

Lessons learned from large wildfires: landscape fuel treatments and wildland fire management strategies

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Resilient Trees



Resister Species:

- Mature trees have built-in inertia
- Resilient to climatic extremes
- Adapted to frequent fire

Seedlings

The most vulnerable phase of a plant's life

- Shallow root systems
- Low reserves
- New leaves/needles



Resilient Forests

Control



Thin

ThinRx



Treatment

All trees

Large-diameter trees

Control

8.4%

34.8%

Thin only

12.5%

39.7%

ThinRx

50.6%

76.6%

An “Epidemic” of Douglas-fir



Resilient Landscapes

Large, stand-replacing fires

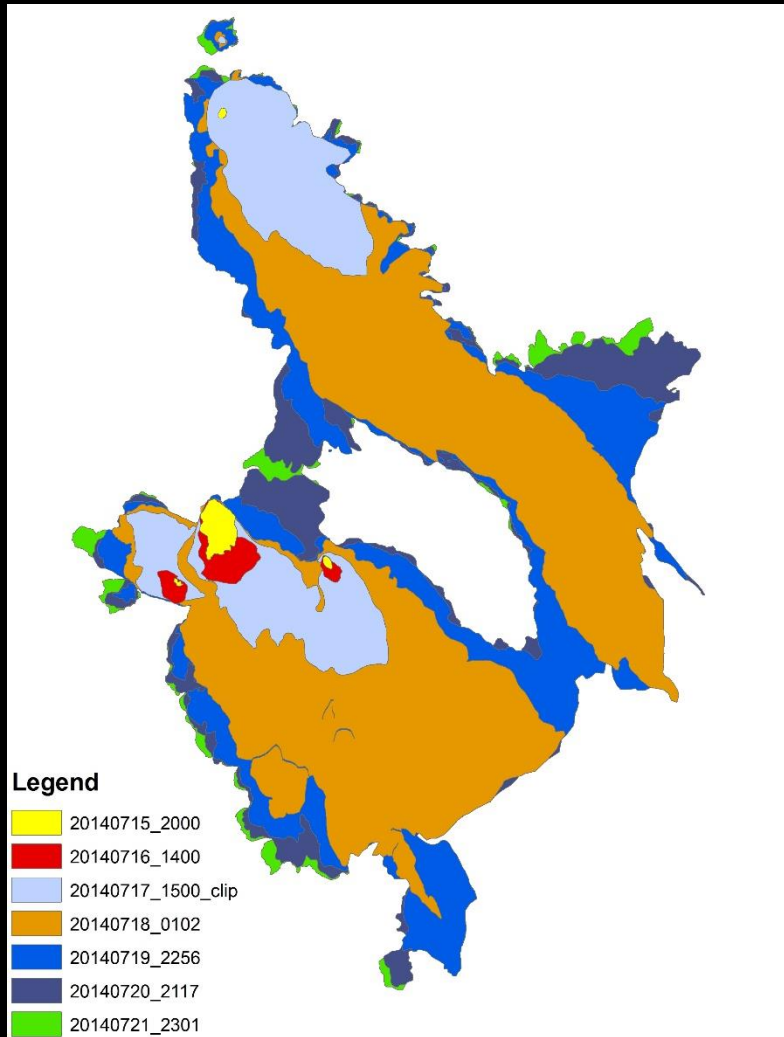
- Clear the slate
- May accelerate responses to climate change



