

# r204\_dmg\_shp

Metadata also available as

## Metadata:

- [Identification Information](#)
  - [Data Quality Information](#)
  - [Spatial Data Organization Information](#)
  - [Spatial Reference Information](#)
  - [Entity and Attribute Information](#)
  - [Distribution Information](#)
  - [Metadata Reference Information](#)
- 

### *Identification\_Information:*

#### *Citation:*

##### *Citation\_Information:*

##### *Originator:*

USDA Forest Service, Rocky Mountain Region, Forest Health Management

*Publication\_Date:* February 2, 2005

*Title:* r204\_dmg\_shp

*Geospatial\_Data\_Presentation\_Form:* vector digital data

*Online\_Linkage:* <<http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>>

##### *Larger\_Work\_Citation:*

##### *Citation\_Information:*

##### *Originator:*

USDA Forest Service, Rocky Mountain Region, Forest Health Management

*Publication\_Date:* 1950 to present

*Title:* Annual Aerial Detection Overview Survey

*Edition:* 2004

*Geospatial\_Data\_Presentation\_Form:* vector digital data

*Online\_Linkage:*

<<http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>>

### *Description:*

#### *Abstract:*

2004 USDA Forest Service, Rocky Mountain Region Aerial Detection Survey Data.  
This data depicts the occurrence and location of forest insect, disease, and other

biotic and abiotic causes of tree mortality and tree damage. Aerial survey data is collected by observing areas of tree damage or tree mortality from an aircraft and manually recording the information onto a map.

Due to the nature of aerial surveys, this data 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 in the data because these agents are not detectable from aerial surveys. The data presented should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and casual agent.

The accompanying "area flown/ not flown" GIS data set entitled "r204\_fln" should be used in conjunction with this data set. This "area flown/ not flown" data set provides information on the spatial extent of the aerial survey for that particular year.

A companion handbook entitled "Aerial Survey Geographic Information System Handbook" should be obtained before using this data set. The handbook is available online at: <http://www.fs.fed.us/foresthealth/publications/id/gishandbook.pdf>. This handbook also serves as a data dictionary necessary for deciphering numeric field codes.

*Purpose:*

Aerial survey data sets are created annually to provide trend information on forest insects, diseases, and other biotic and abiotic causes of tree mortality and tree damage; referred to herein as "damage causal agents". 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.

*Supplemental\_Information:*

Aerial survey data sets are created annually to provide trend information on forest insects, diseases, and other biotic and abiotic causes of tree mortality and tree damage; referred to herein as "damage causal agents". Aerial survey data is collected by observing areas of tree damage or tree mortality from an aircraft and manually recording the information 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 sets provide estimates 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.

*Time\_Period\_of\_Content:*

*Time\_Period\_Information:*

*Single\_Date/Time:*

*Calendar\_Date:* 2004 (summer field season)

*Currentness\_Reference:* publication date

*Status:*

*Progress:* Complete

*Maintenance\_and\_Update\_Frequency:* As needed

*Spatial\_Domain:*

*Bounding\_Coordinates:*

*West\_Bounding\_Coordinate:* -110.183052

*East\_Bounding\_Coordinate:* -94.603574

*North\_Bounding\_Coordinate:* 45.080012

*South\_Bounding\_Coordinate:* 36.688290

*Keywords:*

*Theme:*

*Theme\_Keyword\_Thesaurus:* None

*Theme\_Keyword:* aerial survey

*Theme\_Keyword:* aerial detection survey

*Theme\_Keyword:* forest insect pests

*Theme\_Keyword:* forest disease pests

*Theme\_Keyword:* damage causal agent

*Theme\_Keyword:* tree mortality

*Theme\_Keyword:* tree damage

*Theme\_Keyword:* forest health

*Theme\_Keyword:* forest health management

*Theme\_Keyword:* forest health protection

*Theme\_Keyword:* forest health monitoring

*Theme\_Keyword:* USDA Forest Service

*Place:*

*Place\_Keyword:* Rocky Mountain Region

*Place\_Keyword:* Colorado

*Place\_Keyword:* Wyoming

*Place\_Keyword:* South Dakota

*Place\_Keyword:* Nebraska

*Place\_Keyword:* Kansas

*Place\_Keyword:* Region 2

*Temporal:*

*Temporal\_Keyword:* 2004

*Access\_Constraints:*

The insect and disease data is available digitally from the USDA Forest Service, Rocky Mountain Region, Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results.

The accompanying "area flown/ not flown" GIS data set entitled "r204\_fln" should be used in conjunction with this data set. This "area flown/ not flown" data set provides information on the spatial extent of the aerial survey for that particular year.

