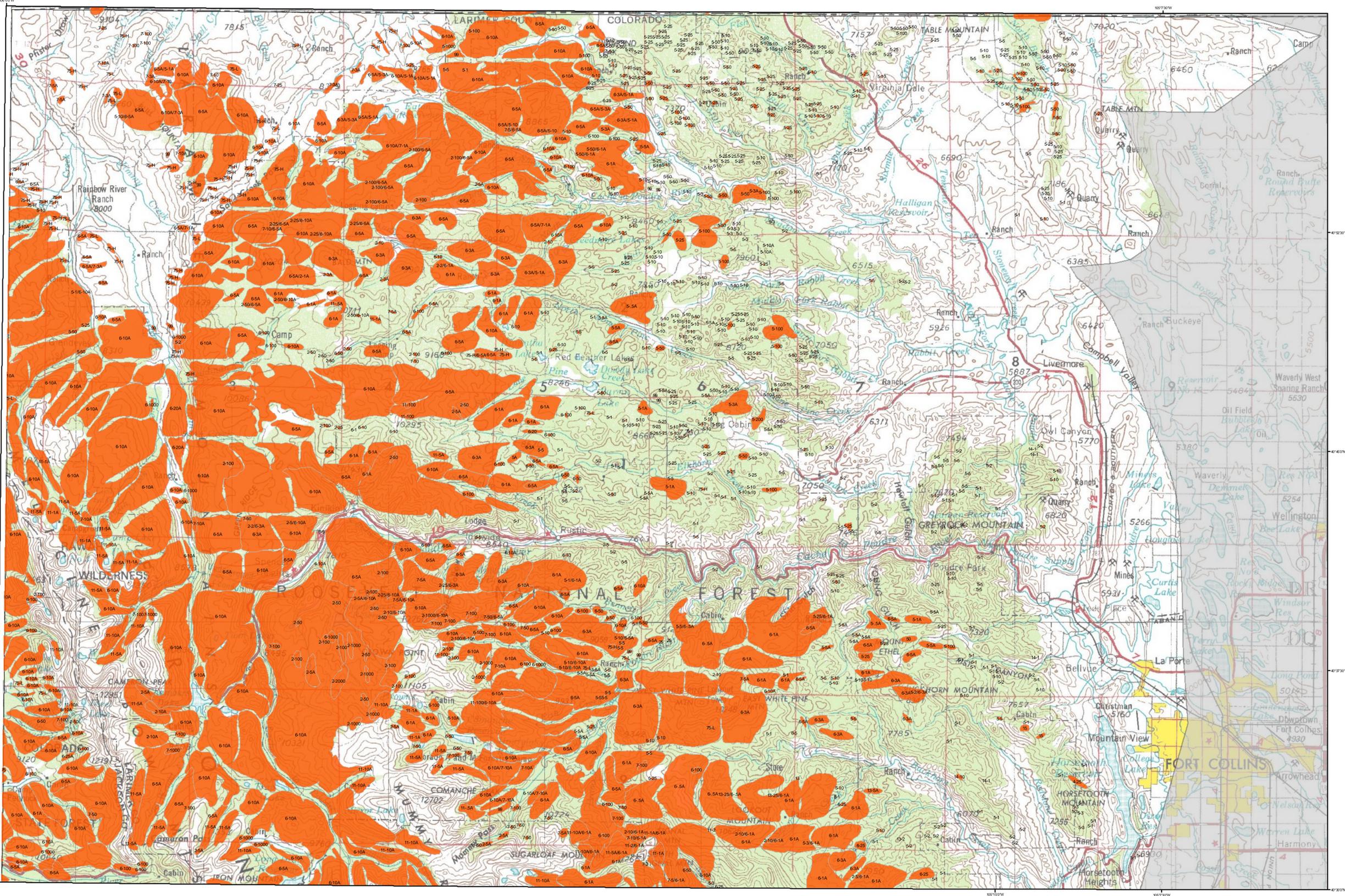


2009 Aerial Insect and Disease Survey Fort Collins, Colorado USGS 100K TOPO!: 40105-E1



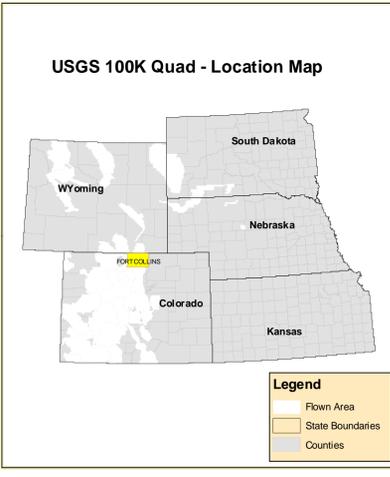
1:100,000

Legend

Orange square: Causal Agent(s)
Grey square: 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 "taster" trees in the polygon or point. When recent dead trees are not counted, an intensity code of Light, Moderate, and 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 "taster" trees (or an intensity code). For example: 5-1/2A = The first number before the dash is the causal agent code. The number after the dash is an estimate of the number of dead "taster" trees in the polygon per acre. In this case it would be an estimation that, on average, one tree per every two acres would be a dead "taster" tree. In another example: 5-3A = that on average, an estimated three trees per acre are dead "taster" trees. A "/" 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
1	Douglas fir beetle	Douglas-fir	49	Anisoplia	Aspen
2	Engelmann spruce beetle	Engelmann Spruce	50	White pine blister rust	White Pine
3	Mountain pine beetle	Ponderosa Pine	51	Deer fly	Deer fly
4	Mountain pine beetle	Lodgepole Pine	52	Elyrodium	Ponderosa Pine
5	Mountain pine beetle	S-Needle Pine	53	Includes #50, 55 & 56	All Tree Species
6	Western pine beetle	Ponderosa Pine	54	Acipollaria	All Tree Species
7	Fire engraver	White Fir	55	Chemical damage	White Spruce
8	Douglas fir engraver beetle	Douglas-fir	56	Lophodermium piceati	Softwoods
9	Western balsam bark beetle	Subalpine Fir	57	Rhabdocline pseudotsugae	Douglas-fir
10	Unidentified bark beetle	Softwoods	58	Lophodermium acicola	Softwoods
11	Pine engraver	Lodgepole Pine	59	Mortality	All Tree Species
12	Pine engraver	Ponderosa Pine	60	Lophodermium concolor	Softwoods
13	Pine engraver	Lodgepole Pine	61	Coltrichia sp.	Softwoods
14	Ponderosa pine needle miner	Ponderosa Pine	62	Needle cast (Hydrometaceae)	Softwoods
