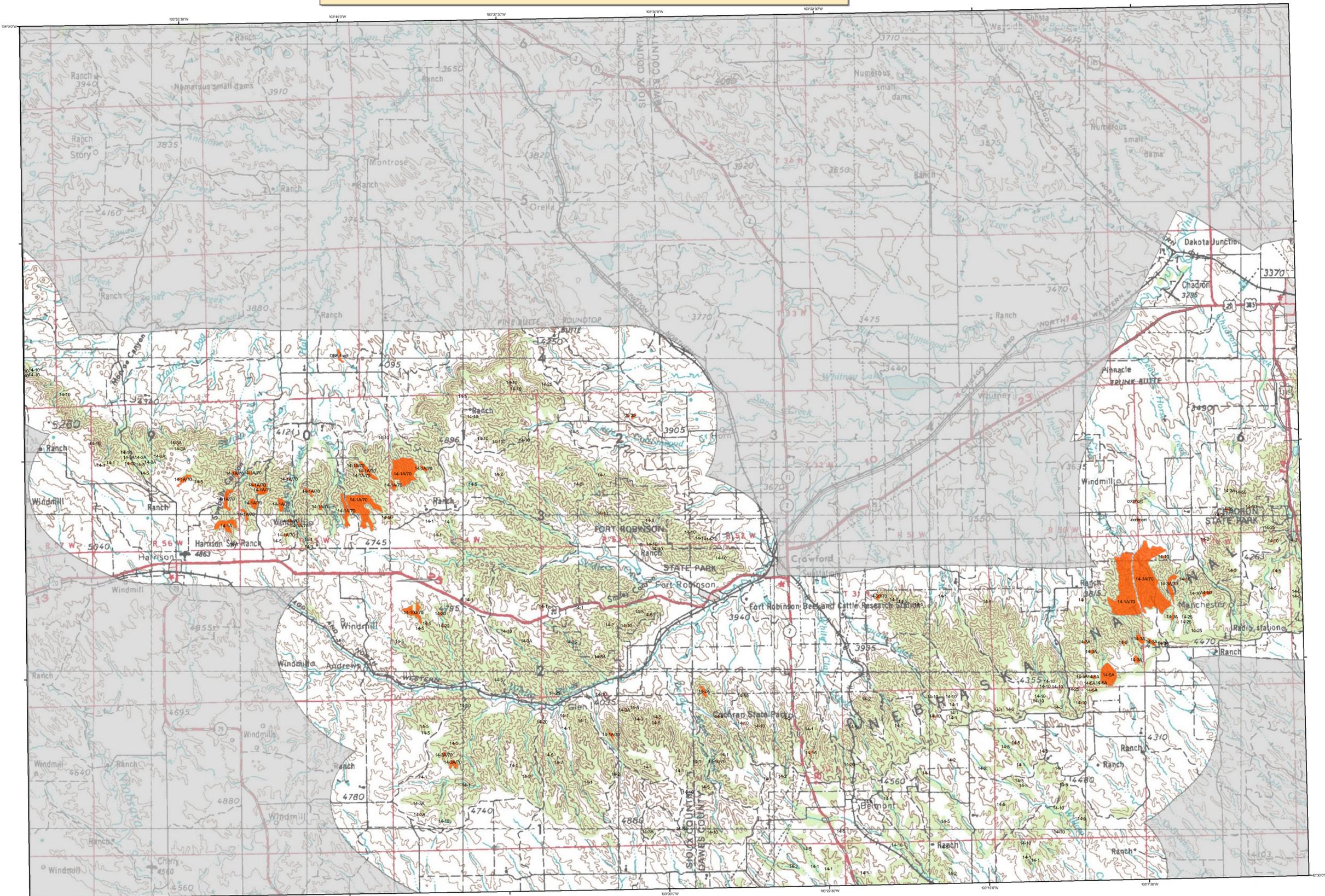


2008 Aerial Insect and Disease Survey Crawford, Nebraska USGS 100K DRG: 42103-E1

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1:100,000

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	59	Anoploa	Lodgepole Pine	105	fox squirrel feigning	Cottonwood/Poplar
2	Engelmann spruce beetle	Engelmann spruce	60	White pine blister rust	5-Needle Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	61	Oswald mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	Ponderosa Pine	62	Elytrodema	Ponderosa Pine	109	pinewood nematode	Scotch Pine
5	Mountain pine beetle	Ponderosa Pine	63	Inducias #02, 00 & 05	All Tree Species	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	64	Air pollution	All Tree Species	111	Scotch disease	All Tree Species
7	Fire Engulver	White Fir	65	Chemical damage	All Tree Species	112	spruce ips	White Spruce
8	Douglas-fir engraver beetle	Douglas-fir	66	Lophodendrom prasinii	Softwoods	113	hemlock chestnut borer	Oak
9	Western balsam bark beetle	Subalpine Fir	67	Rhabdocline pseudotsugae	Douglas-fir	114	anthracnose like foliar disease	Bur Oak
10	Unidentified bark beetle	Softwoods	68	Lophodermium arcuta	Softwoods	115	Dieback	All Tree Species
11	Pine engraver	Lodgepole Pine	69	Lophodermium arcuta	Softwoods	116	Mortality	All Tree Species
12	Pine engraver	Ponderosa Pine	70	Lophodermium concolor	Softwoods	117	Discoloration	All Tree Species
13	Pondosa pine needle miner	Lodgepole Pine	71	Cotoneaster gall	Softwoods	118	Herbicide	All Tree Species
14	Lodgepole pine needle miner	Ponderosa Pine	72	Needle cast (Hypodermaceae)	Softwoods	119	Flagging	Quaking Aspen
15	Jack pine budworm	Jack Pine	73	Root Rot	All Tree Species	120	Japan tortix	Quaking Aspen
16	Spruce budworm, light defol.	Douglas-fir	74	Unidentified disease	All Tree Species	121	Marroniana Blight	Ash
17	Spruce budworm, medium defol.	Douglas-fir	75	Winter damage light	All Tree Species	200	Dieback (ash)	Ash
18	Spruce budworm, heavy defol.	Douglas-fir	76	Winter damage medium	All Tree Species	201	Dieback (cottonwood)	Cottonwood/Poplar
19	Douglas-fir tussock moth	Douglas-fir	77	Winter damage heavy	All Tree Species	202	Dieback (hardwood)	Hardwoods
