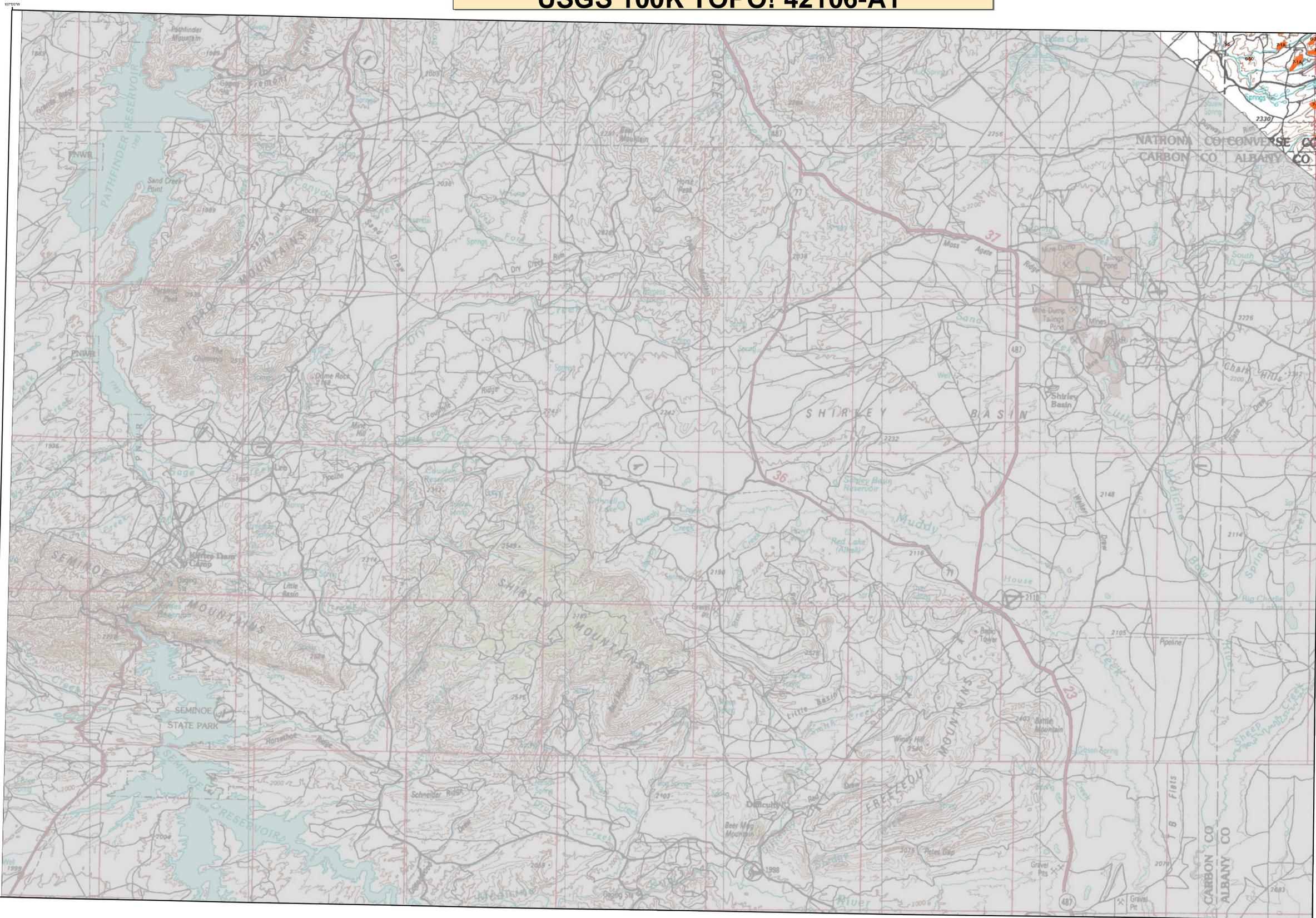


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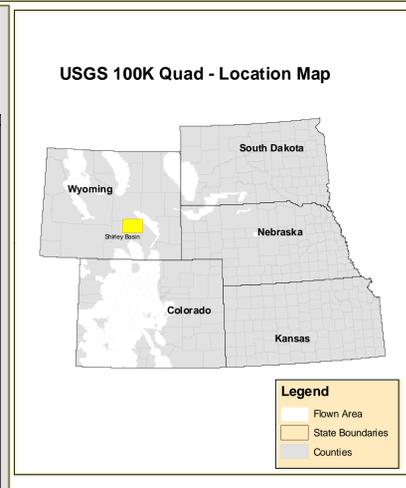


