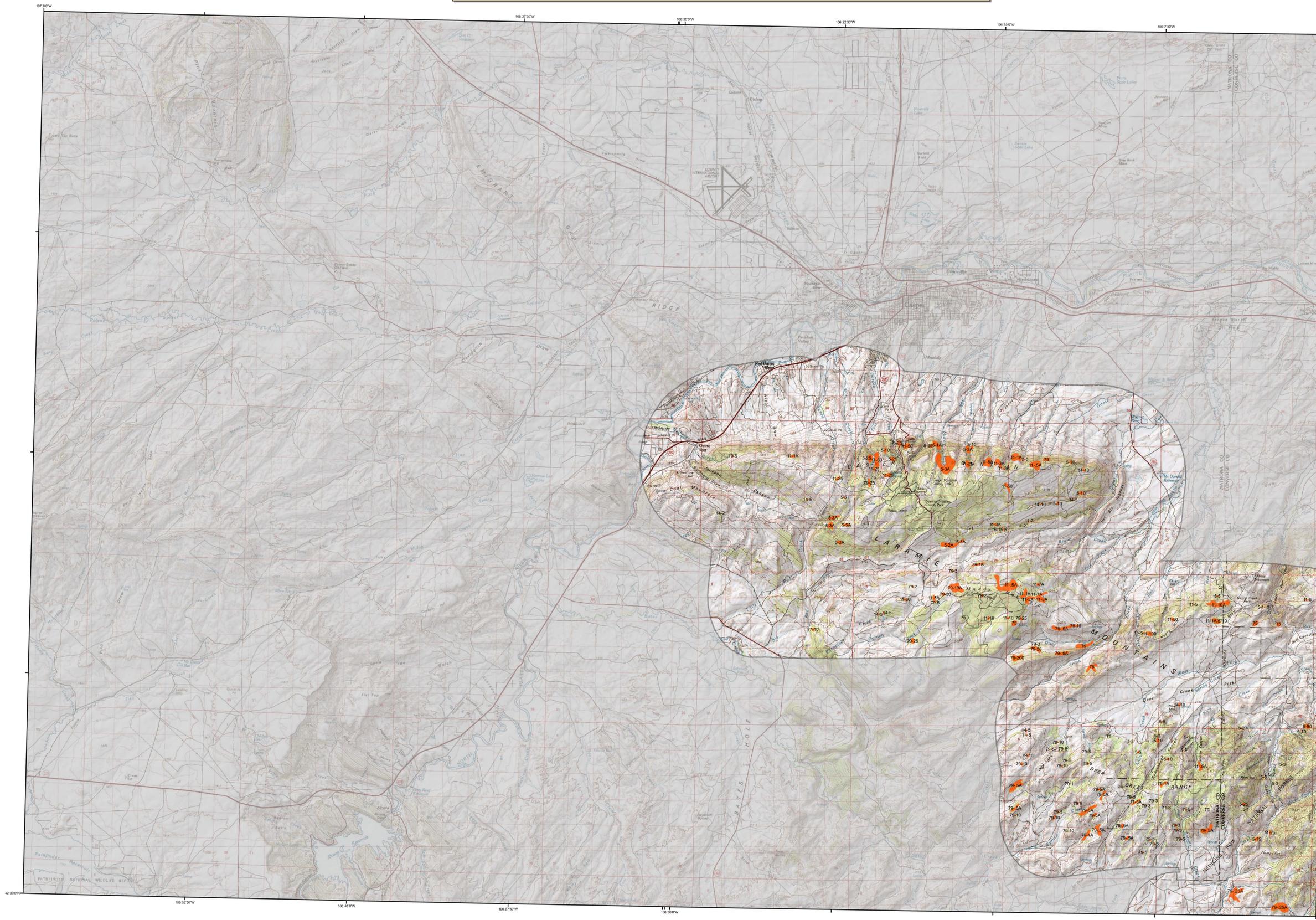


# 2005 Aerial Insect and Disease Survey Casper, Wyoming USGS 100K TOPO! 42106-E1



1:100,000

## Legend

**Causal Agent(s)** **Not Flown in 2005**

Use of the Number System  
 Example: 5-25 = The first number before the dash is the number of dead "fader" 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 acreage estimates are used after the causal agent code instead of number of dead "fader" trees (or an intensity code). For example: 5-10A = 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 per acre. In this case it would be an estimation that, on the average, one tree per every two acres would be a dead "fader" tree. In another example: 5-5A = that on the average, an estimated three trees per acre are dead "fader" 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      | 109  | Herpetella                            | Lodgepole Pine   | 109  | Red squirrel flagging               | Cottonwood/Poplar |
| 2    | Engelmann Spruce Beetle                   | Engelmann Spruce | 110  | White pine blister rust               | 5-Needle Pine    | 107  | fall webworm                        | Cottonwood/Poplar |
| 3    | Mountain pine beetle                      | Ponderosa Pine   | 111  | Dwarf mistletoe                       | Softwoods        | 108  | road salt                           | Softwoods         |
| 4    | Mountain pine beetle                      | Lodgepole Pine   | 112  | Elysiodesma                           | Ponderosa Pine   | 109  | orangead nematode                   | Spruce Pine       |
| 5    | Mountain pine beetle                      | 5-Needle Pine    | 113  | Inclusus #05, 06 & 08                 | All Tree Species | 110  | oak wilt                            | Oak               |
| 6    | Western pine beetle                       | Ponderosa Pine   | 114  | Air pollution                         | All Tree Species | 111  | foliage disease                     | All Tree Species  |
| 7    | White Fir                                 | White Fir        | 115  | Chemical damage                       | Softwoods        | 112  | spruce Ips                          | White Spruce      |
| 8    | Fir Engriaver                             | Softwoods        | 116  | Lophodermium pinastri                 | Softwoods        | 113  | terminal shoot blight               | Oak               |
| 9    | Douglas-fir engraver beetle               | Douglas-fir      | 117  | Phaeodictyon pseudotsugae             | Douglas-fir      | 114  | anthracnose like foliar disease     | Bur Oak           |
| 10   | Western balsam bark beetle                | Subsopine Pine   | 118  | Lophodermella arcuata                 | Softwoods        | 115  | Dieback                             | All Tree Species  |
| 11   | Undersified bark beetle                   | Lodgepole Pine   | 119  | Lecanostoma axiospora                 | Softwoods        | 116  | Mortality                           | All Tree Species  |
| 12   | Pine engraver                             | Ponderosa Pine   | 120  | Lophodermella concolor                | Softwoods        | 117  | Discoloration                       | All Tree Species  |
