

# Fire Initiatives & Strategic Planning





## Presentation Goals

- Explain the choice of priority landscapes
- Demonstrate effective process for setting priorities, developing project proposal, and documentation for NEPA
- Discuss simple facts about the Mojave Desert

# Mission Statement

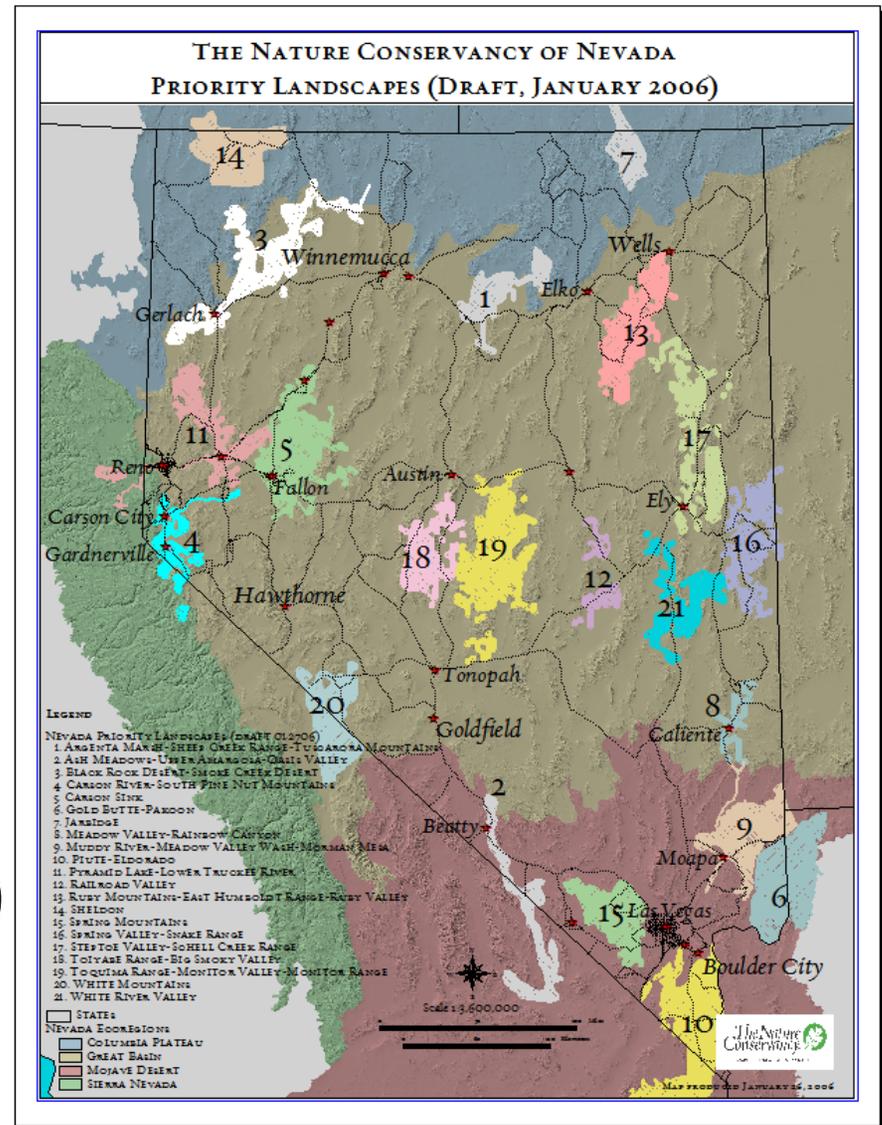
The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive



# Where TNC Works in Nevada

For 21 priority landscapes:

- Nearly all major ecological systems per ecoregion represented;
- 50% of imperiled and rare species captured;
- Choice of landscapes not set in stone (example, #6)





## Presentation Goals

- Explain the choice of priority landscapes
- **Demonstrate effective process for setting priorities, developing project proposal, and documentation for NEPA**
- Discuss simple facts about the Mojave Desert



# Enhanced Conservation Action Planning

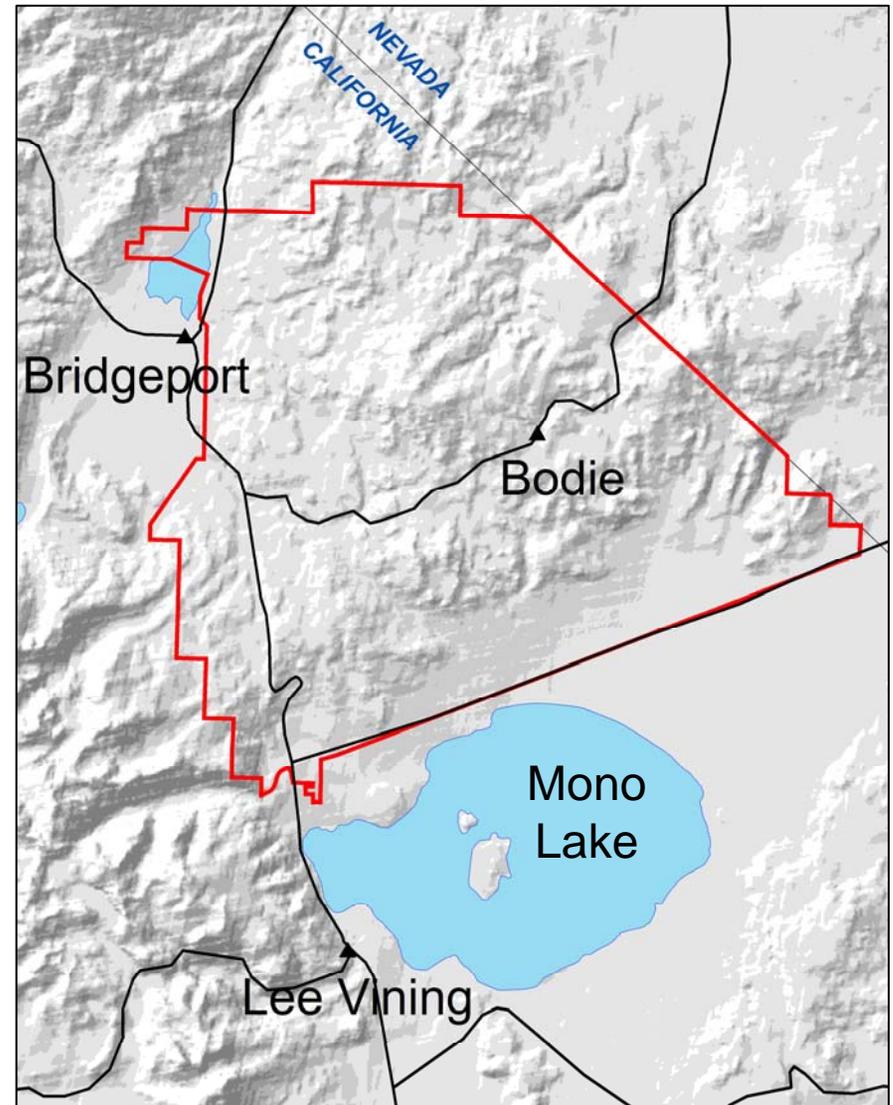
## Honed under TNC's Fire Learning Network

- Which ecological systems and where to act?  
**Fire Regime Condition Mapping**
- Why and how to improve ecological systems? Where to treat first?  
**TNC's Conservation Action Planning (CAP)**
- Will strategies work?  
**Modeling of management actions**



Bodie Hills  
~ 192,000 acres

Only landscape where  
partners requested all  
three steps of  
enhanced CAP





Bodie Hills- Mono Lake Basin, CA

# Project History: 2007-2008

## Inyo Register

50¢

THURSDAY

JUNE 19, 2008

### Group formed to study Bodie Hills

Computer modeling, evidence of drought patterns from Middle Ages and other data to help plan for area's eco-management

By Ken Koerner  
Register Staff

Using scientifically-derived data of past climatic conditions during the Middle Ages, combined with the latest in satellite and computer modeling and statistical technology, the Bureau of Land Management and The Nature Conservancy are exploring paths toward the future ecological health of the Bodie Hills.

An approximately 200,000-acre tract of land in Mono County, bounded on the north near State Route 182, on the east by the California-Nevada border, on the south by State Route 167 and on the west by the eastern front of the Sierra Nevada, is being studied by a collaboration of stakeholders identified by the BLM as the Bodie Hills Coordinated Resource Management Planning (CRMP) group.

During a series of three workshops beginning in March and concluding today (June 19) at the BLM's Bishop office, scientists, researchers, conservationists, ranchers, private land owners and agency staff have been studying the historical, current and potential future status of the diverse spectrum of ecological life forms that call

See BODIE, page A-3

### BODIE

Continued from front page  
this area home.

"On a national basis, the BLM is taking advantage of resources from outside the agency -- and soliciting significant input from the public -- as we continue to tackle the complexity of managing the millions of acres of lands for which we are responsible," BLM Bishop Field Office Manager Bill Dunkleberger said. "This Bodie Hills CRMP is a classic example of how mutual interests can be brought into the mix to forge mutually-beneficial results for everyone committed to conserving and enjoying our wildlands."

A primary contributor to this effort are staff from The Nature Conservancy.

"The BLM approached The Nature Conservancy to assist in the development of computer models reflective of the current status of the ecology of the Bodie Hills area," said Greg Low, director of The Nature Conservancy's Northern Sierra and Great Basin Programs. "We were excited about the potential for the collaborative effort Bill (Dunkleberger) envisioned and were more than willing to generate data and advice on a variety of ecological responses to benefit this unique piece of the American west."

More than simply input and suggestions are being provided by the conservation group, Dunkleberger explained, since The Nature Conservancy is also providing a 30 percent "funding match" for the cost of the CRMP study.

Nearly four dozen various participants have been involved in the CRMP effort during its three planning sessions, each with their own perspective and knowledge about the area to bring to the table.

The west lands targeted in this study includes significant BLM acreage, private homes and ranches, as well as the Bodie State Historic Park, a California gold-mining ghost town.

