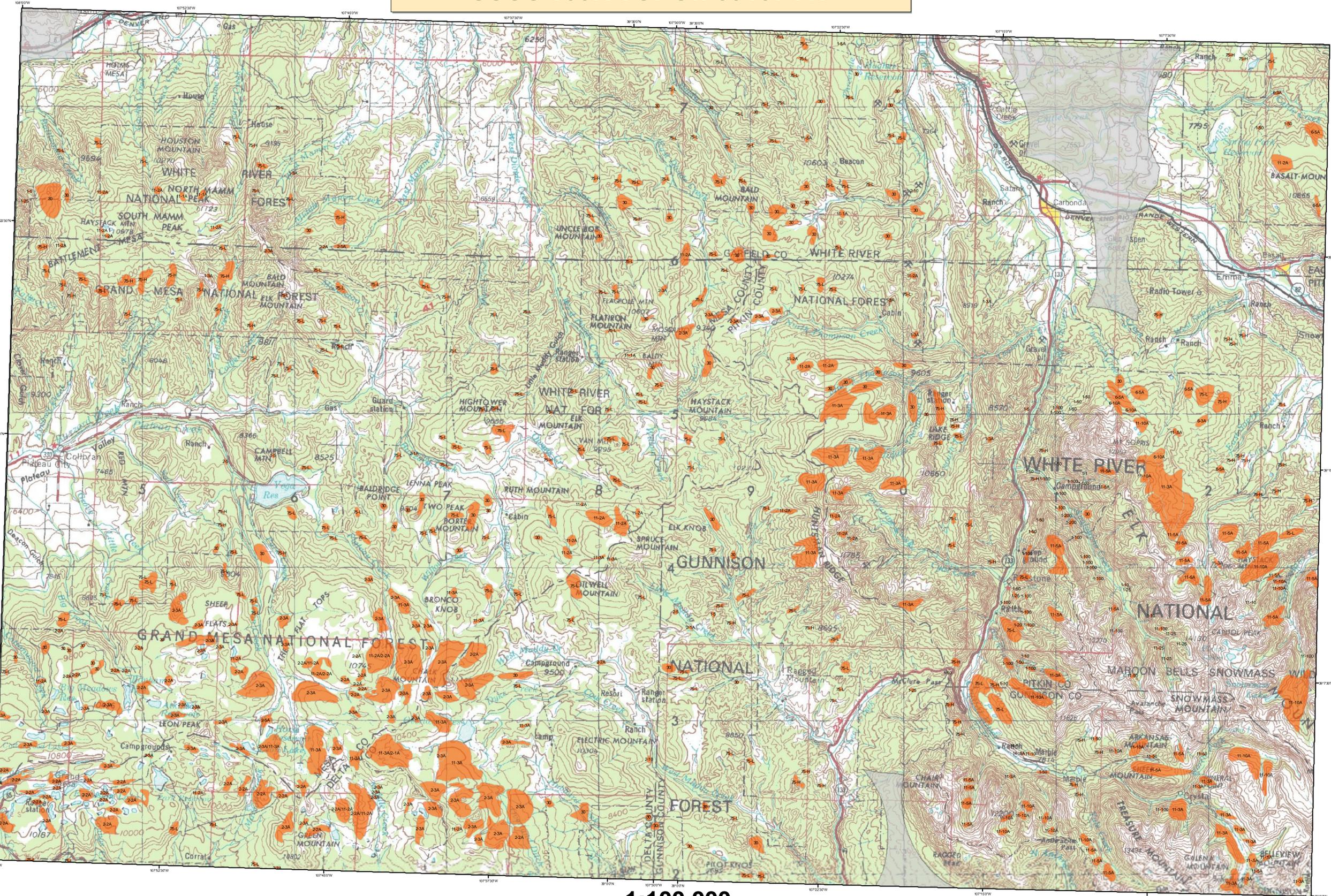


# 2010 Aerial Insect and Disease Survey Carbondale, Colorado USGS 100K TOPO!: 39107-A1



1:100,000

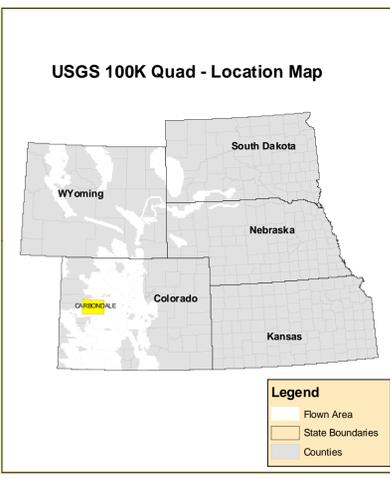
**Legend**

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 "fader" 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 "fader" trees (or an intensity code). For example: 1/25 = The first number before the dash is the causal agent code. The number after the dash is an estimate of the number of dead "fader" 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 "fader" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A "7" is used as a separator when a

