

Boulder County Land Use Department



Bark Beetles

Ryan Ludlow

Forestry Education and Outreach Coordinator
Boulder County Land Use Department

You are the Steward of your land!

People move to the Mountains for many reasons

- To view wildlife
- To live in nature
- To get away/privacy
- The list goes on and on

Living in the mountains comes with new challenges

- Throw away the lawn mower and buy a chainsaw and weedwhip
- It is everyone's responsibility to actively manage their forest to create healthier forest ecosystems.



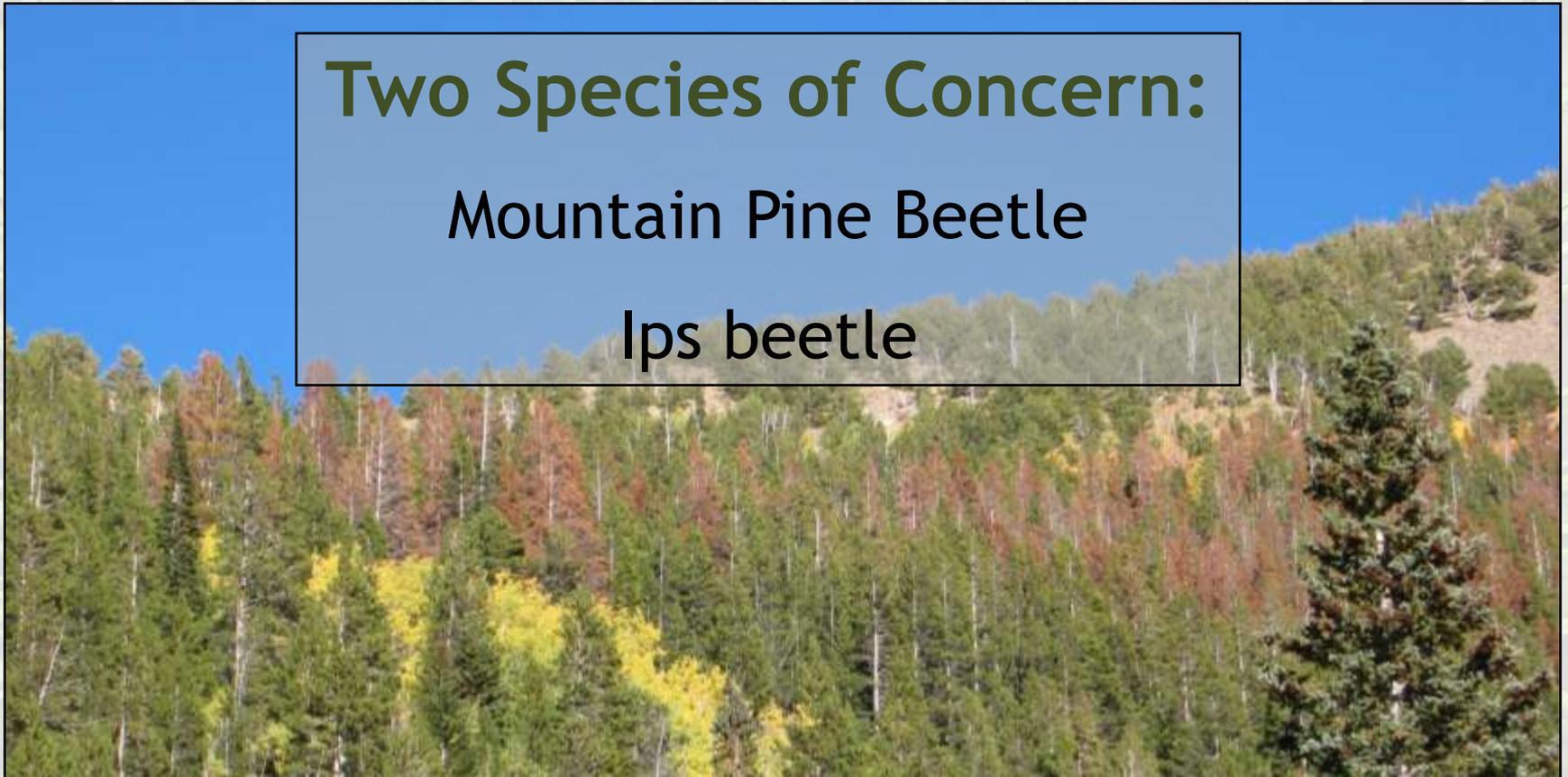
Bark Beetles in Boulder County

How will they affect you and what can you do?

