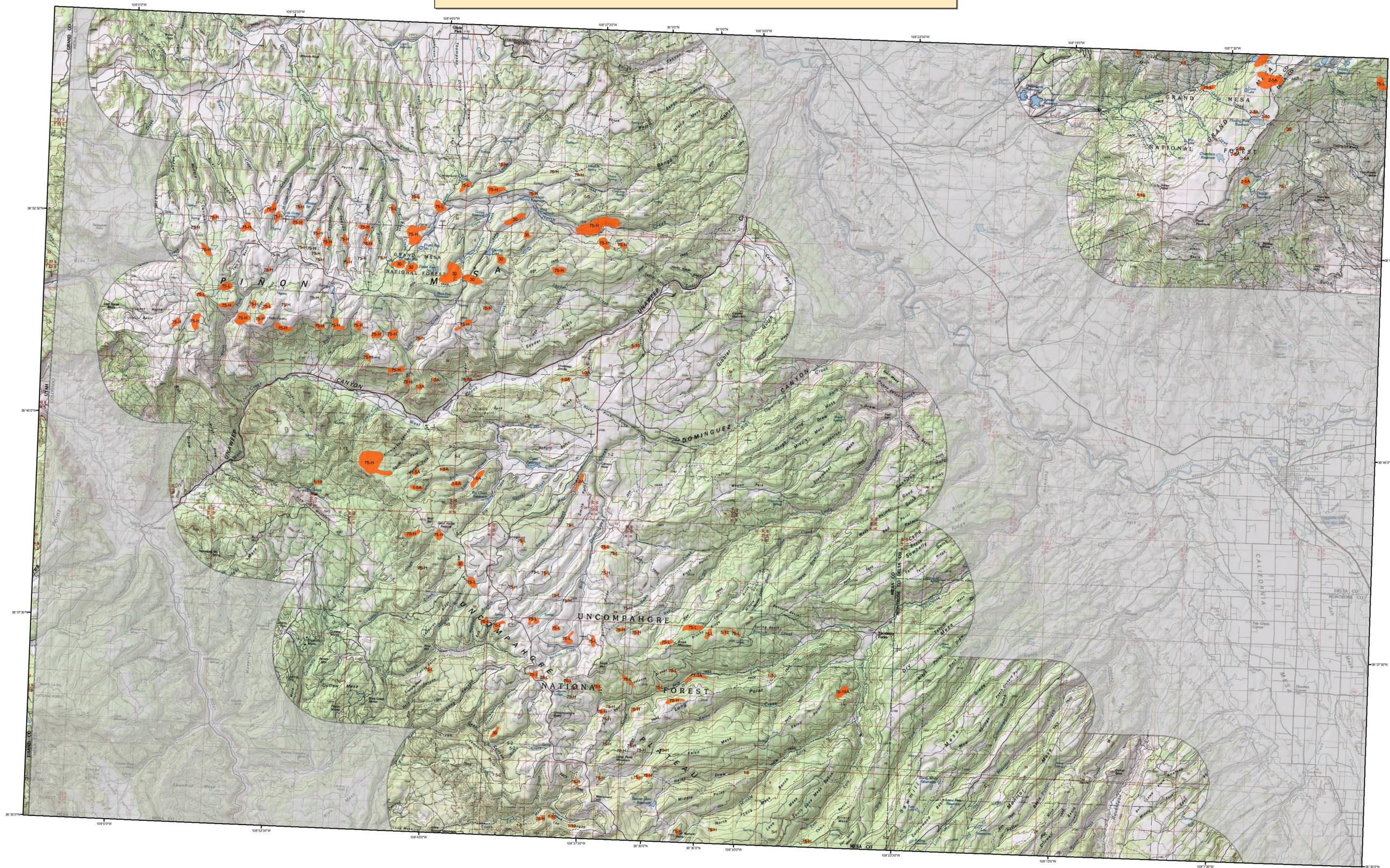
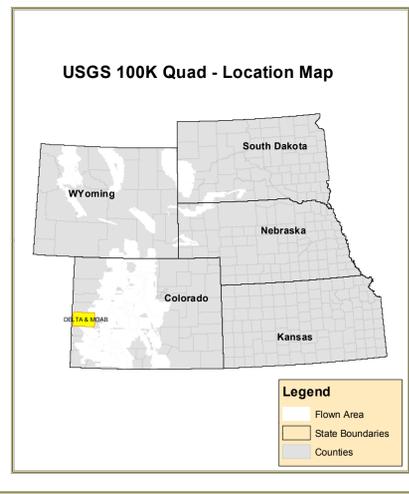


