Enhanced Conservation Action Planning

Maps, Models & Metrics

Maps

Models

Metric

Biophysical Settings – aka Ecological Systems
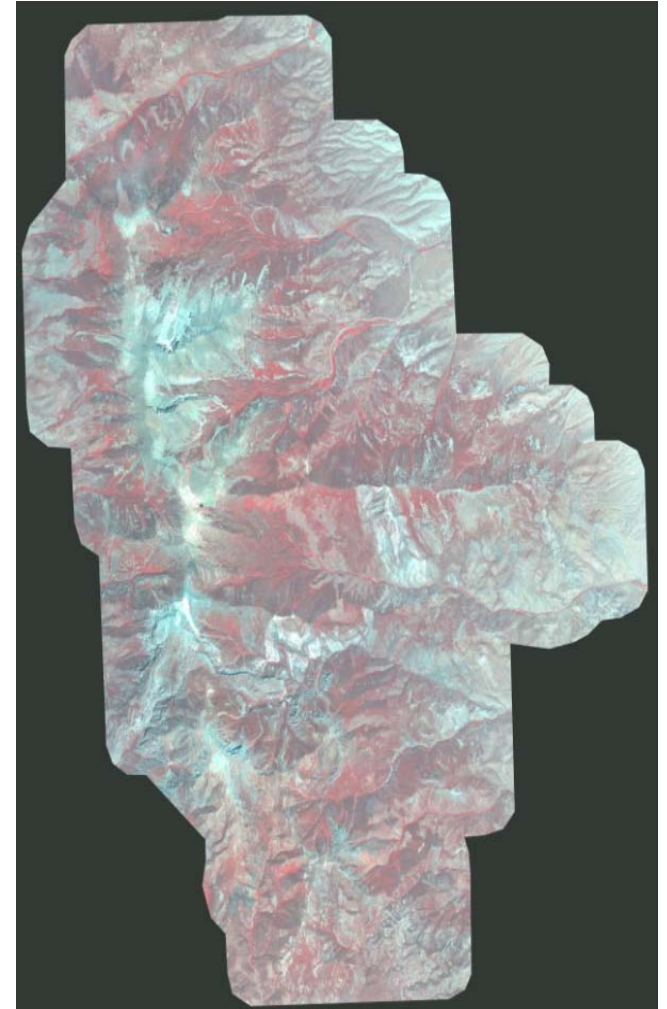
Dominant vegetation type expected in the physical environment (geology & climate) under a natural disturbance regime.

Great Basin National Park
Biophysical Settings
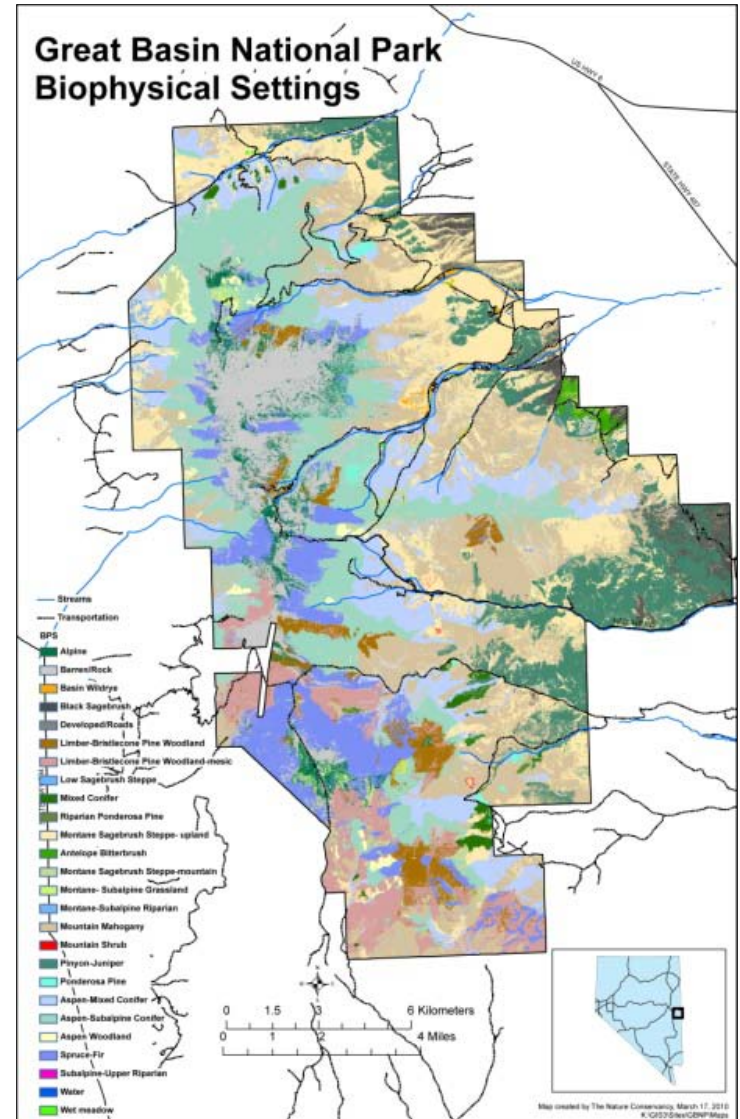
Current Vegetation

