

Using Data to Integrate Traditional Ecological Knowledge into Forest Management



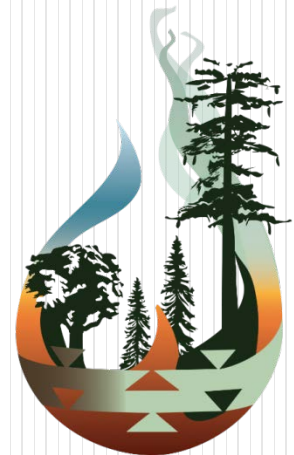
Klamath Fire Ecology Symposium

Orleans, CA

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Jill Beckmann

Karuk Tribe Department of Natural Resources



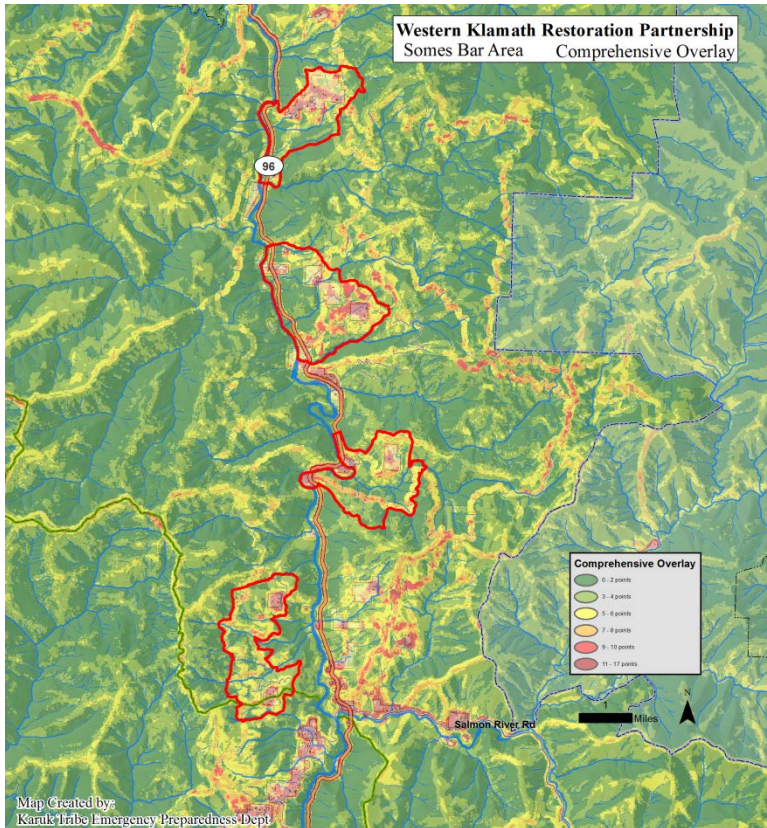
Western Klamath Restoration Partnership

Shared Values

1. Fire Adapted Communities
2. Restored Fire Regimes
3. Healthy River Systems
4. Resilient Bio-diverse Forests/Plants/and Animals
5. Sustainable Local Economies
6. Cultural and Community Vitality



