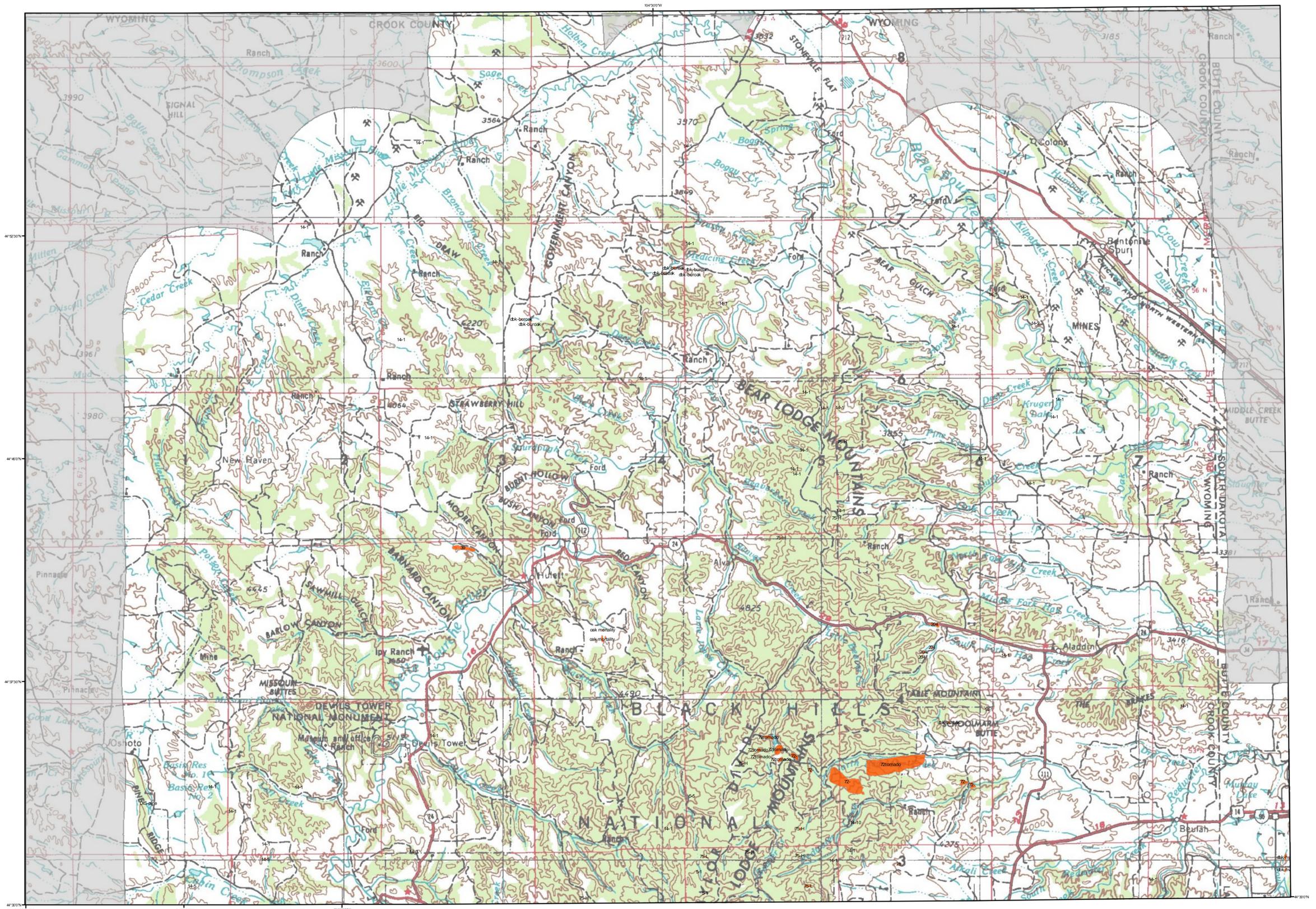
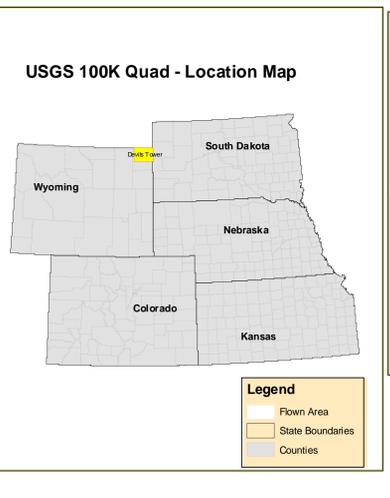


