

USFS Region 6 Forest Insect and Disease Aerial Detection Survey Data Dictionary Date: 12/2016

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Region Six Insect and Disease Layers Available:

r6id1947.shp	r6id1967.shp	r6id1987.shp	r6id2007.shp
r6id1948.shp	r6id1968.shp	r6id1988.shp	r6id2008.shp
r6id1949.shp	r6id1969.shp	r6id1989.shp	r6id2009.shp
r6id1950.shp	r6id1970.shp	r6id1990.shp	r6id2010.shp
r6id1951.shp	r6id1971.shp	r6id1991.shp	r6id2011.shp
r6id1952.shp	r6id1972.shp	r6id1992.shp	r6id2012.shp
r6id1953.shp	r6id1973.shp	r6id1993.shp	r6id2013.shp
r6id1954.shp	r6id1974.shp	r6id1994.shp	r6id2014.shp
r6id1955.shp	r6id1975.shp	r6id1995.shp	r6id2015.shp
r6id1956.shp	r6id1976.shp	r6id1996.shp	r6id2016.shp
r6id1957.shp	r6id1977.shp	r6id1997.shp	
r6id1958.shp	r6id1978.shp	r6id1998.shp	
r6id1959.shp	r6id1979.shp	r6id1999.shp	
r6id1960.shp	r6id1980.shp	r6id2000.shp	
r6id1961.shp	r6id1981.shp	r6id2001.shp	
r6id1962.shp	r6id1982.shp	r6id2002.shp	
r6id1963.shp	r6id1983.shp	r6id2003.shp	
r6id1964.shp	r6id1984.shp	r6id2004.shp	
r6id1965.shp	r6id1985.shp	r6id2005.shp	
r6id1966.shp	r6id1986.shp	r6id2006.shp	

Data Description:

Theme keywords: insect, disease, tree mortality, tree defoliation, tree damage, disturbance.

Place keywords: Oregon and Washington

Temporal keywords: 1980-2016

Feature Class: polygon

Data source and date: various (see narrative below)

Data extent: all forested lands in Oregon and Washington (all ownerships)

Data Confidence: fair (see narrative)

Locational Confidence: fair (see narrative)

Scale: 1:100,000

Date data transferred to base: various/none (see narrative)

Projection: Albers

Horizontal Datum: NAD 83

Units: Meters

Spheroid: GRS 1980

1st standard parallel: 43 0 0.000

2nd standard parallel: 48 0 0.000

Central Meridian: -120 0 0.00

Latitude of projection's origin: 34 0 0.00

False Easting (meters): 600000.00000

False Northing (meters): 0.00000

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Originator/publisher: USFS/R6/RO/State and Private Forestry/Forest Health Protection

Availability for download: <https://www.fs.usda.gov/detail/r6/forest-grasslandhealth/insects-diseases/?cid=stelprd3791643>

Download format: arc/Info .e00 files; shapefiles

Column	Item	Definition	Description
1-24			Standard coverage items
25-54	ALYYYY	30,30,C	Summary of the damaging agent(s) and the total number of current dead trees and/or severity level of the defoliation affecting that polygon; there are 1-3 damaging agents/polygon.
55-58	AGENT1	4,4,C	First damaging agent code
59-64	DAM1C	6,6,C	Number of dead trees/acre or severity level associated with the first damaging agent; character field
65-68	AGENT2	4,4,C	Second damaging agent code
69-74	DAM2C	6,6,C	Number of dead trees/acre or severity level associated with the second damaging agent; character field
75-78	AGENT3	4,4,C	Third damaging agent code
79-84	DAM3C	6,6,C	Number of dead trees/acre or severity level associated with the third damaging agent; character field
85-94	DAM1	10,10,N,4	Number of dead trees/acre (if present in dam1c); numeric field
95-104	DAM2	10,10,N,4	Number of dead trees/acre (if present in dam2c); numeric field
105-114	DAM3	10,10,N,4	Number of dead trees/acre (if present in dam3c); numeric field

Attribute Examples:

Example 1.) If AL2000 = '4-10!BS-L!1-.25A' and the polygon is 20 acres, then:

AGENT1: 4
DAM1C: .5 (10 dead trees / 20 acre polygon = .5 dead trees/acre)
AGENT2: BS
DAM2C: L
AGENT3: 1
DAM3C: .25 ('A' indicates dead trees/acre; no conversion needed)
DAM1: .5
DAM2: .0
DAM3: .25

Example 2.) If AL1984 = 'RD' and the polygon is 10 acres, then:

AGENT1: RD
DAM1C: (no severity modifier is **required**, so this item may remain blank)
AGENT2: (there is no second damaging agent, so this item remains blank)
DAM2C: (there is no second agent severity, so this item remains blank)
AGENT3: (there is no third damaging agent, so this item remains blank)
DAM3C: (there is no third agent severity, so this item remains blank)
DAM1: .0
DAM2: .0
DAM3: .0

Process Record/Narrative:

Each year, all forested federal, state and private land in Oregon and Washington are aerially surveyed for insect and disease activity. This survey is flown cooperatively by Region 6 USDA Forest Service, Forest Health Protection (FHP); Oregon Department of Forestry (ODF), Insect and Disease Section; and Washington Department of Natural Resources (WDNR). These data are collected to determine regional insect and disease trends and to serve as an indicator to land owners/managers on insect and disease activity in their area.

Data are collected during annual surveys that are generally flown from early July through September. Historically, the surveys were flown in fixed-wing aircraft on various grid patterns. The accuracy of polygon placement and polygon attributes may be limited by several factors, including: surveyor experience, weather, time of day, time of year and visibility. Areas of activity were sketched on 1:126,720 or 1:100,000 USGS quad, paper maps by two flight observers, each one sketching approximately a two mile swath out their side of the plane. After the flight, the two observer's maps were

combined and overlapping polygons were resolved on a final map. The data was then manuscripted on a stable base and scanned; it was edited and attributed using Arc/Info software. All data was forced into a UTM Zone 10 projection.

In 2000, Region 6 aerial surveyors began beta-testing a digitally assisted sketchmapping system (DASM). GeoLink software allows the surveyor to digitize and attribute the damage polygons in real time using gps and a geo-referenced, digital base map on a laptop. After the flight, the data is converted to ArcGIS shape files and processed. Since 2000, portions of the regional surveys have been flown using this software. Since 2003, 100% of the surveys have been flown using GeoLink. Further details about DASM is at:

http://www.fs.fed.us/foresthealth/technology/pdfs/dasm_detailed_overview.pdf

Feature datasets showing when areas were flown, which data capture method was used, and who flew the areas are available on request.

Since 2003, the insect and disease data has also been posted as 100k quad .pdf maps on the web. They are best used when plotted at 36"x36", but users can also zoom in, on screen, and print a small area of interest. The 95 quad maps cover the forested areas in Oregon and Washington that are surveyed each year. The base map data is the TOPO! 100K quad series from National Geographic. Finalized survey maps and spatial survey data are generally posted on the website by November of the survey year. Links to these maps can be found at: <http://www.fs.usda.gov/detail/r6/forest-grasslandhealth/insects-diseases/?cid=stelprdb5294941>

The draft version of the survey data is published periodically during the survey season (between July and September) for use during the current year's field season. Feedback from field personnel is used to help clean up the current-year data for final posting. The draft data can be viewed at:

<http://usfs.maps.arcgis.com/apps/webappviewer/index.html?id=87d6cf9c2e1a45408ef01a357b84c811>

Cumulative mortality (back to 1985) and cumulative defoliation (back to 2010) derived from the aerial survey data can be viewed at:

http://fs.bioe.orst.edu/web_maps/R6_Cumulative_Mortality_Defoliation.html

New codes added in 2016 were "DP" (Diplodia in pine), "DRT" (Drought), and "DT" (Dead tanoak). The new "DP" code was not used in 2016. "DRT" was appended to other codes when a surveyor believed the primary cause of mortality or damage was from drought, and was not used as a stand-alone code. "DT" was used for dead tanoak outside of the Sudden Oak Death Generally-Infested Area in SW Oregon. "DP" was created to collect diplodia

and other similar diseases in ponderosa pine (a signature of branch flagging).

Disclaimer:

The insect and disease data should be used only as an indicator of insect and disease activity, and should be ground-verified for actual causal agent and location. Polygons indicate areas of tree mortality and/or defoliation; intensity of damage is variable and not all trees indicated by polygons are dead or defoliated. The joint cooperators reserve the right to correct, modify, update or replace the data as necessary. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results.