Consequently, in addition to land and resource management issues to consider, the CRMP must also incorporate eco-planning with an eye toward mitigating against fire dangers to human habitation and cultural



Greg Low, director of The Nature Conservancy's Northern Sierra and Great Basin Programs, gives a presentation during a meeting Tuesday of the newly-formed Bodie Hills Coordinated Resource Management Planning group, a collaborative of stakeholders with an interest in developing an eco-management plan for the area. Photo by Ken Koerner

elements.

More than a dozen specific ecological systems are represented amid the flora of the Bodie Hills. This vegetation ranges from alpine plants sprouting among rocky terrain to lower elevation stands of Wyoming Sagebrush growing in sandy soil.

"The BLM approached The Nature Conservancy to assist in the development of computer models reflective of the current status of the ecology of the Bodie Hills area. We were excited about the potential for the collaborative effort and were more than willing to generate data and advice on a variety of ecological responses to benefit this unique piece of the American west."

— Greg Low,  
Director,  
The Nature Conservancy  
Northern Sierra and Great  
Basin Programs

The rigorous nature of this group's efforts is easily seen in the work of The Nature Conservancy Director of Conservation Ecology Louis Provencher, who foraged

through evidence collected about drought patterns during the Middle Ages, from 520-1250 A.D., in order to better interpret current and predictable future moisture conditions in this part of the Eastern Sierra. Provencher also included potential climate changes in the decades to come as part of the computer modeling used in evaluating a variety of eco-plans to present at the conclusion of the CRMP process.

The three-day schedule for the CRMP's workshop in Bishop (June 17-19) began with a review of the output from the earlier meetings and was then expected to include "review and refinement" of the computer models developed for the multiple possible approaches to eco-management for the Bodie Hills.

The range of action planning is laid out from "no change to current management" to a variety of steps of proactive management, including prescribed burns, mechanical thinning of invasive trees, mowing and attacking the spread of "invasive cheat-grass that competes too successfully against native grass," like Basin Wildrye.

Following the culmination of the study, the BLM will review the various courses of action -- and their costs -- to evaluate the desirability and the efficiency

of the different approaches.

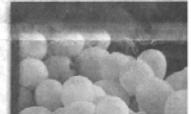
Meetings will also be held in the future to share the CRMP results with the public and gather its input on the available avenues to protect the ecology of the Bodie Hills. This public input is deemed of primary importance by the agency.

"People appreciate the opportunity to come and participate in an open dialogue on such projects," BLM Bishop Field Office Vegetation Management Planner Dale Johnson said. "It increases the public's comprehension of the variety of land management issues our agency must consider. It's a win-win situation whenever the public has a chance to make their voices heard."

No dates have yet been set for when these community meetings may be scheduled.

For additional information, contact the BLM Bishop Office at (760) 872-5000.

### Ingredients for





# Project History

## **Spring-Summer 2007**

- Fire Regime Condition Class mapping: Remote sensing & field surveys

## **Fall 2007 - Spring 2008**

- Five CAP and modeling workshops
- One partner field trip

## **Summer 2008**

- Non-spatial and spatial modeling of management scenarios

## **Fall 2008**

- Report delivery
- Town hall meeting in Lee Vining



# Definitions

Biophysical Settings (BpS)

Natural Range of Variability

Fire Regime Condition

Fire Regime Condition Class



# Definition: Biophysical Settings (BpS)

- Recurring groups of biological communities that co-occur on landscapes
- 10s - 1000s of ha; persist for 50+ years
- Found in similar physical environments
- Influenced by similar dynamic ecological processes (e.g., fire, flooding)
- Defined in part by the combination of plant communities and abiotic factors

# Natural Range of Variability (NRV)

The distribution of vegetation development classes per Biophysical Settings (potential vegetation type) in the *pre-settlement* or *naturally functioning* landscape.

Example: Blackbrush LANDFIRE Model

Early development



120 yrs  
after fire



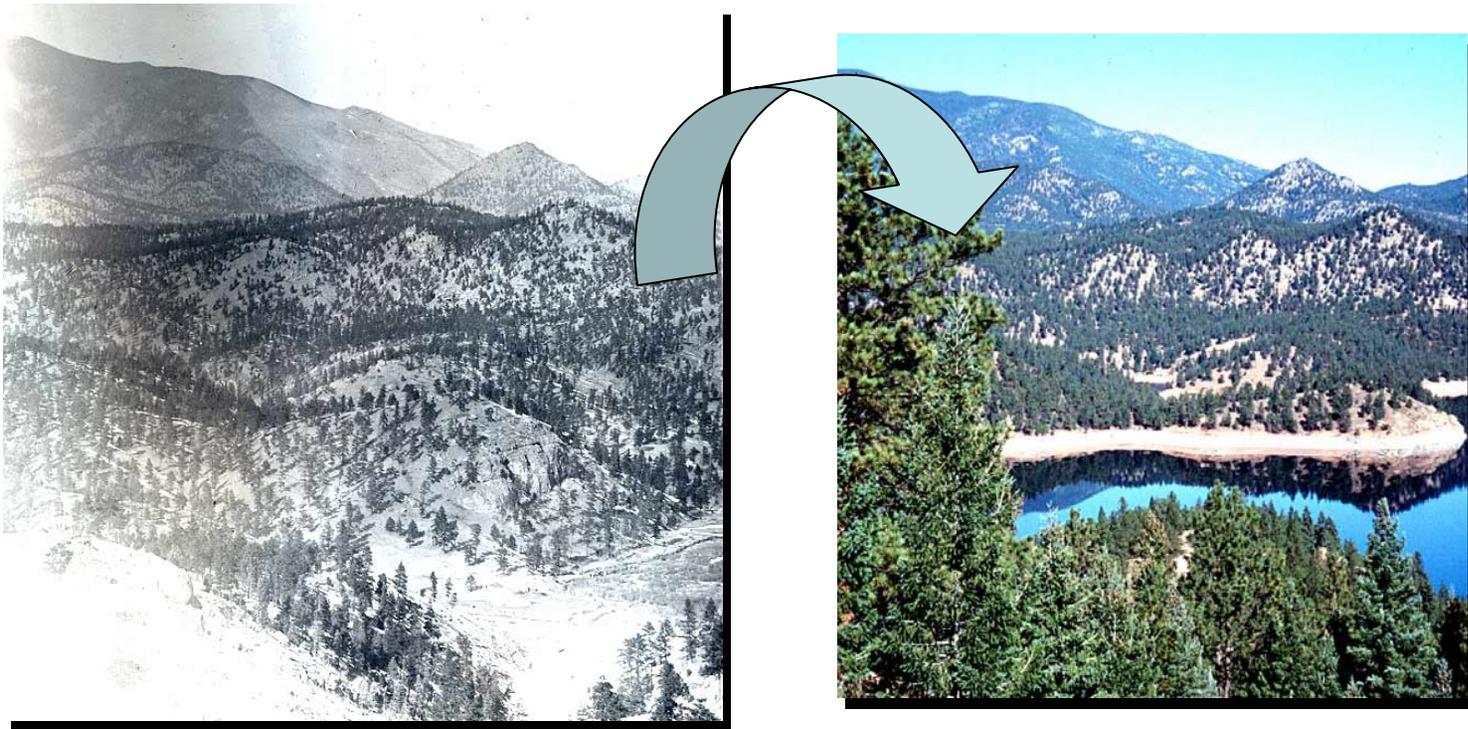
Late development



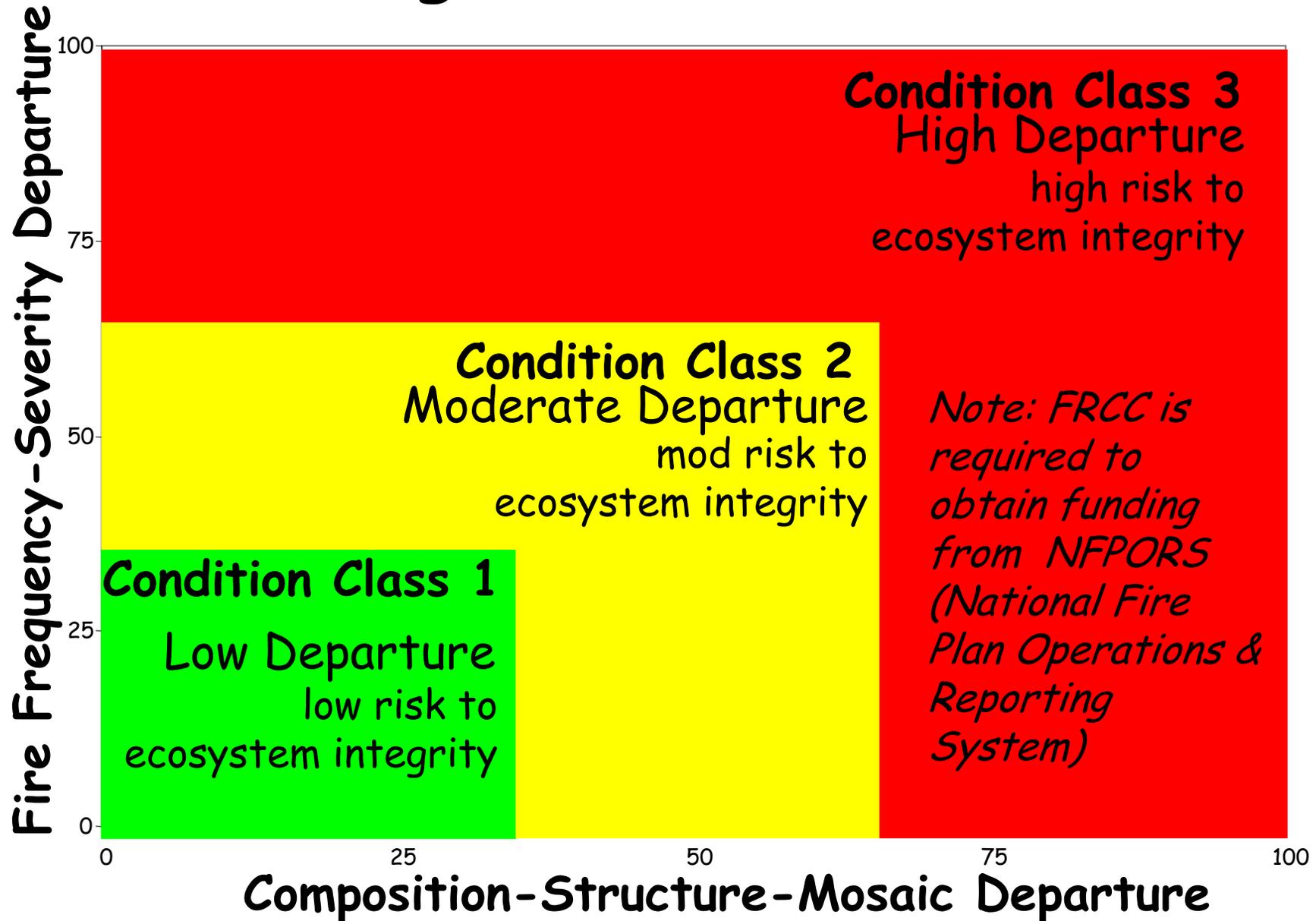
5% ← NRV → 95%

# Fire Regime Condition

The departure (dissimilarity from 0 - 100%) of current vegetation and fire regime conditions from the natural range of variability