Where/Why? - Overlay Assessment

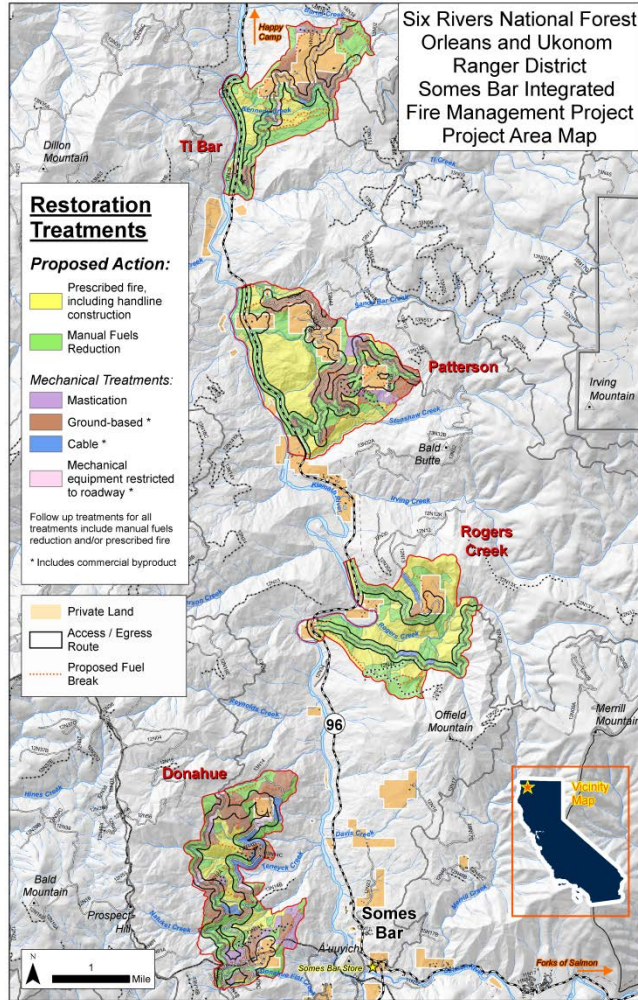


- Prioritization Scheme:
 - Roads/Ridges/Trails
 - Private Property
 - Elk habitat potential
 - Vegetation Types
 - Fire History
 - Slope/Insolation
 - Management History

Project Rationale / Principles

- Restore fire processes
- Retain and enhance legacy hardwoods, large diameter conifers, and ‘cultural vegetation characteristics’
- Increase landscape heterogeneity to meet needs of a variety of species
- Improve safety of access/egress routes in case of wildfire
- Improve forest resiliency adjacent to private property
- Limit negative impacts to watersheds during implementation
- Improve health of riparian areas
- Provide diverse revenue streams for healthy economy

Somes Bar Integrated Fire Management Project



Mechanical Treatment with Restoration By-Products *

	<u>Number of Units</u>	<u>Total Acres</u>
Doug-Fir Plantations	31	354
Pine Plantations	17	306
Non-Plantations	41	569

** will also receive fuels and Rx fire treatments*

Fuels and Fire Treatments

Masticate + Manual + Rx Burn Plantations	16	187
Manual + Rx Burn Planations	55	502
Manual + Rx Burn Non-Plantations	134	2,108
Rx Burn Plantations	8	106
Rx Burn Non-Plantations	29	1,381

Other Unique Treatments

	2	15
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**EASTERN KLAMATH
RESTORATION
PARTNERSHIP**



Current Conditions / Historic Context

- Cultural Genocide
- Fire Suppression
- Hardwood deficit (Crawford et al. 2015)
- Increased vulnerability of encroached hardwoods (Cocking et al., 2012)
- Legacy of timber management
- Decline of Northern Spotted Owl and other species
- Boom and Bust Economy
- History of failed attempts at collaboration
- Climate Change

Traditional Ecological Knowledge

- “Animals taught us how to manage”
- Manage for all species, not just one
- Acknowledgement of interdependence of species
- Acknowledgement of and emphasis on familial relationship between Karuk people and native plants and animals
- Holistic view and approach
- Selection of Five Focal Species



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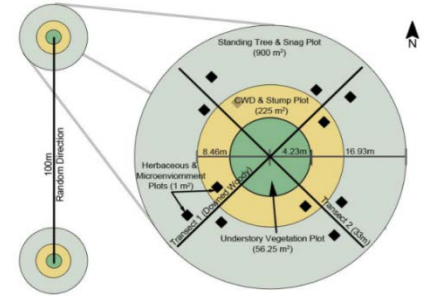
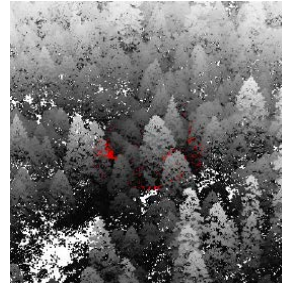
Photo: Kirsten Vinyeta