Two Species of Concern:

Mountain Pine Beetle

Ips beetle



Mountain Pine Beetle (MPB)

Scientific name: *Dendroctonus ponderosae*

- Native insect to Boulder County
- Always present in our forests in endemic populations
- Recent outbreaks occurred in Boulder County during the 1970's in ponderosa pine

Mountain Pine Beetle



Adult MPB



Tiny insect- the size of a grain of rice

Rocky Mountain Region Archive, USDA Forest Service, Bugwood.org

UGA1441137

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Mountain Pine Beetle

- One of numerous species of native bark beetles
 - Ips, Spruce, Douglas-fir... and other bark beetles
- Phloem feeder- eats the inner bark of a tree
- Attacks both 2-3 needle & 5 needle pines
- Primary native hosts in our area:
 - limber, lodgepole, & ponderosa pine
 - also attacks urban pines- Scotch & Austrian pine
- One year life cycle
- Annual flight from mid-July to mid-Sept.



MPB LIFE CYCLE

ATTACKING
ADULT



EGG



LARVA



LARVA



PUPA



BROOD
ADULT



SUMMER



FALL



OVER-WINTER



SPRING



SECOND SUMMER



Courtesy of Tom Eager

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Adult *Ips pini* bark beetle



Rocky Mountain Region Archive, USDA Forest Service, Bugwood.org

Tiny insect- the size of a grain of rice
(a little smaller than MPB)

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Ips beetle

aka pine engraver

Scientific name: *Ips pini*

- Native insect to Boulder County
- Always present in our forests in endemic populations
- Eleven species of Ips beetle in Colorado
 - each Ips species has specific tree species it prefers to attack
- Attacks both 2-3 needle & 5 needle pines
- Primary native hosts in our area:
 - lodgepole and ponderosa pine



Ips beetle

- Attracted to smaller diameter freshly cut material
- Hits tops of trees and larger branches
- Builds populations in freshly cut material
- Research suggests that populations often spike and naturally crash in a few years



Ips Life Cycle

- 2-4 generations of beetles per year in Colorado
- Beetles fly from last spring hard freeze to first fall hard freeze
- When it is warm Ips can fly
- Trees can fade to red quickly - within 5 weeks of being attacked

Signs of a mountain pine beetle attack

pitch tubes



Steven Katovich, USDA Forest Service, Bugwood.org

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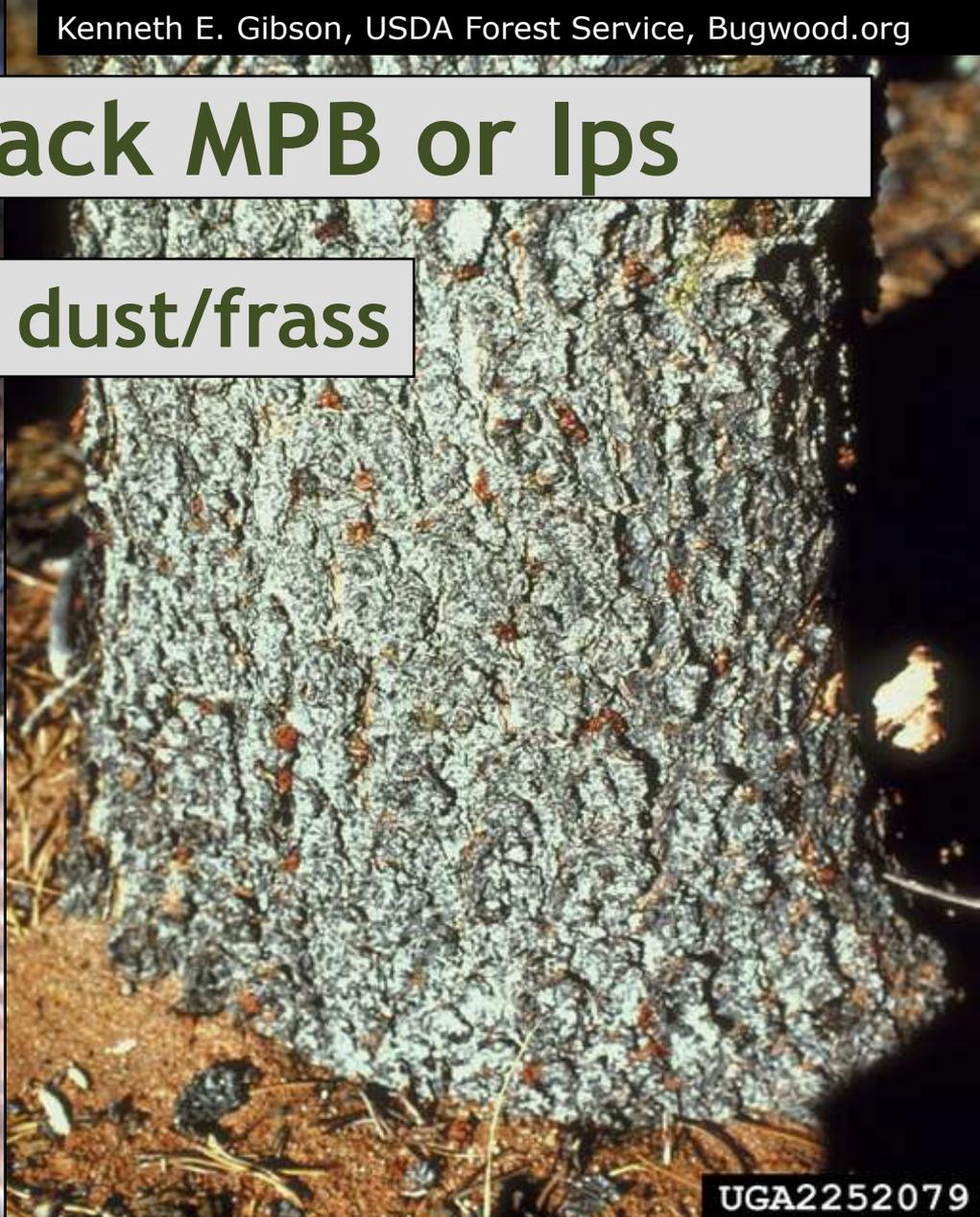


