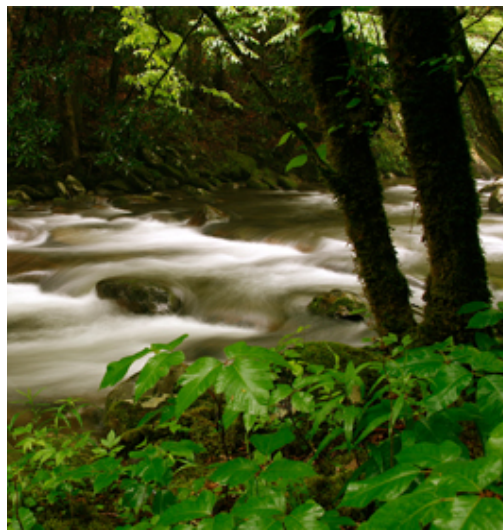




An Adaptation Portfolio Approach to Managing Climate Risk



Managing Climate Risk

- Identifying the risk
- A framework for considering change
- Spreading the risk with a portfolio of strategies
- Making it spatial





What are we concerned about?



- Loss of biodiversity?
- Loss of ecosystem services?
- Loss of the legacy of a century of conservation?
- The benefits of wildland ecosystems.



What makes a wildland wild?



From Section 2(c) of the Wilderness Act:

A wilderness...is hereby recognized as an area where the **earth and its community of life** are **untrammelled** by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in the Act an area of undeveloped Federal land retaining its **primeval character** and **influence**, without permanent improvements or human habitation, which is protected and managed so as to preserve its **natural conditions** and which...generally appears to have been **affected primarily by the forces of nature...**





Wildland Qualities



Earth and its
community of life
Primeval character
Natural conditions

Untrammeled by man
Primeval influence
Affected primarily by
the forces of nature



Wildland Qualities



Earth and its
community of life
Primeval character
Natural conditions

=

Ecological
condition
(Wholeness or
“historical fidelity”)

Untrammeled by man
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Wildland Qualities



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=

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Untrammeled by man
Primeval influence
Affected primarily by
the forces of nature

=

Freedom from
human control



Dimensions of Wildness



Freedom from Control

“Self-willed”

