

Using State-and-Transition Models to Understand Management Trade-offs: Demonstration of an Interactive STM Simulation Game

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Agriculture

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Roadmap

- Background
- *Play the game!!*
- Debriefing & discussion



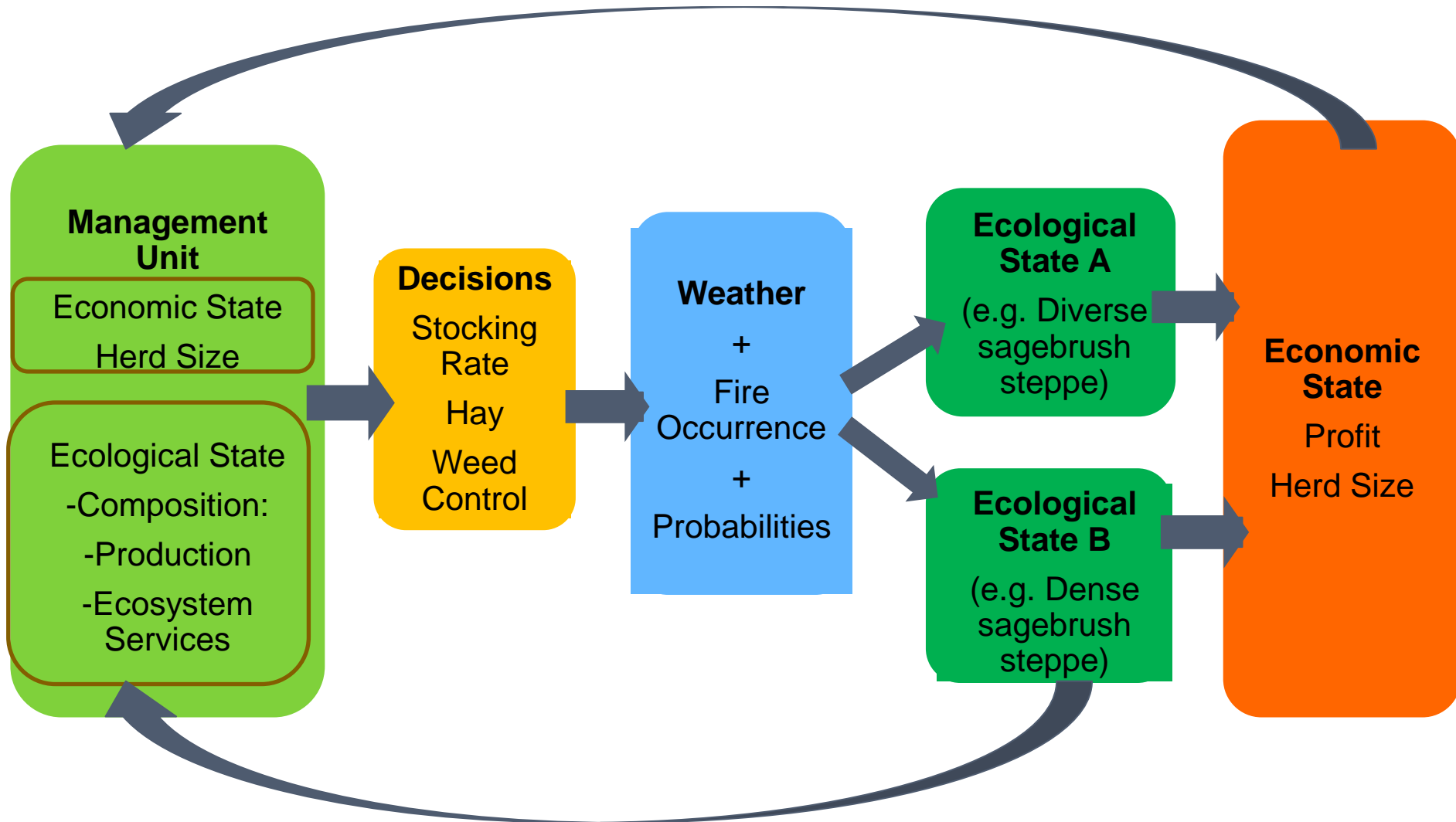
Background

	Never heard of STMs	Heard of STMs but never read or used one	Have read an STM, but not used	Have used STMs
Ranchers (n=411)	69%	20%	9%	2%
Natural Resource Professionals (n=312)	24%	19%	26%	31%

