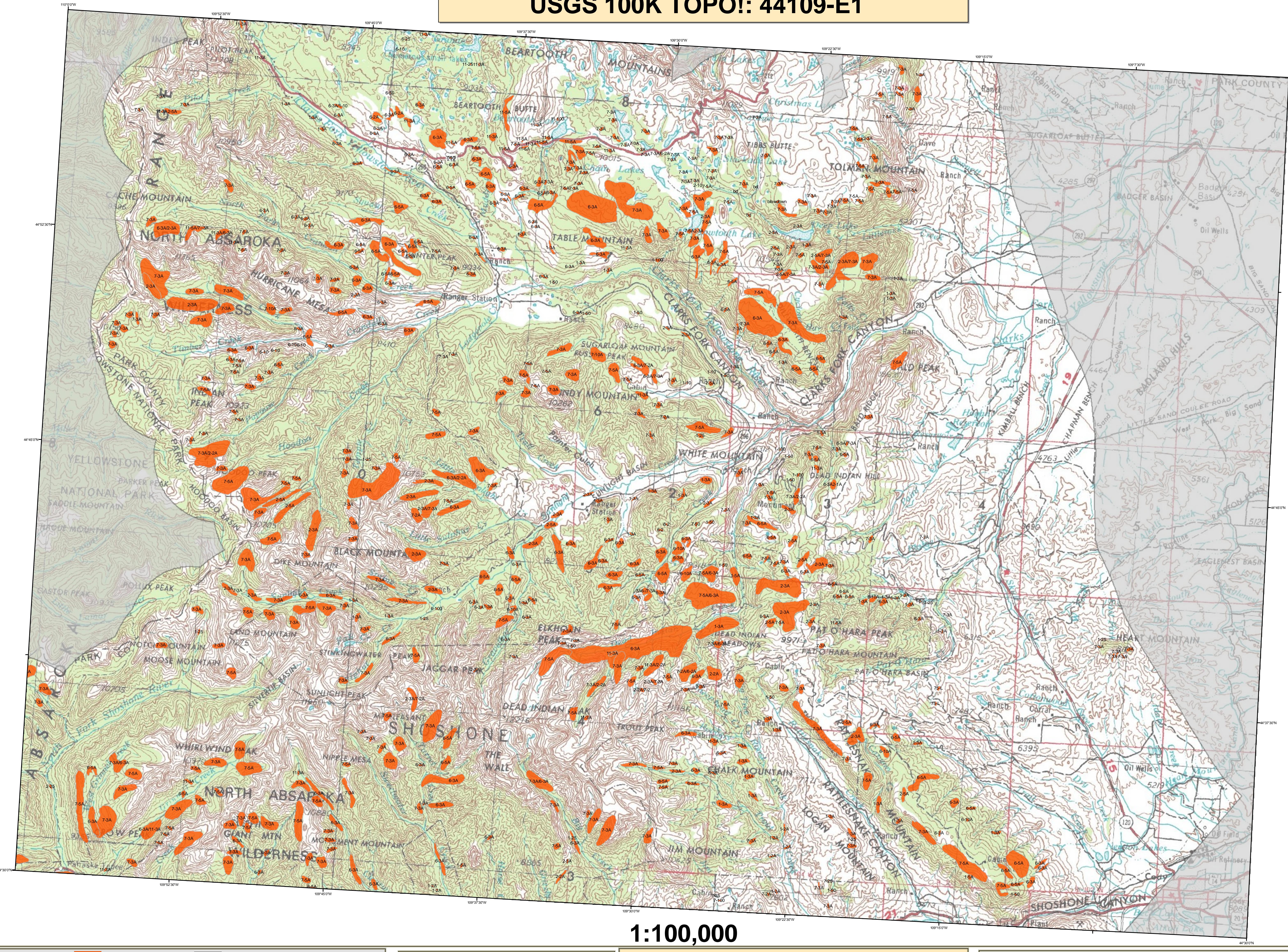


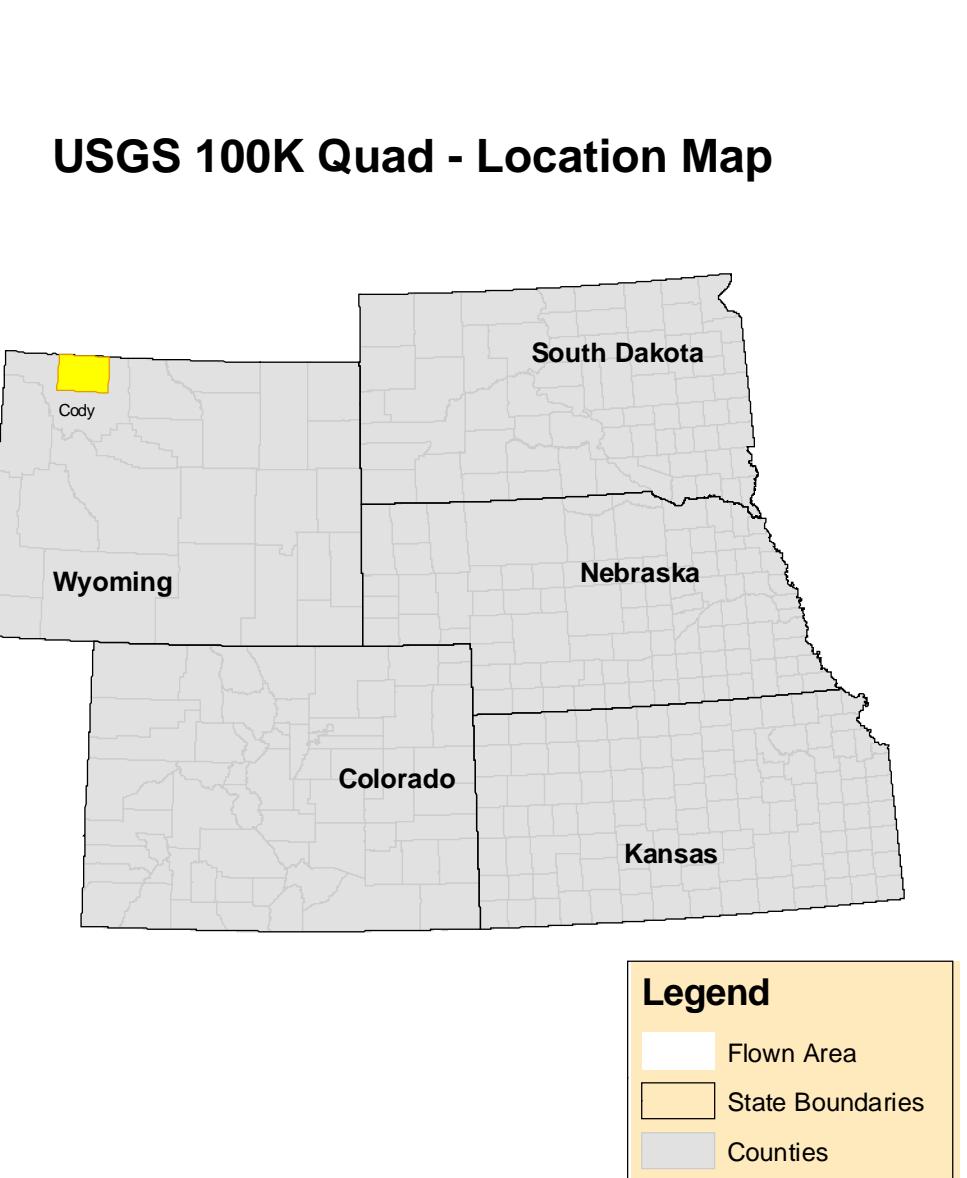
**\*\*DRAFT\*\***

**2008 Aerial Insect and Disease Survey**  
**Cody, Wyoming**  
**USGS 100K TOPO!: 44109-E1**

**\*\*DRAFT\*\***



Legend		Not Flown
		Use of the Number System Example 5-2c: 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 of color. When recording tree mortality, the causal agent code and the dash may be used after the number of dead "fader" trees. Periodically, tree coverage estimates are used after the causal agent code instead of numbers of dead "fader" trees (see causal agent 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 area. In this case it would be an estimation that, on average, one tree per every two acres would be a dead "fader" tree. In another example, 5-3A - trees in the average, an estimated three trees per acre are dead "fader" trees. An "A" is used as a separator when a polygon contains more than one causal agent.
Code Causal Agent	Primary Host	Code Causal Agent
1 Douglas-fir beetle	Douglas-fir	49 Atropis
2 Engelmann Spruce Beetle	Engelmann Spruce	50 White pine blister rust
3 Alpine spruce beetle	Alpine Spruce	51 Spruce budworm
4 Mountain pine beetle	Mountain Pine	52 Lodgepole Pine
5 Mountain pine beetle	Mountain Pine	53 Include 50, 60 & 68
6 Mountain pine beetle	Mountain Pine	54 Spruce beetles
7 Mountain pine beetle	Mountain Pine	55 White fir
8 White fir	White Fir	56 Lophodermium piniastri
