



Landscape Evaluation Overview

**Workshop on Science-Driven Prescriptions to
Create More Resilient Environments**

5 October 2023

Presentation Overview

- Why a Landscape Perspective
- Landscape Evaluation Process
- Landscape Prescription
- Application to Local Managers



Focus on Forest Restoration/Health



United States
Department of
Agriculture

Forest Service

Pacific
Northwest
Region

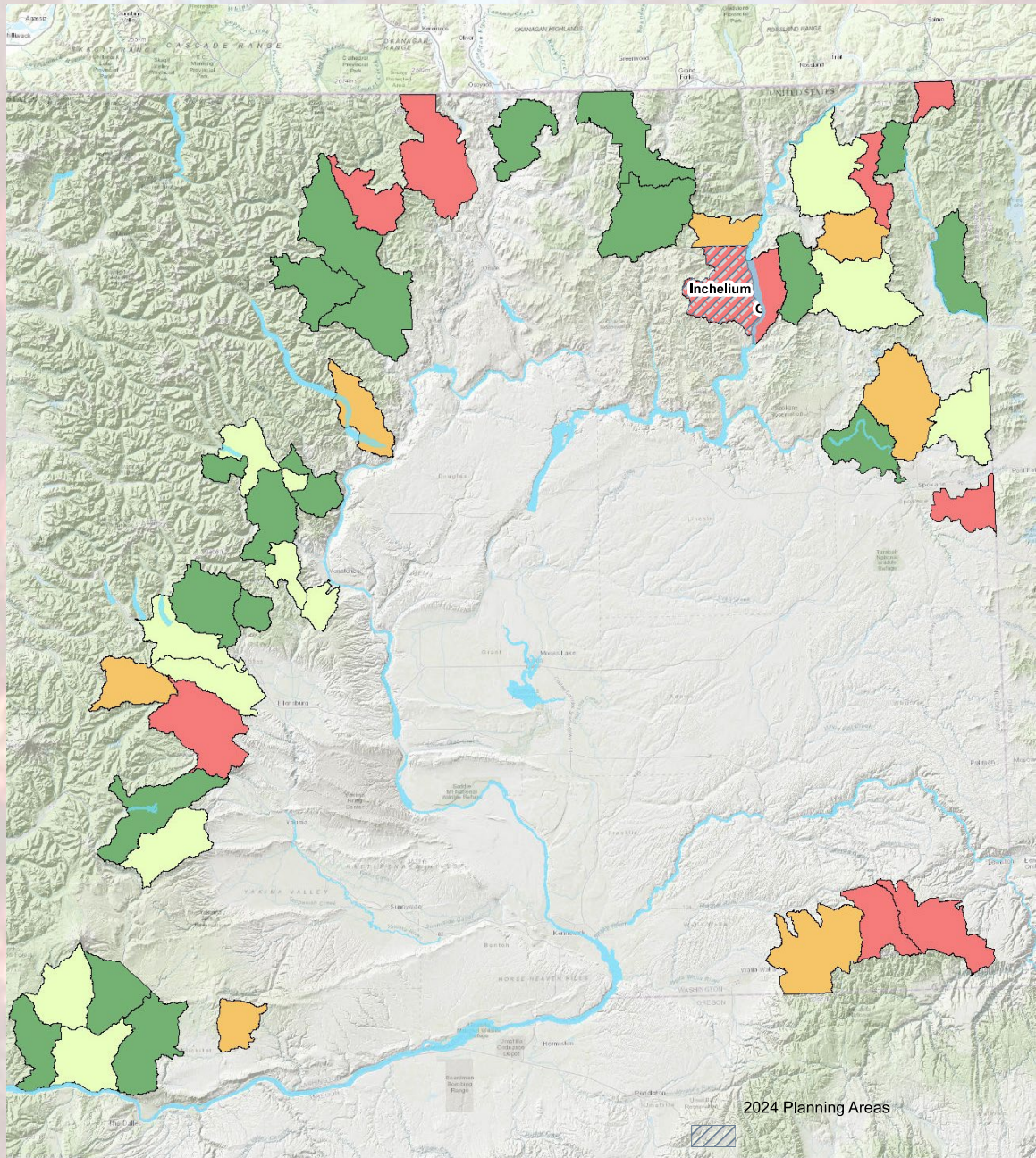


The Okanogan-Wenatchee National Forest Restoration Strategy: adaptive ecosystem management to restore landscape resiliency

2012 Version

Okanogan-Wenatchee National Forest
November 2012





Why Landscapes?

Principle 1: Important ecological processes operate across spatial scales – from tree neighborhood to regional landscapes. *Implication: Planning and management must incorporate and link the tree neighborhood, patch, drainage/hillslope, local landscapes, and regional landscapes.*

Principle 2: Topography provides a natural template for vegetation and disturbance patterns across the landscape hierarchy scales. *Implication: Use topography to guide restoration treatments*