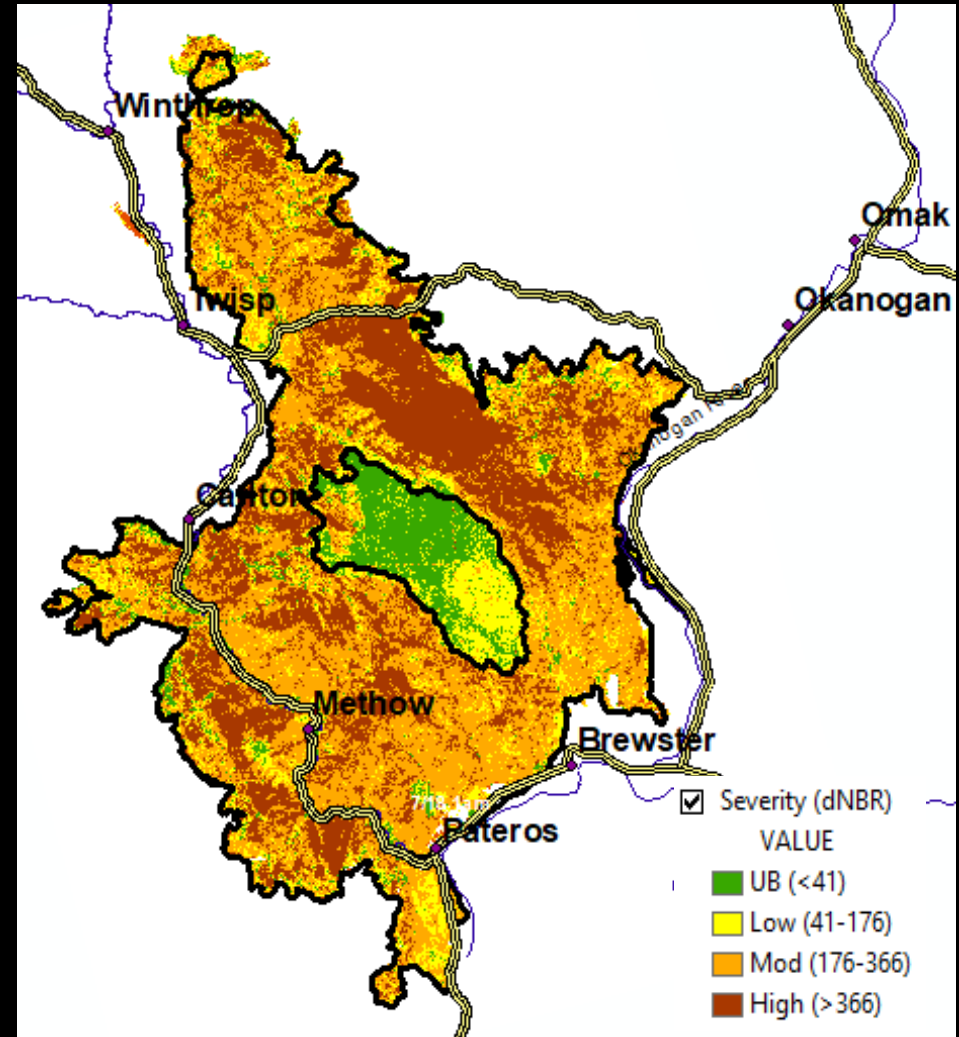
2014 Carlton Complex, Upper Finley Canyon

