

Moving from First to Second Generation EDS's:

Changes in Structure and Content of
Ecological Site Descriptions

Rick L. Peterson

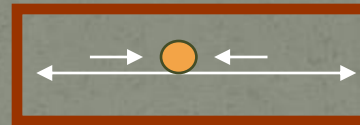
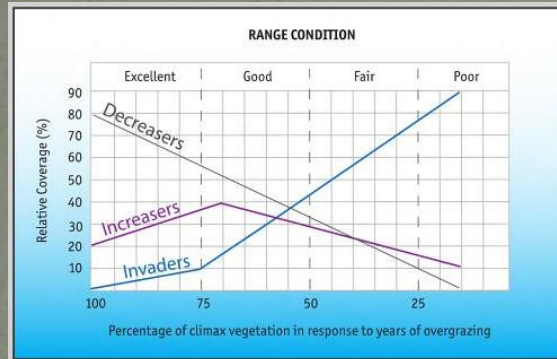
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Background History

- The Soil Conservation Service (SCS) provided guidance and direction for States to begin development of Range Site Descriptions 1956.
- Driven by the work of Dr. Edsko, J. Dyksterhuis and others.
- 1949 JRM
“Condition and Management of Range Lands Based on Quantitative Ecology”.

Range Site Descriptions

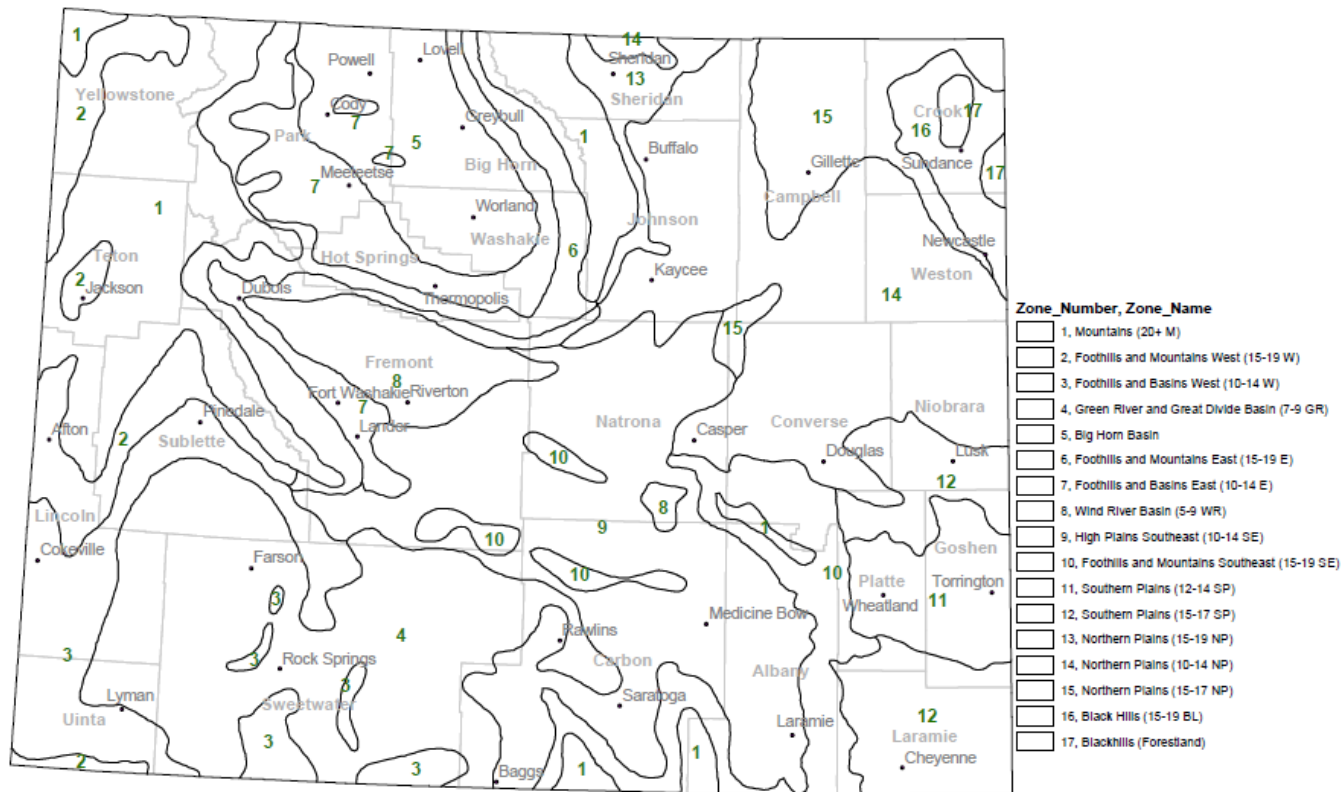
- Adaptation of Climatic Climax Theory



- Climatic Zones (Precipitation Zones)
- Grazing Interpretations
- Plant Community Scale
- Soil Map Unit Components

Wyoming Precipitation Zones and Range Site

Range from 20+ inches to 5 inches



Wyoming

April 1995



US Department of Agriculture
Natural Resources Conservation Service

Plant Community

- The **climax plant community** was described, a unique plant community considered to be in dynamic equilibrium with surrounding environment.
- By the late 80's Range Site Descriptions had evolved to incorporate more detailed information to describe the site.

Range Site Description

Physiographic Features

- Landscape position, slope, geology, etc.

Climate Features

- Precipitation
- Optimum growing season of plants

Native Climax Vegetation

- Quantitative description of climax plant community
- Species list with percent composition
- Plants categorized as Decreaser - Increaser - Invader
- Total production
 - Favorable Year
 - Median Year
 - Unfavorable Year
- Descriptive statement of climax vegetation and land form
- Ground cover
- Site Index if trees are present

Range Site Description – Cont.