Pitch tubes are a tree's natural defense



Signs of attack MPB or Ips

boring dust/frass



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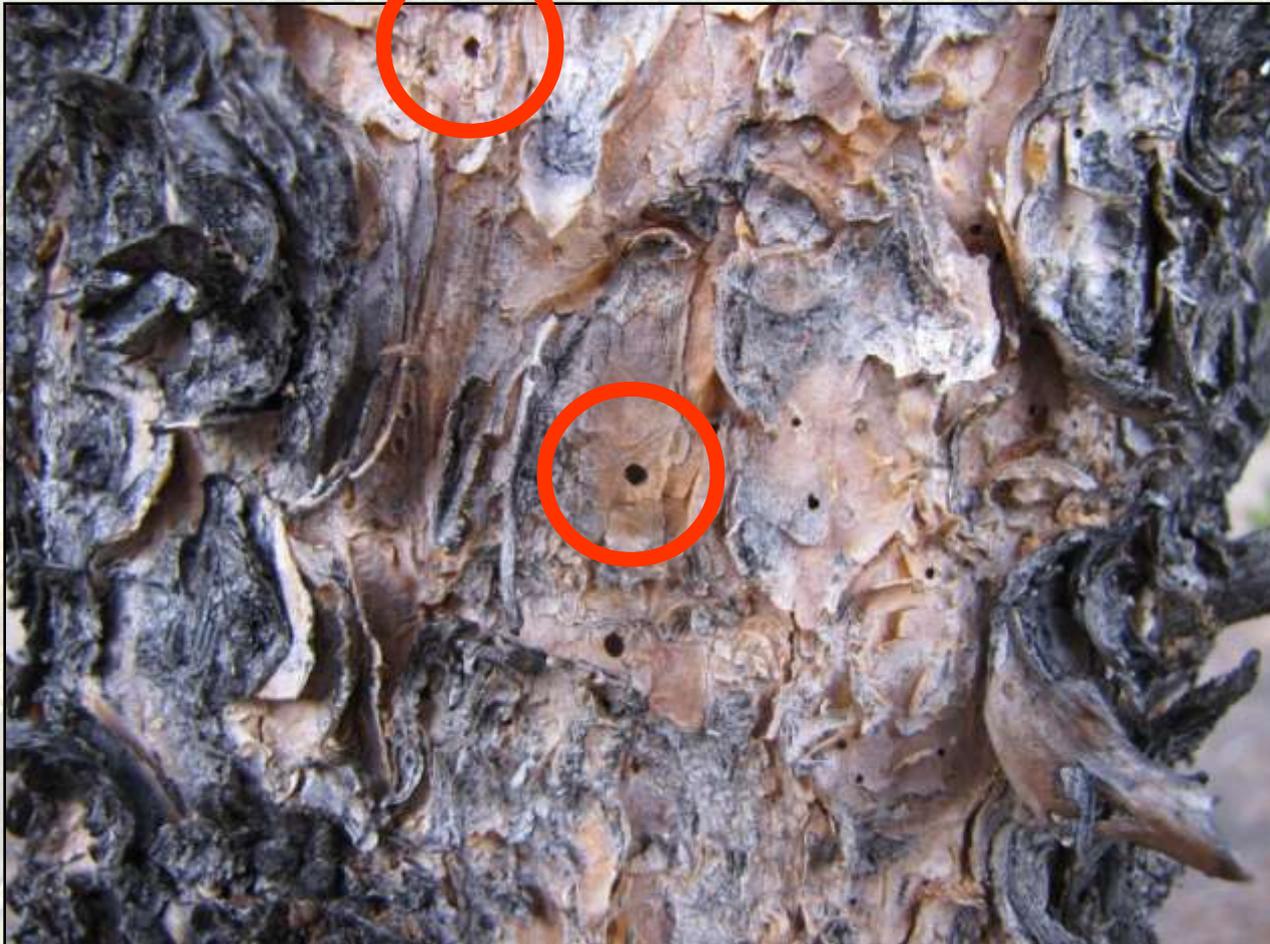
Blue Stain Fungi another sign of attack



