

Approaches to Biodiversity Conservation Planning



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Transportation Planning: paradigm shifts

“... the avoidance, minimization, and mitigation efforts used may not always provide the greatest environmental benefit, or may do very little to promote ecosystem sustainability.”

Eco-Logical: An Ecosystem Approach
to Infrastructure Projects

Biodiversity Conservation Planning: paradigm shifts

*“... we protect the last of the least,
and the best of the rest.”*

Often heard adage among staff of
The Nature Conservancy
throughout the 1980s and early
1990s

Systematic Biodiversity Conservation Planning

Seems like everyone is doing it!

- n The Nature Conservancy - Ecoregional Conservation Plans & Conservation Action Plans
- n State Comprehensive Wildlife Conservation Strategies
- n Bird Conservation Region and Joint Venture plans
- n GAP Analysis Projects
- n Forest Products Industry
- n National Wildlife Refuges
- n And many, many others

The process and products need to be...

- n Transparent
- n Measurable
- n Actionable
- n 'Bulletproof'
 - n Scientific Literature
 - n Expert Knowledge
 - n Partner Consensus

Government

Industry

Conservation
NGOs

Value of Using a Common Planning Framework

- n Increase efficiency**
- n Improve credibility and defensibility**
- n Roll up or step down conservation needs across scales**
- n Share monitoring protocols and many data-related investments across jurisdictions**