Controlled

C&O Canal

Chesapeake Bay

Arctic Refuge

Vacant Lot

Fire-excluded Ponderosa Pine Forest

Everglades

Downtown

Pine Plantation

Curtis Prairie

Novel

Pristine

Ecological Condition



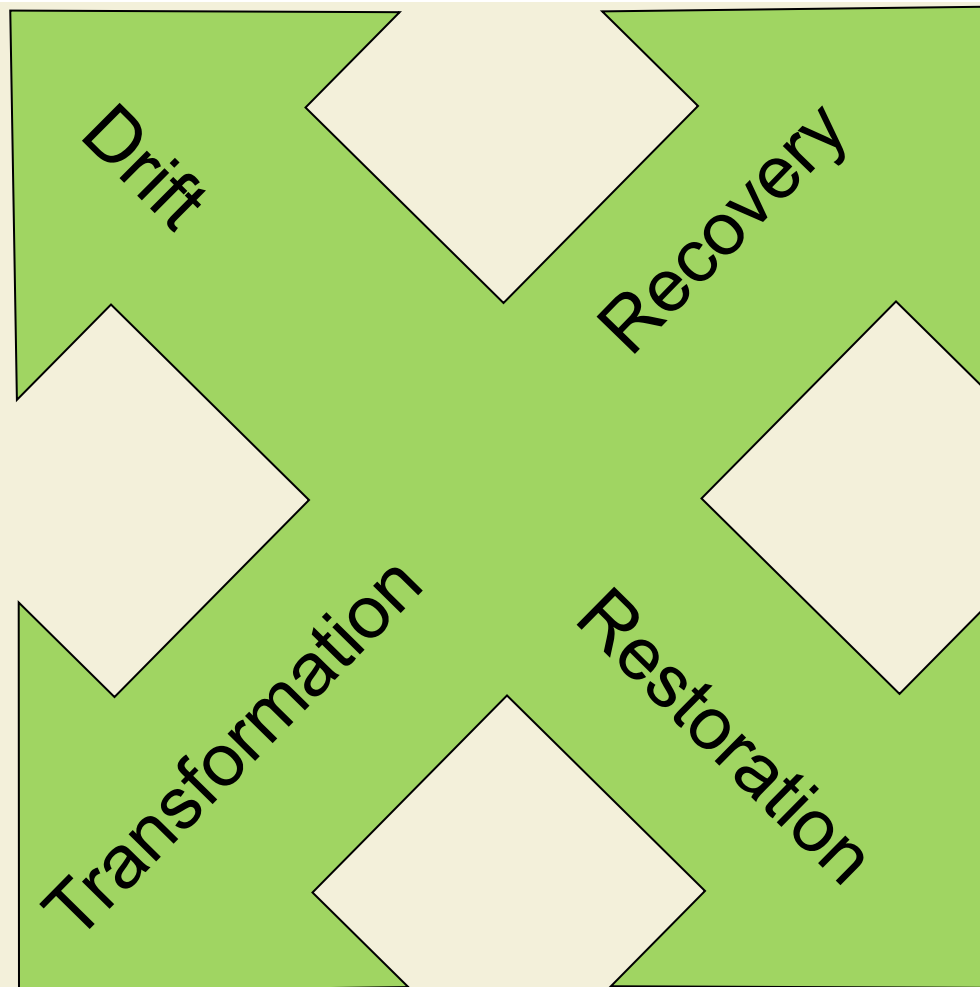
“Directions” of Management



Freedom from Control

“Self-willed”

