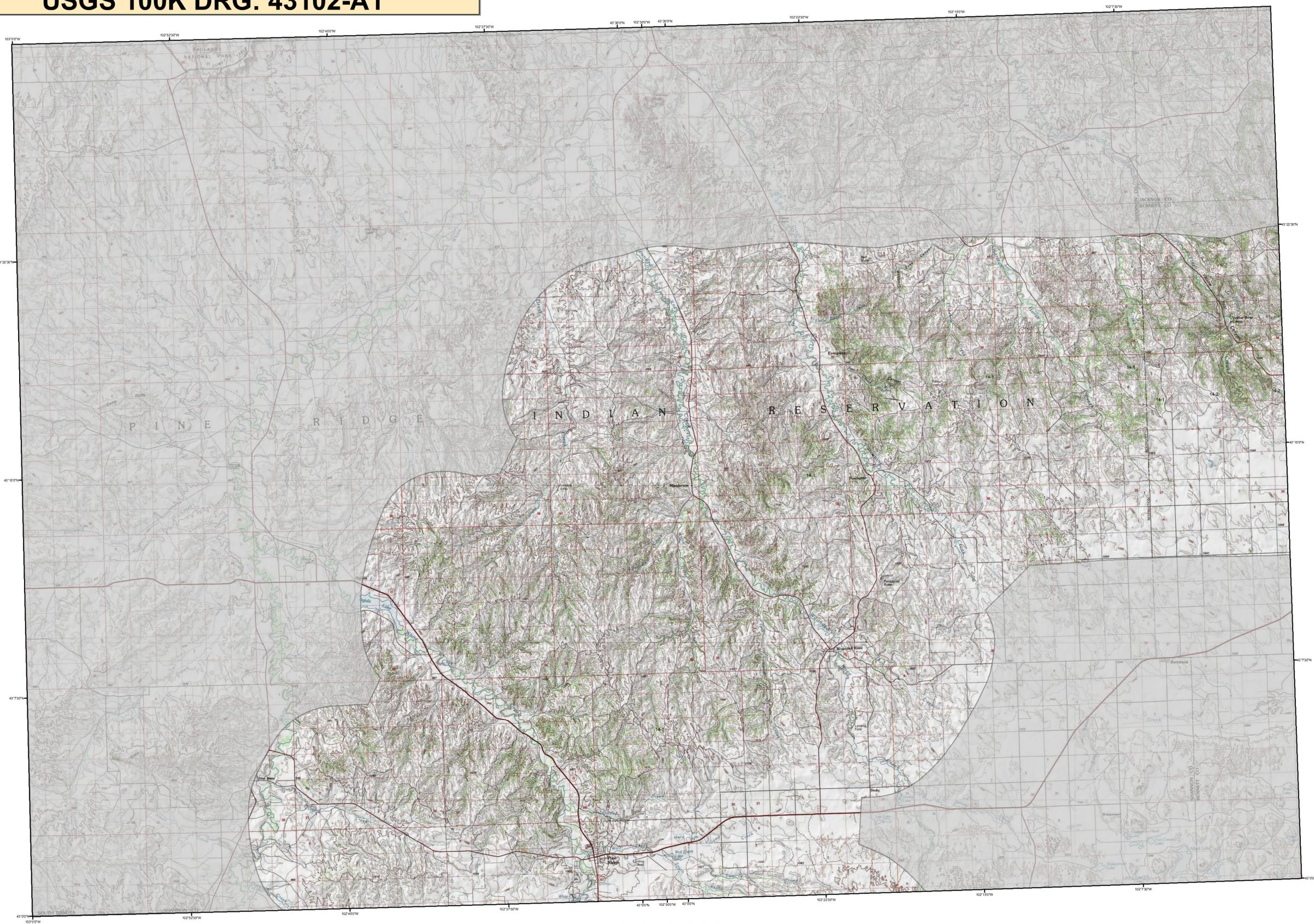


2011 Aerial Insect and Disease Survey

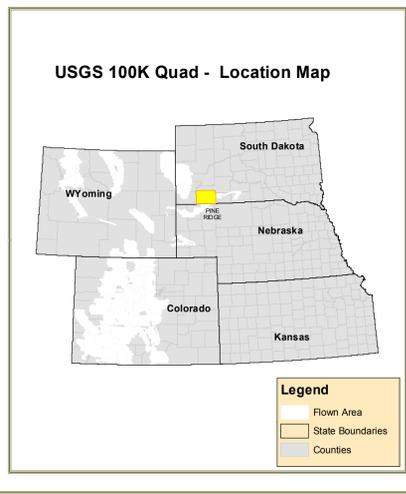
Pine Ridge, South Dakota

USGS 100K DRG: 43102-A1



1:100,000

Legend		Causal Agent(s)	Not Flown		
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 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 "/" 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
1	Douglas fir beetle	Douglas fir	49	Atypical	Lodgepole Pine
2	Engelmann spruce beetle	Engelmann Spruce	48	Stalactiform rust	Lodgepole Pine
3	Blue spruce ips	Blue Spruce	50	White pine blister rust	S-Needle Pine
5	Mountain pine beetle	Ponderosa Pine	51	Dwarf mistletoe	Softwoods
6	Mountain pine beetle	Lodgepole Pine	52	Elysiadema	Ponderosa Pine
7	Mountain pine beetle	S-Needle Pine	53	Includes #65, 66 & 68	All Tree Species
8	Western pine beetle	Ponderosa Pine	54	Air pollutants	All Tree Species
9	Fir engraver	White Fir	55	Chemical damage	All Tree Species
10	Douglas fir engraver beetle	Douglas fir	56	Lophodermium pinastri	Softwoods
11	Western balsam bark beetle	Subalpine Fir	57	Rhododionneous/straggar	Douglas fir
12	Unidentified bark beetle	Softwoods	58	Lophodermium arcuta	Douglas fir
13	Pine engraver	Lodgepole Pine	59	Lecanorhina acicola	Softwoods
14	Pine engraver	Ponderosa Pine	60	Lophodermium concolor	Softwoods
15	Ponderosa pine needle miner	Lodgepole Pine	61	Dofhinotoma pini	Softwoods
16	Lodgepole pine needle miner	Ponderosa Pine	62	Needle cast (Hypodermatomyces)	Softwoods
17	Jack pine budworm	Jack Pine	63	Rust Red	All Tree Species
18	Spruce budworm, light defol.	Douglas fir	64	Unidentified disease	Softwoods
19	Spruce budworm, medium defol.	Douglas fir	65	Winter damage light	All Tree Species
20	Spruce budworm, heavy defol.	Douglas fir	66	Winter damage medium	All Tree Species
22	Douglas fir bark beetle	Douglas fir	67	Winter damage heavy	All Tree Species
23	Pine butterfly	Ponderosa Pine	68	Dipodia	Softwoods
24	Pine looper	Ponderosa Pine	69	Pinon black stain	Common Pinon
27	Pine tortrix	Ponderosa Pine	70	Fire	All Tree Species
28	Tent caterpillar	Hardwoods	71	Porcupine	All Tree Species
29	Leaf beetles	Hardwoods	72	Windthrow	All Tree Species
30	Aspen defoliation	Quaking Aspen	73	High water damage	All Tree Species
33	Oak leaf roller	Hardwoods	74	Avalanche	All Tree Species
34	Pine needle-shaft miner	Ponderosa Pine	75	Aspen decline-multiple agents)	Quaking Aspen