Soils

- Texture, depth, permeability, salinity, and erodibility
- Soil taxonomic units which characterize the site

Major Uses and Interpretation

- Grazing
- Wood Products
- Wildlife (Cows, Sheep, Coyotes)
- Watershed (Hydrologic Interpretations)
- Recreation and Natural Beauty
- Threatened or Endangered Plant and Animals

Type Location of the site

Guide to Suggested Initial Stocking Rates

First Generation ESD's

- 1997 – Chapter 3 - National Range and Pasture Handbook (Revised in 2003)
- 1999 - States were directed to move forward with developing Ecological Sites.
- The actual process of transitioning was left up to the states...

Ecological Site Descriptions

Sites Correlated to MLRA's

- Consistency between States,
- Common site names and ID's for sites that crossed state boundaries

STATE AND TRANSITION

- Non-equilibrium dynamic theory

Multiple Benefits Interpretations

Plant Community Scale

Soil Map Unit Components

Ecological Site Description (1997)

- **Major Land Resource Area**
- **Physiographic Features**
- **Climate Features**
- **Influencing Water Feature**
- **Representing Soil Features**

Ecological Site Description (continued)

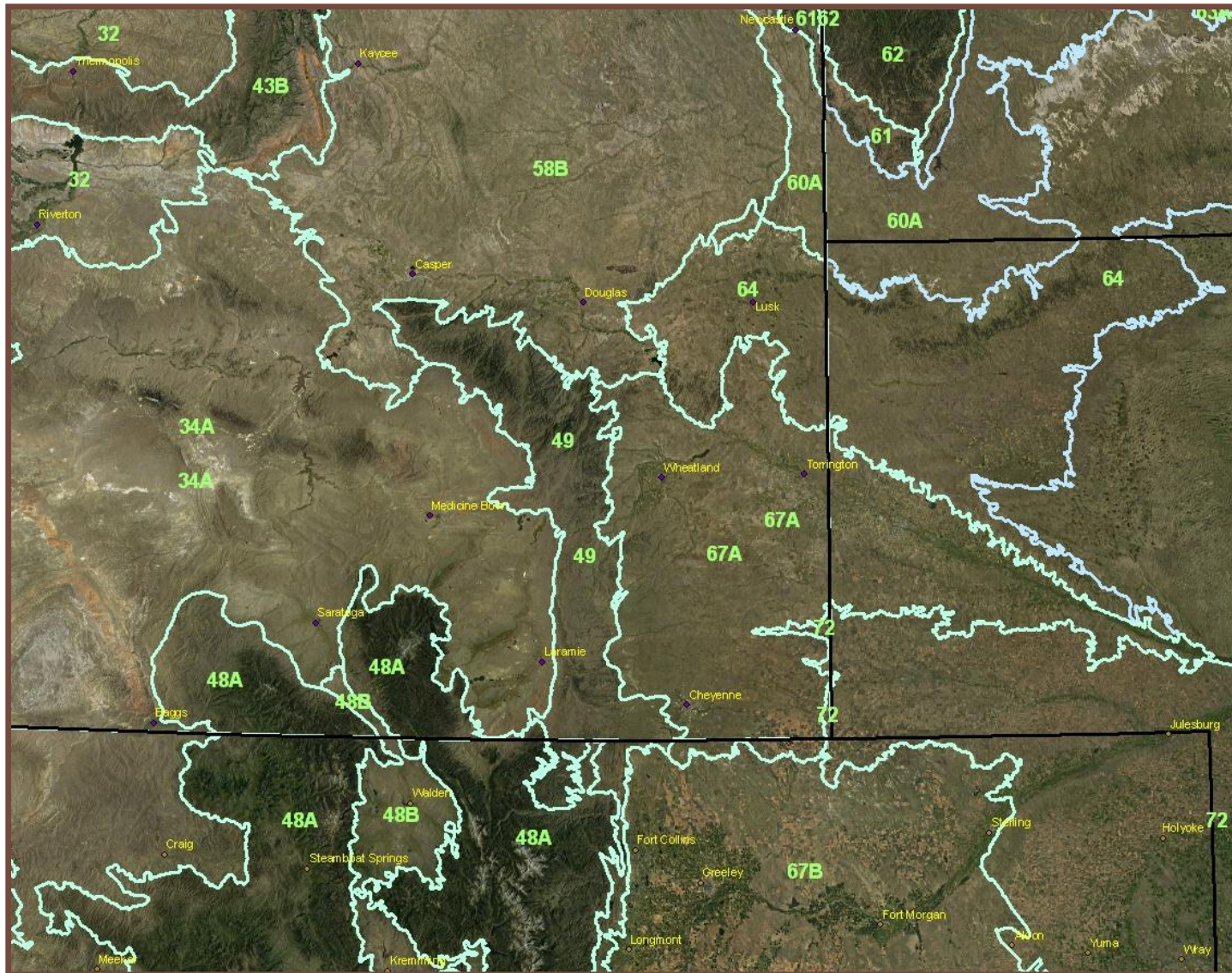
- **Plant Communities**

- Description of the vegetation dynamics
- State & Transition Model
- Description of common states, plant communities, and pathways
- Plant community composition
- Production
- Ground cover and structure
- Growth curves
- Photos of each state or community.

Ecological Site Descriptions Cont.

- **Site Interpretations**
 - Wildlife
 - Livestock
 - Hydrologic Function
 - Recreational uses
 - Wood products
 - Other products
- **Supporting Information**
 - Associated Sites
 - Similar Sites
 - Inventory data references
 - State correlation
 - Type locality
 - Relationship to other established classification systems
 - Other references
- **Reference Sheet – Range Land Health**

