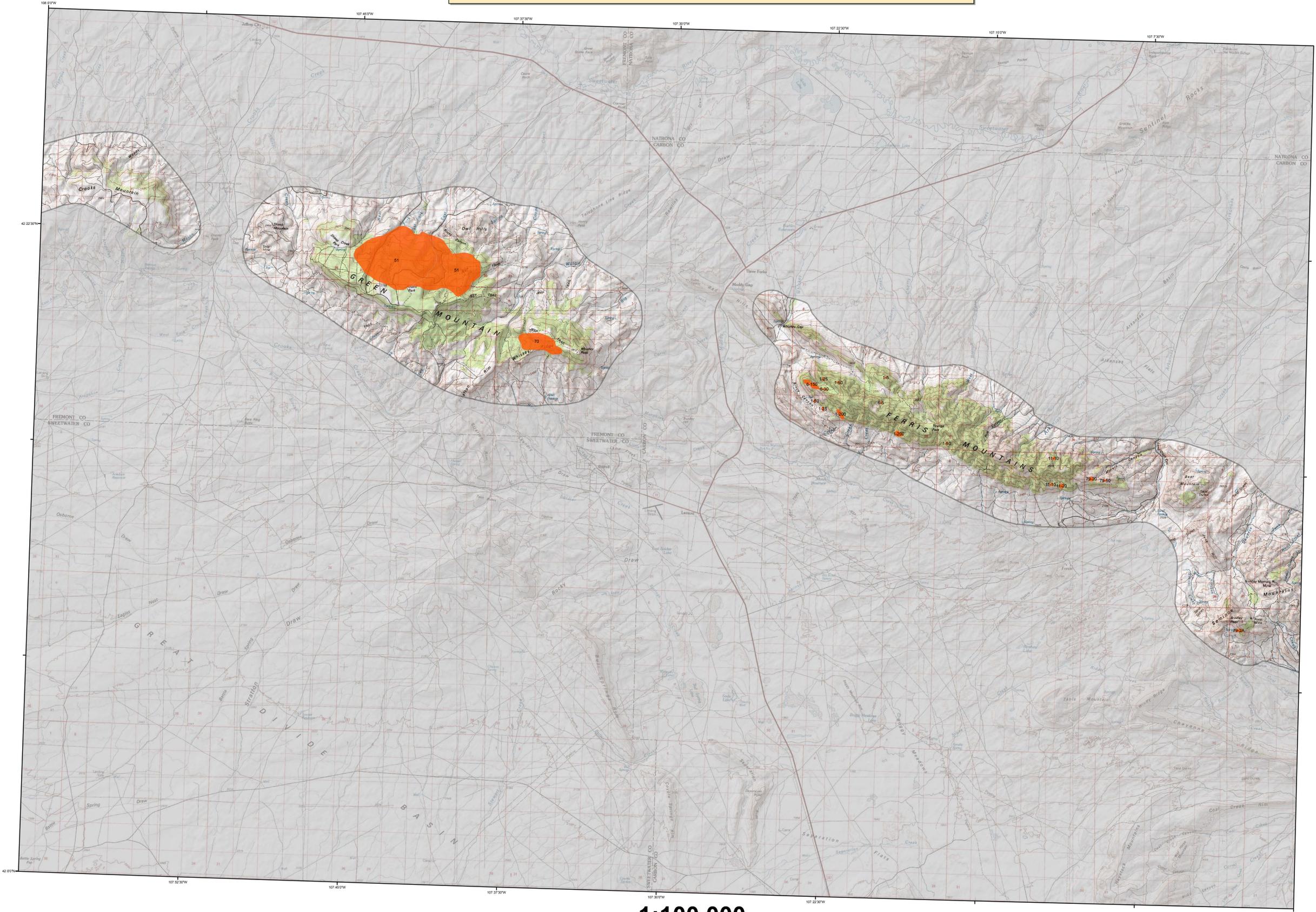
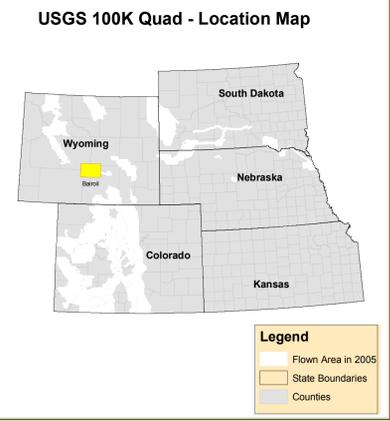