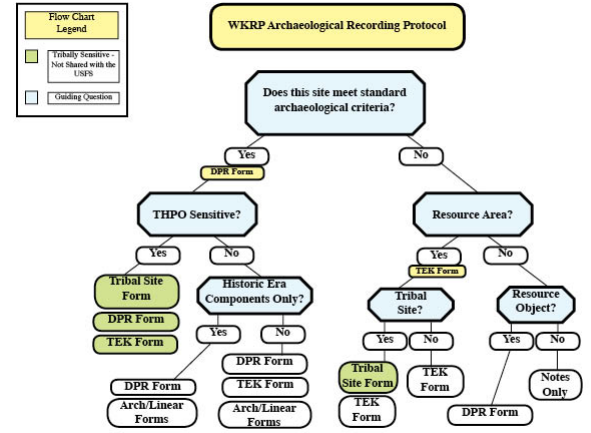
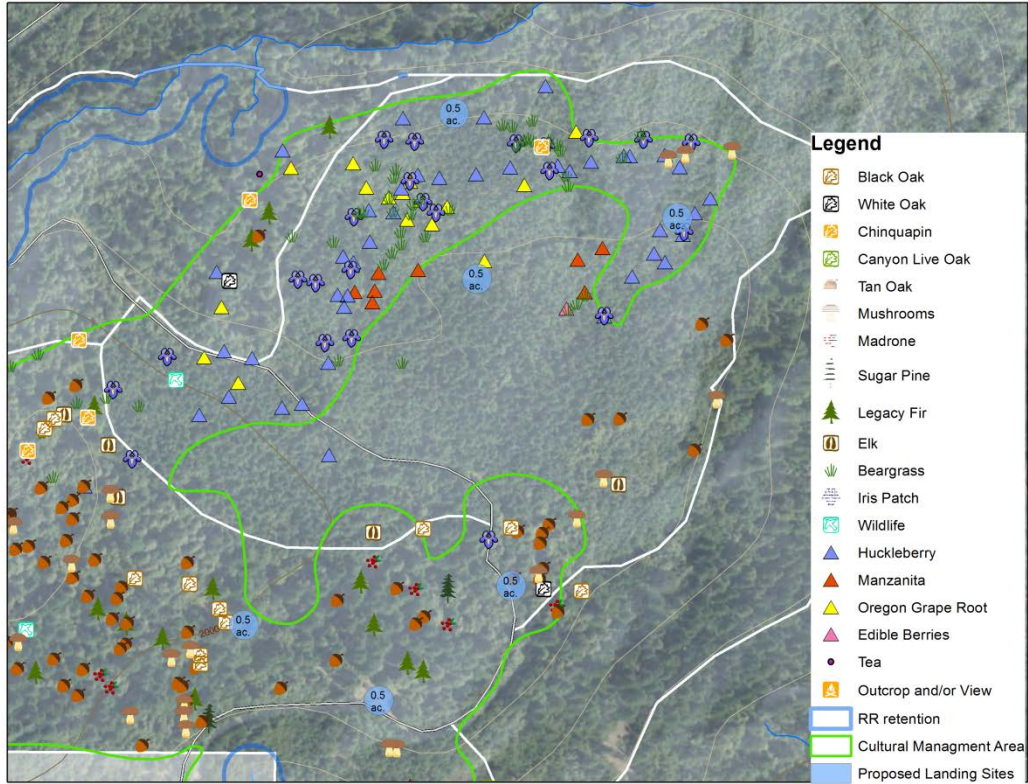
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Data Collection