| 13   | Pine engraver                             | Lodgepole Pine   | 121  | Cotinus sp.                           | Softwoods        | 118  | Herbicide                           | All Tree Species  |
| 14   | Pine engraver                             | Ponderosa Pine   | 122  | Needle cast (Hypodemateaceae)         | Softwoods        | 119  | Flagging                            | All Tree Species  |
| 15   | Ponderosa pine needle miner               | Lodgepole Pine   | 123  | Root Rot                              | All Tree Species | 120  | aspen tortix                        | Quaking Aspen     |
| 16   | Ponderosa pine needle miner               | Ponderosa Pine   | 124  | Undersified disease                   | Softwoods        | 121  | Marsdenia blight                    | Quaking Aspen     |
| 17   | Jack pine budworm                         | Jack Pine        | 125  | Winter damage light                   | All Tree Species | 200  | Dieback (ash)                       | Ash               |
| 18   | Spruce budworm, light defol.              | Douglas-fir      | 126  | Winter damage medium                  | All Tree Species | 201  | Dieback (cottonwood)                | Cottonwood/Poplar |
| 19   | Spruce budworm, medium defol.             | Douglas-fir      | 127  | Winter damage heavy                   | All Tree Species | 202  | Dieback (hardwood)                  | Hardwoods         |
| 20   | Spruce budworm, heavy defol.              | Douglas-fir      | 128  | Winter damage very heavy              | All Tree Species | 204  | Dieback (cottonwood)                | Oak               |
| 21   | Douglas-fir tussock moth                  | Douglas-fir      | 129  | Prionus black stain                   | Common Prinson   | 210  | Mortality (oak cottonwood)          | Cottonwood/Poplar |
| 22   | Pine butterfly                            | Ponderosa Pine   | 130  | Fire                                  | All Tree Species | 211  | Mortality (eastern cedar)           | Eastern Red Cedar |
| 23   | Pine looper                               | Ponderosa Pine   | 131  | Pine/aspine                           | Softwoods        | 212  | Mortality (spruce)                  | Softwoods         |
| 24   | Pine tortrix                              | Hardwoods        | 132  | Windthrow                             | All Tree Species | 213  | Mortality (oak)                     | Oak               |
| 25   | Leaf caterpillars                         | Hardwoods        | 133  | High water damage                     | All Tree Species | 214  | Mortality (spruce)                  | Spruce            |
| 26   | Leaf beetles                              | Hardwoods        | 134  | Avalanche                             | All Tree Species | 220  | Discoloration (ash)                 | Ash               |
| 27   | Oak leaf roller                           | Ponderosa Pine   | 135  | Aspen decline-multiple agent(s)       | Quaking Aspen    | 221  | Discoloration (conifer)             | Softwoods         |
