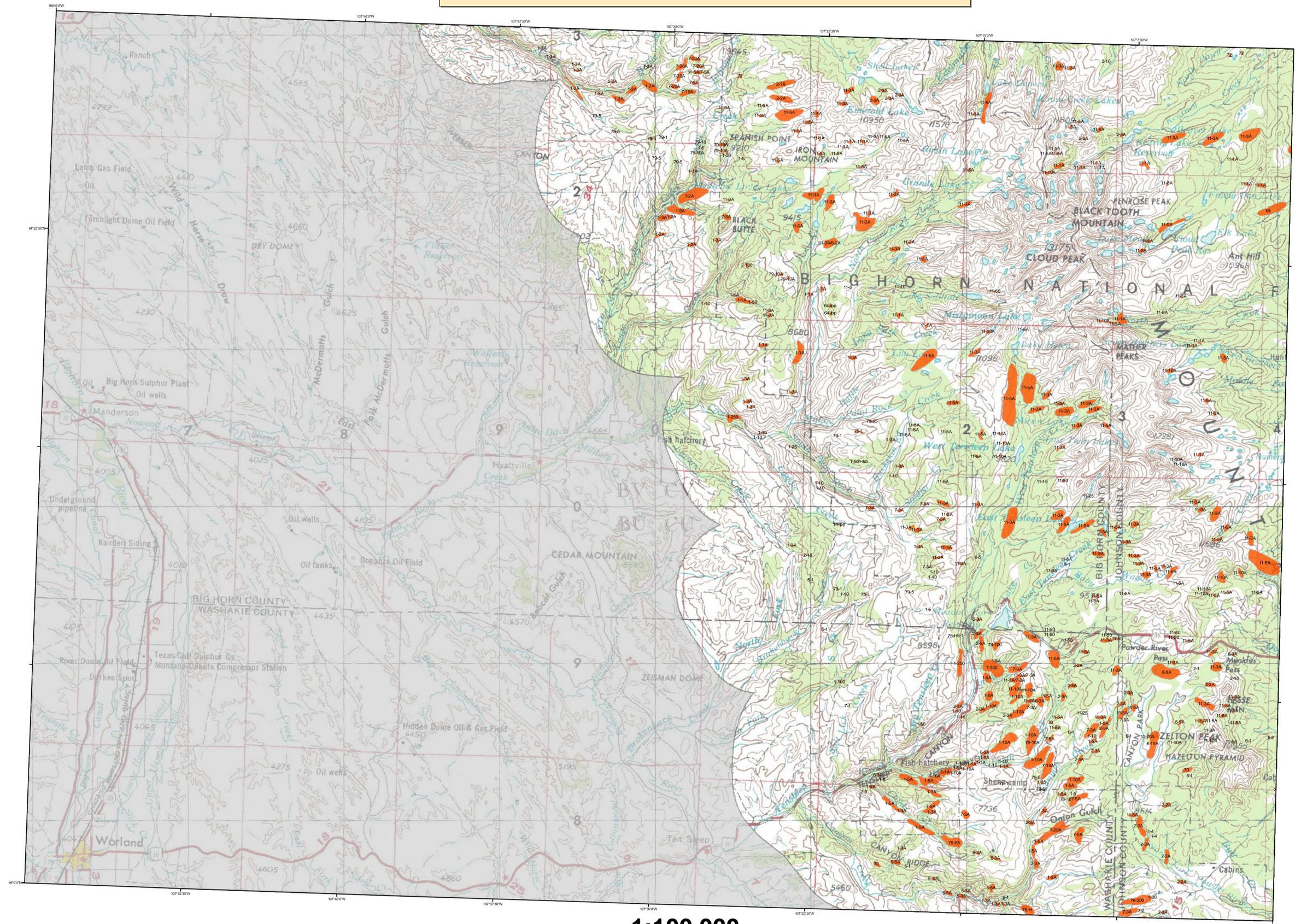


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2008 Aerial Insect and Disease Survey Worland, Wyoming USGS 100K TOPO!: 44107-A1

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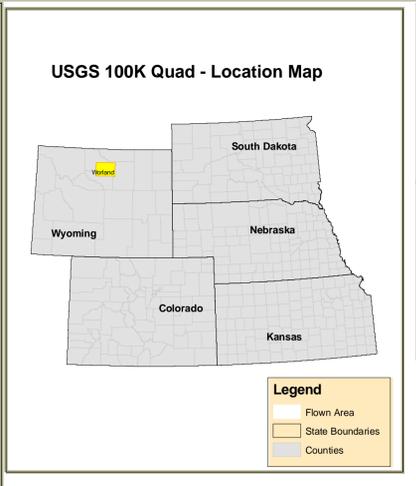