1:100,000

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 "faded" 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 "faded" trees (or an intensity code). For example: 5-1/2A = The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "faded" 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 "faded" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "faded" trees. A "7" 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	Alfalfa	Lodgepole Pine	105	fox squirrel flagg	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann Spruce	41	White pine blister rust	Sitka Spruce	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	Elysiades	Ponderosa Pine	109	powdered nematode	Softwoods
5	Mountain pine beetle	5-Needle Pine	44	Inclusives #05, 00 & 03	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	45	Air pollutants	All Tree Species	111	foliage disease	All Tree Species
7	White fir	White Fir	46	Chemical damage	All Tree Species	112	spine louse	White Spruce
8	Douglas-fir engraver beetle	Douglas-fir	47	Lophodermium pinastri	Softwoods	113	twined chestnut borer	Bur Oak
9	Western balsam bark beetle	Subsopine Fir	48	Rhabdocline assectuagae	Douglas-fir	114	anthracnose leaf blotch disease	Bur Oak
10	Undersized bark beetle	Softwoods	49	Lophodermium arcuta	Softwoods	115	Diaback	All Tree Species
11	Pine engraver	Lodgepole Pine	50	Lecanospira acicola	Softwoods	116	Mortality	All Tree Species
12	Pine engraver	Ponderosa Pine	51	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
13	Ponderosa pine needle miner	Lodgepole Pine	52	Dobsonia pini	Softwoods	118	Hartbeide	All Tree Species
14	Lodgepole pine needle miner	Ponderosa Pine	53	Needle cast (Nepodermataceae)	Softwoods	119	Flagging	All Tree Species
15	Jack pine budworm	Jack Pine	54	Root Rot	All Tree Species	120	aspen tortrix	Quaking Aspen
16	Spruce budworm, light defol.	Douglas-fir	55	Undersized disease	Softwoods	121	Masonna Blight	Quaking Aspen
17	Spruce budworm, medium defol.	Douglas-fir	56	Winter damage light	All Tree Species	200	Diaback (ash)	Ash
18	Spruce budworm, heavy defol.	Douglas-fir	57	Winter damage medium	All Tree Species	201	Diaback (cottonwood)	Cottonwood/Poplar
19	Douglas-fir tussock moth	Douglas-fir	58	Winter damage heavy	All Tree Species	202	Diaback (hardwood)	Hardwoods
20	Pine butterfly	Ponderosa Pine	59	Pinyon bark stain	Softwoods	204	Diaback (oak)	Oak
21	Pine tortrix	Ponderosa Pine	60	Pinyon black stain	Common Pinyon	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Leaf caterpillars	Hardwoods	70	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Leaf beetles	Hardwoods	71	Ponopine	Softwoods	212	Mortality (hardwood)	Oak
24	Oak leaf roller	Hardwoods	72	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Pine needle-shaft miner	Ponderosa Pine	73	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Pine sawflies	Ponderosa Pine	74	Avalanche	All Tree Species	215	Mortality (cottonwood)	Cottonwood/Poplar
27	Pine sawflies	Ponderosa Pine	75	Aspen decline-multiple agents	Quaking Aspen	221	Discoloration (conifer)	Softwoods
28	Cankerworms	Hardwoods	76	Pinyon pine mortality	Common Pinyon	222	Discoloration (decid)	Softwoods
29	Undersized defoliator	All Tree Species	77	Juniper mortality-unknown agents	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
30	Heteroeciaion anisomum (Fomes anisomus)	Softwoods	78	Aspen oak decline-unknown agents	Quaking Oak	224	Discoloration (hardwood)	Oak
31	Amelara entyrea (Amelara mekela)	Softwoods	79	Limber pine decline-multiple agents	Limber Pine	225	Discoloration (oak)	Oak
32	Pityopsis schwartzii	Softwoods	80	Hail damage	All Tree Species	226	Discoloration (spruce)	Spruce
33	Pityopsis schwartzii	Softwoods	81	Unknown polygon	All Tree Species	227	Hartbeide (cottonwood)	Cottonwood/Poplar
34	Cytospora	All Tree Species	100	old pinyon mortality	Common Pinyon	231	Hartbeide (eastern cedar)	Eastern Red Cedar
35	Western gall rust	Unknown	101	road salt	Lodgepole Pine	240	Flagging (hardwood)	Hardwoods
36	Shabelforme rust	Lodgepole Pine	102	dutch elm disease	Elm	250	Undersized defoliator (cottonwood)	Cottonwood/Poplar
37	Shabelforme rust	Lodgepole Pine	103	diploida blight	Ponderosa Pine	251	Undersized defoliator (elm)	Elm
38	Shabelforme rust	Lodgepole Pine	104	fox burdett	Spruce White Spruce	252	Undersized defoliator (hardwood)	Hardwoods
39	Shabelforme rust	Lodgepole Pine	105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood	300	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 December 8 2009
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 2 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.