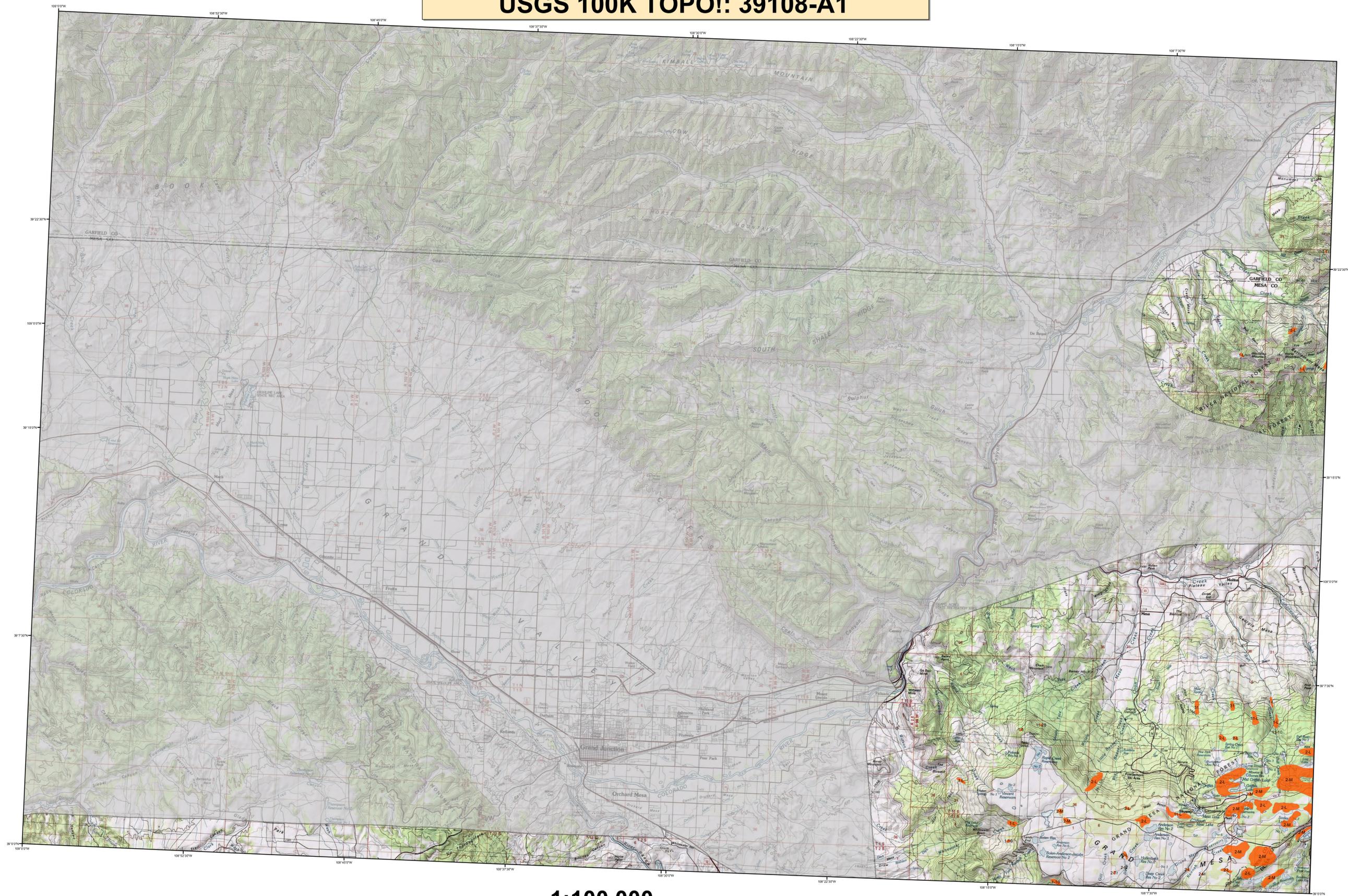
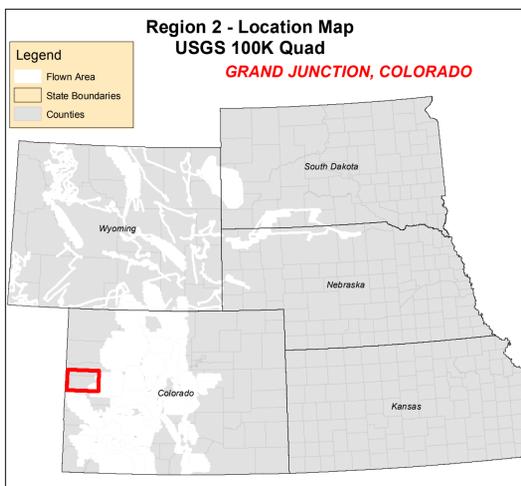