Pest and Diseases Image Library, Bugwood.org



Exit holes in bark



Ips Brood Galleries



UGA1678055b

David McComb, USDA Forest Service,
Bugwood.org

MPB Brood Galleries



Ladd Livingston, Idaho Department of
Lands, Bugwood.org

To what extent has the epidemic progressed and where is it going.....

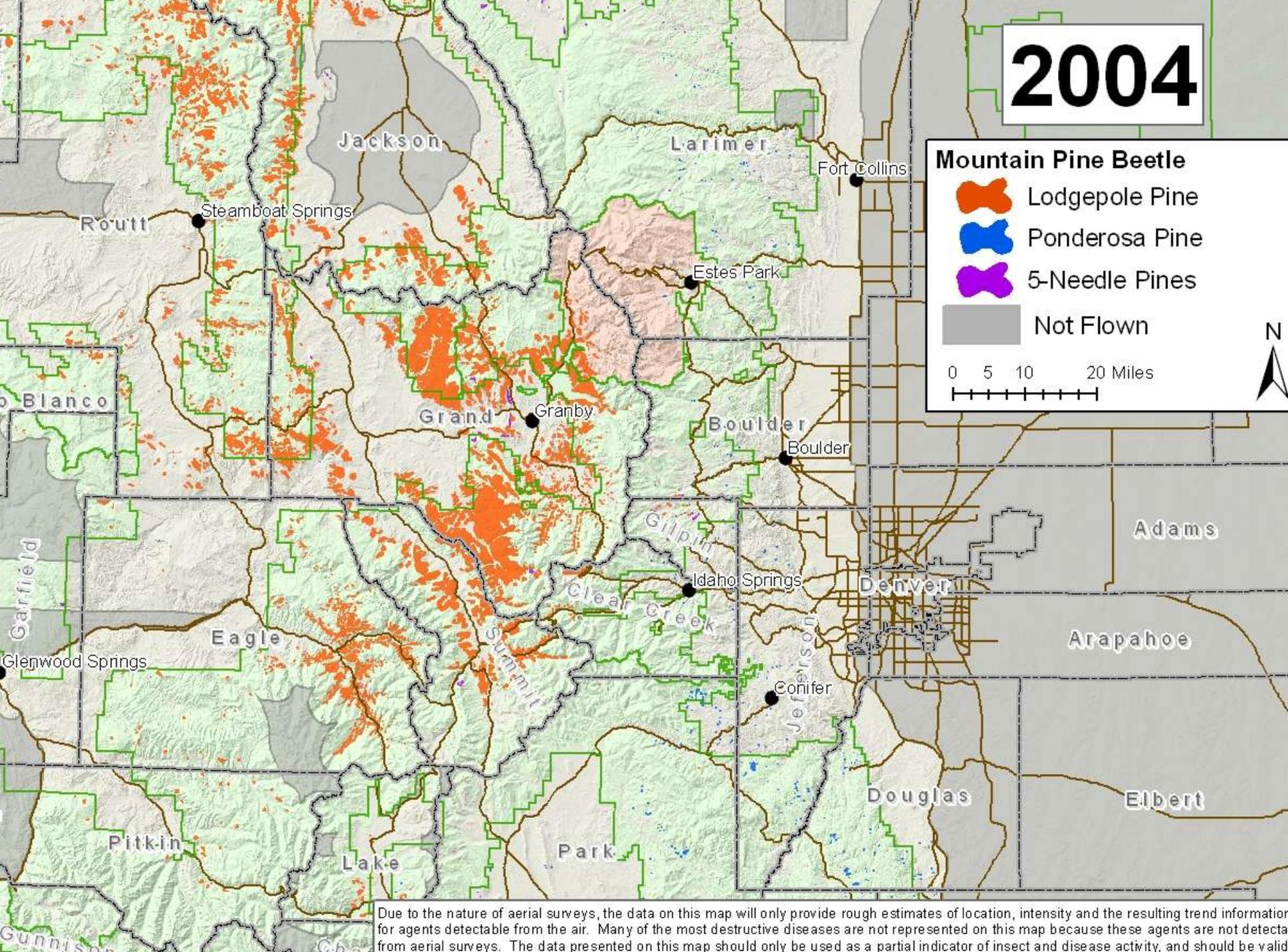
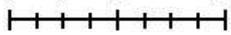


