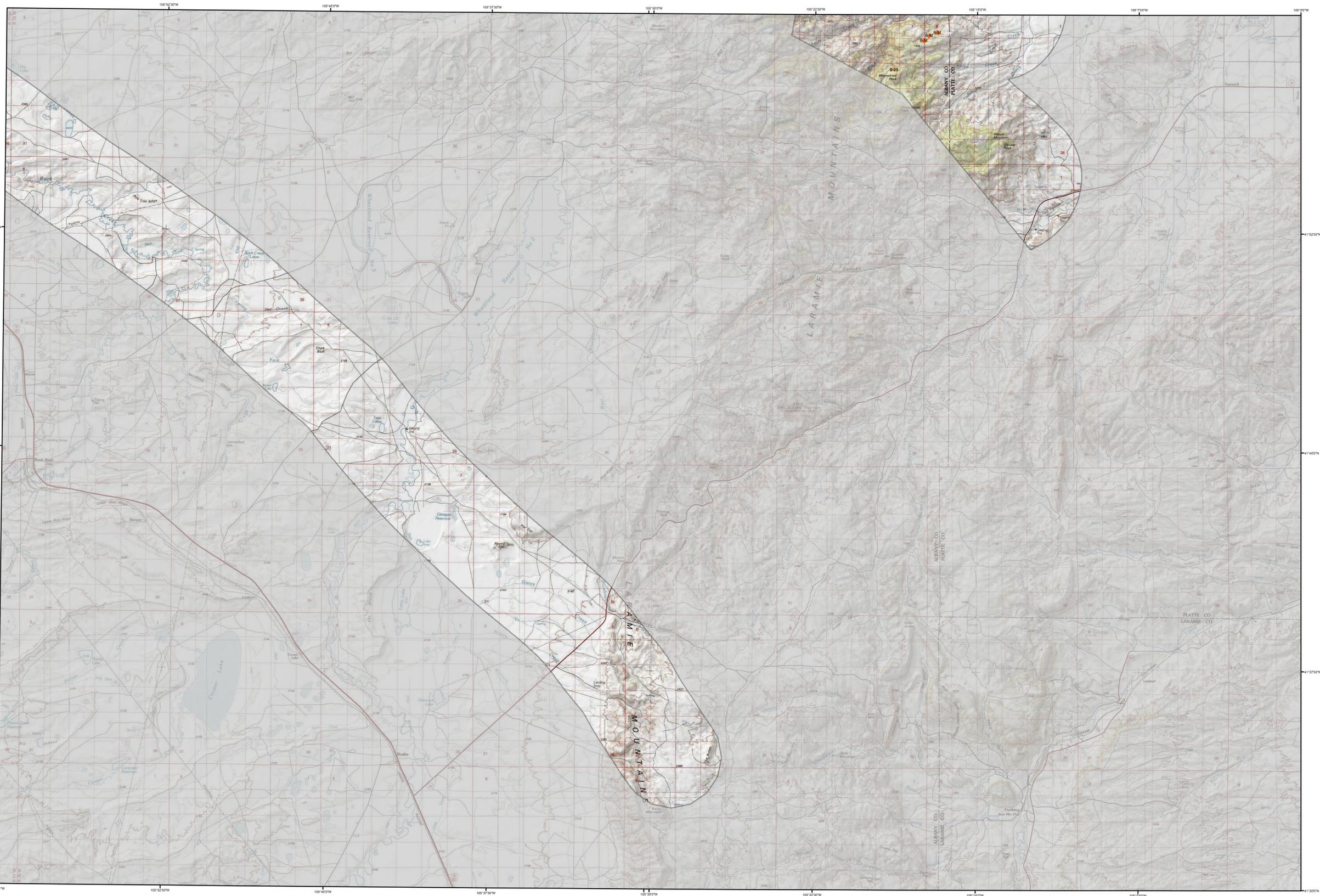
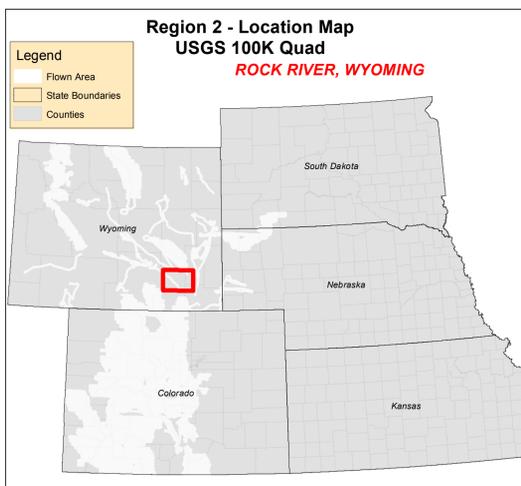


