Landscape Management Demonstration Areas

Concept Presentation

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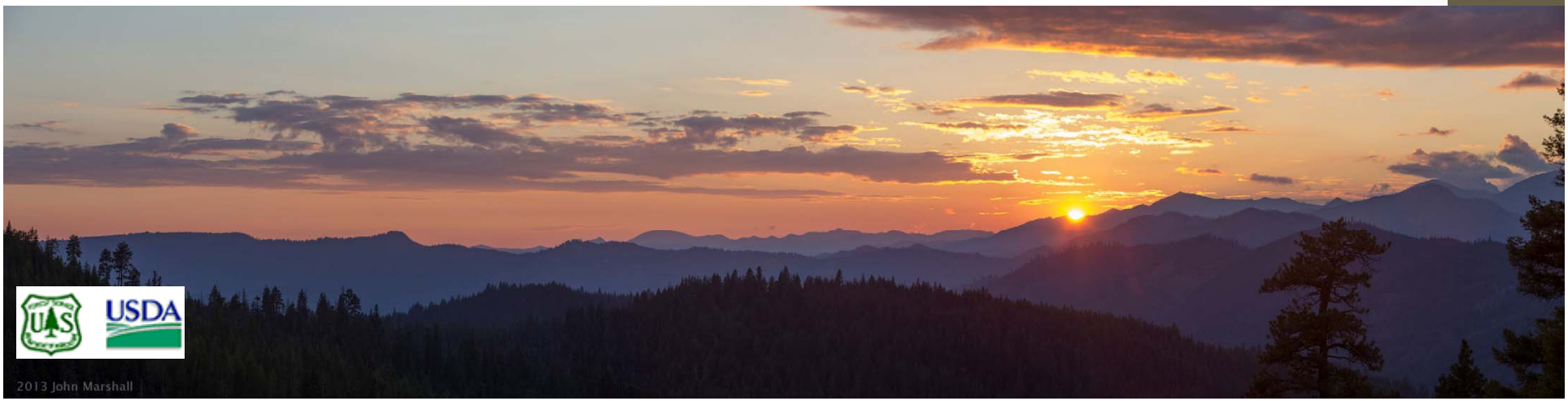

Changes to Western Forests in the last 100 years

Incentive

- Western US Forests are no longer resilient to disturbances such as wildfire and drought
- Decades of fire suppression, intensive logging practices, and other factors have reduced heterogeneity and homogenized forests
- Species composition has shifted from shade-intolerant, fire-resistant to shade-tolerant, fire-sensitive species
- Structure has changed from a few large trees to many more medium to small trees, and
- Primary driver of forest ecosystems, fire, has been largely removed.
- Much of the forest landscape is susceptible to both uncharacteristic impacts from disturbance (mainly fire) and chronic stress from changing climate.

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Addressing Restoration at a Landscape Scale

- If trends of the last 100 years are not addressed, forests are unlikely to continue providing the ecosystem services
- The present pace and scale of forest management needs to change
- Can we enable fire and other disturbance factors to function and do ecosystem work?
- Population growth and its associated impacts and climate change compound the challenges
- We need significant strategic advances in both land management and collaboration with partners and the public

- **Striving for Ecosystem Resilience**

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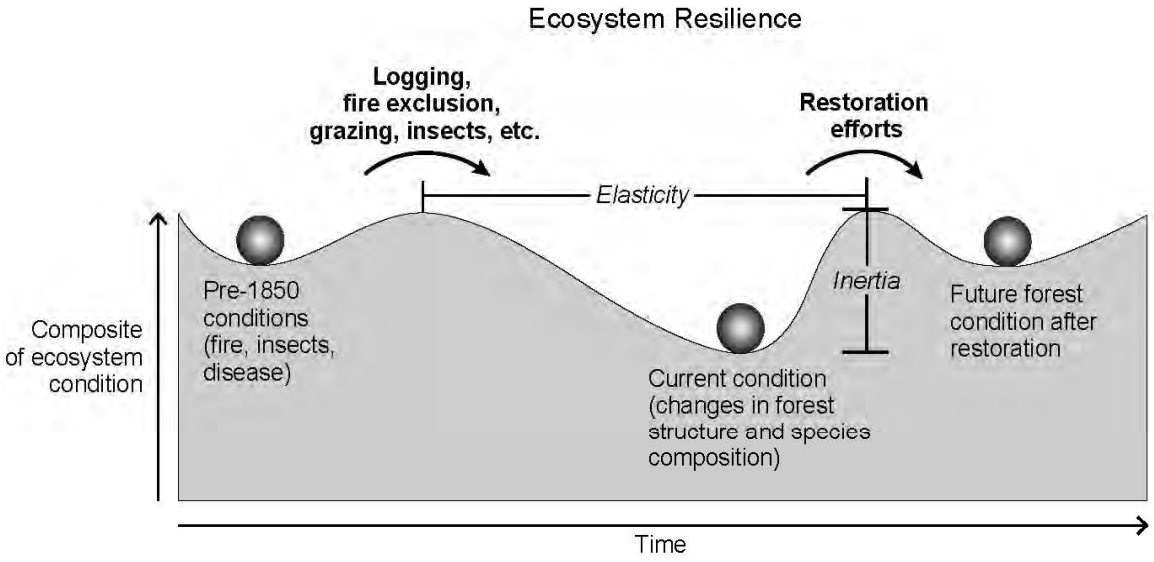
Ecosystem Resilience



Ball and cup heuristic of ecosystem stability (adapted from Gunderson 2000). Valleys represent the boundaries in which ecosystems are coping with disturbances, balls represent the ecosystem, and arrows represent disturbances. Some disturbances push the system out of a past "stable" state into a different ecosystem condition. The influences of inertia and elasticity are indicated in the diagram.

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Restoring resilience
What does this look like in western coniferous forests?

- Develop **greater heterogeneity, structural complexity**
- Facilitate dynamic ecological conditions
- Store carbon in more stable and fire-resistant forms
- Maintain and restore native species diversity
- Deliver sustainable flows of ecosystem services
- Minimize negative influences of invasive species
- Encompass coupled social and ecological resilience
- Enhance community capacity to support local well-being
- Exploring and identifying appropriate measures of forest resilience

