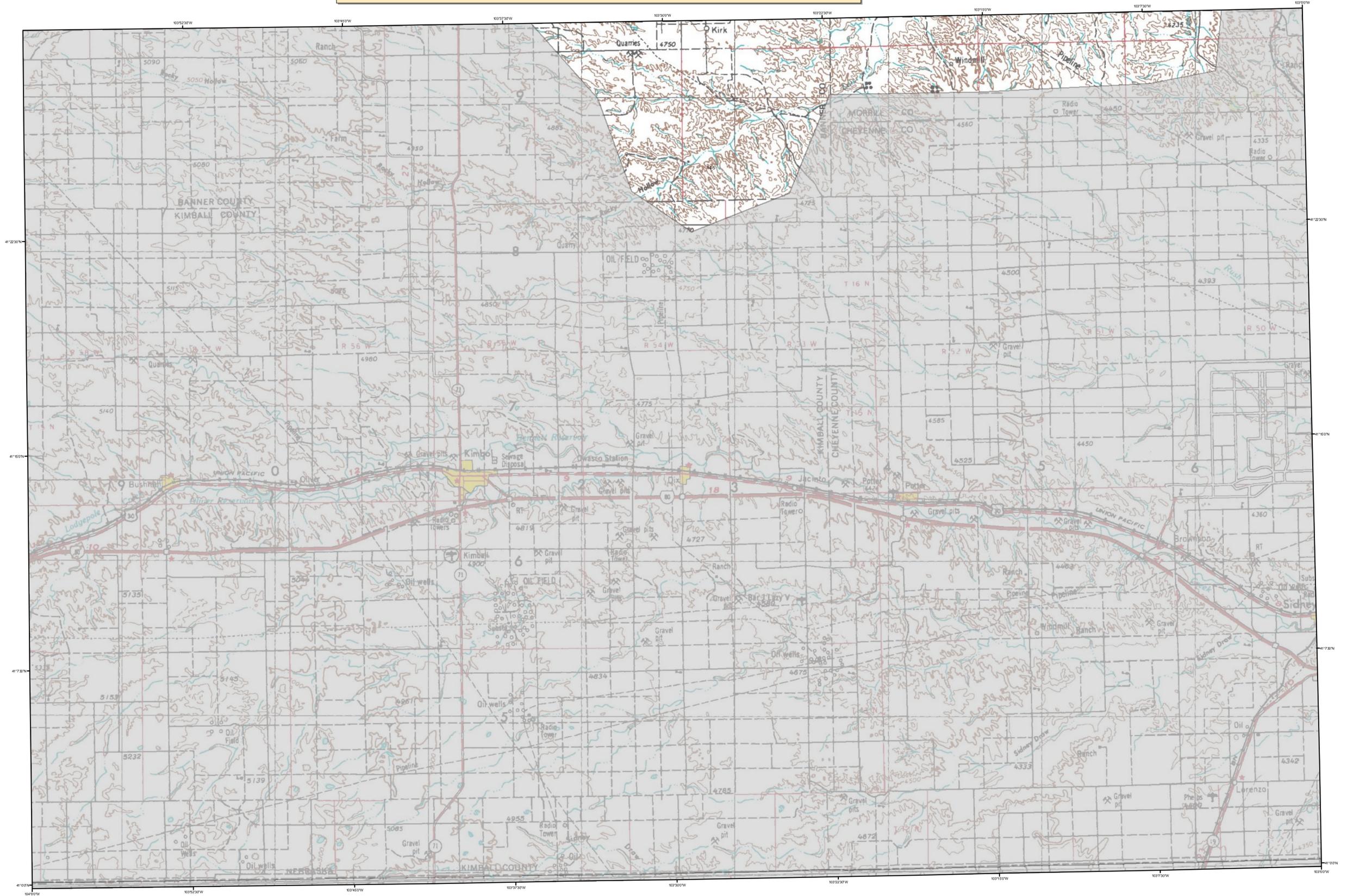


2010 Aerial Insect and Disease Survey Kimball, Nebraska USGS 100K DRG: 41103-A1

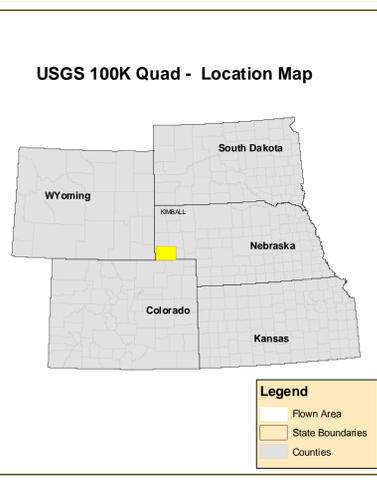


1:100,000

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 "ladder" 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 acre estimates are used after the causal agent code instead of number of dead "ladder" trees (or an intensity code). For example: 5-1/2A = The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "ladder" 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 "ladder" tree. In another example: 5-2A = that on the average, an estimated three trees per acre are dead "ladder" 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	49	Ring-necked Pigeon	Lodgepole Pine	100	fox squirrel foraging	Cottonwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	50	White pine blister rust	5-Needle Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	51	Owl mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	Lodgepole Pine	52	Elytrodema	Ponderosa Pine	109	pinewood nematode	Scotch Pine
5	Mountain pine beetle	5-Needle Pine	53	Indusides #02, 00 & 05	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	54	Air pollution	All Tree Species	111	foliar disease	All Tree Species
7	White Fir	White Fir	55	Chemical damage	All Tree Species	112	spruce ips	White Spruce
8	White Fir	Douglas-fir	56	Lophodermium pinastri	Softwoods	113	hemlock chestnut borer	Oak
9	White Fir	Subalpine Fir	57	Rhabdocline pseudotsugae	Douglas-fir	114	anthracnose like foliar disease	Bur Oak
10	Douglas-fir engraver beetle	Douglas-fir	58	Lophodermium arcuta	Softwoods	115	Diaback	All Tree Species
11	Western balsam bark beetle	Subalpine Fir	59	Lophodermium concolor	Softwoods	116	Mortality	All Tree Species
12	Unidentified bark beetle	Lodgepole Pine	60	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
13	Pine engraver	Lodgepole Pine	61	Cotoneaster psyllid	Softwoods	118	Heterocid	All Tree Species
14	Pine engraver	Ponderosa Pine	62	Needle cast (Hymenoptera)	Softwoods	119	Flagging	All Tree Species
15	Ponderosa pine needle miner	Lodgepole Pine	63	Rust Rot	All Tree Species	120	Japan tortix	Quaking Aspen
16	Lodgepole pine needle miner	Ponderosa Pine	64	Unidentified disease	Softwoods	121	Marronina Blight	Quaking Aspen
17	Jack pine budworm	Jack Pine	65	Winter damage light	All Tree Species	200	Diaback (ash)	Ash
18	Spruce budworm, light defol.	Douglas-fir	66	Winter damage medium	All Tree Species	201	Diaback (cottonwood)	Cottonwood/Poplar
19	Spruce budworm, medium defol.	Douglas-fir	67	Winter damage heavy	All Tree Species	202	Diaback (hardwood)	Hardwoods
20	Spruce budworm, heavy defol.	Douglas-fir	68	Opilidia	Softwoods	204	Diaback (oak)	Oak