Adaptive Conservation

Evaluate

Develop
Strategies

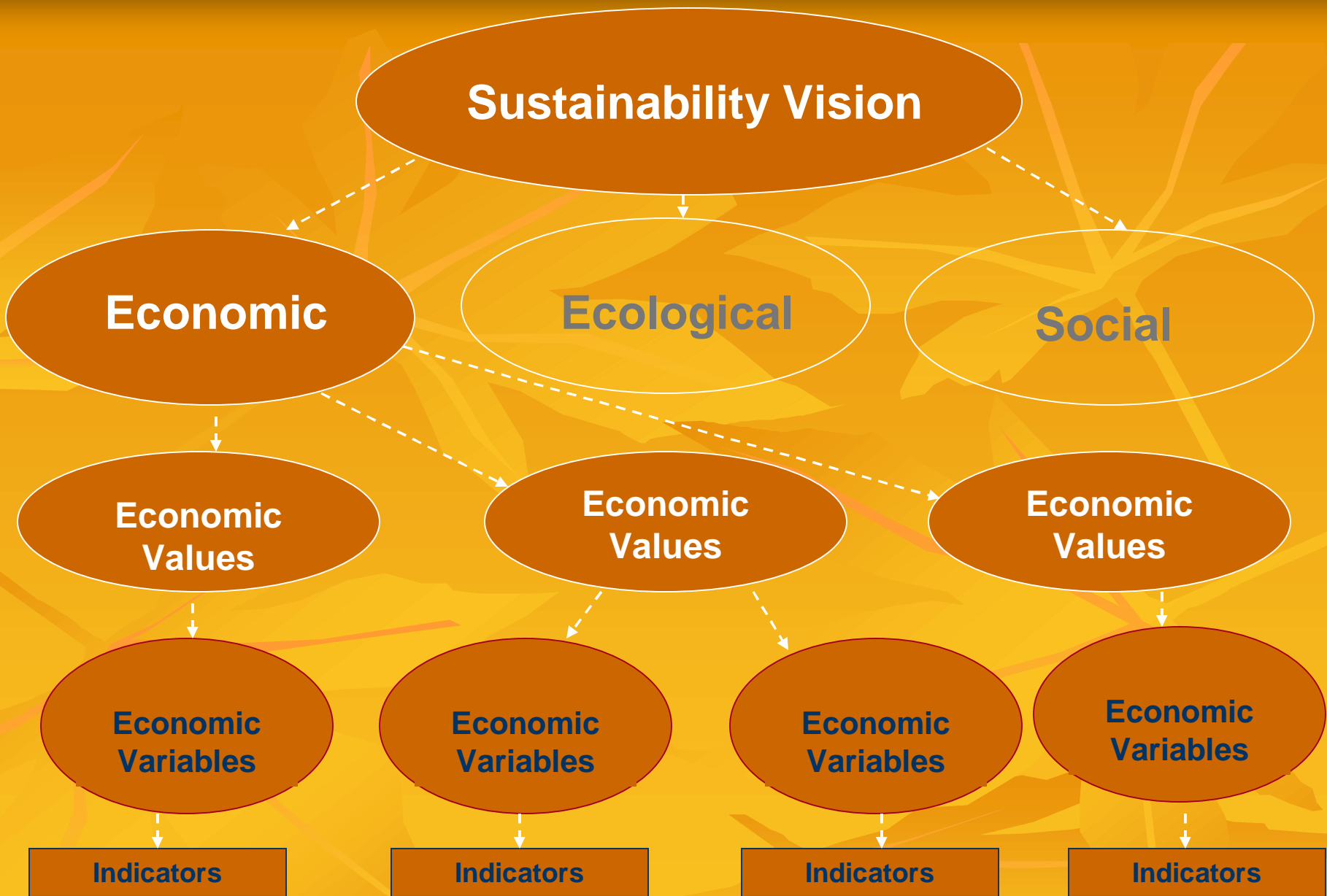
Monitor

Implement





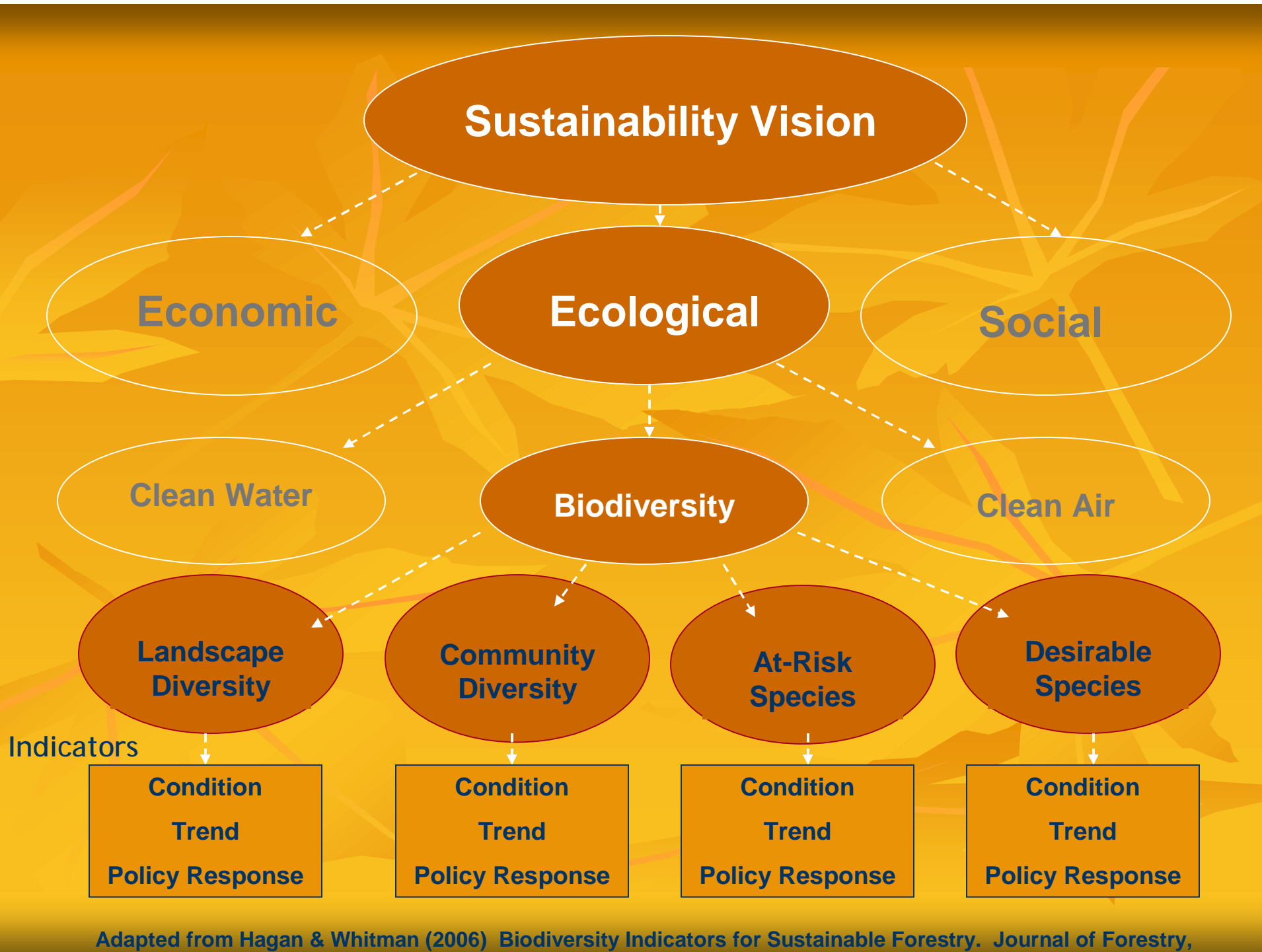
Adapted from Hagan & Whitman (2006) Biodiversity Indicators for Sustainable Forestry. *Journal of Forestry*, June 2006



