Agenda

• Introduction and Older Forest Policy Review
• Old Growth Field Assessment
• Monitoring Forest Growth Over Time
• Measuring Older Forest Progression
• Forest Carbon
• Summary and Next Steps
Old Growth and Older Forest Policy Review

Policies that shaped our current management

• 1997 Habitat Conservation Plan
• 2004 Sustainable Harvest Calculation
• 2004 Legislation on Old–Growth
• 2006 Policy for Sustainable Forests
• 2019 Marbled Murrelet Long-term Conservation Strategy – Habitat Conservation Plan Amendment
Summary from May 2021

Trust Lands are managed for long-term revenue

_Old Growth is identified and protected from harvest_

HCP landscape conservation protects species, habitat, and biodiversity

Policy framework creates landscapes with substantial structurally complex forests

HCP Amendment reinforced landscape conservation and released older forests not essential to conservation goals
DNR’s Old-Growth Field Assessment Process
Outline:

• DNR’s Old-Growth Program structure (west side)

• What triggers an assessment?

• Field work

• Criteria assessed and how

• Outcomes
Structure of DNR’s Old-Growth Program

**Purpose:** Implement the Board’s policy on deferring old-growth forests
- Old-growth structure
- Age (pre-1850)
- >5 acres

Headed by Forest Resources Division scientists (Olympia)

Each west-side region has trained OG “designees”

OG trainings conducted every ~1-3 years

Approach:
- Expose lots of staff to training to increase awareness
- “Designee” status conferred only after several assessments completed satisfactorily
What triggers an OG assessment?

1. Forest inventory data

   • “WOGHI” scores
     (Weighted Old Growth Habitat Index)

   • Developed by original Old-Growth expert panel (Franklin, Spies, Van Pelt, Pabst, et al.)

   • Statistical regressions based on abundance of:
     - Large trees
     - Large snags
     - Down wood
     - Diameter diversity (canopy layers)
What triggers an OG assessment?

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     - Large snags
     - Down wood
     - Diameter diversity (canopy layers)

   • Moderate & high points in/next to proposed activity trigger an assessment
What triggers an OG assessment?

1. Forest inventory data
   • “WOGHI” scores
     (Weighted Old Growth Habitat Index)

2. Observations on the ground
What triggers an OG assessment?

1. Forest inventory data
   - “WOGHI” scores
     (Weighted Old Growth Habitat Index)
2. Observations on the ground
3. Aerial/remote sensing data
4. Other sources
   (e.g. neighbor/public input)
Field work in an assessment

Visit WOGHI points

Walk, walk, walk the stand (spatially thorough)

Evaluate stand for:

- Structural development
- Pre-1850 age
- Acreage

PSF old growth definition
Field work in an assessment

Structural development

Emphasizes stand development key

(Van Pelt 2007)
Field work in an assessment

Structural development

Emphasizes stand development key

(Van Pelt 2007)
Field work in an assessment

Structural development

Emphasizes stand development key (Van Pelt 2007)

Additional components evaluated (e.g. snags, down wood, old cut stumps) as clues to stand history/development - but no strict thresholds on these
Field work in an assessment

- Pre-1850 stand age
- Individual tree age score from Van Pelt 2007
Field work in an assessment

• Pre-1850 stand age
• Individual tree age score from Van Pelt 2007
• If necessary, tree coring
  • Minimum ~10-12 cores
  • Can be >50 cores
  • Extra levels of statistical rigor when pre-1850 call is less certain initially
Field work in an assessment

- Pre-1850 stand age
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Field work in an assessment

- Pre-1850 stand age
- **Individual tree age score** from Van Pelt 2007
- If necessary, tree coring
  - Minimum ~10-12 cores
  - Can be >50 cores
  - Extra levels of statistical rigor

Pre 1850

Post 1850

Establishment date of cored trees

Decade ending in year X

Count of sampled trees

18
16
14
12
10
8
6
4
2
0
Not all outcomes are simple...

Clearly NOT Old Growth

Clearly Old-Growth
Not all outcomes are simple...

Clearly NOT Old Growth

Maturing stands

Feathered edges

Low productivity sites, logging history

Clearly Old-Growth

Multi-cohort stands
WADNR WEST SIDE OLD GROWTH ASSESSMENT
June, 2007

1. BATCH COVER SHEET TABLE

<table>
<thead>
<tr>
<th>Older Forest Batch Id</th>
<th>Primary Town-Range-Sec</th>
<th>Name of Assessor</th>
<th>Exam Date</th>
<th>Number Sample Points Visited</th>
<th>Number Old Growth Polygons Created</th>
<th>Number LULC FIUs Visited</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS Batch Id</td>
<td>St.</td>
<td>Jumper</td>
<td>Simms, Doug</td>
<td>07/06/2015</td>
<td>6</td>
<td>2</td>
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</table>

Access notes: Sale is accessed from the L-1200 to L-1210, to L-1211. A single gate is located on the L-1210 and can be accessed with a PPCI key.

