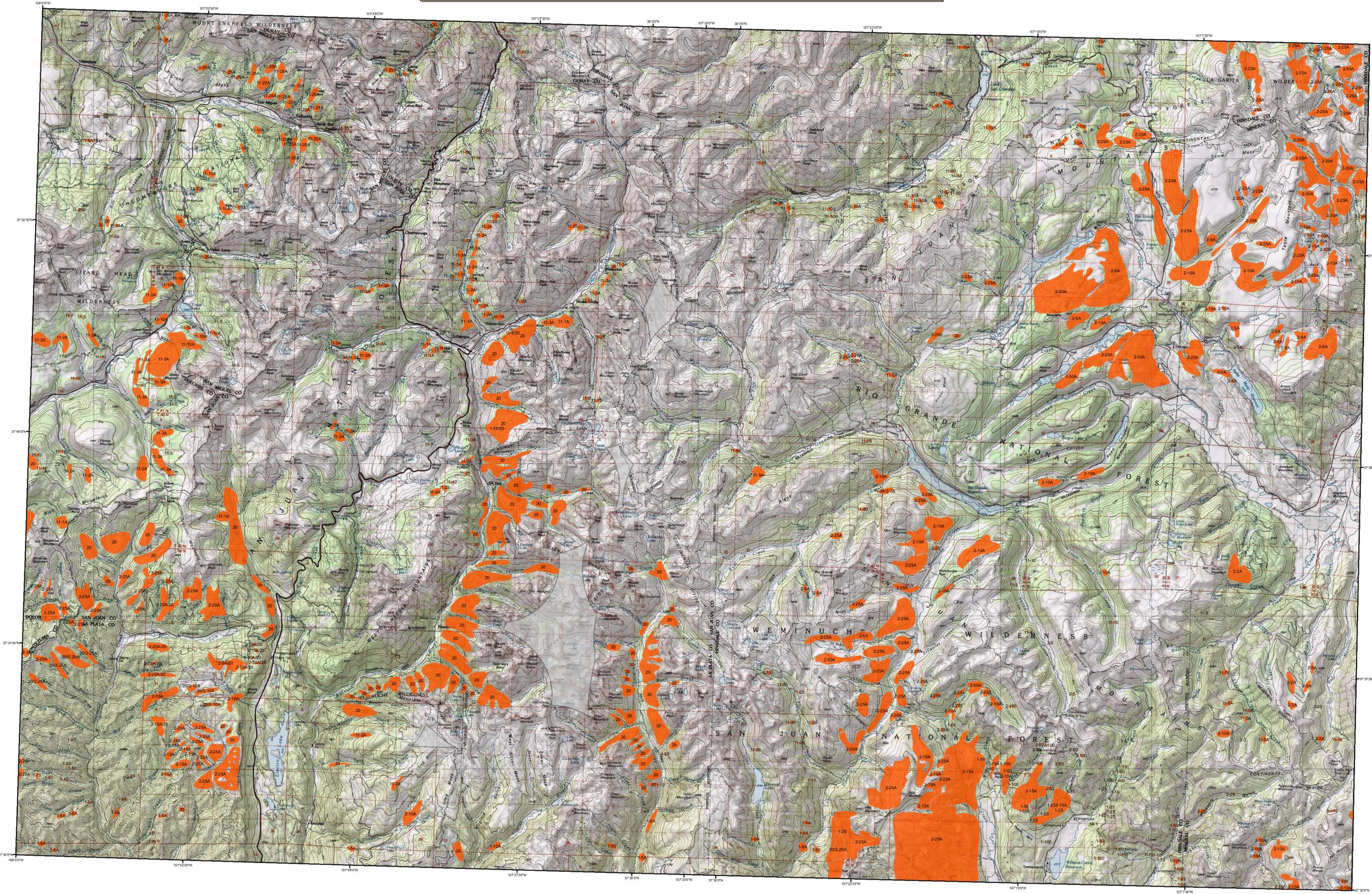


# 2011 Aerial Insect and Disease Survey Silverton, Colorado USGS 100K TOPO!: 37107-E1



1:100,000

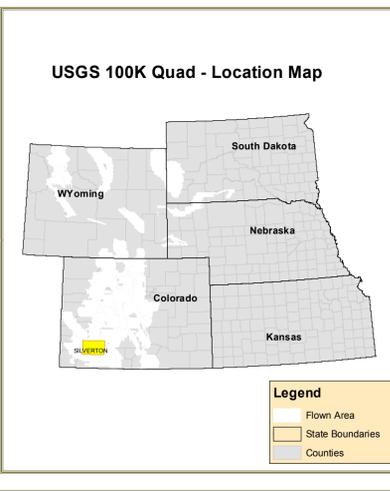
**Legend**

Causal Agent(s)