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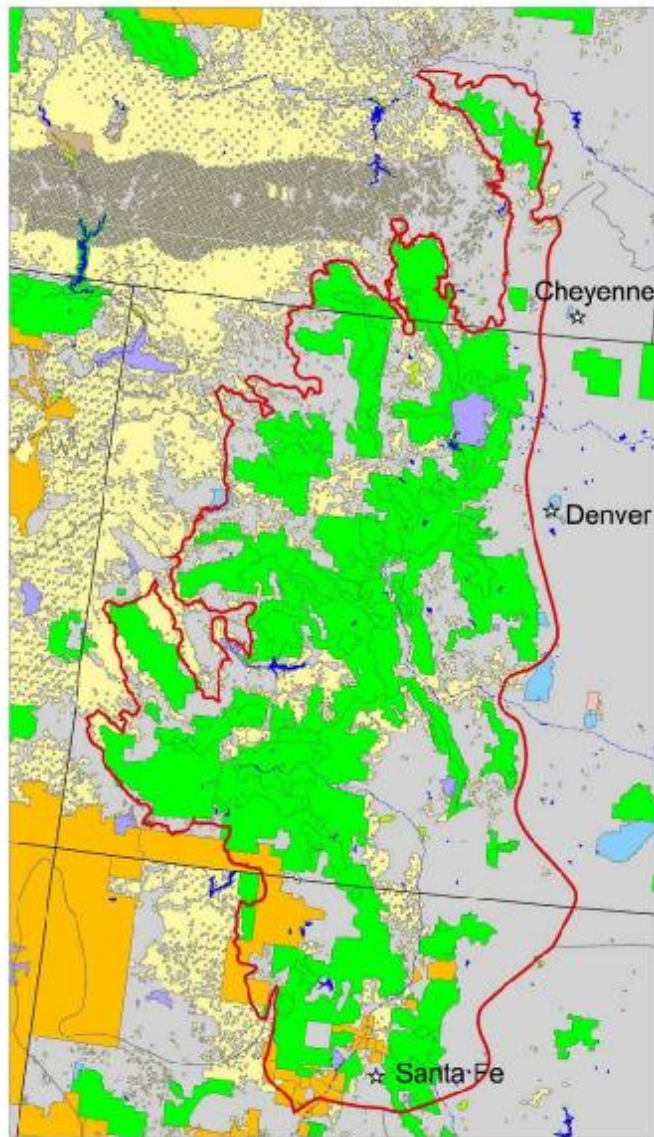
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Analysis at Multiple Spatial Scales

- **Regional-scale** (e.g., habitat representation throughout the Southern Rocky Mountains ecoregion)
- **Public/Private Land Planning Unit**
(e.g., management emphasis on the Arapaho & Roosevelt National Forests)
- **Local Landscape** (e.g., multiple habitat patches within a proposed project area)
- **Individual Habitat Patch** (e.g., one wetland or species habitat patch of conservation concern)

10 Common Steps in Planning

- WHAT IS THE PLANNING AREA?
 - WHAT ECOSYSTEMS AND SPECIES REQUIRE CONSIDERATION?
 - WHERE ARE THEY?
-
- WHAT ARE REFERENCE CONDITIONS?
 - WHAT ARE CURRENT CONDITIONS?
 - WHAT ARE THE TRENDS AMONG THOSE CONDITIONS?
 - WHAT ARE DESIRED CONDITIONS?
-
- WHAT STRATEGIES WILL MOVE US TOWARD DESIRED CONDITIONS?
 - WHAT ARE EXPECTED OUTCOMES FROM IMPLEMENTING STRATEGIES?
 - HOW WILL WE MONITOR AND EVALUATE OUR IMPLEMENTATION?



Federal Land Status in the Southern Rocky Mountains Ecoregion

LAND MANAGEMENT CATEGORIES

- Bureau of Land Management
- U.S. Forest Service
- Dept. of Defense (also includes other federal lands possibly DOD)
- National Park Service
- U.S. Fish & Wildlife Service
- Bureau of Reclamation
- Other: includes other DOD installations, Dept. of Energy, etc.
- Native American Lands/ Bureau of Indian Affairs
- Background

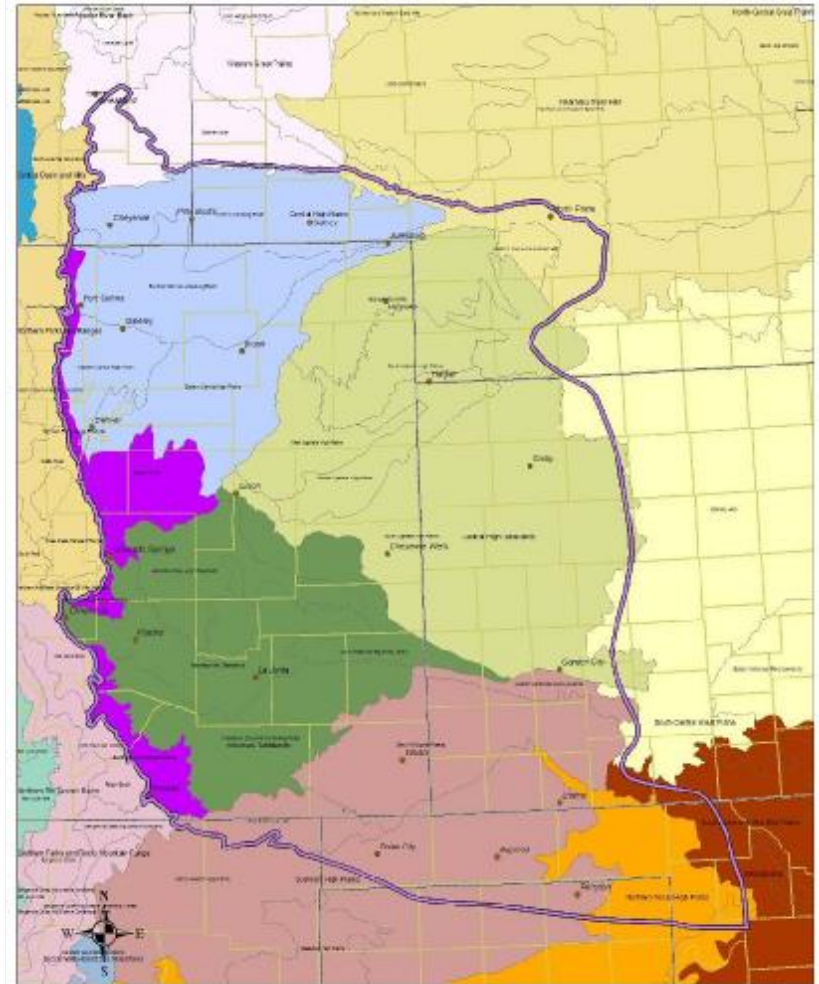
- State boundaries
- Capital cities

WATER FEATURES

- Perennial lake or reservoir
- Glacier
- Intermittent lake or reservoir
- Major rivers

