DecAID: the Decayed Wood Advisor for managing snags, partially dead trees, and down wood for biodiversity in the forests of Washington and Oregon.

What is dead wood?

- Cavity in snag
- Insect mortality
- Woodpecker holes
- Hollow log
- Blowdown
- Decaying snag nurse tree
- Root wad
- Snags in clearcut
What is DecAID Advisor?
- Online information and advice
- A synthesis of literature and statistics on:
  - wildlife use of snags and down wood
  - inventory of snags and down wood
  - information on insects, pathogens, fungi, and ecosystems related to wood decay
- A tool to help you manage dead wood for biodiversity

What can DecAID Advisor do for you?
- Help you manage snags, down wood, partially dead trees, and other wood decay
- Answer these questions:
  - How much to leave?
  - What sizes to leave?
  - What is useful for wildlife?
  - What matches general “unharvested” conditions?
  - What insects and pathogens create significant dead wood, and how do they respond to management?
  - Other questions on process and function

Why is dead wood important for forests?
- Provides critical habitat for many species of wildlife, plants, fungi, and invertebrates
- Stabilizes soil on slopes
- Is a source of organic matter for productive soils
- Is a source of time-release nutrients for growing trees
- Holds moisture
- Is a part of a natural forest setting
- Nursery logs

Running DecAID Advisor

1 Select your wildlife habitat type and structural condition class

Example:

2 View a summary narrative on:
- Synthesis and management implications
- Introduction to vegetation condition
- Introduction to available data
- Integrated summary of wildlife data and inventory data from unharvested plots
- Ancillary information on wildlife species use of wood decay elements
- General wildlife-habitat relations with wood decay elements
- Landscape-level distribution of wood decay elements
- Relationships of fungi
- Considerations for stand dynamics
- Ecological functions and processes of wood decay elements

3 View graphs and charts on wildlife species’ use of snag and down wood sizes and amounts

Example:

Other considerations in dead wood management (not addressed by DecAID Advisor)
- Fire hazards
- Safety concerns (OSHA)
- Stand growth—maintaining future snags, down wood, and other wood decay elements for biodiversity over time
- Spatial arrangement of dead wood within stands or across a landscape or watershed
DecAID Advisor presents wildlife and inventory data in “tolerance levels” (percentages of populations, calculated by combining data from multiple studies):

- 30% tolerance level (might apply to timber-emphasis objectives, or low productivity or high fire risk sites)
- 50% tolerance level (might apply to multiuse objectives, or moderate productivity or moderate fire risk sites)
- 80% tolerance levels (might apply to biodiversity emphasis objectives, or high productivity or low fire risk sites)

You decide which level to use!

**View underlying wildlife data—“drill down” to the source literature and view species information**

*View synthesis of data from the literature...*

**...study-specific data...**

**...species data from each study...**

**...details of study-specific data...**


**View graphs and charts of inventory data—on size and amounts of snags and down wood, in unharvested forests, and in the entire landscape**

*Examples:*

**Figure WLC1L0O_L-inv-2.** 30%, 50%, and 90% tolerance levels, and range of densities (dths) of snags ≥ 25.4 cm dbh on unharvested inventory plots (n=113) that contained measurable snags (upper figure) and all unharvested inventory plots (n=141) (lower figure) in the Westside Lowland Conifer-Hardwood Forest, Oregon Coast Range, Larger trees. Vegetation Condition.

**Figure WLC1L0O_L-inv-14.** Distribution of the unharvested area of the WLC1L0O_L Vegetation Condition among snag density classes (dths) for snags ≥ 25.4 cm dbh, based on 102 unharvested inventory plots.
### View underlying inventory data—“drill down” to component data layers