Objectives

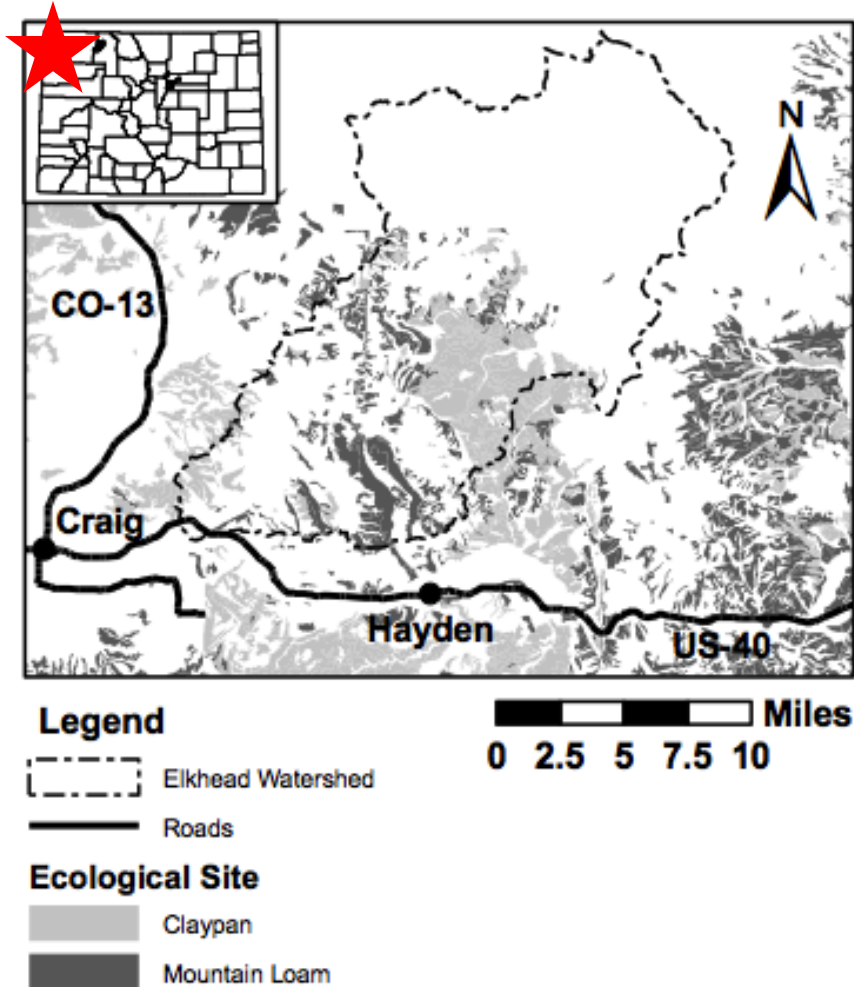
- Create a linked ecological-economic STM at the ranch scale
- Turn ranch simulation model into an interactive game to teach/learn about STMs and management trade-offs