2014 Carlton Complex

Early fire progressions



Burn severity



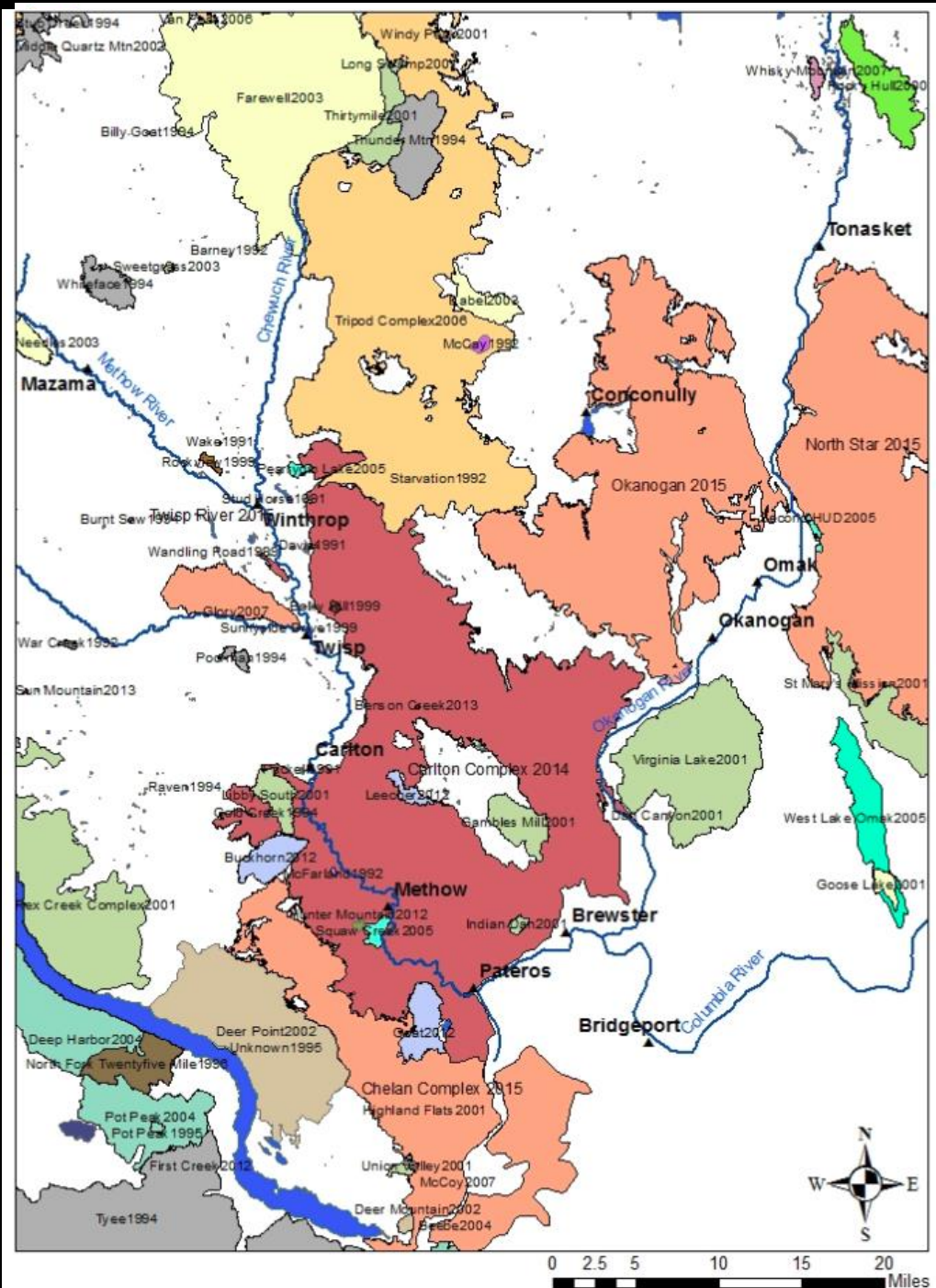
2015

Okanogan
Complex

304,782 acres

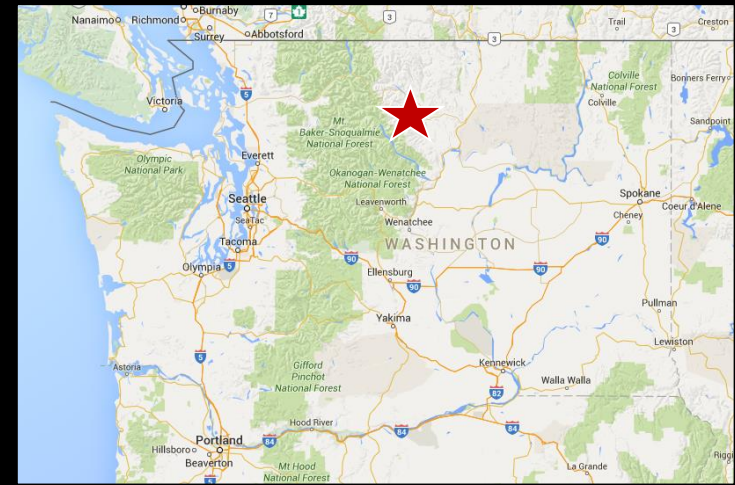
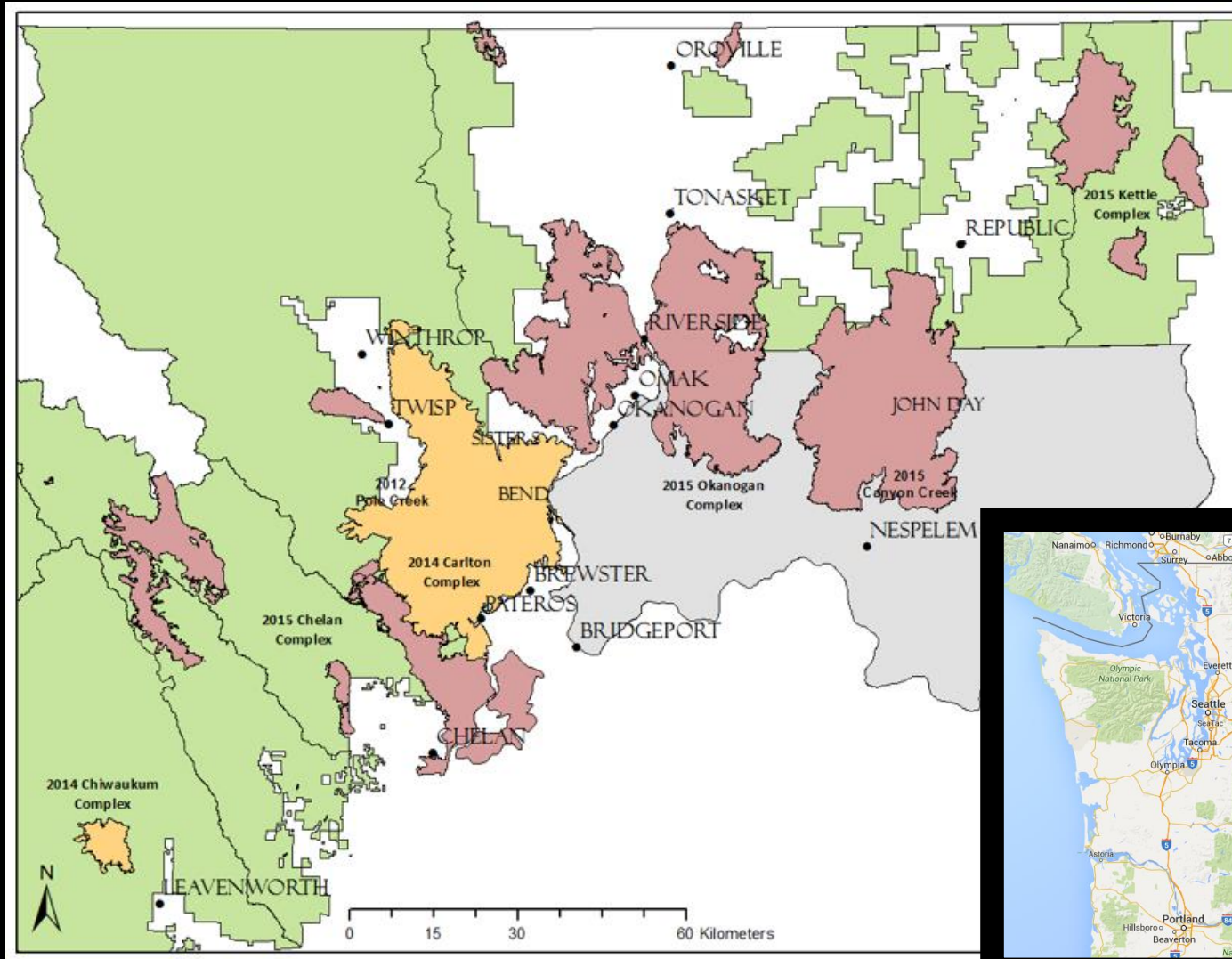
2017

Diamond Creek
Complex



Joint Fire Science Program (17-1-01-09)

Landscape fuel treatments & wildland fire mgmt strategies within recent large fire events



Research Questions

- 1) Were past fuel reduction treatments, including recent wildfires, effective in the 2014 and 2015 wildfires?
- 2) How did topography and fire weather influence treatment effectiveness?
- 3) How did prior fuel reduction treatments assist in safe and effective firefighting responses?