35	Pine sawflies	Ponderosa Pine	76	Pinon pine mortality	Common Pinon
40	Cottonwood Decline/Mortality	Cottonwood	77	Juniper mortality-unknown agents)	Juniper
41	Hesperobasion arvenum (Fomes annosus)	Softwoods	78	Camble oak decline-unknown agents)	Camble Oak
42	Amelaria setyae (Amelaria mellea)	Softwoods	79	Limber pine decline-multiple agents)	Limber Pine
44	Thrompsia	Softwoods	80	Hail damage	All Tree Species
45	Cystospora	Unknown	89	Unknown polygon	Unknown
46	Western gall rust	Unknown	100	usd pinon disease	Common Pinon
47	Dendroica rust	Unknown	101	rust salt lip	Lodgepole Pine
			102	rust salt lip	Softwoods
			103	dipodia blight	Pinon
			105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood
			106	fox squirrel flaging	Cottonwood Poplar
			107	fall webworm	Cottonwood Poplar
			108	rust oak	Softwoods
			109	pinewood nematode	Scottish Pine
			110	oak wilt	Oak
			111	knag disease	All Tree Species
			112	spruce ips	White Spruce
			113	bark beetle chestnut borer	Oak
			114	anthracnose like solar disease	Bur Oak
			115	Dieback	All Tree Species
			116	Mortality	All Tree Species
			117	Decoloration	All Tree Species
			118	Flagging	All Tree Species
			119	Flagging	All Tree Species
			120	aspen tortix	Quaking Aspen
			121	Manssonia Blight	Quaking Aspen
			200	Dieback (left)	Ash
			201	Dieback (cottonwood)	Cottonwood Poplar
			202	Dieback (hardwood)	Hardwoods
			204	Dieback (oak)	Oak
			210	Mortality (old cottonwood)	Cottonwood Poplar
			211	Mortality (eastern cedar)	Eastern Red Cedar
			212	Mortality (hardwood)	Hardwoods
			213	Mortality (oak)	Oak
			214	Mortality (spruce)	Spruce
			220	Discoloration (ash)	Ash
			221	Discoloration (cottonwood)	Softwoods
			222	Discoloration (cottonwood)	Cottonwood Poplar
			223	Discoloration (eastern cedar)	Eastern Red Cedar
			224	Discoloration (hardwood)	Hardwoods
			225	Discoloration (oak)	Oak
			226	Discoloration (spruce)	Spruce
			230	Hericida (cottonwood)	Cottonwood Poplar
			231	Hericida (eastern cedar)	Eastern Red Cedar
			240	Flagging (hardwood)	Hardwoods
			250	Unidentified defolator (cottonwood)	Cottonwood Poplar
			251	Unidentified defolator (oak)	Hardwoods
			252	Unidentified defolator (hardwood)	Hardwoods
			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 December 1 2011
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.