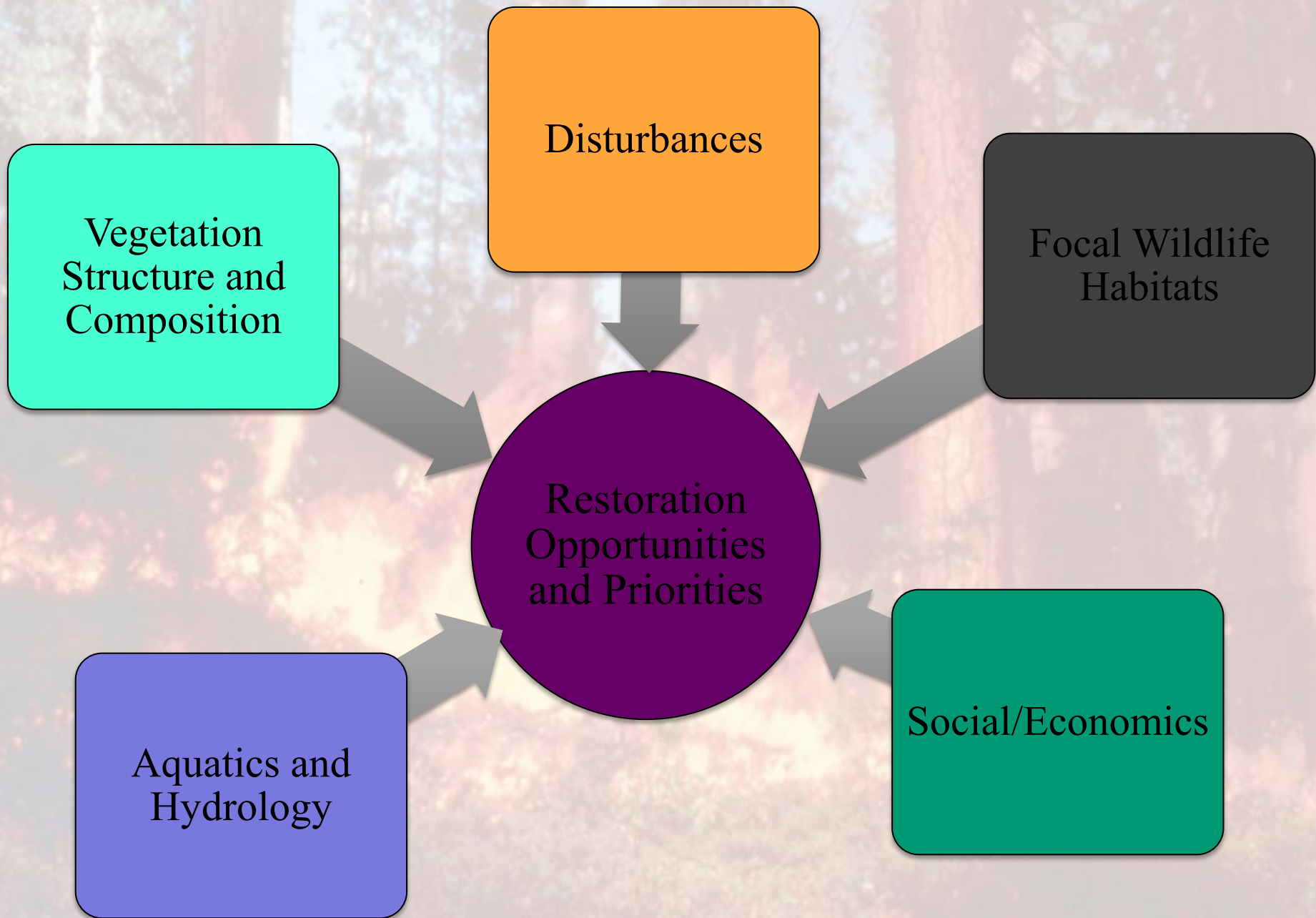
Principle 3: Disturbance and succession drive ecosystem dynamics. *Implication: Focus on restoring the ecosystems' inherent fire/disturbance regimes and vegetation successional patterns; other ecological processes will follow.*

Principle 4: Predictable distributions of forest-patch sizes naturally emerge from interactions climate-disturbance-topography-vegetation. *Implication: focus on restoring the natural distribution of forest patch sizes across landscapes.*

Principle 5: Patches are “landscapes within landscapes: *Implication: focus on restoring characteristic tree clump and gap patterns within stands/patches.*

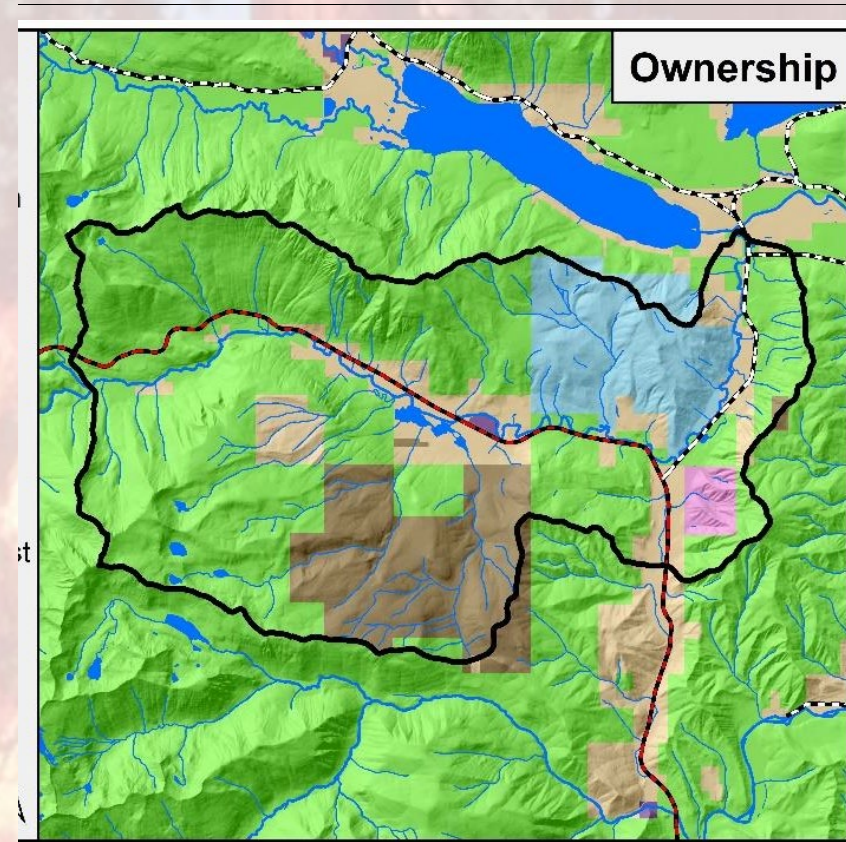
Principle 6: Widely distributed large, old trees, provide a critical ecological backbone for forested landscapes. *Implication: focus on retaining and promoting large/old trees and post-disturbance large snags and down logs.*

Principle 7: Traditional patterns of land ownership and management disrupt inherent landscape and ecosystem patterns. *Implication: develop restoration projects that effectively work across forest ownership and management allocations.*



Landscape Evaluation

- A process for assessing the condition of a landscape or watershed and level of resilience to future disturbances.
- Identify restoration opportunities and priorities.
- A common basis and language for stakeholders and land managers to assess and balance a range of resources, risks, tradeoffs and treatment options.



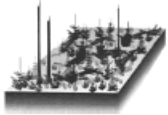
Reference Conditions

- Objective Measure of Current Conditions
 - More resilient landscapes and watersheds
- Changes Over Time
 - Historical Range of Variation
 - Future Range of Variation
- Amount and Configuration
 - Spatial arrangement matters



A photograph of a forest fire. Large, bright orange and yellow flames are rising from the ground, partially obscured by thick, white and grey smoke. In the foreground, several dark, vertical tree trunks are visible, some with charred or peeling bark. The background shows more trees and a hazy, smoke-filled sky.

Vegetation Structure and Composition



A. Stand Initiation (SI): Growing space is reoccupied following a stand replacing disturbance.



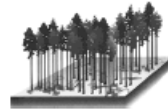
E. Young Forest Multi-Strata (YFMS): Two or more cohorts are present through establishment after periodic disturbances. Large and/or old early seral trees are often at reduced density from fire or logging.



