



*Intro into Ecological Sites &
Terrestrial Ecosystem Unit
Survey*

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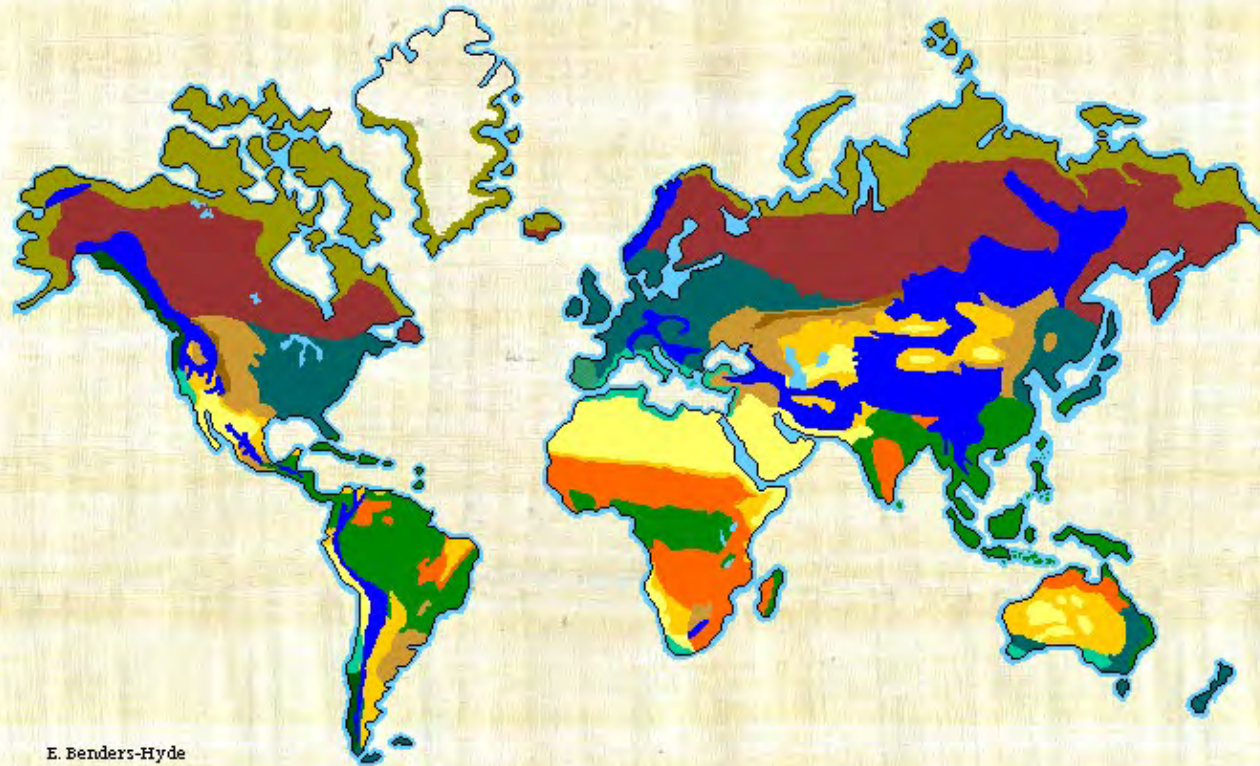
Looking across any
landscape is easy to
recognize that