Not Flown

**Use of the Number System**  
 Example: 5-25 = The first number before the dash is the causal agent code. The number after the dash is the number of dead "faded" trees in the polygon or point. When recent dead trees are not counted, an intensity code of L-light, M-moderate, and H-high may be used after the causal agent code. Periodically, trees per acre estimates are used after the causal agent code instead of number of dead "faded" trees (or an intensity code). For example: 5-12A = The first number before the dash is the causal agent code. The number after the dash is an estimate of the number of dead "faded" trees in the polygon per acre. In this case it would be an estimate that, on the average, one tree per every two acres would be a dead "faded" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "faded" trees. A "7" is used as a separator when a point polygon has more than one causal agent code.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas fir beetle	Douglas fir	49	Atropis	Loggipole Pine	106	Box squirrel flagging	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann Spruce	50	Stachytaraxa rust	Loggipole Pine	107	Bull weevil	Cottonwood/Poplar
3	Blue spruce tip	Blue Spruce	51	White pine blister rust	S-Needle Pine	108	road salt	Softwoods
4	Mountain pine beetle	Ponderosa Pine	52	Chaff mistletoe	Loggipole Pine	109	powdered nematode	Scratch Pine
5	Mountain pine beetle	Loggipole Pine	53	Elytrodema	Ponderosa Pine	110	oak wilt	Oak
6	Mountain pine beetle	S-Needle Pine	54	Include #55, 56 & 58	All Tree Species	111	straggle disease	All Tree Species
7	Western pine beetle	Ponderosa Pine	55	Chemical damage	All Tree Species	112	inclined chestnut borer	White Spruce
8	Douglas fir engraver beetle	White Fir	56	Lophodermium	All Tree Species	113	anthracnose like leaf disease	Bur Oak
9	Fire engraver	Ponderosa Pine	57	Rhabdocline pseudotsugae	Douglas fir	114	anthracnose like leaf disease	All Tree Species
10	Douglas fir engraver beetle	Subalpine Fir	58	Lophodermium arcauata	Softwoods	115	Dieback	All Tree Species
11	Western balsam bark beetle	Softwoods	59	Leucanica apocota	Softwoods	116	Mortality	All Tree Species
12	Unidentified bark beetle	Softwoods	60	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
13	Pine engraver	Loggipole Pine	61	Deltostoma pine	Softwoods	118	Herbicide	All Tree Species
14	Pine engraver	Ponderosa Pine	62	Needle cast (Hypodermatocae)	Softwoods	119	Flagging	All Tree Species
15	Ponderosa pine needle miner	Loggipole Pine	63	Root Rot	All Tree Species	120	aspen tortrix	Quaking Aspen
16	Loggipole pine needle miner	Ponderosa Pine	64	Unidentified disease	All Tree Species	121	Marsdenia blight	Quaking Aspen
17	Jack pine budworm	Jack Pine	65	Winter damage light	All Tree Species	122	Dieback (oak)	Ash
18	Spruce budworm, light defol.	Douglas fir	66	Winter damage medium	All Tree Species	200	Mortality (oak)	Hardwoods
19	Spruce budworm, medium defol.	Douglas fir	67	Winter damage heavy	All Tree Species	204	Dieback (oak)	Oak
20	Spruce budworm, heavy defol.	Douglas fir	68	Diablotia	Softwoods	210	Mortality (oak)	Eastern Red Cedar
21	Pine tussock moth	Douglas fir	69	Phrygan black stain	Common Piñon	211	Mortality (hardwood)	Hardwoods
22	Pine butterfly	Ponderosa Pine	70	Fire	All Tree Species	212	Mortality (spruce)	Oak
23	Pine looper	Ponderosa Pine	71	Porcupine	Hardwoods	213	Mortality (oak)	Oak
24	Pine tortrix	Ponderosa Pine	72	Windthrow	Hardwoods	214	Mortality (spruce)	Spruce
25	Text caterpillar	Hardwoods	73	High water damage	All Tree Species	215	Quaking Aspen	Ash
26	Leaf beetles	Hardwoods	74	Avalanche	All Tree Species	221	Discoloration (oak)	Softwoods
27	Aspen defoliation	Hardwoods	75	Aspen decline multiple agents)	Quaking Aspen	222	Discoloration (cottonwood)	Cottonwood/Poplar
28	Oak leaf roller	Hardwoods	76	Pinon pine mortality	Common Piñon	223	Discoloration (eastern cedar)	Eastern Red Cedar
29	Pine needle-needle miner	Ponderosa Pine	77	Juniper mortality unknown agents)	Juniper	224	Discoloration (hardwood)	Hardwoods
30	Pine sawflies	Ponderosa Pine	78	Cambium oak decline unknown agents)	Gambel Oak	225	Discoloration (oak)	Oak
31	Pine tussock moth	Ponderosa Pine	79	Limber pine decline multiple agents)	Limber Pine	226	Discoloration (spruce)	Spruce
32	Carabid beetles	Hardwoods	80	Hail damage	All Tree Species	230	Herbicide (cottonwood)	Cottonwood/Poplar
33	Variable oak leaf caterpillar	Hardwoods	81	Unknown polygon	Unknown	240	Flagging (hardwood)	Hardwoods
34	Unidentified defoliator	All Tree Species	82	Unknown polygon	Unknown	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
35	Cottonwood Decline/Mortality	Hardwoods	83	Old piñon mortality	Common Piñon	251	Unidentified defoliator (elm)	Elm
36	Heterobasidium annosum (Fomes annosus)	Softwoods	84	Old salt tip	Loggipole Pine	252	Unidentified defoliator (hardwood)	Hardwoods
37	Aemilia octopuncta (Aemilia melles)	Softwoods	85	Dutch elm disease	Elm	300	Mortality (spruce)	Pine
38	Phoropsis	Softwoods	86	Drought killed narrow leaf cottonwood	Narrowleaf Cottonwood			
39	Cynophora	All Tree Species						
40	Phoropsis	Softwoods						
41	Heterobasidium annosum (Fomes annosus)	Softwoods						
42	Aemilia octopuncta (Aemilia melles)	Softwoods						
43	Phoropsis	All Tree Species						
44	Phoropsis	Softwoods						
45	Cynophora	All Tree Species						
46	Western gall rust	Unknown						
47	Conradia rust	Unknown						



