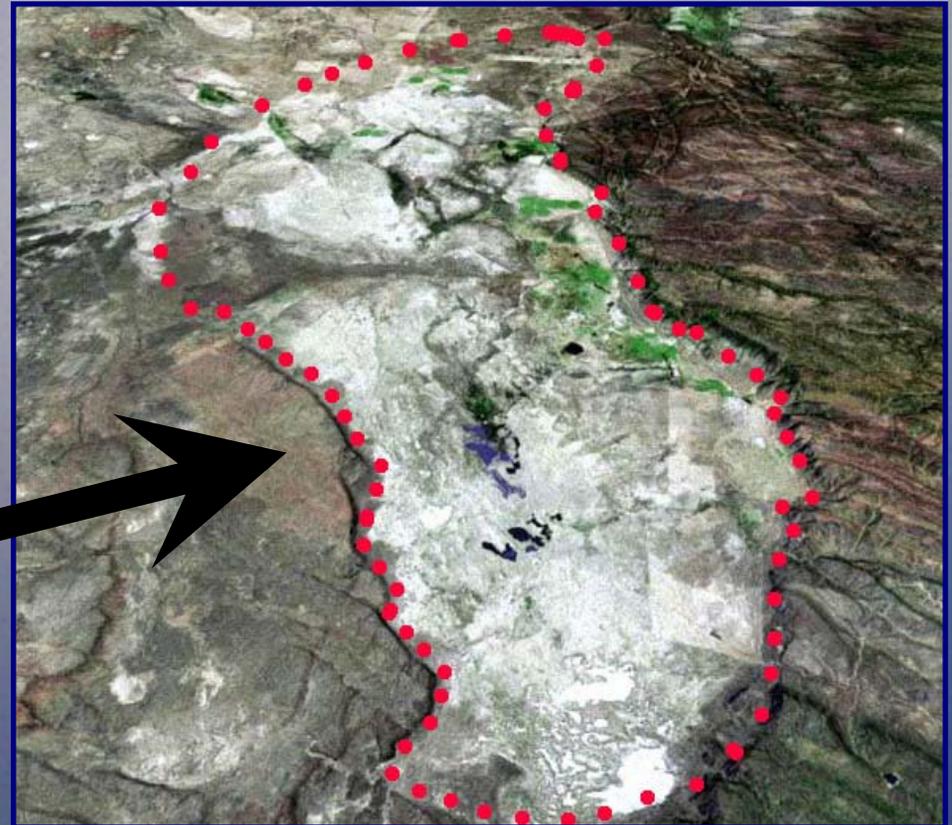
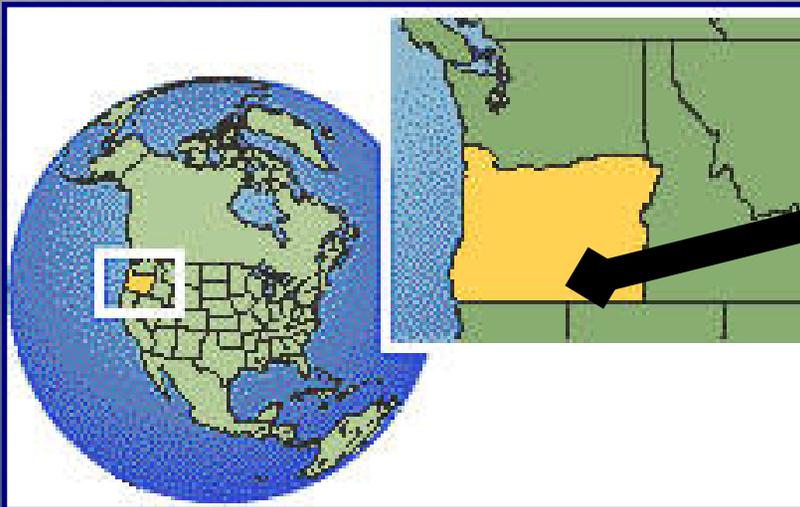


# OVERVIEW

**A rainstorm in the Catlow  
Valley, May 2007**

# THE CATLOW VALLEY

Located between Steens Mountain and Hart Mountain in southeastern Oregon



Catlow Valley:

May 2007



Catlow Valley:

May 2007



**Mickey Basin:**

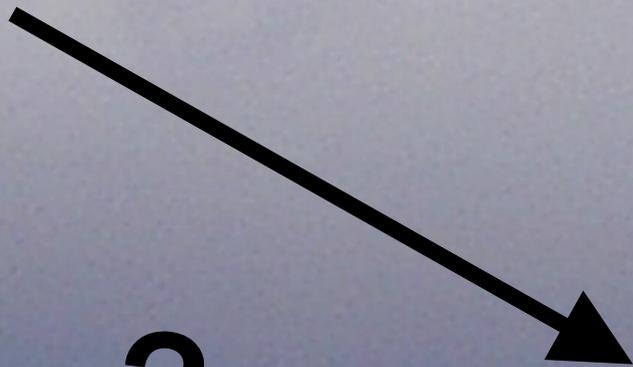
**Excluded from cattle and  
feral horses in 1989, photo  
taken in July 2007**





**Mickey Basin:**

**Excluded from cattle and  
feral horses in 1989, photo  
taken in July 2007**



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# RESEARCH GOALS

- Determine Winterfat Resilience:  
Exclosure Study
- Work towards a state and transition conceptual framework to explain dynamics in vegetation and soil properties
- Verify Framework:  
Well Gradient Study



- **Exclosure Study: 16 Locations**
- **3 Treatments: Cow, Rabbit, and Open**
- **Sampling**
- **2002 Exclosures Established**