# Fire Regime Condition Classes



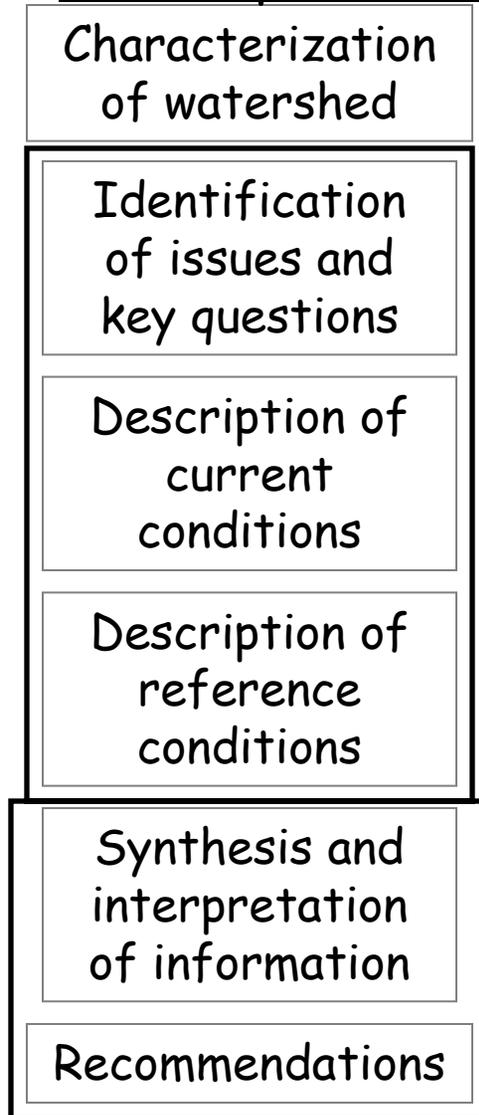


# Conservation Action Planning

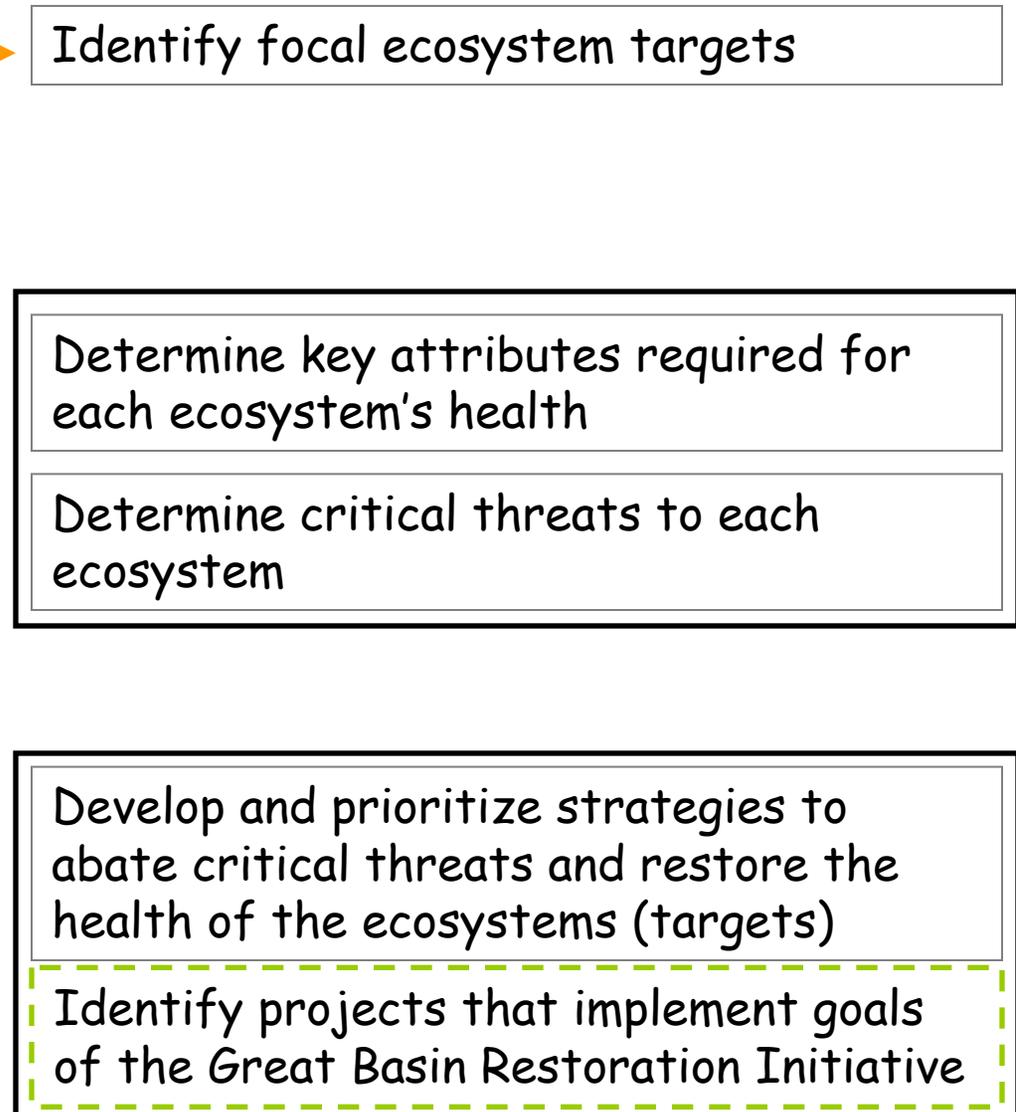
Back to assessment process...