Controlled

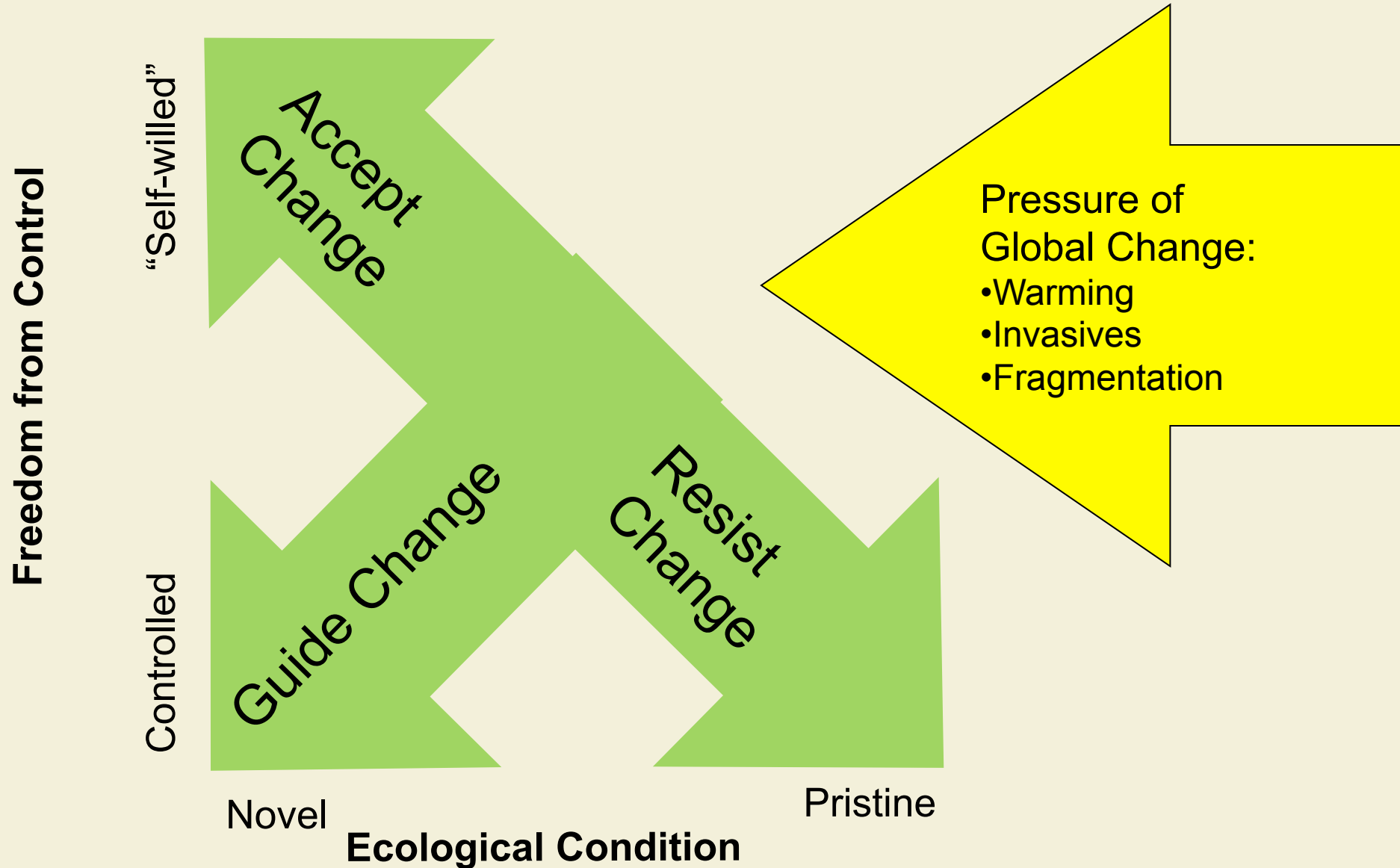


Novel

Pristine

Ecological Condition

Global Change: The End of Recovery?





Choices in the face of climate change



Accept change:

Observation only

Resist change:

Restoration

Guide change:

Innovation and
experimentation



Certain Uncertainty



“We might feel confident of broad-scale future environmental changes (such as global mean temperature increases), but we cannot routinely predict even the direction of change at local and regional scales (such as increasing or decreasing precipitation).”

Millar et al. (2007)



What to do?

