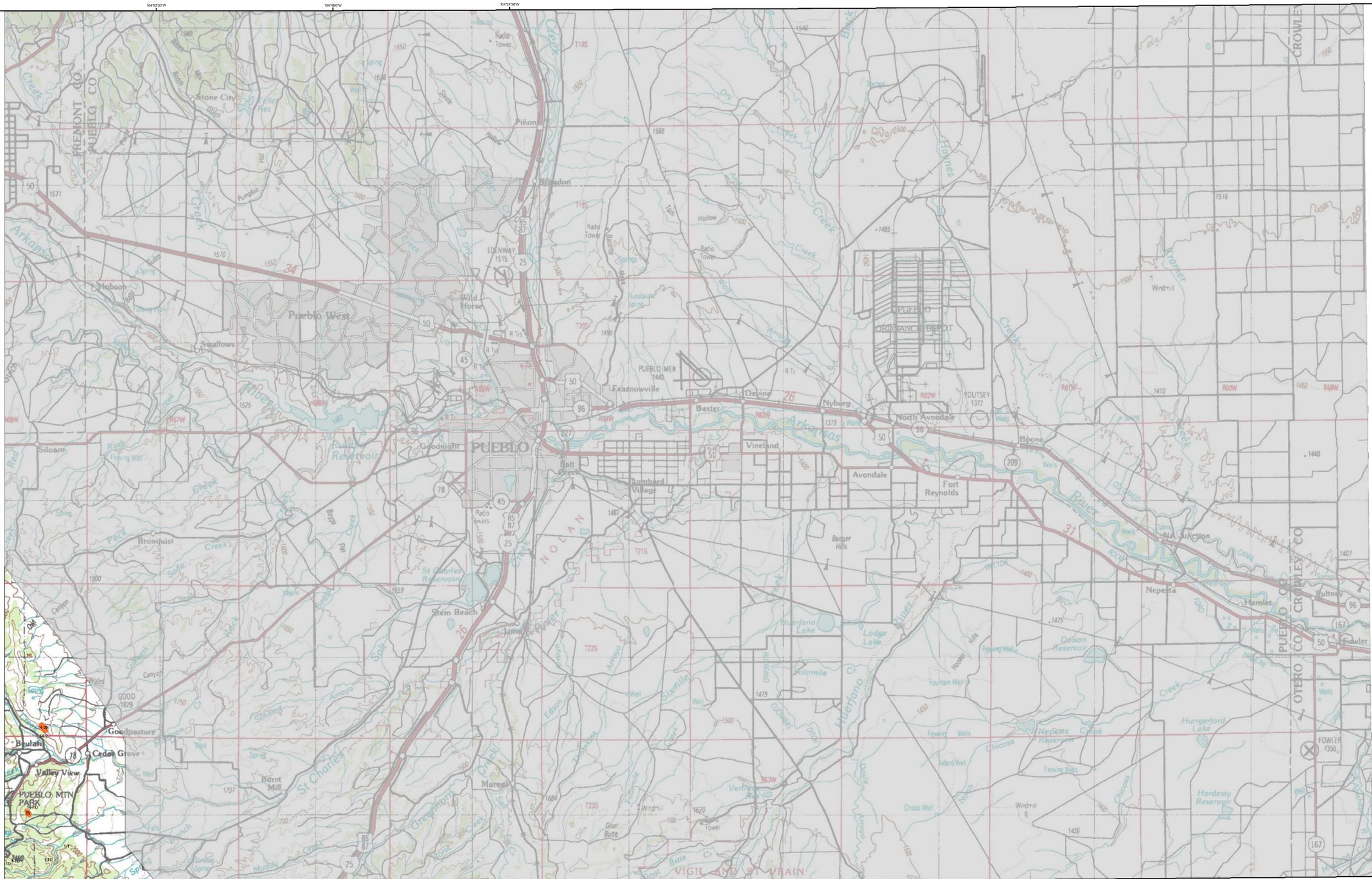


2009 Aerial Insect and Disease Survey Pueblo, Colorado USGS 100K DRG: 38104-A1



1:100,000

Legend

Code	Causal Agent(s)	Primary Host	Code	Causal Agent(s)	Primary Host
1	Douglas fir beetle	Douglas fir	106	For skunk tagging	Cottonwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	108	east oak	Softwoods
4	Mountain pine beetle	Lodgepole Pine	109	pine wood nematode	Scotch Pine
5	Mountain pine beetle	S-Needle Pine	110	oak wilt	Oak
6	Western pine beetle	Ponderosa Pine	111	ridge disease	All Tree Species
7	Fire Engiever	White Fir	112	spruce ips	White Spruce
8	Douglas fir engraver beetle	Douglas fir	113	beetled chestnut borer	Oak
9	Western balsam bark beetle	Subspline Fir	114	anthracnose like foliar disease	Bur Oak
10	Unidentified bark beetle	Softwoods	115	Dieback	All Tree Species
11	Pine engraver	Lodgepole Pine	116	Mortality	All Tree Species
12	Ponderosa pine needle miner	Ponderosa Pine	117	Discoloration	All Tree Species
13	Lodgepole pine needle miner	Lodgepole Pine	118	Heterosylla	All Tree Species
14	Jack pine budworm	Jack Pine	119	Flagging	All Tree Species
15	Spruce budworm, light defol.	Douglas fir	120	aspen tent	Quaking Aspen
16	Spruce budworm, heavy defol.	Douglas fir	121	Marsannia Blight	Quaking Aspen
17	Douglas fir tussock moth	Douglas fir	200	Dieback (ash)	Ash
18	Pine looper	Ponderosa Pine	201	Dieback (cottonwood)	Cottonwood/Poplar
19	Tent caterpillars	Hardwoods	202	Dieback (hardwood)	Hardwoods
20	Leaf beetles	Hardwoods	210	Mortality (old cottonwood)	Cottonwood/Poplar
21	Oak leaf roller	Hardwoods	211	Mortality (eastern cedar)	Eastern Red Cedar
22	Pine needle-shear miner	Ponderosa Pine	212	Mortality (oak)	Oak
23	Jack pine budworm	Ponderosa Pine	214	Mortality (spruce)	Spruce
24	Pine tussock moth	Ponderosa Pine	220	Discoloration (ash)	Ash
25	Cantharidomys	Hardwoods	221	Discoloration (cedar)	Softwoods
