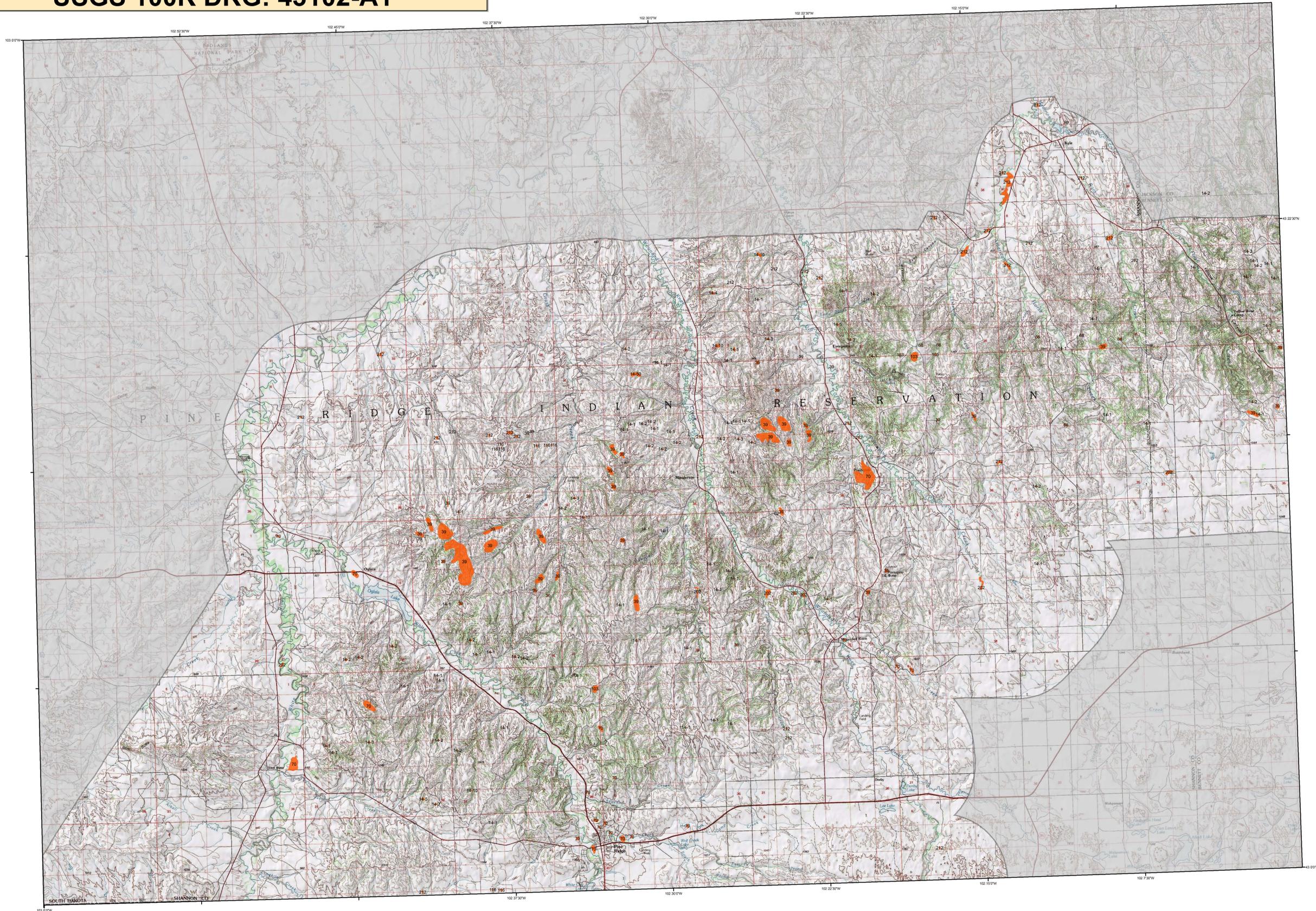


2007 Aerial Insect and Disease Survey Pine Ridge, South Dakota USGS 100K DRG: 43102-A1



1:100,000

Legend

Code	Causal Agent(s)	Primary Host	Code	Causal Agent(s)	Primary Host	Code	Causal Agent(s)	Primary Host
1	Douglas-fir beetle	Douglas-fir	65	Hemlock	Lodgepole Pine	105	fox squirrel flagging	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann Spruce	66	White pine blister rust	5-Needle Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	67	Oval midribbark	Softwoods	108	road kill	Softwoods
4	Mountain pine beetle	Lodgepole Pine	68	Elytridema	Ponderosa Pine	109	pinewood nematode	Softwoods
5	Mountain pine beetle	Schweide Pine	69	Incluses #05, 06 & 08	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	70	Air pollutants	All Tree Species	111	foliage disease	All Tree Species
7	Fire Engriaver	White Fir	71	Chemical damage	All Tree Species	112	spring ice	White Spruce
8	Douglas-fir engraver beetle	Douglas-fir	72	Lophodermium praeurti	Softwoods	113	beetle/ chestnut borer	Oak
9	Fire Engriaver	Subalpine Fir	73	Rhizoctonia pseudotilgiae	Douglas-fir	114	androsaceae like foliar disease	Bur Oak
10	Douglas-fir engraver beetle	White Fir	74	Lophodermium arcuta	Softwoods	115	Daback	All Tree Species
11	Western balsam bark beetle	Subalpine Fir	75	Lachnospiza axicola	Softwoods	116	Mortality	All Tree Species
12	Unidentified bark beetle	Softwoods	76	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
13	Pine engraver	Lodgepole Pine	77	Cochlostoma pin	Softwoods	118	Herbicide	All Tree Species
14	Pine engraver	Ponderosa Pine	78	Needle cast (Hypodermataceae)	Softwoods	119	Flagging	All Tree Species
15	Ponderosa pine needle miner	Lodgepole Pine	79	Rust Rot	All Tree Species	120	aspen borers	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa Pine	80	Unidentified disease	Softwoods	121	Mesoxena blight	Quaking Aspen
17	Jack pine budworm, light defol.	Douglas-fir	81	Winter damage light	All Tree Species	200	Daback (ash)	Ash
18	Jack pine budworm, medium defol.	Douglas-fir	82	Winter damage medium	All Tree Species	201	Daback (cottonwood)	Cottonwood/Poplar
19	Jack pine budworm, heavy defol.	Douglas-fir	83	Winter damage heavy	All Tree Species	202	Daback (hardwood)	Hardwoods
20	Jack pine budworm, heavy defol.	Douglas-fir	84	Opilidia	Softwoods	204	Daback (oak)	Oak