2011 Aerial Insect and Disease Survey Delta and Moab, Colorado USGS 100K TOPO!: 38108-E1 & 38109-E1



1:106,000

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, tree pair average estimates are used after the causal agent code instead of number of dead "faded" 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 estimation of the number of dead "faded" trees in the polygon per acre. In this case it would be an estimation 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 "/" 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	Causal Agent	Douglas-Fir	100	Red squirrel flagg	Cottonwood Poplar
2	Engelmann spruce beetle	Engelmann Spruce	107	Red squirrel flagg	Cottonwood Poplar
3	Blue spruce tip	Blue Spruce	108	Red squirrel flagg	Subwood
4	Mountain pine beetle	Ponderosa Pine	109	Red squirrel flagg	Scotch Pine
5	Mountain pine beetle	Lodgepole Pine	110	Red squirrel flagg	Oak
6	Mountain pine beetle	S-Needle Pine	111	Red squirrel flagg	All Tree Species
7	Western pine beetle	Ponderosa Pine	112	Red squirrel flagg	White Spruce
8	Fire Enginer	White Fir	113	Red squirrel flagg	Western Red Cedar
9	Douglas fir engraver beetle	Douglas-Fir	114	Red squirrel flagg	Bur Oak
10	Western balsam bark beetle	Subalpine Fir	115	Red squirrel flagg	All Tree Species
11	Unidentified bark beetle	Softwoods	116	Red squirrel flagg	All Tree Species
12	Pine engraver	Lodgepole Pine	117	Red squirrel flagg	All Tree Species
13	Pine engraver	Ponderosa Pine	118	Red squirrel flagg	All Tree Species
14	Ponderosa pine needle miner	Lodgepole Pine	119	Red squirrel flagg	All Tree Species
15	Lodgepole pine needle miner	Ponderosa Pine	120	Red squirrel flagg	Quaking Aspen
16	Jack pine budworm	Jack Pine	121	Red squirrel flagg	Quaking Aspen
17	Spruce budworm, light defol.	Douglas-Fir	200	Red squirrel flagg	Ash
18	Spruce budworm, medium defol.	Douglas-Fir	201	Red squirrel flagg	Cottonwood Poplar
19	Spruce budworm, heavy defol.	Douglas-Fir	202	Red squirrel flagg	Oak
20	Douglas fir bark moth	Douglas-Fir	203	Red squirrel flagg	Hardwoods
21	Pine butterfly	Ponderosa Pine	204	Red squirrel flagg	Oak
22	Pine looper	Ponderosa Pine	205	Red squirrel flagg	Cottonwood Poplar
23	Pine tortrix	Ponderosa Pine	206	Red squirrel flagg	Eastern Red Cedar
24	Text caterpillar	Hardwoods	207	Red squirrel flagg	Oak
25	Leaf beetles	Hardwoods	208	Red squirrel flagg	Oak
26	Aspen defoliation	Quaking Aspen	209	Red squirrel flagg	Ash
27	Oak leaf roller	Hardwoods	210	Red squirrel flagg	Softwoods
28	Pine needle-shed miner	Ponderosa Pine	211	Red squirrel flagg	Cottonwood Poplar
29	Pine sawflies	Ponderosa Pine	212	Red squirrel flagg	Eastern Red Cedar
30	Pine bark moth	Ponderosa Pine	213	Red squirrel flagg	Oak
31	Carline worms	Hardwoods	214	Red squirrel flagg	Oak
32	Unidentified defoliator	All Tree Species	215	Red squirrel flagg	Cottonwood Poplar
33	Cottonwood Decline/Mortality	Hardwoods	216	Red squirrel flagg	Eastern Red Cedar
34	Heliothis annosum (Fomes annosus)	Softwoods	217	Red squirrel flagg	Hardwoods
35	Amelara selysiae (Amelara mellea)	Softwoods	218	Red squirrel flagg	Ash
36	Thrombia	Softwoods	219	Red squirrel flagg	Softwoods
37	Cystospora	All Tree Species	220	Red squirrel flagg	Cottonwood Poplar
38	Western gall rust	Unknown	221	Red squirrel flagg	Hardwoods
39	Dominica rust	Unknown	222	Red squirrel flagg	Pine



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/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 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.