“Managing in the face of uncertainty will require a portfolio of approaches, including short-term and long-term strategies, that focus on enhancing ecosystem resistance and resilience...as climates and environments continue to shift.”

Millar et al. (2007)

“A portfolio of adaptation and mitigation measures can diminish the risks associated with climate change.”

IPCC Adaptation Report



An Experimental Landscape Approach: Making It Spatial



Observation only in some places
(both treatment and control)

Restoration in some places
("Keeping all the parts")

Innovation in some places (novel
conservation)

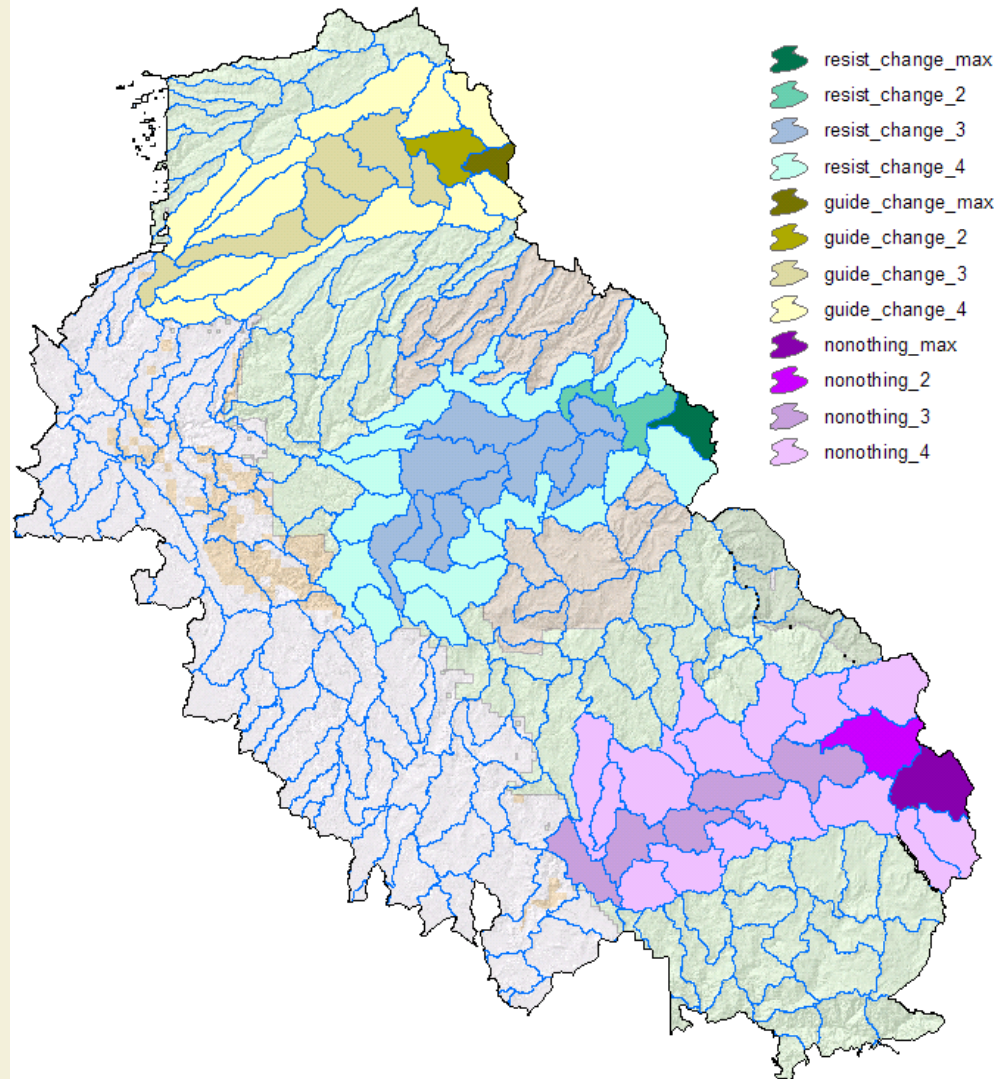
Integrated across the landscape in
a cohesive experiment

