20-Year Forest Health Plan
Landscape Evaluation Update

Derek Churchill, WA DNR
October 4, 2018
Planning Areas

- Combined data driven prioritization with local priorities and input
- Multiple projects in each “collaborative zone”.

This priority map is a composite reflecting the overlap of forest health/wildfire risks (Tier 1) and the values at risk (Tier 2). Tier 1 and Tier 2 scores were normalized on a 0-1 range and then added together, this ensured equal weight for each tier in the final composite. A low score does not mean a watershed has no forest issues or values at risk. Instead, it means that the metrics and overall needs are lower relative to other watersheds.
**Planning Areas**

- Manager and stakeholder meetings: Modifications to boundaries.
- Next update of boundary changes this Fall.
## 2018 Planning Areas

<table>
<thead>
<tr>
<th>Plan Area</th>
<th>Total Acres</th>
<th>Forested Acres</th>
<th>Collab Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stemilt</td>
<td>38,960</td>
<td>25,164</td>
<td>NCW-FHC</td>
</tr>
<tr>
<td>Upper Wenatchee</td>
<td>74,778</td>
<td>67,109</td>
<td>NCW-FHC</td>
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<tr>
<td>Tillicum</td>
<td>14,326</td>
<td>13,134</td>
<td>NCW-FHC</td>
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<tr>
<td>Mission Maint.</td>
<td>49,121</td>
<td>37,923</td>
<td>NCW-FHC</td>
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<tr>
<td>Chewelah A-Z</td>
<td>195,407</td>
<td>151,500</td>
<td>NEW-FC</td>
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<tr>
<td>Mill Creek A-Z</td>
<td>186,305</td>
<td>158,574</td>
<td>NEW-FC</td>
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<tr>
<td>Mt Spokane</td>
<td>121,766</td>
<td>93,062</td>
<td>NEW-FC</td>
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<tr>
<td>Trout Lake</td>
<td>117,154</td>
<td>106,970</td>
<td>South GP</td>
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<tr>
<td>White Salmon</td>
<td>126,691</td>
<td>95,351</td>
<td>South GP</td>
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<tr>
<td>Ahtanum</td>
<td>120,478</td>
<td>104,856</td>
<td>Tapash</td>
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<tr>
<td>Cle Elum</td>
<td>91,320</td>
<td>69,415</td>
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<tr>
<td>Manas.-Taneum</td>
<td>135,470</td>
<td>99,707</td>
<td>Tapash</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>1,271,776</strong></td>
<td><strong>1,022,766</strong></td>
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</tr>
</tbody>
</table>
## 2020 Planning Areas

<table>
<thead>
<tr>
<th>Plan Area</th>
<th>Total Acres</th>
<th>Forested Acres</th>
<th>Collab Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chumstick-Eagle</td>
<td>50,310</td>
<td>46,431</td>
<td>NCW-FHC</td>
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<tr>
<td>Mad Roaring Mills</td>
<td>65,008</td>
<td>40,610</td>
<td>NCW-FHC</td>
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<tr>
<td>Methow Valley</td>
<td>183,290</td>
<td>116,104</td>
<td>NCW-FHC</td>
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<tr>
<td>Mt Hull</td>
<td>105,430</td>
<td>34,308</td>
<td>NCW-FHC</td>
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<tr>
<td>Nason Creek</td>
<td>31,679</td>
<td>28,661</td>
<td>NCW-FHC</td>
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<tr>
<td>Twisp River</td>
<td>84,710</td>
<td>70,375</td>
<td>NCW-FHC</td>
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<tr>
<td>Ione-Sand</td>
<td>59,571</td>
<td>54,671</td>
<td>NEW-FC</td>
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<tr>
<td>Long Lake</td>
<td>80,297</td>
<td>35,519</td>
<td>NEW-FC</td>
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<tr>
<td>Republic</td>
<td>208,002</td>
<td>163,920</td>
<td>NEW-FC</td>
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<tr>
<td>Skookum</td>
<td>115,066</td>
<td>92,737</td>
<td>NEW-FC</td>
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<td>Stranger</td>
<td>89,904</td>
<td>70,419</td>
<td>NEW-FC</td>
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<td>The Wedge</td>
<td>138,548</td>
<td>118,811</td>
<td>NEW-FC</td>
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<td>Toroda-Tonata</td>
<td>129,879</td>
<td>93,403</td>
<td>NEW-FC</td>
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<tr>
<td>Glenwood</td>
<td>116,773</td>
<td>101,313</td>
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<td>HWY 97</td>
<td>60,397</td>
<td>45,418</td>
<td>South GP</td>
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<tr>
<td>Klickitat</td>
<td>143,535</td>
<td>104,828</td>
<td>South GP</td>
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<tr>
<td>Little White</td>
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<td>71,696</td>
<td>South GP</td>
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<tr>
<td>Teanaway</td>
<td>132,119</td>
<td>120,634</td>
<td>Tapash</td>
</tr>
<tr>
<td>Tieton</td>
<td>148,634</td>
<td>130,315</td>
<td>Tapash</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>2,038,910</strong></td>
<td><strong>1,540,173</strong></td>
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<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2020</th>
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<tbody>
<tr>
<td></td>
<td>1,271,776</td>
<td>1,022,766</td>
</tr>
<tr>
<td><strong>Total 2018 &amp; 2020</strong></td>
<td><strong>3,310,686</strong></td>
<td><strong>2,562,938</strong></td>
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</tbody>
</table>
• Goals: treatment targets and general spatial locations