# 2013 Aerial Insect and Disease Survey ROCK RIVER, WYOMING USGS 100K TOPO!: 41105-E1



1:100,000

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Unidentified bark beetle	Douglas-fir	99	Widow	Lodgepole Pine	106	Scy squirrel flapping	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann Spruce	48	Stalactiform rust	Lodgepole Pine	107	fall webworm	Cottonwood/Poplar
3	Blue spruce saw	Blue Spruce	50	White pine blister rust	S-S needle Pine	108	road salt	Softwoods
5	Mountain pine beetle	Ponderosa Pine	51	Deer mistletoe	Ponderosa Pine	109	pine wood nematode	Scotch Pine
7	Mountain pine beetle	S-S needle Pine	52	Elytomyces	Ponderosa Pine	110	oak wilt	All Tree Species
8	Western pine beetle	Ponderosa Pine	53	Inouise #65, 66 & 68	All Tree Species	112	spruce ips	White Spruce
9	Fir engraver	White fir	54	Air pollutants	All Tree Species	113	bedford chestnut borer	Oak
10	Douglas-fir engraver beetle	Douglas-fir	55	Chemical damage	All Tree Species	114	anthracnose like foliar disease	Bur Oak
11	Western balsam bark beetle	Subalpine fir	56	Lophodermium pinastri	Softwoods	115	Dieback	All Tree Species
12	Unidentified bark beetle	Softwoods	57	Rhabdocline pseudotsugae	Douglas-fir	116	Mortality	All Tree Species
13	Pine engraver	Lodgepole Pine	58	Lophodermium arcuta	Softwoods	117	Discoloration	All Tree Species
14	Pine engraver	Ponderosa Pine	59	Lecanostoma acicola	Softwoods	118	Herbicide	All Tree Species
15	Ponderosa pine needle miner	Lodgepole Pine	61	Dofstomium pini	Softwoods	119	Flagging	All Tree Species
16	Lodgepole pine needle miner	Ponderosa Pine	62	Needle cast (Hypodermataceae)	All Tree Species	120	aspen tortrix	Quaking Aspen
17	Jack pine budworm	Jack Pine	63	Root Rot	All Tree Species	121	Miscanoxia blight	Quaking Aspen
18	Spruce budworm, light defol.	Douglas-fir	64	Unidentified disease	Softwoods	200	Dieback (ash)	Ash
19	Spruce budworm, medium defol.	Douglas-fir	65	Winter damage light	All Tree Species	201	Dieback (cottonwood)	Cottonwood/Poplar
20	Spruce budworm, heavy defol.	Douglas-fir	66	Winter damage medium	All Tree Species	202	Dieback (hardwood)	Hardwoods
22	Douglas-fir tussock moth	Douglas-fir	67	Winter damage heavy	All Tree Species	204	Dieback (oak)	Oak
23	Pine butterfly	Ponderosa Pine	68	Dipodia	Softwoods	210	Mortality (old cottonwood)	Cottonwood/Poplar
26	Pine looper	Ponderosa Pine	69	Prion black stain	Common Prinson	211	Mortality (eastern cedar)	Eastern Red Cedar
27	Pine tortrix	Ponderosa Pine	70	Fire	All Tree Species	212	Mortality (hardwood)	Hardwoods
28	Tent caterpillar	Hardwoods	71	Porcupine	Softwoods	213	Mortality (oak)	Oak
29	Leaf beetles	Hardwoods	72	Windthrow	All Tree Species	214	Mortality (spruce)	Spruce
30	Aspen defoliation	Quaking Aspen	73	High water damage	All Tree Species	220	Discoloration (ash)	Ash
33	Oak leaf roller	Hardwoods	74	Avetanche	All Tree Species	221	Discoloration (coulter)	Softwoods
34	Pine needle-sheath miner	Ponderosa Pine	75	Aspen decline-multiple agents)	Quaking Aspen	222	Discoloration (cottonwood)	Cottonwood/Poplar
35	Pine sawflies	Ponderosa Pine	76	Prion pine mortality	Common Prinson	223	Discoloration (eastern cedar)	Eastern Red Cedar
36	Pine tussock moth	Ponderosa Pine	77	Juniper mortality-unknown agents)	Juniper	224	Discoloration (hardwood)	Hardwoods
37	Cankers/rot	Hardwoods	78	Cambial dieback-unknown agents)	Gambel Oak	225	Discoloration (oak)	Oak
38	Variable oak leaf caterpillar	Hardwoods	79	Limber pine decline-multiple agents)	Limber Pine	228	Discoloration (spruce)	Spruce
39	Unidentified defoliator	All Tree Species	80	Hail damage	All Tree Species	230	Herbicide (cottonwood)	Cottonwood/Poplar
40	Cottonwood Decline/Mortality	Softwoods	89	Unknown polygon	Unknown	231	Herbicide (eastern cedar)	Eastern Red Cedar
41	Heterobasidion annosum (Fomes annosus)	Softwoods	100	old pinon mortality	Common Prinson	240	Flagging (hardwood)	Hardwoods
42	Armillaria ostoyae (Armillaria mellea)	Softwoods	101	rod salt ip	Lodgepole Pine	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
43	Phomopsis	Softwoods	102	cutch elm disease	Elm	251	Unidentified defoliator (elm)	Elm
44	Cytospora	All Tree Species	103	diploia blight	Ponderosa Pine	262	Unidentified defoliator (hardwood)	Hardwoods
45	Western gall rust	Unknown	105	straggle killed narrow leaf cottonwood	Narrowleaf Cottonwood	300	Mortality (spruce)	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: 1/2/2014**  
**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 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.