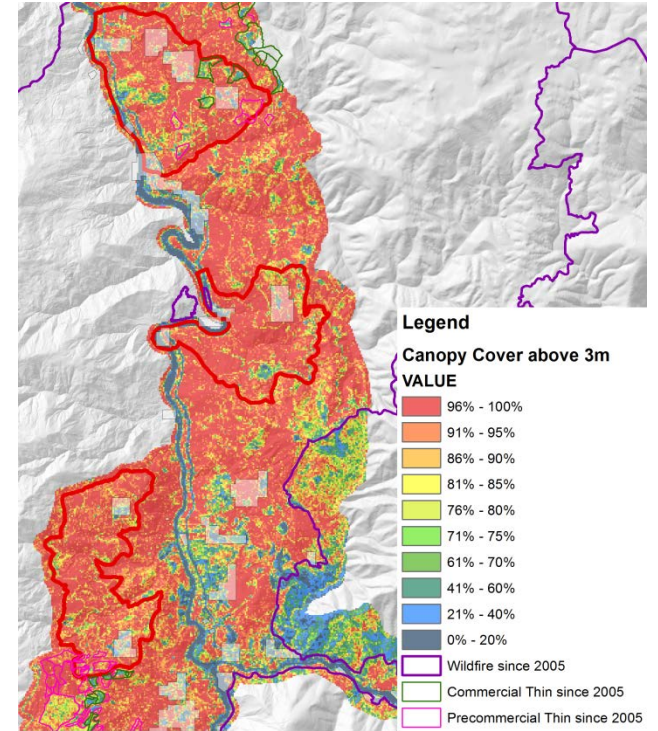
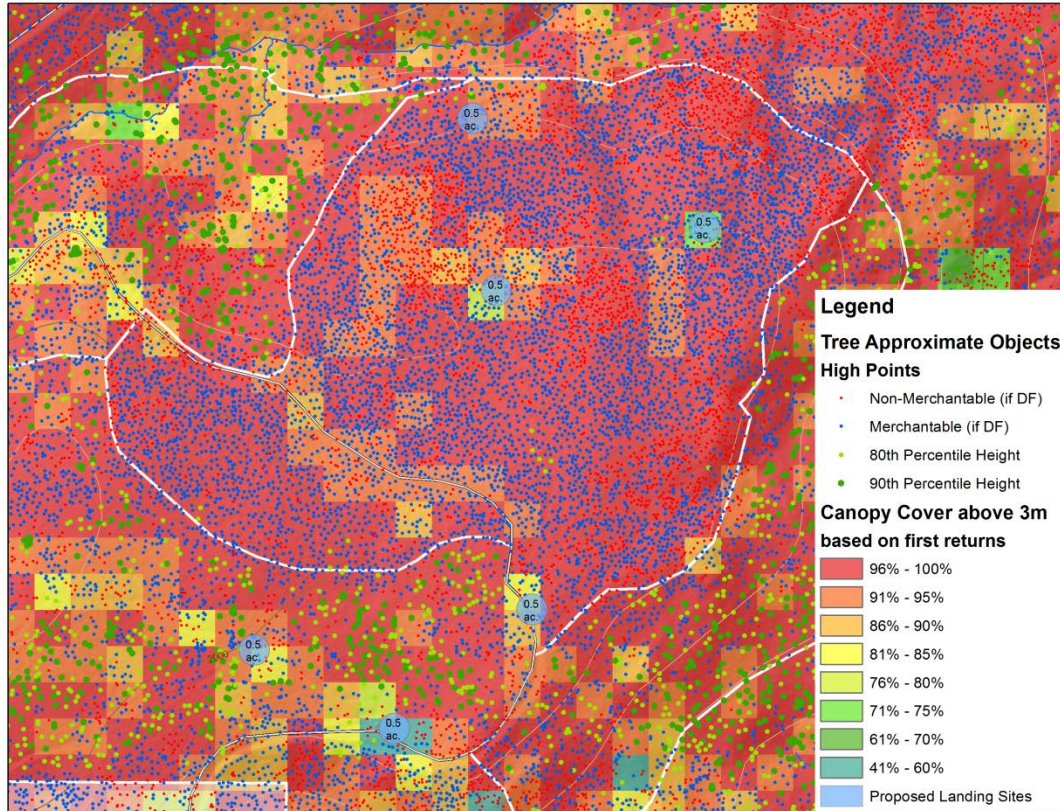
- LiDAR validation plots
- Common Stand Exam
- TEK data as part of archeological survey effort
- Food Crew Assessments
- Additional LiDAR-derived products



