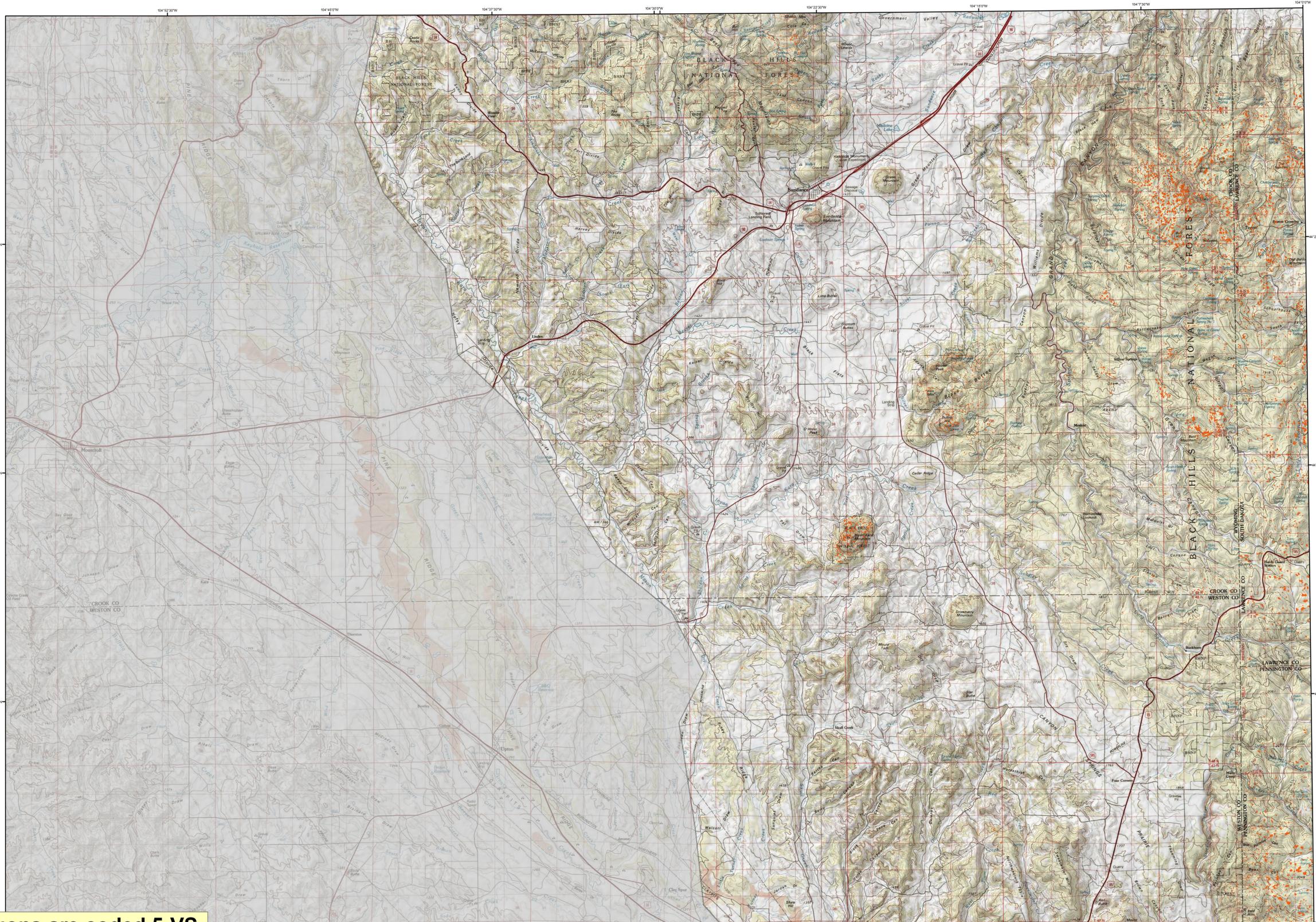


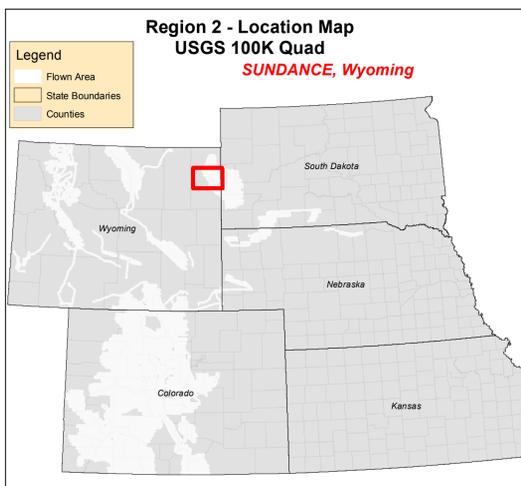
2015 Aerial Insect and Disease Survey SUNDANCE, Wyoming USGS 100K TOPO!: 44104-A1



Polygons are coded 5-VS unless otherwise labelled.

