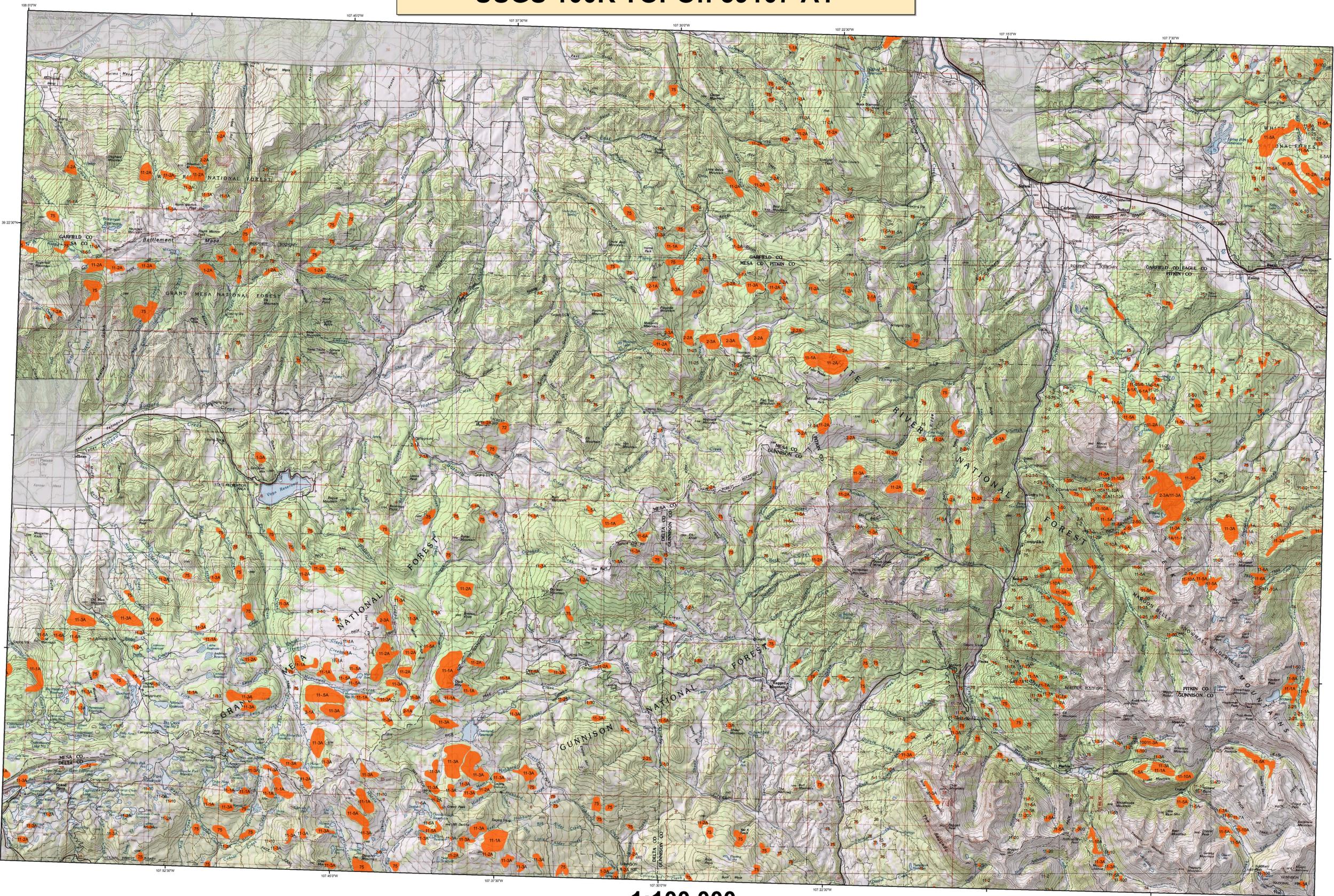


2006 Aerial Insect and Disease Survey Carbondale, Colorado USGS 100K TOPO!: 39107-A1



1:100,000

Legend

Causal Agent(s) (Orange shaded area)
Not Flown in 2006 (Grey shaded area)