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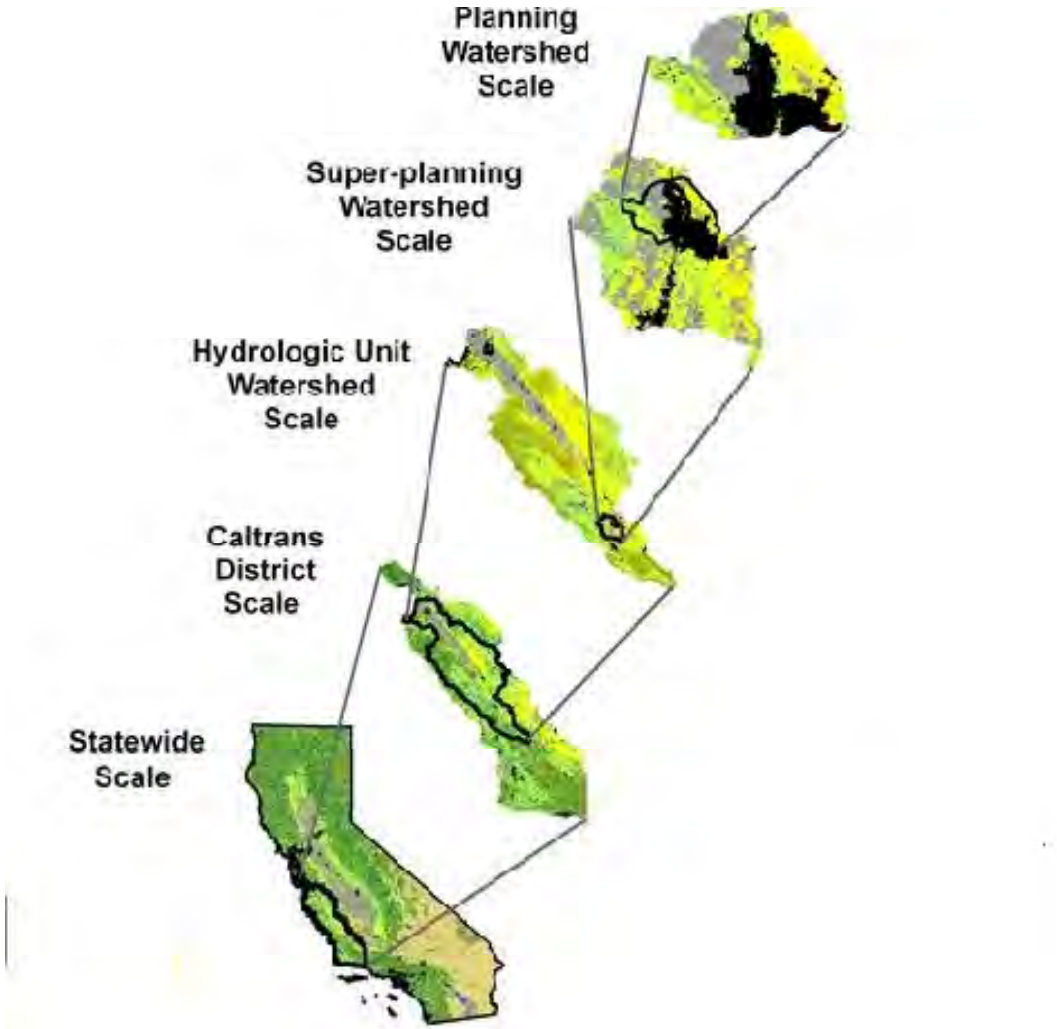

Watersheds/Firesheds
A geographic framework for addressing fire behavior

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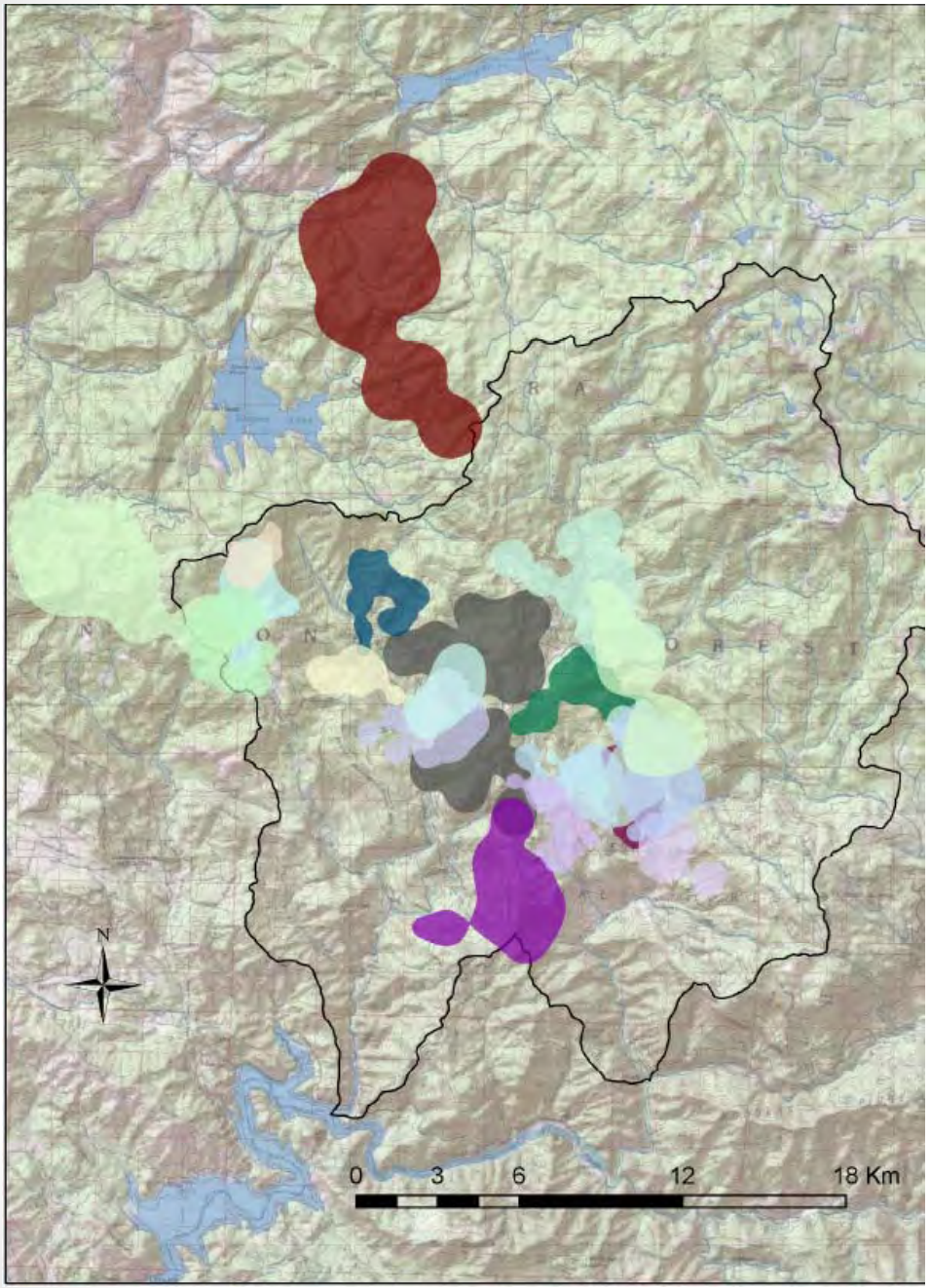
Fireshed or Watershed Scale

- On the order of a USGS SubBasin (4th level)
- Approximately 150,000 to 200,000 ha