some landscapes are
different from others in
the kinds and amount of
vegetation




World Biomes




E. Benders-Hyde

 Tundra


 Taiga


 Grasslands


 Deciduous
Forest

 Chaparral

 Desert

 Desert-scrub

 Savanna

 Rainforest

 Alpine

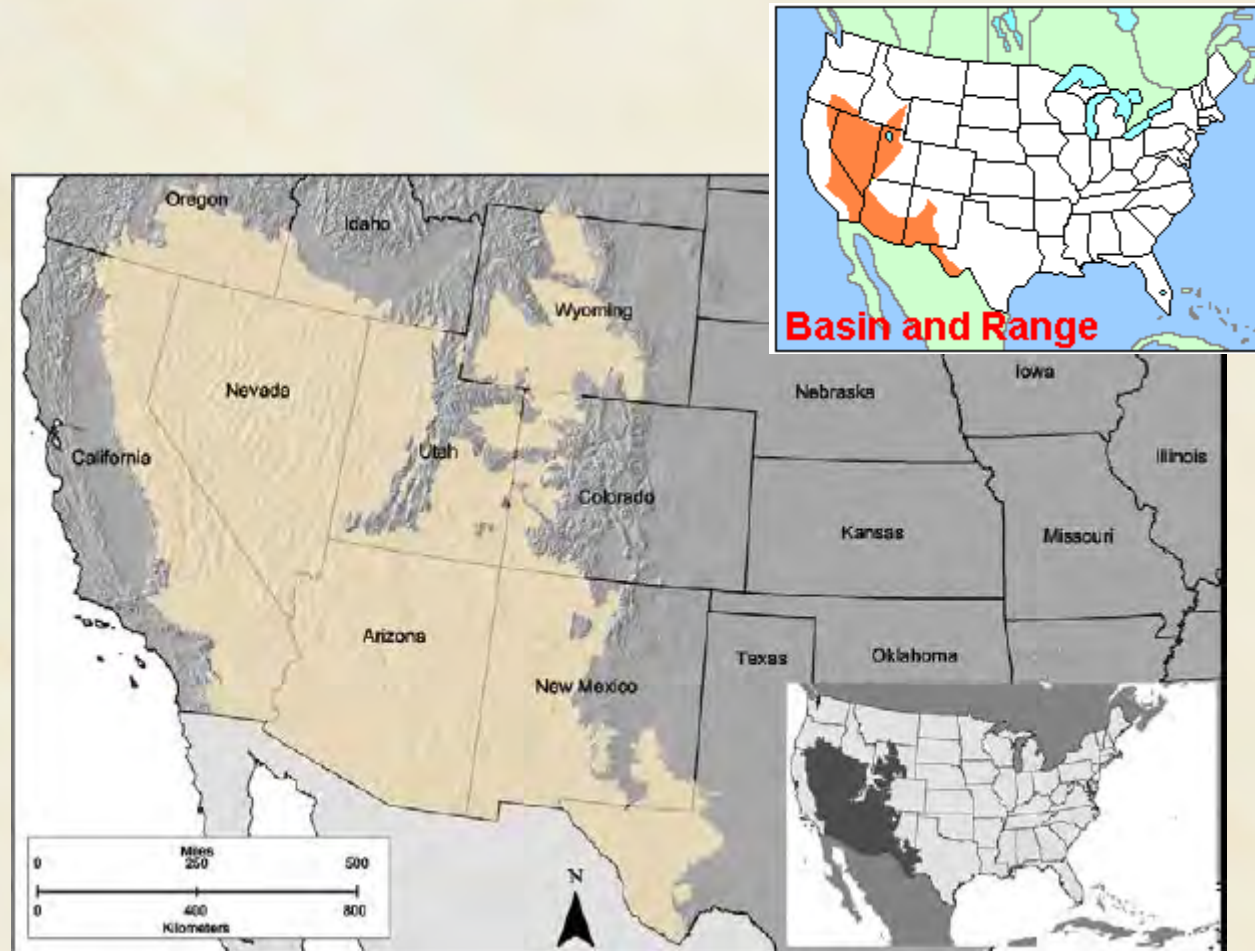


To Begin with...

- Climate, land forms, & soils
 - Land Resource Regions (LRR)
 - Major Land Resource Area (MLRA)
 - Land Resource Units (LRU)



LRR



D – Western Range & Irrigation Region



MLRA



D38 – Mogollon Transition



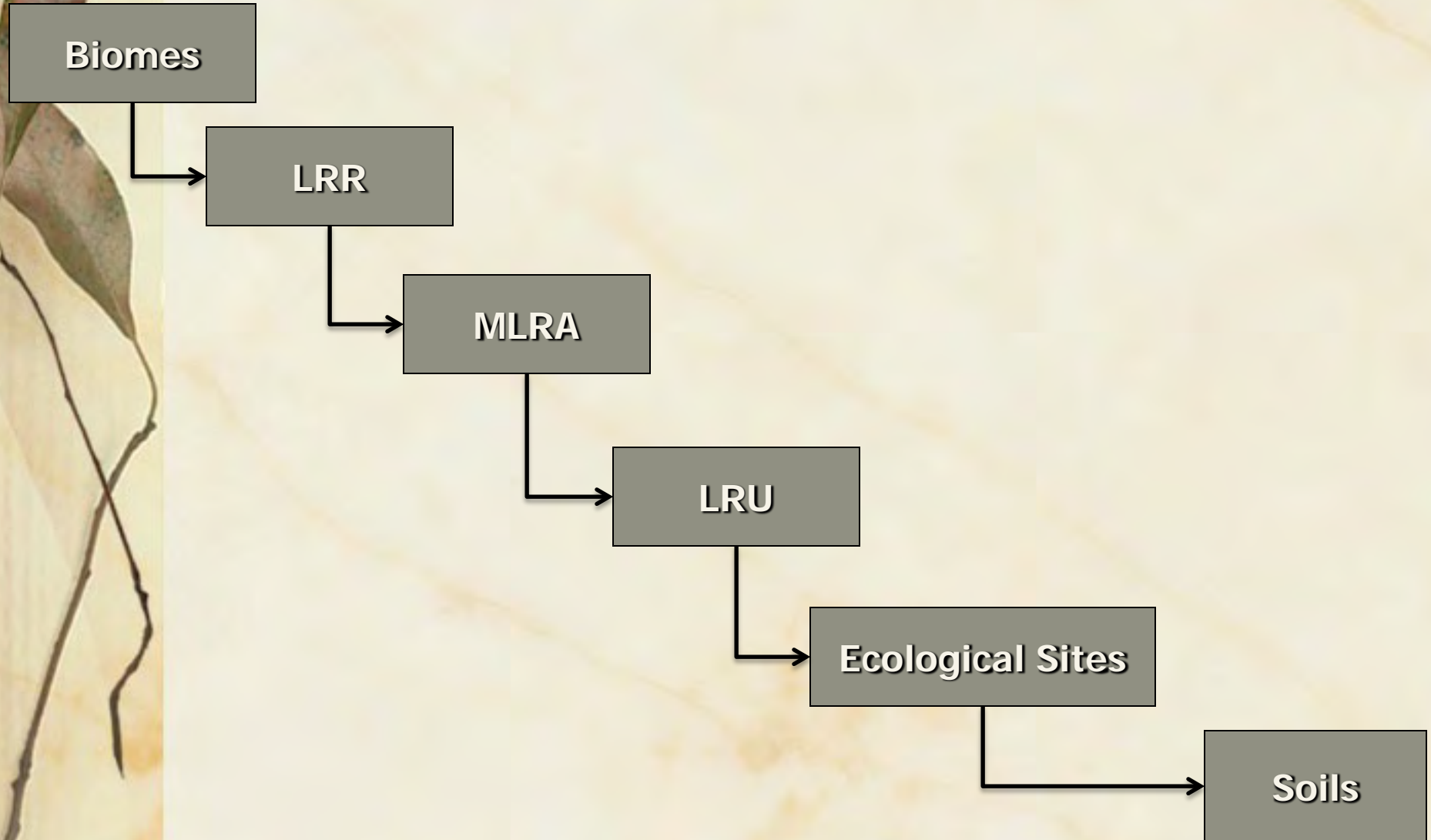
LRU



D38-1 – Lower Interior Chaparral



Land Stratification



What is an Ecological Site?

A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation, AND it's ability to respond to management actions & natural disturbances.



Simpler terms...