15	Lodgepole pine needle miner	Lodgepole Pine	63	Rust	All Tree Species
16	Jack pine budworm	Jack Pine	64	Unidentified disease	All Tree Species
17	Spruce budworm, light defol.	Douglas-fir	65	Winter damage light	All Tree Species
18	Spruce budworm, medium defol.	Douglas-fir	66	Winter damage medium	All Tree Species
19	Spruce budworm, heavy defol.	Douglas-fir	67	Winter damage heavy	All Tree Species
20	Douglas-fir tussock moth	Douglas-fir	68	Deltoidea	Softwoods
21	Pine looper	Ponderosa Pine	69	Pinus bark stain	Common Pinus
22	Test caterpillars	Hardwoods	70	Pine	All Tree Species
23	Leaf beetles	Hardwoods	71	Phragmites	Softwoods
24	Oak leaf roller	Hardwoods	72	Windthrow	All Tree Species
25	Pine needle-sheath miner	Ponderosa Pine	73	High water damage	All Tree Species
26	Jack pine budworm	Jack Pine	74	Avalanche	All Tree Species
27	Spruce budworm, light defol.	Douglas-fir	75	Aspen decline-multiple agents)	Common Pinus
28	Spruce budworm, medium defol.	Douglas-fir	76	Pinus pine mortality	Common Pinus
29	Spruce budworm, heavy defol.	Douglas-fir	77	Juniper mortality-unknown agents)	Juniper
30	Unidentified defoliator	Hardwoods	78	Gambel oak decline-unknown agents)	Gambel Oak
31	Heterobasidium annosum (Fomes annosus)	All Tree Species	79	Lumber pine decline-multiple agents)	Lumber Pine
32	Armillaria ostroyae (Armillaria mellea)	Softwoods	80	Hail damage	All Tree Species
33	Polyporus schweinitzii	Softwoods	81	Unknown polygon	Unknown
34	Phragmites	Softwoods	82	Unknown polygon	Unknown
35	Cytospora	All Tree Species	83	Unknown polygon	Unknown
36	Western gall rust	Unknown	84	Unknown polygon	Unknown
37	Andromeda rust	Unknown	85	Unknown polygon	Unknown
38	Stemflow rust	Lodgepole Pine	86	Unknown polygon	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 20 2009
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/aerialsurveys/>

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****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/aviation/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.