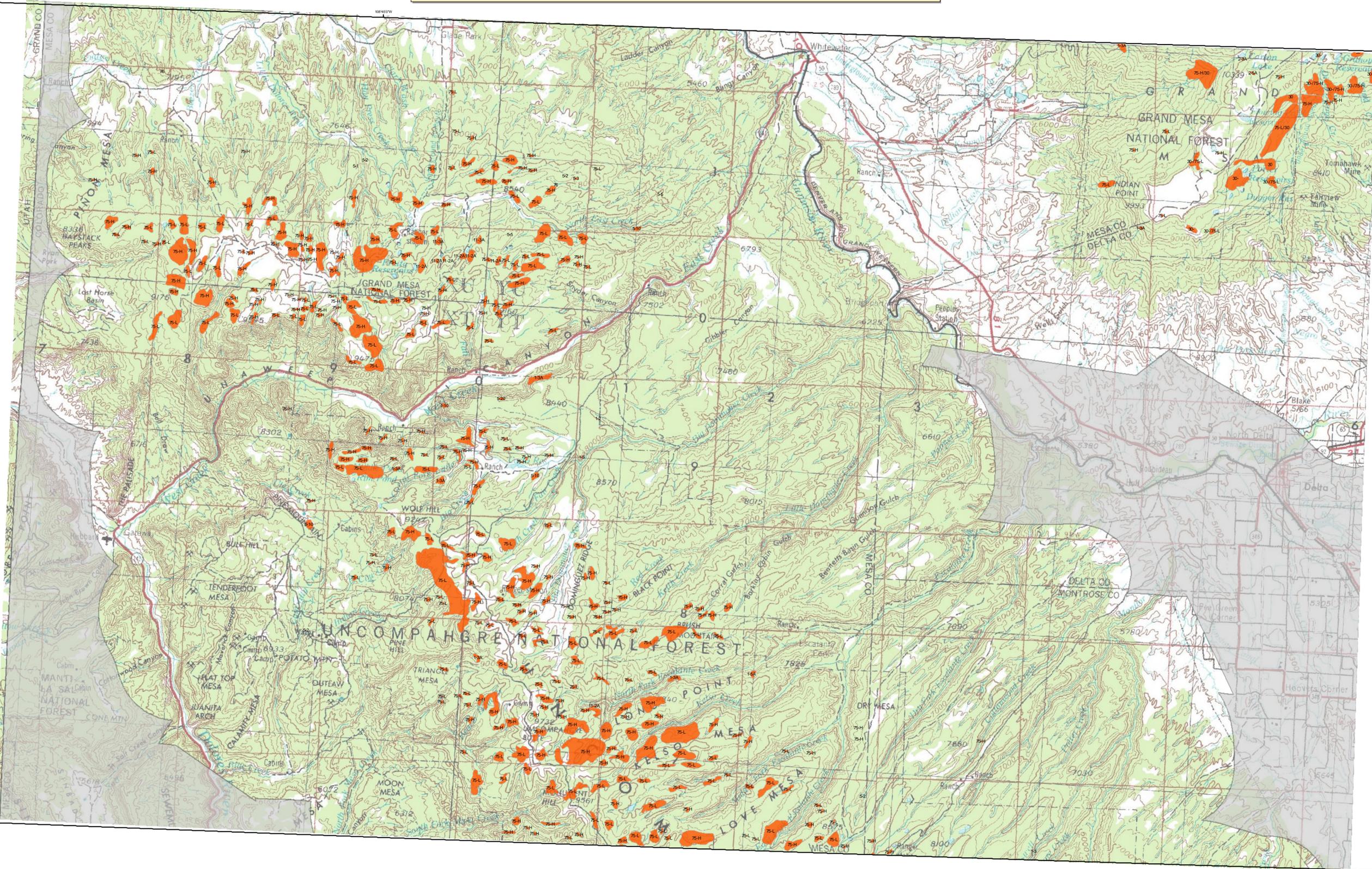


# 2009 Aerial Insect and Disease Survey Delta and Moab, Colorado USGS 100K TOPO!: 38108-E1 & 38109-E1



1:106,000

## Legend

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 "ladder" 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 acreage estimates are used after the causal agent code instead of number of dead "ladder" trees (or an intensity code). For example: 5-125L = The first number before the dash is the causal agent code. The number after the dash is an estimate of the number of dead "ladder" trees on the average, one tree per every two acres would be a dead "ladder" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "ladder" 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	47	Aspen	Aspen
2	Engelmann Spruce Beetle	Engelmann Spruce	50	White pine blister rust	5-Needle Pine
3	Mountain pine beetle	Ponderosa Pine	61	Dwarf mistlebe	Softwoods
4	Mountain pine beetle	Lodgepole Pine	62	Elysiadema	Ponderosa Pine
5	Mountain pine beetle	5-Needle Pine	63	Induleta 605, 60 & 66	All Tree Species
6	Western pine beetle	Ponderosa Pine	64	Air pollutants	All Tree Species
7	Fire Engiever	White Fir	65	Chemical damage	Softwoods
8	Douglas-fir engraver beetle	Douglas-fir	66	Lophodermium pinastri	Softwoods
9	Western balsam bark beetle	Subalpine Fir	67	Rhabdocline piceae/steppe	Douglas-fir
10	Unidentified bark beetle	Softwoods	68	Lophodermium acicola	Softwoods
11	Pine engraver	Softwoods	69	Leucosticte acicola	Softwoods
12	Pine engraver	Ponderosa Pine	70	Lophodermium concolor	Softwoods
13	Pine engraver	Lodgepole Pine	71	Cythospora pin	Softwoods
14	Pine engraver	Ponderosa Pine	72	Needle cast (Hypodermataceae)	Softwoods
15	Ponderosa pine needle miner	Ponderosa Pine	73	Root Rot	All Tree Species
16	Lodgepole pine needle miner	Lodgepole Pine	74	Unidentified disease	All Tree Species
17	Jack pine woodworm	Jack Pine	75	Winter damage light	All Tree Species
18	Spruce budworm, light defol.	Douglas-fir	76	Winter damage medium	All Tree Species