Major Land Resource Area



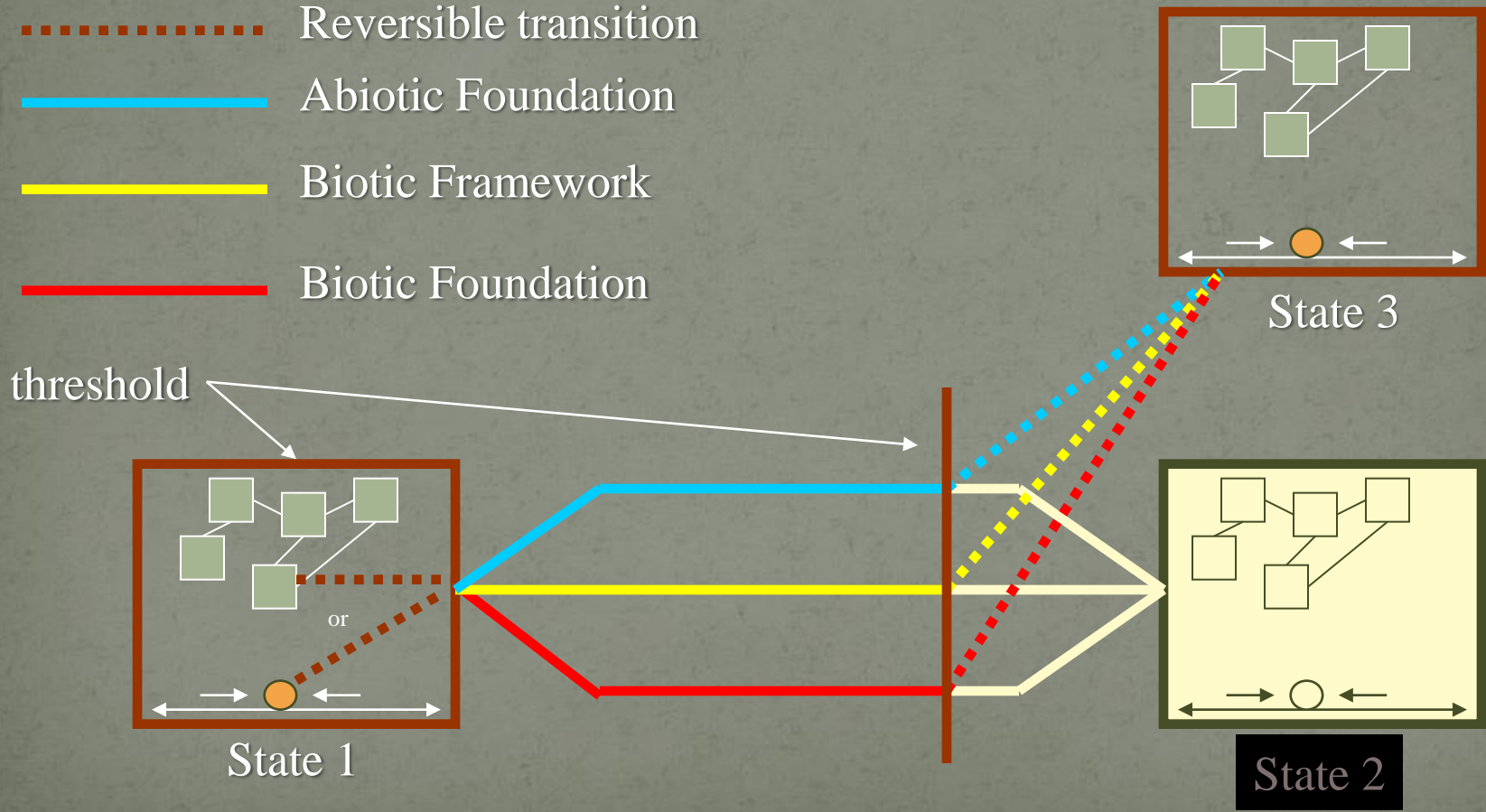
State and Transition Model

- Used to describe the vegetation dynamics and management interactions associated with each site.
- The model provides a method to communicate complex information about vegetation response to disturbance (fire, lack of fire, drought, insects, disease, etc.) and management.

