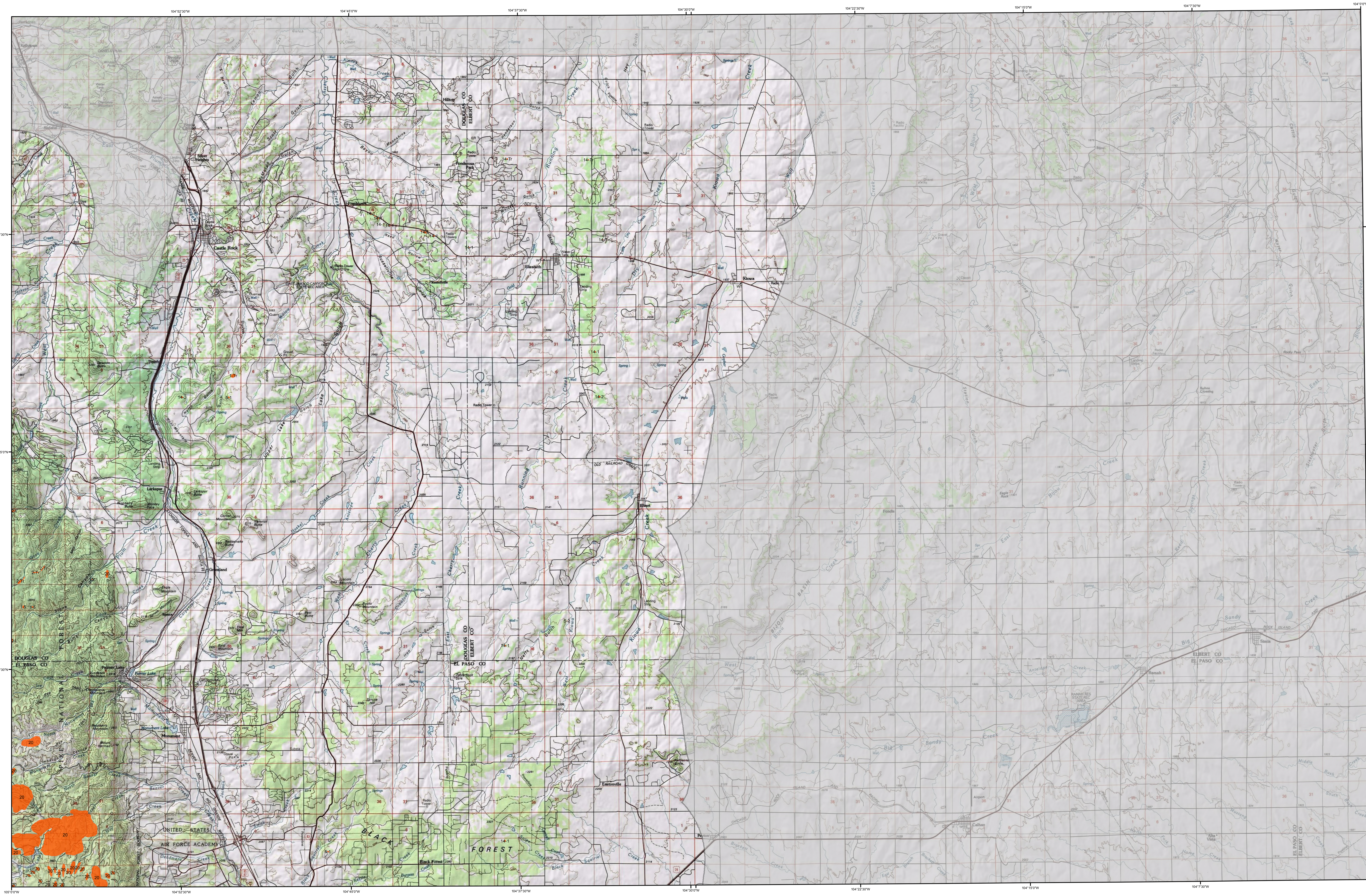
2016 Aerial Insect and Disease Survey
CASTLE ROCK, COLORADO
USGS 100K TOPO!: 39104-A1