Principles of Allocation

- Representation
- Connectivity across gradients
- Configuration



An illustration



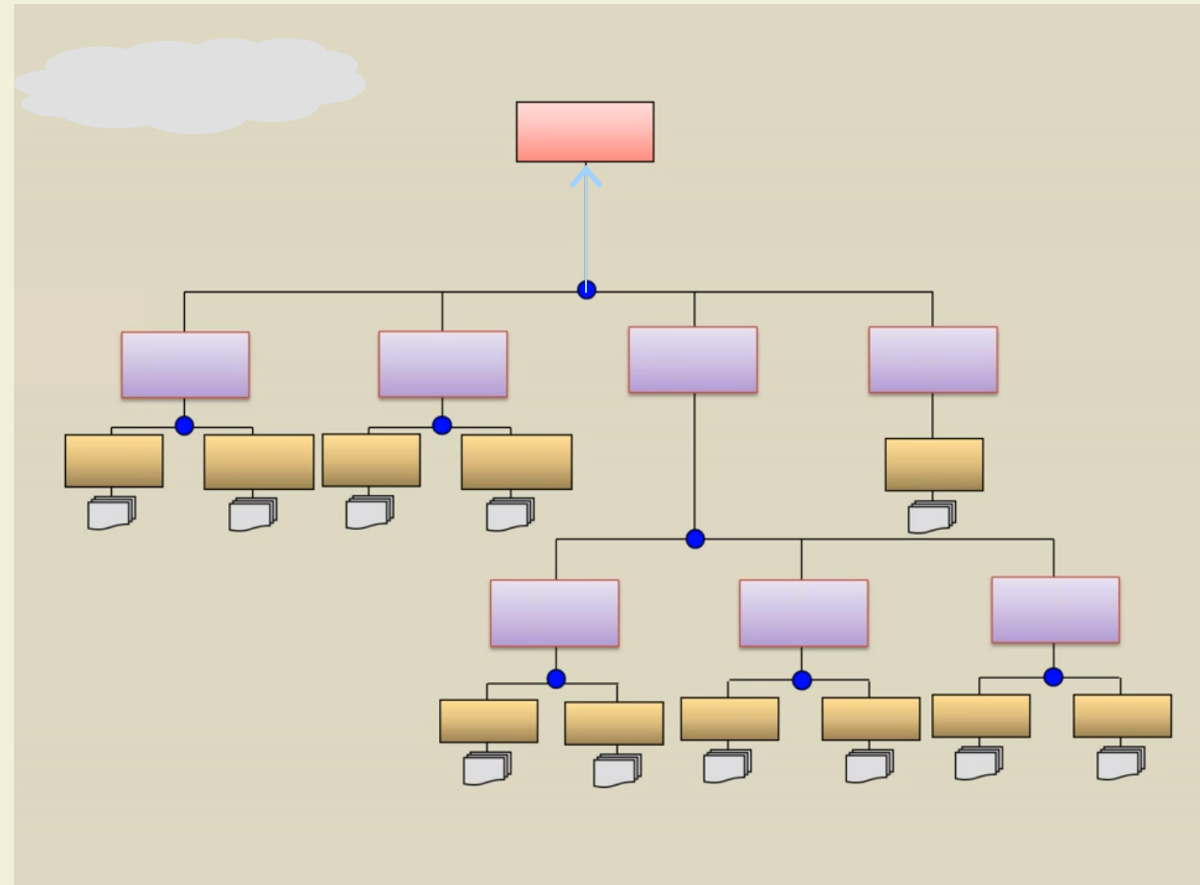


THE
WILDERNESS
SOCIETY





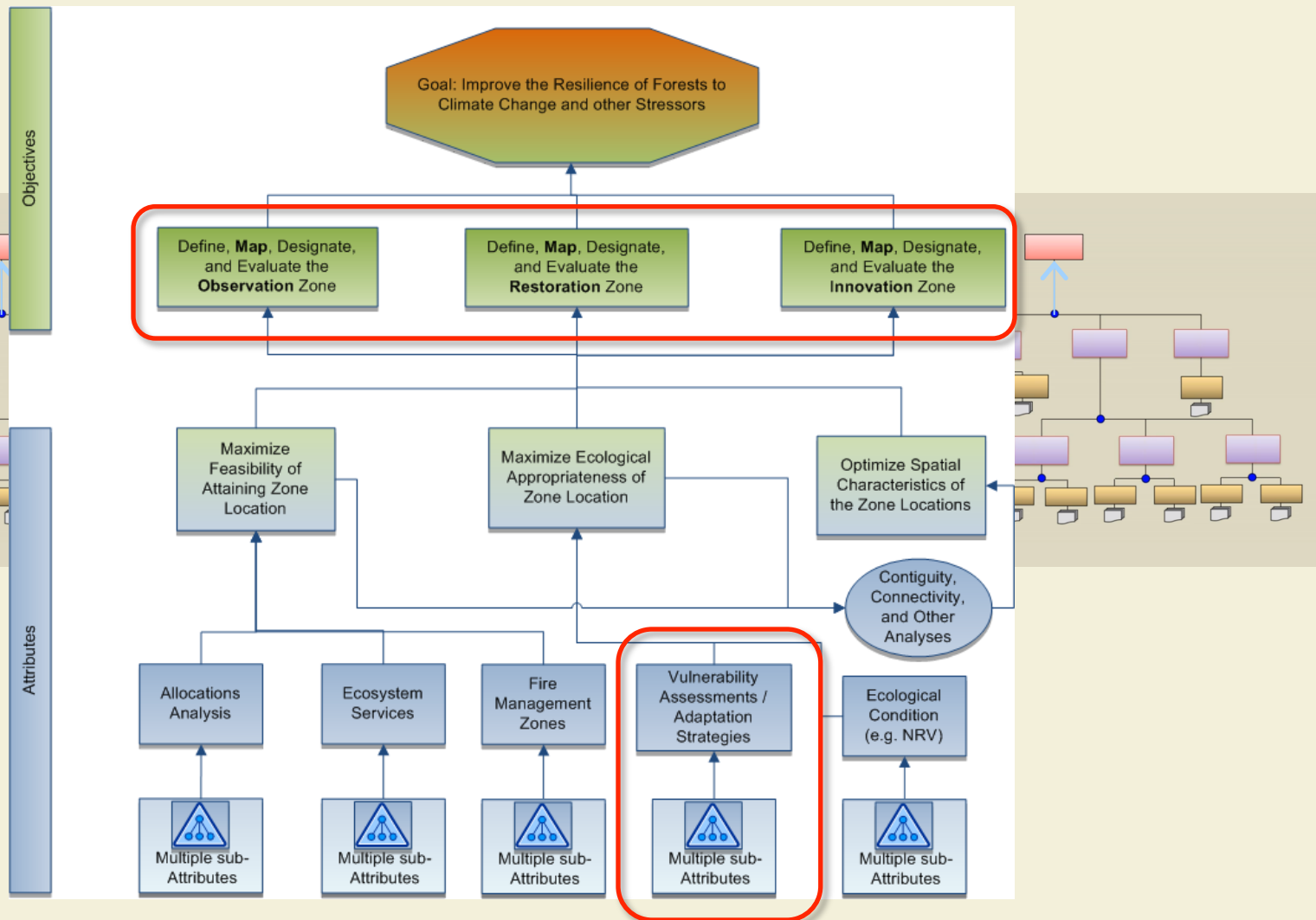
Spatial Logic Model



Graphic from a Conservation Biology Institute presentation



Multi-Criteria and Multi-Objective Decision Analysis