2004

Mountain Pine Beetle

-  Lodgepole Pine
-  Ponderosa Pine
-  5-Needle Pines
-  Not Flown

0 5 10 20 Miles

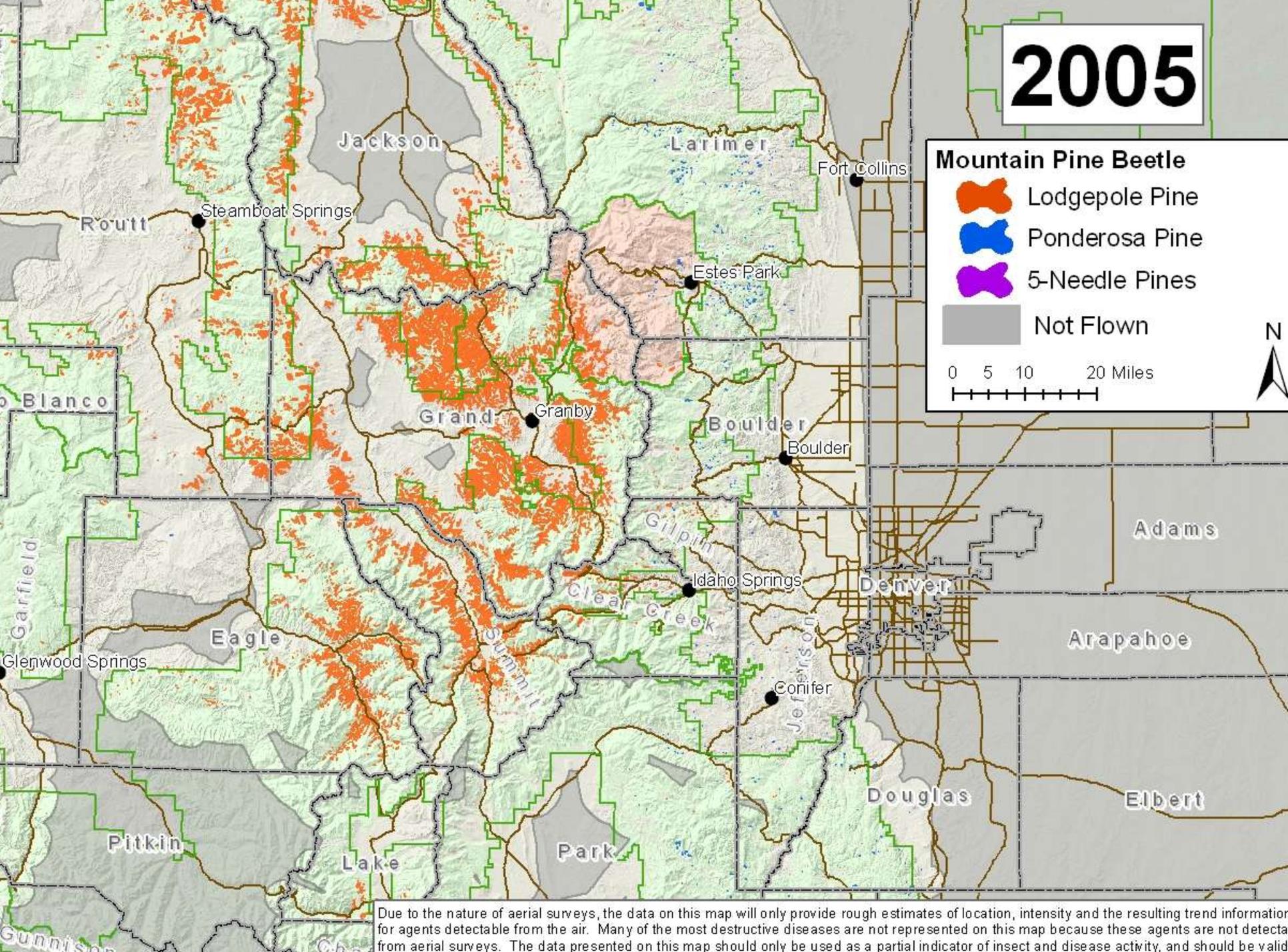
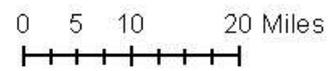