# Vegetation

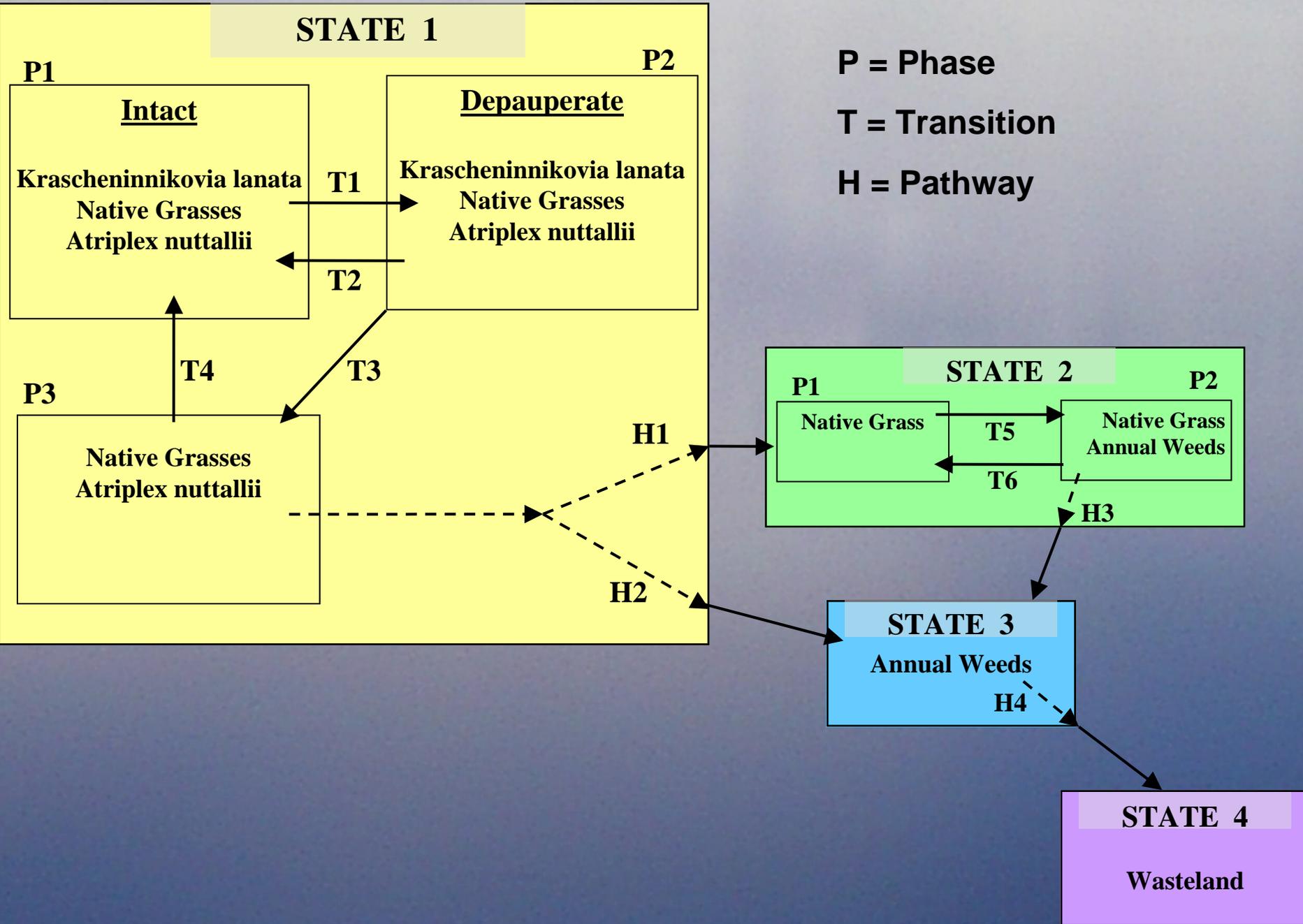


Soil

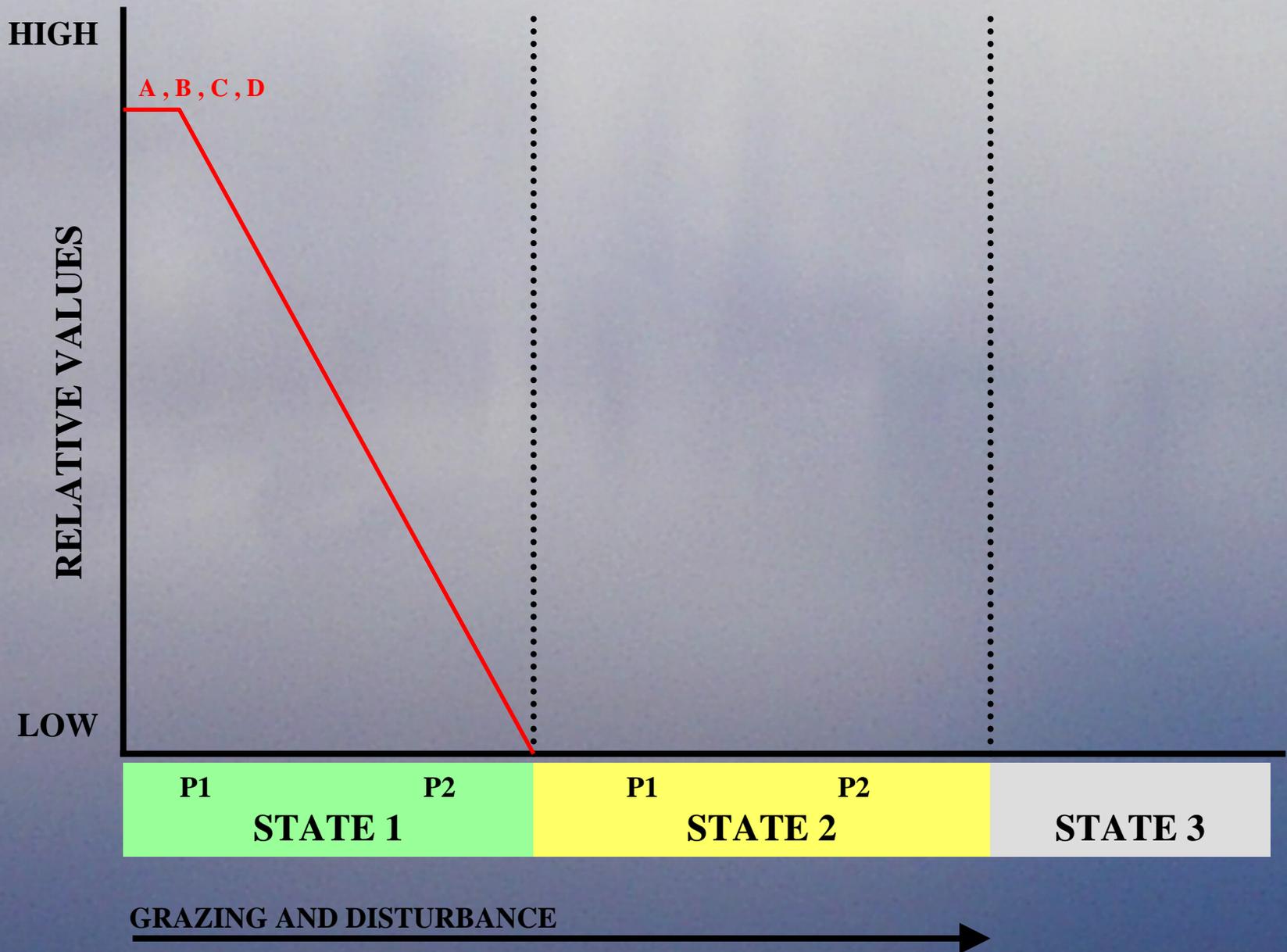