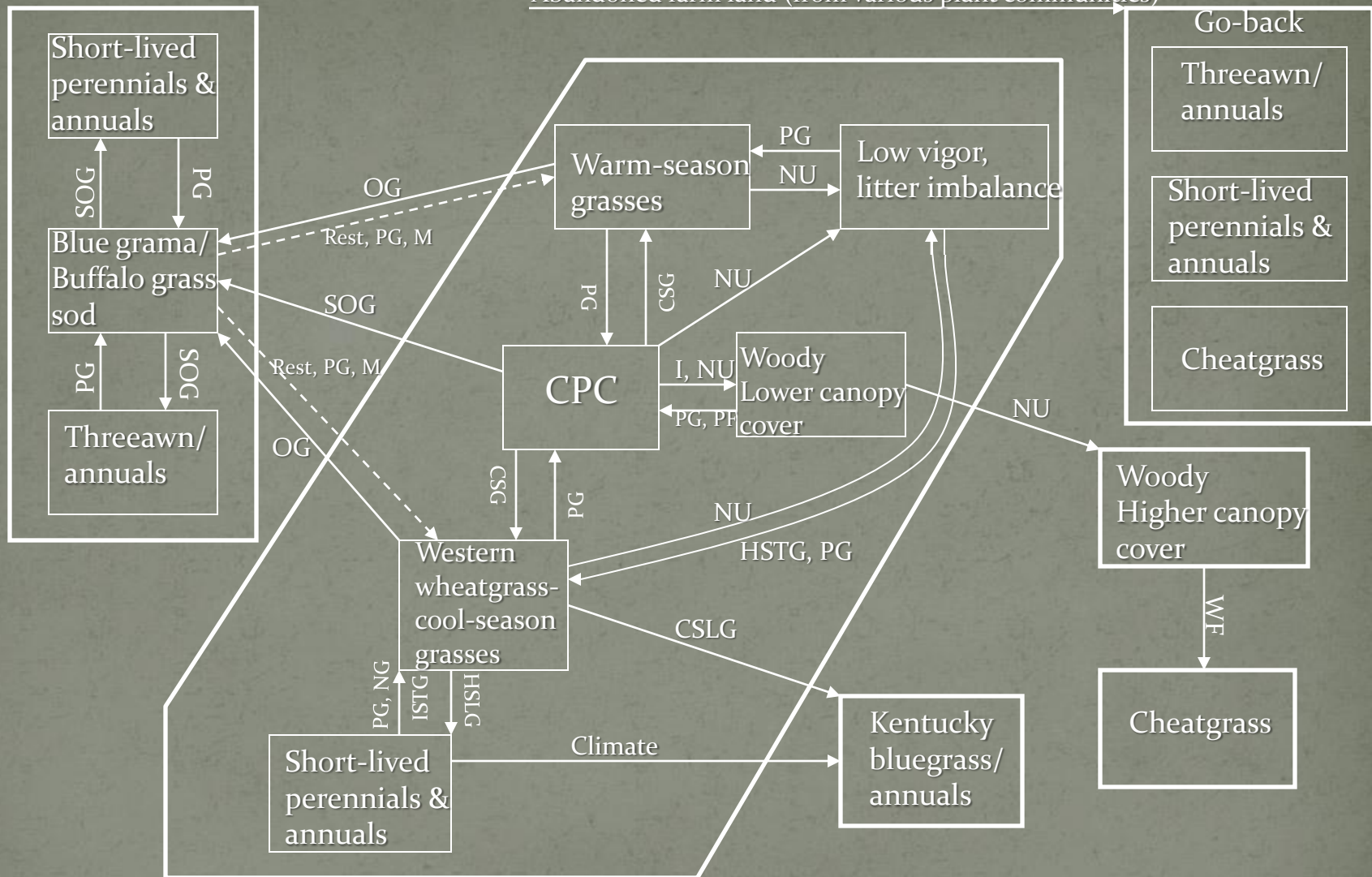
State & Transition Model

Transitions

- Reversible transition
- Abiotic Foundation
- Biotic Framework
- Biotic Foundation

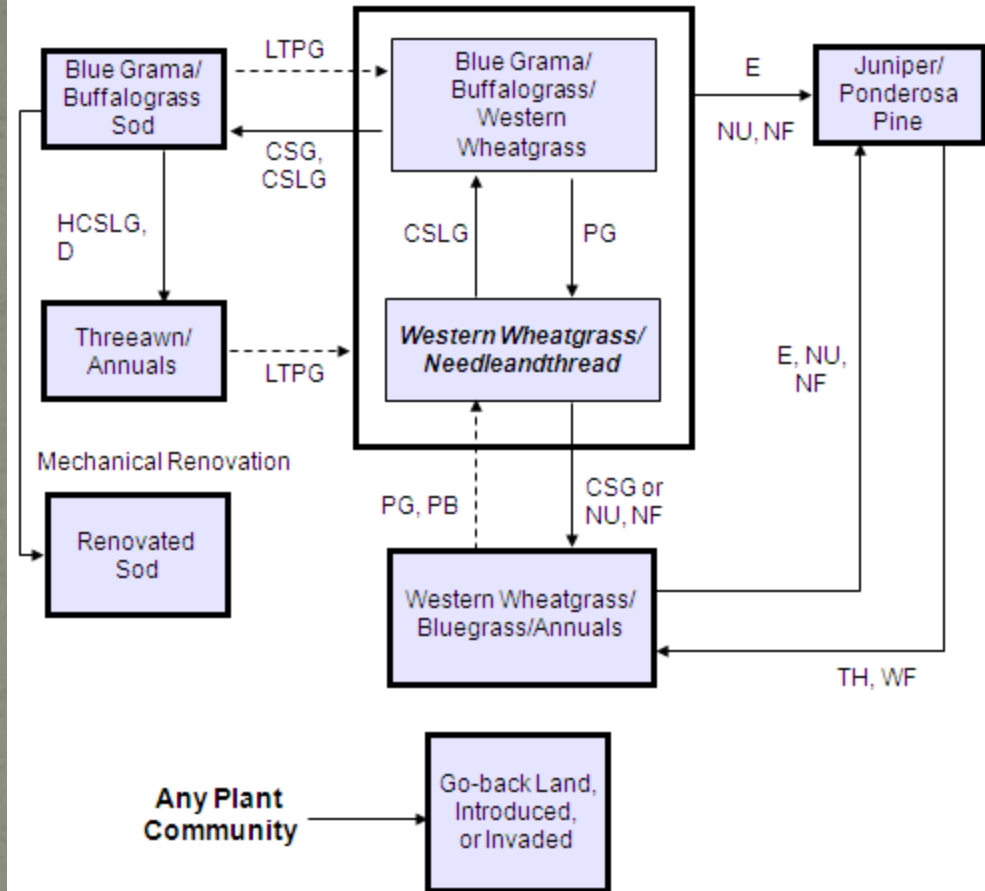


Abandoned farm land (from various plant communities)



PG - Prescribed grazing; NG - no grazing; SOG - Seasonal overgrazing; CSLG - Continuous season-long grazing
 I - Invasion; OG - Overgrazing; M - Mechanical treatment; WF - Wildfire; CSG - Continuous seasonal grazing
 NU - Non-use, no fire; PF - Prescribed fire; ISTG - Intensive short-term grazing; HSTG - Heavy short-term grazing

More effort needed to describe triggers and feedback mechanisms in the transition and community narratives.