2009 Aerial Insect and Disease Survey Devils Tower, Wyoming USGS 100K TOPO! 44104-E1



1:100,000

Legend		Causal Agent(s)		Not Flown	
Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	49	Atropisella	Lodgepole Pine
2	Engelmann spruce beetle	Engelmann spruce	50	White pine blister rust	Lodgepole Pine
5	Mountain pine beetle	Ponderosa Pine	51	Dwarf mistletoe	Softwoods
7	Mountain pine beetle	Lodgepole Pine	62	Elysiptera	Ponderosa Pine
8	Western pine beetle	Shade Pine	63	Inedules red. 05 & 09	All Tree Species
9	Fir engraver	Ponderosa Pine	64	Air pollutants	All Tree Species
10	Douglas-fir engraver beetle	White Fir	65	Chemical damage	All Tree Species
11	Western balsam bark beetle	Douglas-fir	66	Lophodermium pinasti	Softwoods
12	Undersized bark beetle	Subalpine Fir	67	Rhabdium pseudotsugae	Douglas-fir
13	Pine engraver	Softwoods	68	Lophodermium arcebuti	Softwoods
14	Pine engraver	Lodgepole Pine	69	Laetisporia acicola	Softwoods
15	Ponderosa pine needle miner	Ponderosa Pine	80	Lophodermium concolor	Softwoods
16	Lodgepole pine needle miner	Lodgepole Pine	81	Dofhinoma pini	All Tree Species
17	Jack pine budworm	Ponderosa Pine	82	Needle cast (Nipodermataceae)	Softwoods
18	Spruce budworm, light defol.	Jack Pine	83	Root Rot	All Tree Species
19	Spruce budworm, medium defol.	Douglas-fir	84	Unidentified disease	Softwoods
20	Spruce budworm, heavy defol.	Douglas-fir	85	Winter damage light	All Tree Species
21	Douglas-fir needle miner	Douglas-fir	86	Winter damage medium	All Tree Species
22	Pine butterfly	Douglas-fir	87	Winter damage heavy	All Tree Species
23	Leaf beetles	Ponderosa Pine	88	Diolida	Softwoods
24	Oak leaf roller	Hardwoods	89	Prion black stain	Common Pinyon
25	Pine needle-shaft miner	Ponderosa Pine	90	Porcupine	All Tree Species
26	Pine sawflies	Hardwoods	91	Windthrow	All Tree Species
27	Pine sawflies	Ponderosa Pine	92	High water damage	All Tree Species
28	Pine sawflies	Ponderosa Pine	93	Limber pine decline-multiple agents)	All Tree Species
29	Pine sawflies	Ponderosa Pine	94	Aspen decline-multiple agents)	All Tree Species
30	Pine sawflies	Ponderosa Pine	95	Prion pine mortality	Common Pinyon
31	Pine sawflies	Ponderosa Pine	96	Juniper mortality (unknown agents)	Juniper
32	Unidentified defoliator	Hardwoods	97	Gambel oak decline-unknown agents)	Gambel Oak
33	Heterobasidion annosum (Fomes annosus)	Softwoods	98	Limber pine decline-multiple agents)	Limber Pine
34	Armillaria ostroyae (Armillaria mellea)	Softwoods	99	Hail damage	All Tree Species
35	Polytopus schweinfii	Softwoods	100	Unmanned polygon	Unknown
36	Phomopsis	Softwoods	101	Old pine mortality	Common Pinyon
37	Catkins	Softwoods	102	road salt tip	Lodgepole Pine
38	Western gall rust	Unknown	103	spolida blight	Elm
39	Coniophora rust	Unknown	104	Ice burning	Ponderosa Pine
40	Strobilomyces rust	Lodgepole Pine	105	straggle killed narrow leaf cottonwood	Spruce White Spruce 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.

Map Created December 1 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/>

DIRECT ALL INQUIRIES TO:

Wyoming State Forestry Division
 1100 West 22nd Street
 Cheyenne, Wyoming 82002

USDA Forest Service, Region 2
 Renewable Resources
 Forest Health Management
 PO Box 25127
 Lakewood, Colorado 80225

*****DISCLAIMER*****

Forest Health Protection (FHP) and its partners strive to maintain an accurate Aerial Defoliation 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/monitoring/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.