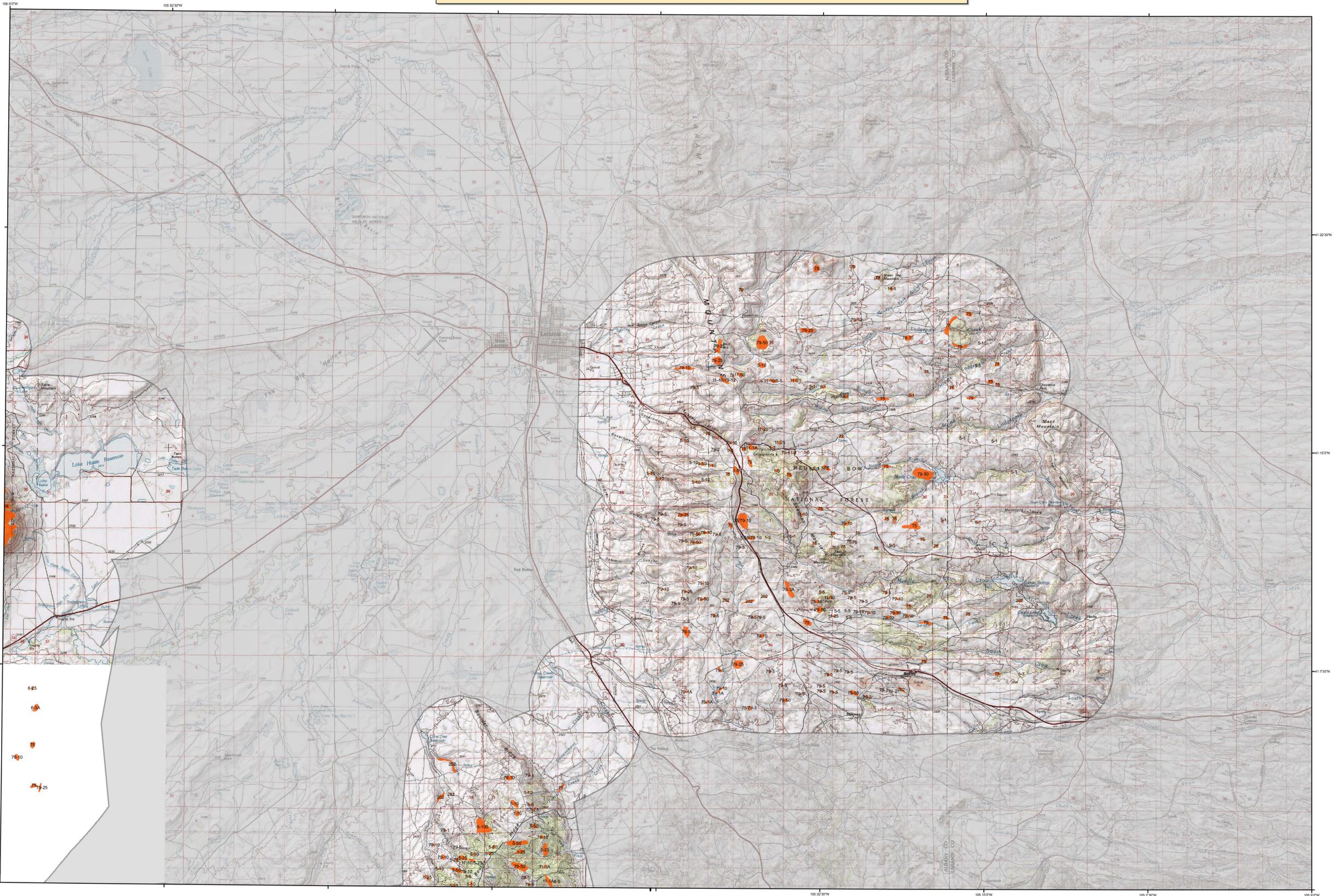
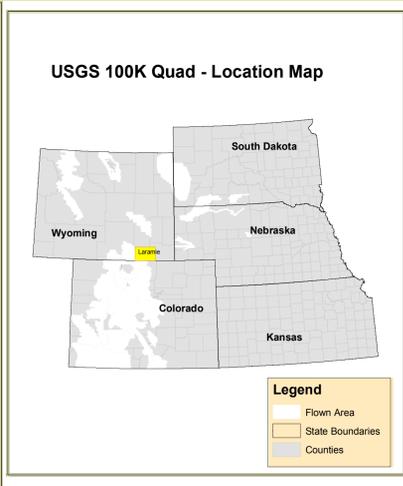