A Coupled Ecological-Economic STM



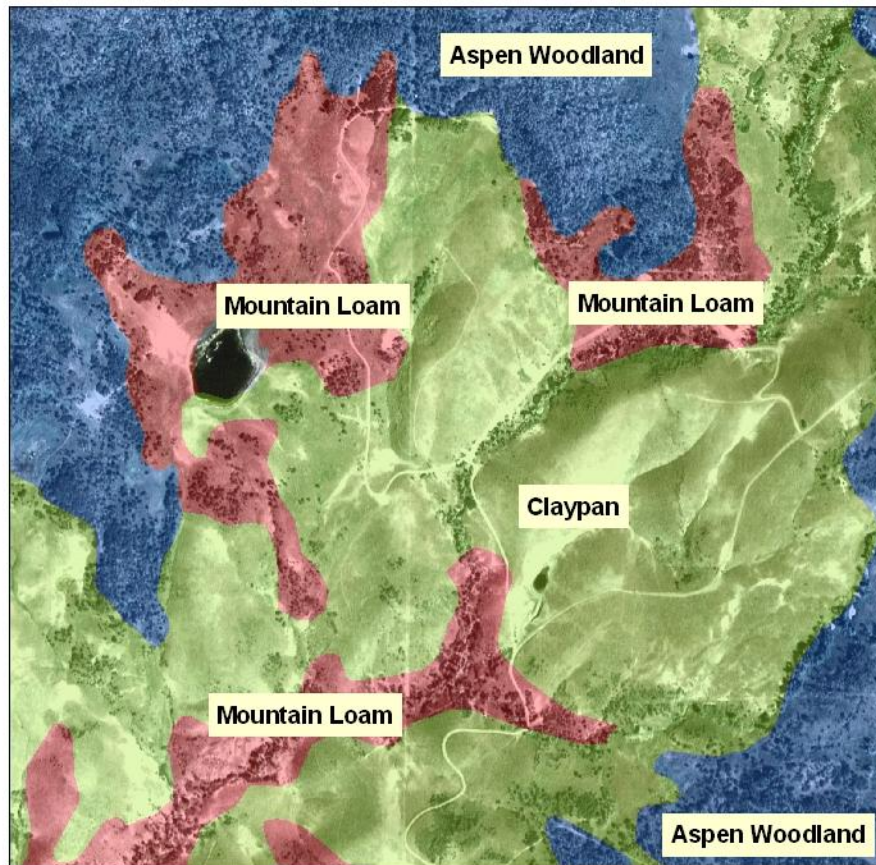
Model Ranch

Elkhead Watershed, NW Colorado

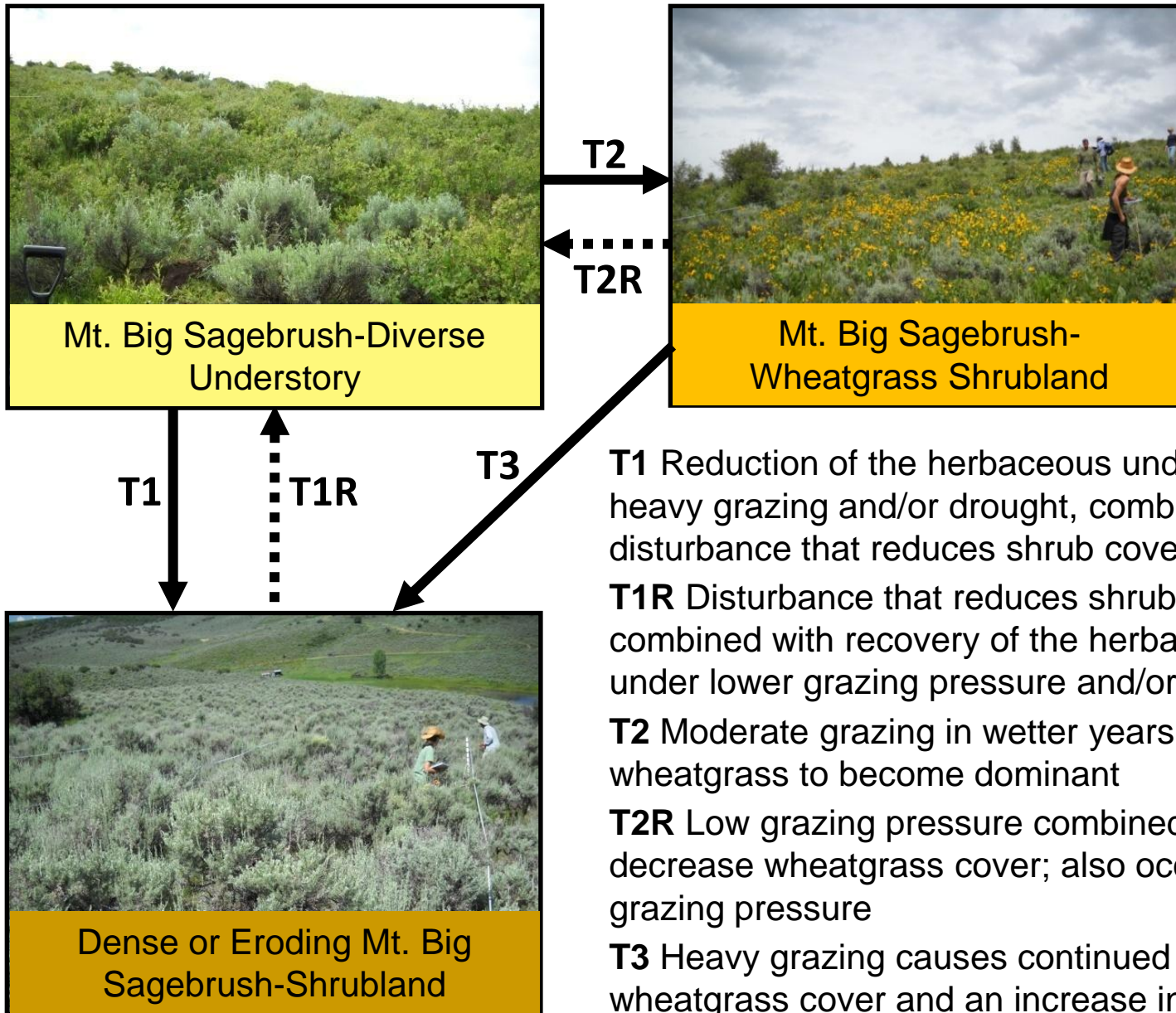


Dominant Ecological Sites

Example Ecological Site Map with Aerial Photo
State and Transition Model Project



Mountain Loam STM-Simplified for Simulation Model



T1 Reduction of the herbaceous understory, caused by heavy grazing and/or drought, combined with lack of disturbance that reduces shrub cover.

