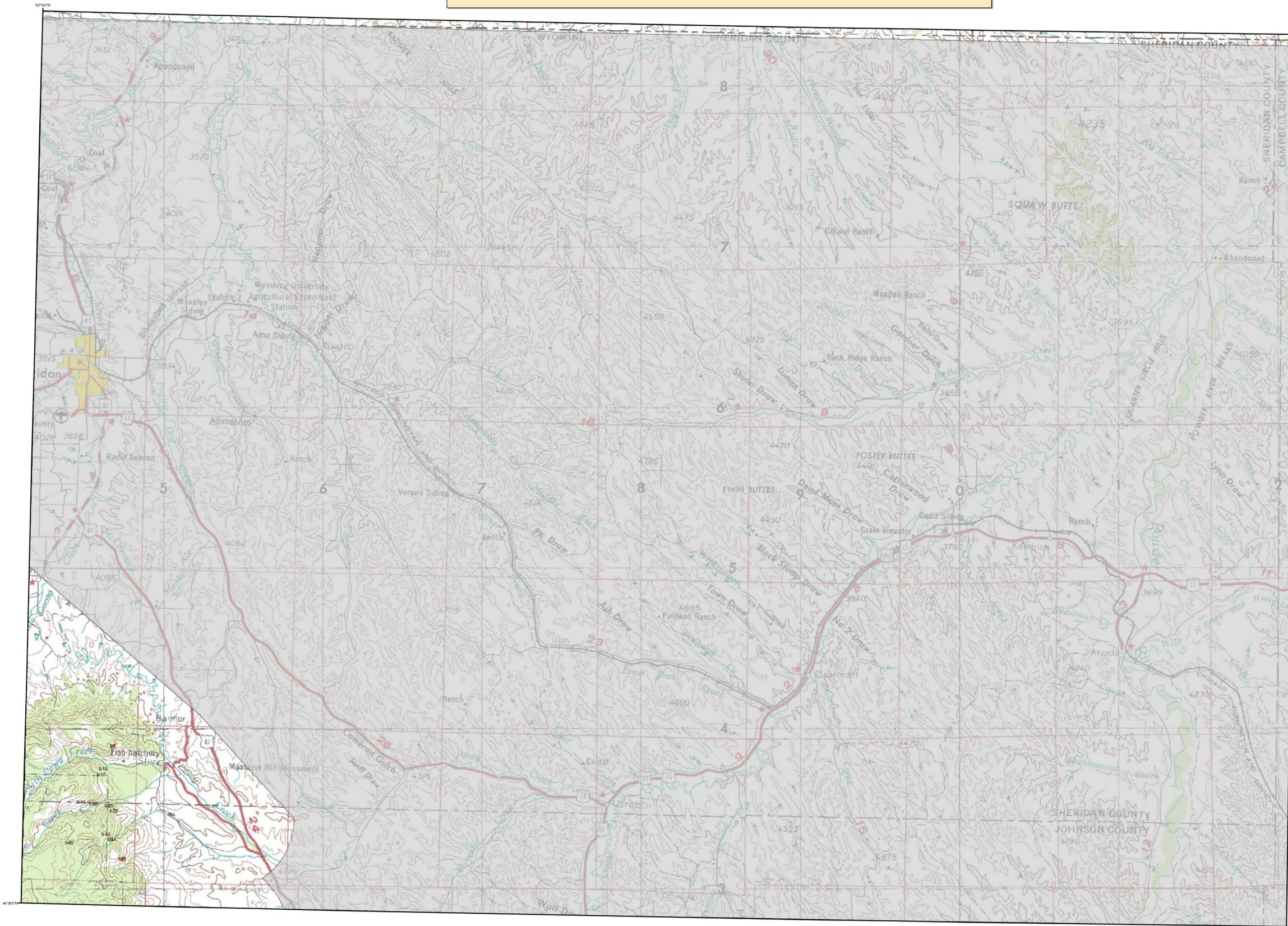


# 2009 Aerial Insect and Disease Survey Sheridan, Wyoming USGS 100K TOPO!: 44106-E1



1:100,000

**Legend**

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 "taster" trees in the polygon or point. When recent dead trees are not counted, an intensity code of L-light, M-moderate, and H-high may be used after the causal agent code. Periodically, trees per acreage estimates are used after the causal agent code instead of number of dead "taster" trees (or an intensity code). For example: 5-12A = The first number before the dash is the causal agent code. The number after the dash is an estimate of the number of dead "taster" trees in the polygon per acre. In this case it would be an estimate that, on the average, one tree per every two acres would be a dead "taster" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "taster" trees. A "7" 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	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Aspen	108	Iron oak/elm leafhopper	Cottonwood/Poplar	109	Iron oak/elm leafhopper	Cottonwood/Poplar
2	Englemann spruce beetle	Englemann spruce	107	fall webworm	Softwoods	110	oak wilt	Oak
3	Mountain pine beetle	Ponderosa pine	106	grasshopper	Softwoods	111	foliage disease	All Tree Species
4	Mountain pine beetle	Lodgepole pine	105	grasshopper	Softwoods	112	spine louse	White Spruce
5	Mountain pine beetle	5-Needle Pine	104	grasshopper	Softwoods	113	twisted chestnut borer	Bur Oak
6	Mountain pine beetle	5-Needle Pine	103	grasshopper	Softwoods	114	anthracnose like foliar disease	All Tree Species
7	Mountain pine beetle	5-Needle Pine	102	grasshopper	Softwoods	115	Diaback	All Tree Species
8	Mountain pine beetle	5-Needle Pine	101	grasshopper	Softwoods	116	Mortality	All Tree Species
9	Western pine beetle	Ponderosa pine	100	grasshopper	Softwoods	117	Flagging	All Tree Species
10	White fir	White fir	99	grasshopper	Softwoods	118	Quaking Aspen	Quaking Aspen
11	Douglas-fir engraver beetle	Douglas-fir	98	grasshopper	Softwoods	119	Quaking Aspen	Quaking Aspen
12	Western balsam bark beetle	Subalpine fir	97	grasshopper	Softwoods	120	Diaback (ash)	Ash
13	Pine engraver	Lodgepole pine	96	grasshopper	Softwoods	121	Diaback (cottonwood)	Cottonwood/Poplar
14	Pine engraver	Ponderosa pine	95	grasshopper	Softwoods	122	Diaback (hardwood)	Hardwoods
15	Ponderosa pine needle miner	Lodgepole pine	94	grasshopper	Softwoods	123	Diaback (oak)	Oak
16	Ponderosa pine needle miner	Ponderosa pine	93	grasshopper	Softwoods	124	Mortality (old cottonwood)	Cottonwood/Poplar