21	Douglas-fir tussock moth	Ponderosa Pine	85	Prionix black stain	Common Prinyon	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Pine looper	Ponderosa Pine	86	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Pine looper	Ponderosa Pine	87	Pineapple	Softwoods	212	Mortality (hardwood)	Hardwoods
24	Pine tortrix	Hardwoods	88	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Tent caterpillar	Hardwoods	89	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Leaf beetles	Hardwoods	90	Avalanche	All Tree Species	220	Discoloration (ash)	Ash
27	Oak leaf roller	Hardwoods	91	Aspen decline-multiple agents)	Quaking Aspen	221	Discoloration (conifer)	Softwoods
28	Pine needle-shash miner	Ponderosa Pine	92	Prionix mortality	Common Prinyon	222	Discoloration (cottonwood)	Cottonwood/Poplar
29	Pine needle-shash miner	Ponderosa Pine	93	Juniper mortality-unknown agents)	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
30	Variable oak leaf caterpillar	Hardwoods	94	Limber pine decline-unknown agents)	Limber Pine	224	Discoloration (hardwood)	Hardwoods
31	Unidentified defoliator	All Tree Species	95	Limber pine decline-multiple agents)	Limber Pine	225	Discoloration (oak)	Oak
32	Variable oak leaf caterpillar	Hardwoods	96	Leaf damage	All Tree Species	226	Discoloration (spruce)	Spruce
33	Cankerworms	All Tree Species	97	Unknown polygon	Unknown	230	Herbicide (eastern cedar)	Cottonwood/Poplar
34	Phonoxas	Softwoods	98	old prionix mortality	Common Prinyon	231	Herbicide (eastern cedar)	Eastern Red Cedar
35	Phonoxas	Softwoods	99	road kill top	Lodgepole Pine	240	Flagging (hardwood)	Hardwoods
36	Cytospora	All Tree Species	100	slash elm disease	Elm	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
37	Western gall rust	Unknown	101	didkida light	Ponderosa Pine	251	Unidentified defoliator (elm)	Elm
38	Commanda rust	Unknown	102	didkida light	Spruce, White Spruce	252	Unidentified defoliator (hardwood)	Hardwoods
39	Stachytarax rust	Lodgepole Pine	103	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood	300	Mortality (pine)	Pine

USGS 100K Quad - Location Map



Legend
 Flown Area
 State Boundaries
 Counties

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.

Area surveyed by Bill Schupp & Al Dymerski
 Map Created: 12/12/2007
 Projection: UTM NAD83 Zone 13
 Author: J. Ross, USDA Forest Service

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****DISCLAIMER****
 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.

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/>