# 2005 Aerial Insect and Disease Survey Bairoil, Wyoming USGS 100K TOPO! 42107-A1



**1:100,000**

Legend		Causal Agent(s)		Not Flown in 2005	
<p><b>Use of the Number System</b>                      Example: 5-25 = The first number before the dash is the causal agent code. The number after the dash is the number of dead "fader" trees in the polygon or point. When recent dead trees are not counted, an intensity code of L, 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 "fader" 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 estimation of the number of dead "fader" 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 "fader" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A // is used as a separator when a point polygon has more than one causal agent code.</p>					
Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	60	White pine blister rust	Lodgepole Pine
2	Engelmann Spruce Beetle	Engelmann Spruce	61	White pine sawfly	White Pine
3	Mountain pine beetle	Ponderosa Pine	62	White pine sawfly	White Pine
4	Mountain pine beetle	Lodgepole Pine	63	White pine sawfly	White Pine
5	Mountain pine beetle	5-Needle Pine	64	White pine sawfly	White Pine
6	Western pine beetle	Ponderosa Pine	65	White pine sawfly	White Pine
7	Fire Engulfer	White Fir	66	White pine sawfly	White Pine
8	Douglas-fir engraver beetle	Douglas-fir	67	White pine sawfly	White Pine
9	Fire Engulfer	Subalpine Fir	68	White pine sawfly	White Pine
10	Western balsam bark beetle	Softwoods	69	White pine sawfly	White Pine
11	Unidentified bark beetle	Lodgepole Pine	70	White pine sawfly	White Pine
12	Pine engraver	Ponderosa Pine	71	White pine sawfly	White Pine
13	Pine engraver	Lodgepole Pine	72	White pine sawfly	White Pine
14	Pine engraver	Ponderosa Pine	73	White pine sawfly	White Pine
15	Pondosa pine needle miner	Lodgepole Pine	74	White pine sawfly	White Pine
16	Lodgepole pine needle miner	Ponderosa Pine	75	White pine sawfly	White Pine
17	Jack pine butworm	Jack Pine	76	White pine sawfly	White Pine
18	Spruce budworm, light defol.	Douglas-fir	77	White pine sawfly	White Pine
19	Spruce budworm, medium defol.	Douglas-fir	78	White pine sawfly	White Pine
20	Spruce budworm, heavy defol.	Douglas-fir	79	White pine sawfly	White Pine
21	Douglas-fir tussock moth	Douglas-fir	80	White pine sawfly	White Pine
22	Pine butterfly	Ponderosa Pine	81	White pine sawfly	White Pine
23	Pine looper	Ponderosa Pine	82	White pine sawfly	White Pine
24	Pine tortrix	Ponderosa Pine	83	White pine sawfly	White Pine
25	Tent caterpillars	Hardwoods	84	White pine sawfly	White Pine
26	Leaf beetles	Hardwoods	85	White pine sawfly	White Pine
27	Oak leaf roller	Hardwoods	86	White pine sawfly	White Pine
28	Pine needle-shaft miner	Ponderosa Pine	87	White pine sawfly	White Pine
29	Pine sawfly	Ponderosa Pine	88	White pine sawfly	White Pine
30	Pine tussock moth	Ponderosa Pine	89	White pine sawfly	White Pine
31	Variable oak leaf caterpillar	All Tree Species	90	White pine sawfly	White Pine
32	Unknown defoliator	Unknown	91	White pine sawfly	White Pine
33	Unknown defoliator	Unknown	92	White pine sawfly	White Pine
34	Unknown defoliator	Unknown	93	White pine sawfly	White Pine
35	Unknown defoliator	Unknown	94	White pine sawfly	White Pine
36	Unknown defoliator	Unknown	95	White pine sawfly	White Pine
37	Unknown defoliator	Unknown	96	White pine sawfly	White Pine
38	Unknown defoliator	Unknown	97	White pine sawfly	White Pine
39	Unknown defoliator	Unknown	98	White pine sawfly	White Pine