- Address fire at the appropriate scale
- Address water at the appropriate scale

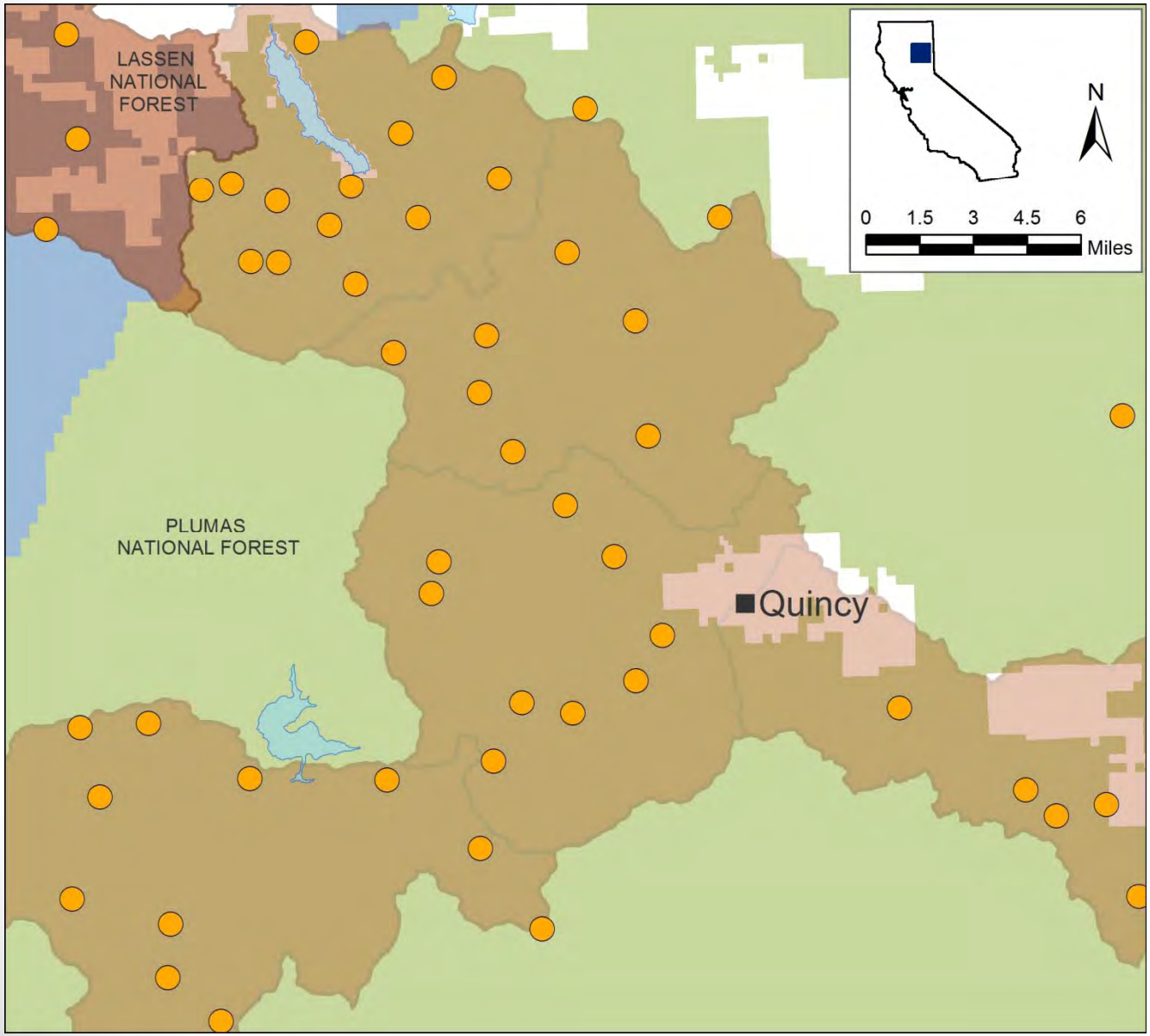


A functional population of fisher operates at a landscape scale

Dinkey Creek Drainage, Sierra National Forest

2009 home ranges for male (dark colors) and female (light colors) fishers in the Kings River Area of the Sierra National Forest, CA. Study area is ~ 53,000 ha, density of fishers is ~ 10-15 per 100 km2

Craig Thompson and Kathryn Purcell

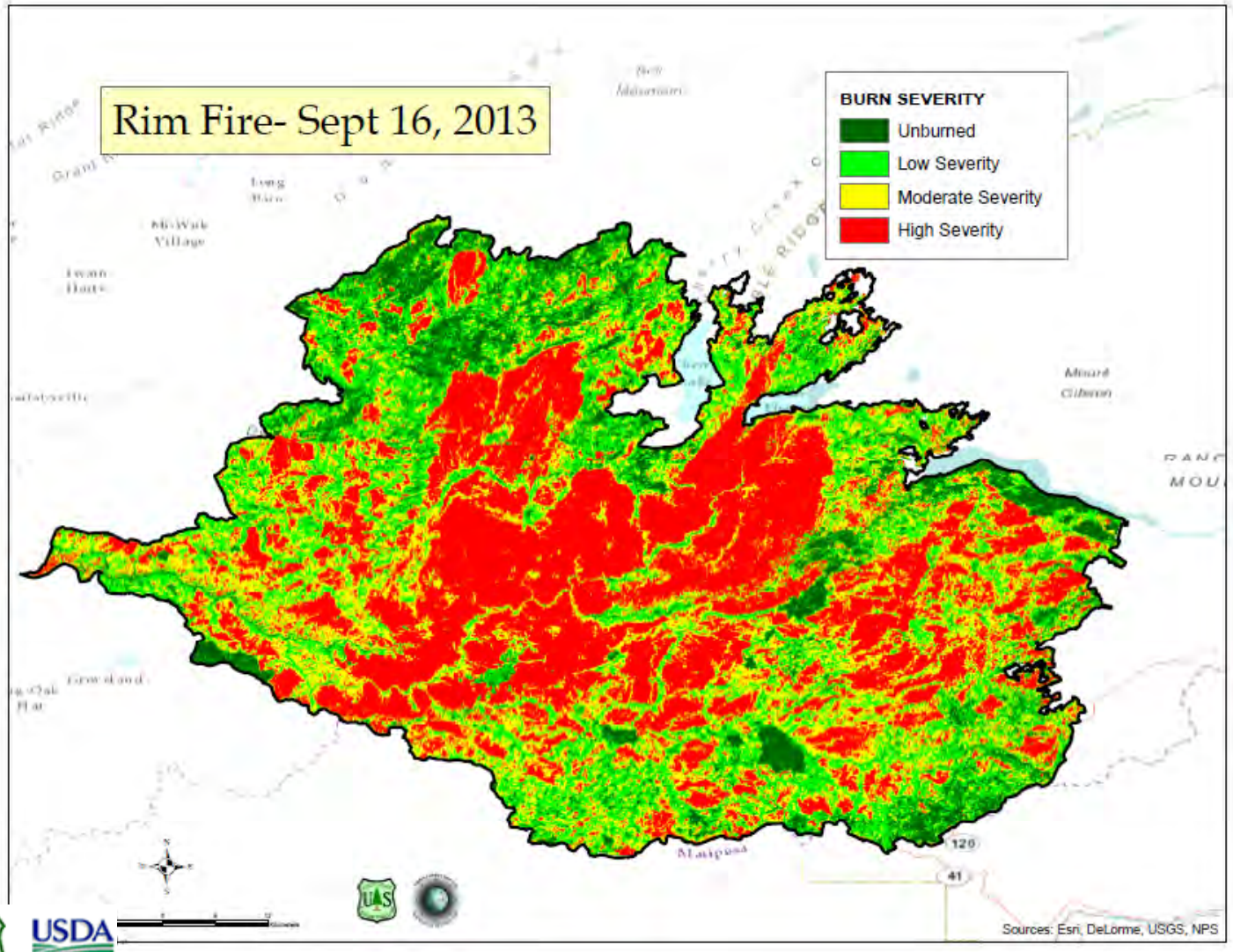


A functional population of CA spotted owls operates at a landscape scale

Owl nesting pairs within the Plumas NF study area (~88,000 ha)