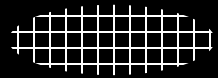
Objective #1

1) Evaluate the effectiveness of fuel reduction treatments in reducing burn severity in the context of:

- Topography (e.g., slope position, site climate)
- Fire weather (e.g. wind, temperature, humidity)



Carlton Complex Past treatments



Past Rx fire



Past wildfire

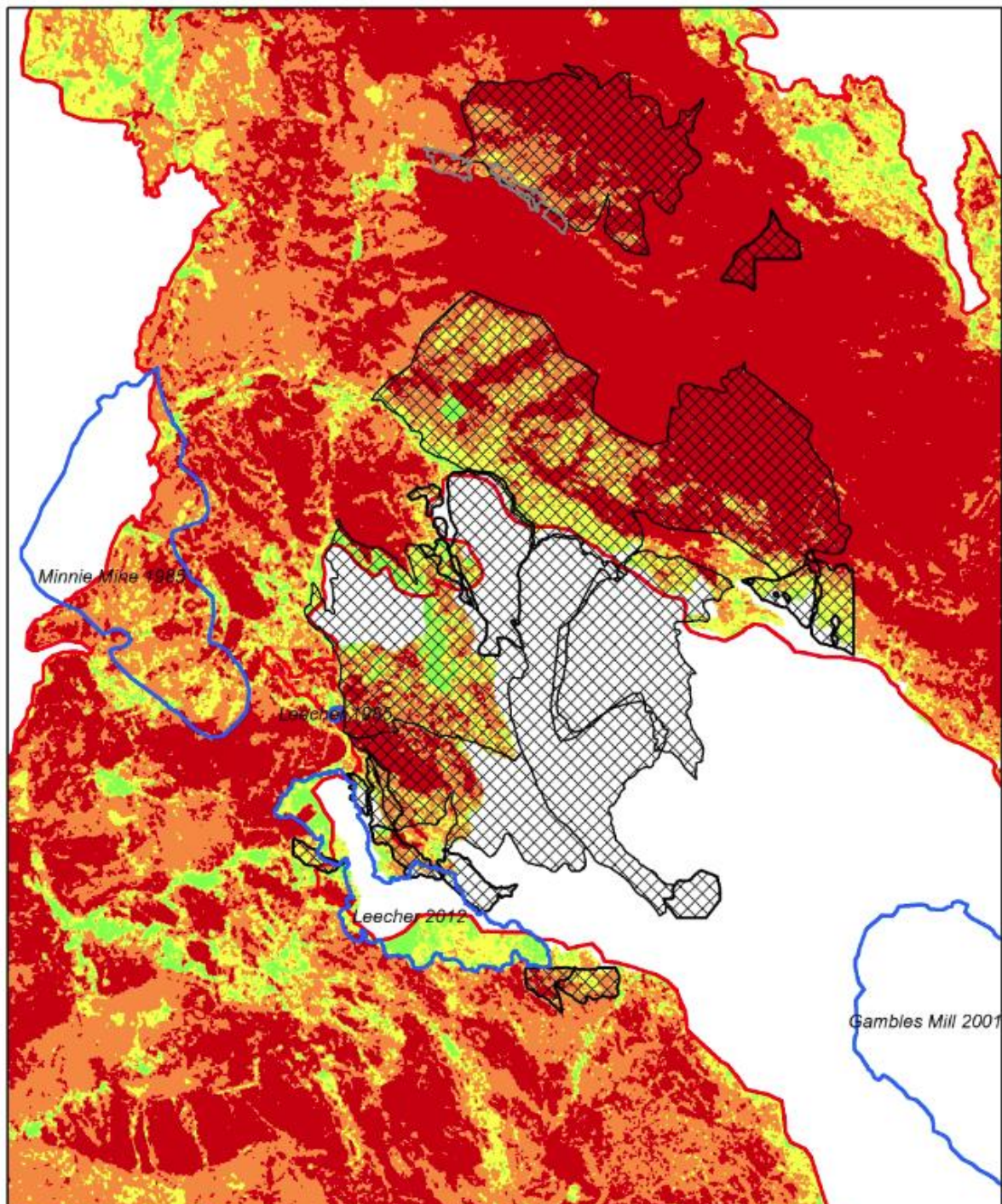
Severity Class

 High

 Moderate

 Low

 Unburned





Objective #2

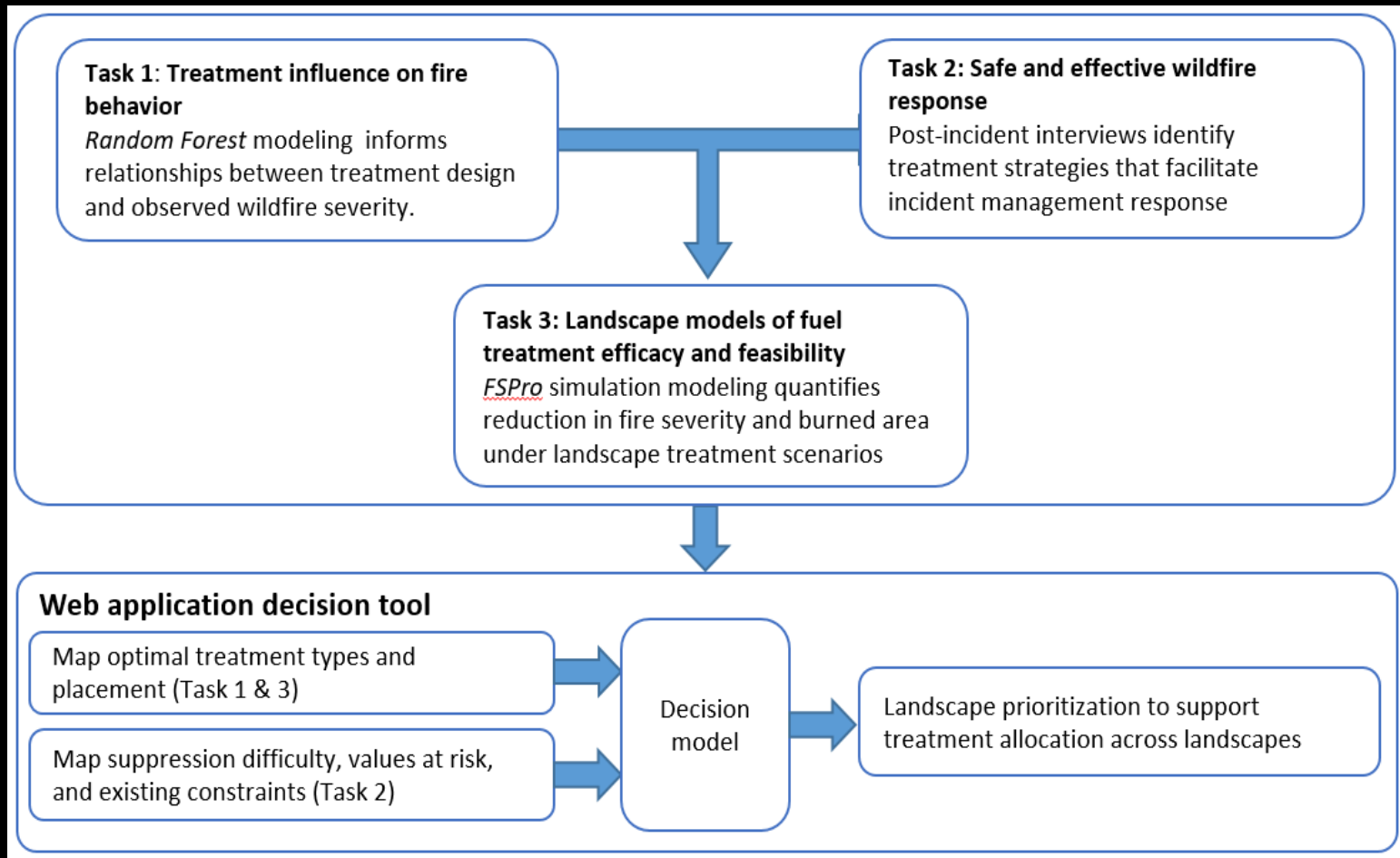
Interview incident command teams on the 2014 and 2015 wildfires

- Document how specific fuel reduction treatments assisted safe and effective fire response
- Report lessons learned for future treatment planning.