TNC WESTERN ECOREGIONS

- SRM Ecoregion boundary
- other TNC Ecoregion boundaries



Ecological Subregions of the Central Shortgrass Prairie Ecoregion



Conservation Elements

Providing Focus for Ecological Sustainability

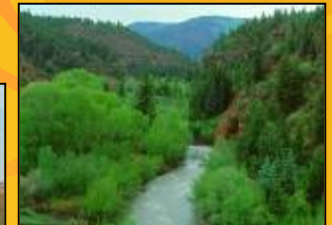
- **Species Diversity**

- Species of Concern

- ESA proposed, candidates, petitioned
 - G1-G3 (T1-T3) NatureServe status
 - May include distinct populations

- Species of Interest

- S1-S2 NatureServe status
 - Other T/E not captured above
 - UAFWS birds of concern
 - Regional/local concern
 - Other public interest requiring plan components



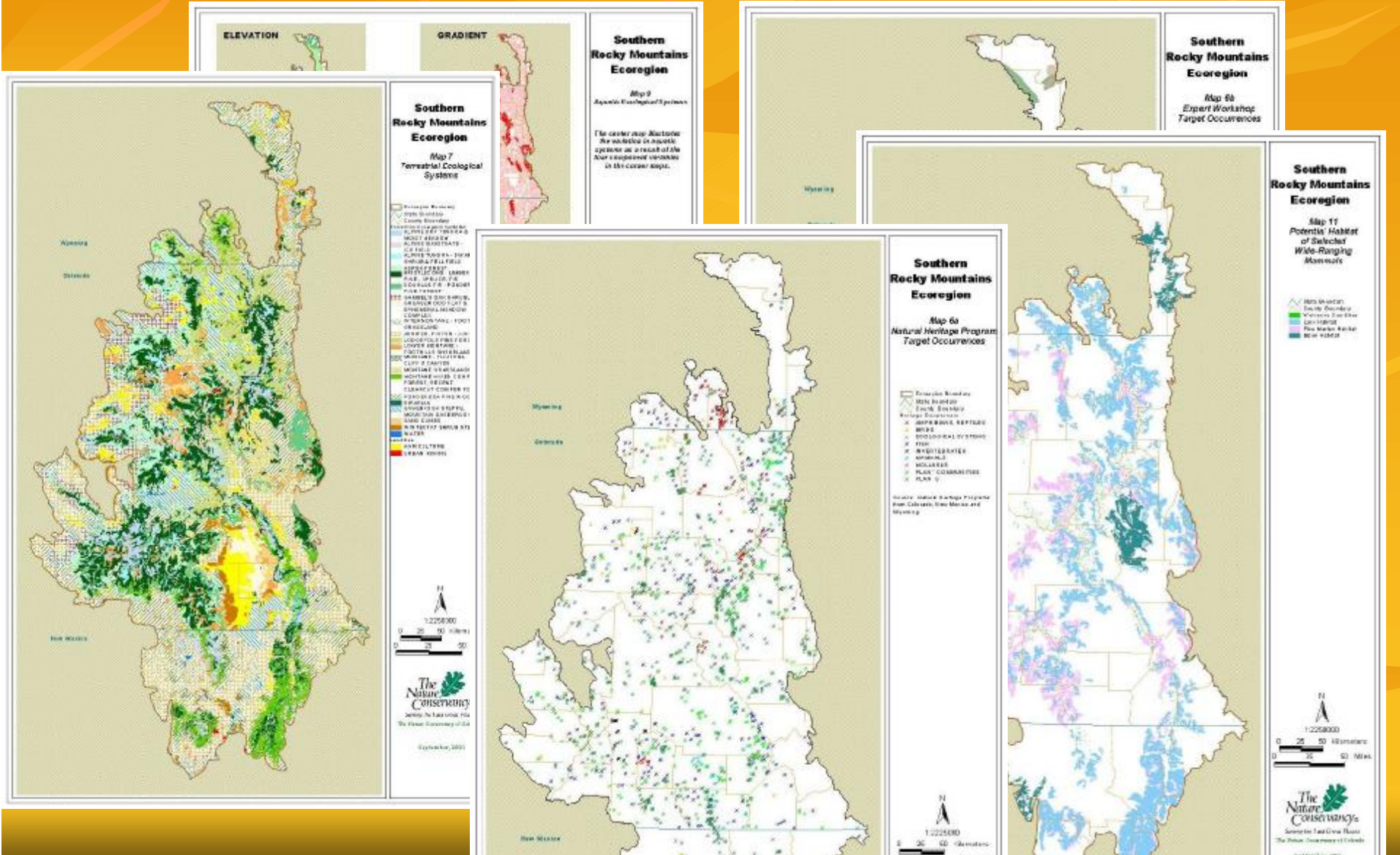
- **Ecosystem Diversity**

- Representative ecosystem types

- Vegetation types and structural stages



Mapping Biodiversity