Ecological Sites divide landscapes into basic units for study, evaluation and management.

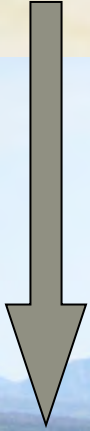


Ecological Sites

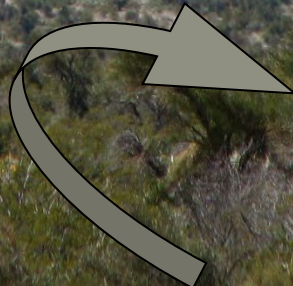
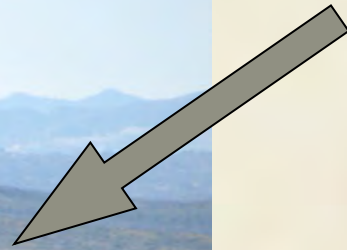
- Geology
- Climate
- Soils
- Land setting (topographic position)
- Response to natural disturbances & management actions



Volcanic Hills



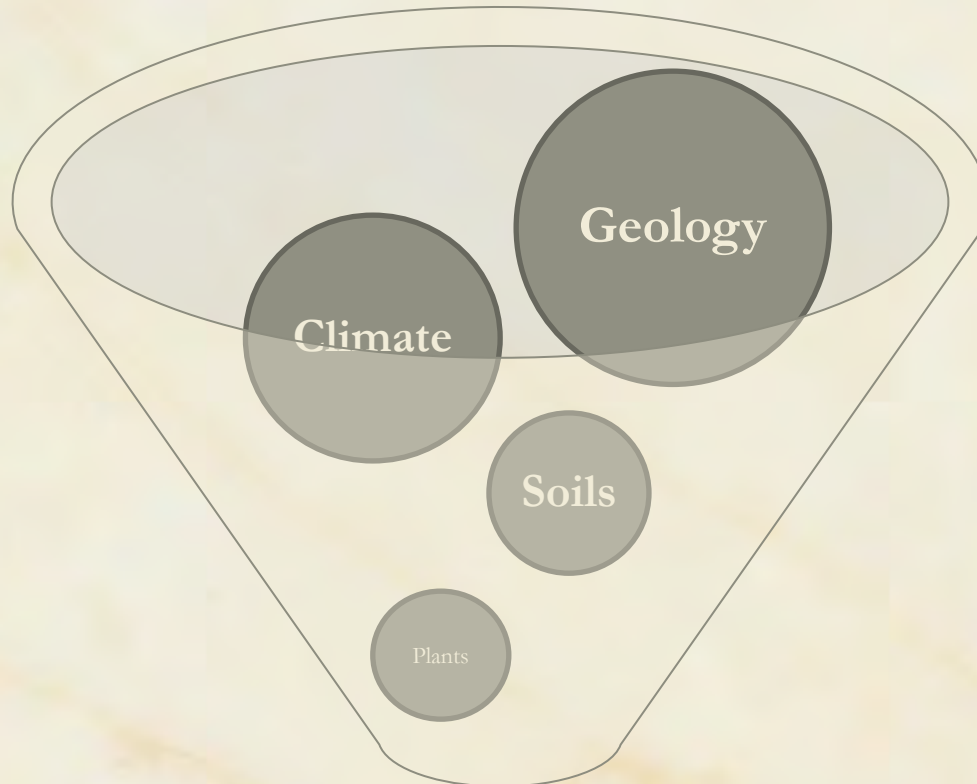
Clayloam Upland



Limestone Hills



We have all this info. Now what?