# Federal Guide for Watershed Analysis (USFS) and Conservation Action Planning (CAP)

## Six-Step Process



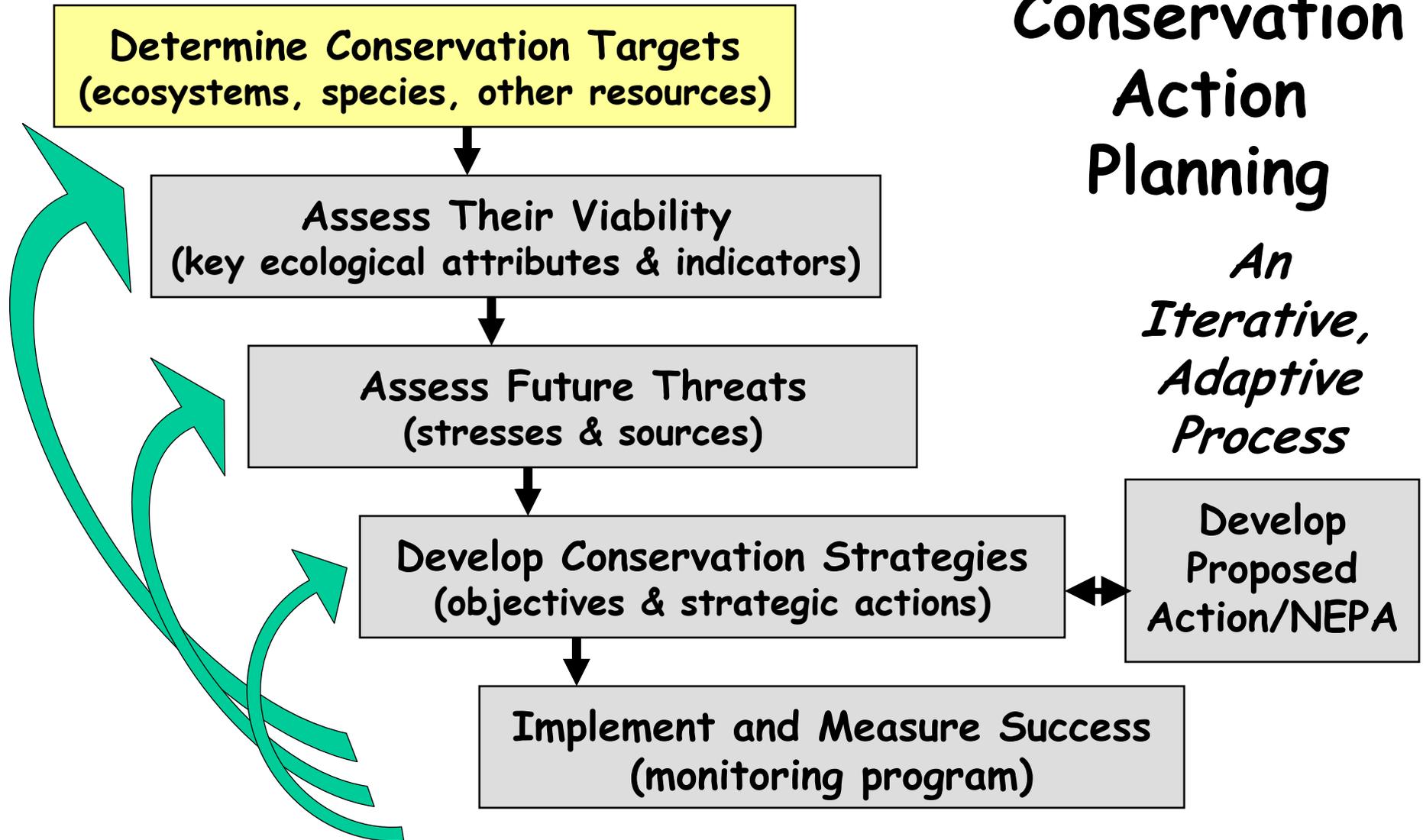
## TNC Process



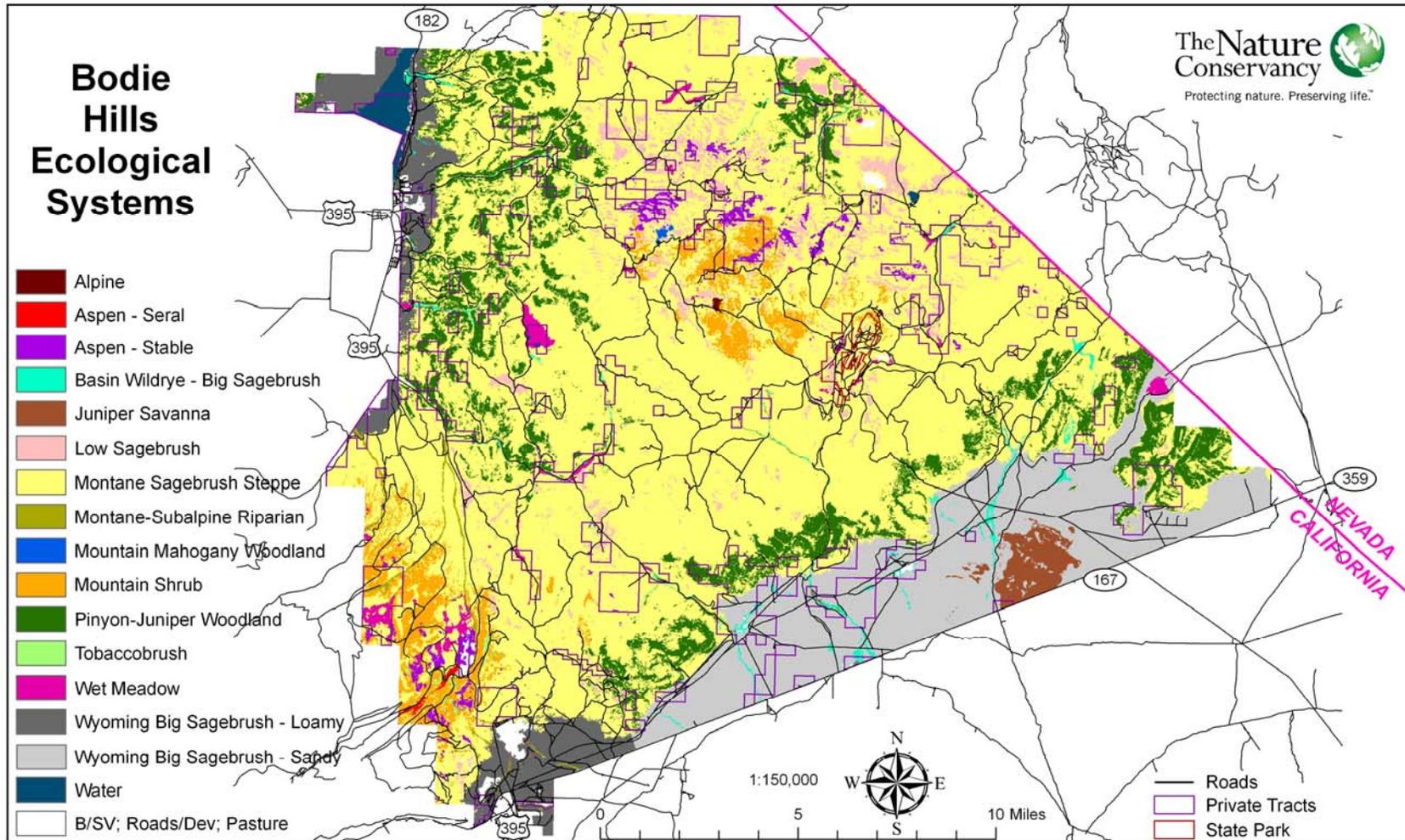
# Conservation Action Planning

## Conservation Action Planning

*An  
Iterative,  
Adaptive  
Process*



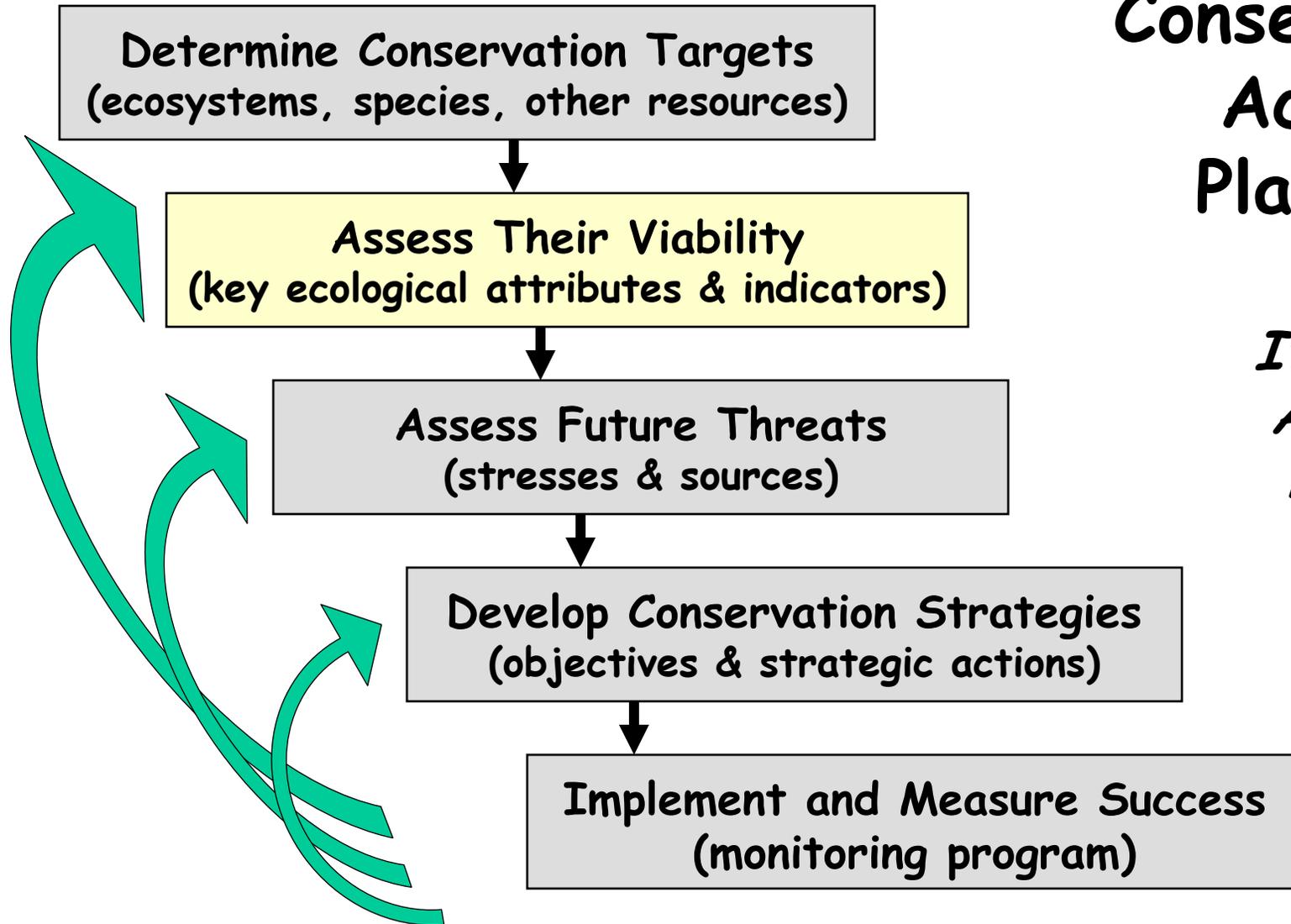
# 15 Biophysical Settings = Conservation Targets



# Conservation Action Planning

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# Viability

BLM partners decided:

- Viability of ecological systems, and their nested species, was best represented by Fire Regime Condition
- Fire Regime Condition is a good measure of ecological departure

# Fire Regime Condition = Ecological Departure

Detailed tables show which succession stages are "out of whack"