40	Unknown defoliator	Unknown	99	White pine sawfly	White Pine
41	Unknown defoliator	Unknown	100	White pine sawfly	White Pine
42	Unknown defoliator	Unknown	101	White pine sawfly	White Pine
43	Unknown defoliator	Unknown	102	White pine sawfly	White Pine
44	Unknown defoliator	Unknown	103	White pine sawfly	White Pine
45	Unknown defoliator	Unknown	104	White pine sawfly	White Pine
46	Unknown defoliator	Unknown	105	White pine sawfly	White Pine
47	Unknown defoliator	Unknown	106	White pine sawfly	White Pine
48	Unknown defoliator	Unknown	107	White pine sawfly	White Pine
49	Unknown defoliator	Unknown	108	White pine sawfly	White Pine
50	Unknown defoliator	Unknown	109	White pine sawfly	White Pine
51	Unknown defoliator	Unknown	110	White pine sawfly	White Pine
52	Unknown defoliator	Unknown	111	White pine sawfly	White Pine
53	Unknown defoliator	Unknown	112	White pine sawfly	White Pine
54	Unknown defoliator	Unknown	113	White pine sawfly	White Pine
55	Unknown defoliator	Unknown	114	White pine sawfly	White Pine
56	Unknown defoliator	Unknown	115	White pine sawfly	White Pine
57	Unknown defoliator	Unknown	116	White pine sawfly	White Pine
58	Unknown defoliator	Unknown	117	White pine sawfly	White Pine
59	Unknown defoliator	Unknown	118	White pine sawfly	White Pine
60	Unknown defoliator	Unknown	119	White pine sawfly	White Pine
61	Unknown defoliator	Unknown	120	White pine sawfly	White Pine
62	Unknown defoliator	Unknown	121	White pine sawfly	White Pine
63	Unknown defoliator	Unknown	122	White pine sawfly	White Pine
64	Unknown defoliator	Unknown	123	White pine sawfly	White Pine
65	Unknown defoliator	Unknown	124	White pine sawfly	White Pine
66	Unknown defoliator	Unknown	125	White pine sawfly	White Pine
67	Unknown defoliator	Unknown	126	White pine sawfly	White Pine
68	Unknown defoliator	Unknown	127	White pine sawfly	White Pine
69	Unknown defoliator	Unknown	128	White pine sawfly	White Pine
70	Unknown defoliator	Unknown	129	White pine sawfly	White Pine
71	Unknown defoliator	Unknown	130	White pine sawfly	White Pine
72	Unknown defoliator	Unknown	131	White pine sawfly	White Pine
73	Unknown defoliator	Unknown	132	White pine sawfly	White Pine
74	Unknown defoliator	Unknown	133	White pine sawfly	White Pine
75	Unknown defoliator	Unknown	134	White pine sawfly	White Pine
76	Unknown defoliator	Unknown	135	White pine sawfly	White Pine
77	Unknown defoliator	Unknown	136	White pine sawfly	White Pine
78	Unknown defoliator	Unknown	137	White pine sawfly	White Pine
79	Unknown defoliator	Unknown	138	White pine sawfly	White Pine
80	Unknown defoliator	Unknown	139	White pine sawfly	White Pine
81	Unknown defoliator	Unknown	140	White pine sawfly	White Pine
82	Unknown defoliator	Unknown	141	White pine sawfly	White Pine
83	Unknown defoliator	Unknown	142	White pine sawfly	White Pine
84	Unknown defoliator	Unknown	143	White pine sawfly	White Pine
85	Unknown defoliator	Unknown	144	White pine sawfly	White Pine
86	Unknown defoliator	Unknown	145	White pine sawfly	White Pine
87	Unknown defoliator	Unknown	146	White pine sawfly	White Pine
88	Unknown defoliator	Unknown	147	White pine sawfly	White Pine
89	Unknown defoliator	Unknown	148	White pine sawfly	White Pine
90	Unknown defoliator	Unknown	149	White pine sawfly	White Pine
91	Unknown defoliator	Unknown	150	White pine sawfly	White Pine
92	Unknown defoliator	Unknown	151	White pine sawfly	White Pine
93	Unknown defoliator	Unknown	152	White pine sawfly	White Pine
