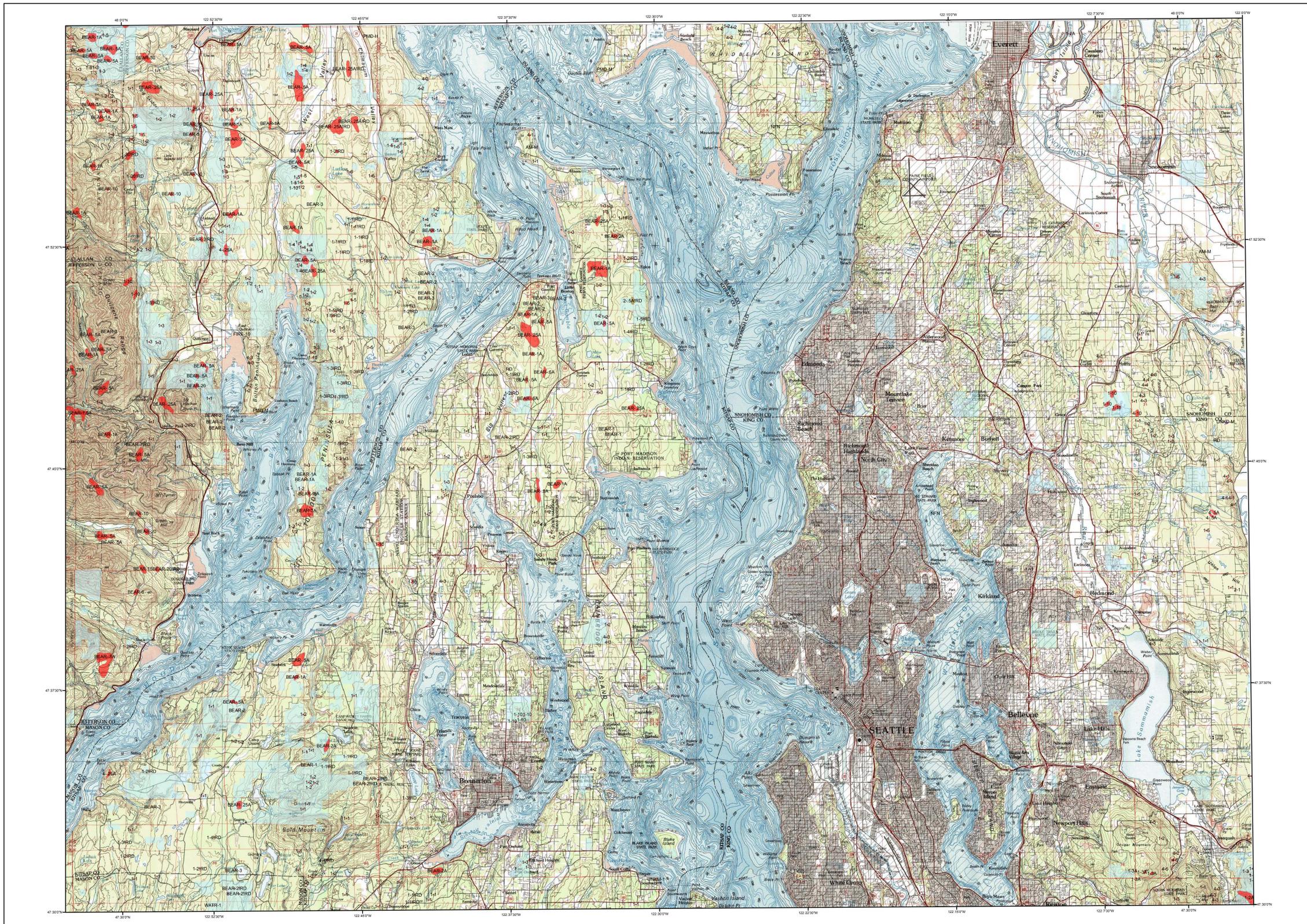


# 2009 Aerial Insect and Disease Survey

## USGS 100K Quad: Seattle - E147122; 3C



Defoliators		Mortality Agents	
Code	Damaging Agent	Code	Damaging Agent
AS	Spruce aphid	1	Douglas-fir beetle
BS	Western blackheaded budworm	2	Douglas-fir engraver
BM	Modio budworm	3	Spruce beetle
BP	Sugar pine tortrix	4	Fire engraver
BS	Western spruce budworm	5	Western balsam bark beetle
BY	Burns's bright lophodermella	6J	Mountain pine beetle
CH	Larch	6K	Mountain pine beetle
HL	Western hemlock looper	6L	Mountain pine beetle
LG	Green striped forest looper	6M	Mountain pine beetle
LL	Larch looper	6N	Mountain pine beetle
LS	Black pine needle scale	6O	Mountain pine beetle
MD	Douglas-fir budmoth	6P	Mountain pine beetle
ML	Larch budmoth	6Q	Mountain pine beetle
MN	Douglas-fir needle midge	6R	Mountain pine beetle
MS	Spruce budmoth	6S	Mountain pine beetle
NJ	Needle miner	6T	Mountain pine beetle
NK	Needle miner	6U	Mountain pine beetle
NL	Needle miner	6V	Mountain pine beetle
NP	Needle miner	6W	Mountain pine beetle
NS	Needle miner	6X	Mountain pine beetle
NT	Needle miner	6Y	Mountain pine beetle
NW	Needle miner	6Z	Mountain pine beetle
CL	Western oak looper	7	Upr sp
PB	Pine butterfly	8	Western pine beetle
PC	Pine needle cast	9	Western pine beetle
PH	Phantom hemlock looper	10	Needle scale
PI	Pine needle scale	11	Needle scale
PJ	Pine needle scale	12	Needle scale
PK	Pine needle scale	13	Needle scale
PL	Pine needle scale	14	Needle scale
PM	Pine needle scale	15	Needle scale
PN	Pine needle scale	16	Needle scale
PO	Pine needle scale	17	Needle scale
PP	Pine needle scale	18	Needle scale
PQ	Pine needle scale	19	Needle scale
PR	Pine needle scale	20	Needle scale
PS	Pine needle scale	21	Needle scale
PT	Pine needle scale	22	Needle scale
PU	Pine needle scale	23	Needle scale
PV	Pine needle scale	24	Needle scale
PW	Pine needle scale	25	Needle scale
PX	Pine needle scale	26	Needle scale
PY	Pine needle scale	27	Needle scale
PZ	Pine needle scale	28	Needle scale
QA	Pine needle scale	29	Needle scale
QB	Pine needle scale	30	Needle scale
QC	Pine needle scale	31	Needle scale
QD	Pine needle scale	32	Needle scale
QE	Pine needle scale	33	Needle scale
QF	Pine needle scale	34	Needle scale
QG	Pine needle scale	35	Needle scale
QH	Pine needle scale	36	Needle scale
QI	Pine needle scale	37	Needle scale