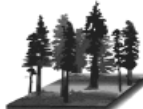
B. Stem Exclusion Open Canopy (SEOC): Below-ground competition limits establishment of new individuals.



F. Old Forest Multi-Strata (OFMS): Two or more cohorts and strata are present including large, old trees.



C. Stem Exclusion Closed Canopy (SECC): New individuals are excluded through light or below-ground competition.

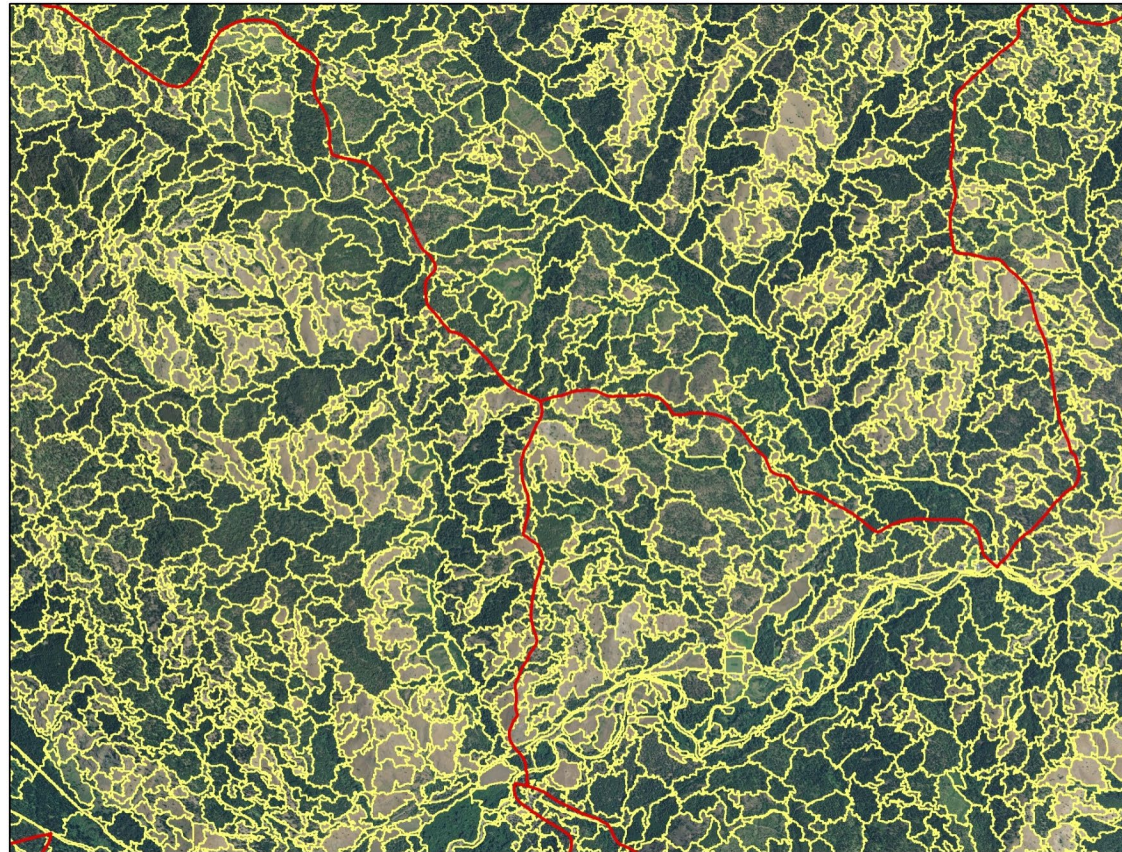


G. Old Forest Single Strata (OFSS): Single stratum stands of large, old trees. Relatively few young trees are present in the understory.

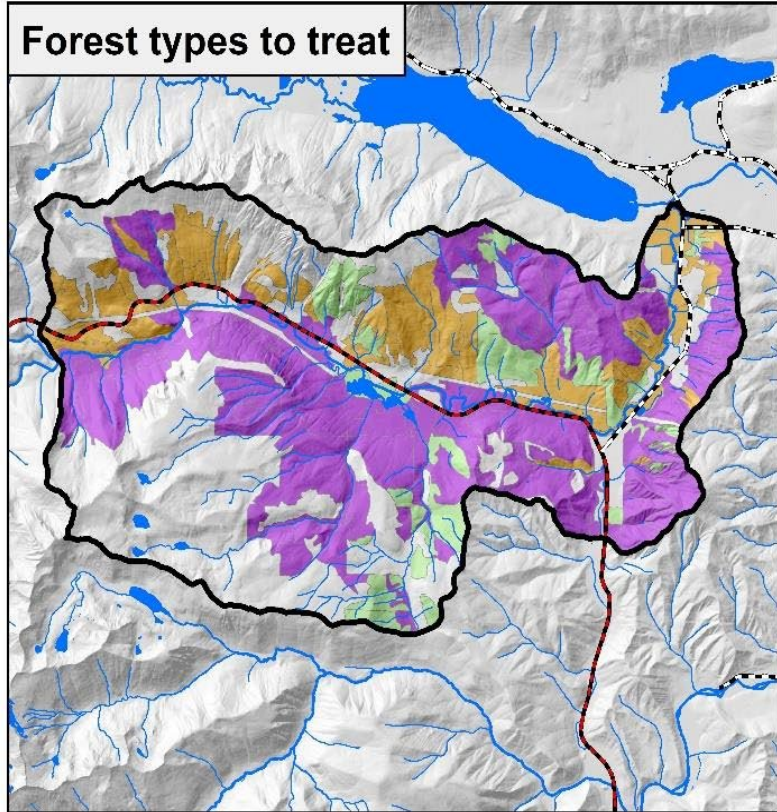


D. Understory Reinitiation (UR): Initiation of a new cohort as the older cohort occupies less than full growing space.

- *Canopy Closure
- *Canopy Layers
- *Species Composition
- *Tree/Snag Size



Forest types to treat



Forest type

- Dry Dense
- Moist Dense
- Dry + Moist Open

Ownership

- DNR-Trustlands
- Other State
- USFS
- Other Federal
- Tribal
- Community Forest
- Industrial
- Private