The agencies which cooperatively conduct this survey (FHP, WDNR and 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 site-specific information.

An accuracy assessment 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, Forest Health; and Oregon Department of Forestry, Forest Health Management” as the source of this data in maps and publications.

Attribute Code Lists:

BEETLES

Code	Description	Severity
1-	Douglas-fir Beetle	# of dead trees
2-	Douglas-fir Engraver	# of dead trees
3-	Engelmann Spruce Beetle	# of dead tress
4-	Fir Engraver	# of dead trees
5-	Western Balsam Bark Beetle, Sub-Alpine Fir	# of dead trees
F-	Flathead fir borer	# of dead trees
F1-	Flatheaded borer; Douglas-fir; saplings (code used in the 70's)	# of dead trees
F2-	Flatheaded borer; Douglas-fir; mixed (used in the 70's)	# of dead trees
F3-	Flatheaded borer; Douglas-fir; saw timber (used in the 70's)	# of dead trees
P-	Flatheaded borer; Ponderosa pine	# of dead trees
P1-	Flatheaded borer; Ponderosa pine; saplings (used in the 70's)	# of dead trees

P2-	Flatheaded borer; Ponderosa pine; mixed (used in the 70's)	# of dead trees
P3-	Flatheaded borer; Ponderosa pine; saw (used in the 70's)	# of dead trees
6B-	Mountain Pine Beetle, Whitebark Pine	# of dead trees
6J-	Jeffrey Pine Beetle, Jeffrey Pine	# of dead trees
6K-	Mountain Pine Beetle, Knobcone Pine	# of dead trees
6L-	Mountain Pine Beetle, Lodgepole Pine	# of dead trees
6P-	Mountain Pine Beetle, Ponderosa Pine	# of dead trees
6S-	Mountain Pine Beetle, Sugar Pine	# of dead trees
6W-	Mountain Pine Beetle, Western White Pine	# of dead trees
7-	Pine Engraver (Historically, L/M/H was used as a modifier) ips	# of dead trees
8-	Western Pine Beetle	# of dead trees
88-	Western Pine Beetle, Pole-size Ponderosa Pine	# of dead trees
9-	Silver Fir Beetle	# of dead trees

OTHER INSECTS

Code	Description	Severity
AB-	Balsam woolly adelgid	# of dead trees - AND/OR - L/M/H*
AC-	Cooley spruce gall aphid	L/M/H
AM	Maple discoloration	L/M/H
AS-	Spruce aphid	L/M/H
BB-	Western blackheaded budworm	L/M/H
BM-	Modoc budworm	L/M/H/V
BM-	Modoc budworm	1/2/3/4**
BP-	Sugar pine tortrix	L/M/H
BS-	Western spruce budworm	L/M/H/V
BS-	Western spruce budworm	1/2/3/4**
CH-	Larch casebearer/Hypodermella	L/M/H
FB-	Alder flea beetle	L/M/H
FM-	Fir mealybug	L/M/H
GP-	Gouty pitch midge	L/M/H
HL-	Western hemlock looper	L/M/H
LG-	Green striped forest looper	L/M/H
LL-	Larch looper	L/M/H
LS-	Black Pine needle scale	L/M/H
MD-	Douglas-fir budmoth	L/M/H
MF-	Pacific silver fir budmoth	L/M/H
ML-	Larch budmoth	L/M/H
MN-	Douglas-fir needle midge	L/M/H
MS-	Spruce budmoth	L/M/H
NM-	Needle miner	L/M/H
ND-	Needle miner, Douglas-fir	L/M/H
NJ-	Needle miner, Jeffrey Pine	L/M/H
NK-	Needle miner, Knobcone Pine	L/M/H
NL-	Needle miner, Lodgepole Pine	L/M/H
NP-	Needle miner, Ponderosa Pine	L/M/H