17	Jack pine budworm	Jack pine	92	grasshopper	Softwoods	125	Mortality (eastern cedar)	Eastern Red Cedar
18	Spruce budworm, light defol.	Douglas-fir	91	grasshopper	Softwoods	126	Mortality (hardwood)	Hardwoods
19	Spruce budworm, medium defol.	Douglas-fir	90	grasshopper	Softwoods	127	Mortality (oak)	Oak
20	Spruce budworm, heavy defol.	Douglas-fir	89	grasshopper	Softwoods	128	Mortality (spruce)	Spruce
21	Douglas-fir tussock moth	Douglas-fir	88	grasshopper	Softwoods	129	Discoloration (oak)	Oak
22	Pine butterfly	Ponderosa pine	87	grasshopper	Softwoods	130	Discoloration (spruce)	Spruce
23	Pine looper	Ponderosa pine	86	grasshopper	Softwoods	131	Discoloration (cottonwood)	Cottonwood/Poplar
24	Pine tortrix	Ponderosa pine	85	grasshopper	Softwoods	132	Discoloration (eastern cedar)	Eastern Red Cedar
25	Tree caterpillars	Hardwoods	84	grasshopper	Softwoods	133	Discoloration (hardwood)	Hardwoods
26	Leaf beetles	Hardwoods	83	grasshopper	Softwoods	134	Discoloration (oak)	Oak
27	Oak leaf miner	Hardwoods	82	grasshopper	Softwoods	135	Discoloration (spruce)	Spruce
28	Pine needle-shaft miner	Ponderosa pine	81	grasshopper	Softwoods	136	Harbicide (cottonwood)	Cottonwood/Poplar
29	Pine sawflies	Ponderosa pine	80	grasshopper	Softwoods	137	Harbicide (eastern cedar)	Eastern Red Cedar
30	Variable oak leaf caterpillar	Hardwoods	79	grasshopper	Softwoods	138	Harbicide (hardwood)	Hardwoods
31	Unidentified defoliator	All Tree Species	78	grasshopper	Softwoods	139	Harbicide (oak)	Oak
32	Heterobasidion annosum (Fomes annosus)	Softwoods	77	grasshopper	Softwoods	140	Harbicide (spruce)	Spruce
33	Amelara corymbosa (Amelara melale)	Softwoods	76	grasshopper	Softwoods	141	Harbicide (cottonwood)	Cottonwood/Poplar
34	Polyponus schweinitzi	Softwoods	75	grasshopper	Softwoods	142	Harbicide (eastern cedar)	Eastern Red Cedar
35	Phomopsis	Softwoods	74	grasshopper	Softwoods	143	Harbicide (hardwood)	Hardwoods
36	Cytospora	All Tree Species	73	grasshopper	Softwoods	144	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
37	Western gall rust	Unknown	72	grasshopper	Softwoods	145	Unidentified defoliator (elm)	Elm
38	Shab-former rust	Lodgepole pine	71	grasshopper	Softwoods	146	Unidentified defoliator (hardwood)	Hardwoods
39			70	grasshopper	Softwoods	147	Mortality (pine)	Pine
40			69	grasshopper	Softwoods	148		
41			68	grasshopper	Softwoods	149		
42			67	grasshopper	Softwoods	150		
43			66	grasshopper	Softwoods	151		
44			65	grasshopper	Softwoods	152		
45			64	grasshopper	Softwoods	153		
46			63	grasshopper	Softwoods	154		
47			62	grasshopper	Softwoods	155		
