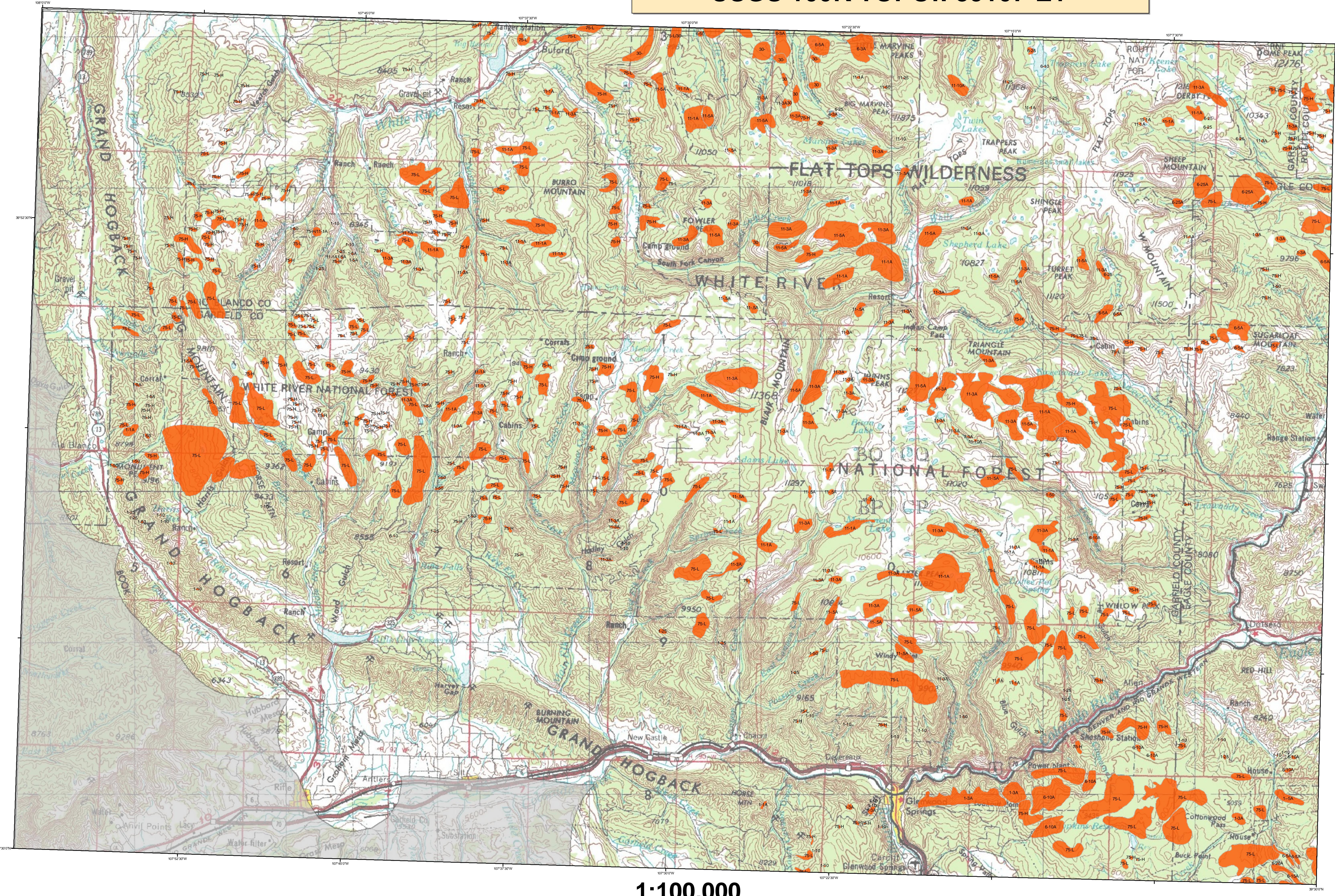


\*\*DRAFT\*\*

# 2008 Aerial Insect and Disease Survey Glenwood Springs, Colorado USGS 100K TOPO! 39107-E1



1:100,000

## Legend

Causal Agent(s)