*Use\_Constraints:*

The insect and disease data is available digitally from the USDA Forest Service, Rocky Mountain Region, Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results.

The accompanying "area flown/ not flown" GIS data set entitled "r204\_fln" should be used in conjunction with this data set. This "area flown/ not flown" data set provides information on the spatial extent of the aerial survey for that particular year.

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*Address\_Type:* physical address

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*Hours\_of\_Service:* 09:00-16:00 MST

*Contact\_Instructions:* email is preferred

*Data\_Set\_Credit:*

USDA Forest Service, Rocky Mountain Region, Forest Health Management; Erik Johnson -  
Aerial Survey Program Manager.

*Native\_Data\_Set\_Environment:*

Microsoft Windows 2000 Version 5.0 (Build 2195) Service Pack 4; ESRI ArcCatalog  
9.0.0.535

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*Data\_Quality\_Information:*

*Lineage:*

*Process\_Step:*

*Process\_Description:* Dataset copied.

*Source\_Used\_Citation\_Abbreviation:*

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*Spatial\_Data\_Organization\_Information:*

*Direct\_Spatial\_Reference\_Method:* Vector

*Point\_and\_Vector\_Object\_Information:*

*SDTS\_Terms\_Description:*

*SDTS\_Point\_and\_Vector\_Object\_Type:* G-polygon

*Point\_and\_Vector\_Object\_Count:* 21692

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*Spatial\_Reference\_Information:*

*Horizontal\_Coordinate\_System\_Definition:*

*Planar:*

*Grid\_Coordinate\_System:*

*Grid\_Coordinate\_System\_Name:* Universal Transverse Mercator

*Universal\_Transverse\_Mercator:**UTM\_Zone\_Number:* 13*Transverse\_Mercator:**Scale\_Factor\_at\_Central\_Meridian:* 0.999600*Longitude\_of\_Central\_Meridian:* -105.000000*Latitude\_of\_Projection\_Origin:* 0.000000*False\_Easting:* 500000.000000*False\_Northing:* 0.000000*Planar\_Coordinate\_Information:**Planar\_Coordinate\_Encoding\_Method:* coordinate pair*Coordinate\_Representation:**Abscissa\_Resolution:* 0.002048*Ordinate\_Resolution:* 0.002048*Planar\_Distance\_Units:* meters*Geodetic\_Model:**Horizontal\_Datum\_Name:* North American Datum of 1983*Ellipsoid\_Name:* Geodetic Reference System 80*Semi-major\_Axis:* 6378137.000000*Denominator\_of\_Flattening\_Ratio:* 298.257222*Entity\_and\_Attribute\_Information:**Detailed\_Description:**Entity\_Type:**Entity\_Type\_Label:* r204\_dmg\_shp*Entity\_Type\_Definition:* USDA Forest Service Region 2 2004 forest damage polygons*Entity\_Type\_Definition\_Source:*Aerial Survey Geographic Information System Handbook (available online at: <http://www.fs.fed.us/foresthealth/publications/id/gishandbook.pdf>)*Attribute:**Attribute\_Label:* FID*Attribute\_Definition:* Internal feature number.*Attribute\_Definition\_Source:* ESRI*Attribute\_Domain\_Values:**Unrepresentable\_Domain:*

Sequential unique whole numbers that are automatically generated.

*Attribute:**Attribute\_Label:* Shape*Attribute\_Definition:* Feature geometry.*Attribute\_Definition\_Source:* ESRI*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain*: Coordinates defining the features.

*Attribute*:

*Attribute\_Label*: ID

*Attribute*:

*Attribute\_Label*: CODE

*Attribute\_Definition*:

Region 2 pest code (see Coding Key for Forest Insect Disease Damage on Aerial Survey Maps USDA Forest Service Region 2 Aerial Survey Program). These are the pest codes that were used by Region 2 aerial surveyors while collecting data from the aircraft. THESE WERE THE ORIGINAL CODES DIGITIZED OFF OF PAPER MAPS OR RECORDED DIGITALLY FROM THE AIR. SOME CODES HAVE BEEN MODIFIED DURING SUBSEQUENT GROUND-TRUTHING ACTIVITIES. THE CHANGES ARE NOT REFLECTED IN THIS FIELD. PLEASE USE THE DCA1, DCA2, AND DCA3 FIELDS FOR QUERIES!