How does that affect us today?



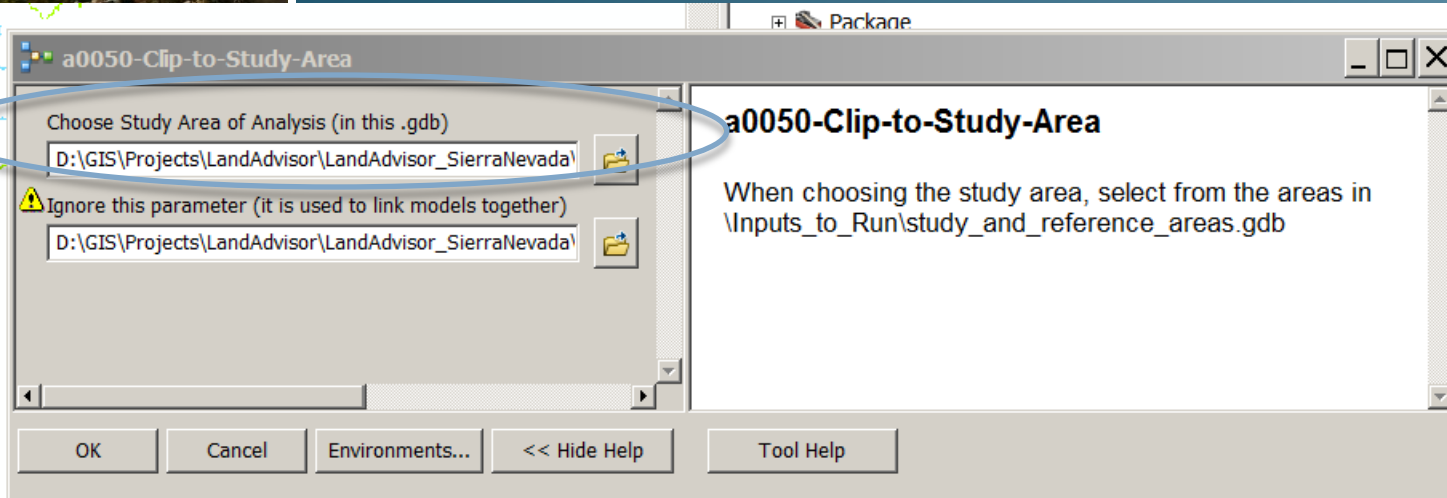
1) Crosswalking your adaptation strategies

- 1) Does it map well with one, two, or all three zones?

2) Geographic Considerations

- 1) What data would you combine to map your strategy?
- 2) What strategies are incompatible?
- 3) What strategies are synergistic?