9 Pm engraver	Pm engraver	57 Lophodermium piniastri
10 Douglas-fir engraver beetle	Douglas-fir	58 Lophodermium arcuata
11 Douglas-fir bark beetle	Douglas-fir	59 Leucania acicella
12 Unidentified bark beetle	Spruce	60 Leucania acicella
13 Pine engraver	Lodgepole Pine	61 Dicentrarchus labrax
14 Pine engraver	Lodgepole Pine	62 Neofestuca cast (Hypodemataeae)
15 Ponderosa pine needle miner	Lodgepole Pine	63 Jack pine
16 Lodgepole pine needle miner	Lodgepole Pine	64 unidentified disease
17 Jack pine	Jack pine	65 Winter damage light
18 Jack pine	Jack pine	66 Winter damage medium
19 Spruce budworm, light defol.	Spruce budworm	67 Winter damage heavy
20 Spruce budworm, heavy defol.	Spruce budworm	68 Diplolepis blanchi
21 Douglas-fir tussock moth	Douglas-fir	69 Fire
22 Douglas-fir tussock moth	Douglas-fir	70 High water damage
23 Pine Butterfly	Ponderosa Pine	71 Avalanche
24 Pine butterfly	Ponderosa Pine	72 Juniper mortality-unknown agent(s)
25 Pine tortrix	Ponderosa Pine	73 Juniper mortality-unknown agent(s)
26 Pine tortrix	Ponderosa Pine	74 Old pineon mortality
27 Pine tortrix	Ponderosa Pine	75 Pinyon pine mortality
28 Tert caterpillars	Hardwoods	76 Juniper mortality-unknown agent(s)
29 Tert caterpillars	Hardwoods	77 Juniper mortality-unknown agent(s)
30 Oak leaf roller	Hardwoods	78 Juniper mortality-unknown agent(s)
31 Oak leaf roller	Hardwoods	79 Juniper mortality-unknown agent(s)
32 Pine needle-shothole miner	Ponderosa Pine	80 Hall damage