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas fir beetle	Aspen	49	Aspen	Lodgepole Pine	107	5-needle flagging	Cottwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	50	White pine blister rust	5-needle Pine	108	fall webworm	Cottwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	51	Deer tick	Softwoods	109	oak leaf	Scotch Pine
4	Mountain pine beetle	Ponderosa Pine	52	Elyrodroma	Ponderosa Pine	110	pinewood nematode	Oak
5	Western pine beetle	Ponderosa Pine	53	Included #5, 6, 8 & 9	All Tree Species	111	sludge disease	All Tree Species
6	Fire Engulfer	White Fir	54	Az polkatis	All Tree Species	112	sonora ip	White Spruce
7	Douglas fir engraver beetle	Softwoods	55	Chemical damage	Softwoods	113	wedged chestnut borer	White Spruce
8	Western bark beetle	Subalpine Fir	56	Lophodermium pinastri	Douglas fir	114	anthracnose like foliar disease	Bur Oak
9	Western bark beetle	Subalpine Fir	57	Rhabdocline pseudotsugae	Douglas fir	115	Diaporion	All Tree Species
10	Western bark beetle	Subalpine Fir	58	Lophodermium araucariae	Softwoods	116	Diaporion	All Tree Species
11	Western bark beetle	Subalpine Fir	59	Leucosticte acicola	Softwoods	117	Diaporion	All Tree Species
12	Pine engraver	Lodgepole Pine	60	Lophodermium concolor	Softwoods	118	Diaporion	All Tree Species
13	Pine engraver	Lodgepole Pine	61	Needle cast (Hypodemateaceae)	Softwoods	119	Flagging	All Tree Species
14	Pine engraver	Ponderosa Pine	62	Needle cast (Hypodemateaceae)	Softwoods	120	Aspen tent	Quaking Aspen
15	Ponderosa pine needle miner	Lodgepole Pine	63	Root Rot	All Tree Species	121	Mansonia Blight	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa Pine	64	Unidentified disease	All Tree Species	200	Diaback (ash)	Ash
17	Jack pine budworm	Jack Pine	65	Winter damage light	All Tree Species	201	Diaback (cottonwood)	All Tree Species
18	Jack pine budworm, light defol.	Douglas fir	66	Winter damage medium	All Tree Species	202	Diaback (hardwood)	Hardwoods
19	Jack pine budworm, heavy defol.	Douglas fir	67	Winter damage heavy	All Tree Species	203	Diaback (oak)	Oak
20	Pine Bark	Ponderosa Pine	68	Deltoide	All Tree Species	204	Mortality (eastern cedar)	Eastern Red Cedar
21	Pine looper	Ponderosa Pine	69	Pinon black stain	Common Pinon	210	Mortality (old cottonwood)	Cottwood/Poplar
22	Test caterpillars	Hardwoods	70	Pine	All Tree Species	211	Mortality (spruce)	Spruce
23	Leaf beetles	Hardwoods	71	Porcupine	Softwoods	212	Mortality (hardwood)	Hardwoods
24	Oak leaf roller	Hardwoods	72	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Pine needle-needle miner	Ponderosa Pine	73	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Pine sawflies	Ponderosa Pine	74	Avulsione	All Tree Species	220	Diaporion (ash)	Ash
27	Pine tussock moth	Ponderosa Pine	75	Aspen decline-multiple agents)	Common Pinon	221	Diaporion (cottonwood)	Cottwood/Poplar
28	Pine tussock moth	Ponderosa Pine	76	Pinon pine mortality	Common Pinon	222	Diaporion (oak)	Cottwood/Poplar
29	Canterflies	Hardwoods	77	Juniper mortality-unknown agents)	Juniper	223	Diaporion (eastern cedar)	Eastern Red Cedar
30	Unidentified defoliar	Softwoods	78	Gambel oak decline-unknown agents)	Gambel Oak	224	Diaporion (hardwood)	Hardwoods
31	Heterobasidium annosum (Fomes annosus)	All Tree Species	79	Limber pine decline-multiple agents)	Limber Pine	225	Diaporion (spruce)	Spruce
32	Armillaria ostoyae (Armillaria mellea)	Softwoods	80	Hail damage	Unknown	230	Harbicide (cottonwood)	Cottwood/Poplar
33	Polyporus schweinitzii	Softwoods	81	Unknown polygon	Unknown	231	Harbicide (eastern cedar)	Eastern Red Cedar
34	Cytospora	All Tree Species	82	Unknown polygon	Common Pinon	232	Harbicide (hardwood)	Hardwoods
35	Western gall rust	Unknown	83	Unknown polygon	Lodgepole Pine	240	Unidentified defoliar (cottonwood)	Cottwood/Poplar
36	Comandra rust	Unknown	84	Unknown polygon	Lodgepole Pine	250	Unidentified defoliar (oak)	Oak
37	Stemflow rust	Lodgepole Pine	85	Unknown polygon	Lodgepole Pine	260	Unidentified defoliar (hardwood)	Hardwoods
38	Stemflow rust	Lodgepole Pine	86	Unknown polygon	Lodgepole Pine	270	Mortality (pine)	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 November 1 2010**  
**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/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.