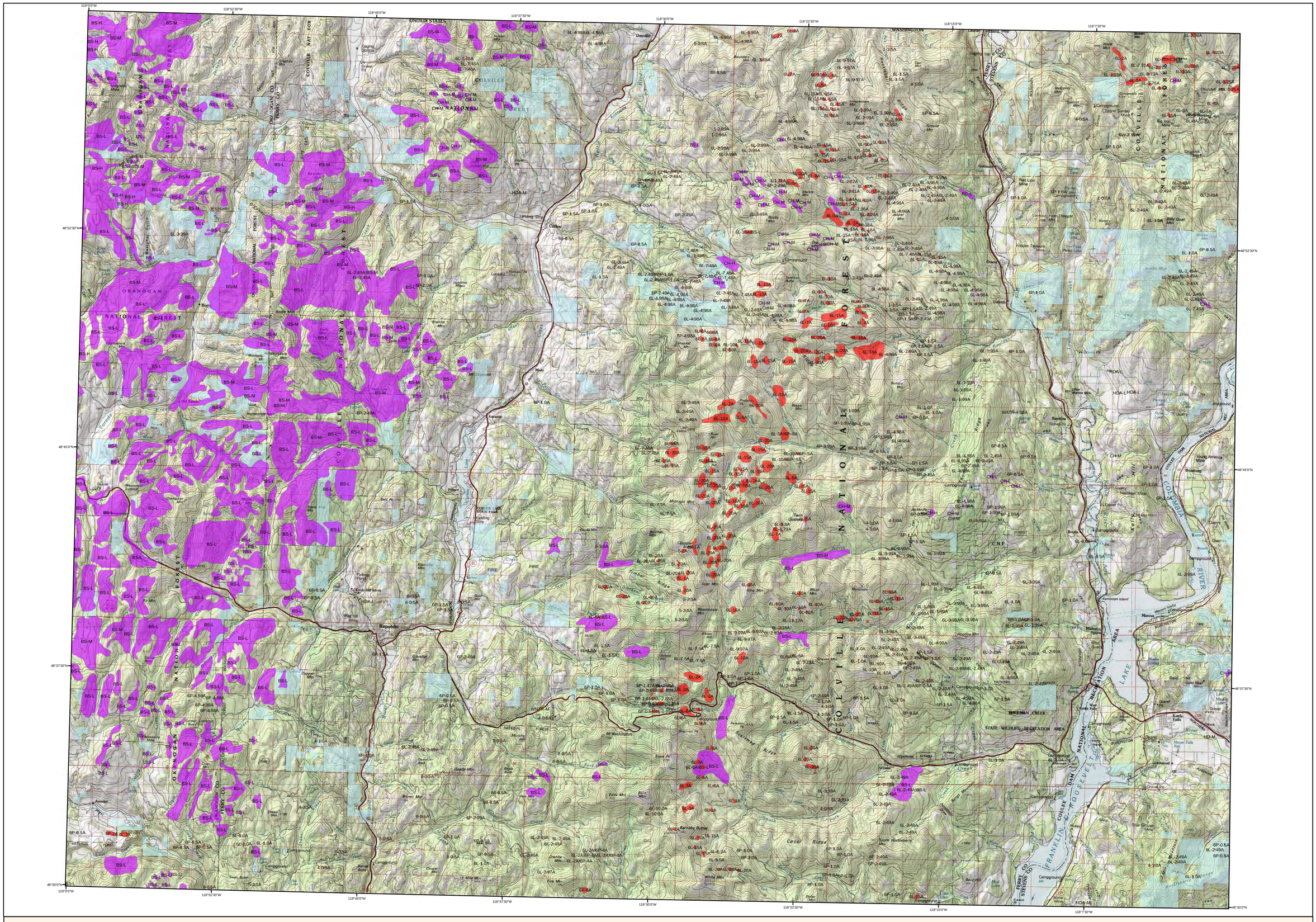
# 2011 Aerial Insect and Disease Survey
# USGS 100K Quad: REPUBLIC - E148118; 7A




## Mortality Agents

| Code | Damaging Agent | Primary Host |
|---|---|---|
| 1 | Douglas-fir beetle | Douglas-fir |
| 2 | Douglas-fir engraver | Douglas-fir |
| 3 | Spruce beetle | Spruce |
| 4 | Fir engraver | True fir |
| 5 | Western balsam bark beetle | Sub-alpine fir |
| 6B | Mountain pine beetle | Whitebark pine |
| 6L | Mountain pine beetle | Lodgepole pine |
| 6P | Mountain pine beetle | Ponderosa pine |
| 6S | Mountain pine beetle | Sugar pine |
| 6W | Mountain pine beetle | Western white pine |
| 7 | Ips spp. | Ponderosa, lodgepole pines |
| 8 | Western pine beetle | Ponderosa pine |
| 88 | Western pine beetle | Pole-sized ponderosa pine |
| 9 | Silver fir beetle | Silver fir , true fir |
| BEAR | Bear damage | Conifer |
| F | Flatheaded woodborer | Douglas-fir |
| LW | Black stain root disease | Douglas-fir, ponderosa pine |
| PL | Port-Orford-cedar root disease | Port-Orford-cedar |
| RD | Root disease | Conifer |
| WATR | Water Damage | All species |