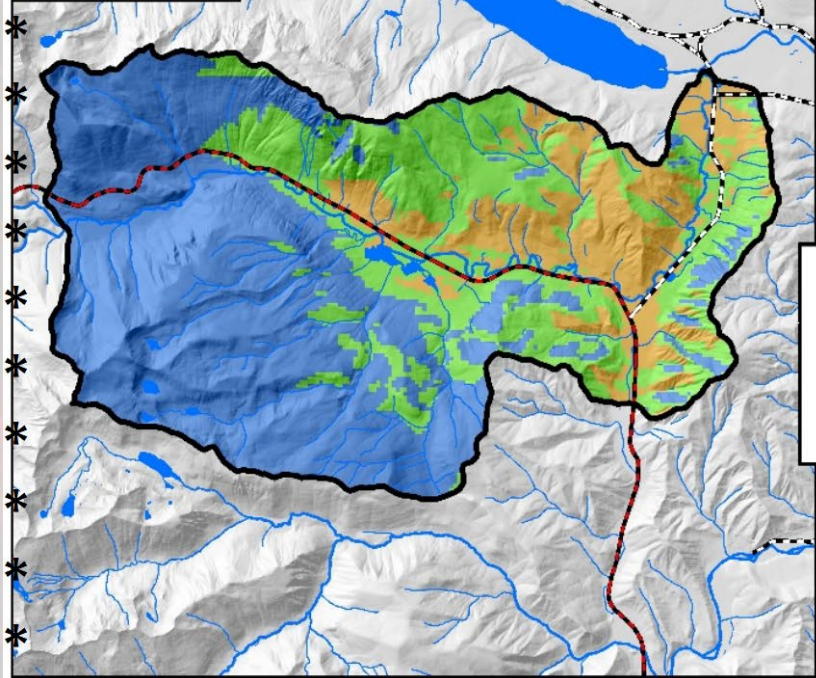
0 1 2 Miles



Ownership



Current
1981-2010



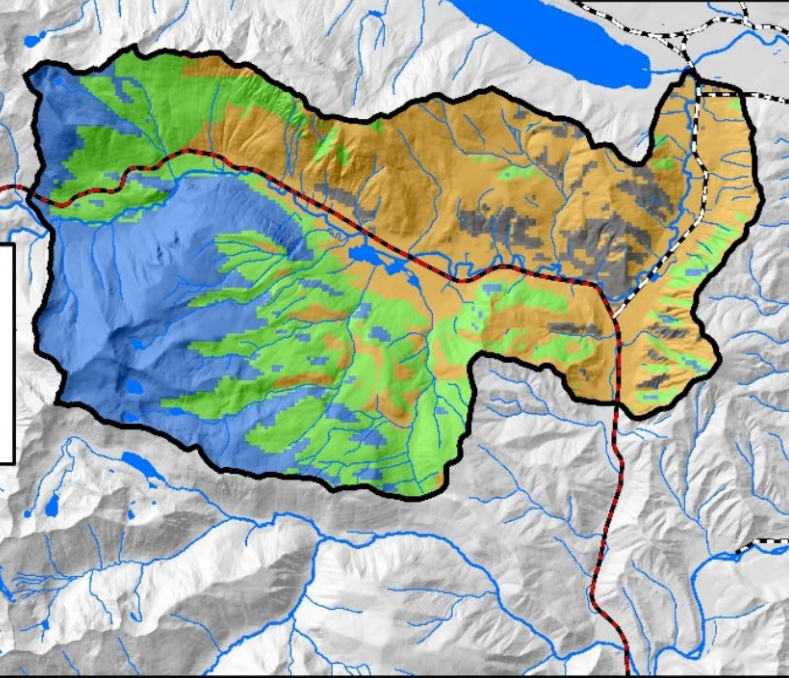
Moisture deficit

- Low
- Moderate
- High
- Very high

Moisture deficit is a measure of water stress faced by plants.



Future
2041-2070



A photograph of a forest fire with the word "Disturbances" overlaid in the center. The fire is bright orange and yellow, consuming the forest floor and some trees. The background shows tall, thin trees and a clear blue sky. The overall scene is a natural disturbance in a forest.