# Hypothesized S-T-M Model 1

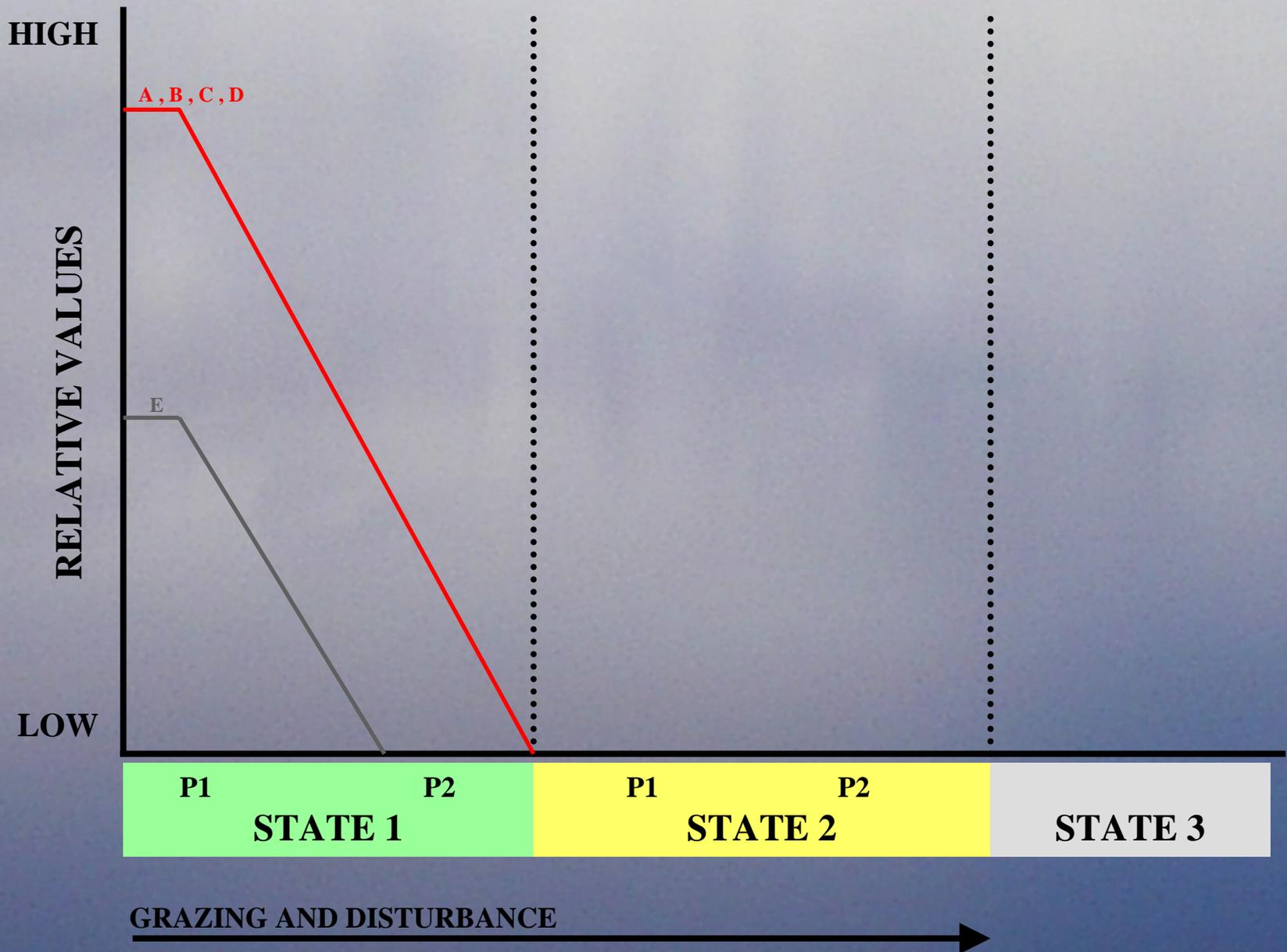
# Lower pH



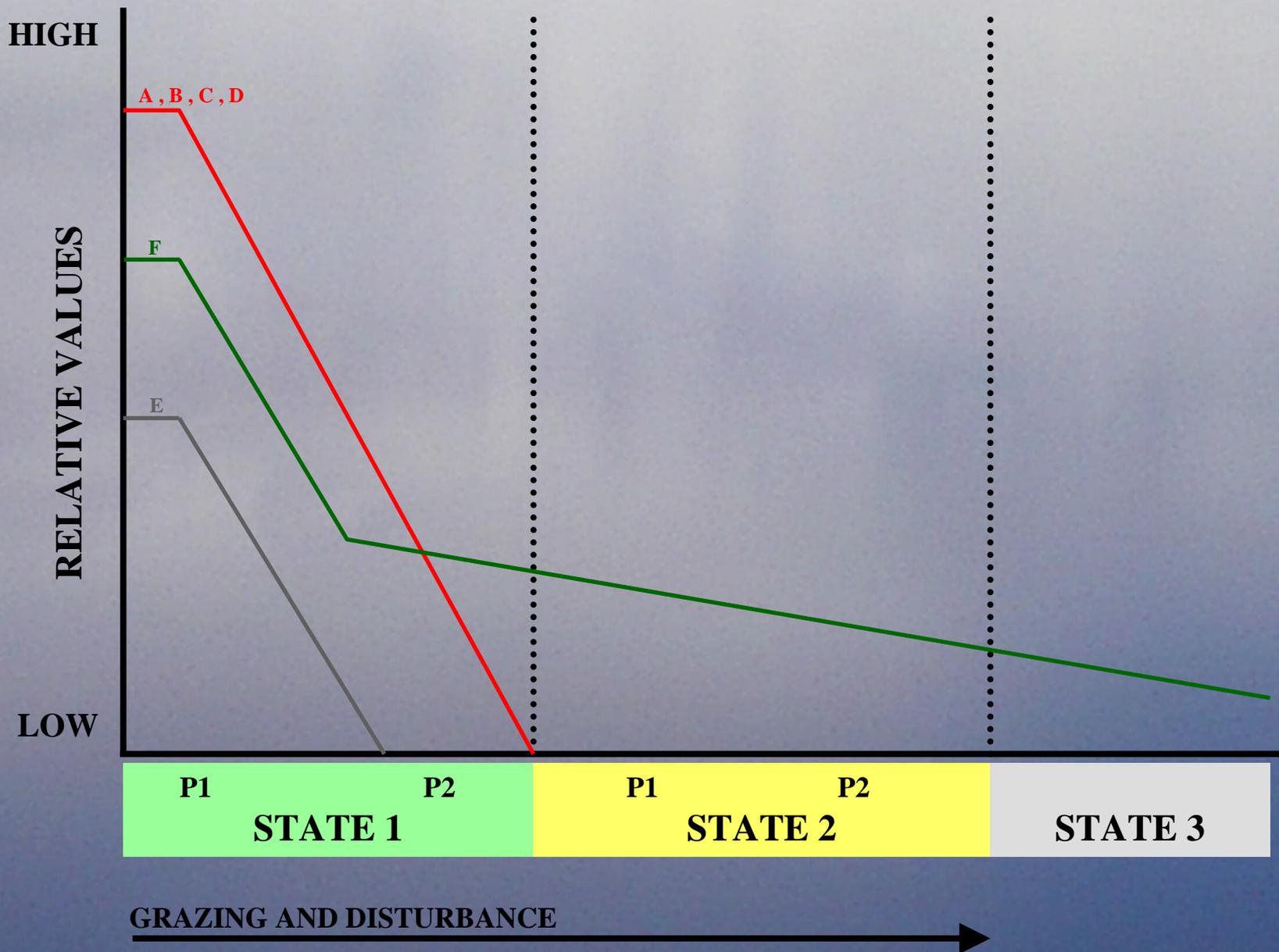