1:100,000

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 "fader" trees in the polygon or point. When record 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 "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.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	60	White pine blister rust	5-Needle Pine	107	fall webworm	Cottonwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	61	White pine sawfly	5-Needle Pine	108	road salt	Cottonwood/Poplar
3	Mountain pine beetle	Lodgepole Pine	62	Deer tick	Softwoods	109	grasshopper	Softwoods
4	Mountain pine beetle	Lodgepole Pine	63	Includes #05, 06 & 08	All Tree Species	110	oak wilt	Oak
5	Western pine beetle	Ponderosa Pine	64	Air pollutants	All Tree Species	111	locust disease	All Tree Species
6	White Fir	Subalpine Fir	65	Chemical damage	All Tree Species	112	spine louse	White Spruce
7	White Fir	Subalpine Fir	66	Lophodermium prostratum	Softwoods	113	leaf-miner chestnut borer	Oak
8	White Fir	Subalpine Fir	67	Rhabdocline pseudotsugae	Douglas-fir	114	anthracnose like foliar disease	Bur Oak
9	White Fir	Subalpine Fir	68	Lophodermium arcutum	Softwoods	115	Dieback	All Tree Species
10	Douglas-fir engraver beetle	Douglas-fir	69	Lophodermium arcutum	Softwoods	116	Mortality	All Tree Species
11	Western balsam beetle	Subalpine Fir	70	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
12	Unidentified bark beetle	Softwoods	71	Dothistroma gii	Softwoods	118	Herbicide	All Tree Species
13	Pine engraver	Lodgepole Pine	72	Needle cast (Hypodermataceae)	Softwoods	119	Flagging	All Tree Species
14	Pine engraver	Lodgepole Pine	73	Rust Rot	All Tree Species	120	aspen tortrix	Quaking Aspen
15	Ponderosa pine needle miner	Ponderosa Pine	74	Unidentified disease	All Tree Species	121	Mansonia blight	Aspen
16	Lodgepole pine needle miner	Ponderosa Pine	75	Winter damage light	All Tree Species	200	Dieback (ash)	Cottonwood/Poplar
17	Jack pine budworm	Jack Pine	76	Winter damage medium	All Tree Species	201	Dieback (cottonwood)	Hardwoods
18	Spine budworm, light defol.	Douglas-fir	77	Winter damage heavy	All Tree Species	202	Dieback (hardwood)	Hardwoods
19	Spine budworm, medium defol.	Douglas-fir	78	Winter damage medium	All Tree Species	203	Dieback (oak)	Oak
20	Spine budworm, heavy defol.	Douglas-fir	79	Pinyon bark stain	Common Pinyon	210	Mortality (old cottonwood)	Cottonwood/Poplar
21	Douglas-fir tussock moth	Douglas-fir	80	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
22	Pine butterfly	Ponderosa Pine	81	Penicillium	Softwoods	212	Mortality (hardwood)	Hardwoods
23	Pine tortrix	Ponderosa Pine	82	Windthrow	All Tree Species	213	Mortality (oak)	Oak
24	Tent caterpillars	Hardwoods	83	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
25	Leaf beetles	Hardwoods	84	Avalanche	All Tree Species	220	Discoloration (ash)	Aspen
26	Oak leaf roller	Hardwoods	85	Pine sawfall (multiple agents)	Quaking Aspen	221	Discoloration (cottonwood)	Softwoods
27	Pine needle-shed miner	Ponderosa Pine	86	Pine tussock moth	Common Pinyon	222	Discoloration (cottonwood)	Cottonwood/Poplar
28	Pine sawfall	Ponderosa Pine	87	Juniper mortality-unknown agents	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
29	Variabil oak leaf caterpillar	Hardwoods	88	Gambel oak decline-unknown agents	Gambel Oak	224	Discoloration (hardwood)	Hardwoods
30	Conk worms	Hardwoods	89	Lumber pine decline-multiple agents	Lumber Pine	225	Discoloration (oak)	Oak
31	Unidentified defoliator	All Tree Species	90	Limber pine decline-multiple agents	Limber Pine	226	Discoloration (spruce)	Spruce
32	Heterodactylus araneus (Fomes araneus)	Hardwoods	91	Unidentified defoliator	All Tree Species	227	Discoloration (cottonwood)	Cottonwood/Poplar
33	Amelara caryocarpa (Amelara melles)	Softwoods	92	Unidentified defoliator (elm)	Elm	228	Herbicide (cottonwood)	Cottonwood/Poplar
34	Polyporus schweinitzii	Softwoods	93	Unidentified defoliator (cottonwood)	Cottonwood/Poplar	230	Herbicide (eastern cedar)	Eastern Red Cedar
35	Phenacoccus	Softwoods	94	Unidentified defoliator (elm)	Elm	231	Unidentified defoliator (hardwood)	Hardwoods
36	Cytospora	All Tree Species	95	Unidentified defoliator (pine)	Pine	232	Mortality (pine)	Pine
37	Western gall rust	Unknown	96	Unidentified defoliator (cottonwood)	Cottonwood/Poplar			
38	Comandra rust	Unknown	97	Unidentified defoliator (hardwood)	Hardwoods			
39	Stachytaraxia rust	Lodgepole Pine	98	Unidentified defoliator (hardwood)	Hardwoods			
100	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood						



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

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Renewable Resources
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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/r2/resources/fhm/aerialsurvey/>