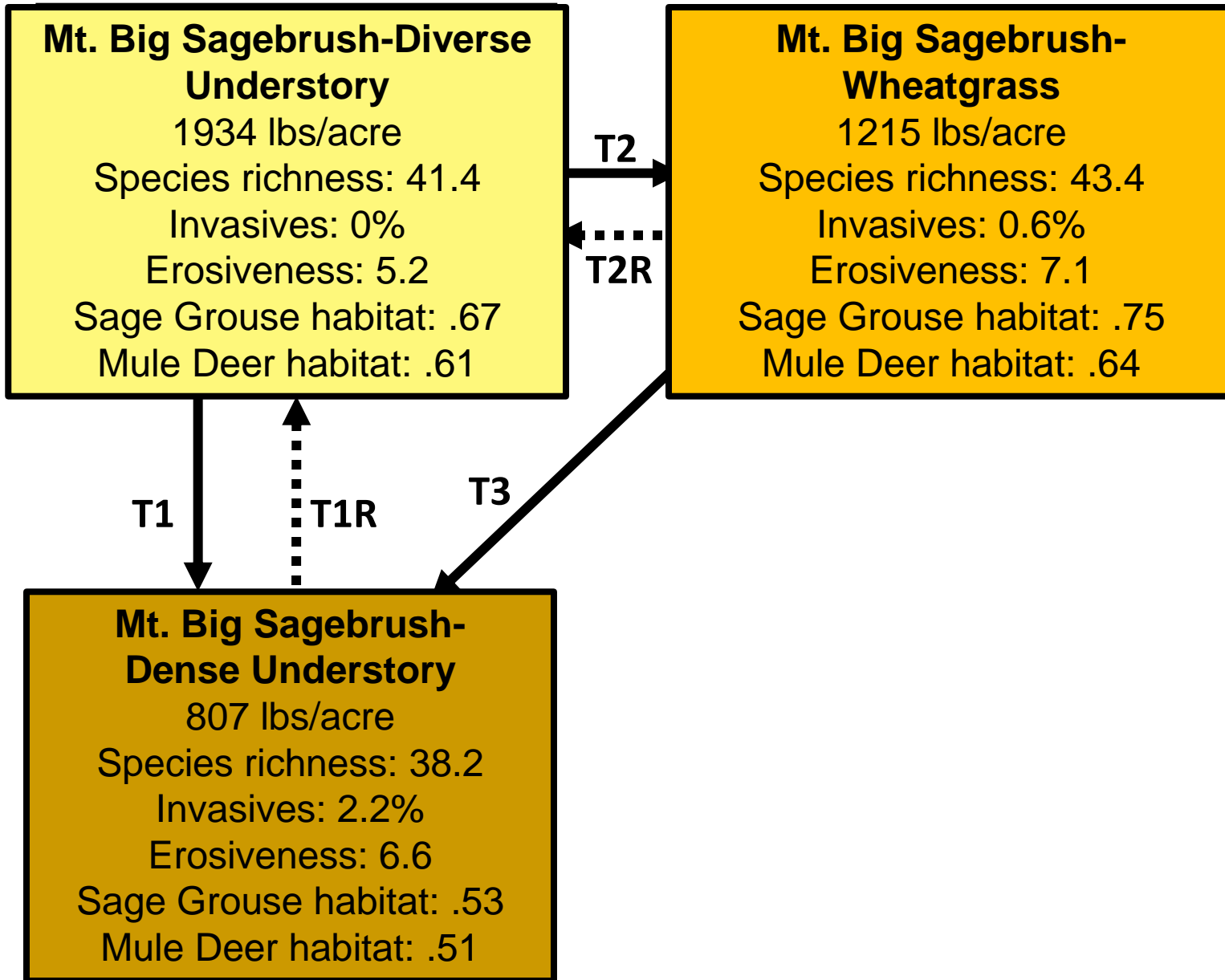
T1R Disturbance that reduces shrub cover (fire, herbicide) combined with recovery of the herbaceous understory under lower grazing pressure and/or more precipitation