**Ecological Site Description
(ESD)**



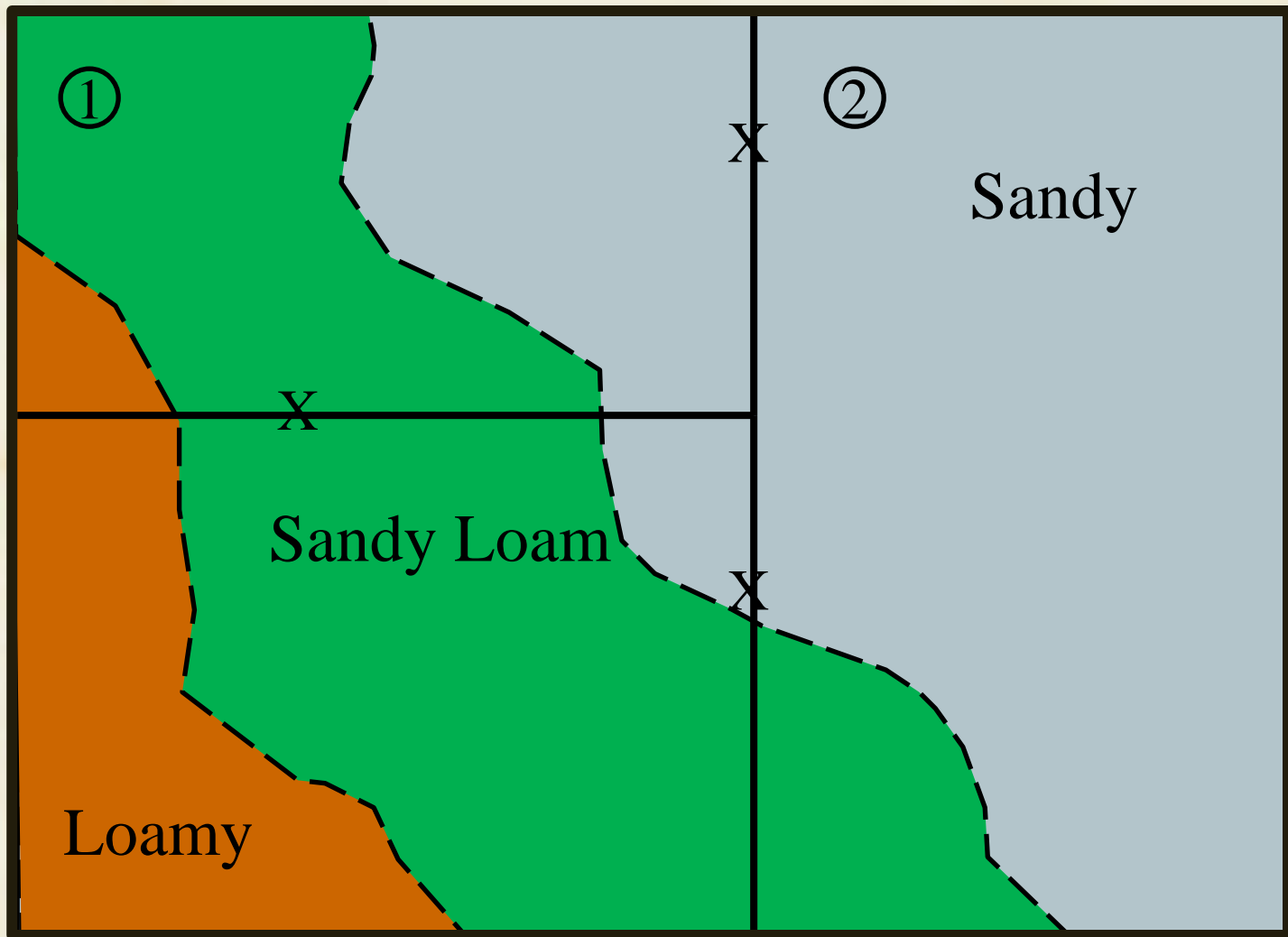


Ecological Site Descriptions (ESDs)

- Report provides detailed info on a specific ecological site
- Describes ecosystem structures, functions, and dynamics
- Communicate similarities of soils, vegetation and processes
- Aids in management expectations
- Help determine appropriate goals



Benchmark and Alternatives



Ecological Site Descriptions (ESDs)

- 4 major sections
 - Site Characteristics
 - Plant Communities
 - Site Interpretations
 - Supporting Information



Site Characteristics

- Physiographic
 - Landform, slope %, elevations, runoff class
- Climate
 - Frost-free days, freeze-days, max/min temps, avg. ann. precip.
- Soil
 - Parent materials, surface/sub-surface textures, EC, AWHC
- Water features
 - Streams, water table



Plant Communities

- Vegetation states
 - HPC (Historic Plant Community)
- Species composition
 - Based on annual production
- Ecological dynamics



Interpretations

- Wildlife/livestock plant preferences
- Recreational Uses
- Wood Products
- Other's
 - Medicinal plants, seed harvest.....



Supporting Data

- Methods used for sampling
- Data locations
- # of sites used to develop concepts and ESD