NS-	Needle miner, Sugar Pine	L/M/H
NT-	Needle miner, True Fir	L/M/H
NW-	Needle miner, Western White Pine	L/M/H
OL-	Western oak looper	L/M/H
OL-	Western oak looper (in Douglas-fir)	# of dead trees
PB-	Pine butterfly	L/M/H
PH-	Phantom hemlock looper	L/M/H
PM-	Pandora moth	L/M/H
PN-	Pine needlesheath miner	L/M/H
PS-	Pine needle scale	L/M/H
S-	Spider mite	L/M/H
SA-	Sawfly	L/M/H
SD-	Sawfly, Douglas-fir	L/M/H
SF-	Sawfly, True fir	L/M/H
SH-	Sawfly, Hemlock	L/M/H
SK-	Sawfly, Knobcone pine	L/M/H
SL-	Sawfly, Lodgepole pine	L/M/H
SM-	Satin moth	L/M/H
SP-	Sawfly, Ponderosa pine	L/M/H
SW-	Sawfly, Western Larch	L/M/H
TA-	Tent caterpillar, Alder	L/M/H
TC-	Tent caterpillar, Other	L/M/H
TM-	Douglas-fir tussock moth	L/M/H
TS-	Tent caterpillar, Aspen	L/M/H
XS-	Noctuid moth	L/M/H

*AB = Number of dead trees or L/M/H. Balsam woolly adelgid can have both mortality and severity reported because of differences in infestation.

- 1) Branch infestation causes flagging and is reported as L/M/H.
- 2) Bole infestation can cause tree mortality, which is reported by the estimated number of current dead stems observed during the survey.

One polygon may have both types of damage recorded (example: AB-L!AB-15).

**The numbering system used in parts of Oregon (1985-1998) and parts of Washington (1991-1998) to reflect current budworm defoliation severities, while indicating relative cumulative damage.

- 1 = Current year's defoliation is visible from the air.
- 2 = Current year's defoliation with some bare tops visible (very little gray and still a lot of green foliage).
- 3 = Current year's defoliation visible with a lot of bare tops (both some gray foliage and some green foliage visible in host trees).
- 4 = Current year's defoliation with bare crowns (very gray in color, no visible green foliage in tree).

OTHER DAMAGING AGENTS

Code	Description	Severity
BEAR-	Bear damage	# of dead trees (1993->present; Prior to 1993, L/M/H were used.)
BR-	Blister rust	# of dead trees - OR - L/M/H
BY-	Bynum's blight/ <i>Lophodermella mordida</i> , host Ponderosa pine	L/M/H
CC-	<i>Cytospora</i> canker	L/M/H
DH-	Dying hemlock	# of dead trees - OR - L/M/H
DP-	<i>Diplodia</i> in pine	L/M/H
DRT	Drought	No modifier
DT-	Dead tanoak	# of dead trees
FIRE-	Fire damage	# of dead trees -OR- No modifier
HAIL-	Hail damage	L/M/H
HD-	Hardwood decline	# of dead trees - OR - L/M/H
HDA-	Hardwood decline in quaking aspen (code introduced in 2011)	# of dead trees -OR- L/M/H
HDM-	Hardwood decline in maple (code introduced 2015)	L/M/H
HDO-	Hardwood decline in oak (code introduced in 2011)	# of dead trees -OR- L/M/H
LC-	Needle cast, lodgepole pine	L/M/H
LW	Black Stain Root Disease (If another agent is present, no modifier is used with the LW code.)	# of dead trees -OR- no modifier
NFH	Areas not flown – have host species.	
NFN	Areas not flown – have no host species.	
OUT	No damage detected (in the middle of a polygon with activity)	
PC-	Needle cast in Ponderosa pine	L/M/H
PL-	Port-Orford-cedar root disease, <i>Phytophthora lateralis</i>	# of dead trees - OR - L/M/H
PMD-	Pacific madrone decline	L/M/H
PR-	Needle rust in poplars	L/M/H
RB-	Red belt	L/M/H
RC-	Needle cast, larch	L/M/H
RD-	Root disease (If another agent is present, no modifier is used with the RD code.)	# of dead trees - OR - No modifier
SNC	Swiss needle cast	L/M/H/S

SLID-	Slide	# of dead trees -OR- No modifier
UNKD-	Unknown defoliation	L/M/H
UNKM-	Unknown mortality	# of dead trees
WATR-	Water damage	# of dead trees - OR - No modifier
WIND	Wind-throw	# of dead trees -OR- No modifier
WNTR	Winter damage	L/M/H - OR - no modifier