John Keane and Claire Gallagher

Threats to Ecosystem Resilience



Landscape Management Demonstration Area Principles

- Work under the direction of the 2012 Planning Rule
- **Restore forests at an appropriate scale –** e.g. a ~ 500,000 drainage basin
- **Understand** of how broad-scale restoration treatments impact key multi-scale ecological phenomena.
- **Integrate management and science - ** the effects treatments are tested, monitored, and refined to reduce the risks
- **Encompass all lands –** include all willing ownerships

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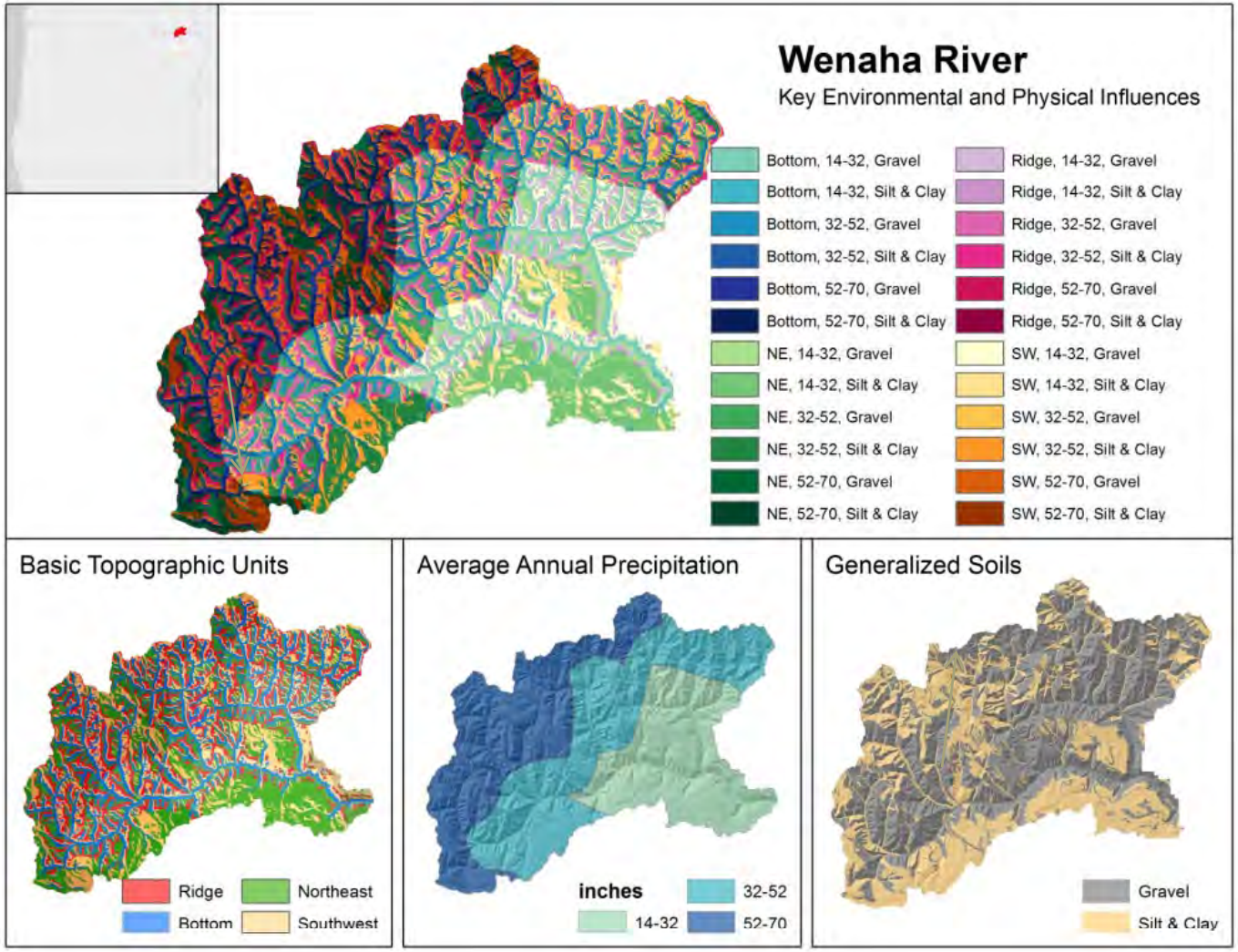
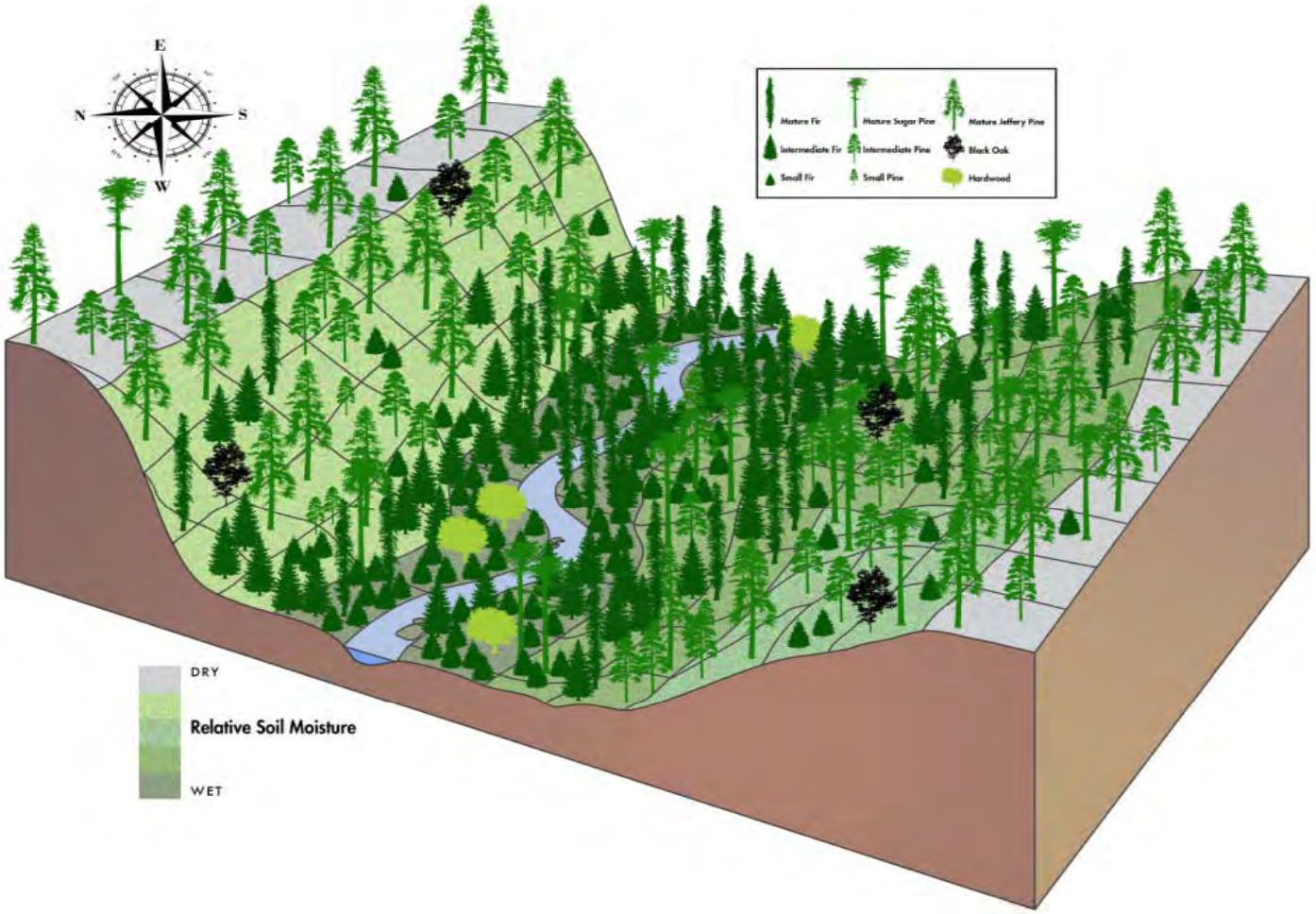
Landscape Heterogeneity