1:100,000

Code	Causal Agent(s)	Primary Host	Code	Causal Agent(s)	Primary Host
1	Douglas fir beetle	Douglas fir	99	Unknown	Unknown
2	Engelmann spruce beetle	Engelmann spruce	100	50 squirrel logging	Cottonwood Poplar
3	Blue spruce tip	Blue spruce	101	fall webworm	Cottonwood Poplar
4	Mountain pine beetle	Ponderosa pine	102	moist soil	Softwoods
5	Mountain pine beetle	Ponderosa pine	103	pinewood nematode	Scotch pine
6	Mountain pine beetle	Lodgepole pine	104	Elysiodesma	Ponderosa pine
7	Mountain pine beetle	5-needle pine	105	insects 865, 86 & 88	All Tree Species
8	Western pine beetle	Ponderosa pine	106	Air pollutants	All Tree Species
9	Fir engraver	White fir	107	snags disease	White spruce
10	Douglas fir engraver beetle	Douglas fir	108	basal/neck/heart rot	Oak
11	Western balsam bark beetle	Subalpine fir	109	anthracnose like foliar disease	Bur oak
12	Unidentified bark beetle	Softwoods	110	Dieback	All Tree Species
13	Pine engraver	Lodgepole pine	111	Mortality	All Tree Species
14	Pine engraver	Ponderosa pine	112	Lecanosticella acicola	All Tree Species
15	Ponderosa pine needle miner	Lodgepole pine	113	Lophodermium concolor	All Tree Species
16	Lodgepole pine needle miner	Ponderosa pine	114	Dithostoma pini	All Tree Species
17	Jack pine budworm	Jack pine	115	Needle cast (Hypodemateaceae)	Softwoods
18	Spruce budworm, light defol.	Douglas fir	116	Root Rot	All Tree Species
19	Spruce budworm, medium defol.	Douglas fir	117	Unidentified disease	Softwoods
20	Spruce budworm, heavy defol.	Douglas fir	118	Winter damage light	All Tree Species
21	Douglas fir tussock moth	Douglas fir	119	Winter damage medium	All Tree Species
22	Pine butterfly	Ponderosa pine	120	Winter damage heavy	All Tree Species
23	Pine looper	Ponderosa pine	121	Mortality (oak cottonwood)	Cottonwood Poplar
24	Pine looper	Ponderosa pine	122	Mortality (eastern cedar)	Eastern Red Cedar
25	Pine tortrix	Ponderosa pine	123	Mortality (hardwood)	Hardwoods
26	Text caterpillars	Hardwoods	124	Mortality (spruce)	Ash
27	Leaf beetles	Hardwoods	125	Mortality (spruce)	Spruce
28	Aspen defoliation	Quaking aspen	126	Discoloration (ash)	Ash
29	Oak leaf roller	Hardwoods	127	Discoloration (cottonwood)	Cottonwood
30	Pine needle-needle miner	Ponderosa pine	128	Discoloration (eastern cedar)	Eastern Red Cedar
31	Pine sawflies	Ponderosa pine	129	Discoloration (hardwood)	Hardwoods
32	Pine tussock moth	Ponderosa pine	130	Discoloration (oak)	Oak
33	Cankers/marks	Hardwoods	131	Discoloration (spruce)	Spruce
34	Variable oak leaf caterpillar	Hardwoods	132	Herbicide (cottonwood)	Cottonwood Poplar
35	Unidentified defoliator	All Tree Species	133	Herbicide (eastern cedar)	Eastern Red Cedar
36	Cottonwood Decline/Mortality	Hardwoods	134	Flagging (hardwood)	Hardwoods
37	Heterobasidion annosum (Fomes annosus)	Softwoods	135	Unidentified defoliator (cottonwood)	Cottonwood Poplar
38	Amelaria octocarya (Amelaria metke)	Softwoods	136	Unidentified defoliator (elm)	Elm
39	Phomopsis	All Tree Species	137	Unidentified defoliator (hardwood)	Hardwoods
40	Cytospora	Unknown	138	Mortality (spruce)	Pine
41	Western gall rust	Unknown			
42	Comandra rust	Unknown			



2013 data for the Black Hills area was generated from aerial photos taken August-September 2013. Cooperators included: Neiman Timber Company, Wyoming Forestry Division, Weston Natural Resource Conservation District, Weston County Weed & Pest, South Dakota Division of Resource Conservation and Forestry, USDA-Forest Service, and the USDI-Bureau of Land Management.

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: 1/29/2016
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/ads/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.