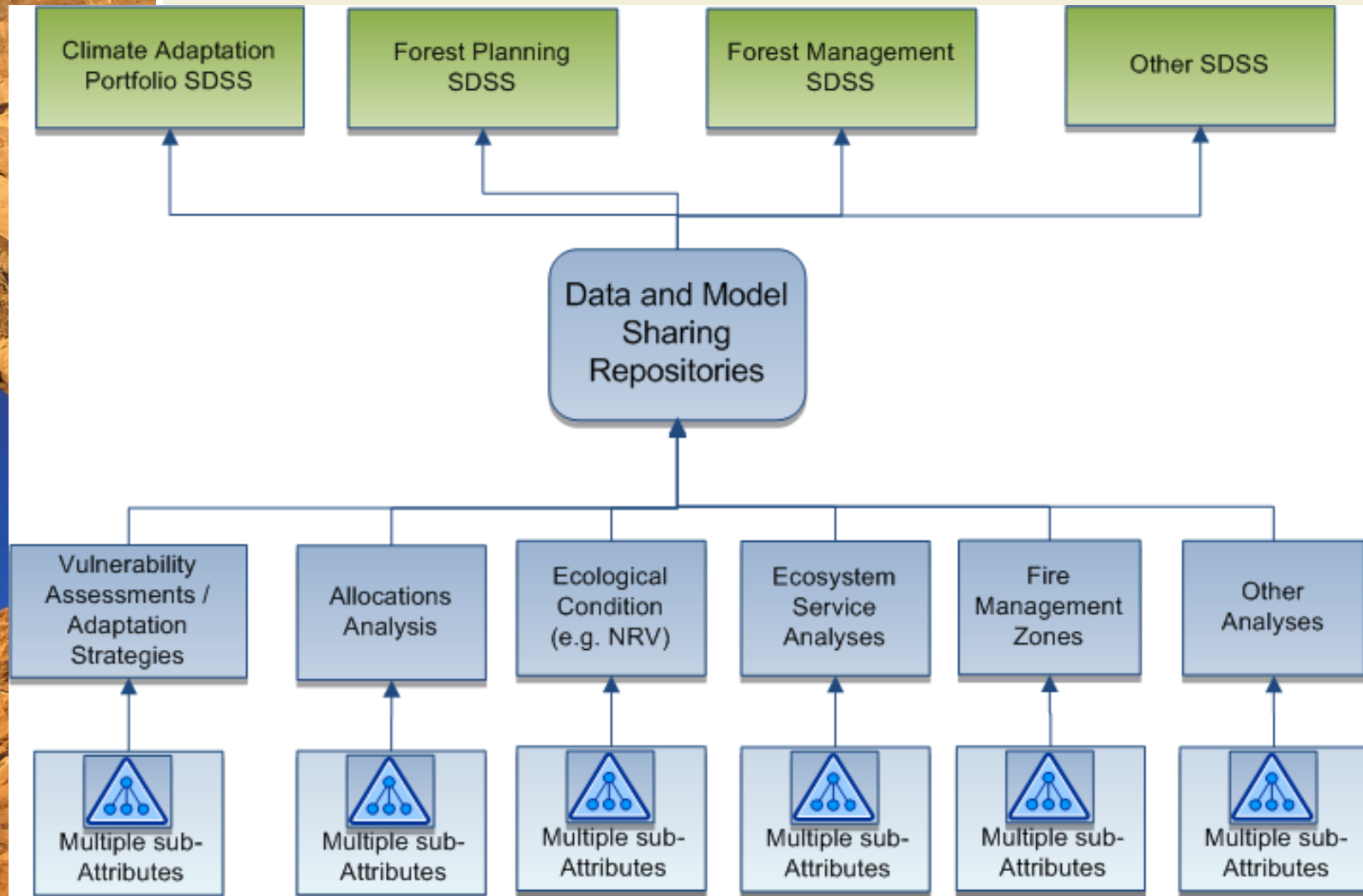
Shareable and Customizable



- + Geocoding Tools
- + Geostatistical Analyst Tools
- LandAdvisor_SierraNevada
 - Pre-Processing
 - Pieces
 - a0004-make-folders
 - a0005-make-geodatabases
 - a0010-copy-data-to-inputs-source-from-USFS-Library
 - a0020-copy-non-USFS-allocation-data-to-inputs-source
 - a0030-make-layers-out-of-fields
 - a0035-make-regional-boundary-files
 - a0037-make-planning-units**
 - a0040-make-rasters-out-of-shapefiles
 - a0050-Clip-to-Study-Area



Opportunity for “Collaborative GIS”





Conclusion

Spatial allocation of adaptation strategies
and philosophies

Resilience: all three zones

Minimize interference, maximize synergy

- Large contiguous zones
- Connected across climate gradients

GIS synthesis approach

Data and model sharing repository

Take home:

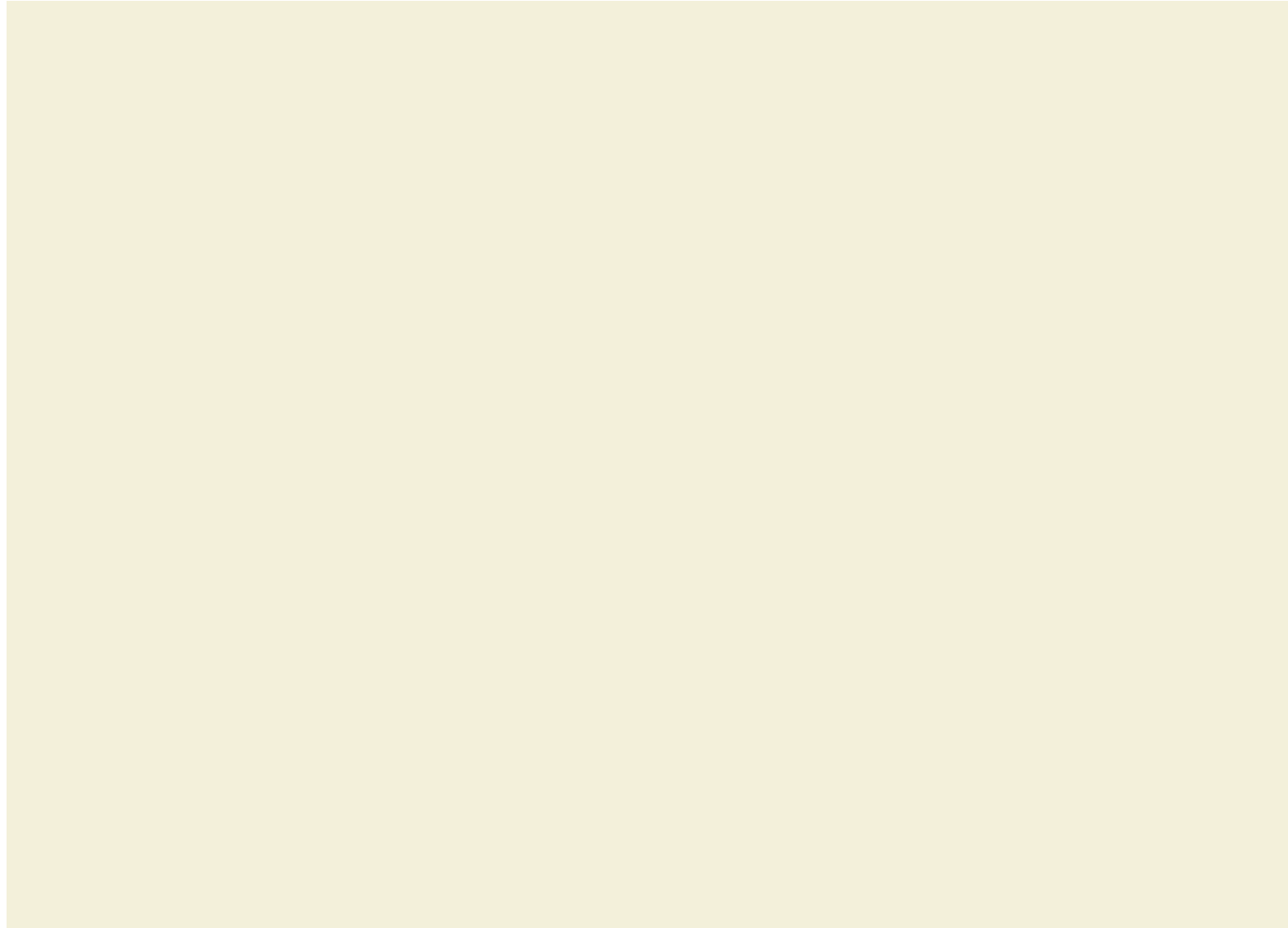
- Crosswalking your Adaptation Strategies
- Geographic considerations





THE
WILDERNESS
SOCIETY

XXXXXXXXXXXXXXXXXXXXXXXXXXXX





Spatial

Not placed willy nilly

But rather clumped in management approaches that are compatible with each other.

- Minimize counter impacts.
- Minimize edge effects
- Minimize unanticipated consequences

Working a on a way

Clearly distinguish the three zones

Request: Crosswalk

Intro: GIS synthesis approach

Request: Data and model sharing repository



GIS Screengrabs

parameters

- Multi-scale Analysis
 - Multi planning unit
 - Multi-resolution
 - Multi-extent