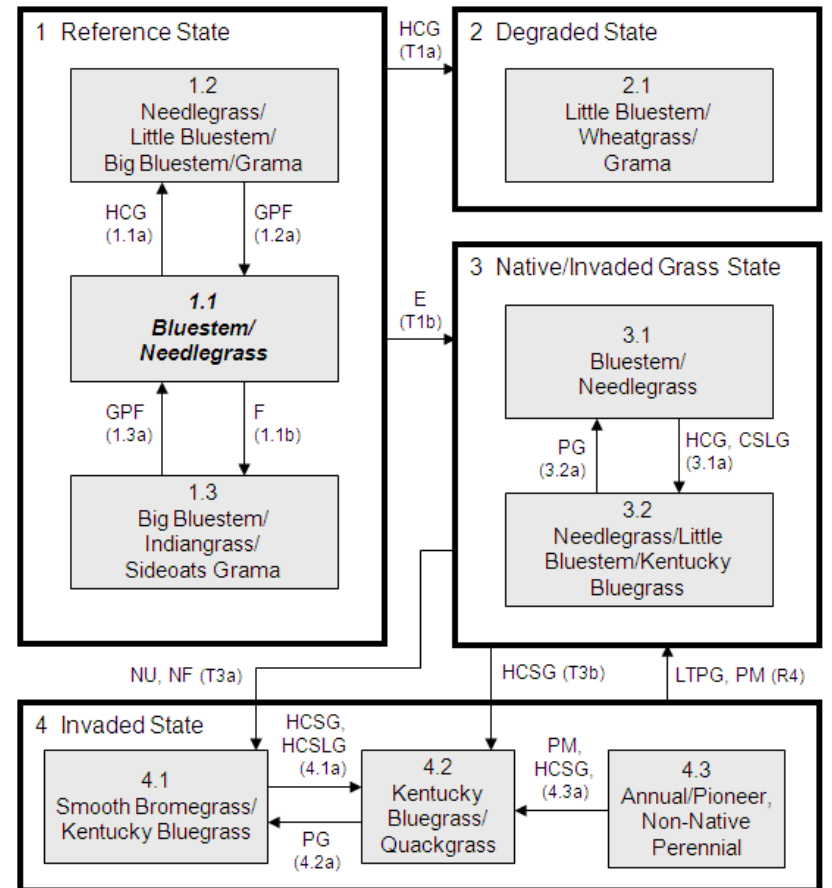
CSG - Continuous seasonal grazing (grazing a unit for an entire portion of a growing season, and the same season every year); CSLG - Continuous season-long grazing (grazing a unit for an entire growing season); D - Defoliation (rodents, insects, etc.); E - Encroachment or Escaped; HCSLG - Heavy continuous season-long grazing; LTPG - Long-term prescribed grazing; NF - No fire; NU - Non-use; PB - Prescribed burning; PG - Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals - see FOTG, Section IV, 528); TH - Timber harvest; WF - Wildfire.

State & Transition Model

1.75

- Moved away from HCPC to Reference State
- Show more detail in natural range of variability
- More consistency in labeling pathways.
- Avoid Value Statements in Naming.

Loamy MLRA 102A – 4/2/09



Refer to narrative for details on pathways: C – Cropped, abandoned; CSLG – Continuous season-long grazing; E – Encroachment of introduced species; F – Fire; GPF – Grazing, precipitation, and/or fire returning to more normal disturbance regime levels and frequencies; HCG – Heavy continuous grazing; HCSG – Heavy continuous seasonal grazing; HCSLG – Heavy continuous season-long grazing; LTPG – Long-term prescribed grazing; NU, NF – Non-use, no fire; PG – Prescribed grazing; PM – Pest management (herbicide); S – Seeding.

E, S, C (T5)
Any Plant Community

Loamy MLRA 120A

Better descriptions of :

- Community Pathways – Succession/Retrogression
- Transitions
- Restoration Pathways

Old Descriptions

1.1a, 2.1a – Continuous seasonal grazing (grazing at moderate stocking levels at the same time of year each year, or a combination of disturbances such as extended periods of below average precipitation coupled with periodic heavy grazing).

1.2a, 2.2a, 5.2a – Prescribed grazing, or periodic light to moderate grazing possibly including periodic rest.

5.3a – Heavy continuous seasonal grazing (stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year each year, typically beginning after early cool-season grasses have reached boot stage), and pest management (herbicide use to control invasive/noxious weeds).

T1a – Encroachment of non-native grasses such as Kentucky bluegrass and smooth bromegrass, and disruption of natural disturbance regimes such as periodic fire followed by short-term high intensity grazing.

T1b – Heavy continuous seasonal grazing (stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year each year, typically beginning early in the season) or heavy continuous season-long grazing. Also encroachment of non-native grasses such as Kentucky bluegrass and smooth bromegrass, and disruption of natural disturbance regimes such as periodic fire followed by short-term high intensity grazing.

T2a, 5.1a – Heavy continuous seasonal grazing (stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year each year, typically beginning early in the season) or heavy continuous season-long grazing.

T3 – Heavy continuous season-long grazing, or frequent and severe defoliation as a result of occupation by rodents.

T2b – Non-use and no fire for extended periods.

T2c – Heavy continuous seasonal grazing (stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year each year, typically beginning after early cool-season grasses have reached boot stage).

T4 – Encroachment of non-native invasive/noxious species, or seeding of introduced and/or native improved varieties of forage species (refer to corresponding Forage Suitability Group for adaptation, production, and management alternatives).

T6 – Encroachment of non-native invasive/noxious species, or seeding of introduced and/or native improved varieties of forage species (refer to corresponding Forage Suitability Group for adaptation, production, and management alternatives), or cropping followed by abandonment of cropping allowing early successional species to dominate.

R3, R4 – Long-term prescribed grazing (moderate stocking levels coupled with adequate recovery periods, or other grazing systems such as high-density, low-frequency intended to treat specific species dominance, or periodic light to moderate stocking levels possibly including periodic rest). This will likely take a long period of time, possibly up to 10 years or more, and recovery may not be attainable.

R5 – Long-term prescribed grazing (moderate stocking levels coupled with adequate recovery periods, or other grazing systems such as high-density, low-frequency intended to treat specific species dominance, or periodic light to moderate stocking levels possibly including periodic rest). Pest management (i.e., herbicide) may also be needed to suppress cool-season invasive grasses. This will likely take a long period of time, possibly up to 10 years or more, and recovery may not be attainable.