**How Aerial Surveys Are Conducted**

Data represented on this map are based on aerial observations manually recorded onto a map. This procedure is considered both an art form and a form of scientific data collection, and is highly subjective. An observer only has 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 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.

Aerial surveys provide information on the current status for many causal agents, and are 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. Aerial surveys can be thought of as the first stage in a multi-stage sampling design. Other remote sensing approaches, including aerial photography, electro-optical sensors, and specially designed aerial surveys with modified flight patterns, can be used to more accurately delineate the extent and severity of a particular disturbance agent. The preceding methods are often more costly than overview surveys, and are generally reserved to address situations of sufficient environmental, economic, or political importance.

**Map Created December 1 2011**  
**Projection: UTM NAD83 Zone 13**  
**Author: J. Ross, USDA Forest Service**

A data dictionary and digital copies of this map and the insect and disease data are available at: <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>

**DIRECT ALL INQUIRIES TO:**

**Colorado State Forest Service**  
**Colorado State University**  
**Fort Collins, Colorado 80523**

**USDA Forest Service, Region 2**  
**Renewable Resources**  
**Forest Health Management**  
**PO Box 25127**  
**Lakewood, Colorado 80225**

**DISCLAIMER**  
 Forest Health Protection (FHP) and its partners strive to maintain an accurate Aerial Detection Survey (ADS) Dataset, but due to the conditions under which the data are collected, FHP and its partners 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/monitoring/qualityassurance.shtml>. Maps and data may be updated without notice. Please cite "USDA Forest Service, Forest Health Protection and its partners" as the source of this data in maps and publications.

Due to the nature of aerial surveys, the data on this map will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented on this map because these agents are not detectable from aerial surveys. The data presented on this map should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. Shaded areas show locations where tree mortality or defoliation were apparent from the air. Intensity of damage is variable and not all trees in shaded areas are dead or defoliated.

The insect and disease data represented on this map are available digitally from the USDA Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this map for purposes other than those for which it was intended may yield inaccurate or misleading results.