# Model 1 Predictions: Pathway 1



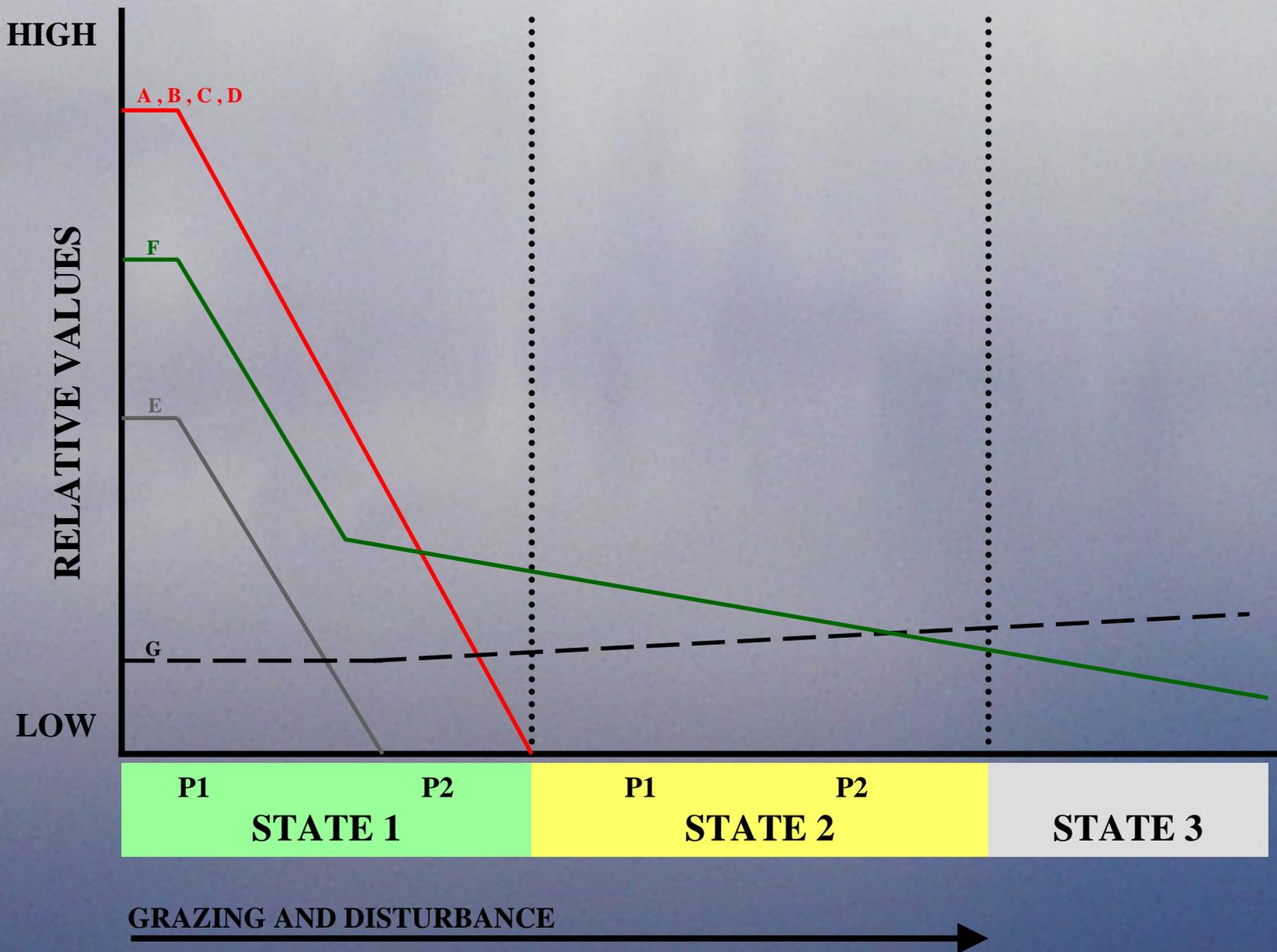
# Model 1 Predictions: Pathway 1