**Example:**

<table>
<thead>
<tr>
<th>Vegetation condition</th>
<th>n</th>
<th>Min.</th>
<th>30% tolerance limit</th>
<th>50% tolerance limit</th>
<th>90% tolerance limit</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WUCH_WCO_0</td>
<td>27</td>
<td>6.6</td>
<td>15.7</td>
<td>50.9</td>
<td>70.1</td>
<td>134</td>
</tr>
<tr>
<td>WUCH_WCO_S</td>
<td>22</td>
<td>5.0</td>
<td>24.6</td>
<td>34.0</td>
<td>118.1</td>
<td>122</td>
</tr>
<tr>
<td>WUCH_WCO_L</td>
<td>129</td>
<td>2.0</td>
<td>11.9</td>
<td>24.7</td>
<td>46.6</td>
<td>105</td>
</tr>
<tr>
<td>WUCH_DCO_0</td>
<td>45</td>
<td>1.7</td>
<td>20.3</td>
<td>33.4</td>
<td>71.7</td>
<td>102</td>
</tr>
<tr>
<td>WUCH_DCO_L</td>
<td>15</td>
<td>2.6</td>
<td>13.1</td>
<td>27.6</td>
<td>81.2</td>
<td>94.2</td>
</tr>
<tr>
<td>WUCH_WCA_0</td>
<td>65</td>
<td>1.2</td>
<td>12.2</td>
<td>42.6</td>
<td>76.0</td>
<td>106</td>
</tr>
<tr>
<td>WUCH_WCA_L</td>
<td>65</td>
<td>1.2</td>
<td>12.2</td>
<td>42.6</td>
<td>76.0</td>
<td>106</td>
</tr>
<tr>
<td>WUCH_DCA_0</td>
<td>40</td>
<td>2.6</td>
<td>13.1</td>
<td>22.6</td>
<td>64.6</td>
<td>143</td>
</tr>
</tbody>
</table>

**Table inv.3a:** Distribution-free tolerance limits (trees per hectare) for snags > 25.4 cm (10.0 in) dbh and > 27.9 cm (11.0 in) tall on unharvested plots, with measurable snags by vegetation condition. The summaries are based on all BLM and CWS plots (all units), and no FIA plots. If the number of plots with measurable snags in a vegetation condition fell below 30, the cells are left blank.

### View information on insects and pathogens

**Examples:**

<table>
<thead>
<tr>
<th>Root Disease(s)</th>
<th>Number of Unharvested Plots</th>
<th>Percent Unharvested Plots with Root Disease Present</th>
<th>Number of Harvested Plots</th>
<th>Percent of Harvested Plots with Root Disease Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinus abundance</td>
<td>5</td>
<td>3.2</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>lodgepole pine</td>
<td>52</td>
<td>12.8</td>
<td>43</td>
<td>15.6</td>
</tr>
<tr>
<td>larch</td>
<td>24</td>
<td>11.0</td>
<td>27</td>
<td>10.0</td>
</tr>
<tr>
<td>black pine</td>
<td>2</td>
<td>11.0</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Post-Odor-cedar</td>
<td>3</td>
<td>1.3</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>unidentified root disease</td>
<td>11</td>
<td>4.6</td>
<td>9</td>
<td>4.1</td>
</tr>
<tr>
<td>At least one including those unidentified</td>
<td>81</td>
<td>29.2</td>
<td>71</td>
<td>27.0</td>
</tr>
<tr>
<td>At least one of the four (HEAN, AROS, PHAE, LEVA) or primary axes</td>
<td>66</td>
<td>26.6</td>
<td>66</td>
<td>23.9</td>
</tr>
</tbody>
</table>

**Western Spruce Budworm**

*Choristoneura occidentalis*

**Key Wildlife Value:**

The western spruce budworm contributes to the creation of snags and down wood by severely defoliating tree and Douglas-fir trees and by interacting with other disturbance agents to cause the death of all stands of tree. By causing topkill in all stands of tree, C. occidentalis contributes to the formation of unique stand structures and facilitates the colonization of nesting structures for many bird species, bats, rodents, and invertebrates. Some of the mortality associated with western spruce budworm defoliation contributes to the formation of canopy gaps, increasing structural diversity.

**Distribution in Oregon and Washington:**

Found throughout both states. (See also Important habitats and Habitat Dynamics)

**Hosts:**

Primarily grand fir, white fir, and Douglas-fir, but also other tree, Engelmann spruce and western larch. During outbreaks, larvae may also feed on understory conifer-host tree species, such as pines or pines.

**Diagnosis:**

During the summer, current year foliage on host trees is checked and evaluated together, often the foliage is found to be feeding and defoliating the tips of young canopies.