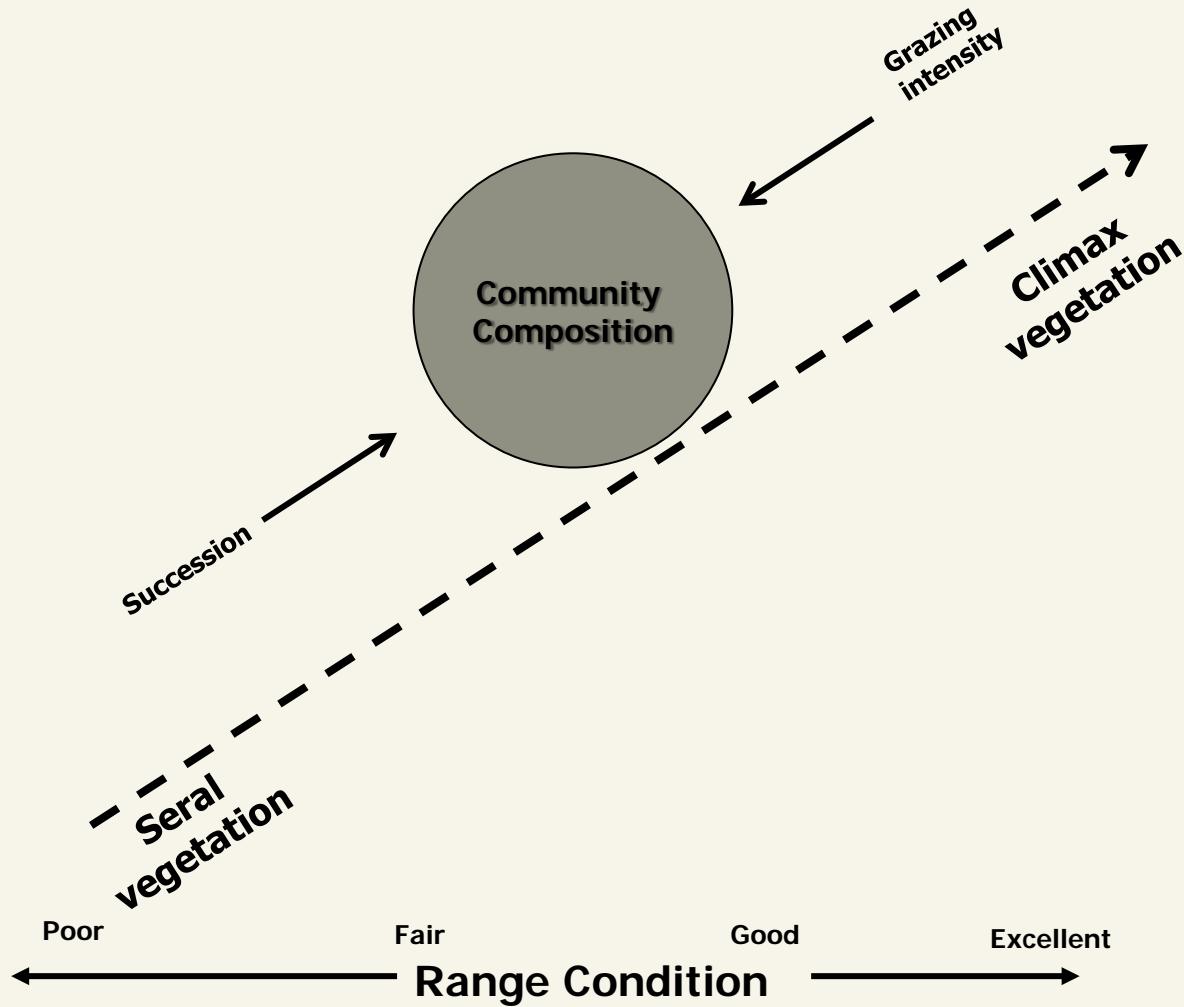
Back to Plant Communities

- Vegetation states
- Species composition
- Ecological dynamics

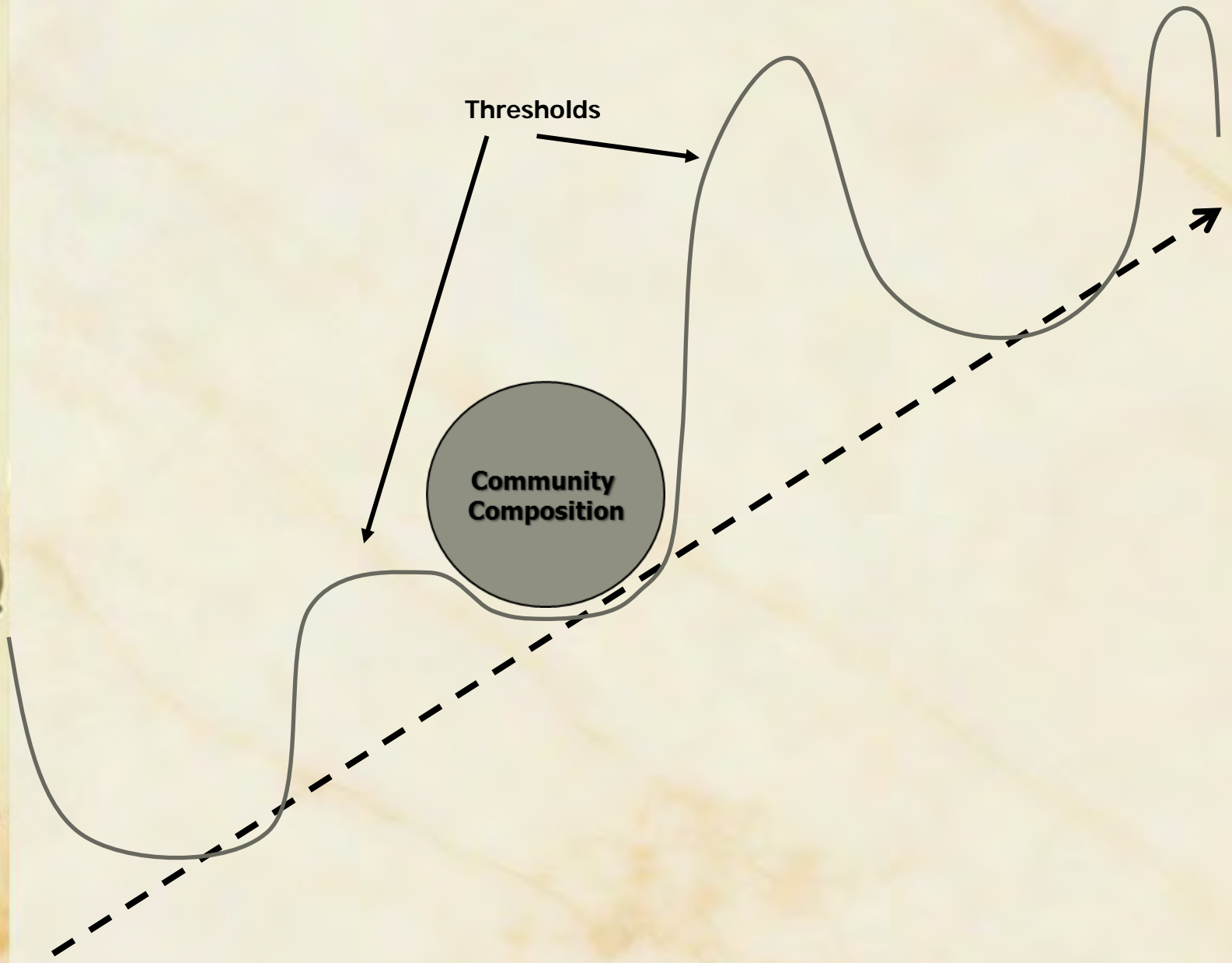


Community Dynamics

Clementsian Theory









On any given ecological site...

- Management can drive a plant community in one direction or another as a result of changes in soil chemistry, hydrology, soil structure, competition and other ecological factors
- Patterns of cause and effect can be used to describe ecological dynamics in a useful manner