Disturbances

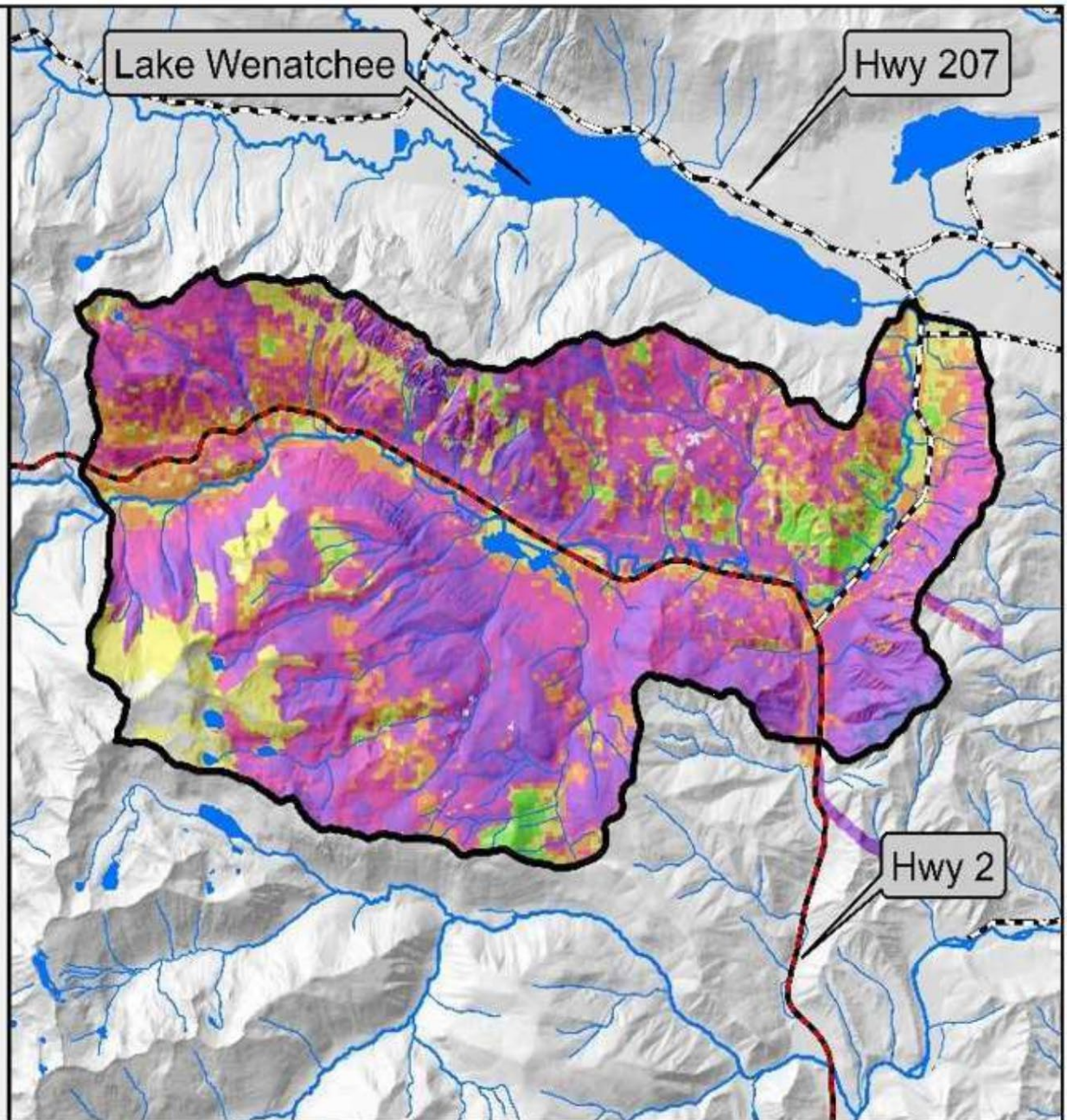
Planning area Geography

-  Nason
-  Streams
-  Highways
-  Main roads

Fire risk

-  Extreme
-  Very High
-  High
-  Moderate
-  Low
-  Beneficial

0 1 2 Miles



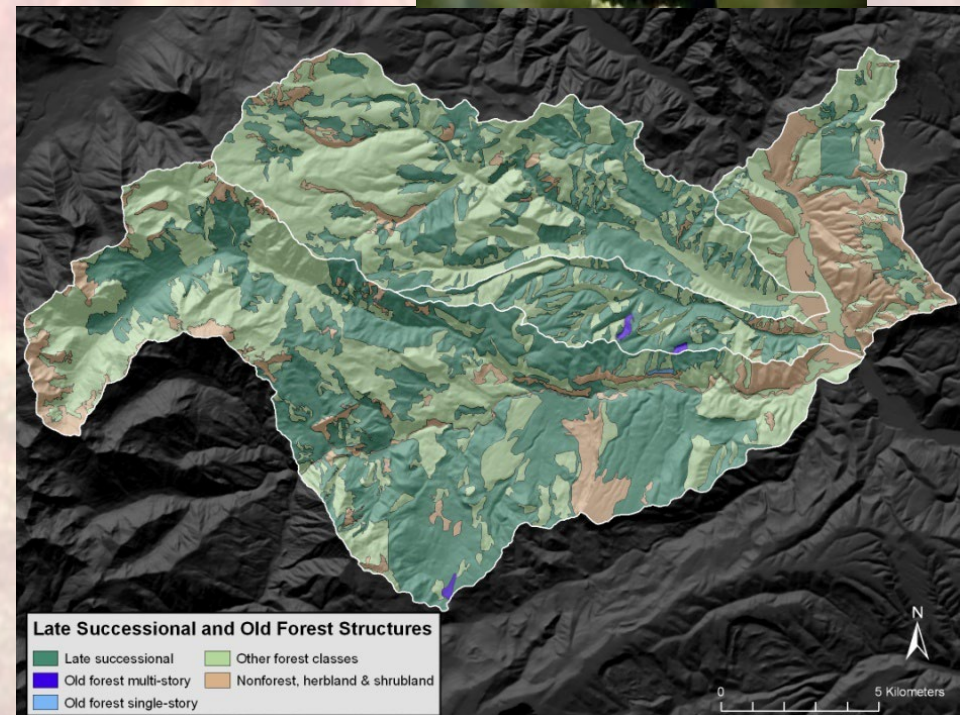
A photograph of a forest fire with large, bright orange and yellow flames rising from the ground, surrounded by thick, dark smoke. The background shows tall, thin trees, some of which are partially obscured by the smoke. The overall scene is hazy and dramatic.