TEK data

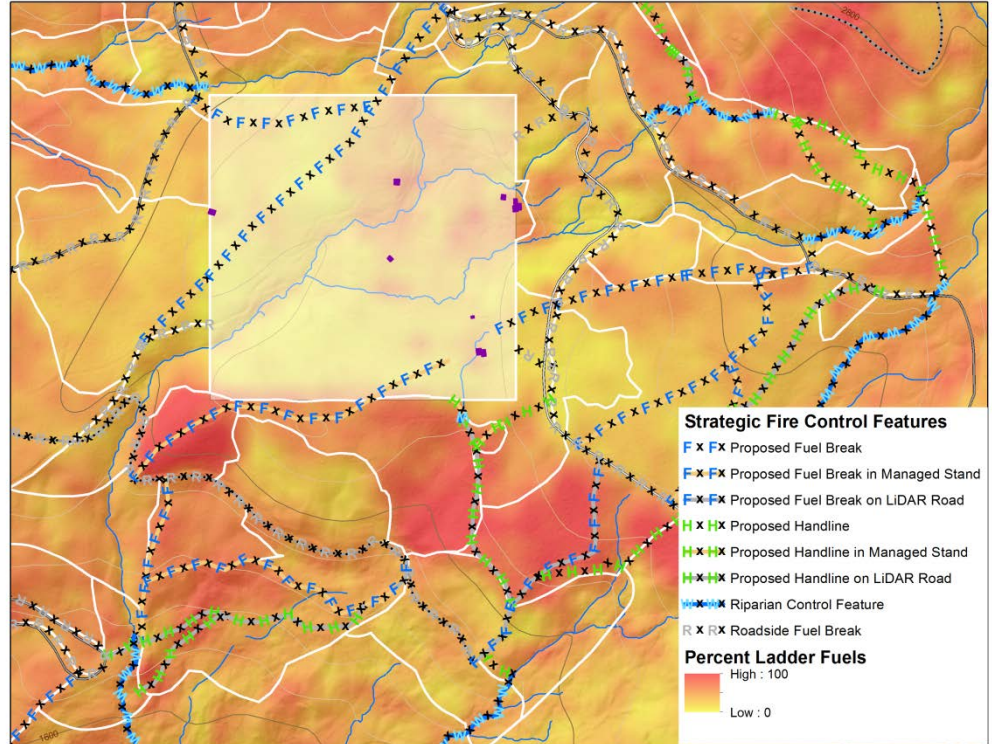
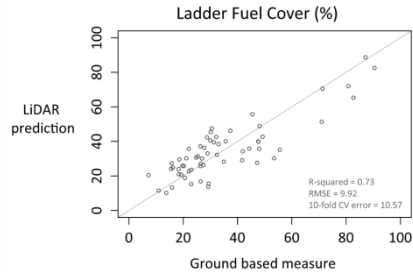
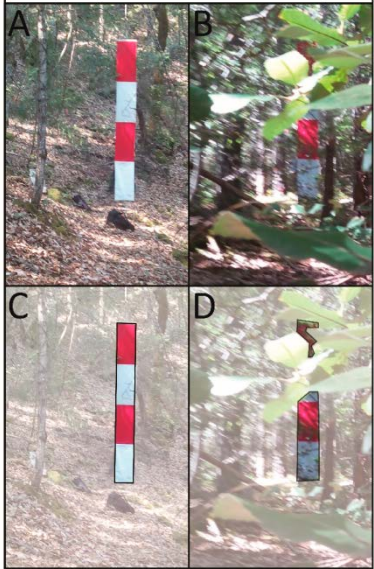


Canopy Cover and TAO's from LiDAR



Percent Ladder Fuels from LiDAR

Sample photos and area analyzed

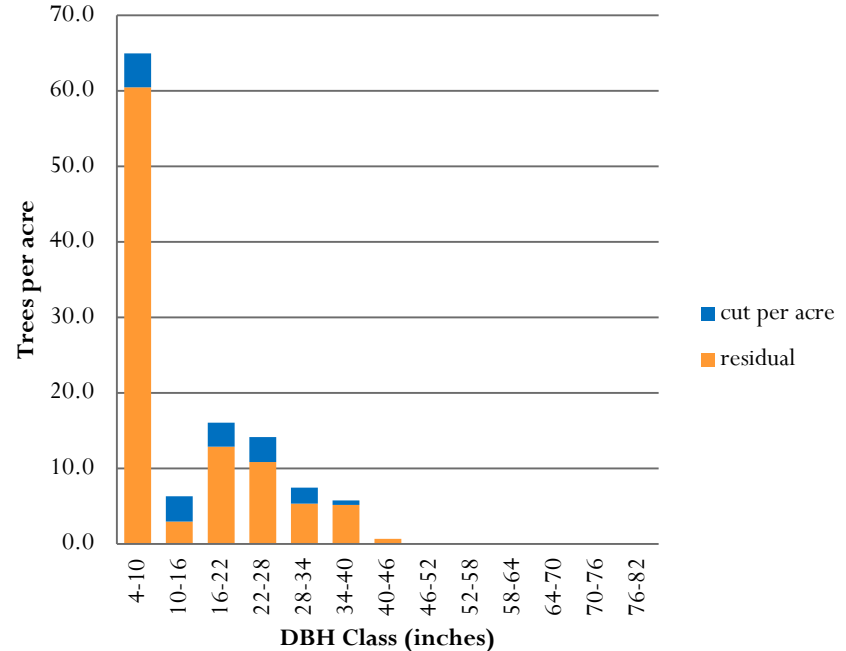


Kramer H, Collins B, Lake F, Jakubowski M, Stephens S, Kelly M (2016) Estimating Ladder Fuels: A New Approach Combining Field Photography with LiDAR. Remote Sensing 8:766.