DRAFT **DRAFT**



1:100,000

Legend

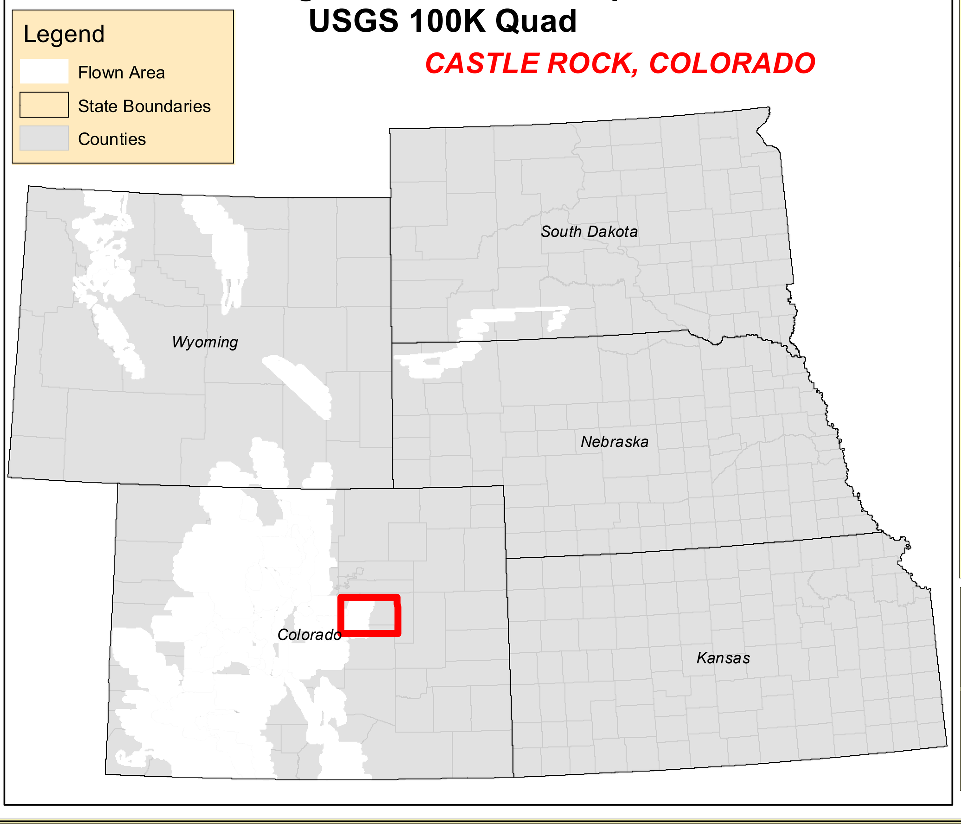
Causal Agent(s) | Not Flown

Use of the Number System
Example: 5-L = The first number before the dash is the causal agent code. The letter after the dash is the estimate of dead "fader" trees in the polygon or point as a percentage of the total trees within the delineated area. An intensity code of Tr- Trace, L- Light, M- Moderate, S- Severe, and VS - Very Severe may be used after the causal agent code.
Trace: 1-3%; Light: 4-10%; Moderate: 11-29%; Severe: 30-50%; Very Severe: >50% Value ranges represent the percent of current "faders" in relation to the total forested area within the polygon. Periodically, whole numbers of trees can used as an intensity code for small groups of trees. For example: 5-10 = 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.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	49	Atropellis	Lodgepole Pine	106	fox squirrel flagging	Cottonwood,Poplar
2	Engelmann Spruce Beetle	Englemann Spruce	48	Stalactiforme rust	Lodgepole Pine	107	fall webworm	Cottonwood,Poplar
3	Blue Spruce Ips	Blue Spruce	50	White pine blister rust	5-Needle Pine	108	road salt	Softwoods
5	Mountain pine beetle	Ponderosa Pine	51	Dwarf mistletoe	Softwoods	109	pinewood nematode	Scotch Pine
6	Mountain pine beetle	Lodgepole Pine	52	Elytroderma	Ponderosa Pine	110	oak wilt	Oak
7	Mountain pine beetle	5-Needle Pine	53	Includes #65, 66 & 68	All Tree Species	111	foliage disease	All Tree Species
8	Western pine beetle	Ponderosa Pine	54	Air pollutants	All Tree Species	112	spruce ips	White Spruce
9	Fir Engraver	White Fir	55	Chemical damage	All Tree Species	113	twolined chestnut borer	Oak
10	Douglas-fir engraver beetle	Douglas-fir	56	Lophodermium pinastri	Softwoods	114	anthracnose like foliar disease	Bur Oak
11	Western balsam bark beetle	Subalpine Fir	57	Rhabdocline pseudotsugae	Douglas-fir	115	Dieback	All Tree Species
12	Unidentified bark beetle	Softwoods	58	Lophodermella arcuata	Softwoods	116	Mortality	All Tree Species
13	Pine engraver	Lodgepole Pine	59	Lecanostica aciocola	Softwoods	117	Discoloration	All Tree Species
14	Pine engraver	Ponderosa Pine	60	Lophodermella concolor	Softwoods	118	Herbicide	All Tree Species
15	Ponderosa pine needle miner	Lodgepole Pine	61	Dothistroma pini	Softwoods	119	Flagging	All Tree Species
16	Lodgepole pine needle miner	Ponderosa Pine	62	Needle cast (Hypodermataceae)	Softwoods	120	aspen tortrix	Quaking Aspen
17	Jack pine budworm	Jack Pine	63	Root Rot	All Tree Species	121	Marssonina Blight	Quaking Aspen
18	Spruce budworm, light defol.	Douglas-fir	64	Unidentified disease	Softwoods	200	Dieback (ash)	Ash
19	Spruce budworm, medium defol.	Douglas-fir	65	Winter damage light	All Tree Species	201	Dieback (cottonwood)	Cottonwood,Poplar
20	Spruce budworm, heavy defol.	Douglas-fir	66	Winter damage medium	All Tree Species	202	Dieback (hardwood)	Hardwoods