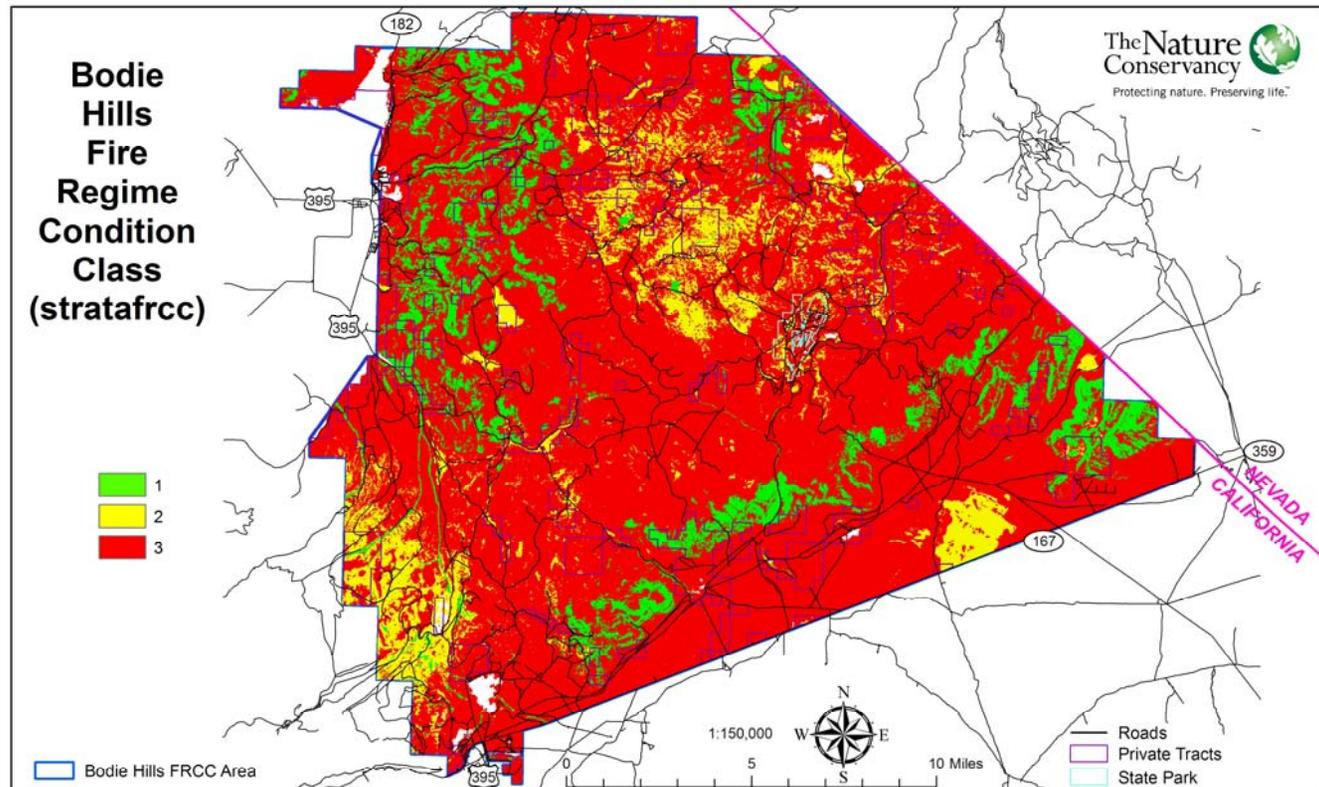
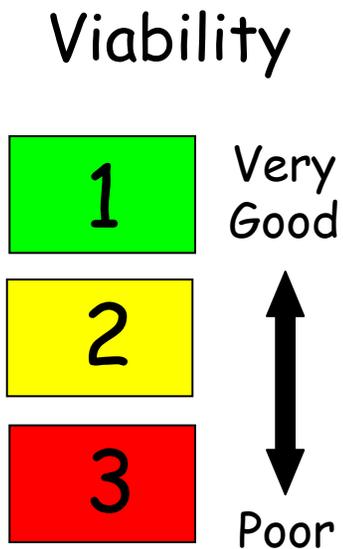
Vegetation Classes	Actual % in Class	NRV % in Class
<u>Class A – Early Development, Open</u> Herbaceous vegetation is dominant; shrub cover is 0 to 10%.	5%	20%
<u>Class B – Mid Development, Open</u> Mountain big sagebrush cover up to 30%; herbaceous cover typically >50%.	10%	50%
<u>Class C – Mid Development,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

Too Little

Too Much

# FRCC

## Local Remote Sensing Effort



80% of area is mountain big sagebrush: FRCC 3

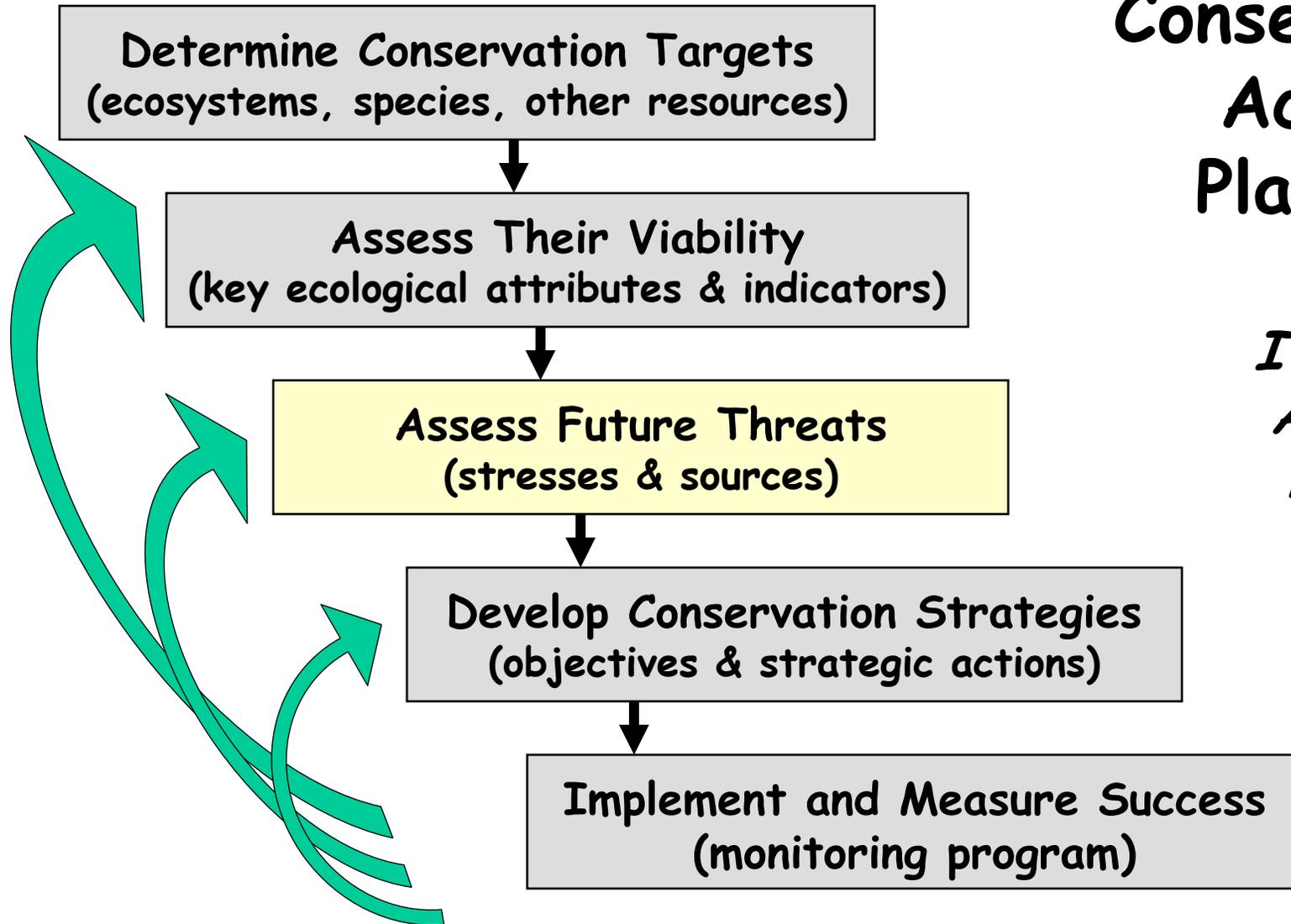
# FRCC by Ecological Systems

Ecological System	FRCC	% Current Departure	High Risk Classes
Alpine	1	5%	
Aspen	2	40%	X
Basin Wildrye – Big Sagebrush	3	73%	X
Juniper Savanna	2	35%	
Low Sagebrush	2	41%	X
Montane Sagebrush Steppe	3	72%	X
Montane-Subalpine Riparian	1	21%	X
Mountain Mahogany Woodland	1	23%	
Mountain Shrub	2	39%	
Pinyon-Juniper Woodland	1	29%	X
Tobaccobrush	1	9%	
Wet Meadow	2	33%	X
Wyoming Big Sagebrush	3	74%	X

# Conservation Action Planning

## Conservation Action Planning

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# Future Threats

## Analysis:

- Partners identified the increase area of High Risk Classes
- High Risk Classes are:
  - Non-native species dominated
  - Very expensive to fix, or
  - Direct pathway to above
- Future increase of threats is quantified by **modeling**

Ecological System	FRCC	% Current Departure	High Risk Classes
Alpine	1	5%	
Aspen	2	40%	X
Basin Wildrye – Big Sagebrush	3	73%	X
Juniper Savanna	2	35%	
Low Sagebrush	2	41%	X
Montane Sagebrush Steppe	3	72%	X
Montane-Subalpine Riparian	1	21%	X
Mountain Mahogany Woodland	1	23%	
Mountain Shrub	2	39%	
Pinyon-Juniper Woodland	1	29%	X
Tobaccobrush	1	9%	
Wet Meadow	2	33%	X
Wyoming Big Sagebrush	3	74%	X