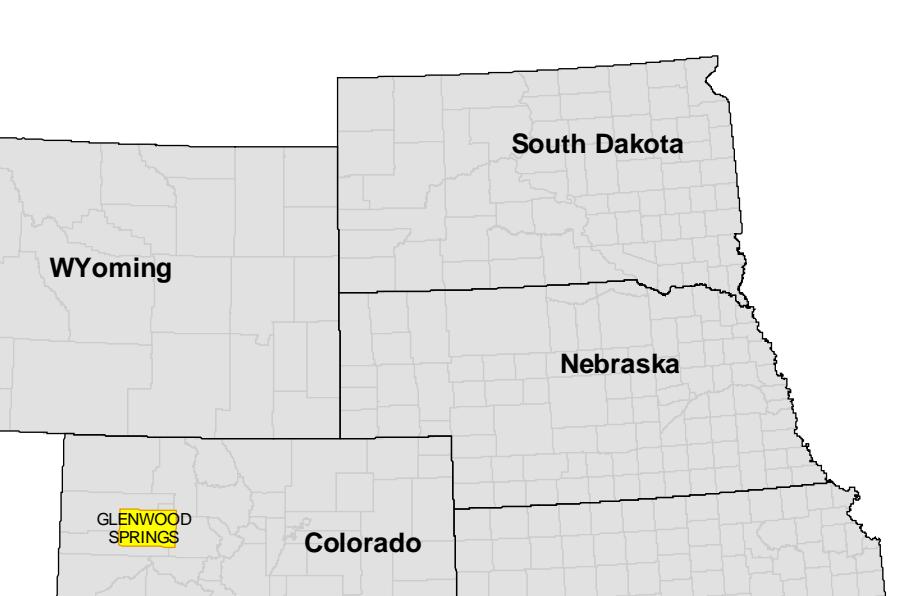
Not Flown

Use of the Number System  
Example: 4-25 The first number before the dash is the causal agent code. The number after the dash is the number of dead "faded" trees in the polygon or plot. When recent dead trees are not counted, an intensity code of L-high, medium, 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 "faded" trees (or an intensity code). For example: 4-12A The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "faded" 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 "faded" tree. Another example: 5-3-A = that on the average, an estimated three trees per acre are dead "faded" trees. An "A" is used as a separator when a polygon contains more than one causal agent code.

Code Causal Agent Primary Host Code Causal Agent Primary Host Code Causal Agent Primary Host