Inherent heterogeneity within a real watershed in response to basic environmental factors.

Landscape Heterogeneity



Example of forest structural heterogeneity in response to topographic position.

Resilience to Fire

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Objectives for Landscape Demonstration Areas

- Experiment with innovative land management approaches
- Scale up an entire landscape (aiming for 2 in CA, 1 in OR and WA)
- Cover the array of contemporary concerns:
  - environmental change, sensitive biota, restoration, and coping with natural disturbances that drive these forested systems
- Research & Development/National Forest System partnership
- Engage academic partners and public participation
- Project planning and NEPA compliance would involve all parties
- The governance needed to accomplish these efforts will be explored
- Publish findings in high-end journals

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Basic Questions Driving LMDAs

- *Outcome Questions*: (e.g., what target conditions will confer the greatest resilience, what conditions can be achieved and sustained?).
- *Management Questions:* (e.g., what treatments result in target conditions, what are the unintended consequences, how do treatment sites change over time?).
- *Monitoring Questions:* (e.g., what are the most informative performance metrics to monitor?).
- *Desired Socioeconomic Outcomes*: (e.g. how do we achieve the necessary social license to restore resiliency?).

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Landscape Demonstration Areas; 1st Steps

Develop pilot studies:

- Large watersheds or other land units.
- Test best management practices.
- Use current science from multiple disciplines.
- Increase pace or scale to readjust current trajectories of resiliency.
- Collaboration includes the research community and the public; open and informed process using an Adaptive Management approach.

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Site Selection Criteria

Biophysical	Sociopolitical	Economic
Overall threats	Agency buy-in	Donor support
Current conservation need	Multijurisdictional collaboration	Job creation
Projected conservation need	Site viability and charisma	Project costs
Species aggregations, rareness, endemism	Current collaborative function	Community resilience
Habitat representativeness and importance	Community buy-in	
Landscape scale and connectivity		
Availability of data		
Availability of a reference landscape		
Documented landscape history		

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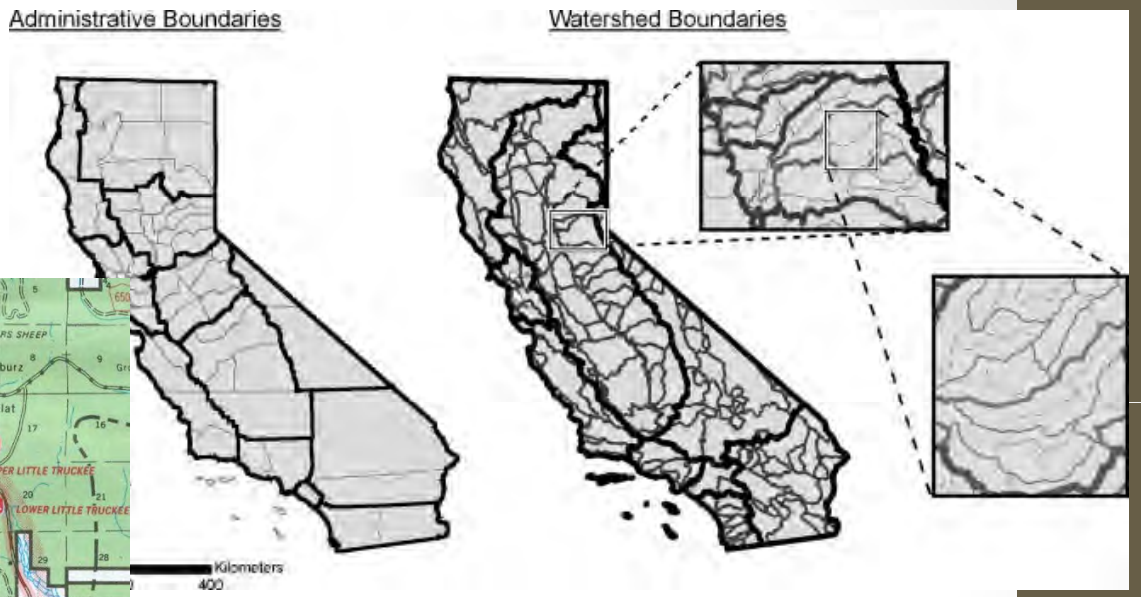
Potential Selection Criteria