T2 Moderate grazing in wetter years allows western wheatgrass to become dominant

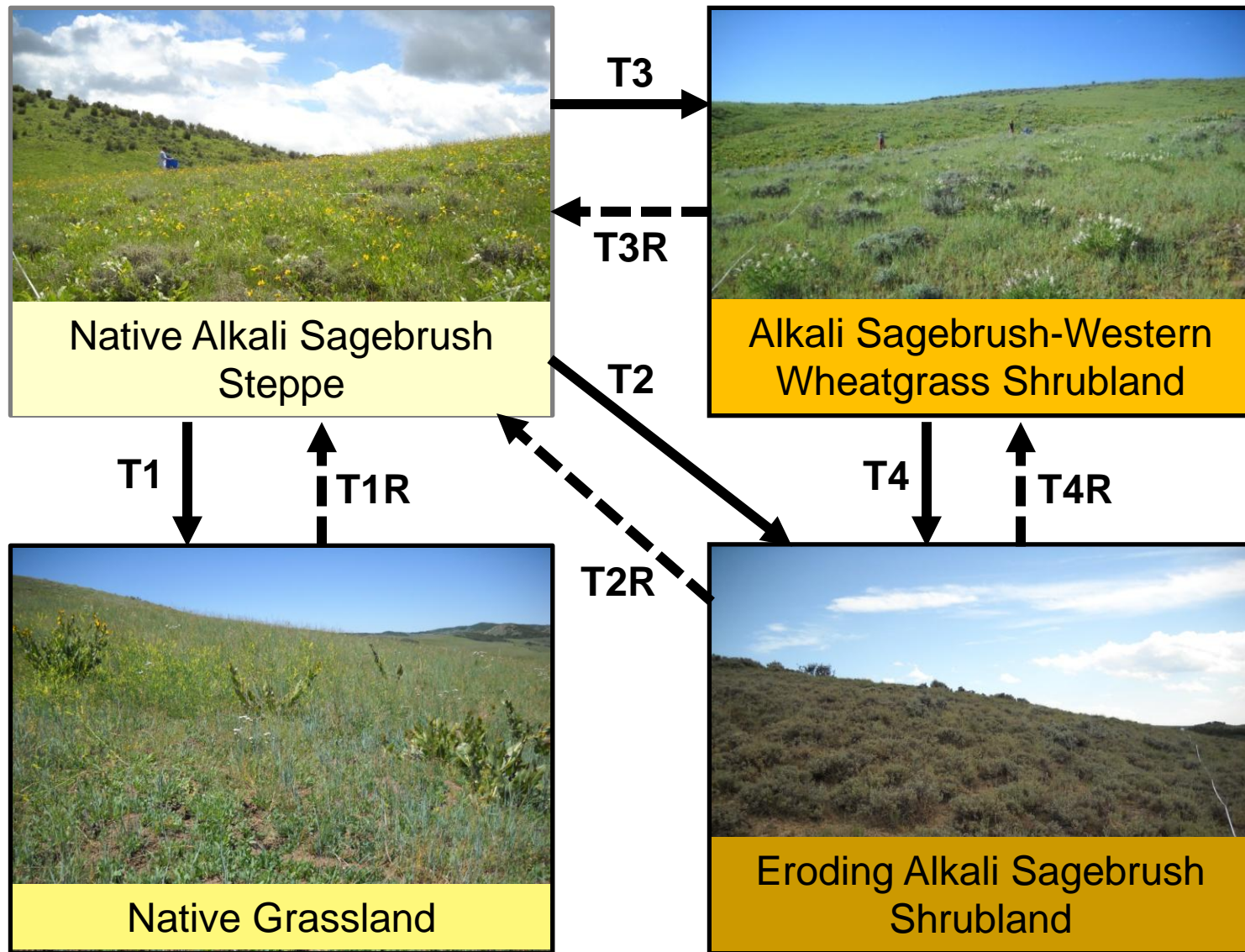
T2R Low grazing pressure combined with drought decrease wheatgrass cover; also occurs under heavy grazing pressure

T3 Heavy grazing causes continued reduction in wheatgrass cover and an increase in shrub cover