19	Spruce budworm, medium defol.	Douglas-fir	77	Winter damage heavy	All Tree Species
20	Spruce budworm, heavy defol.	Douglas-fir	78	Diplota	Softwoods
21	Douglas-fir tussock moth	Douglas-fir	79	Prionus bark stain	Common Pinon
22	Pine looper	Ponderosa Pine	80	Fire	All Tree Species
23	Pine tortrix	Ponderosa Pine	81	Phenacoma	All Tree Species
24	Teal caterpillar	Hardwoods	82	Windthrow	All Tree Species
25	Leaf beetles	Hardwoods	83	High water damage	All Tree Species
26	Oak leaf roller	Hardwoods	84	Avulsaria	All Tree Species
27	Pine needle-sheath miner	Ponderosa Pine	85	Aspen decline-multiple agents	Quaking Aspen
28	Pine sawflies	Ponderosa Pine	86	Prionus pine mortality	Common Pinon
29	Pine tussock moth	Ponderosa Pine	87	Juniper mortality-unknown agents	Juniper
30	Cankerworms	Hardwoods	88	Quercus oak decline-unknown agents	Quercus Oak
31	Phagomyia	Hardwoods	89	Lumber pine decline-multiple agents	Lumber Pine
32	Unidentified defoliator	All Tree Species	90	Hail damage	All Tree Species
33	Heterodactylus anomus (Forbes armous)	Softwoods	91	Unkown prion	Common Pinon
34	Armillaria ostroyae (Armillaria meles)	Softwoods	100	old prion mortality	Lodgepole Pine
35	Polytopora schweinitzi	Softwoods	101	leaf roll	All Tree Species
36	Phragmites	All Tree Species	102	club elm disease	Elm
37	Cytospora	Unknown	103	club elm disease	Ponderosa Pine
38	Western gall rust	Unknown	104	leaf miner	Spruce, White Spruce
39	Coniosticta rust	Unknown	105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood
40	Stactofromia rust	Lodgepole Pine			

## USGS 100K Quad - Location Map



Legend  
 - Flown Area  
 - State Boundaries  
 - Counties

## 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 17 2009

Projection: UTM NAD83 Zone 13

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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/fhn/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/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.