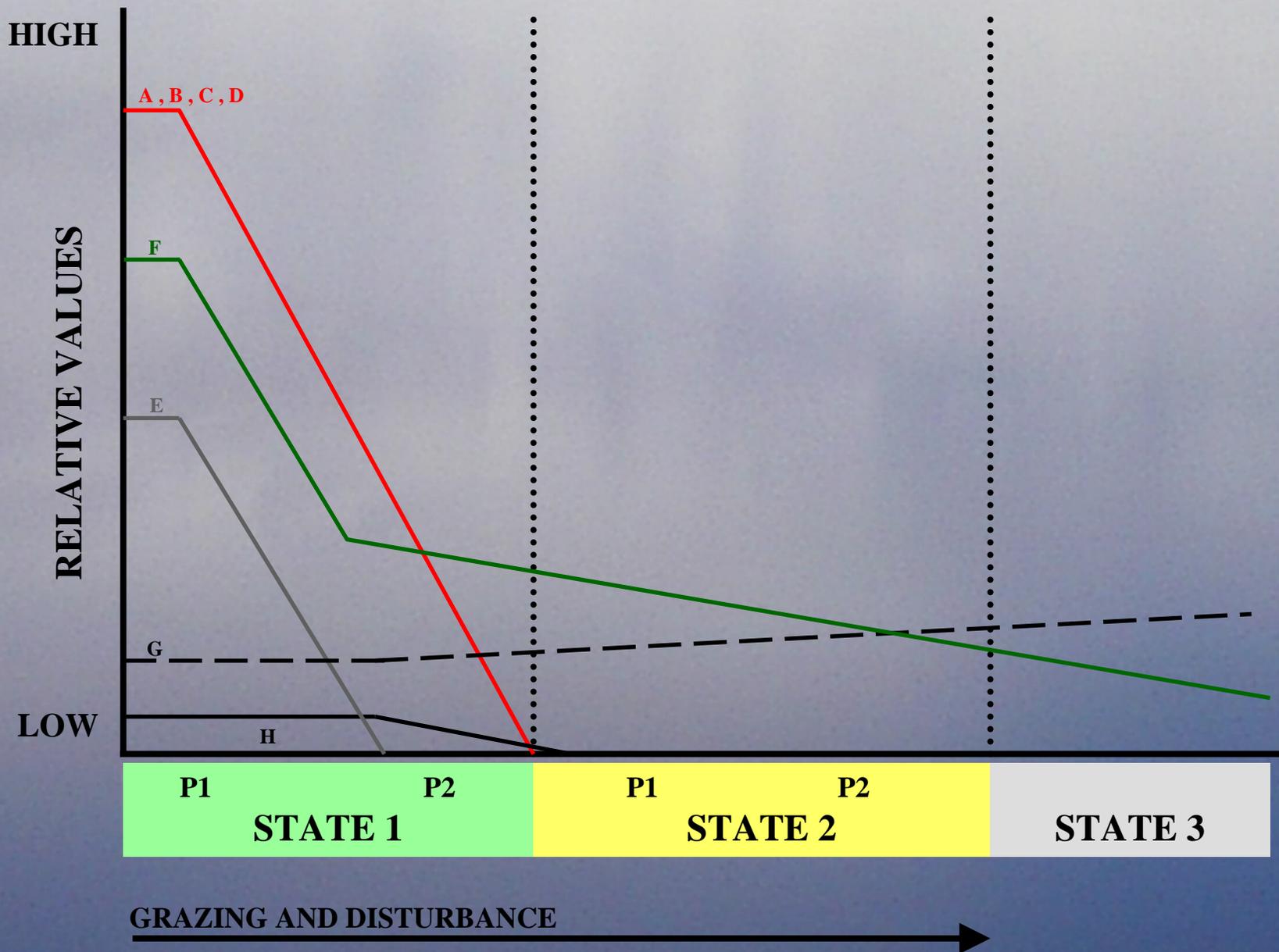
# Model 1 Predictions: Pathway 1



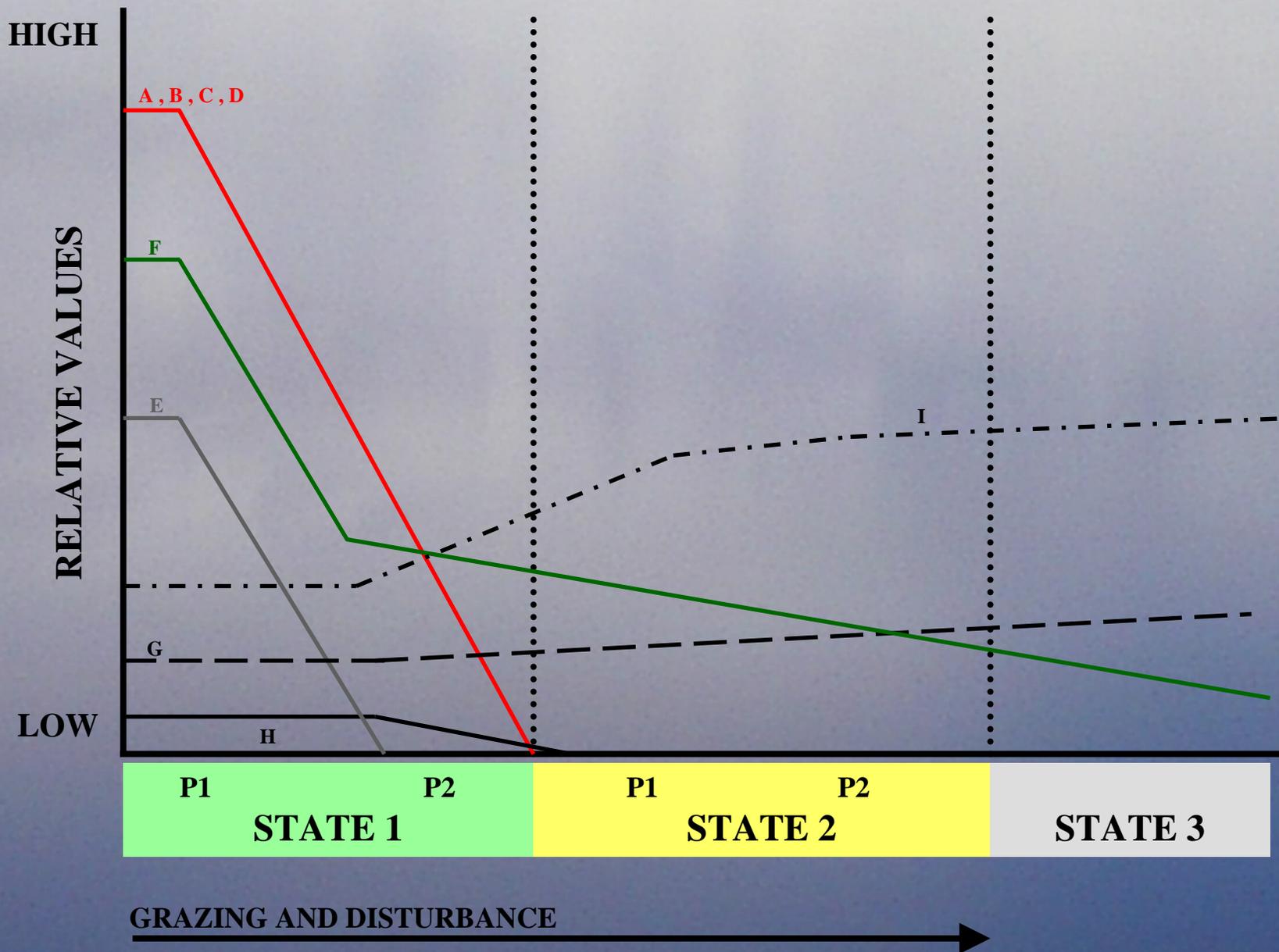
# Model 1 Predictions: Pathway 1



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# Model 1 Predictions: Pathway 1