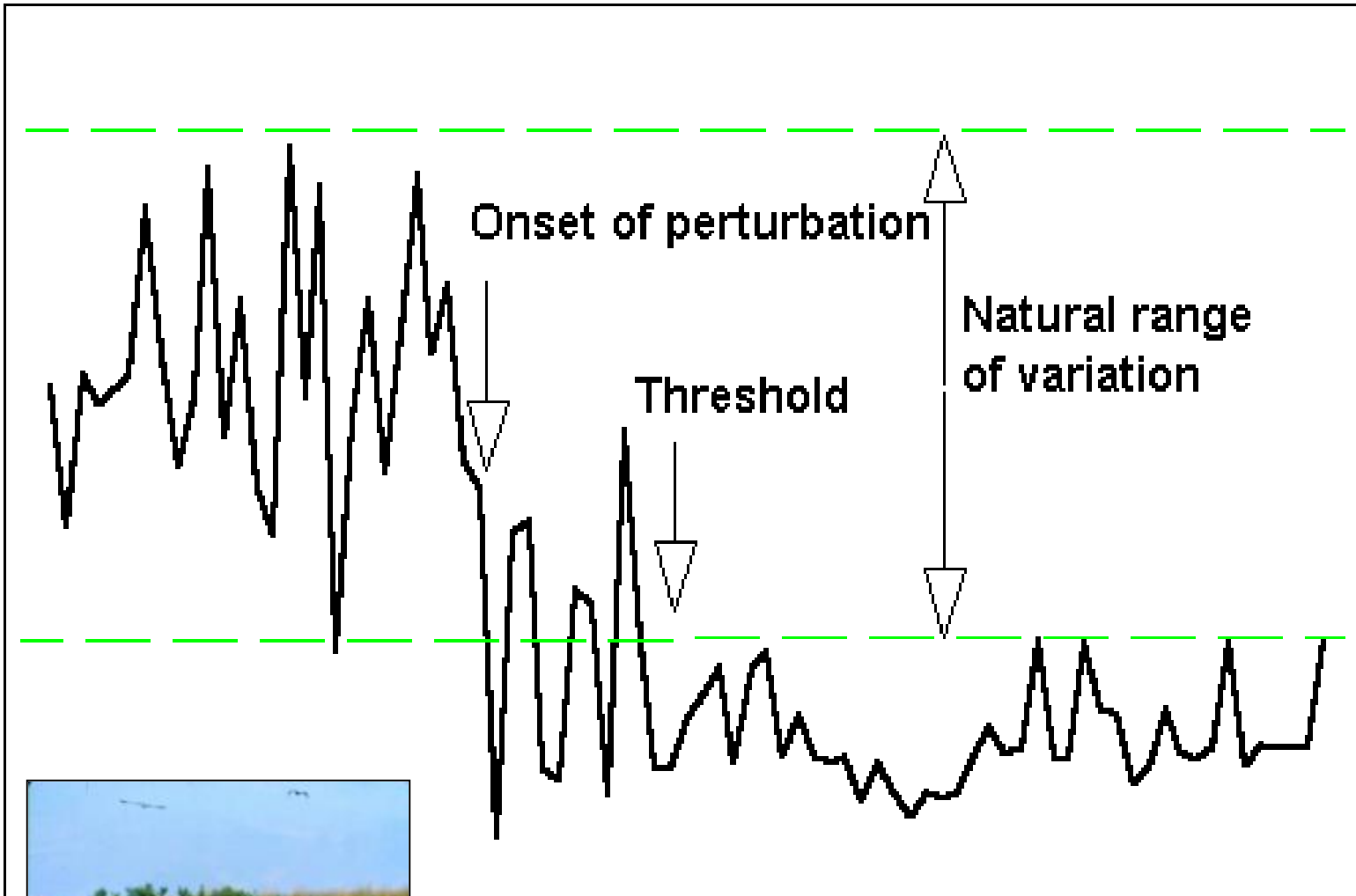


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Variability in Nature

Ecosystem process or state



Time

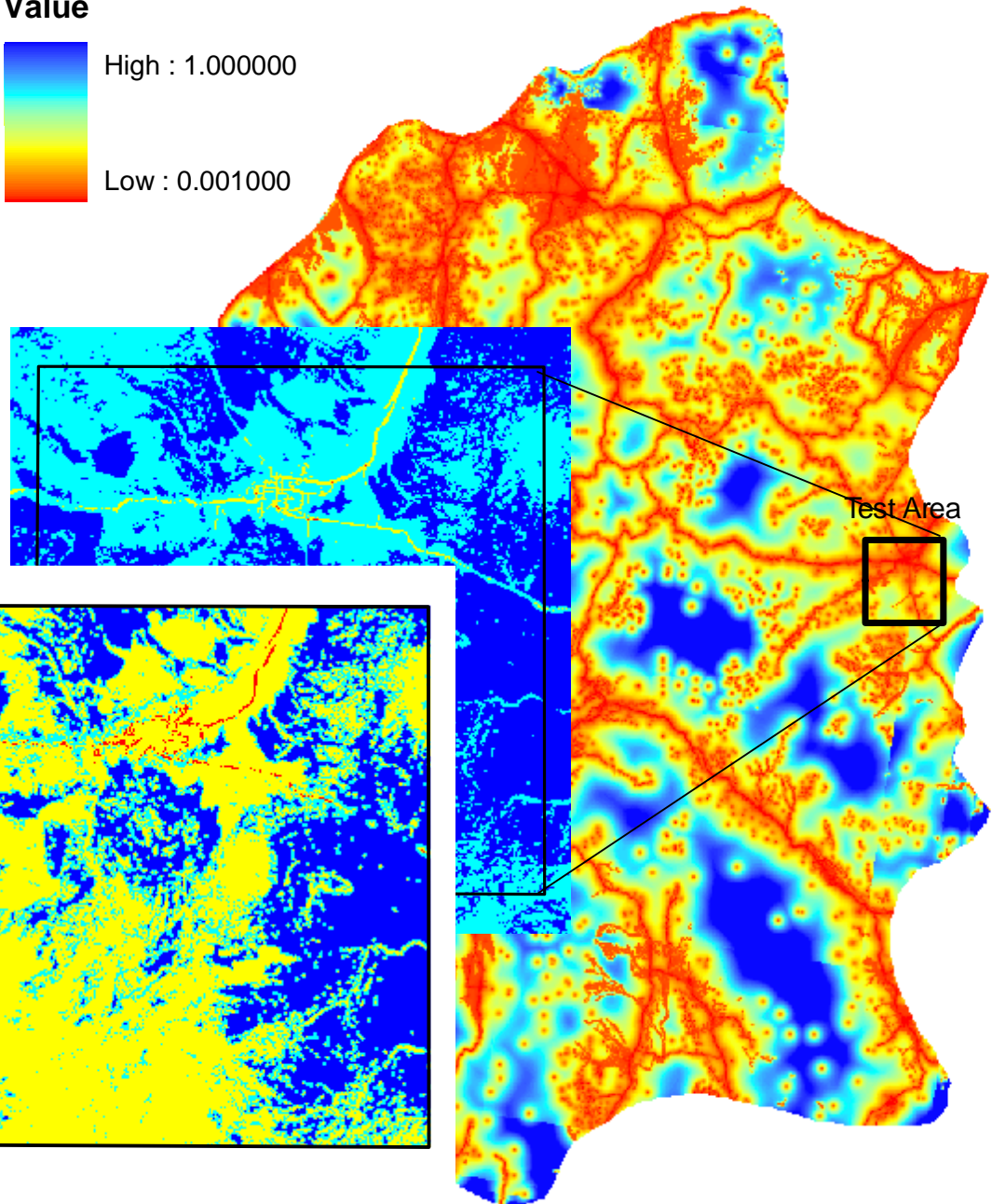
Modeling Landscape Condition for Wildlife

Value



High : 1.000000

Low : 0.001000



Stating Desired Conditions

"Avoid High Value Places"



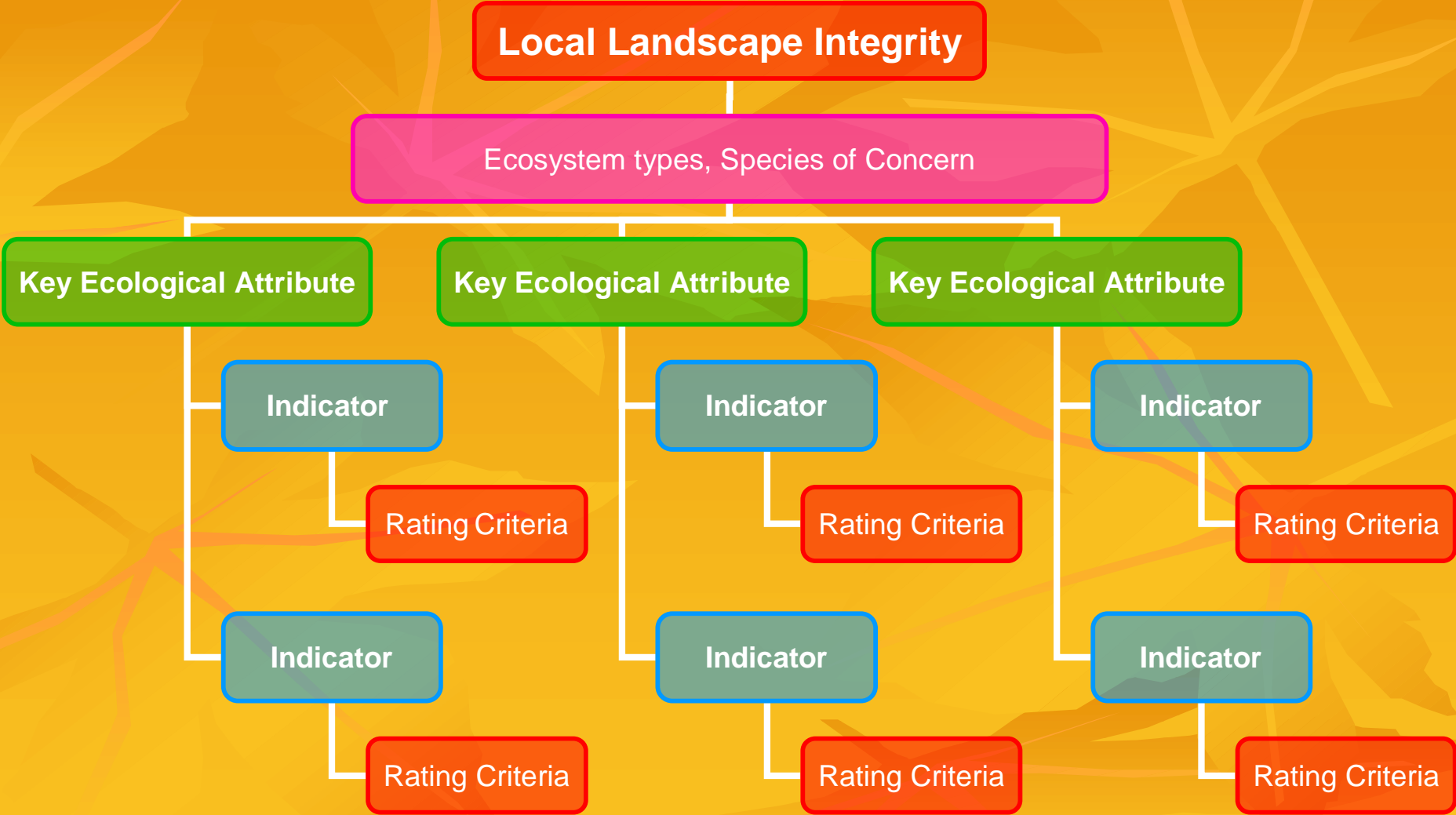
"No Net Loss"



