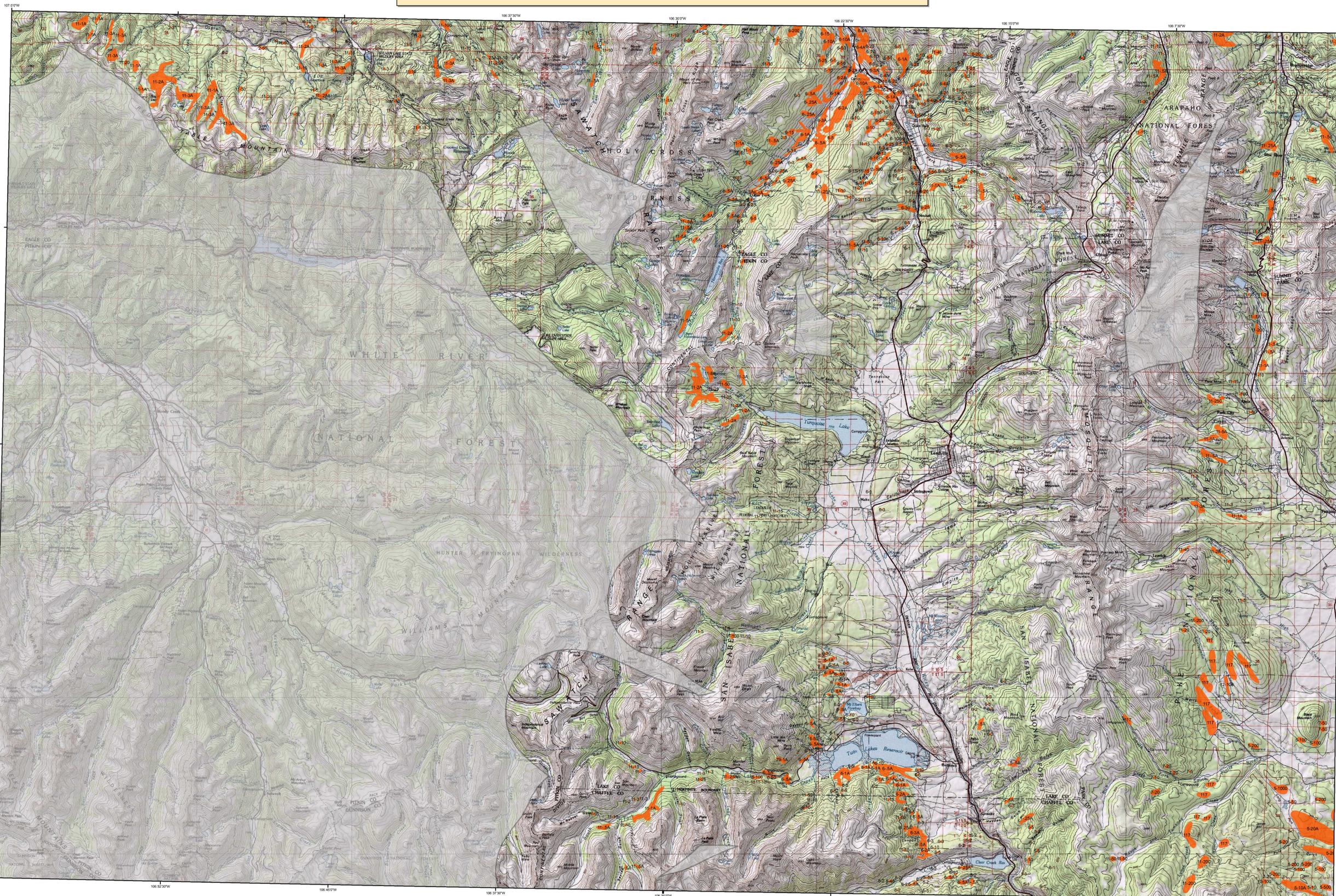


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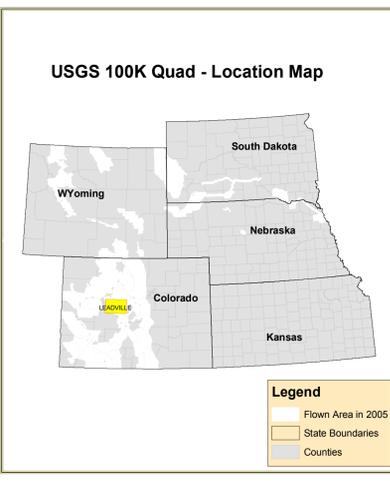