5a. Large Tree Characteristics (mapage.png): Old-growth Douglas-fir trees dominate this stand (see IMG_0276), comprising 20% of the canopy cover. Trees are 50+ inches in diameter, have hard bark with deep fissures, no knot indications on the lower bole, large epicormic branches, and dead tops. These large trees are evenly distributed throughout the delineated polygon.

5b. Snag Characteristics (mapage.png): Very few snags exist on the site. Snags that do exist are from a younger cohort and are a result of competitive exclusion or damage done by a bear.

5c. Down Wood Characteristics (mapage.png): Down wood amounts are below average for the Larch landscape. No evidence of snagging that occurred after the Yacolt Burn was present.
Outcomes

1. The assessed area meets all old-growth policy criteria
   - 5+ acre patch delineated and deferred from harvest

2. Old trees or small patches with old-growth components present, but less than 5 acres
   - No patch deferred
   - BUT, trees/patches emphasized for retention *(under different procedures)*

3. No old-growth components present
   - Activity proceeds
Field Assessment Summary

Completed to date...
- ~250 field assessments
- ~920 points assessed

41 Old-Growth stands protected (~1550 acres)

There is other old-growth on DNR land
- WOGHI points needing assessment
And within areas managed for
- Marbled murrelets
- Northern spotted owls
- Riparian
Thanks
Monitoring Forest Growth Over Time

Josh Halofsky
Natural Resource Scientist
Washington State Department of Natural Resources
How are we doing?

Assessing the effectiveness of DNR’s Habitat Conservation Plan in fostering complex forest structure
Ways to measure change in habitat condition
Ways to measure change in habitat condition
Status and Trends of Late-Successional and Old-Growth Forests

Dividing the landscape

Somewhere in Washington... recently
Dividing the landscape

Same place... in the past

Low

Management intensity

High

Riparian lands

Uplands

GEM lands
Area analyzed

DNR - 1973

DNR - 2020
What are we assessing?

Mature + Old-growth = Old Growth Structural Index

OGSI_80

Older forest
So...how are we doing?
So...how are we doing?

1984-1998
5% decline in older forest
(-10,974 acres)

1998-2016
13% increase in older forest
(+29,873 acres)
In summary

- Quantitative, independent, and repeatable
- Structurally complex forests are increasing
- All we need is time

Thanks!
Measuring Older Forest Progression

Mike Buffo
Assistant Division Manager Forest Informatics
Washington State Department of Natural Resources
Stand Development Stages

• Foundation of Ecological Forestry *(Carey, Franklin, et al.)*
• Interrelationships of biodiversity, function, and structure
• Use to assist in silviculture decision making

<table>
<thead>
<tr>
<th>Less Complex Forest</th>
<th>Summarized Stand Development Stage</th>
<th>Stand Development Stage</th>
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</thead>
<tbody>
<tr>
<td>Ecosystem Initiation</td>
<td></td>
<td>Ecosystem Initiation</td>
</tr>
<tr>
<td>Competitive Exclusion</td>
<td></td>
<td>Sapling Exclusion</td>
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<tr>
<td></td>
<td></td>
<td>Pole Exclusion</td>
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<tr>
<td></td>
<td></td>
<td>Large Tree Exclusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understory Development</td>
</tr>
<tr>
<td>More Complex Forest</td>
<td>Structurally Complex</td>
<td>Botanically Diverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Niche Diversification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fully Functional</td>
</tr>
</tbody>
</table>
How were the forests analyzed?