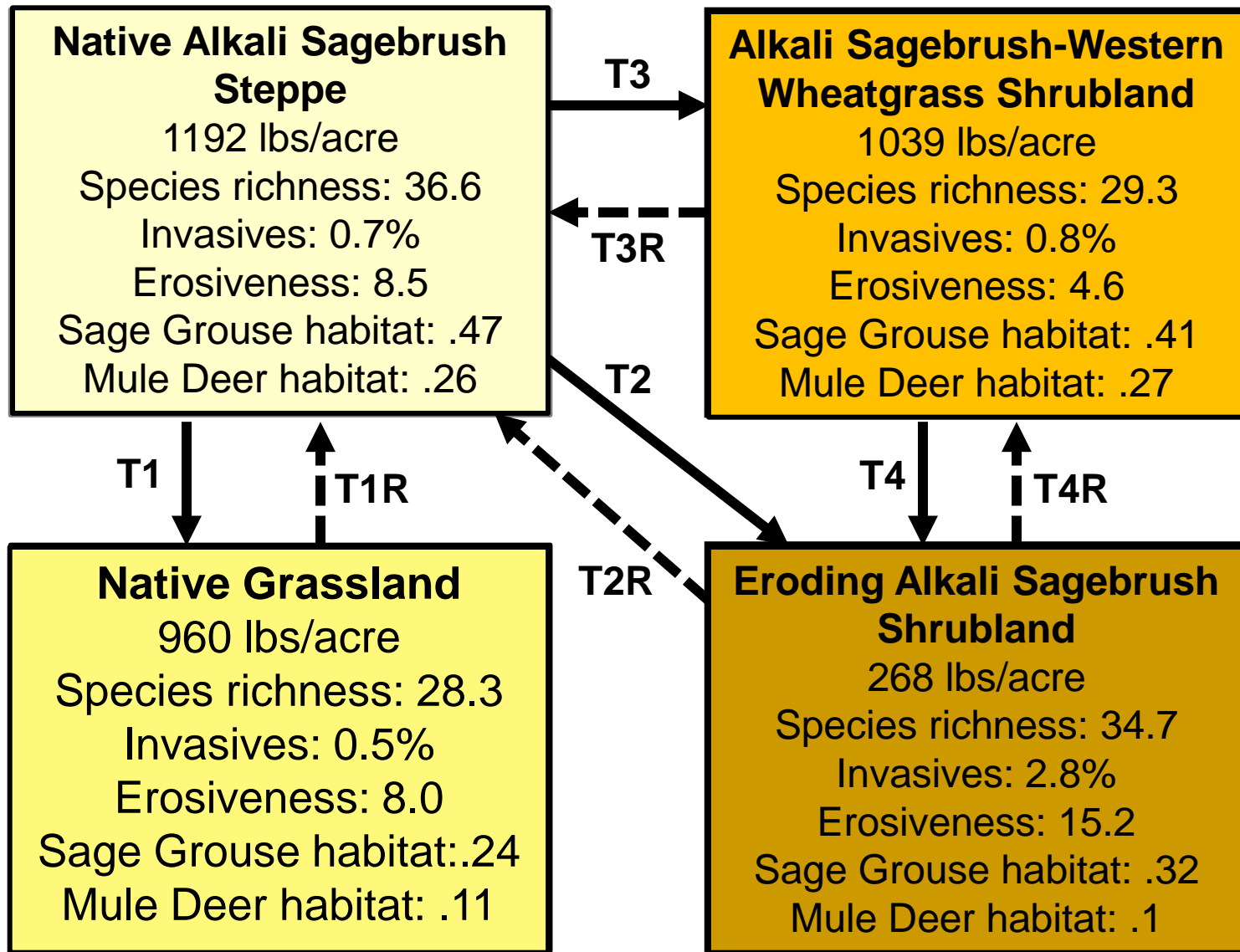
Mountain Loam STM--Ecosystem Services



Claypan STM-Simplified for Simulation Model



Claypan STM-Ecosystem Services



Learning Objectives

- Introduce ecological site & STM concepts
- Demonstrate using STMs to make decisions
- Stimulate thinking about
 - ❖ management trade-offs
 - ❖ ecological-economic feedbacks

Play the Game!!



Debrief

- What were the teachable moments?
- What surprised you?
- Would you use it with your clientele?
Your classroom?
- What improvements would you make?

Thanks!

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Community Advisory Group: Ranchers of the Elkhead watershed and Moffat County, Routt County Extension, Routt National Forest, BLM Little Snake Field Office, CO Division of Wildlife, TNC Carpenter Ranch, NRCS, Community Agricultural Alliance, Tread of Pioneers Museum.

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