QJ	Pine needle scale	38	Needle scale
QK	Pine needle scale	39	Needle scale
QL	Pine needle scale	40	Needle scale
QM	Pine needle scale	41	Needle scale
QN	Pine needle scale	42	Needle scale
QO	Pine needle scale	43	Needle scale
QP	Pine needle scale	44	Needle scale
QQ	Pine needle scale	45	Needle scale
QR	Pine needle scale	46	Needle scale
QS	Pine needle scale	47	Needle scale
QT	Pine needle scale	48	Needle scale
QU	Pine needle scale	49	Needle scale
QV	Pine needle scale	50	Needle scale
QW	Pine needle scale	51	Needle scale
QX	Pine needle scale	52	Needle scale
QY	Pine needle scale	53	Needle scale
QZ	Pine needle scale	54	Needle scale
RA	Pine needle scale	55	Needle scale
RB	Pine needle scale	56	Needle scale
RC	Pine needle scale	57	Needle scale
RD	Pine needle scale	58	Needle scale
RE	Pine needle scale	59	Needle scale
RF	Pine needle scale	60	Needle scale
RG	Pine needle scale	61	Needle scale
RH	Pine needle scale	62	Needle scale
RI	Pine needle scale	63	Needle scale
RJ	Pine needle scale	64	Needle scale
RK	Pine needle scale	65	Needle scale
RL	Pine needle scale	66	Needle scale
RM	Pine needle scale	67	Needle scale
RN	Pine needle scale	68	Needle scale
RO	Pine needle scale	69	Needle scale
RP	Pine needle scale	70	Needle scale
RQ	Pine needle scale	71	Needle scale
RR	Pine needle scale	72	Needle scale
RS	Pine needle scale	73	Needle scale
RT	Pine needle scale	74	Needle scale
RU	Pine needle scale	75	Needle scale
RV	Pine needle scale	76	Needle scale
RW	Pine needle scale	77	Needle scale
RX	Pine needle scale	78	Needle scale
RY	Pine needle scale	79	Needle scale
RZ	Pine needle scale	80	Needle scale
SA	Pine needle scale	81	Needle scale
SB	Pine needle scale	82	Needle scale
SC	Pine needle scale	83	Needle scale
SD	Pine needle scale	84	Needle scale
SE	Pine needle scale	85	Needle scale
SF	Pine needle scale	86	Needle scale
SG	Pine needle scale	87	Needle scale
SH	Pine needle scale	88	Needle scale
SI	Pine needle scale	89	Needle scale
SJ	Pine needle scale	90	Needle scale
SK	Pine needle scale	91	Needle scale
SL	Pine needle scale	92	Needle scale
SM	Pine needle scale	93	Needle scale
SN	Pine needle scale	94	Needle scale
SO	Pine needle scale	95	Needle scale
SP	Pine needle scale	96	Needle scale
SQ	Pine needle scale	97	Needle scale
SR	Pine needle scale	98	Needle scale
SS	Pine needle scale	99	Needle scale
ST	Pine needle scale	100	Needle scale