Focal Wildlife Habitats

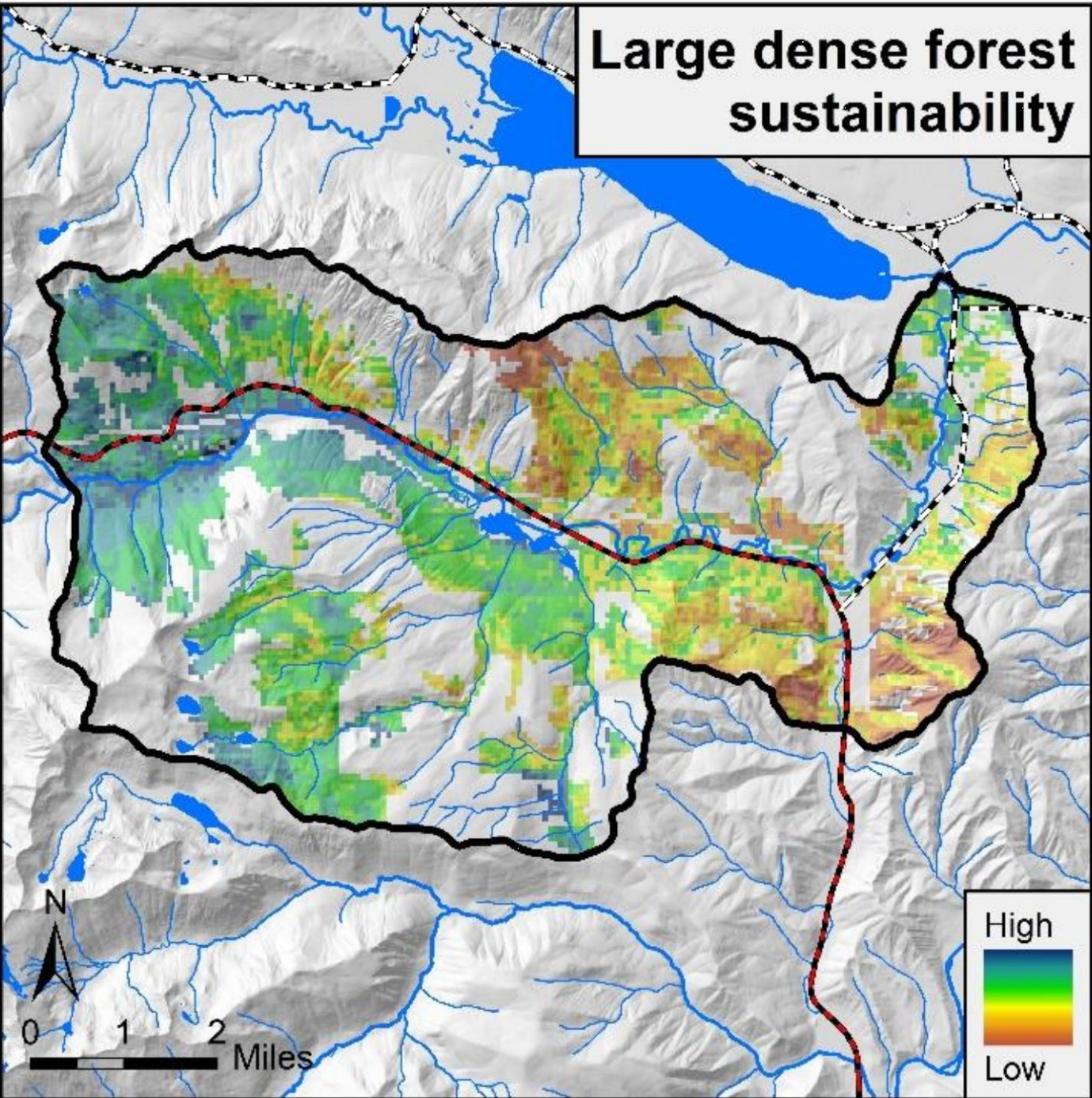


Wildlife Habitat

- Focal Wildlife Species
 - Northern goshawk
 - White-headed woodpecker
 - Pileated woodpecker
- Reference Conditions
 - Current amount and arrangement of habitats
 - HRV, FRV
- Species of Interest
 - Mule deer
 - Elk

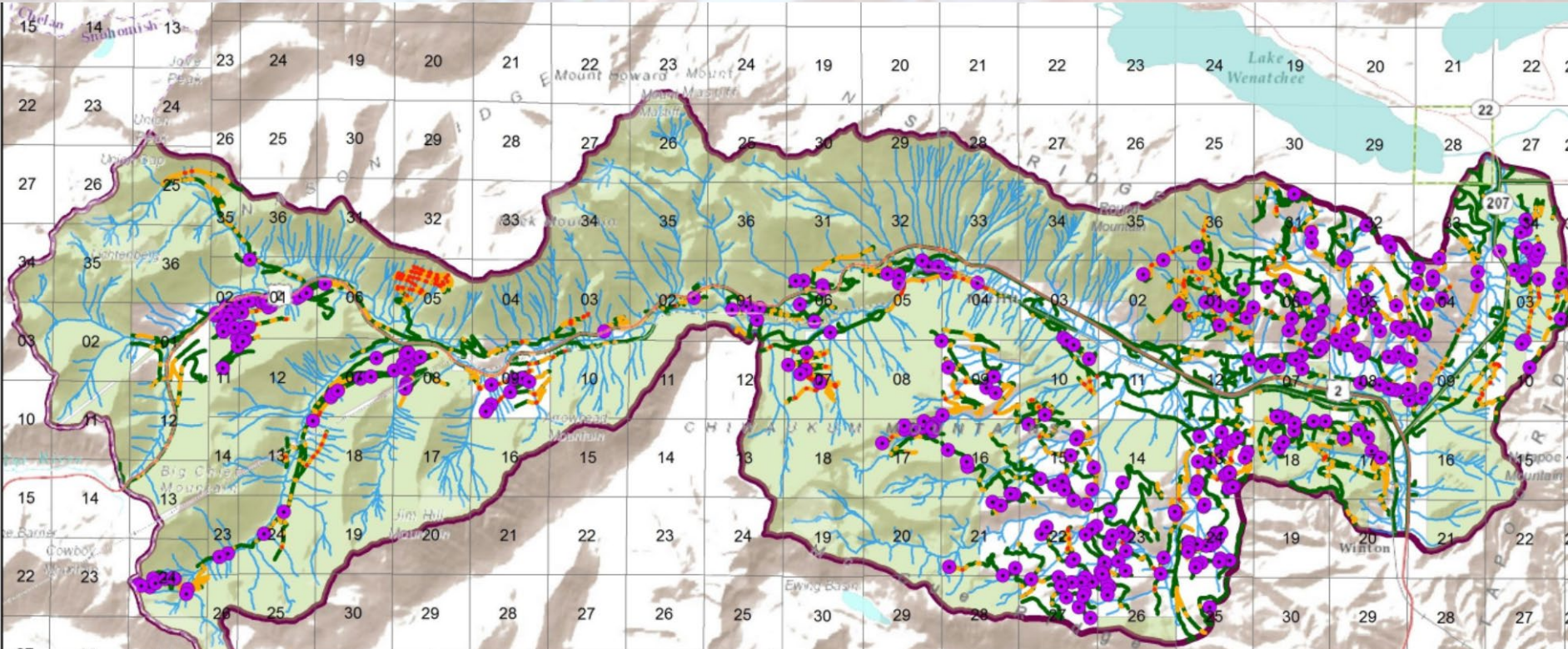


Large dense forest sustainability




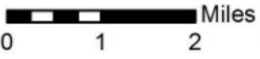
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Aquatics and Hydrology



General Erosion Potential

- Erosion Points
 - Stream Delivered**
 - ~ Roads in High
 - ~ Roads in Moderate
 - ~ Roads in Low
 - ~ Streams
 - Public Lands
- 