# Modeling & Anatomy of Montane Sagebrush I

Age 1-11



Age 12-49



Age >50



Age 71-114



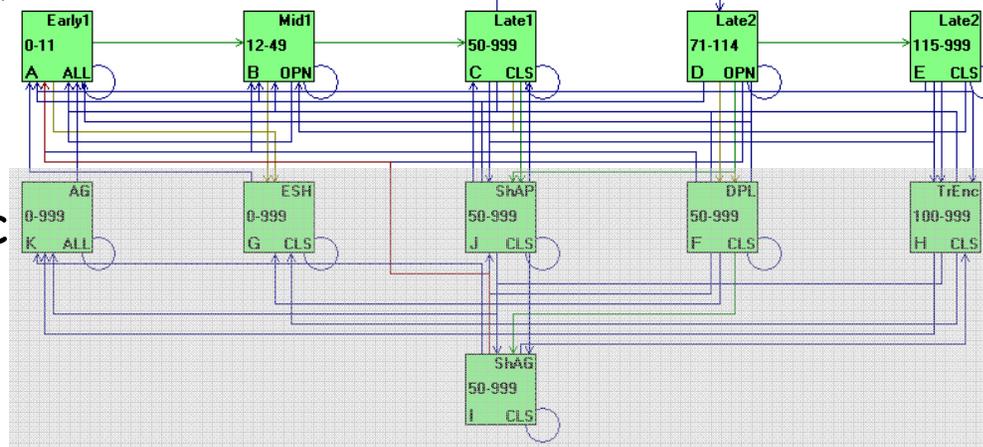
Age >115



Increasing time since fire

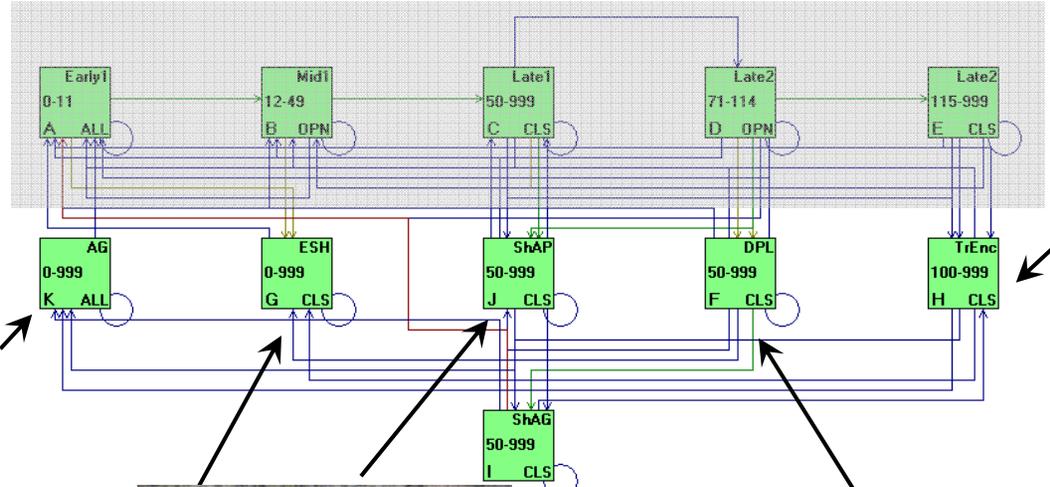
Reference classes

Uncharacteristic classes



# Modeling & Anatomy of Montane Sagebrush II

Reference classes  
 .....  
 Uncharacteristic classes



Tree Encroached



Annual Grassland



Shrub-Annual Grass-Perennial Grass



Shrub-Annual Grass-



Depleted Sagebrush

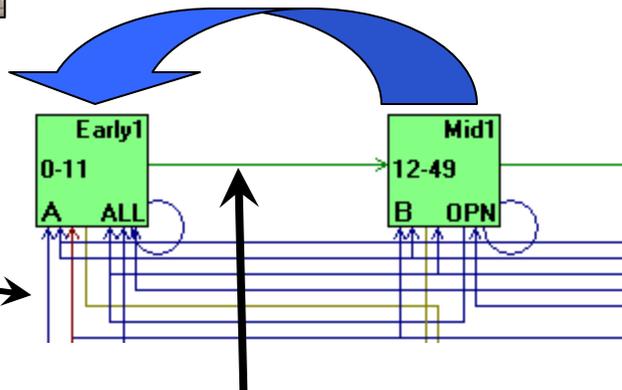


Early Shrub

# Modeling & Anatomy of Montane Sagebrush III



Disturbance  
Transition  
(top or  
bottom  
of box)



Succession Pathway  
(green, side of box)

# Future High Risk Classes

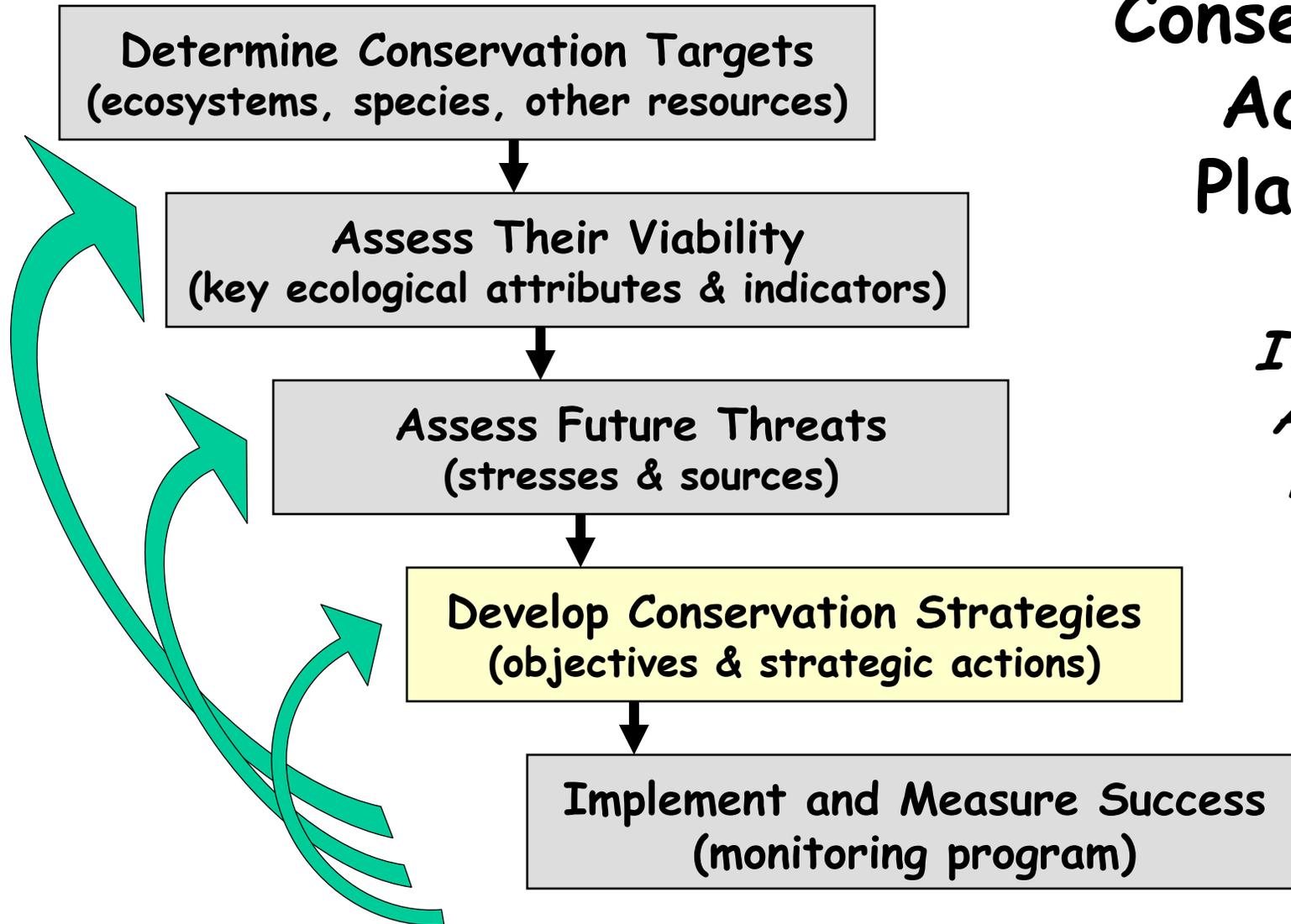
Ecological System	FRCC	High Risk Acres Now	Future (20 yrs) High Risk
Alpine	1		
<b>Aspen</b>	2		X
<b>Basin Wildrye – Big Sagebrush</b>	3	X	X
Juniper Savanna	2		
<b>Low Sagebrush</b>	2		X
<b>Montane Sagebrush Steppe</b>	3	27%	31%
<b>Montane-Subalpine Riparian</b>	1		X
Mountain Mahogany Woodland	1		
Mountain Shrub	2		
Pinyon-Juniper Woodland	1	X	X
Tobaccobrush	1		
<b>Wet Meadow</b>	2		X
<b>Wyoming Big Sagebrush</b>	3	X	X

← An example:  
3% increase

# Conservation Action Planning

## Conservation Action Planning

*An  
Iterative,  
Adaptive  
Process*





# Conservation Strategies

- Each objective is designed to
  - Abate a critical threat *and/or...*
  - Enhance the viability of a target
- What is achieved - a measurable outcome that defines success and how you do it

# Conservation Strategy: Example

<b>Project</b>	<b>Bodie Hills</b>				
<b>Conservation Target</b>	<b>Montane Sagebrush Steppe</b>				
<b>Objective</b>	Improve ecological condition of ~120,000 acres of Bodie Hills montane sagebrush steppe from 72% departure (FRCC 3) from NRV to ~55% departure (FRCC 2), prevent increase in highest-risk classes to xx% or less... over 20 years, and establish fuel break around Bodie State Park providing ecological benefits by increasing Classes A & B				
<b>Acres Treated/Year</b>					975
<b>Total Ecosystem Acres</b>					119,836
<b>Strategy</b>	Treat ~1000 acres/yr of montane sagebrush steppe -- with prescribed fire, mowing/burning/ drilling/seeding, lopping & canopy thinning.				
<b>Actions</b>		<b>One Time Costs</b>	<b>Acres/Year</b>	<b>Cost/Acre</b>	<b>Cost/Year</b>
	Lop Class D & DPL & ShAP to prevent conversion to Tree Encroached Class; make available for firewood; explain fire risk		50	\$ 300	\$ 15,000
	Conduct early spring burns of Shrub/Annual/Perennial Grass Class (ShAP) to Class A		500	\$ 40	\$ 20,000
	DPL restoration & 300 ft. fuel break around 7 miles of State Park (280 acres over 3 years @\$207/acre)	\$ 112,000	-	\$ 400	\$ -
	Regular prescribed fire in Classes C & D		400	\$ 50	\$ 20,000
	Canopy thinning of Class C as needed for WUI objectives		25	\$ 400	\$ 10,000
	Archeological & plant surveys	\$ 9,800	900	\$ 35	\$ 31,500
<b>Total Cost/Year</b>	<b>excluding one time costs</b>	<b>\$ 121,800</b>			<b>\$ 96,500</b>
<b>Number of Years</b>					20
<b>Probability of Success</b>					High <input type="button" value="v"/>
<b>Notes</b>	Arch & plant survey @\$55 (may not be needed for lop DPL and early grazing) DPL restoration assumes reduced cost-per-acre (ave. between \$207 - \$600) for large-scale contract				