**USGS 100K Quad: Seattle - E147122; 3C**  
**2009 Aerial Insect and Disease Detection Survey**  
**Mapscale: 1:100,000**  
**Date: January 20, 2010**

### Legend

- Defoliating Agents
- Mortality Agents
- Other Damage
- WadNR Managed Lands
- Areas Not Flown

**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	Fire-needle pines
CC	Cytospora canker	True fir
CH	Dying hemlock	Hemlock
FI	Fire	All species
GP	Gouy pitch midge	Ponderosa pine
HA	Hail	Hardwoods
HD	Hardwood decline	Hardwoods
NH	Areas not flown - non host	
NF	Areas not flown - host	
NO	No damage detected	
PD	Pacific madrone	Poplar
PI	Leaf rust in poplars	All species
SL	Silva	All species
UN	Unknown defoliation	All species
UNM	Unknown mortality	All species
WD	Water damage	All species
WDR	Wind-thrown	All species
WTR	Winter damage	All species

The map base was created with TOPOI (Copyright 2001, National Geographic); available online at: [www.ngmapstore.com](http://www.ngmapstore.com)

A data dictionary, digital copies of this map and ArcGIS insect and disease data are available at: [www.fs.fed.us/r6/nr/fld/data.shtml](http://www.fs.fed.us/r6/nr/fld/data.shtml)

### 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 and the Washington Department of Natural Resources. 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  
 Olympia, WA 98504

-- OR --

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

DISCLAIMER: Forest Health Protection (FHP) and Washington Department of Natural Resources (WDNR) strive to maintain an accurate Aerial Detection Survey (ADS) Dataset, but due to the conditions under which the data are collected, FHP and WDNR shall not be held responsible for missing or inaccurate data. ADS are not intended to replace more 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/operations/ads/ads.html>. Maps and data may be updated without notice. Please cite: USDA Forest Service, Forest Health Protection and Washington Department of Natural Resources, Resource Protection Division, Forest Health, as the source of this data in maps and publications.