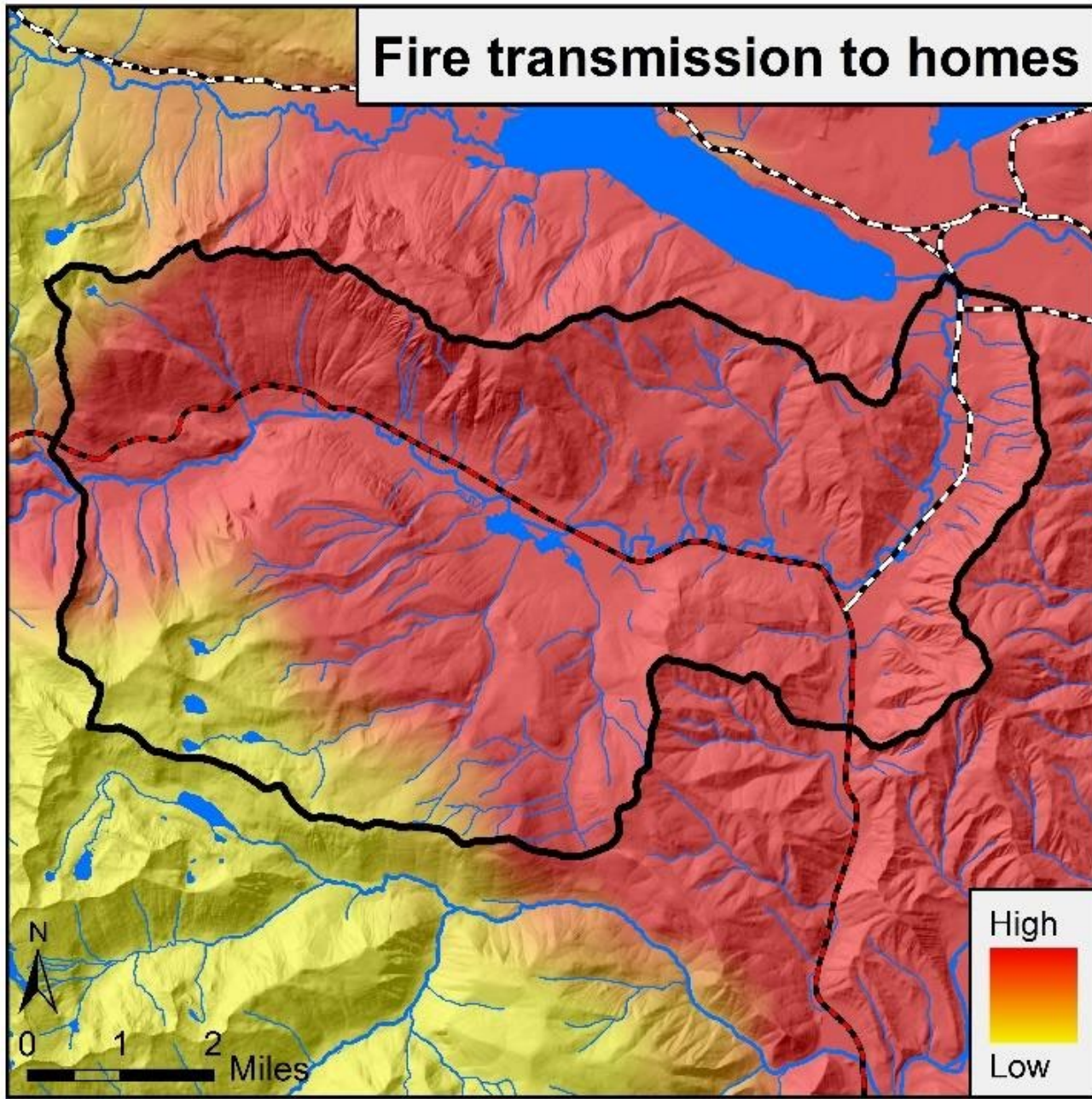


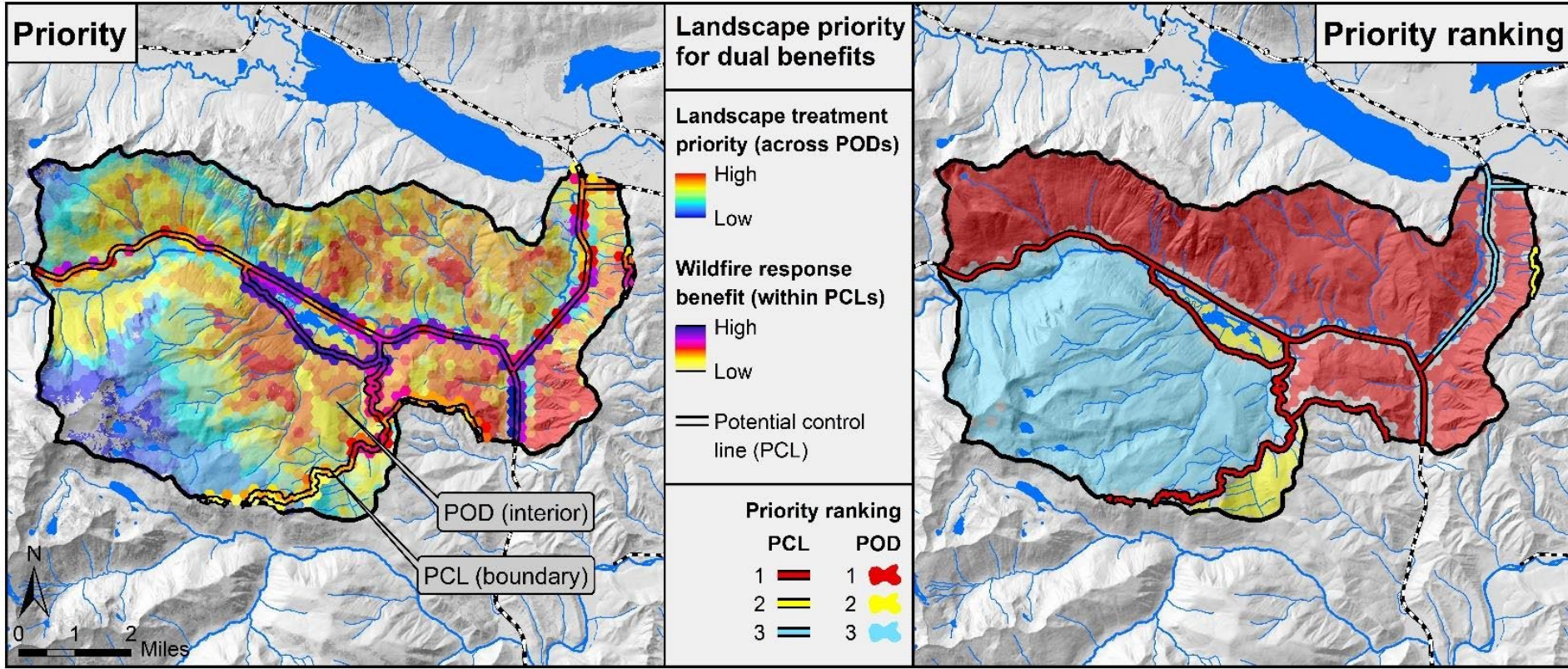
Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA



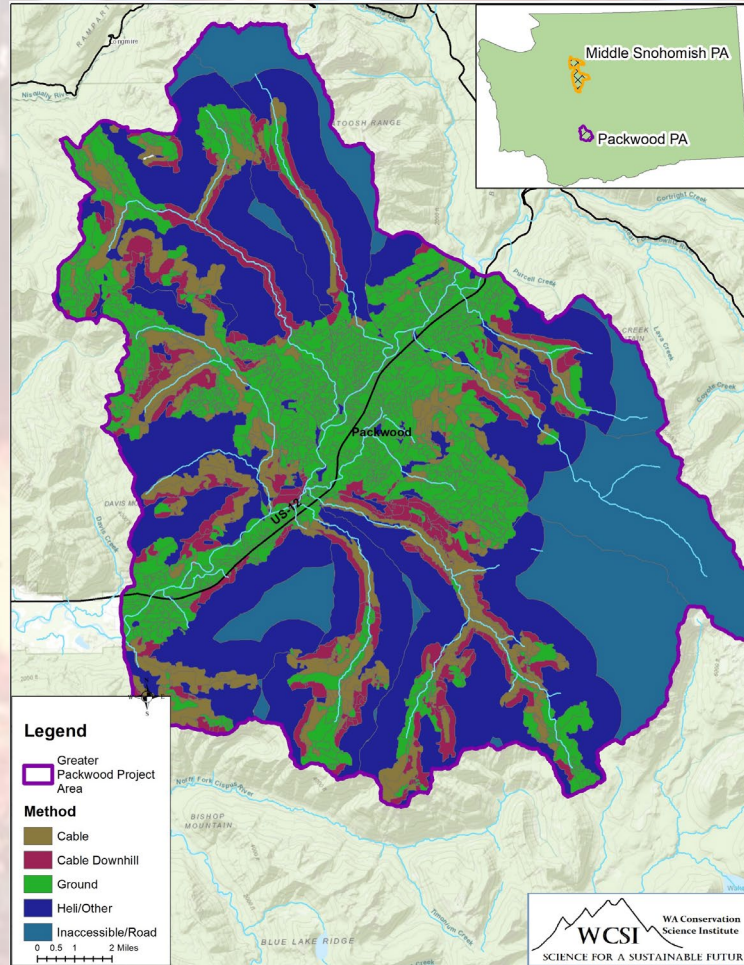
Social/Economics

Fire transmission to homes





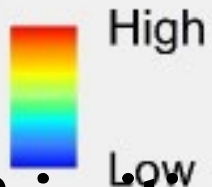
Economic and Operational Tools



Landscape Prescription

- Restoration of Landscape and Watershed Resilience
 - Current Condition compared to HRV and FRV
- Identifies amount and location of potential aquatic and terrestrial restoration opportunities
- A “blueprint” for what a “resilient” landscape could look like
- Used to Inform Forest Restoration/Forest Health Project Level Planning

Landscape treatment priority

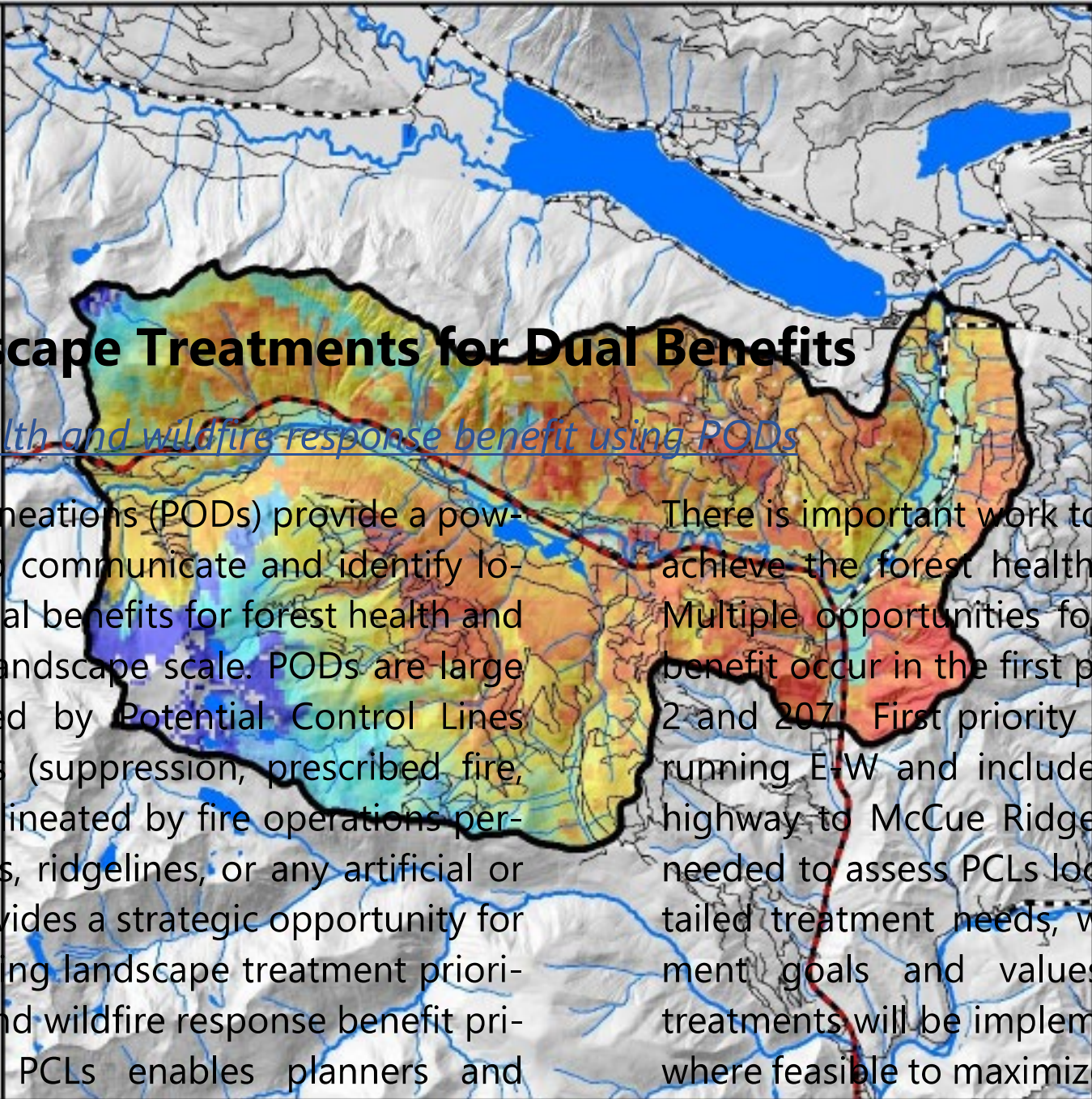


Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for fire operations (suppression, prescribed fire, and managed wildfire) delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and

There is important work to achieve the forest health. Multiple opportunities for benefit occur in the first pr 2 and 207. First priority F running E-W and include highway to McCue Ridge needed to assess PCLs local tailed treatment needs, w ment goals and values treatments will be imple where feasible to maximize



Key Points

- Collaborative Partnerships
- Integrates multiple resource values and climate change science
- Restoration treatments in priority areas and strategic locations across ownerships
- Increase efficiency to increase restoration footprint
- A tool for monitoring progress
- More resilient landscapes/watersheds for communities and ecosystems
- Provides context for stand-level treatments