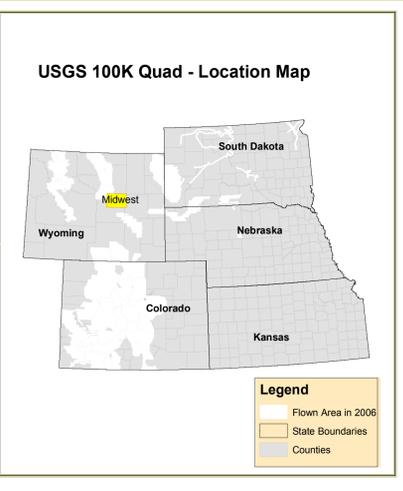


2006 Aerial Insect and Disease Survey Midwest, Wyoming USGS 100K TOPO!: 43106-A1



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	Atropella	Lodgepole Pine	106	fox squirrel flagg	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann Spruce	41	White pine blister rust	White Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	51	Dwarf mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	Lodgepole Pine	52	Elysiodes	Ponderosa Pine	109	pinewood nematode	Scots Pine
5	Mountain pine beetle	5-Needle Pine	53	Includes #55, 05 & 05	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	54	Air pollutants	All Tree Species	111	foliage disease	All Tree Species
7	White fir engraver	White Fir	55	Arbutus damage	All Tree Species	112	spruce top	White Spruce
8	Douglas-fir engraver beetle	Douglas-fir	56	Lophodermium pinastri	Softwoods	113	twined chestnut borer	All Tree Species
9	Western balsam bark beetle	Subalpine Fir	57	Rhizoctonia pseudotypogae	Douglas-fir	114	anthracnose like foliar disease	Scots Pine
10	Unidentified bark beetle	Softwoods	58	Lophodermium arcuta	Softwoods	115	Diaback	All Tree Species
11	Pine engraver	Lodgepole Pine	59	Lophodermium arcuta	Softwoods	116	aspen tortrix	All Tree Species
12	Pine engraver	Lodgepole Pine	60	Lophodermium concolor	Softwoods	117	Mortality	All Tree Species
13	Pine engraver	Ponderosa Pine	61	Diphtheria siri	Softwoods	118	Discoloration	All Tree Species
14	Ponderosa pine needle miner	Lodgepole Pine	62	Needle cast (Tropidmatocae)	Softwoods	119	Harbicide	All Tree Species
15	Lodgepole pine needle miner	Ponderosa Pine	63	Root Rot	All Tree Species	120	Flagging	All Tree Species
16	Jack pine budworm	Jack Pine	64	Unidentified disease	Softwoods	121	Marronina blight	Quaking Aspen
17	Spruce budworm, light defol.	Douglas-fir	65	Winter damage light	All Tree Species	122	Diaback (ash)	Quaking Aspen
18	Spruce budworm, medium defol.	Douglas-fir	66	Winter damage medium	All Tree Species	200	Diaback (oak)	Ash
19	Spruce budworm, heavy defol.	Douglas-fir	67	Winter damage heavy	All Tree Species	201	Diaback (cottonwood)	Cottonwood/Poplar
20	Pine looper	Douglas-fir	68	Diploids	Softwoods	202	Diaback (hardwood)	Hardwood
21	Pine tortrix	Ponderosa Pine	69	Pinon black stain	Common Pinon	204	Diaback (oak)	Oak
22	Tent caterpillars	Ponderosa Pine	70	Pinon mortality	Common Pinon	210	Mortality (old cottonwood)	Cottonwood/Poplar
23	Leaf beetles	Hardwoods	71	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
24	Oak leaf roller	Hardwoods	72	Windthrow	All Tree Species	212	Mortality (hardwood)	Hardwoods
25	Pine needle-bark miner	Ponderosa Pine	73	High water damage	All Tree Species	213	Mortality (spruce)	Spruce
26	Pine sawflies	Ponderosa Pine	74	Avian	All Tree Species	214	Discoloration (ash)	Ash
27	Pine sawflies	Ponderosa Pine	75	Aspen decline-multiple agents	Quaking Aspen	221	Discoloration (conifer)	Softwoods
28	Cankworms	Hardwoods	76	Juniper mortality-unknown agent(s)	Common Pinon	222	Discoloration (cottonwood)	Cottonwood/Poplar
29	White oak leaf sawfly	All Tree Species	77	Juniper mortality-unknown agent(s)	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
30	Unidentified defoliator	All Tree Species	78	Limber pine decline-unknown agent(s)	Limber Pine	224	Discoloration (hardwood)	Hardwoods
31	Heterobasidion annosum (Fomes annosus)	Softwoods	79	Limber pine decline-multiple agents	Limber Pine	225	Discoloration (oak)	Oak
32	Amillaria rotynia (Amillaria rotynia)	Softwoods	80	Hail damage	All Tree Species	226	Discoloration (spruce)	Spruce
33	Polyphrus schweinitzi	Softwoods	81	Unknown polygon	Common Pinon	231	Harbicide (eastern cedar)	Eastern Red Cedar
34	Phomopsis	Softwoods	100	old pinon mortality	Common Pinon	240	Flagging (hardwood)	Hardwoods
35	Cytospora	All Tree Species	101	road salt ipg	Lodgepole Pine	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
36	Western gill rust	Unknown	102	dutch elm disease	Elm	251	Unidentified defoliator (elm)	Elm
37	Comandra rust	Unknown	103	lipoida blight	Ponderosa Pine	252	Unidentified defoliator (hardwood)	Hardwoods
38	Strobiliforme rust	Lodgepole Pine	104	fox hawker	Spruce White Spruce	300	Mortality (pine)	Pine
39			105	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 Al Dymerski & Brian Howell 07/26/2006
Map Created: 01/10/2007
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/>