• Developed datasets and methodologies

• Conducted 8 new landscape evaluations in 6 months
  - Further developed 2 existing evaluations
  - 2 planning areas did not need evaluation

• Presented Draft LE’s to stakeholders
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
**Landscape Evaluations**

1. Identify zones & ownerships with different primary management objectives

2. Departure Analysis
   - PI Approach: OWNF-Hessburg
   - State & Transition Model + LiDAR: CNF – South GP/Mt Adams.

3. Fire Behavior & Risk Analysis

4. Climate change adaptation: Drought Stress and Biophysical Alignment

5. Assessment of focal species habitat

   ➞ General treatment targets & spatial locations

6. Aquatic Evaluation

7. Economic and operational analysis

8. Other resource needs

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**Landscape Rx:**

- Treatment Targets
- Recommended treatment locations & types
Examples of LE’s

1. Upper Wenatchee
   - PI approach

2. Chewelah
   - STM-LiDAR approach
Upper Wenatchee Planning Area

• 85% Forest Service
• 13% private
• 2% DNR and State Parks.
Departure Analysis

- Photo-interpretation (PI) for current and historical conditions
Fire: Quantitative Risk Assessment

Pacific Northwest Research
Wildfire Risk Framework

Likelihood
Wildfire risk
Intensity
Susceptibility

Julie Gilbertson-Day, JPL

Rick Stratton
United States Forest Service

January 12, 2018
Fire: Quantitative Risk Assessment

FS SIM:

Fire Intensity

Legend
Annual Burn Probability
0 - 0.001
0.001 - 0.005
0.005 - 0.01
0.01 - 0.015
0.015 - 0.02
0.02 - 0.025
0.025 - 0.03
0.03 - 0.04
0.04 - 0.048
WA_Highways

Legend
Conditional Flame Length
0 - 2
2 - 4
4 - 6
6 - 8
8 - 12
12 - 20
20 - 50
50 - 100
WA_Highways
Fire: Quantitative Risk Assessment

Burn Probability

Fire Intensity

Legend
- Upper Wenatchee Basin
- Burn Probability
  - 0.001
  - 0.001 - 0.005
  - 0.005 - 0.01
  - 0.01 - 0.015
  - 0.015 - 0.02
  - 0.02 - 0.025
  - 0.025 - 0.03
  - 0.03 - 0.04
  - 0.04 - 0.047348

Legend
- Upper Wenatchee Basin
- Conditional Flame Length
  - 0 - 2
  - 2 - 4
  - 4 - 6
  - 6 - 8
  - 8 - 12
  - 12 - 20
  - 20 - 50
  - 50 - 100
Fire Risk
Community Protection Zone

- Use QRA to evaluate risk to private property
- Defensible Space: ¼ mile buffer on USFS land
Climate Adaption: Biophysical Alignment

Current: 1981-2010

- Low: Moist-Cold Forest
- Moderate: Dry-Moist Forest
- High: Dry Forest
- Extreme: Woodland-Steppe

Map showing various climate adaptation zones.
Climate Adaption: Biophysical Alignment

Future: 2045-2075

- Low: Moist-Cold Forest
- Moderate: Dry-Moist Forest
- High: Dry Forest
- Extreme: Woodland-Steppe
Fire Risk & NSO

- NSO Habitat from PI Layer
- Calculate Risk: Net Value Change
Fire Risk x Future NSO Sites

Legend

- Upper_wenatchee_Bdry
- Private_Land_Blocks
- Deficit_2055_RCP85.img
- UpWen_NSO_eNVC.tif