Actual current vegetation classes (S-class) for each ecological system

- early to late succession

- open vs. closed canopy

- natural vs. uncharacteristic (U-class)

Maps

Models

Metric

"All Models Are Wrong But Some Are Useful"

George E.P. Box

Cherokee National Forest Landscape Restoration Initiative

LANDFIRE developed reference condition models for every ecological system in the United States

Cherokee National Forest Landscape Restoration Initiative

LANDFIRE also developed computer models for each system in VDDT software
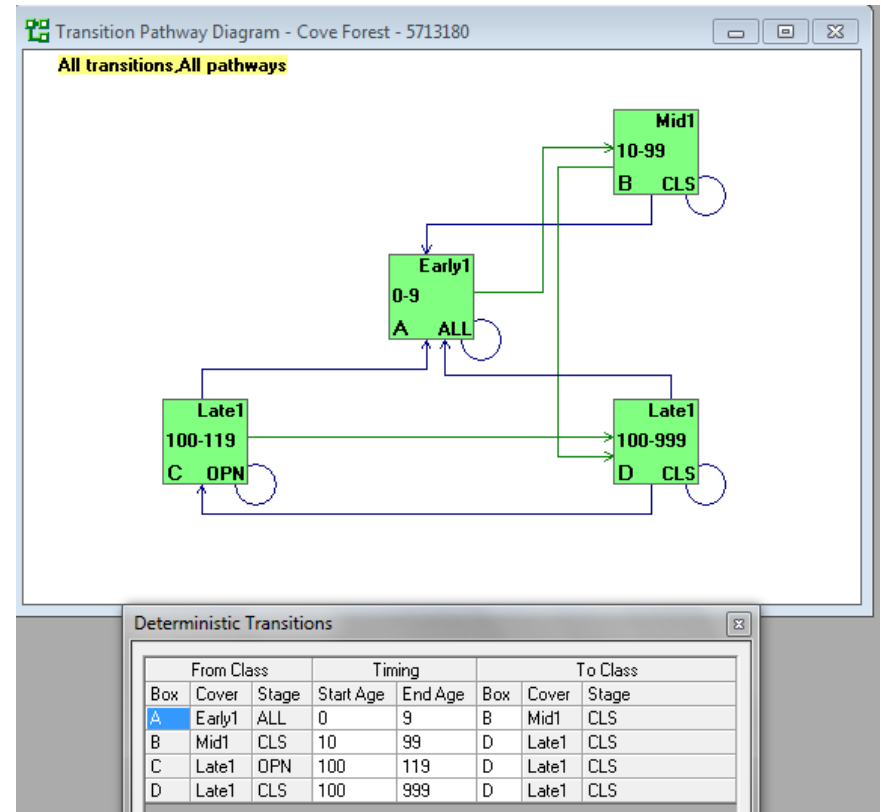
Cherokee National Forest Landscape Restoration Initiative