Objective #3

Evaluate the type, extent, and landscape configuration of treatments required to restore landscape resilience

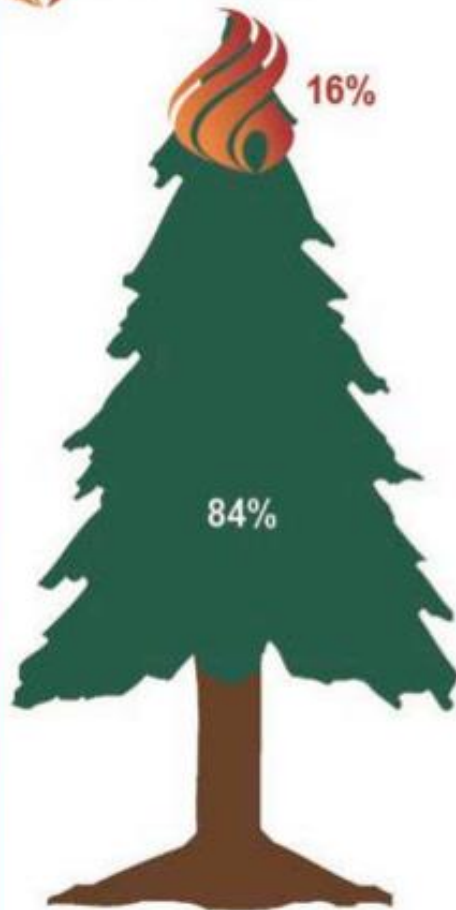


Barriers to Dry Forest Restoration

Yesterday, Today, and Tomorrow
Wildland Fire Cost Consumes
Forest Service Budget



Wildland fire cost



FY 1995



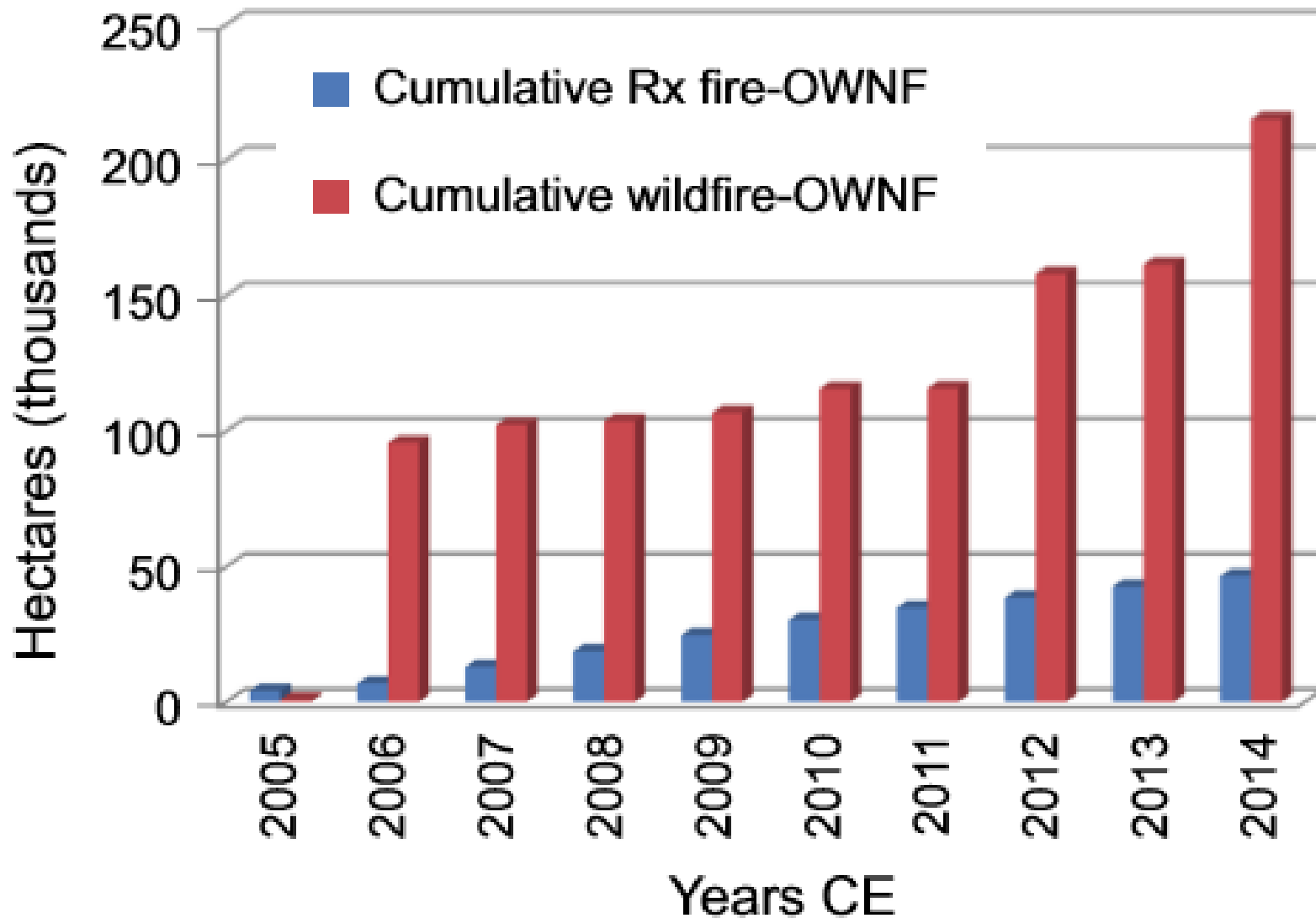
FY 2015



FY 2025 Projected



Area burned by Wildfires vs. Prescribed Fires (Okanogan-Wenatchee NF)



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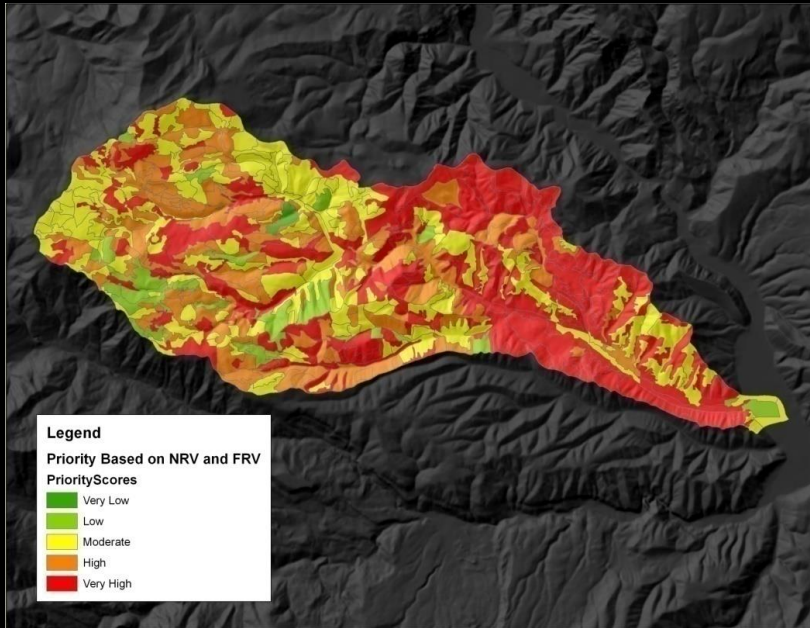
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Landscape Restoration Strategy

- 1) Landscape evaluation for prioritizing restoration
 - Vegetation pattern and departure
 - Risk (contagion) of insects, disease
 - Fire potential
 - Habitats of focal fish & wildlife species
- 2) Adaptive ecosystem management
 - Uses reference landscapes that represent hotter, drier analogues



Landscape

Retain and promote old forest development

Support patchwork mosaics of vegetation structures, types and age classes (diversity of habitat)

Use topography to guide restoration of patchworks

Restore patch mosaics (“patchwork hierarchies”) that are less permeable to widespread insect, disease and fire

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REVIEW ARTICLE

Restoring fire-prone Inland Pacific landscapes: seven core principles

Paul F. Hessburg · Derek J. Churchill · Andrew J. Larson · Ryan D. Haugo · Carol Miller · Thomas A. Spies · Malcolm P. North · Nicholas A. Povak · R. Travis Belote · Peter H. Singleton · William L. Gaines · Robert E. Keane · Gregory H. Aplet · Scott L. Stephens · Penelope Morgan · Peter A. Bisson · Bruce E. Rieman · R. Brion Salter · Gordon H. Reeves

Dry Forest Restoration – mitigating future wildfire severity