| 28   | Pine needle-shaft miner                   | Ponderosa Pine   | 136  | Prionus pine mortality                | Common Prinson   | 222  | Discoloration (cottonwood)          | Cottonwood/Poplar |
| 29   | Pine sawfly                               | Ponderosa Pine   | 137  | Juniper mortality-unknown agent(s)    | Juniper          | 223  | Discoloration (eastern cedar)       | Eastern Red Cedar |
| 30   | Pine tussock moth                         | Ponderosa Pine   | 138  | Gambel oak decline-unknown agent(s)   | Gambel Oak       | 224  | Discoloration (hardwood)            | Hardwoods         |
| 31   | Variable oak leaf caterpillar             | Hardwoods        | 139  | Limber pine decline-multiple agent(s) | Limber Pine      | 225  | Discoloration (oak)                 | Oak               |
| 32   | Cankworms                                 | Hardwoods        | 140  | Hail damage                           | All Tree Species | 226  | Discoloration (spruce)              | Spruce            |
| 33   | Variable oak leaf caterpillar             | Hardwoods        | 141  | Unknown polygon                       | Unknown          | 230  | Herbicide (cottonwood)              | Cottonwood/Poplar |
| 34   | Undersified defoliator                    | All Tree Species | 142  | 100 old prison mortality              | Common Prinson   | 231  | Herbicide (eastern cedar)           | Eastern Red Cedar |
| 35   | Heterodactylon artemisium (Fomes artemis) | Softwoods        | 143  | 100 old prison mortality              | Lodgepole Pine   | 240  | Flagging (hardwood)                 | Hardwoods         |
| 36   | Armillaria ostroyae (Armillaria mellea)   | Softwoods        | 144  | 100 old prison mortality              | Lodgepole Pine   | 250  | Undersified defoliator (cottonwood) | Cottonwood/Poplar |
| 37   | Polytopus snowentzii                      | Softwoods        | 145  | 100 old prison mortality              | Lodgepole Pine   | 251  | Undersified defoliator (elm)        | Elm               |
| 38   | Phomopsis                                 | Softwoods        | 146  | 100 old prison mortality              | Lodgepole Pine   | 300  | Mortality (pine)                    | Pine              |
| 39   | Cytospora                                 | All Tree Species | 147  | 100 old prison mortality              | Lodgepole Pine   |      |                                     |                   |
| 40   | Western gall rust                         | Unknown          | 148  | 100 old prison mortality              | Lodgepole Pine   |      |                                     |                   |
| 41   | Conioidia rust                            | Unknown          | 149  | 100 old prison mortality              | Lodgepole Pine   |      |                                     |                   |
| 42   | Stelactiform rust                         | Lodgepole Pine   | 150  | 100 old prison mortality              | Lodgepole 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 Erik Johnson & Bob Cain 7/11 - 7/15 2005**  
**Map Created: 01-06**  
**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/>