2007 Aerial Insect and Disease Survey Laramie, Wyoming USGS 100K TOPO! 41105-A1



1:100,000

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas fir beetle	Douglas fir	40	Arsenites	Lodgepole Pine	105	Tom thorn	Hagging
2	Engelmann Spruce Beetle	Engelmann Spruce	41	White pine blister rust	5-Needle Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	42	Dwarf mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	Lodgepole Pine	43	Elytromera	Ponderosa Pine	109	pinewood nematode	Softwoods
5	Mountain pine beetle	5-Needle Pine	44	Air pollutants	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	45	Chemical damage	All Tree Species	111	foliage disease	All Tree Species
7	Fire Engulfer	White Fir	46	Lophodermium praeasti	Softwoods	112	spruce Ips	White Spruce
8	Douglas fir engraver beetle	Douglas fir	47	Rhabdoline pseudotsugae	Douglas fir	113	twined chestnut borer	Oak
9	Western balsam bark beetle	Subalpine Fir	48	Lophodermium arcuta	Softwoods	114	anthracnose like foliar disease	Bur Oak
10	Unidentified bark beetle	Lodgepole Pine	49	Lecanotia aspicosa	Softwoods	115	Diaback	All Tree Species
11	Pine engraver	Ponderosa Pine	50	Lophodermium concolor	Softwoods	116	Mortality	All Tree Species
12	Pine engraver	Lodgepole Pine	51	Dobsonia sp.	Softwoods	117	Discoloration	All Tree Species
13	Pine engraver	Lodgepole Pine	52	Neelara cast (Hymenoptera)	Softwoods	118	Heticoid	All Tree Species
14	Pine engraver	Ponderosa Pine	53	Rioot Rot	All Tree Species	119	Flagging	All Tree Species
15	Ponderosa pine needle miner	Lodgepole Pine	54	Unidentified disease	All Tree Species	120	aspen tortrix	Quaking Aspen
16	Lodgepole pine needle miner	Lodgepole Pine	55	Winter damage light	All Tree Species	121	Marsipona Bright	Quaking Aspen
17	Jack pine budworm	Jack Pine	56	Winter damage medium	All Tree Species	200	Diaback (ash)	Ash
18	Spruce budworm, light defol.	Douglas fir	57	Winter damage heavy	All Tree Species	201	Diaback (cottonwood)	Cottonwood/Poplar
19	Spruce budworm, medium defol.	Douglas fir	58	Winter damage heavy	All Tree Species	202	Diaback (hardwood)	Hardwoods
20	Spruce budworm, heavy defol.	Douglas fir	59	Pinyon black stain	Common Pinyon	204	Mortality (oak)	Oak
21	Douglas fir tussock moth	Douglas fir	60	Fire	All Tree Species	210	Mortality (eastern cedar)	Eastern Red Cedar
22	Pine butterfly	Ponderosa Pine	61	Pineup	Softwoods	211	Mortality (oak)	Oak
23	Pine tortrix	Ponderosa Pine	62	Winter damage heavy	All Tree Species	212	Mortality (spruce)	Spruce
24	Leaf sawflies	Hardwoods	63	High water damage	All Tree Species	213	Discoloration (ash)	Ash
25	Oak leaf roller	Hardwoods	64	Aspen decline-multiple agent(s)	Quaking Aspen	221	Discoloration (cottonwood)	Cottonwood/Poplar
26	Pine needle-shaft miner	Ponderosa Pine	65	Pinyon mortality	Common Pinyon	222	Discoloration (eastern cedar)	Eastern Red Cedar
27	Pine sawflies	Ponderosa Pine	66	Juniper mortality-unknown agent(s)	Juniper	223	Discoloration (oak)	Oak
28	Variable oak leaf caterpillar	Hardwoods	67	Limber pine mortality	Limber Pine	224	Discoloration (spruce)	Spruce
29	Unidentified defoliator	All Tree Species	68	Hail damage	All Tree Species	225	Flagging (hardwood)	Hardwoods
30	Hawthorn sawfly (Fomes annosus)	Softwoods	69	Unknown polygon	Softwoods	231	Discoloration (spruce)	Spruce
31	Amelara corymbosa (Amelara mellea)	Softwoods	70	old pinon mortality	Common Pinyon	232	Mortality (eastern cedar)	Eastern Red Cedar
32	Polyporus schweinitzii	Softwoods	71	road salt top	Lodgepole Pine	240	Flagging (hardwood)	Hardwoods
33	Phomopsis	Softwoods	72	oak wilt disease	Elm	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
34	Cylindropuntia	Unknown	73	dogwood blight	Ponderosa Pine	251	Unidentified defoliator (elm)	Elm
35	Western gall rust	Unknown	74	dogwood blight	Ponderosa Pine	252	Unidentified defoliator (hardwood)	Hardwoods
36	Comandra rust	Unknown	75	dogwood blight	Ponderosa Pine	300	Mortality (pine)	Pine
37	Shabaciforme rust	Lodgepole Pine	76	dogwood blight	Ponderosa 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.

Area surveyed by Bill Schaupp & Brian Howell
Map Created: 12/12/2007
Projection: UTM NAD83 Zone 13
Author: J. Ross, USDA Forest Service

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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/>