94	Unknown defoliator	Unknown	153	White pine sawfly	White Pine
95	Unknown defoliator	Unknown	154	White pine sawfly	White Pine
96	Unknown defoliator	Unknown	155	White pine sawfly	White Pine
97	Unknown defoliator	Unknown	156	White pine sawfly	White Pine
98	Unknown defoliator	Unknown	157	White pine sawfly	White Pine
99	Unknown defoliator	Unknown	158	White pine sawfly	White Pine
100	Unknown defoliator	Unknown	159	White pine sawfly	White Pine
101	Unknown defoliator	Unknown	160	White pine sawfly	White Pine
102	Unknown defoliator	Unknown	161	White pine sawfly	White Pine
103	Unknown defoliator	Unknown	162	White pine sawfly	White Pine
104	Unknown defoliator	Unknown	163	White pine sawfly	White Pine
105	Unknown defoliator	Unknown	164	White pine sawfly	White Pine
106	Unknown defoliator	Unknown	165	White pine sawfly	White Pine
107	Unknown defoliator	Unknown	166	White pine sawfly	White Pine
108	Unknown defoliator	Unknown	167	White pine sawfly	White Pine
109	Unknown defoliator	Unknown	168	White pine sawfly	White Pine
110	Unknown defoliator	Unknown	169	White pine sawfly	White Pine
111	Unknown defoliator	Unknown	170	White pine sawfly	White Pine
112	Unknown defoliator	Unknown	171	White pine sawfly	White Pine
113	Unknown defoliator	Unknown	172	White pine sawfly	White Pine
114	Unknown defoliator	Unknown	173	White pine sawfly	White Pine
115	Unknown defoliator	Unknown	174	White pine sawfly	White Pine
116	Unknown defoliator	Unknown	175	White pine sawfly	White Pine
117	Unknown defoliator	Unknown	176	White pine sawfly	White Pine
118	Unknown defoliator	Unknown	177	White pine sawfly	White Pine
119	Unknown defoliator	Unknown	178	White pine sawfly	White Pine
120	Unknown defoliator	Unknown	179	White pine sawfly	White Pine
121	Unknown defoliator	Unknown	180	White pine sawfly	White Pine
122	Unknown defoliator	Unknown	181	White pine sawfly	White Pine
123	Unknown defoliator	Unknown	182	White pine sawfly	White Pine
124	Unknown defoliator	Unknown	183	White pine sawfly	White Pine
125	Unknown defoliator	Unknown	184	White pine sawfly	White Pine
126	Unknown defoliator	Unknown	185	White pine sawfly	White Pine
127	Unknown defoliator	Unknown	186	White pine sawfly	White Pine
128	Unknown defoliator	Unknown	187	White pine sawfly	White Pine
129	Unknown defoliator	Unknown	188	White pine sawfly	White Pine
130	Unknown defoliator	Unknown	189	White pine sawfly	White Pine
131	Unknown defoliator	Unknown	190	White pine sawfly	White Pine
132	Unknown defoliator	Unknown	191	White pine sawfly	White Pine
133	Unknown defoliator	Unknown	192	White pine sawfly	White Pine
134	Unknown defoliator	Unknown	193	White pine sawfly	White Pine
135	Unknown defoliator	Unknown	194	White pine sawfly	White Pine
136	Unknown defoliator	Unknown	195	White pine sawfly	White Pine
137	Unknown defoliator	Unknown	196	White pine sawfly	White Pine
138	Unknown defoliator	Unknown	197	White pine sawfly	White Pine
139	Unknown defoliator	Unknown	198	White pine sawfly	White Pine
140	Unknown defoliator	Unknown	199	White pine sawfly	White Pine
141	Unknown defoliator	Unknown	200	White pine sawfly	White 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.

**Area surveyed by Les Koch 8/11/2005**  
**Map Created: January 2006**  
**Projection: UTM NAD83 Zone 13**  
**Author: J. Ross, USDA Forest Service**

**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**

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.

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/>