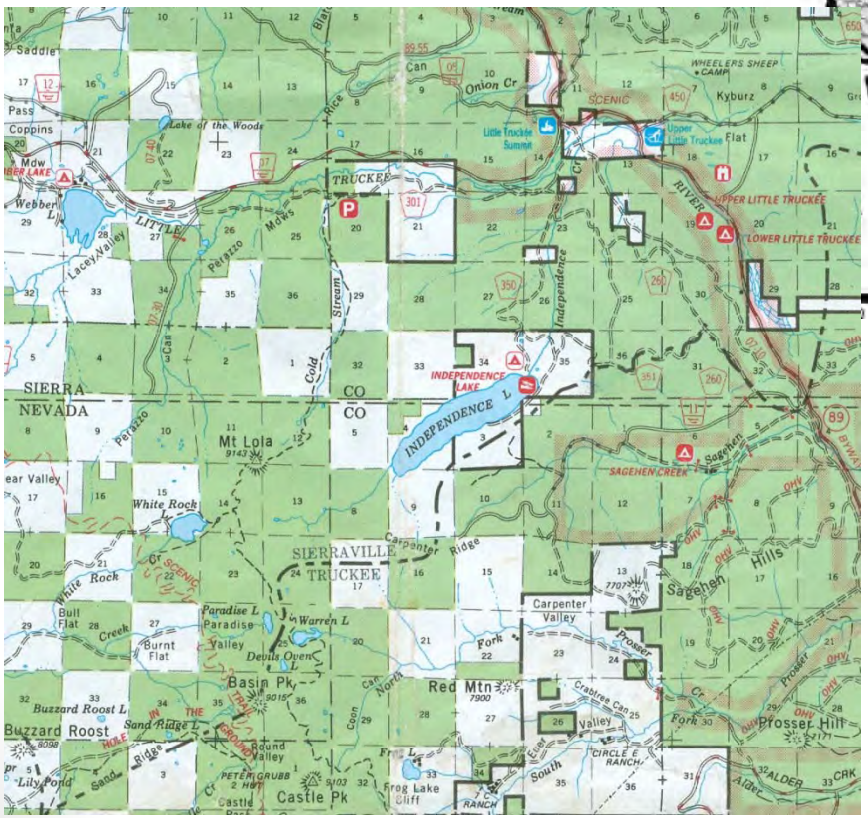
BIOPHYSICAL Criteria:	
Overall Threats	What is the overall threat to the landscape or specific sites from development, improper land management, lack of water, etc.?
Current Conservation "Need"	How much conservation "bang for the buck" could we get here?
Projected Conservation "Need"	Looking 20 to 50 years ahead, and considering climate change, human demographics, and other factors, how threatened is this forest?
Species	Rare/endemic/T&E species, charismatic spp., important associations or aggregations?
Habitat	Habitat representativeness, keystone or biodiversity hotspot habitat e.g., meadows, riparian, aspen.
Landscape	Landscape scale restoration possible here? Creation of connectivity to isolated habitat? Ecological processes such as migration, critical ecosystem services
Data availability	long-term data sets, comprehensive ecosystem research, other research
Documented landscape history	historical land use

SOCIO-POLITICAL Criteria	
Prospects for Forest Service Buy-In	How motivated and capable are the Forest Service personnel at this site? To what extent would NFF's proposed activities support the leadership intent and forest's management plan? Is the District Ranger an out-of-box thinker?
Transboundary Collaboration	Are there opportunities for collaboration across multiple agency, community and other jurisdictions? Other important land designations such as Research Natural or Important Bird Areas?
Site Visibility/Charisma	What is the overall beauty, visibility and charisma of the site itself, e.g., how big Oohs and Aaahs does it get when people see it? Special site designations, e.g., RNAs and EFRs
Collaboratives	Are there existing or nascent collaborative groups working in this area?
Prospects for Community Buy-in	What is the capacity of local non-profits to carry out restoration work? How motivated and capable are community-based stakeholders to engage constructively? History of involvement? Potential to expand local constituency? What is the likelihood of NEPA appeals for proposed work?

ECONOMIC Criteria:	
Prospects to Attract Donor Support	What's the fundraising potential? Interest by current donors? Interest by potential donor base? History of financial support?
Jobs	Are there opportunities for job creation due to site restoration activities?
Project Costs	How expensive would this site be, considering the likely project activities, travel costs, and other factors?
Community Resilience	How would implementation in a given area affect economic health of the community

Landscape Demonstration Areas





- Large watersheds
- Multiple ownerships (“All Lands”)
- Restoring resilient forests and rangelands
- Anticipating changing conditions
- Partnerships in science
- Increase capacity to change conditions over space and time
- Collaborative work

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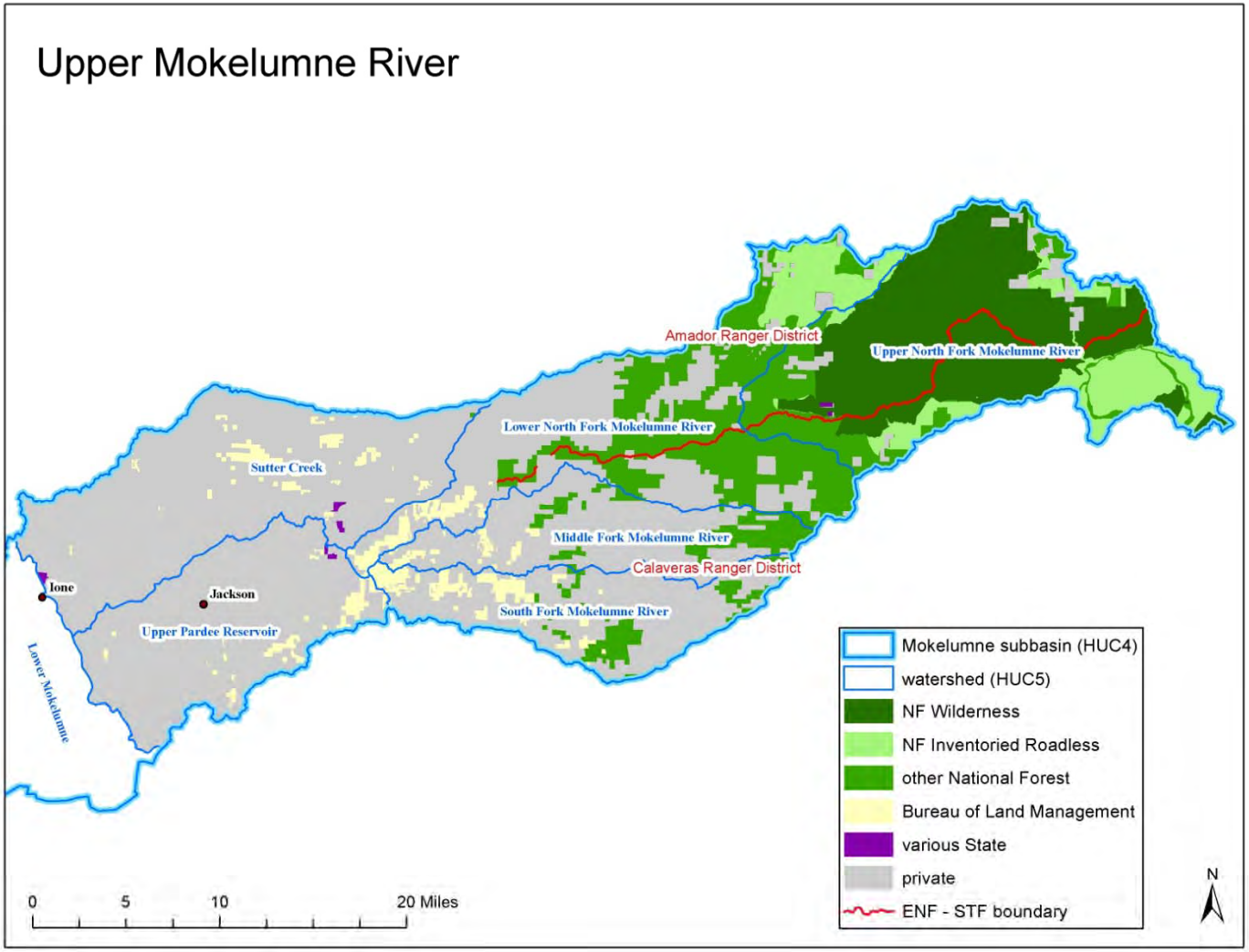
Example Landscapes



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Collaborative Forest Landscape Restoration

CFLRs began in 2010, intended to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes.