*Attribute\_Definition\_Source*:

Coding Key for Forest Insect Disease Damage on Aerial Survey Maps USDA Forest Service Region 2 Aerial Survey Program

*Attribute*:

*Attribute\_Label*: WEB\_CODE

*Attribute\_Definition*:

Region 2 pest code (see Coding Key for Forest Insect Disease Damage on Aerial Survey Maps USDA Forest Service Region 2 Aerial Survey Program). These are the codes used to attribute aerial survey maps viewed on our website. Changes based on ground-truthing activities are represented in this field, however, IT IS STILL RECOMMENDED THAT QUERIES BE MADE USING THE DCA1, DCA2, AND DCA3 FIELDS.

*Attribute\_Definition\_Source*:

Coding Key for Forest Insect Disease Damage on Aerial Survey Maps USDA Forest Service Region 2 Aerial Survey Program

*Attribute*:

*Attribute\_Label*: SURVEY\_ID1

*Attribute\_Definition*: Year surveyed (0=2000, 99=1999, etc.)

*Attribute\_Definition\_Source*: Aerial Survey Geographic Information System Handbook

*Attribute*:

*Attribute\_Label*: SURVEY\_ID2

*Attribute\_Definition*:

Year surveyed (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source*: Aerial Survey Geographic Information System Handbook

*Attribute*:

*Attribute\_Label*: SURVEY\_ID3

*Attribute\_Definition:* Year surveyed (used only for polygons with three attributes).

*Attribute\_Definition\_Source:* Aerial Survey Geographic Information System Handbook

*Attribute:*

*Attribute\_Label:* DMG\_TYPE1

*Attribute\_Definition:*

Damage type (see Aerial Survey Geographic Information System Handbook, Appendix A)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* DMG\_TYPE2

*Attribute\_Definition:*

Damage type (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* DMG\_TYPE3

*Attribute\_Definition:* Damage type (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* SEVERITY1

*Attribute\_Definition:*

Severity of damage (see Aerial Survey Geographic Information System Handbook, Appendix A)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* SEVERITY2

*Attribute\_Definition:*

Severity of damage (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* SEVERITY3

*Attribute\_Definition:*

Severity of damage (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* PATTERN1

*Attribute\_Definition:* Pattern (currently not used by USFS Region 2)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* PATTERN2

*Attribute\_Definition:* Pattern (currently not used by USFS Region 2)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* PATTERN3

*Attribute\_Definition:* Pattern (currently not used by USFS Region 2)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* TPA1

*Attribute\_Definition:*

Number of trees per acre (see Aerial Survey Geographic Information System Handbook, Appendix A)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* TPA2

*Attribute\_Definition:*

Number of trees per acre (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* TPA3

*Attribute\_Definition:*

Number of trees per acre (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* NO\_TREES1

*Attribute\_Definition:*

Number of trees affected/ killed (see Aerial Survey Geographic Information System Handbook, Appendix A)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* NO\_TREES2

*Attribute\_Definition:*

Number of trees affected/ killed (used only for polygons with more than one

attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* NO\_TREES3

*Attribute\_Definition:*

Number of trees affected/ killed (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A

*Attribute:*

*Attribute\_Label:* DCA1

*Attribute\_Definition:*

Damage-causing agent code. This is the most reliable field for queries pertaining to damage-causing agents and it is recommended over the R2 pest code or web code fields (see Aerial Survey Geographic Information System Handbook, Appendix A and Appendix E)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix E

*Attribute:*

*Attribute\_Label:* DCA2

*Attribute\_Definition:*

Damage-causing agent code (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix E

*Attribute:*

*Attribute\_Label:* DCA3

*Attribute\_Definition:*

Damage-causing agent code (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix E

*Attribute:*

*Attribute\_Label:* HOST1

*Attribute\_Definition:*

Host tree species code (see Aerial Survey Geographic Information System Handbook, Appendix A and Appendix F)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix F

*Attribute:*

*Attribute\_Label:* HOST2

*Attribute\_Definition:*

Host tree species code (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix F

*Attribute:*

*Attribute\_Label:* HOST3

*Attribute\_Definition:*

Host tree species code (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix F

*Attribute:*

*Attribute\_Label:* FOR\_TYPE1

*Attribute\_Definition:*

Forest type code (see Aerial Survey Geographic Information System Handbook, Appendix A and Appendix G)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix G

*Attribute:*

*Attribute\_Label:* FOR\_TYPE2

*Attribute\_Definition:*

Forest type code (used only for polygons with more than one attribute)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix G

*Attribute:*

*Attribute\_Label:* FOR\_TYPE3

*Attribute\_Definition:* Forest type code (used only for polygons with three attributes)