Upland Ecological Site Grassland





Upland Ecological Site





Trees, Native grasses

Upland Ecological Site



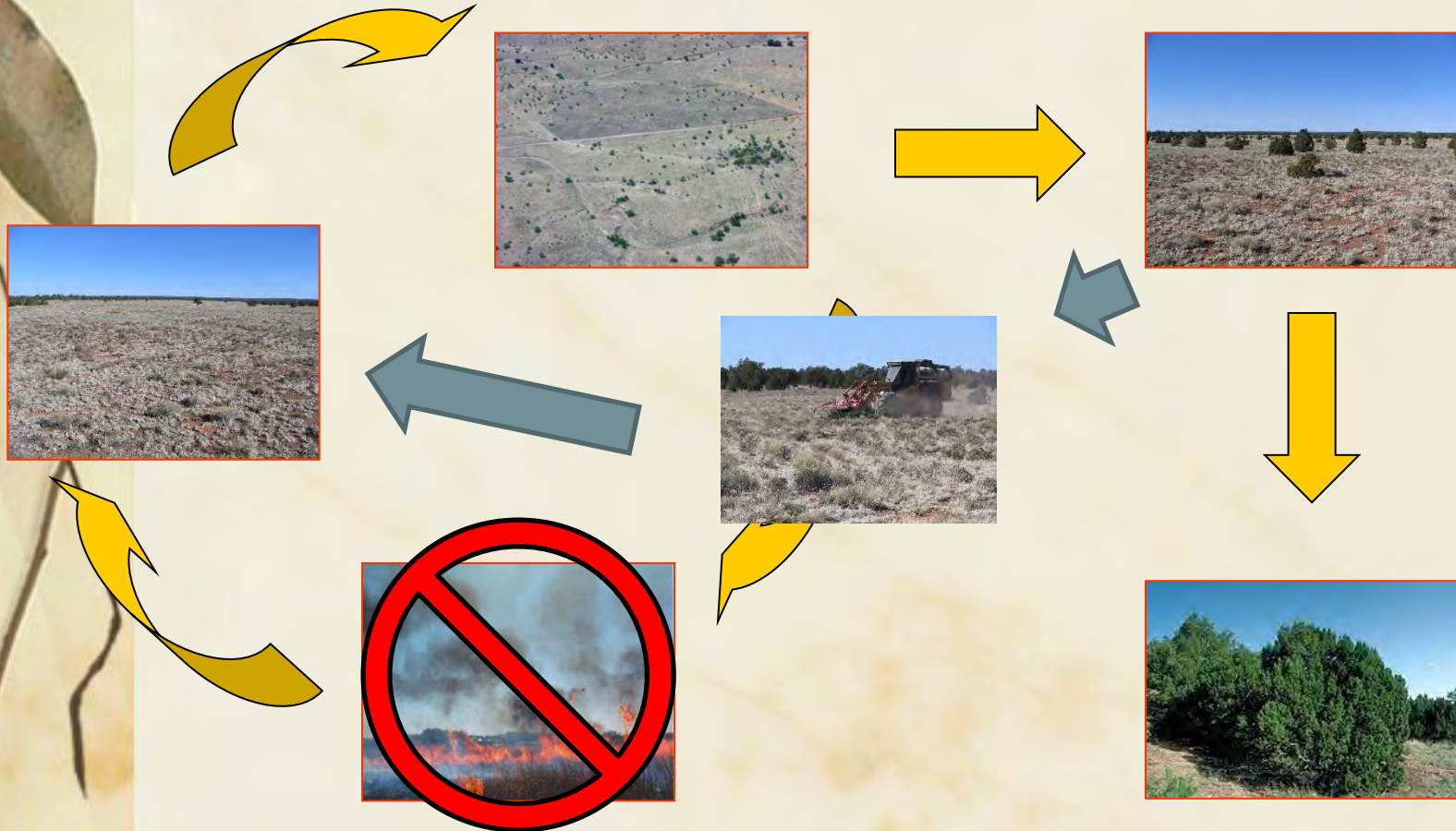


Dense/Mature trees, increased bare ground

Upland Ecological Site



Upland Ecological Site



How ESDs Help.....

- Understanding ecological processes can highlight opportunities for improvement
- Recognizing indicators of healthy ecological conditions provides positive feedback (rangeland health evaluation)
- Recognizing susceptibility to degradation can help avoid problems (monitoring)
- Assess & evaluate



How do you know which Ecological Site?

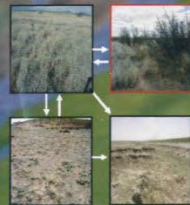
- Soil Survey
- Web Soil Survey
- Ecological Site Key's
- Expert knowledge
 - Ecological Site Specialist
 - Area Range Specialist
 - State Range Specialist
- Ground Truth!



Rangelands

Society for Range Management
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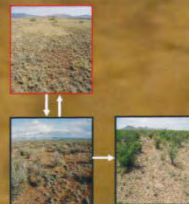
Draw
Shrub Invaded Grassland



Gravelly
Shrub Savanna



Gravelly Loam
Shrub Savanna



Hills
Shrub Savanna

Ecological Sites



TEUI Interpretations

- Productivity Potentials
- Potentials
- Source Suitability
- Limitations
- Hazards
- Soil Properties
- Soil Loss Rates
- Vegetative Ground Cover
- Current Surface Cover
- Quantitative Plant Community Descriptions



Map Unit Legend

Map No.	Unit Comp.	Soil Name or	Phase	Climate Class	Veg. Symbol	Slope/Compositio Climax/Kind of Ml
154	1	Udic Haplustalfs clayey-skeletal frigid smectitic	MD ST SL	HSC5-1	PIPOS/PIED/JUMO/QUGA	15-40 % 45 % Primary-Edaphic CM
154	2	Udic Haplustalfs fine frigid smectitic	MD ST SL	HSC5-1	PIPOS/PIED/JUMO/QUGA	15-40 % 40 % Primary-Edaphic CM
154	5	Udic Haplustalfs fine-loamy active frigid mixed	MD CB SL	HSC5-1	PIPOS/PIED/JUMO/QUGA	15-40 % 10 % Primary-Edaphic CM
154	6	Udic Haplustalfs loamy-skeletal active frigid mixed	MD CB SL	HSC5-1	PIPOS/PIED/JUMO/QUGA	15-40 % 5 % Primary-Edaphic CM



Map Unit Setting Data

Table 2. Map Unit Properties For Region 3 Terrestrial Ecosystem Survey USDA-FS, R-3 Date 11/21/200 Page 80