33 Pine needle-shothole miner	Ponderosa Pine	81 Juniper mortality
34 Pine needle-shothole miner	Ponderosa Pine	82 Juniper mortality
35 Pine needle-shothole miner	Ponderosa Pine	83 Juniper mortality
36 Pine tussock moth	Ponderosa Pine	84 Juniper mortality
37 Cankerworms	Hardwoods	85 Juniper mortality
38 Juniper leaf caterpillar	Hardwoods	86 Juniper mortality
39 unidentified defolator	All Tree Species	87 Juniper mortality
40 All Tree Species	All Tree Species	88 Juniper mortality
41 Heterobasidion annosum (Fomes annosus)	Spruce	89 Juniper mortality
42 Amelanchier leafy (Amelanchier alnifolia)	Spruce	90 Juniper mortality
43 Polygraphus schwartzii	Spruce	91 Juniper mortality
44 Rhopalosiphon	Spruce	92 Juniper mortality
45 Liriomyza species	Spruce	93 Juniper mortality
46 Western gall rust	Spruce	94 Juniper mortality
47 Comandra rust	Spruce	95 Juniper mortality
48 Statocitiforme rust	Lodgepole Pine	96 Juniper mortality



**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 Al Dymerski**  
**Map Created:**  
**Projection: UTM NAD83 Zone 13**  
**Author: J. Ross, USDA Forest Service**

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**Forest Health Management**  
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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 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/2/resources/fhm/aerialsurvey/>

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