# Well Gradient Study

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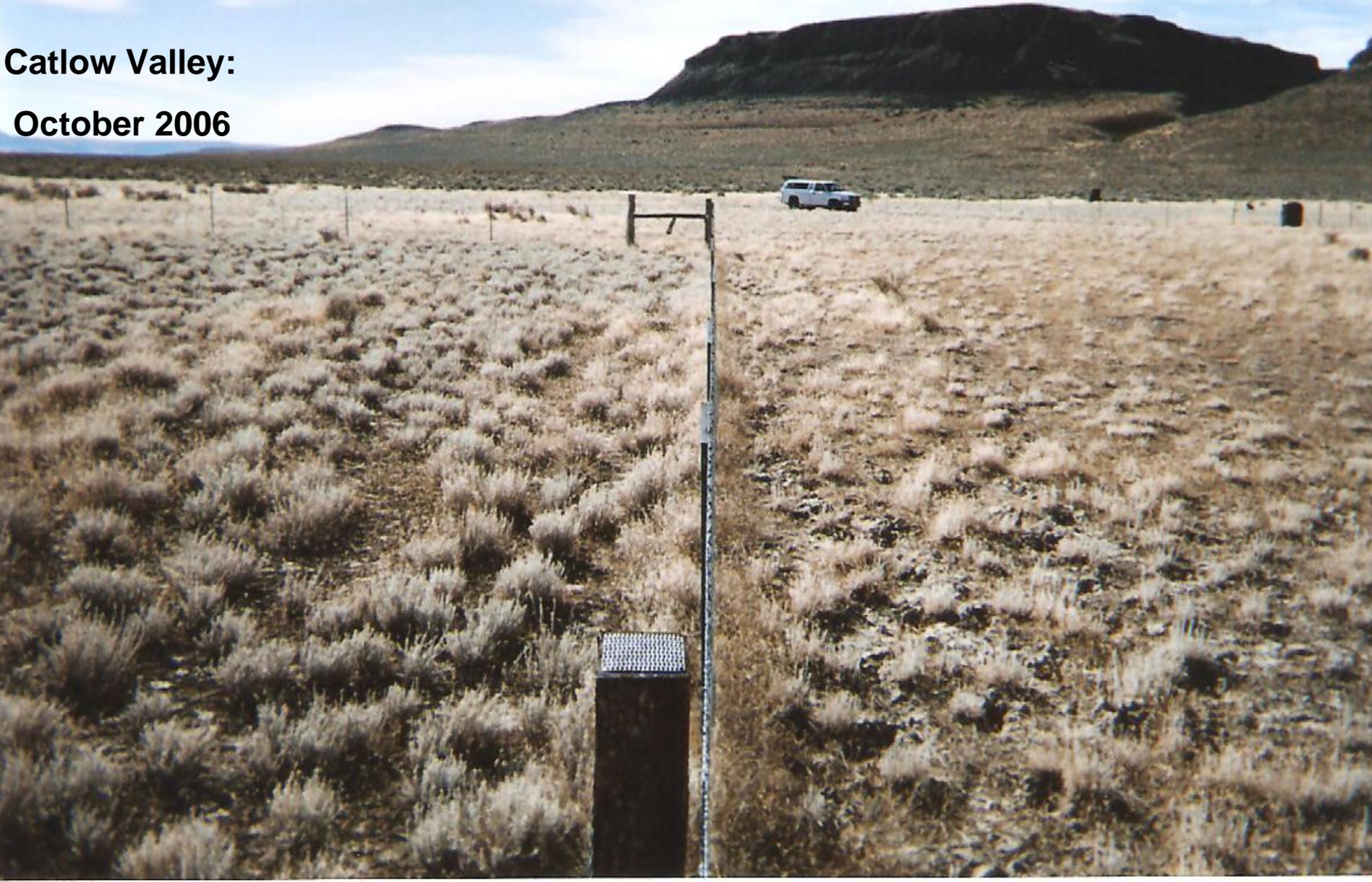
# Well Gradient Study