| Code | Causal Agent                                 | Primary Host                                 | Code | Causal Agent                       | Primary Host   | Code                                  | Causal Agent          | Primary Host       |
|------|--|--|------|------------------------------------|----------------|---------------------------------------|-----------------------|--------------------|
| 1    | Douglas-fir beetle                           | Douglas-fir                                  | 49   | Atriplex                           | Lodgepole Pine | 105                                   | Fox squirrel          | Cottonwood, Poplar |
| 2    | Engelmann spruce beetle                      | Engelmann Spruce                             | 50   | White pine blister rust            | 107            | Fall webworm                          | Cottonwood, Poplar    |                    |
| 3    | Pine needle miner                            | Pine needle miner                            | 51   | White pine tip borer               | 108            | Gypsy moth                            | Spruce, Fir           |                    |
| 4    | Mountain pine beetle                         | Mountain pine beetle                         | 52   | Elytrodema                         | 109            | pinewood nematode                     | Scotch Pine           |                    |
| 5    | Mountain pine beetle                         | Mountain pine beetle                         | 53   | Includes #05, #5 & #8              | 110            | oak wilt                              | Oak                   |                    |
| 6    | 5-Needle Pine                                | 5-Needle Pine                                | 54   | All Tree Species                   | 111            | white pine disease                    | All Tree Species      |                    |
| 7    | Ponderosa Pine                               | Ponderosa Pine                               | 55   | All Tree Species                   | 112            | spruce los                            | White Spruce          |                    |
| 8    | White Fir                                    | White Fir                                    | 56   | Chemical damage                    | 113            | twinned chestnut borer                | Oak                   |                    |
| 9    | Fir Engraver                                 | Fir Engraver                                 | 57   | Douglas-fir                        | 114            | aspen gall wasp like polar disease    | Birch                 |                    |
| 10   | Douglas-fir engraver beetle                  | Douglas-fir                                  | 58   | Lophodermes pustulatus             | 115            | Dieback                               | Birch                 |                    |
| 11   | Douglas-fir bark beetle                      | Douglas-fir                                  | 59   | Schwoers                           | 116            | Mortality                             | All Tree Species      |                    |
| 12   | Subalpine Fir                                | Subalpine Fir                                | 60   | Lecanosticta acicola               | 117            | Aspen defoliation                     | All Tree Species      |                    |
| 13   | Unidentified bark beetle                     | Unidentified bark beetle                     | 61   | Dothistoma pin                     | 118            | Hericosis                             | All Tree Species      |                    |
| 14   | Unidentified bark beetle                     | Unidentified bark beetle                     | 62   | Needle cast (Hypodermataceae)      | 119            | Flagging                              | All Tree Species      |                    |
| 15   | Ponderosa pine needle miner                  | Ponderosa Pine                               | 63   | All Tree Species                   | 120            | Aspen                                 | All Tree Species      |                    |
| 16   | Lodgepole pine needle miner                  | Lodgepole Pine                               | 64   | Unidentified disease               | 121            | Marssonina Blight                     | Quaking Aspen         |                    |
| 17   | Juniper tip borer                            | Juniper tip borer                            | 65   | Winter damage light                | 122            | Dieback (ash)                         | Ash                   |                    |
| 18   | Spruce budworm, light defol.                 | Spruce budworm                               | 66   | Winter damage medium               | 123            | Dieback (hardwood)                    | Cottonwood, Poplar    |                    |
| 19   | Spruce budworm, medium defol.                | Spruce budworm                               | 67   | Winter damage heavy                | 124            | Dieback (hardwood)                    | Hardwoods             |                    |
| 20   | Douglas-fir, heavy defol.                    | Douglas-fir                                  | 68   | Common black stain                 | 125            | Dieback (oak)                         | Cottonwood, Poplar    |                    |
| 21   | Douglas-fir luscox moth                      | Douglas-fir                                  | 69   | Fire                               | 126            | Mortality (common black stain)        | Oak                   |                    |
| 22   | Pine Butterfly                               | Pine Butterfly                               | 70   | Forcupine                          | 127            | Mortality (eastern cedar)             | Eastern Red Cedar     |                    |
| 23   | Tortrix                                      | Tortrix                                      | 71   | Porcupine                          | 128            | Mortality (hardwood)                  | Hardwood              |                    |
| 24   | Tent caterpillars                            | Tent caterpillars                            | 72   | All Tree Species                   | 129            | Mortality (oak)                       | Oak                   |                    |
| 25   | Hardwoods                                    | Hardwoods                                    | 73   | High water damage                  | 130            | Mortality (spruce)                    | Spruce                |                    |
| 26   | Hardwoods                                    | Hardwoods                                    | 74   | Avalanche                          | 131            | Discoloration (ash)                   | Ash                   |                    |
| 27   | Oak leaf roller                              | Oak leaf roller                              | 75   | Juniper pine mortality             | 132            | Discoloration (cottonwood)            | Spruce                |                    |
| 28   | Pine needle sheath miner                     | Pine needle sheath miner                     | 76   | Juniper mortality unknown agent(s) | 133            | Discoloration (cottonwood)            | Cottonwood, Poplar    |                    |
| 29   | Pine needle multiple agents                  | Pine needle multiple agents                  | 77   | Larch                              | 134            | Discoloration (eastern cedar)         | Eastern Red Cedar     |                    |