2014 Aerial Insect and Disease Survey GRAND JUNCTION, COLORADO USGS 100K TOPO!: 39108-A1



1:100,000

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas fir beetle	Douglas fir	107	Scirpiforme rust	Cottonwood Poplar
2	Engelmann spruce beetle	Engelmann spruce	108	fall webworm	Cottonwood Poplar
3	Blue spruce tip	Blue spruce	109	moist soil	Softwoods
4	Mountain pine beetle	Ponderosa pine	110	pinewood nematode	Scotch pine
5	Mountain pine beetle	Lodgepole pine	111	oak wilt	Oak
6	Mountain pine beetle	5-needle pine	112	foliage disease	All Tree Species
7	Mountain pine beetle	Ponderosa pine	113	spruce ips	White spruce
8	Western pine beetle	White fir	114	anthracnose like foliar disease	Bur oak
9	Fire scorpion	Douglas fir	115	Dieback	All Tree Species
10	Douglas fir engraver beetle	Subalpine fir	116	Mortality	All Tree Species
11	Western balsam bark beetle	Softwoods	117	Discoloration	All Tree Species
12	Unidentified bark beetle	Lodgepole pine	118	Herbicide	All Tree Species
13	Pine engraver	Ponderosa pine	119	Flagging	All Tree Species
14	Pine engraver	Ponderosa pine	120	aspen tortrix	Quaking Aspen
15	Ponderosa pine needle miner	White fir	121	Quaking Aspen	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa pine	122	Marsdenia Blight	Quaking Aspen
17	Jack pine budworm	Jack pine	123	Dieback (ash)	Ash
18	Spruce budworm, light defol.	Douglas fir	124	Dieback (cottonwood)	Cottonwood Poplar
19	Spruce budworm, medium defol.	Douglas fir	125	Dieback (hardwood)	Hardwoods
20	Spruce budworm, heavy defol.	Douglas fir	126	Dieback (oak)	Oak
21	Douglas fir tussock moth	Douglas fir	127	Mortality (oak cottonwood)	Cottonwood Poplar
22	Pine butterfly	Ponderosa pine	128	Mortality (eastern cedar)	Eastern Red Cedar
23	Pine looper	Ponderosa pine	129	Mortality (hardwood)	Hardwoods
24	Pine tortrix	Ponderosa pine	130	Mortality (spruce)	Spruce
25	Tent caterpillars	Hardwoods	131	Discoloration (ash)	Ash
26	Leaf beetles	Hardwoods	132	Discoloration (cottonwood)	Softwoods
27	Aspen defoliation	Quaking Aspen	133	Discoloration (eastern cedar)	Cottonwood Poplar
28	Oak leaf roller	Ponderosa pine	134	Discoloration (hardwood)	Hardwoods
29	Pine needle sheath miner	Ponderosa pine	135	Discoloration (oak)	Oak
30	Pine sawflies	Ponderosa pine	136	Discoloration (spruce)	Spruce
31	Pine tussock moth	Ponderosa pine	137	Herbicide (cottonwood)	Cottonwood Poplar
32	Cankermite	Hardwoods	138	Herbicide (eastern cedar)	Eastern Red Cedar
33	Variable oak leaf caterpillar	Hardwoods	139	Flagging (hardwood)	Hardwoods
34	Unidentified defoliator	All Tree Species	140	Flagging (hardwood)	Hardwoods
35	Cottonwood Decline/Mortality	Softwoods	141	Unidentified defoliator (cottonwood)	Cottonwood Poplar
36	Heterobasidion annosum (Fomes annosus)	Softwoods	142	Unidentified defoliator (elm)	Elm
37	Amillaria totiposa (Amillaria metke)	Softwoods	143	Unidentified defoliator (hardwood)	Hardwoods
38	Phomopsis	Softwoods	144	Mortality (spruce)	Pine
39	Cytospora	All Tree Species			
40	Western gall rust	Unknown			
41	Conandria 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: 2/9/2015
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/>

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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/ads/qualitysource.html>. 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 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.