48			61	grasshopper	Softwoods	156		
49			60	grasshopper	Softwoods	157		
50			59	grasshopper	Softwoods	158		
51			58	grasshopper	Softwoods	159		
52			57	grasshopper	Softwoods	160		
53			56	grasshopper	Softwoods	161		
54			55	grasshopper	Softwoods	162		
55			54	grasshopper	Softwoods	163		
56			53	grasshopper	Softwoods	164		
57			52	grasshopper	Softwoods	165		
58			51	grasshopper	Softwoods	166		
59			50	grasshopper	Softwoods	167		
60			49	grasshopper	Softwoods	168		
61			48	grasshopper	Softwoods	169		
62			47	grasshopper	Softwoods	170		
63			46	grasshopper	Softwoods	171		
64			45	grasshopper	Softwoods	172		
65			44	grasshopper	Softwoods	173		
66			43	grasshopper	Softwoods	174		
67			42	grasshopper	Softwoods	175		
68			41	grasshopper	Softwoods	176		
69			40	grasshopper	Softwoods	177		
70			39	grasshopper	Softwoods	178		
71			38	grasshopper	Softwoods	179		
72			37	grasshopper	Softwoods	180		
73			36	grasshopper	Softwoods	181		
74			35	grasshopper	Softwoods	182		
75			34	grasshopper	Softwoods	183		
76			33	grasshopper	Softwoods	184		
77			32	grasshopper	Softwoods	185		
78			31	grasshopper	Softwoods	186		
79			30	grasshopper	Softwoods	187		
80			29	grasshopper	Softwoods	188		
81			28	grasshopper	Softwoods	189		
82			27	grasshopper	Softwoods	190		
83			26	grasshopper	Softwoods	191		
84			25	grasshopper	Softwoods	192		
85			24	grasshopper	Softwoods	193		
86			23	grasshopper	Softwoods	194		
87			22	grasshopper	Softwoods	195		
88			21	grasshopper	Softwoods	196		
89			20	grasshopper	Softwoods	197		
90			19	grasshopper	Softwoods	198		
91			18	grasshopper	Softwoods	199		
92			17	grasshopper	Softwoods	200		
93			16	grasshopper	Softwoods	201		
94			15	grasshopper	Softwoods	202		
95			14	grasshopper	Softwoods	203		
96			13	grasshopper	Softwoods	204		
97			12	grasshopper	Softwoods	205		
98			11	grasshopper	Softwoods	206		
99			10	grasshopper	Softwoods	207		
100			9	grasshopper	Softwoods	208		
101			8	grasshopper	Softwoods	209		
102			7	grasshopper	Softwoods	210		
103			6	grasshopper	Softwoods	211		
104			5	grasshopper	Softwoods	212		
105			4	grasshopper	Softwoods	213		
106			3	grasshopper	Softwoods	214		
107			2	grasshopper	Softwoods	215		
108			1	grasshopper	Softwoods	216		



**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 17 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/>

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**DISCLAIMER**

Forest Health Protection (FHP) and its partners strive to maintain an accurate Aerial Detection Survey (ADS) Database, 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.