20	Pine looper	Ponderosa Pine	78	Dieback (oak)	Oak	204	Dieback (oak)	Oak
21	Tent caterpillar	Hardwoods	79	Prinyon black stain	Common Prinyon	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Leaf beetles	Hardwoods	80	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Oak leaf roller	Hardwoods	81	Peronospora	Hardwoods	212	Mortality (hardwood)	Hardwoods
24	Pine needle-shaft miner	Ponderosa Pine	82	Windthrow	All Tree Species	213	Mortality (oak)	Oak
25	Pine tussock moth	Ponderosa Pine	83	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Variable oak leaf caterpillar	Hardwoods	84	Avalanche	All Tree Species	220	Discoloration (ash)	Ash
27	Unidentified defoliator	All Tree Species	85	Alpen decidue-multiple agents)	Common Prinyon	222	Discoloration (cottonwood)	Cottonwood/Poplar
28	Armillaria ostoyae (Armillaria mellea)	Softwoods	86	Juniper mortality-unknown agents)	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
29	Polygonus schweinfertii	Softwoods	87	Juniper mortality-unknown agents)	Juniper	224	Discoloration (hardwood)	Hardwoods
30	Phomopsis	Softwoods	88	Quercus oak decline-unknown agents)	Quercus Oak	225	Discoloration (oak)	Oak
31	Cytospora	All Tree Species	89	Limber pine decline-multiple agents)	Limber Pine	226	Discoloration (spruce)	Spruce
32	Western gall rust	Unknown	90	Unkown polygon	Unknown	230	Herbicide (cottonwood)	Cottonwood/Poplar
33	Comandra rust	Unknown	91	Unkown polygon	Unknown	231	Herbicide (eastern cedar)	Eastern Red Cedar
34	Sheathform rust	Lodgepole Pine	92	Unkown polygon	Unknown	232	Flagging (hardwood)	Hardwoods
			93	Unkown polygon	Unknown	233	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
			94	Unkown polygon	Unknown	234	Unidentified defoliator (hem)	Hemlock
			95	Unkown polygon	Unknown	235	Unidentified defoliator (hardwood)	Hardwoods
			96	Unkown polygon	Unknown	300	Mortality (pine)	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 Bill Schapp & AI Dymerski
Map Created:
Projection: UTM NAD83 Zone 13
Author: J. Ross, USDA Forest Service**

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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/>