Map Unit No. Comp	Landscape Features						Potential Plant Community (canopy cover)								
	Landform:	Structural Domes (Undiff)-Structural-Tectonic					Tree	%	Shrub	%	Forb	%	Gram	%	
154 1		Elevation: 2200-2500 Meters					Climax Class: Primary-Edaphic								
		Slope:					JUDE2	3	CEFE	1	ACMI2	0	BLTR	3	
		Gradient: 30 % 20 Meters					JUMO	2	CEMO2	2	ANRO3	0	BOGR2	5	
		Aspect: Includes all aspects					JUSC2	2	GUSA2	1	ARCA14	1	CAREX	2	
		Shape, Plan: Convex					PIED	10	QUGA	5	BADI	0	ELEL5	0.5	
		Shape, Section: Convex					PIPOS	15	QUPA4	2	ERFL	0	KOMA	1	
		Precip.: 46-56 Cm Bedrock: Sandstone							YUBA	0.2	ERJA	0.2	LYPH	2	
		P.M.Kind/Orign: Residuum derived from claystone, shale, sandstone							YUGL	0.1	HECA8	3	MUMO	2	
		Condit- Surface Components Canopy										HYFI	0.2	POFE	1
		RkFrg	BSoil	Litter	VegBA	OvStry	Ht					IPAG	0	SCSC	5
		Current:	50 %	15 %	25 %	10 %	35 %	4 m				LOWR	0		
		Natural:	50 %	5 %	55 %	15 %	50 %	4 m				LUKI	0.2		
		Notes:													
		A low soil bearing strength, rock fragments in the subsoil, slope and bedrock at depth between 50 and 100 centimeters somewhat limit use and management. Erosion hazard is moderate.													



Map Unit Interpretations

Map unit
No. Comp.

154 1

Production Potentials For

Pipos	Psmeg	Pien	Hb/Wd	Forg.	ForgM	Fuel/Wd
<----- Site Index ----->			<----- lb/ac/yr ----->		cd/ac	
55			800	175	2000	4

<----- Potential For ----->

Re-Veg	Re-Forest
Low	Low
too clayey	too arid

<----- Source Suitability ----->

Top Soil	Roadfill
Poor	Poor
too clayey	too stony

Limitation Ratings

Timber Harvest	Cutbank Stability	Unsurfaced Roads	Trails	Campgrounds	Wheeled Off-Road Vehicles
Moderate	Moderate	Moderate	Slight	Severe	Moderate
erodes easil	slope	too shallow		slope	erodes easily



Erosion Hazard

Moderate

Mass Wasting

Low

Windthrow Hazard

Severe

low strength

Plant Competition

Moderate

Quga

Soil Condition: Impaired

Factor <— Soil Wetness —>
K Months Depths
.02

Unified Class Liquid Limit
GC 44

Plasticity Index Shrink/Swell
22 Moderate

Soil Loss (Sheet/Rill Erosion)