Due to the nature of aerial surveys, the data on this map will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented on this map because these agents are not detectable from aerial surveys. The data presented on this map should only be used as a partial indicator of insect and disease activity, and should be valid

2005

Mountain Pine Beetle

-  Lodgepole Pine
-  Ponderosa Pine
-  5-Needle Pines
-  Not Flown



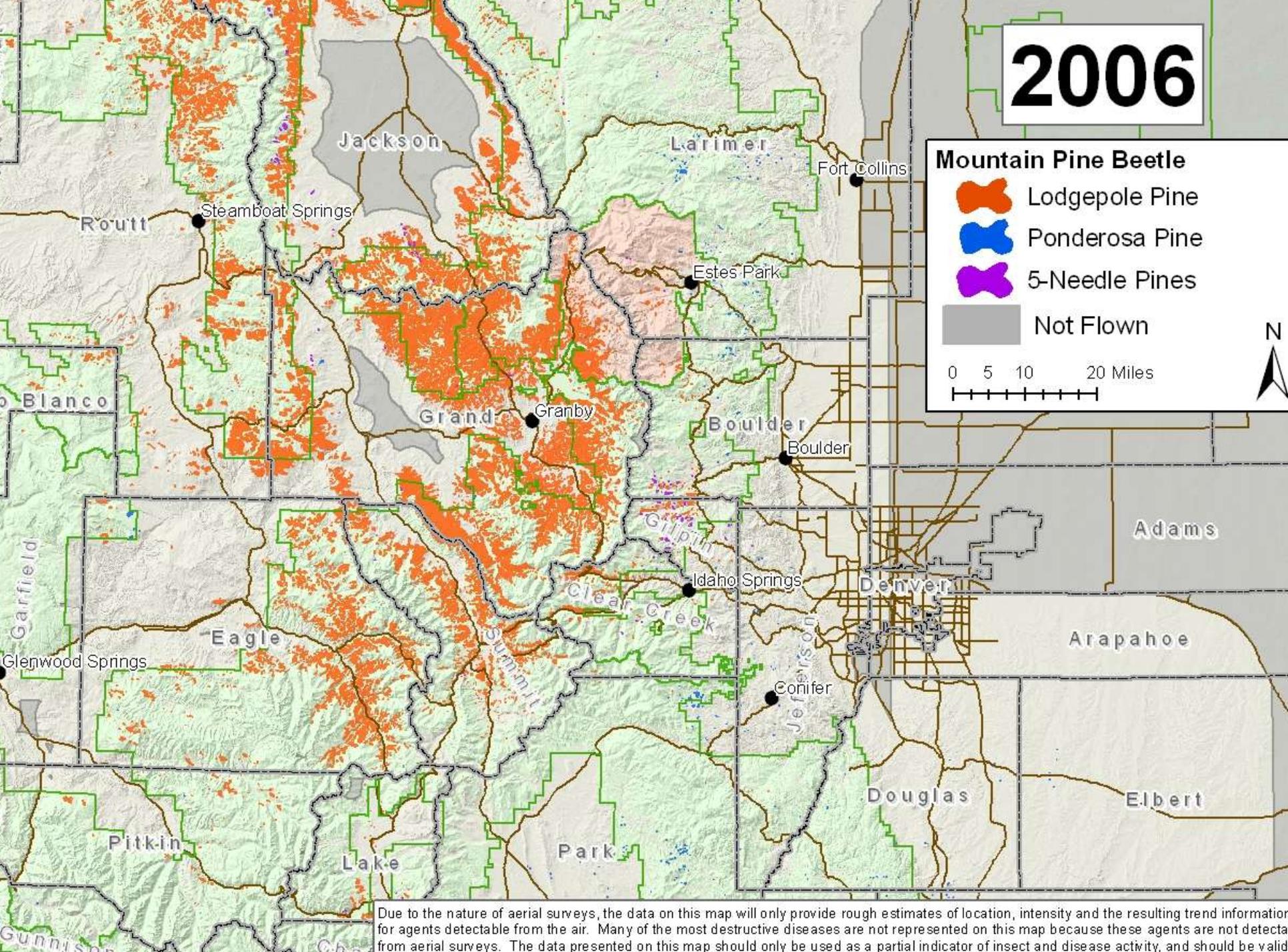
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2006