# Strategy Development

## Calculating Area to Change I

Area change data was first obtained from FRCC Mapping Tool, then adjusted to reflect management constraints – a static approach

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

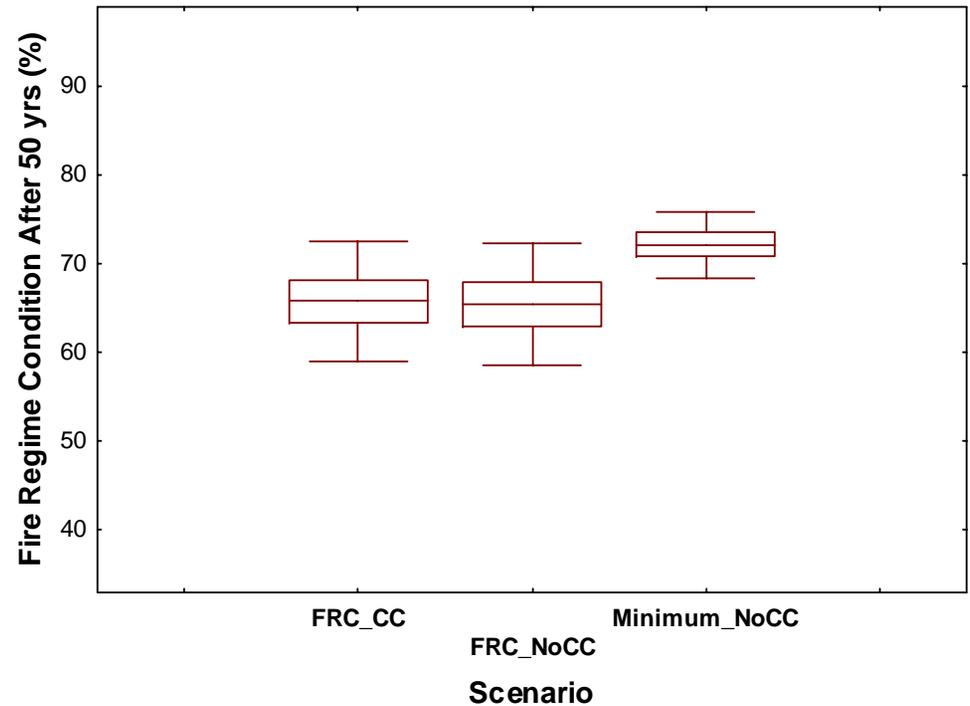
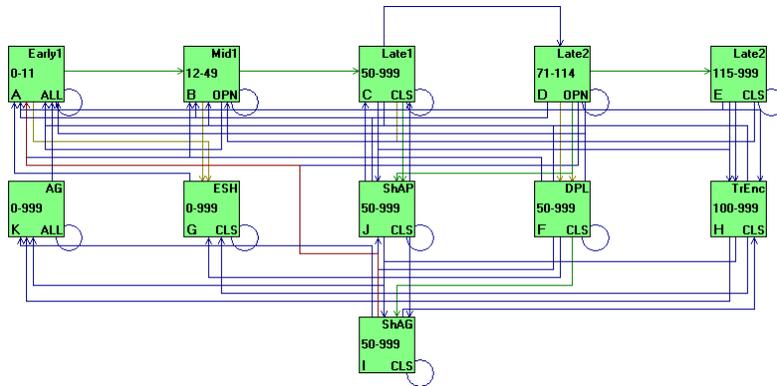
Too Little

Too Much

# Strategy Development

## Calculating Area to Change II

Area treated data were finally modeled and tested:  
 How many acres can be fixed assuming failure rates & budget constraints



### Scenario Legend:

- Minimum\_NoCC = Minimum management, no climate change
- FRC\_NoCC = Ecological management, no climate change
- FRC\_CC = Ecological management with climate change

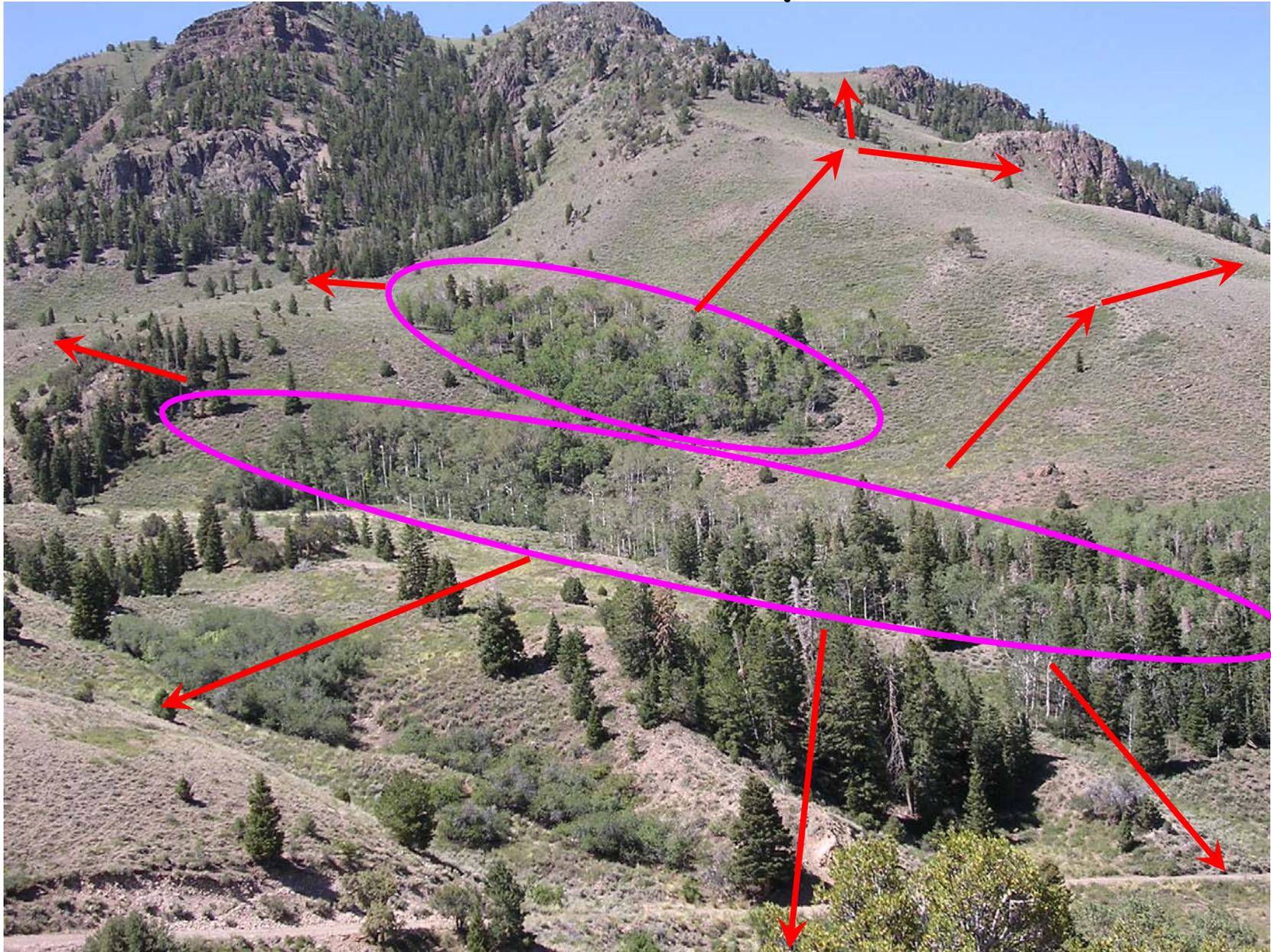


# Project Identification

## Two approaches

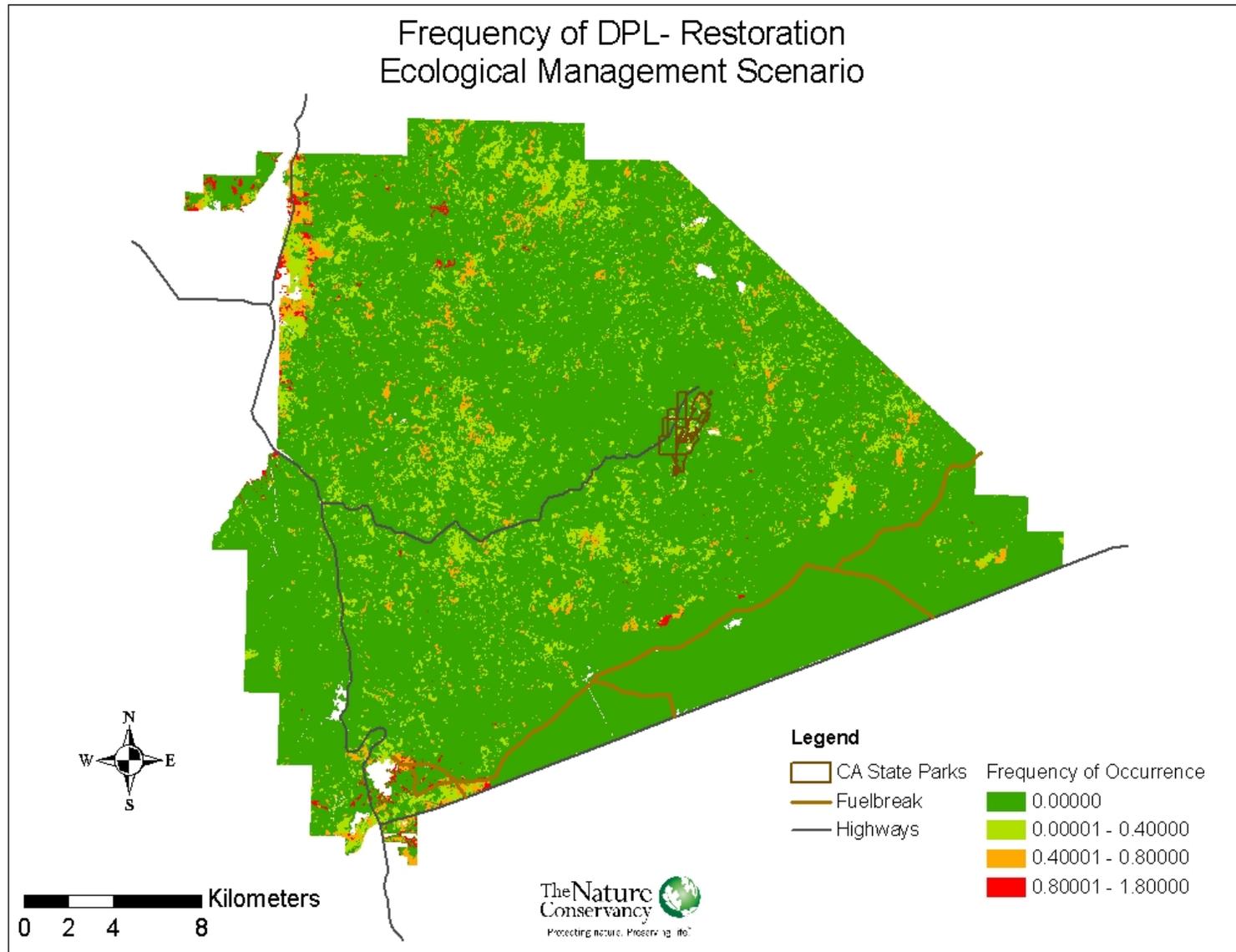
- Less expensive: GIS overlays
- More expensive: Spatial modeling