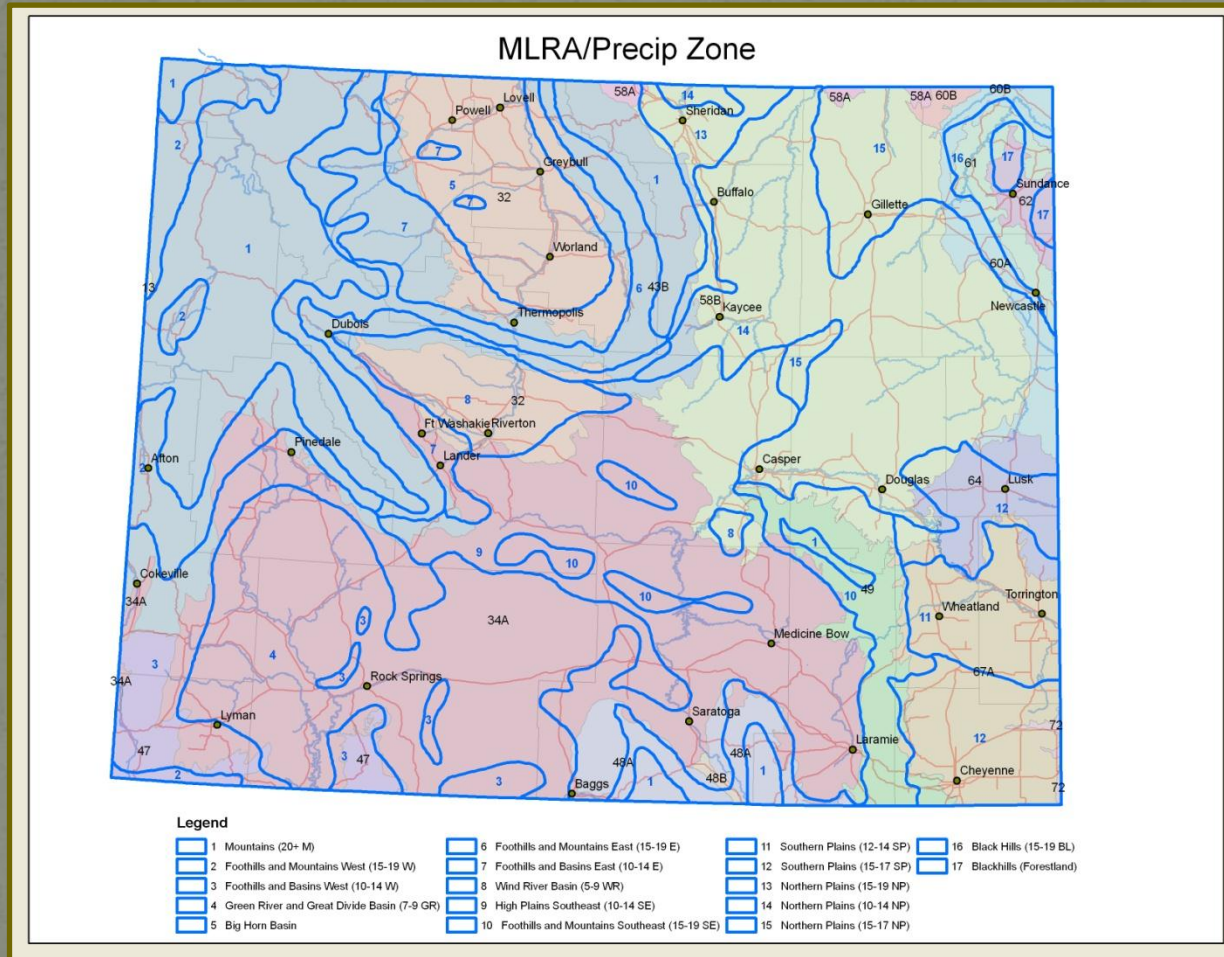
In a *Perfect World*--

First Generation ESD's

- Followed Guidance
- States collaborated
- Adequate *time* and *staff* were allocated to develop descriptions.

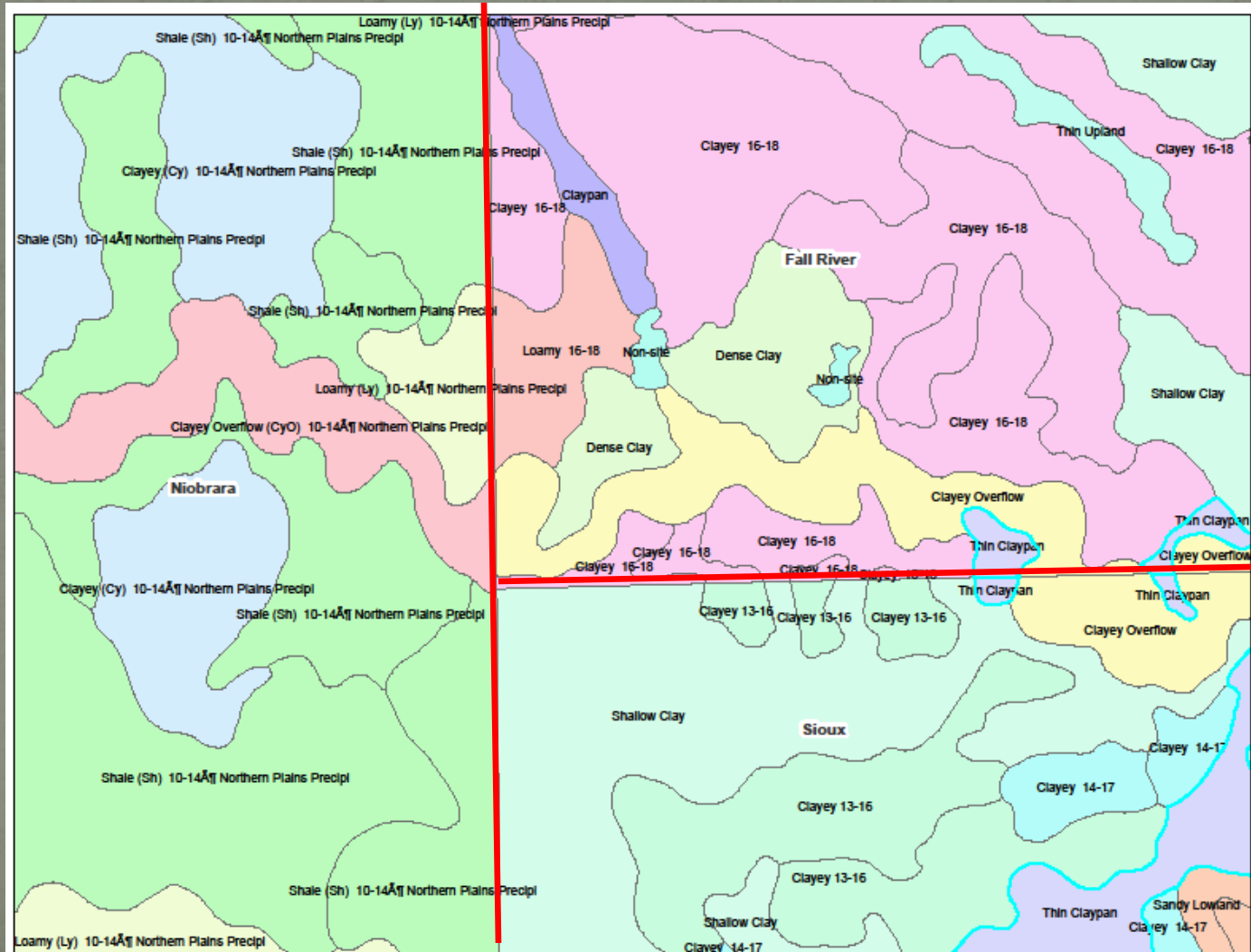
We have some baggage...