Representation Goals as measurable expressions of societal values.

(e.g., "secure 25 discrete sub-populations of size j for species X , distributed across the ecoregions A , B , and C ...")

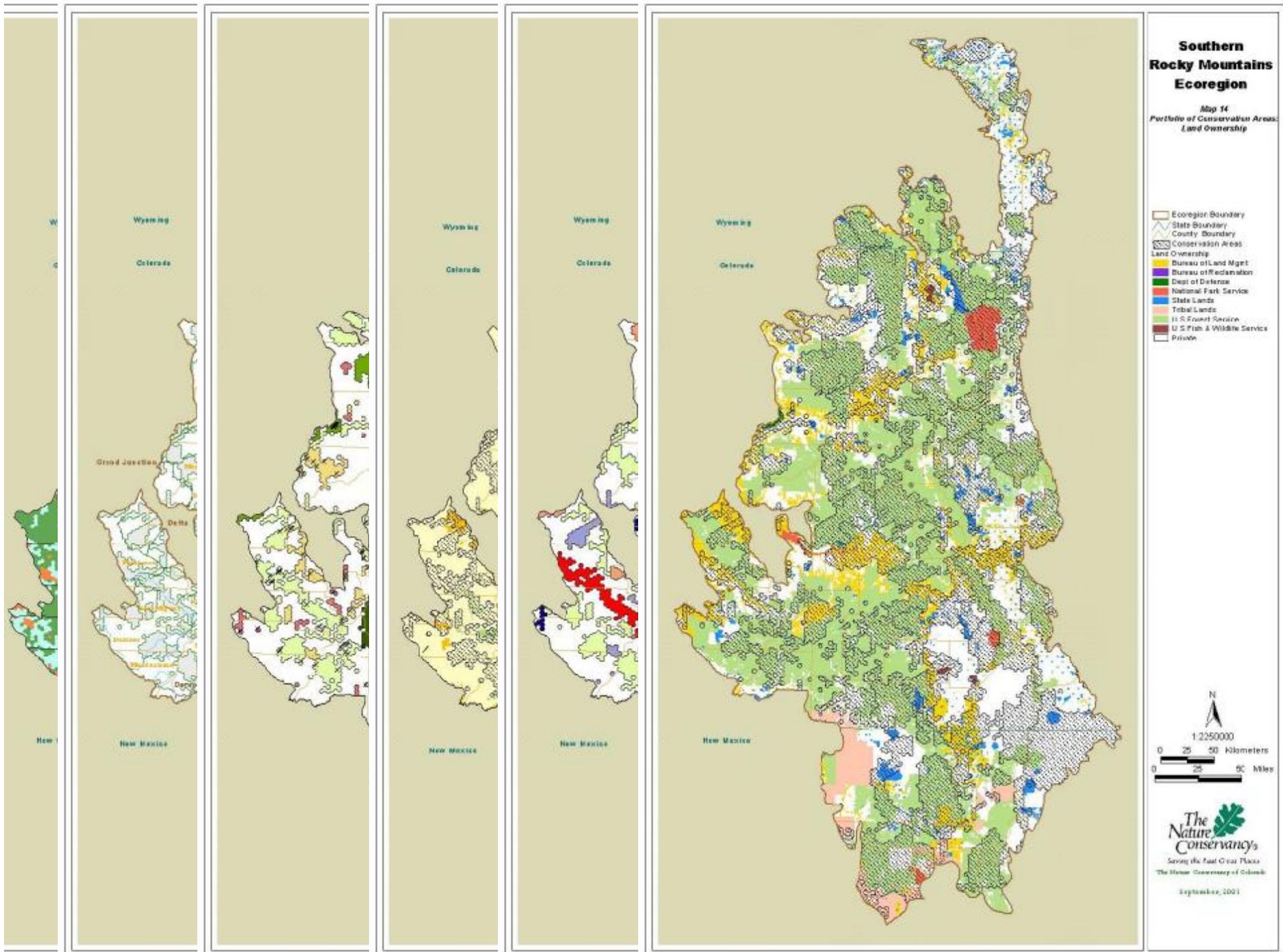
Conditions at Local Scales



Key Ecological Attribute	Indicator	Indicator Description	Rating Criteria				Current Value	Current Rank	Desired Conditions
			Poor	Fair	Good	Very Good			
Fire Regime	Fire Frequency	Average percent of ecosystem acreage burned within last 7 years.	<25	25-50	51-75	>75	44	Fair	Objective: Burn at least 50% of oak woodland acreage on no more than 7 yr return interval. Design Criteria: Allow at least 2 years between burns in oak woodland.
	Fire Season/ Intensity	Percent of burned areas burned during either March/April or Aug/Sept	<25	25-50	51-75	>75	71	Good	Objective: Burn at least 50% of oak woodland burned acreage during the growing season.
Understory Development	Native Herbaceous Cover	Percent of ecosystem acreage with > 70% ground cover in native grass/forbs	<25	25-50	51-75	>75	20	Poor	DC: "Ground cover in oak woodlands is dominated by native grasses and forbs; the woody component of ground cover is scattered and subordinate."
Vegetation Structure	Canopy Closure	Percent of ecosystem acreage with canopy closure of 10-60%	<25	25-50	51-75	>75	83	Very Good	DC: "Oak woodlands have canopy closure ranging from 10-60 percent."