21	Douglas-fir tussock moth	Ponderosa Pine	69	Prionyn black stain	Common Prinyon	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Pine butterfly	Ponderosa Pine	70	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Pine tortrix	Ponderosa Pine	71	Parasitism	Softwoods	212	Mortality (hardwood)	Hardwoods
24	Variable oak leaf caterpillar	Hardwoods	72	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Leaf beetles	Hardwoods	73	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Oak leaf roller	Hardwoods	74	Avalanche	All Tree Species	220	Discoloration (ash)	Ash
27	Pine needle-shaft miner	Ponderosa Pine	75	Aspen beetle-multiple agents)	Softwoods	221	Discoloration (cottonwood)	Cottonwood/Poplar
28	Pine needle-shaft miner	Ponderosa Pine	76	Prionyn pine mortality	Common Prinyon	222	Discoloration (eastern cedar)	Eastern Red Cedar
29	Variable oak leaf caterpillar	Hardwoods	77	Juniper mortality-unknown agents)	Juniper	223	Discoloration (hardwood)	Hardwoods
30	Unidentified defoliator	All Tree Species	78	Limber pine decline-multiple agents)	Limber Pine	224	Discoloration (spruce)	Spruce
31	Hemlock-looper (Pristiphora annosus)	Softwoods	79	Limber pine decline-multiple agents)	Limber Pine	225	Discoloration (oak)	Oak
32	Leaf beetles	Softwoods	80	Hail damage	All Tree Species	226	Discoloration (hardwood)	Hardwoods
33	Leaf beetles	Softwoods	81	Unknown	Unknown	227	Discoloration (eastern cedar)	Eastern Red Cedar
34	Pine needle-shaft miner	Ponderosa Pine	82	Unknown	Unknown	228	Discoloration (oak)	Oak
35	Pine tussock moth	Ponderosa Pine	83	Unknown	Unknown	229	Discoloration (spruce)	Spruce
36	Carleworms	Hardwoods	84	Unknown	Unknown	230	Herbicide (cottonwood)	Cottonwood/Poplar
37	Variable oak leaf caterpillar	Hardwoods	85	Unknown	Unknown	231	Herbicide (eastern cedar)	Eastern Red Cedar
38	Unidentified defoliator	All Tree Species	86	Unknown	Unknown	232	Flagging (hardwood)	Hardwoods
39	Phonopias	Softwoods	87	Unknown	Unknown	240	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
40	Phonopias	Softwoods	88	Unknown	Unknown	242	Unidentified defoliator (oak)	Oak
41	Phonopias	Softwoods	89	Unknown	Unknown	250	Unidentified defoliator (hardwood)	Hardwoods
42	Armillaria ostoyae (Armillaria mellea)	Softwoods	90	Unknown	Unknown	252	Mortality (pine)	Pine
43	Polygonus schweinfurthii	Softwoods	91	Unknown	Unknown			
44	Phonopias	Softwoods	92	Unknown	Unknown			
45	Cyrtopora	All Tree Species	93	Unknown	Unknown			
46	Western gall rust	Unknown	94	Unknown	Unknown			
47	Comandra rust	Unknown	95	Unknown	Unknown			
48	Stachytarax rust	Lodgepole Pine	96	Unknown	Unknown			



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 November 1 2010
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*****

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.

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