26	Variable oak leaf caterpillar	Hardwoods	222	Discoloration (cottonwood)	Cottonwood/Poplar
27	Unidentified defoliator	All Tree Species	223	Discoloration (eastern cedar)	Eastern Red Cedar
28	Heterobasidion annosum (Fomes annosus)	Softwoods	224	Discoloration (hardwood)	Oak
29	Armillaria ostoyae (Armillaria mellea)	Softwoods	225	Discoloration (spruce)	Spruce
30	Phytophthora schweinitzii	Softwoods	230	Flagging (cottonwood)	Cottonwood/Poplar
31	Phytophthora	Softwoods	231	Heterosylla (eastern cedar)	Eastern Red Cedar
32	Cytospora	All Tree Species	240	Flagging (hardwood)	Hardwoods
33	Western gall rust	Unknown	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
34	Comandra rust	Unknown	251	Unidentified defoliator (spruce)	Softwoods
35	Shearwater rust	Lodgepole Pine	252	Unidentified defoliator (hardwood)	Hardwoods
36			253	Mortality (pine)	Pine

USGS 100K Quad - Location Map



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.

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Map Created December 11 2009
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/aerialsurveys/>

DISCLAIMER
Forest Health Protection (FHP) and its partners strive to maintain an accurate Aerial Detection Survey (ADS) Database, but due to the conditions under which the data are collected, FHP and its partners shall not be held responsible for missing or inaccurate data. ADS are not intended to replace more specific information. An accuracy assessment has not been done for this dataset; however, ground checks are completed in accordance with local and national guidelines <http://www.fs.fed.us/foresthealth/aviation/qualityassurance.shtml>. Maps and data may be updated without notice. Please cite "USDA Forest Service, Forest Health Protection and its partners" as the source of this data in maps and publications.

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.