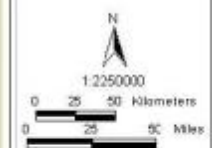
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Southern Rocky Mountains Ecoregion
 Map 14
 Portfolio of Conservation Areas
 Land Ownership

- Ecoregion Boundary
- State Boundary
- County Boundary
- ▨ Conservation Areas
- Land Ownership
- Bureau of Land Mgmt
- Dept of Defense
- National Park Service
- State Lands
- Tribal Lands
- U.S. Forest Service
- U.S. Fish & Wildlife Service
- Private



The Nature Conservancy
 Saving the Best of our Places
 The Nature Conservancy of Colorado
 September, 2001



NatureServe VISTA

Analysis: Existing Protected Areas Evaluation

Settings

Scenario Existing Protected Areas
 Goals Default
 Filter Community-defined Elements

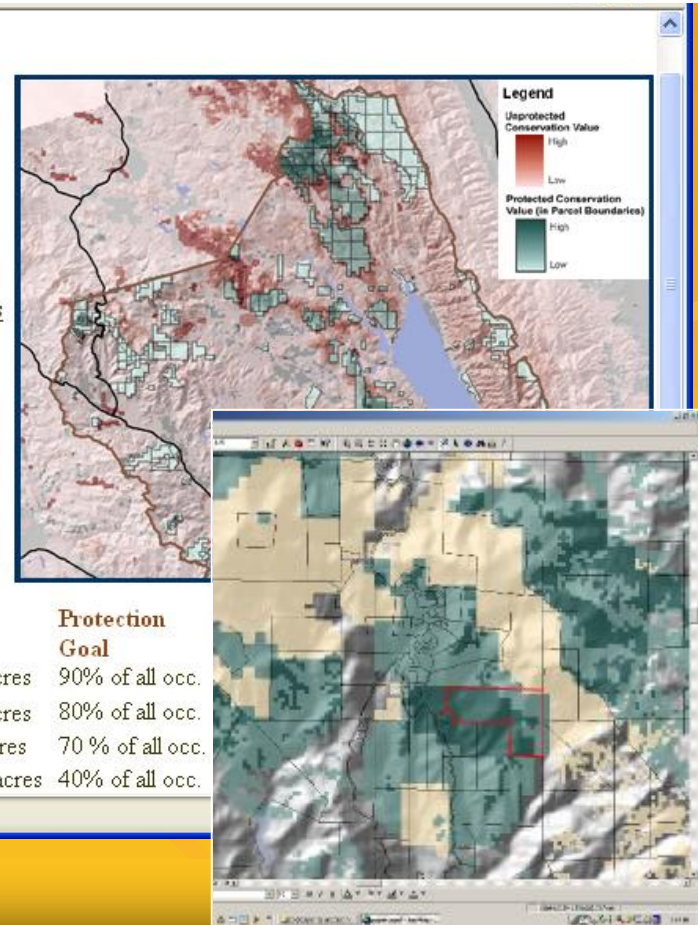
Results:

Summary

Scenario meets 4 of 21 element conservation goals

Details:

Element	Existing	Protection Goal
<u>Jepson's linanthus</u>	2 occ. in 21.3 acres	90% of all occ.
<u>Calistoga ceanothus</u>	5 occ. in 63.8 acres	80% of all occ.
<u>Soft bird's-beak</u>	16 occ. in 31 acres	70 % of all occ.
<u>Sonoma ceanothus</u>	23 occ. in 21.3 acres	40% of all occ.





What Are We Aiming For?

- Common Planning Framework
- Common Library
- Standard Tools