Prescription Development

- Increase Heterogeneity (North and Sherlock, 2012)
 - Retention patches (5-10%)
 - Openings (10-20%)
 - Thinning area
 - Plantations – variable density
 - Non-Plantations – Release “Trees of Interest” by 50% and reduce Ladder Fuels
- Site-specific customization using TEK data and other info

Sample Mark, Unit 2400 / 2453



Marking Guides

Unit 2xxx

1969 Plantation

Total Acres: 44

Elk Habitat – Foraging, Dry

NSO Habitat – Mostly dispersal,
some foraging

Insolation – Moderate

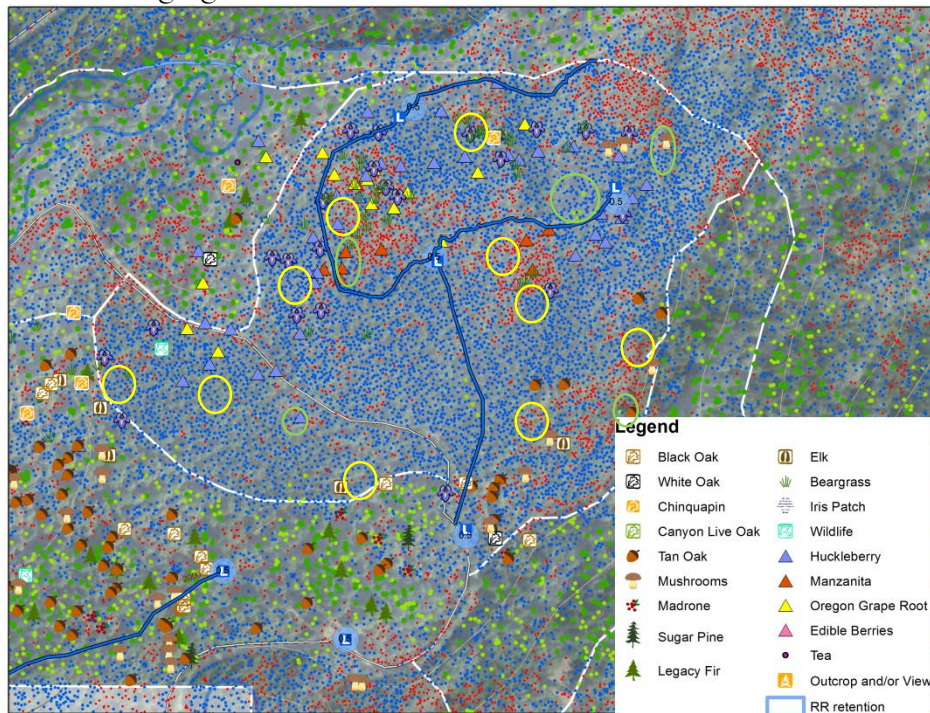
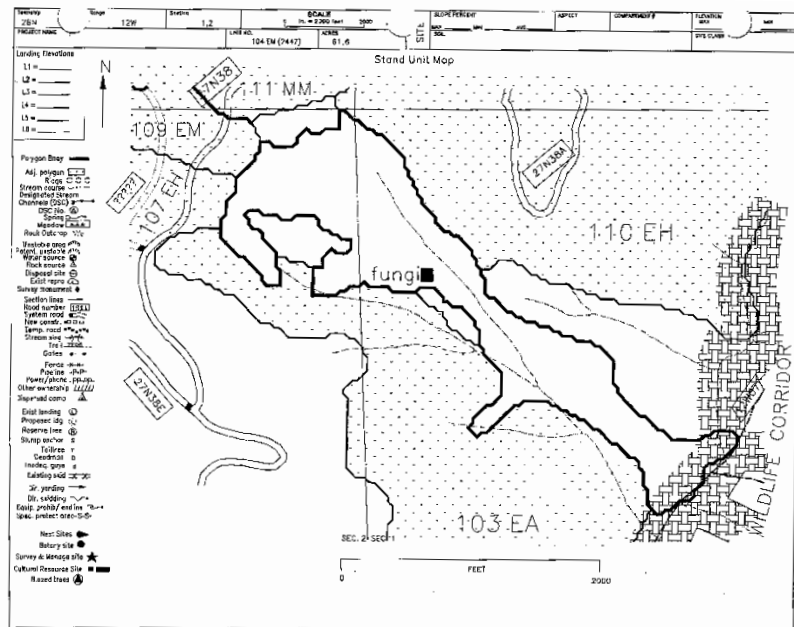
Current CC – 97%

Avg. Ladder Fuels – 34%

Current BA DougFir – 149 ft²/ac

Current Total BA – 200 ft²/ac

Retain 50% CC





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