*Attribute\_Definition\_Source:*

Aerial Survey Geographic Information System Handbook, Appendix A and Appendix G

*Attribute:*

*Attribute\_Label:* NOTES

*Attribute\_Definition:* Notes and comments

*Attribute\_Definition\_Source:* Aerial Survey Geographic Information System Handbook

*Attribute:*

*Attribute\_Label:* AREA

*Attribute:*

*Attribute\_Label:* PERIMETER

*Attribute:**Attribute\_Label:* ACRES*Attribute\_Definition:* Acres (calculated using XTOOLS)*Attribute:**Attribute\_Label:* wb*Overview\_Description:**Entity\_and\_Attribute\_Overview:*

While the companion handbook entitled "Aerial Survey Geographic Information System Handbook" (available at <http://www.fs.fed.us/foresthealth/publications/id/gishandbook.pdf>) should be obtained before using the dataset in order to decipher numeric field codes, some of the more common Region 2 DCA (damage causal agent) and host codes are listed as follows:

DCA NAME 11002 western pine beetle 11006 mountain pine beetle 11007 Douglas-fir beetle 11009 spruce beetle 11029 pine engraver 11030 Ips engraver beetles 11049 Douglas-fir engraver 11050 fir engraver 12040 western spruce budworm 12123 Douglas-fir tussock moth 12180 tent caterpillar 24022 Dutch elm disease 30000 Fire 50006 hail 50001 wind/tornado 70001 herbicides 70014 road salt 80001 aspen decline 80002 subalpine fir mortality 80003 five-needle pine mortality 80004 pinyon pine mortality

Hosts 1 = hardwoods 2 = softwoods 3 = hardwoods/softwoods 15 = white fir 19 = subalpine fir 68 = eastern redcedar 93 = Englemann spruce 101 = whitebark pine 105 = jack pine 106 = common pinyon 108 = lodgepole pine 113 = limber pine 122 = ponderosa pine 202 = Douglas-fir 313 = boxelder 462 = hackberry 740 = cottonwood, poplar 746 = quaking aspen 749 = narrowleaf cottonwood 814 = Gambel oak 823 = bur oak 970 = elm

Due to the difficulty of discerning dying whitebark pine from dying limber pine from the air, all of these polygons are originally coded as "5-needle pne mortality" by the sketchmapper. Later, the hosts for these polygons are determined using the following procedure:

1. Select potential whitebark sites: ("DCA1" = 80003 OR "DCA2" =80003 OR "DCA3" =80003) AND ("HOST1" = 101 OR "HOST2" = 101)
2. Potential whitebark sites fall within 50m of whitebark polygons from local vegetation datasets are recoded whitebark only.
3. Potential whitebark polygons that occur below 8,000 ft were recoded as limber pine only.
4. Remaining polygons (>8,000ft elevation and not within 50m of whitebark poly) were left as is (coded both 101 and 113) coded mixed- except changing TPA (and # of trees) to reflect a 50/50 split.

*Entity\_and\_Attribute\_Detail\_Citation:*

Aerial Survey Geographic Information System Handbook

(<http://www.fs.fed.us/foresthealth/publications/id/gishandbook.pdf>)

*Entity\_and\_Attribute\_Detail\_Citation:*

Coding Key for Forest Insect Disease Damage on Aerial Survey Maps USDA Forest Service Region 2 Aerial Survey Program (contact Erik Johnson ejohnson02@fs.fed.us or Jennifer Ross jross@fs.fed.us for this document)

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*Distribution\_Information:*

*Distributor:*

*Contact\_Information:*

*Contact\_Organization\_Primary:*

*Contact\_Organization:*

USDA Forest Service, Rocky Mountain Region, Forest Health Management

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*Hours\_of\_Service:* 0900-1600 MST

*Contact\_Instructions:* email preferred

*Resource\_Description:* Downloadable Data

*Standard\_Order\_Process:*

*Digital\_Form:*

*Digital\_Transfer\_Information:*

*Transfer\_Size:* 13.327

*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20060628

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Organization\_Primary:*

*Contact\_Organization:*

USDA Forest Service, Rocky Mountain Region, Forest Health  
Management

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*Hours\_of\_Service:* 0900-1600 MST

*Contact\_Instructions:* email preferred

*Metadata\_Standard\_Name:* FGDC Content Standards for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001-1998

*Metadata\_Time\_Convention:* local time

*Metadata\_Extensions:*

*Online\_Linkage:* <<http://www.esri.com/metadata/esriprof80.html>>

*Profile\_Name:* ESRI Metadata Profile