These models have been reviewed and modified for the Cherokee National Forest to reflect local conditions
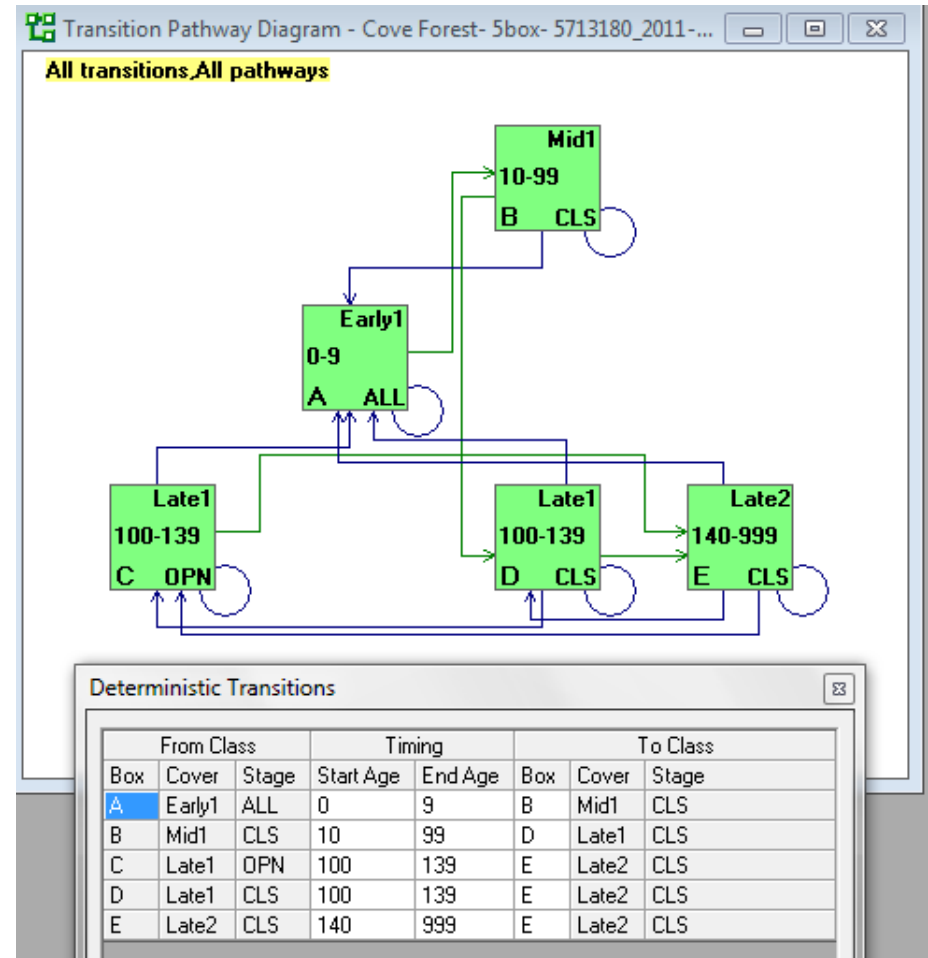
Cherokee Model Revision and Refinement

➢ Created new model for Montane Red-Chestnut Oak

➢ Revised Dry Oak model

➢ Revised and refined disturbance regimes for oak systems

➢ Added old growth age classes for oak & cove forests

➢ Other minor adjustments so models match up with map data

Maps

Models

Metric

Metric: Ecological Departure

➢ Measures each ecological system's condition *across a landscape*

➢ Integrated measure based upon vegetation *composition*, *structure* and *disturbance* regimes

➢ *Departure* of current vegetation from its natural range of variability (NRV) -- i.e., dissimilarity between expected and current vegetation classes

Low ⬅➡ High

| 0-33% | 34-66% | 67-100% |

Cherokee National Forest Landscape Restoration Initiative
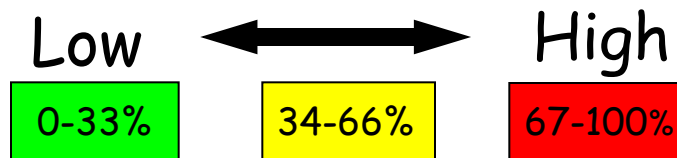
Natural Range of Variability (NRV)

- The distribution of vegetation succession classes (S-class) for each ecological system in a naturally functioning landscape.

- Assumes landscape condition and disturbances pre-European settlement

- Percentages for each system's vegetation classes determined by VDDT model runs over 1000 years using age classes, transitions and disturbances.