## Defoliators

| Code | Damaging Agent | Primary Host |
|---|---|---|
| BS | Western spruce budworm | True fir, Douglas-fir, spruce |
| CH | Larch casebearer/hypodermella | Western larch |
| HL | Western Hemlock looper | Western hemlock |
| LC | Needle cast | Lodgepole pine |
| LS | Black pine leaf scale | Ponderosa pine |
| ML | Larch budmoth | Western larch |
| PB | Pine butterfly | Ponderosa pine |
| PC | Pine needle cast | Ponderosa pine |
| RC | Needle cast | Western larch |
| SF | Sawfly | True fir |
| SH | Sawfly | Hemlock |
| SM | Satin moth | Aspen |
| SNC | Swiss needle cast | Douglas-fir |
| SP | Sawfly | Ponderosa pine |
| TA | Tent caterpillar, alder | Alder |
| TM | Douglas-fir tussock moth | True fir, Douglas-fir |

## Other Damaging Agents

| Code | Damaging Agent | Primary Host |
|---|---|---|
| AB | Balsam woolly adelgid | True fir |
| AC | Cooley spruce gall adelgid | Spruce, Douglas-fir |
| AM | Leaf discoloration | Maple |
| BR | Blister rust | Five-needle pines |
| CC | Cystispora canker | True fir |
| DH | Dying hemlock | Hemlock |
| FIRE | Fire | All species |
| HD | Hardwood decline | Hardwoods |
| HDA | Hardwood decline | Aspen |
| HDO | Hardwood decline | Oak |
| NFN | Areas not flown - non host | |
| NFH | Areas not flown - host | |
| PMD | Pacific madrone decline | Pacific madrone |
| PR | Leaf rust in poplars | Poplars |
| RB | Red belt | All species |
| SLID | Slide | All species |
| WATR | Water damage | All species |
| WIND | Windthrow | All species |
| WNTR | Winter damage | All species |

**The cause of damage is described by a symbol above and is followed by: number of trees affected; number of trees/acre (example: 5A); or intensity of damage (L- Light, M- Moderate, H- Heavy).**

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**2011 Aerial Insect and Disease Survey**
**Map Scale: 1:100,000**
**Date:15 December 2011**

## Legend

- **Defoliating Agents**
- **Mortality Agents**
- **Other Damage**
- **WaDNR Managed Lands**
  Source: Washington Dept. of Natural Resources
- **Areas Not Flown**
- **2011 Large Fires**
  Source: Northwest Interagency Coordination Center

N W E S

Vicinity Map

The TOPO! maps are seamless, scanned images of United States Geological Survey (USGS) paper topographic maps. For more information on this map, visit us online at http://goto.arcgisonline.com/maps/USA_Topo_Maps

A data dictionary, digital copies of this map and Arcgis insect and disease data are available at: www.fs.usda.gov/goto/r6/fhp/ads

### How the Aerial Surveys Are Conducted

Data represented on this map are based on trees visibly affected by forest insects and diseases detected and recorded during aerial survey flights conducted by the USDA Forest Service, the Washington Department of Natural Resources and the Oregon Department of Forestry. Observers have just a few seconds to recognize the color difference between healthy and damaged trees of different species; diagnose causal agents correctly; estimate intensity; delineate the extent of damage; and precisely record this information on a georeferenced, digital map. Air turbulence, cloud shadows, distance from aircraft, haze, smoke and observer experience can all affect the quality of the survey. These data summaries provide an estimate of conditions on the ground and may differ from estimates derived by other methods.

The aerial survey provides information on the current status for many causal agents, and is important when examining insect activity trends by comparing historical and current survey data over large areas.

Overview surveys are a 'snap shot' in time and therefore may not be timed to accurately capture the true extent or severity of a particular disturbance activity. Specially designed surveys with modified flight patterns and timing may be conducted to more accurately delineate the extent and severity of a particular disturbance agent. Special surveys, such as Swiss needle cast surveys, are conducted when resources are available to address situations of sufficient economic, political or environmental importance.

### DIRECT ALL INQUIRIES TO:


Washington State Department of Natural Resources
Resource Protection Division
Forest Health
1111 Washington St. SE
MS 47037
Olympia, WA 98504-7037

-- OR --

USDA Forest Service, Region 6
Natural Resources
Forest Health Protection
PO Box 3623
Portland, Oregon 97208



DISCLAIMER
Forest Health Protection (FHP), Washington Department of Natural Resources (WDNR) and Oregon Department of Forestry (ODF) strive to maintain an accurate Aerial Detection Survey (ADS) Dataset, but due to the conditions under which the data are collected FHP, WDNR and ODF shall not be held responsible for missing or inaccurate data. ADS are not intended to replace more specific information. An accuracyassessment has not been done for this dataset; however, ground checks are completed in accordance with local and national guidelines: http://www.fs.fed.us/foresthealth/aviation/qualityassurance.shtml. Maps and data may be updated without notice. Please cite: "USDA Forest Service, Forest Health Protection; Washington Department of Natural Resources, Resource Protection Division; and Oregon Department of Forestry, Forest Health Management" as the source of this data.