Many similarities

- CFLR projects are
  - often smaller
  - have minimal scientific role/presence
  - don't necessarily address the pace and scale issue
- A LMDA could be folded into an existing CFLR project
- Only a small number of LMDAs would be implemented because of the investment required for a rigorous involvement of R&D

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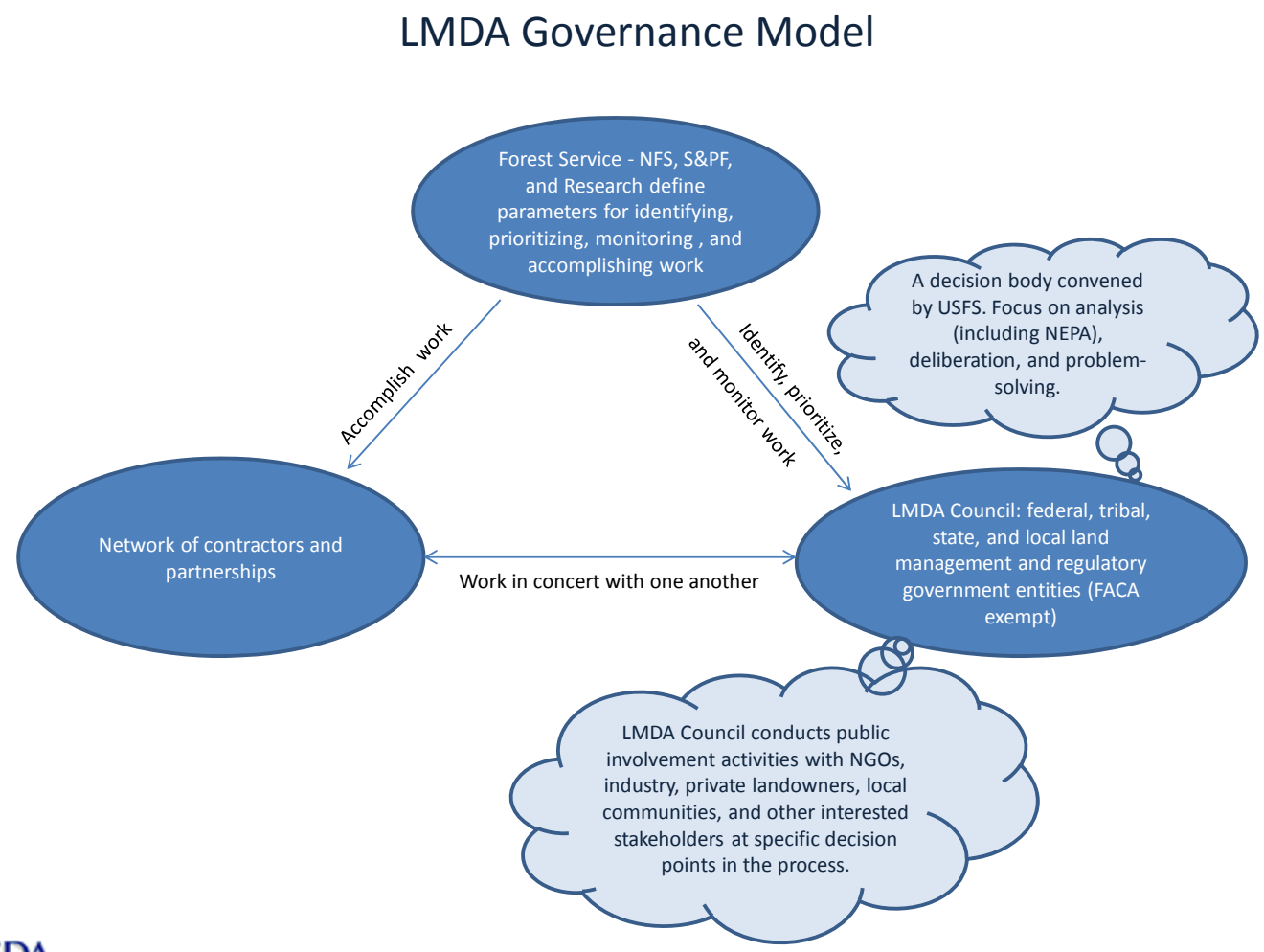
Potential Governance Approach