Ecological Departure = which vegetation classes are "out of whack"

Montane Sagebrush

Vegetation Classes	Actual % in Class	NRV % in Class
Class A – Early Development, Open Herbaceous vegetation is dominant; shrub cover is 0 to 10%.	5%	20%
Class B – Mid Development, Open Mountain big sagebrush cover up to 30%; herbaceous cover typically >50%.	10%	50%
Class C – Mid Development, Closed Shrubs are dominant with canopy cover of 31-50%. Herbaceous cover is typically <50%. Conifer sapling cover is <10%.	10%	15%
Class D – Late Development, Open Conifers are the upper lifeform; conifer cover is 10- 30%.	10%	10%
Class E – Late Development, Closed Conifers are dominant; conifer cover is 316 – 80%.	45%	5%
Class U – Uncharacteristic	20%	-

Too Little

Too Much
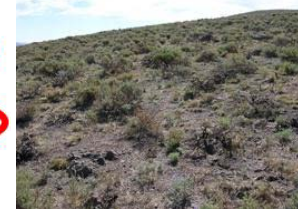
Cherokee National Forest Landscape Restoration Initiative

All Leading to Restoration Strategies

Allows land managers and stakeholders to develop and test alternative strategies to restore ecological systems

The Nature Conservancy
Protecting nature. Preserving life.™

Bodie Hills Conservation Action Planning
Final Report to the Bureau of Land Management Bishop Field Office
July 2009

Photo: Southern Bodie Hills and Mono Lake viewed from Bodie Peak; Susan Abele, 2008

By

Louis Provencher, Greg Low, and Susan Abele
The Nature Conservancy, One East First Street, Suite 1007, Reno, NV 89501
775-322-4990

Aspen-Mixed Conifer Woodland	Average acres/yr Years 1-5	Average acres/yr Years 15-20	Cost/acre ($)
Mechanical thinning of late succession classes	43	20	$ 150
Prescribed fire applied to late succession classes	95	50	$ 150
Average Annual Cost	**$ 20,700**	**$ 10,500**	

Cherokee National Forest Landscape Restoration Initiative

To find cost-effective, landscape-scale solutions

Ward Mountain Ecological Forecasts						
June 23, 2010						
Ecological System	Ecological Departure			Acres	20 Year Cost Preferred Mgmt	Preferred Mgmt ROI (area-weighted)
	Current Condtion	Minimum Mgmt - 20 yrs	Preferred Mgmt			
Black Sagebrush	79	69	36	46,660	$ 5,150,000	5.6
Montane Sagebrush Steppe - Upland	62	41	29	25,610	$ 1,016,900	3.8
Montane Sagebrush Steppe - Mountain	47	31	31	2,570	-	n/a
Aspen Mixed-Conifer	53	50	25	2,240	$ 106,300	5.9
Wyoming Big Sagebrush	77	74	61	8,330	$ 1,021,000	3.9
Basin Wildrye	86	86	43	1,650	$ 405,600	3.9
Winterfat	78	87	47	610	$ 225,000	2.5
Aspen Woodland	45	39	24	590	$ 20,000	4.6
Montane-Subalpine Riparian	59	55	32	170	$ 90,200	0.6
Mountain Shrub	47	35	27	33	-	n/a
					$ 402,000	ave. per year

E-CAP Workshops & Outcomes

Cherokee National Forest Landscape Restoration Initiative

Workshop I - Today
- Review ecological systems map and data
- Review vegetation succession classes and data
- Review current conditions (departure from NRV)
- Discuss restoration objectives

Workshop II – April 12
- Confirm restoration objectives
- Review projected future conditions
- Select focal ecological systems for management
- Develop and test alternative management strategies for 1 to 2 ecological systems
- Develop list of potential management strategies and costs

Cherokee National Forest Landscape Restoration Initiative

Workshop III – May 31

➢ Review preliminary simulations and outcomes of alternative management strategies

➢ Recommend adjustments to management strategies, budgets or models

Workshop IV – June 23

➢ Review final simulations and outcomes, including return on investment

➢ Recommend preferred management strategies or options

➢ Determine next steps for project completion

Some Thoughts Before
We Begin…

Cherokee National Forest Landscape Restoration Initiative

Maps

Our map data are imperfect, but we've made big improvements in accuracy and have a reasonable approximation of the landscape.

Models

Models are inherently imperfect, but our LANDFIRE-based models have been improved and are very useful. They are transparent, based on good science input, have been & can be revised, & allow us to test things.

Metric

NRV does not necessarily have to be your only metric of your desired future condition.

_____

"The perfect is the enemy of the good."

Voltaire

Some E-CAP Limitations… but things you may want to otherwise address in your restoration recommendations

➢ Efforts to restore chestnut species

➢ Single-species pest and pathogens (e.g., gypsy moth, hemlock woolly adelgid)

➢ Invasive plant species that don't have landscape-scale impacts (e.g., kudzu)

Questions?