# GIS overlays



**Great Basin Aspen: Sets the Stage for Uplands Restoration**

# Identify Projects Spatial Simulation Map



The title slide features a wide-angle photograph of a mountainous landscape. The foreground shows a rocky, sparsely vegetated slope with some evergreen trees. In the background, a range of blue-toned mountains stretches across the horizon under a clear sky. The text "North Schell Watershed Assessment" is overlaid in a bright yellow, bold, sans-serif font.

# North Schell Watershed Assessment

Setting Priorities:  
Return on Investment

# Return on Investment

## Lowest Cost Strategies for Improved Ecosystem Health

### Bodie Hills Strategies for Ecological Systems

Ecological System	Conservation Strategy	Annual Cost	Probability of Success
Aspen (stable)	Treat 50 acres/year of late succession aspen classes, provide fencing for 200 uncharacteristic acres and continue active herd management	\$25,000	Very High
Basin Wildrye - Big Sagebrush	Treat 50+ acres/year of depleted basin wildrye to convert to early development class (e.g. one drainage/year) as field circumstances permit; continue weed inventory & control; add prescribed fire as needed in future	\$18,000	High
Low Sagebrush	Mechanically thin ~125 acres/year of late-successional low sagebrush to prevent new tree encroachment	\$11,000	High
Montane Riparian	Continue weed inventories, spot treatments and active herd management in riparian areas (1/3 is on private land); stabilize headouts and restore natural channels on targeted creeks	\$6,000	High
Montane Sagebrush Steppe	Treat ~1000 acres/yr of montane sagebrush steppe – with prescribed fire, mowing/burning/ drilling/seeding, lopping & canopy thinning.	\$97,000	High
Wet Meadows	Continue weed inventories, spot treatments & active herd management in wet meadows (50% are on private land; private landowners & agencies cooperate on coordinated weed mgmt area); treat iris/silver sage at targeted meadows	\$10,000	High
Wyoming Big Sagebrush (loamy)	Create WUI and ecological fuel breaks in Wyoming loamy sagebrush – using mowing, seeding, mechanical brush control, possible aeration, and some very small spring burning of Depleted and Class C sagebrush – to convert to Classes B and A	\$4,000	Medium
Wyoming Big Sagebrush (sandy)	Create ecological fuel breaks in Wyoming big sagebrush (sandy) along sandy roads and other WUI fuel breaks as needed	\$18,000	High
		<b>\$189,000</b>	



# **CAP Conclusion**

# Expected Change in FRC After 20 yrs

Ecological System	Current	20 Years No Mgmt	20 Years Ecological Mgmt
Alpine	5	5	n/a
Aspen	41	49	33
Basin Wildrye – Big Sagebrush	73	79	45
Juniper Savanna	35	29	n/a
Low Sagebrush	41	37	37
Montane Sagebrush Steppe	72	69	57
Montane-Subalpine Riparian	21	33	27
Mountain Mahogany Woodland	22	15	n/a
Mountain Shrub	39	49	n/a
Pinyon-Juniper Woodland	29	30	n/a
Tobaccobrush	9	15	n/a
Wet Meadow	33	38	19
Wyoming Big Sagebrush (loamy)	74	70	58
Wyoming Big Sagebrush (sandy)	99	99	97

20 yr results based on state-and-transition management models





## Benefits

### Effectiveness

restoring ecosystems with greatest need and ability to recover

### Efficiency

spending limited dollars in the right places

### Scientific foundation for NEPA

data available to support decision



## Presentation Goals

- Explain the choice of priority landscapes
- Demonstrate effective process for setting priorities, developing project proposal, and documentation for NEPA
- **Discuss simple facts about the Mojave Desert**

# Mojave Desert

## Spring Mtns

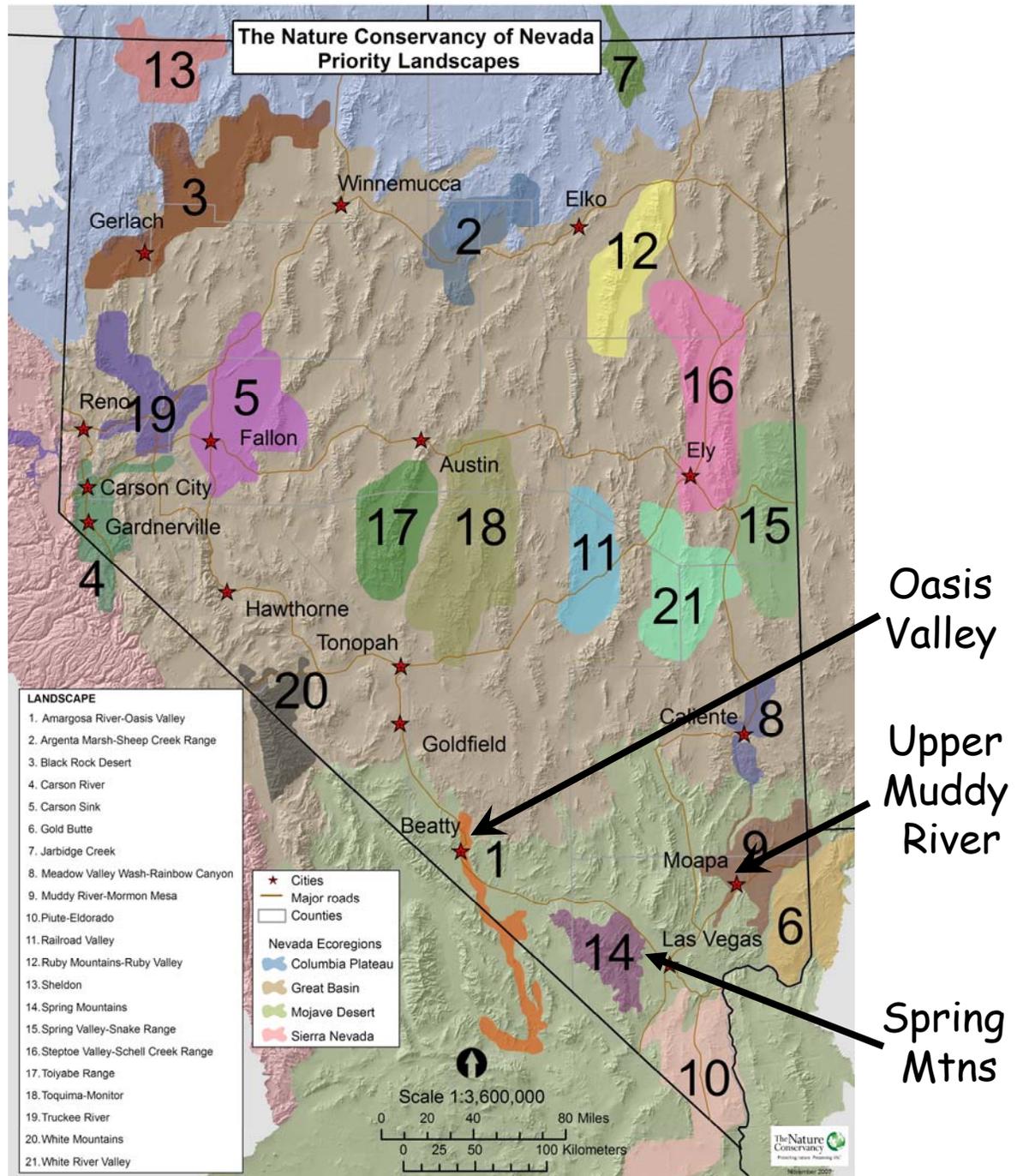
- Finalizing FRCC mapping for 1.25 million acres
- Ready for enhanced CAP

## Muddy River

- Effectiveness monitoring of saltcedar & knapweed removal

## Oasis Valley

- Rx Fire of wetlands & nonnative species removal



# Mojave Desert—Simple Facts

- Lower and middle elevations have not generally evolved with fire:
  - Fire suppression is the strategy
- Red brome and cheatgrass are widespread and cause uncharacteristic fires at these elevations
  - Map uninfested areas and protect them
  - Map high value areas and restore them
    - ✓ identify promising herbicides (?)
    - ✓ isolate & mass produce competitive native plant varieties (?)
    - ✓ Identify & mass produce annual grass diseases (?)



# Mojave Desert—Simple Facts

- Montane and higher elevations are fire dependent or tolerant
  - Engage in active fuels management
- Lowest elevation systems do not have red brome and fire is rare
  - Conserve these systems
- Less common ecological systems appear healthy
  - Conserve these systems



A landscape photograph showing a field of tall, dry, golden-brown grasses in the foreground. In the middle ground, there is a line of green shrubs. The background features a range of rugged, brown mountains under a clear blue sky. The word "Questions?" is overlaid in the center of the image in a large, black, sans-serif font.

Questions?