Pot. Nat. Cur. Tol.
<— tons/ha/yr —>
6 1 1.8 4.5

% Veg. Ground Cover

Pot. Nat. Cur. Tol.
0 70 45 6

% Current Surface Cover

RkFr Veg. Littr Soil
50 10 25 15



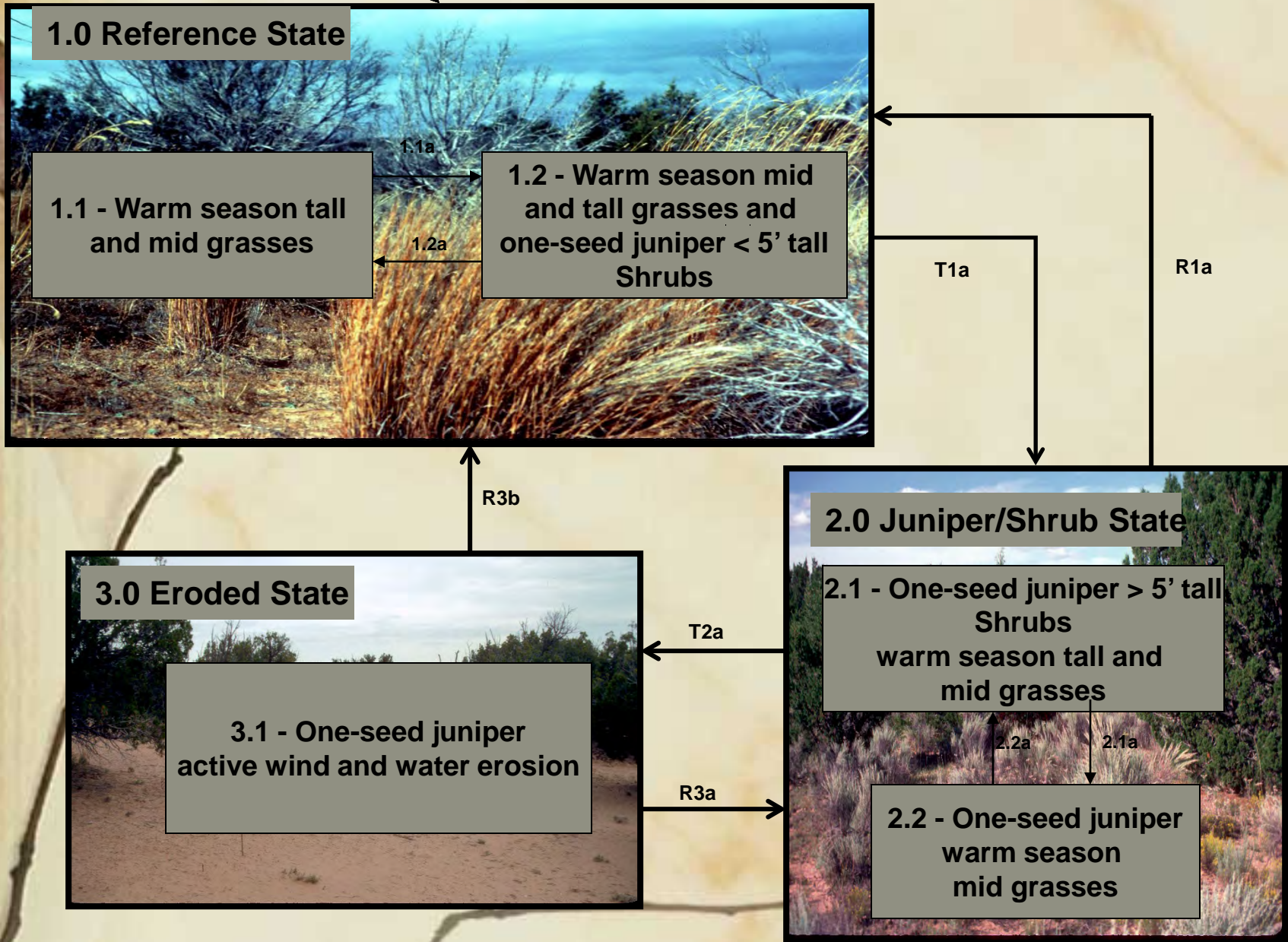
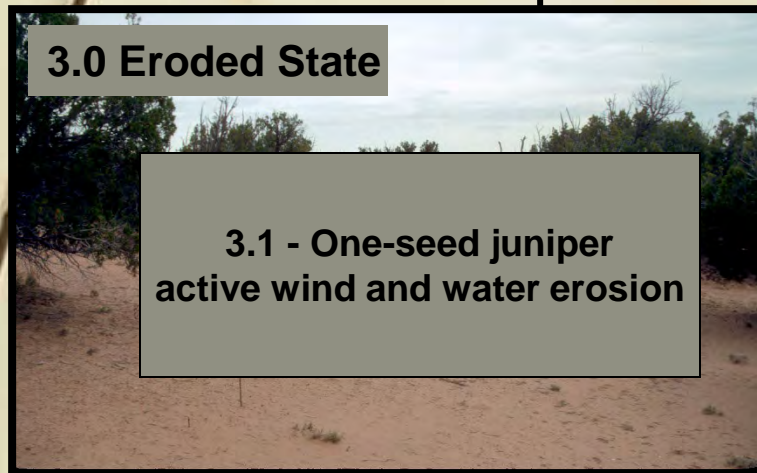
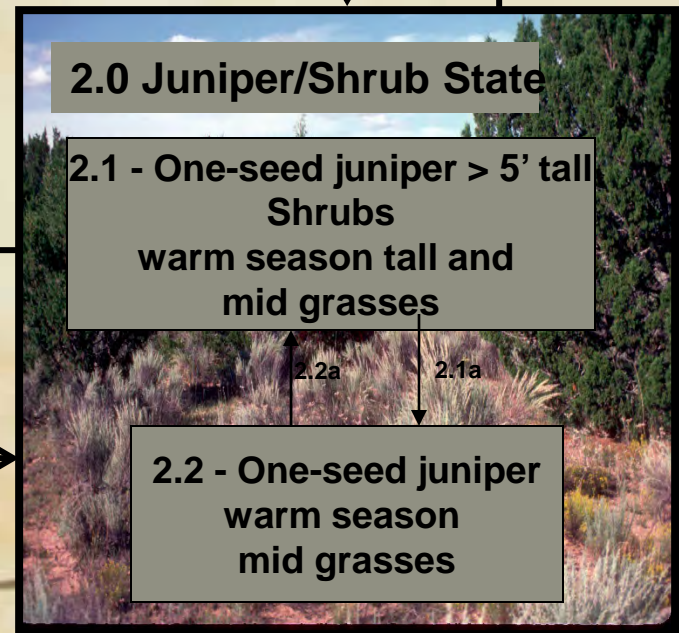
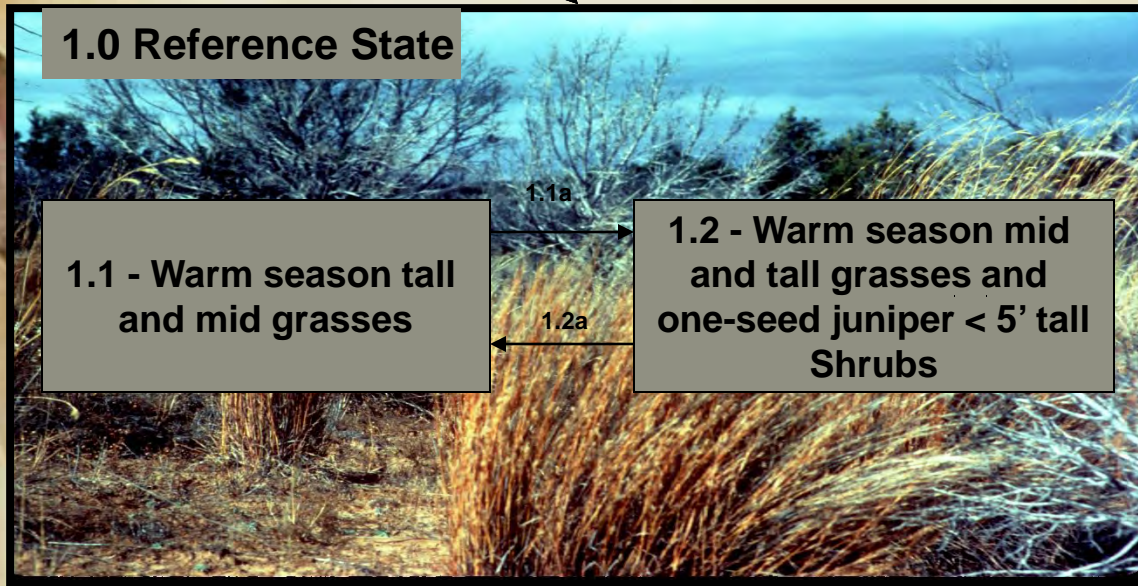
Future Direction

Integration of TEUI and Ecological Classification
Systems to Support Building State and
Transition Ecological Models



Questions?





Questions?





Thanks!!