• 2004 Sustainable Harvest Calculation
  • Defined and queried
  • Plot-based inventory

• Updated analysis
  • Remote-sensing and plot based inventory
  • Older forests in areas conserved by the law, policy, or HCP strategies:
    • Northern Spotted Owl
    • Marbled Murrelet
    • Riparian
## Older Forest Comparison with Prior Analyses

<table>
<thead>
<tr>
<th>Source</th>
<th>Analysis Area</th>
<th>Current Older Forest %</th>
<th>~2060 Older Forest %</th>
<th>2100 Older Forest %</th>
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</thead>
<tbody>
<tr>
<td>2004 Sustainable harvest FEIS</td>
<td>Western Washington</td>
<td>&lt;2%</td>
<td>10% (2067)</td>
<td>-</td>
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<tr>
<td>2007 Sustainable harvest FEIS addendum</td>
<td>Western Washington</td>
<td>&lt;1%</td>
<td>16% (2067)</td>
<td>-</td>
</tr>
<tr>
<td>2010 South Puget HCP Planning Unit Forest Land Plan FEIS</td>
<td>South Puget HCP Planning Unit</td>
<td>&lt;2%</td>
<td>18.2%</td>
<td>33.3%</td>
</tr>
<tr>
<td>2016 Olympic Experimental State Forest HCP Planning Unit Forest Land Plan FEIS</td>
<td>OESF HCP Planning Unit</td>
<td>11%</td>
<td>15.5% (2013 RDEIS)</td>
<td>21.6% (2013 RDEIS)</td>
</tr>
<tr>
<td>2019 Sustainable harvest FEIS</td>
<td>Western Washington</td>
<td>3.1%</td>
<td>8% (2068)</td>
<td>-</td>
</tr>
<tr>
<td>2021 Older Forest (this analysis)</td>
<td>Western Washington</td>
<td>3.4%</td>
<td>6.9%</td>
<td>20.5%</td>
</tr>
</tbody>
</table>

Current and future area of older forest conditions based on analyses performed as part of previous landscape planning processes.
# Current and Projected Area of Older Forest Conditions

## Table

<table>
<thead>
<tr>
<th>HCP Planning Unit</th>
<th>2021</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
<th>2060</th>
<th>2070</th>
<th>2080</th>
<th>2090</th>
<th>2100</th>
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<tbody>
<tr>
<td><strong>Columbia</strong></td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.3%</td>
<td>1.7%</td>
<td>2.6%</td>
<td>4.4%</td>
<td>7.4%</td>
<td>11.6%</td>
<td>16.1%</td>
</tr>
<tr>
<td><strong>North Puget</strong></td>
<td>3.3%</td>
<td>4.1%</td>
<td>5.1%</td>
<td>6.6%</td>
<td>8.6%</td>
<td><strong>11.3%</strong></td>
<td>14.6%</td>
<td>18.5%</td>
<td>22.5%</td>
</tr>
<tr>
<td><strong>OESF</strong></td>
<td><strong>10.3%</strong></td>
<td><strong>10.9%</strong></td>
<td><strong>11.4%</strong></td>
<td><strong>12.3%</strong></td>
<td><strong>13.5%</strong></td>
<td><strong>15.5%</strong></td>
<td><strong>18.9%</strong></td>
<td><strong>25.6%</strong></td>
<td><strong>32.6%</strong></td>
</tr>
<tr>
<td><strong>South Coast</strong></td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.7%</td>
<td>1.2%</td>
<td>2.2%</td>
<td>3.6%</td>
<td>6.1%</td>
<td>9.0%</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>South Puget</strong></td>
<td>2.5%</td>
<td>3.3%</td>
<td>4.3%</td>
<td>5.7%</td>
<td>7.4%</td>
<td>9.8%</td>
<td><strong>12.9%</strong></td>
<td>16.3%</td>
<td>19.6%</td>
</tr>
<tr>
<td><strong>Straits</strong></td>
<td>1.7%</td>
<td>2.4%</td>
<td>3.1%</td>
<td>4.1%</td>
<td>5.4%</td>
<td>7.1%</td>
<td>9.6%</td>
<td><strong>12.3%</strong></td>
<td>14.8%</td>
</tr>
<tr>
<td><strong>TOTAL</strong> (Western Washington)</td>
<td>3.4%</td>
<td>3.9%</td>
<td>4.5%</td>
<td>5.5%</td>
<td>6.9%</td>
<td>9.0%</td>
<td><strong>12.0%</strong></td>
<td><strong>16.1%</strong></td>
<td><strong>20.5%</strong></td>
</tr>
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</table>

Percent area western Washington HCP planning units with older forest conditions in conservation areas by decade through 2100

Values over 10% in bold
Forest Carbon
A Carbon Loop

Atmosphere

Wood building materials

Forests
Estimated Forest and Wood Products Carbon

Estimated carbon stored in the forest and wood products over the next 50 years (data from 2019 SHL FEIS)
• Conducting ongoing old-growth field assessments

• HCP strategies have resulted in increased older forest conditions

• Projections show:
  • Continuing increase in older forest conditions
  • Increasing stored forest carbon
Next Steps

• Board discussion of possible next steps at July meeting