22	Douglas-fir tussock moth	Douglas-fir	67	Winter damage heavy	All Tree Species	204	Dieback (oak)	Oak
23	Pine Butterfly	Ponderosa Pine	68	Diplodia	Softwoods	210	Mortality (old cottonwood)	Cottonwood,Poplar
26	Pine looper	Ponderosa Pine	69	Pinyon black stain	Common Pinyon	211	Mortality (eastern cedar)	Eastern Red Cedar
27	Pine tortrix	Ponderosa Pine	70	Fire	All Tree Species	212	Mortality (hardwood)	Hardwoods
28	Tent caterpillars	Hardwoods	71	Porcupine	Softwoods	213	Mortality (oak)	Oak
29	Leaf beetles	Hardwoods	72	Windthrow	All Tree Species	214	Mortality (spruce)	Spruce
30	Aspen defoliation	Quaking Aspen	73	High water damage	All Tree Species	220	Discoloration (ash)	Ash
33	Oak leaf roller	Hardwoods	74	Avalanche	All Tree Species	221	Discoloration (conifer)	Softwoods
34	Pine needle-sheath miner	Ponderosa Pine	75	Aspen decline-multiple agent(s)	Quaking Aspen	222	Discoloration (cottonwood)	Cottonwood,Poplar
35	Pine sawflies	Ponderosa Pine	76	Pinyon pine mortality	Common Pinyon	223	Discoloration (eastern cedar)	Eastern Red Cedar
36	Pine tussock moth	Ponderosa Pine	77	Juniper mortality-unknown agent(s)	Juniper	224	Discoloration (hardwood)	Hardwoods
37	Cankerworms	Hardwoods	78	Gamble oak decline-unknown agent(s)	Gambel Oak	225	Discoloration (oak)	Oak
38	Variable oak leaf caterpillar	Hardwoods	79	Limber pine decline-multiple agent(s)	Limber Pine	226	Discoloration (spruce)	Spruce
39	Unidentified defoliator	All Tree Species	80	Hail damage	All Tree Species	230	Herbicide (cottonwood)	Cottonwood,Poplar
40	Cottonwood Decline/Mortality	Cottonwood	99	Unknown polygon	Unknown	231	Herbicide (eastern cedar)	Eastern Red Cedar
41	Heterobasidion annosum (Fomes annosus)	Softwoods	100	old pinion mortality	Common Pinyon	240	Flagging (hardwood)	Hardwoods
42	Armillaria ostoyae (Armillaria mellea)	Softwoods	101	road salt Ipp	Lodgepole Pine	250	Unidentified defoliator (cottonwood)	Cottonwood,Poplar
44	Phomopsis	Softwoods	102	dutch elm disease	Elm	251	Unidentified defoliator (elm)	Elm
45	Cytospora	All Tree Species	103	diplodia blight	Ponderosa Pine	252	Unidentified defoliator (hardwood)	Hardwoods
46	Western gall rust	Unknown	105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood	300	Mortality (pine)	Pine
47	Comandra rust	Unknown						

Region 2 - Location Map
USGS 100K Quad

CASTLE ROCK, COLORADO



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: 9/9/2016
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/

DIRECT ALL INQUIRIES TO:

Colorado State Forest Service
Colorado State University
Fort Collins, Colorado 80523

USDA Forest Service, Region 2
State and Private Forestry
Forest Health Protection
740 Simms St.
Golden, CO 80401

*****DISCLAIMER*****

Forest Health Protection (FHP) and its partners strive to maintain an accurate Aerial Detection Survey (ADS) Dataset, 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.