Mountain Pine Beetle

-  Lodgepole Pine
-  Ponderosa Pine
-  5-Needle Pines
-  Not Flown

0 5 10 20 Miles



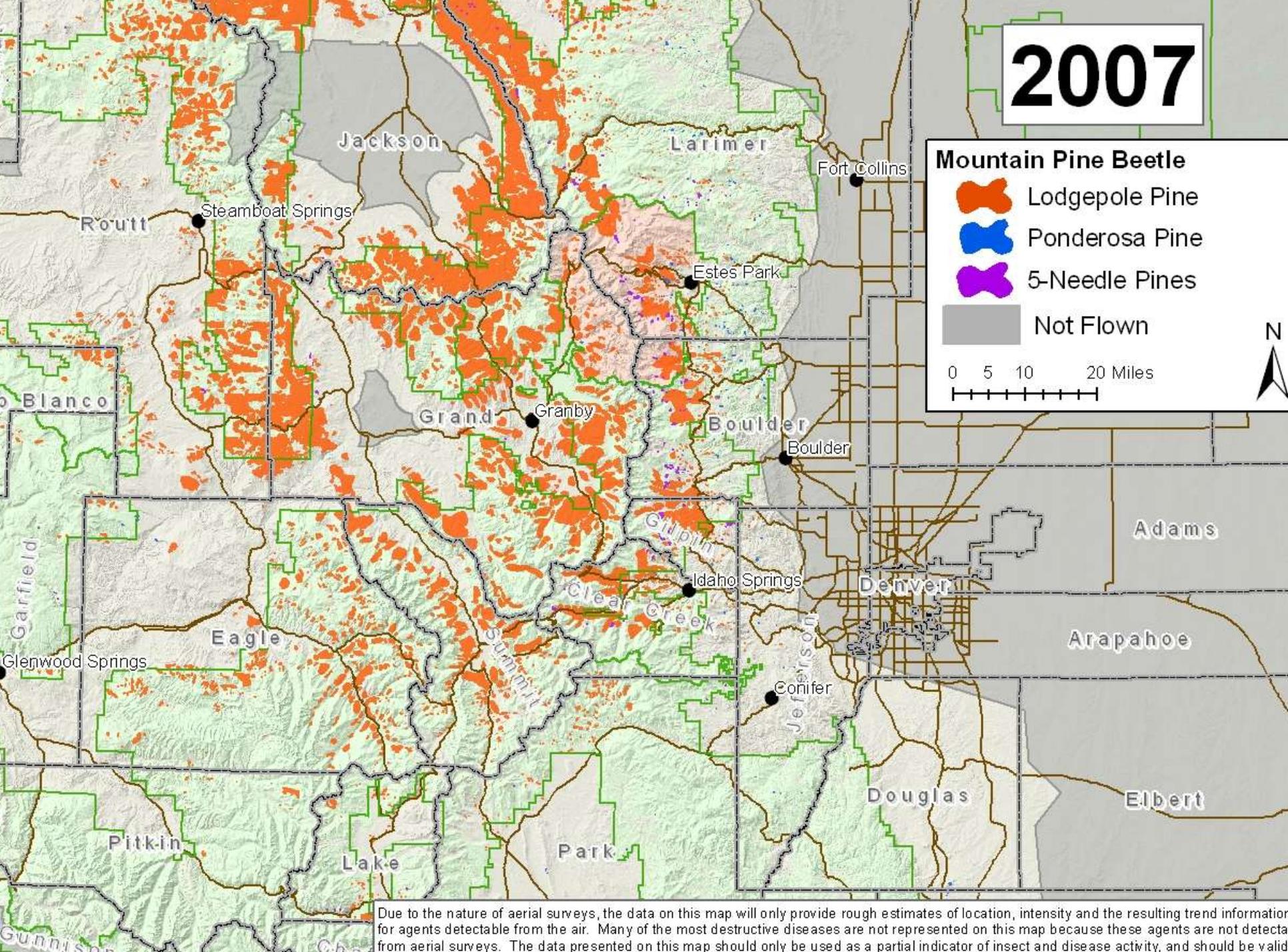
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2007