| 30   | Pine tussock moth                            | Pine tussock moth                            | 78   | Larch mortality unknown agent(s)   | 135            | Discoloration (larch)                 | Hardwoods             |                    |
| 31   | Cankerworm                                   | Cankerworm                                   | 79   | Lime pine decline multiple agents  | 136            | Discoloration (oak)                   | Oak                   |                    |
| 32   | Eastern tent caterpillar                     | Eastern tent caterpillar                     | 80   | Hail damage                        | 137            | Discoloration (spruce)                | Spruce                |                    |
| 33   | Unidentified defolator                       | Unidentified defolator                       | 81   | All Tree Species                   | 138            | Herbicide (eastern cedar)             | Cottonwood, Poplar    |                    |
| 34   | Heterobasidion annosum (Fomes annosus)       | Heterobasidion annosum (Fomes annosus)       | 82   | Old pine mortality                 | 139            | Herbicide (eastern cedar)             | Eastern Red Cedar     |                    |
| 35   | All Tree Species                             | All Tree Species                             | 83   | Lodgespole Pine                    | 140            | Flagging (hardwood)                   | Hardwood              |                    |
| 36   | Phomopsis                                    | Phomopsis                                    | 84   | Pinus                              | 141            | Flagging (oak)                        | Oak                   |                    |
| 37   | Phomopsis                                    | Phomopsis                                    | 85   | Unknown                            | 142            | Unidentified defolator (elm)          | Elm                   |                    |
| 38   | Phomopsis                                    | Phomopsis                                    | 86   | Unknown                            | 143            | Unidentified defolator (hardwood)     | Hardwoods             |                    |
| 39   | Phomopsis                                    | Phomopsis                                    | 87   | Unknown                            | 144            | Mortality (pine)                      | Pine                  |                    |
| 40   | Phomopsis schweinfurthii                     | Phomopsis schweinfurthii                     | 88   | Unknown                            | 145            | Drought killed narrow leaf cottonwood | Narrowleaf Cottonwood |                    |
| 41   | Polytopus sphaerosporus (Amelaria meleagris) | Polytopus sphaerosporus (Amelaria meleagris) | 89   | Unknown                            | 146            | Western gall rust                     |                       |                    |
| 42   | Unknown                                      | Unknown                                      | 90   | Unknown                            | 147            | Comandra rust                         |                       |                    |
| 43   | Unknown                                      | Unknown                                      | 91   | Unknown                            | 148            | Strobilaform rust                     |                       |                    |
| 44   | Unknown                                      | Unknown                                      | 92   | Unknown                            | 149            | Lodgespole Pine                       |                       |                    |
| 45   | Unknown                                      | Unknown                                      | 93   | Unknown                            | 150            | Unknown                               |                       |                    |
| 46   | Unknown                                      | Unknown                                      | 94   | Unknown                            | 151            | Unknown                               |                       |                    |
| 47   | Unknown                                      | Unknown                                      | 95   | Unknown                            | 152            | Unknown                               |                       |                    |
| 48   | Unknown                                      | Unknown                                      | 96   | Unknown                            | 153            | Unknown                               |                       |                    |
| 49   | Unknown                                      | Unknown                                      | 97   | Unknown                            | 154            | Unknown                               |                       |                    |
| 50   | Unknown                                      | Unknown                                      | 98   | Unknown                            | 155            | Unknown                               |                       |                    |
| 51   | Unknown                                      | Unknown                                      | 99   | Unknown                            | 156            | Unknown                               |                       |                    |
| 52   | Unknown                                      | Unknown                                      | 100  | Unknown                            | 157            | Unknown                               |                       |                    |
| 53   | Unknown                                      | Unknown                                      | 101  | Unknown                            | 158            | Unknown                               |                       |                    |
| 54   | Unknown                                      | Unknown                                      | 102  | Unknown                            | 159            | Unknown                               |                       |                    |
| 55   | Unknown                                      | Unknown                                      | 103  | Unknown                            | 160            | Unknown                               |                       |                    |
| 56   | Unknown                                      | Unknown                                      | 104  | Unknown                            | 161            | Unknown                               |                       |                    |
| 57   | Unknown                                      | Unknown                                      | 105  | Unknown                            | 162            | Unknown                               |                       |                    |

## USGS 100K Quad - Location Map



Legend  
Flown Area  
State Boundary  
Counties

## 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.

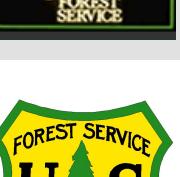
Aerial surveys provide information on the current status for many causal agents, and are important when examining insect activity trends by comparing historical and current survey data over large areas.

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.

## DIRECT ALL INQUIRIES TO:



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



USDA Forest Service, Region 2  
Renewable Resources  
Forest Health Management  
PO Box 25127  
Lakewood, Colorado 80225

### \*\*\*\*\*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 were 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/>

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