1:100,000

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 "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: 5-122A = 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 point/polygon has more than one causal agent code.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas fir beetle	Douglas fir	40	Aspen	Lodgepole Pine	102	Ice storm flagging	Cottwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	51	White pine blister rust	5-Needle Pine	107	fall sawworm	Cottwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	61	Dwarf mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	Lodgepole Pine	52	Eurodesmia	Ponderosa Pine	109	greenwood nematode	Scots Pine
5	Mountain pine beetle	5-Needle Pine	53	Includes #50, 55 & 58	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	54	Air pollution	All Tree Species	111	silvage disease	All Tree Species
7	Fire Engraver	White Fir	55	Chemical damage	All Tree Species	112	spruce ips	White Spruce
8	Douglas fir engraver beetle	Douglas fir	56	Lophodermium pinastri	Softwoods	113	swelled chestnut borer	Oak
9	Western balsam bark beetle	Subalpine Fir	57	Rhabdocline pseudotsugae	Douglas fir	114	anthracnose like foliar disease	Bur Oak
10	Unidentified bark beetle	Softwoods	58	Lophodermella acuta	Softwoods	115	Diaback	All Tree Species
11	Pine engraver	Lodgepole Pine	59	Leucostoma acicola	Softwoods	116	Mortality	All Tree Species
12	Pine engraver	Ponderosa Pine	60	Lophodermella concolor	Softwoods	117	Discoloration	All Tree Species
13	Pine engraver	Lodgepole Pine	61	Dactylopius sp.	Softwoods	118	Herbicide	All Tree Species
14	Pine engraver	Ponderosa Pine	62	Needle cast (hypodermataceae)	Softwoods	119	Flagging	All Tree Species
15	Lodgepole pine needle miner	Lodgepole Pine	63	Root Rot	All Tree Species	120	aspen tortrix	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa Pine	64	Unidentified disease	Softwoods	121	Marsdenia Blight	Quaking Aspen
17	Jack pine budworm	Jack Pine	65	Winter damage light	All Tree Species	200	Diaback (ash)	Ash
18	Spruce budworm, light defol.	Douglas fir	66	Winter damage medium	All Tree Species	201	Diaback (cottonwood)	Cottwood/Poplar
19	Spruce budworm, medium defol.	Douglas fir	67	Winter damage heavy	All Tree Species	202	Diaback (hardwood)	Hardwoods
20	Spruce budworm, heavy defol.	Douglas fir	68	Diploia	Softwoods	204	Diaback (oak)	Oak
21	Winter damage moth	Douglas fir	69	Prion bark stain	Common Pinon	210	Mortality (red cottonwood)	Cottwood/Poplar
22	Pine Buttefly	Ponderosa Pine	70	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Pine looper	Ponderosa Pine	71	Fire	All Tree Species	212	Mortality (hardwood)	Hardwoods
24	Leaf beetles	Hardwoods	72	Fire	All Tree Species	213	Mortality (oak)	Oak
25	Oak leaf roller	Hardwoods	73	Fire	All Tree Species	214	Mortality (spruce)	Spruce
26	Oak leaf roller	Hardwoods	74	Avulsion	All Tree Species	220	Discoloration (ash)	Ash
27	Pine needle-sheath miner	Ponderosa Pine	75	Aspen decline-multiple agents)	Quaking Aspen	221	Discoloration (cedar)	Softwoods
28	Pine tussock moth	Ponderosa Pine	76	Prion bark stain	Common Pinon	222	Discoloration (cottonwood)	Cottwood/Poplar
29	Pine tussock moth	Ponderosa Pine	77	Juniper mortality-unknown agents)	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
30	Cankerworms	Hardwoods	78	Chambic oak decline-unknown agents)	Quaking Oak	224	Discoloration (hardwood)	Hardwoods
31	Variable oak leaf defoliator	All Tree Species	79	Lumber pine decline-multiple agents)	Lumber Pine	225	Discoloration (oak)	Oak
32	Unidentified defoliator	All Tree Species	80	Hail damage	All Tree Species	226	Discoloration (spruce)	Spruce
33	Heterobasidion annosum (Pines annosus)	Softwoods	89	Unknown pathogen	Softwoods	230	Herbicide (cottonwood)	Cottwood/Poplar
34	Armillaria ostroyae (Armillaria mellea)	Softwoods	100	old prison mortality	Lodgepole Pine	231	Herbicide (eastern cedar)	Eastern Red Cedar
35	Polytoporus softwoodii	Softwoods	101	road salt	Softwoods	240	Flagging (hardwood)	Hardwoods
36	Phomopsis	Softwoods	102	oak elm disease	Elm	250	Unidentified defoliator (cottonwood)	Cottwood/Poplar
37	Cytospora	All Tree Species	103	oak leaf roller	Hardwoods	251	Unidentified defoliator (elm)	Elm
38	Western gall rust	Unknown	104	oak leaf roller	Hardwoods	252	Unidentified defoliator (hardwood)	Hardwoods
39	Concordia rust	Unknown	105	oak leaf roller	Hardwoods	300	Mortality (pine)	Pine
40	Strobilomyces rust	Lodgepole Pine	106	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood			



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 Erik Johnson 8/22 - 9/7 2005
Map Created: 02-06
Projection: UTM NAD83 Zone 13
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****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/>