VALUE:
- 0 - 250
- 250.00000001 - 275
- 275.00000001 - 644.6147935

Value:
- High: 0.0091827
- Low: -0.0374603

NSO Units
### Table 1

<table>
<thead>
<tr>
<th>Forest Conditions that need Treatment</th>
<th>Treatment Need Acres</th>
<th>Current Acres by Major Landowner*</th>
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</thead>
<tbody>
<tr>
<td>Forest Type</td>
<td>Structure Class</td>
<td>USFS</td>
</tr>
<tr>
<td>Dry</td>
<td>Med.-Large Dense</td>
<td>12,000-18,000</td>
</tr>
<tr>
<td>Moist</td>
<td>Med.-Large Dense</td>
<td>3000-7000</td>
</tr>
<tr>
<td>Dry</td>
<td>Med.-Large Open</td>
<td>500-2000</td>
</tr>
<tr>
<td>Total Acres</td>
<td></td>
<td>15,500-27,000</td>
</tr>
</tbody>
</table>

*These are total current acres, not targets

<table>
<thead>
<tr>
<th>Anticipated Treatment Type</th>
<th>Commerical thin + fuels treatment. (Maybe regen, non-commercial, or fire only in some cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>Maintenance: prescribed fire or mechanical fuels treatment.</td>
</tr>
</tbody>
</table>

### Figure

- Dry Forest
- Moist-Cold Forest

#### Maintenance Treatments

- [Image of trees and tools]
Pattern
Departure Analysis

• Historical ranges from State and Transition Models
• Models From CNF, ILAP + modifications by Josh Halofsky + Derek Churchill
• Additional review underway by Miles Hemstrom + local feedback.

• Current conditions from LiDAR. GNN inserted where LiDAR does not exist

<table>
<thead>
<tr>
<th>CNF-SC8 - CNF Structure classes: 8 classes</th>
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<tbody>
<tr>
<td>Class</td>
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<tr>
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</tr>
<tr>
<td>1</td>
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<td>7</td>
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<td>8</td>
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</table>
Departure Analysis

Dry Douglas-fir

- A_EarlyOpen
- B_EarlyClose
- C_MidOpe
- D_MidMo
- E_MidClose
- F_LateOpe
- G_LateMi
- H_LateClosed

- Dry Douglas-fir: 52%
- NRM Moist Mx Conifer: 19%
- Cedar/Hemlock: 5%
- Subalpine Fir: 2%
- Non Forest: 22%

Northern Rockies Moist Mix-Con

- A_EarlyOpen
- B_EarlyClose
- C_MidOpe
- D_MidMo
- E_MidClose
- F_LateOpe
- G_LateMi
- H_LateClosed

- Alpine Fir: 52%

Fire Risk

Legend:
- Extreme
- Very High
- High
- Moderate
- Low
- Beneficial

Map shows varying levels of fire risk across the region, with color coding indicating risk levels from extreme to beneficial.
Stability

Legend
- Chewelah_Bdnry
- Roads
  - Main Roads
- Deficit_2055_RCP85
  - WRC or CD < 70
  - Moist MC 70-100
  - Mx Con-DF 100-150
  - Dry Mx Con-PP 150-225
  - PP 225-330
  - Shrub - Steppe > 330

Persistent DF Mix-Con
Stability

Persistent moist mix-con
Mid-hi elevation N-facing ridges
Change

DF-dominated -> PP-dominated
Lower-elevation S-facing valleys
Moist Mix-Con -> DF Mix-Con
Ubiquitous in Mid-elevations
20-Year Forest Health Plan
Landscape Evaluation Update

<table>
<thead>
<tr>
<th>NEAR-TERM ACTIONS</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>Sept - Oct</th>
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</thead>
<tbody>
<tr>
<td>Identify Planning Areas</td>
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<tr>
<td>Conduct Landscape Evaluations</td>
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<td>Develop Landscape Prescriptions</td>
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<tr>
<td>Develop a Prioritized List of Treatments for Appropriations Request</td>
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</table>
Overall Treatment Needs
20-Year Forest Health Plan
Landscape Evaluation Update

Next Steps

• Finish 2 page summaries (End of October)
  ➔ Feedback from stakeholders by early Nov.

• “Finalize” LE’s and data products

• Report to Legislature by Dec 1.
20-Year Forest Health Plan
Landscape Evaluation Update

Next Steps
• Ongoing work with local stakeholders on refining Landscape Rx.
• Upgrades: economics, deficit, species, pattern.
• 2020 planning areas
  • Trail, Teanaway ...