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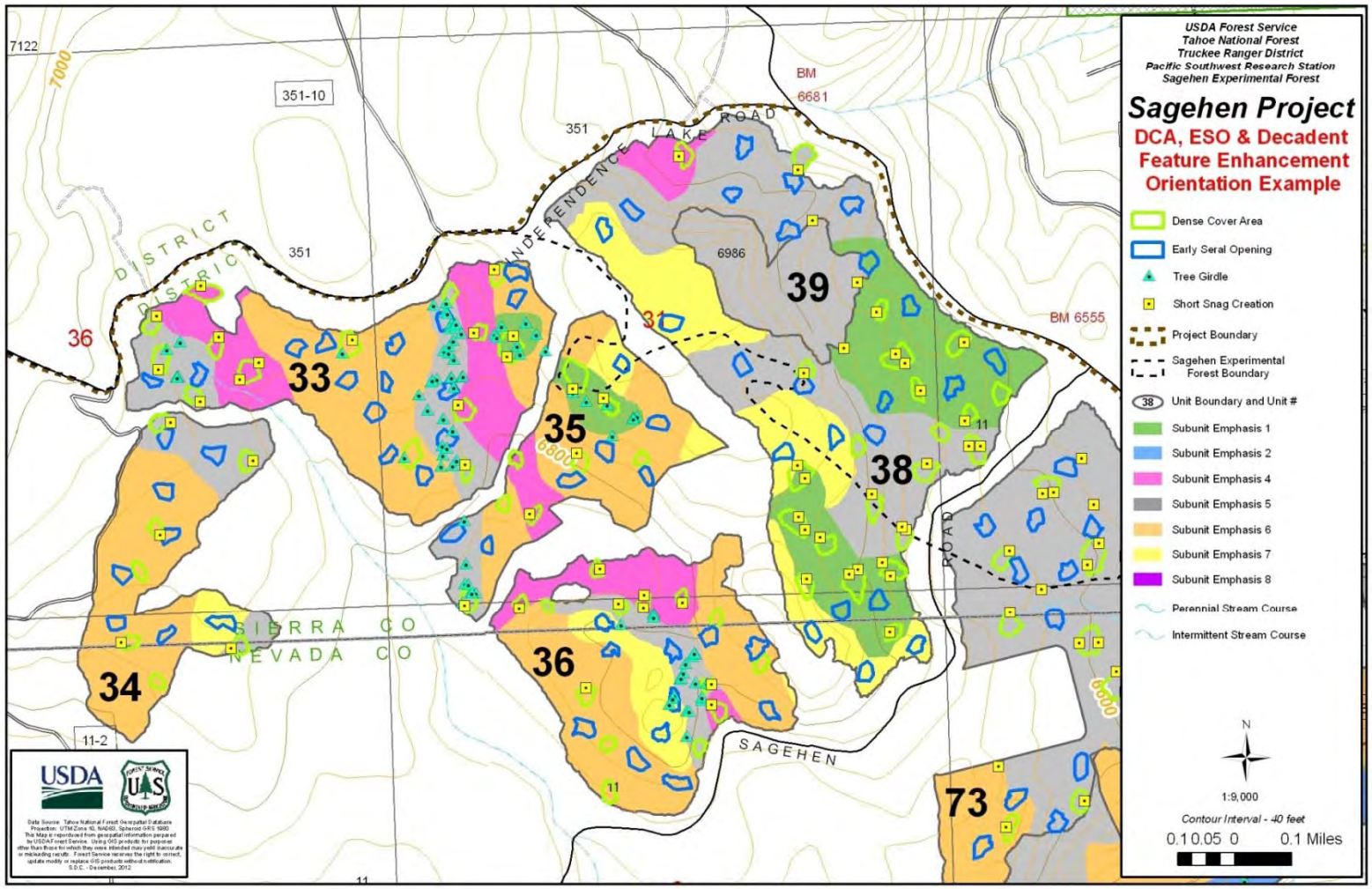
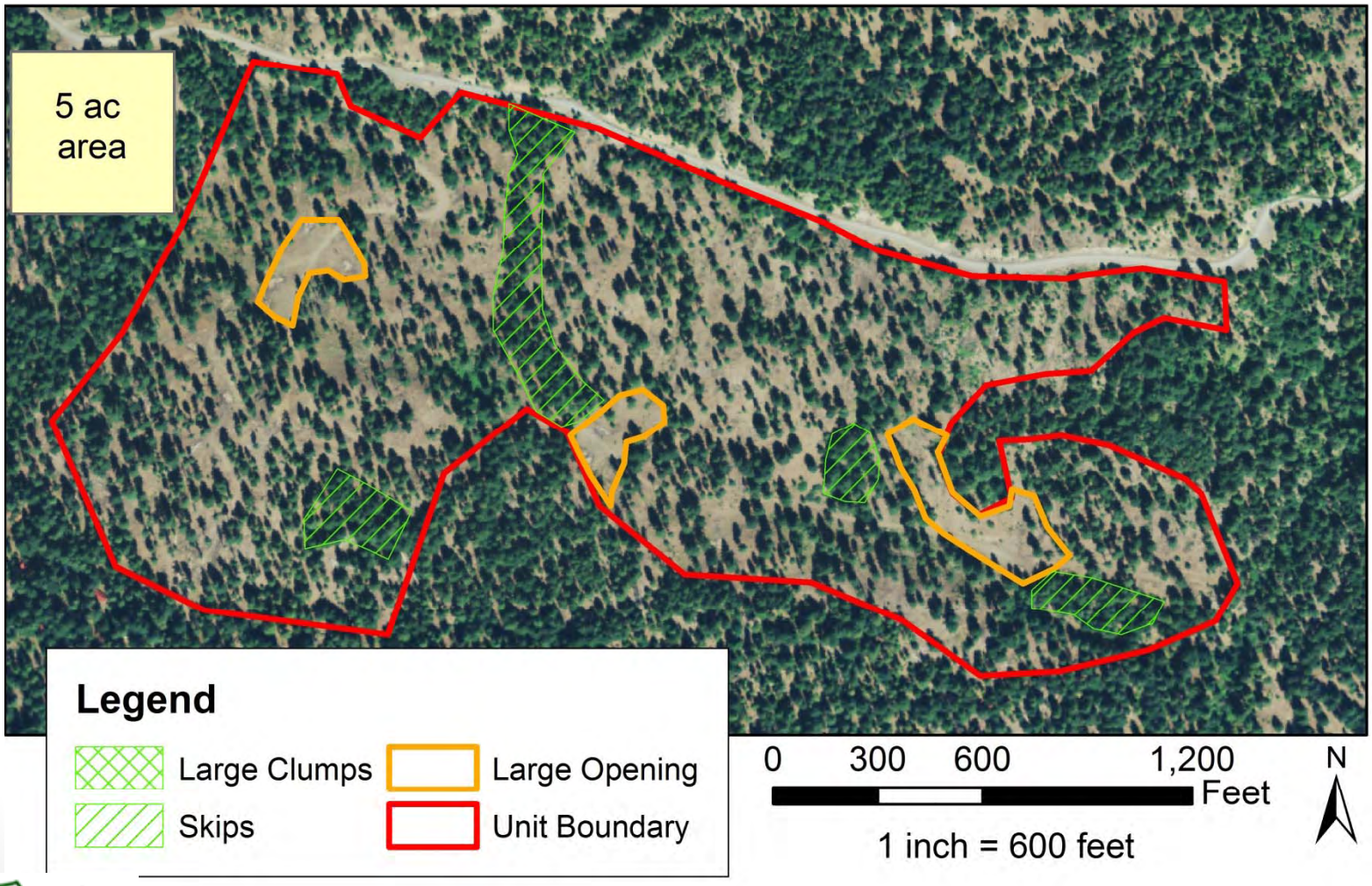
Dense Cover Areas, Early Seral Openings; Sagehen Experimental Forest



Individuals, Clumps, and Openings (ICO) (Churchill et al. 2013)



Operating Principles

- Planned activities oriented towards achieving management objectives of forest restoration
- Activities jointly designed between management, research, and the collaborating public
- Research structured to examine environmental and social response to projects in an adaptive management framework
- Landscape scale planning and learning are the foundational principles
- Apply these concepts in light and in support of the new Planning Rule

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Lessons Learned from Prior Efforts

a) Participation; be inclusive, engage participants from diverse points of view, seek buy in to the notion that there is a greater good for the collaboration that for individual points of view.

b) Process; can make or break success

- Joint development of proposed action
- No surprises
- Sharing is good
- Integration of ideas
- Agree upon features of the plan
- Shared vision of the monitoring and adaptive management plan.

c) Expectations, People must be heard and their issues addressed. Be clear what is possible and what is within the purview of the collaborative.

Transparency, accountability, and trustworthiness are key elements of the expectations for all participants.

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Thanks for your time