Current Wyoming MLRA/ Precipitation Zones



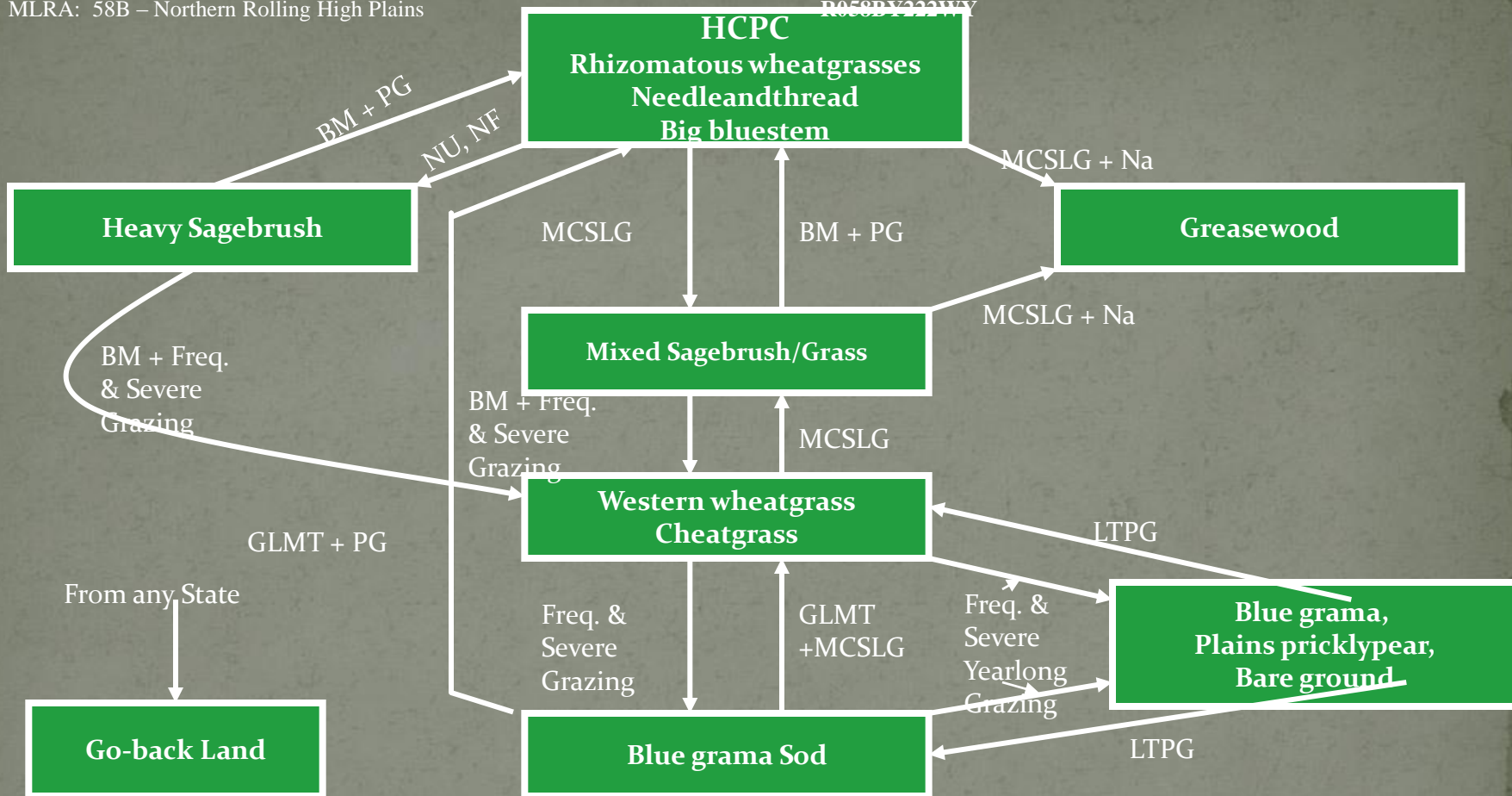
Ecological Sites at the WY/SD/NE Borders

WY
10-14" PZ



SD
16-18" PZ

NE
14-17" PZ



- BM - Brush Management (fire, chemical, mechanical)
- Freq. & Severe Grazing - Frequent and Severe Utilization of the Cool-season Mid-grasses during the Growing Season
- GLMT - Grazing Land Mechanical Treatment
- LTPG - Long-term Prescribed Grazing
- MCSLG - Moderate, Continuous Season-long Grazing
- NU, NF - No Use and No Fire
- PG - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)
- VLTPG - Very Long-term Prescribed Grazing (could possibly take generations)
- Na - found adjacent to a saline site

Moving to 2nd Generation ESD's

- Throw out the baggage (or at least fold the clothes).
- Update Soil Map Units and Soil Component.
- Develop LRU's. MLRAs are too large for single set of ESD's.
 - Precipitation, Temperature, Frost Free Days, Geology, Elevation, Etc.