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 acreage estimates are used after the causal agent code instead of number of dead "fader" trees (or an intensity code). For example: 5-120A = The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "fader" 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 "fader" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A / 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	Douglas fir	49	Anoploa	Lodgepole Pine	106	Fire scorpion flapping	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann spruce	50	White pine blister rust	5-needle pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa pine	51	Deer tick	Softwoods	108	east ash	Softwoods
4	Mountain pine beetle	Lodgepole pine	52	Elyrodroma	Ponderosa pine	109	pinewood nematode	Scotch Pine
5	Western pine beetle	Sitka spruce	53	Insects 05, 06 & 08	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa pine	54	Aspidiotus	All Tree Species	111	oak leaf disease	All Tree Species
7	Fire engraver	White fir	55	Chemical damage	All Tree Species	112	spruce ips	White Spruce
8	Fire engraver	Douglas fir	56	Lophodermium concolor	Softwoods	113	woolly chestnut borer	Softwoods
9	Douglas fir engraver beetle	Douglas fir	57	Rhabdocline pseudotsugae	Douglas fir	114	ambrosia like foliar disease	Bur Oak
10	Western balsam bark beetle	Subalpine fir	58	Lophodermium concolor	Softwoods	115	Diabrotica	All Tree Species
11	Unidentified bark beetle	Lodgepole pine	59	Lophodermium concolor	Softwoods	116	Diabrotica	All Tree Species
12	Pine engraver	Lodgepole pine	60	Lophodermium concolor	Softwoods	117	Diabrotica	All Tree Species
13	Pine engraver	Lodgepole pine	61	Needle cast (Hypodermataceae)	Softwoods	118	Mortality	All Tree Species
14	Pine engraver	Ponderosa pine	62	Needle cast (Hypodermataceae)	Softwoods	119	Flagging	All Tree Species
15	Ponderosa pine needle miner	Lodgepole pine	63	Road kill	All Tree Species	120	aspen bark	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa pine	64	Unidentified disease	Softwoods	121	Marsipposia blight	Quaking Aspen
17	Jack pine budworm	Jack pine	65	Winter damage light	All Tree Species	200	Diabrotica (ash)	Ash
18	Spruce budworm, light defol.	Douglas fir	66	Winter damage medium	All Tree Species	201	Diabrotica (cottonwood)	Cottonwood/Poplar
19	Spruce budworm, heavy defol.	Douglas fir	67	Winter damage heavy	All Tree Species	202	Diabrotica (hardwood)	Hardwoods
20	Pine tussock moth	Ponderosa pine	68	Diabrotica	Softwoods	204	Diabrotica (oak)	Oak
21	Pine butterfly	Ponderosa pine	69	Pinus black stain	Common Pinus	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Pine looper	Ponderosa pine	70	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Leaf caterpillars	Hardwoods	71	Porcupine	Softwoods	212	Mortality (hardwood)	Hardwoods
24	Leaf beetles	Hardwoods	72	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Oak leaf roller	Hardwoods	73	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Pine needle-shed miner	Ponderosa pine	74	Avulsione	All Tree Species	220	Diabrotica (ash)	Ash
27	Pine sawflies	Ponderosa pine	75	Aspen decline-multiple agent(s)	Quaking Aspen	221	Unidentified defolator (elm)	Softwoods
28	Pine tussock moth	Ponderosa pine	76	Pinus pine mortality	Common Pinus	222	Diabrotica (cottonwood)	Cottonwood/Poplar
29	Cankers/rot	Hardwoods	77	Juniper mortality-unknown agent(s)	Juniper	223	Diabrotica (eastern cedar)	Eastern Red Cedar
30	Variable oak leaf caterpillar	Hardwoods	78	Quercus oak decline-unknown agent(s)	Quercus oak	224	Diabrotica (hardwood)	Hardwoods
31	Unidentified defolator	All Tree Species	79	Limber pine decline-multiple agent(s)	Limber Pine	225	Diabrotica (oak)	Oak
32	Heterobasidion annosum (Fomes annosus)	Softwoods	80	Hail damage	All Tree Species	226	Diabrotica (spruce)	Spruce
33	Armillaria ostoyae (Armillaria mellea)	Softwoods	81	Unknown polygon	Unknown	230	Harbicide (cottonwood)	Cottonwood/Poplar
34	Polygonum schweinfii	Softwoods	82	old prairie mortality	Common Pinus	231	Harbicide (eastern cedar)	Eastern Red Cedar
35	Phytophthora	Softwoods	83	old prairie mortality	Lodgepole Pine	232	Unidentified defolator (hardwood)	Hardwoods
36	Cytospora	All Tree Species	84	dutch elm disease	Elm	250	Unidentified defolator (cottonwood)	Cottonwood/Poplar
37	Western gall rust	Unkn	85	spikea blight	Ponderosa Pine	251	Unidentified defolator (elm)	Elm
38	Comandra rust	Unkn	104	lps hunter	Spruce, White Spruce	252	Unidentified defolator (hardwood)	Hardwoods
39	Shearblow rust	Lodgepole Pine	105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood	253	Mortality (pine)	Pine

USGS 100K Quad - Location Map



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.

Area surveyed by Pat Ahern & Kelly Rogers 09/19 - 09/20 2006
Erik Johnson & Pat Ahern 07/24 - 07/31 2006
Map Created: 01/03/2007
Projection: UTM NAD83 Zone 13
Author: J. Ross, USDA Forest Service

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
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.

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/>