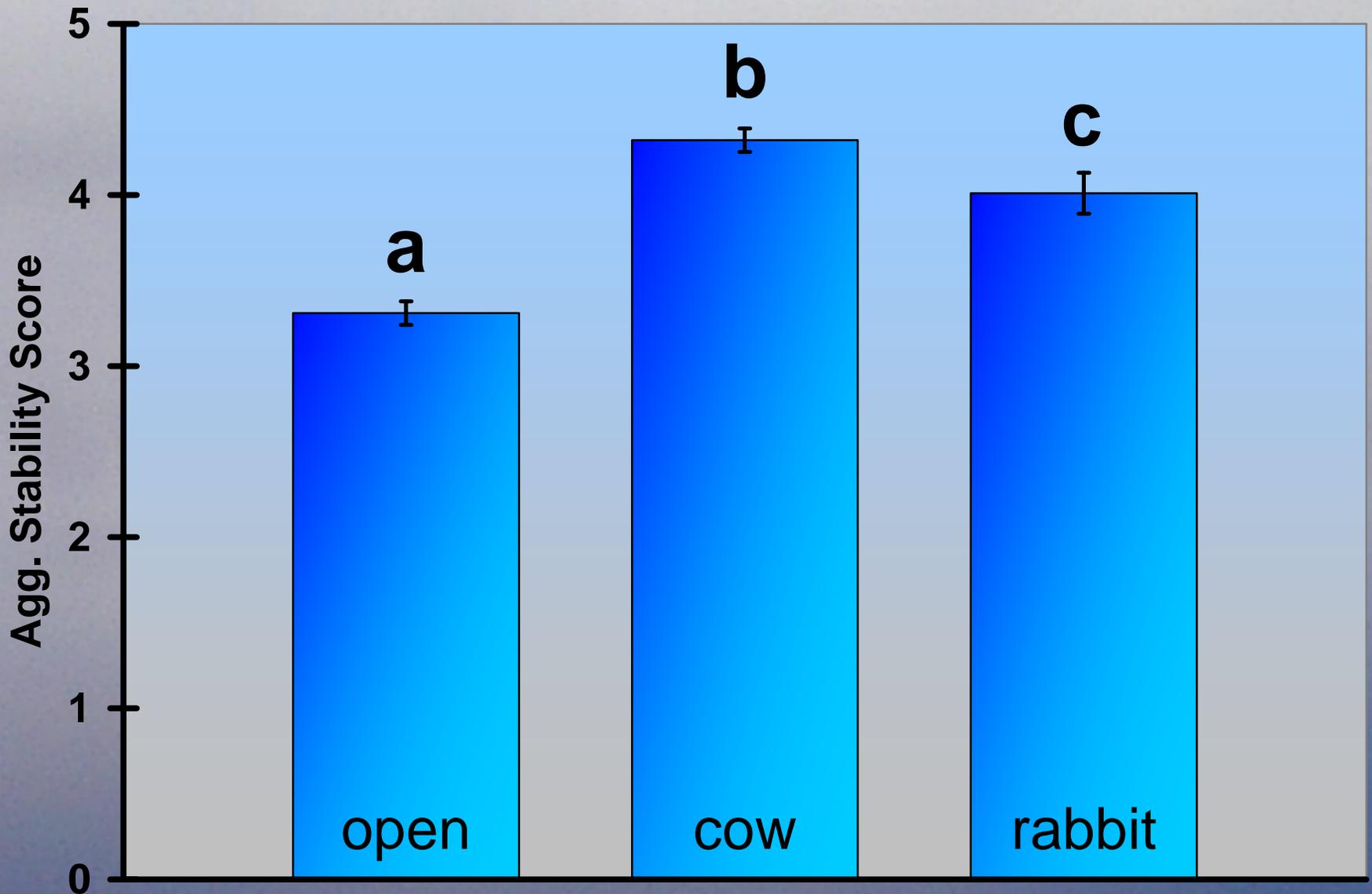


# Early Results From Exclosure Study

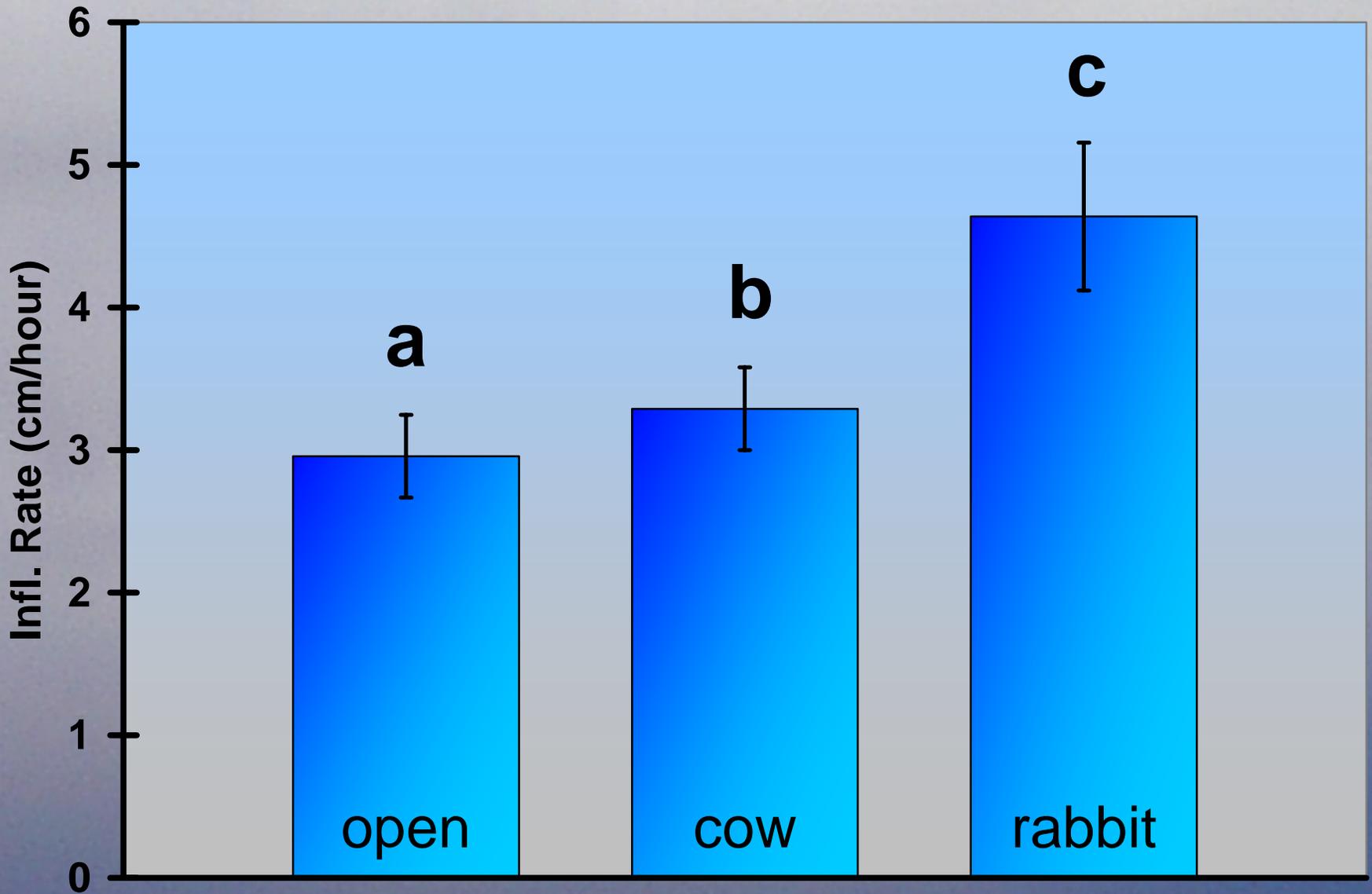
Catlow Valley:

October 2006





Comparison of aggregate stability scores across treatments in 2007. ANOVA  $p < 0.001$  Means and standard errors displayed.



Comparison of infiltration rates across treatments in 2007.

ANOVA  $p < 0.001$  Means and standard errors displayed.



**Mickey Basin:**

**Outside of the exclosure,  
photo taken in July 2007**