Land Resource Unit (LRU)

MLRA 34A

Legend

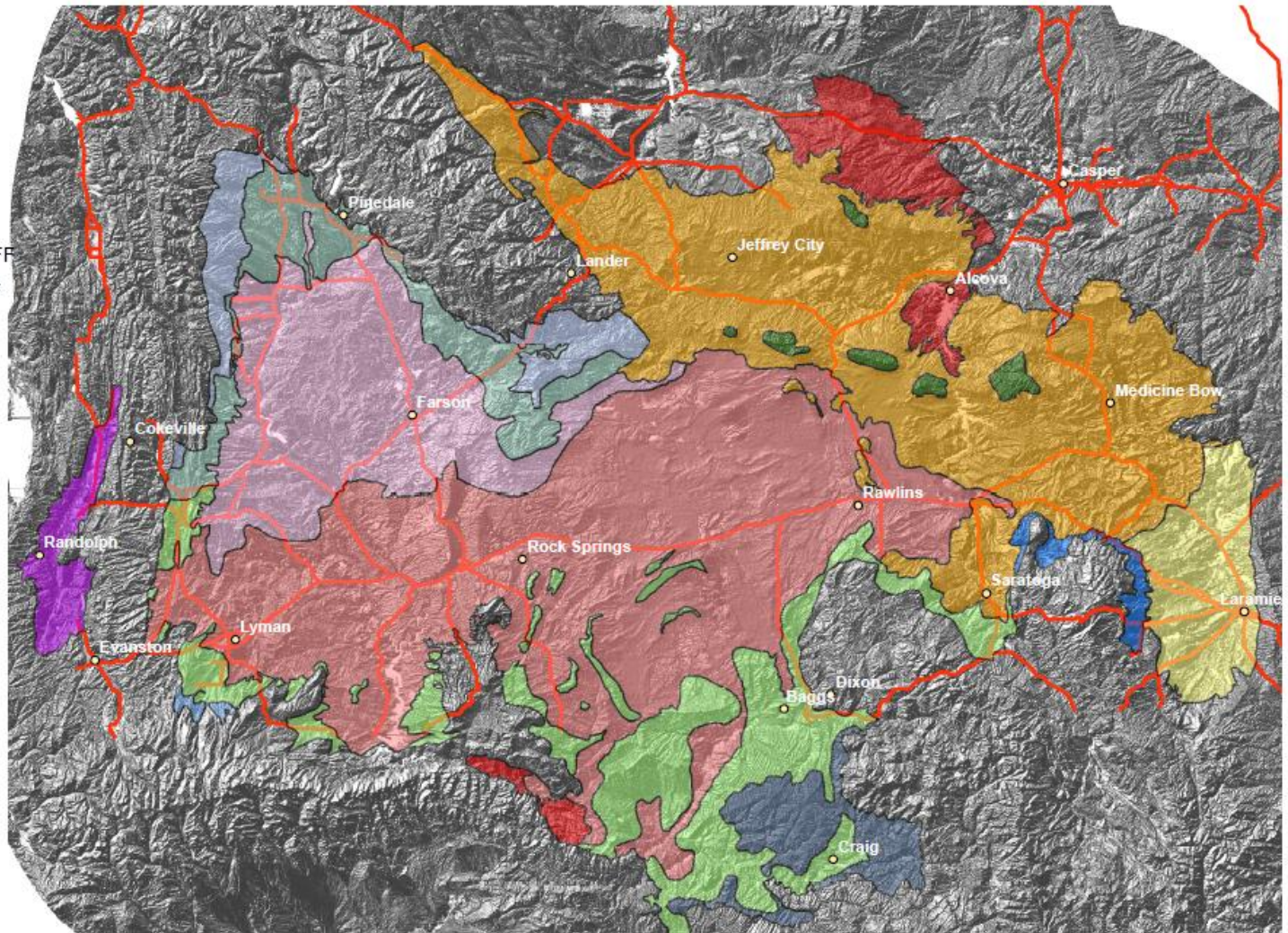
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LRU_34A

■ <all other values>

LRU

- 7-11 - Mesic
- 7-11 - Frigid - Shorter FF
- 7-11 - Frigid-Longer FF
- 8-12 - Mesic (32 or 58)
- 8-12 Xeric
- 8-12 - SE
- 9-14 LB
- 12-15 - Frigid
- 12-15 - Cold Frigid
- 15-19 - Frigid
- 15-19 - Frigid (47)
- 15-19 - Cryic (43B)
- 15-19 - Cryic (48A)
- 15-19 - Cryic (49)
- Colorado



Moving to 2nd Generation ESD's

Local Work Groups

- More inclusive
- Not too many folks but not too few
- Multi-disciplinary
- Institutional knowledge
- Historical knowledge
- Research Information
- Must have time and commitment to process
- Check egos at the door – ESD development is not a competition.

Moving to 2nd Generation ESD's

- At Risk Plant Communities
- Describe triggers and feedback
- Describe response to disturbances
 - Drought
 - Grazing
 - Fire or No Fire
 - Invasive species
 - Management
 - Climate change
 - Recreational activities
 - Affects on nutrient, water, and energy cycles

Moving to 2nd Generation ESD's, continued

Restoration

- Pathways
- Is it feasible
- Length of time to achieve

Other Values

- Wildlife habitat elements
- Recreation
- Water sheds
- Etc.

Ecological Site Descriptions Provide:

- **Decision Support** – Provide a means to make management decisions based on predicted outcomes.
- **Performance Measures** – With the use of similarity index, rangeland trend, and Rangeland Health, provides a means to measure success of management actions.
- **Risk Assessment** – Can evaluate the level of risk associated with various thresholds, transitions, and pathways and the actions associated with each.
- **Knowledge Transfer** – Provides a framework for transferring experience and knowledge.

In Summary

The foundation is solid

- Soils surveys
- Soils/Site Correlations
- Existing ESD's
- Learned from past experience

The process is spelled out well

- 2010 Interagency Handbook for ESD's
- Common terminology to describe succession processes
- Improve value for end user

The players are in place

- ARS, BLM, NRCS, USFS, NGO's, Etc.

More expertise working collectively to make a better product.

- Multi-disciplinary approach
- Repository of knowledge to describe ecological processes

Questions