Mountain Pine Beetle

-  Lodgepole Pine
-  Ponderosa Pine
-  5-Needle Pines
-  Not Flown

0 5 10 20 Miles



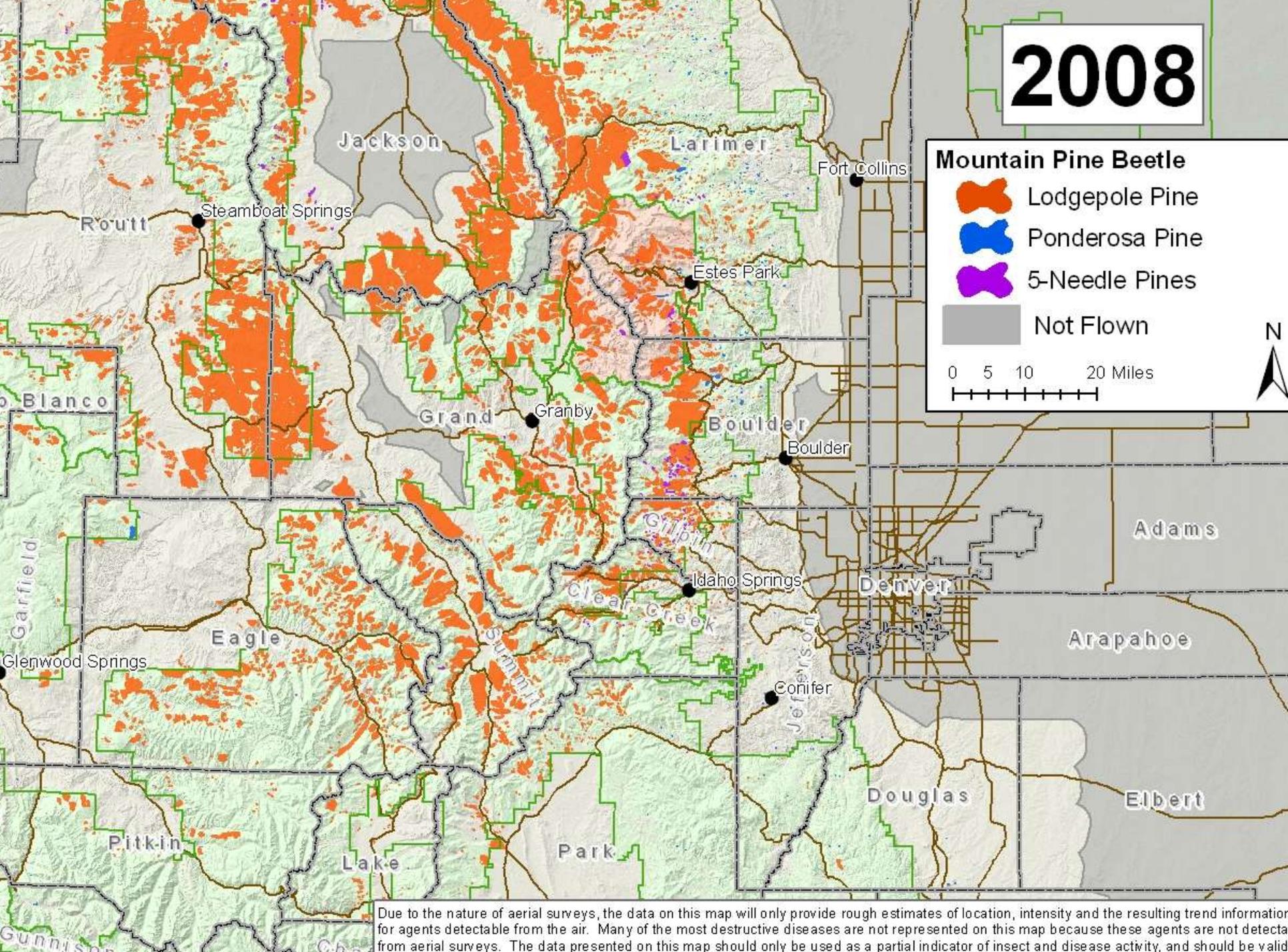
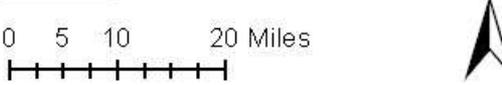
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2008

Mountain Pine Beetle

-  Lodgepole Pine
-  Ponderosa Pine
-  5-Needle Pines
-  Not Flown

0 5 10 20 Miles



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 valid

So why is this epidemic so severe?

“Perfect Storm” Syndrome

- Over-mature even-aged lodgepole across a landscape
- Climatic changes
 - warmer and drier
 - extended drought
- Elimination of disturbance
 - fire suppression

‘Our Forests are not static, they are disturbance driven and must remain so in order to be sustainable’

Ronald F. Billings, Texas Forest Service, Bugwood.org

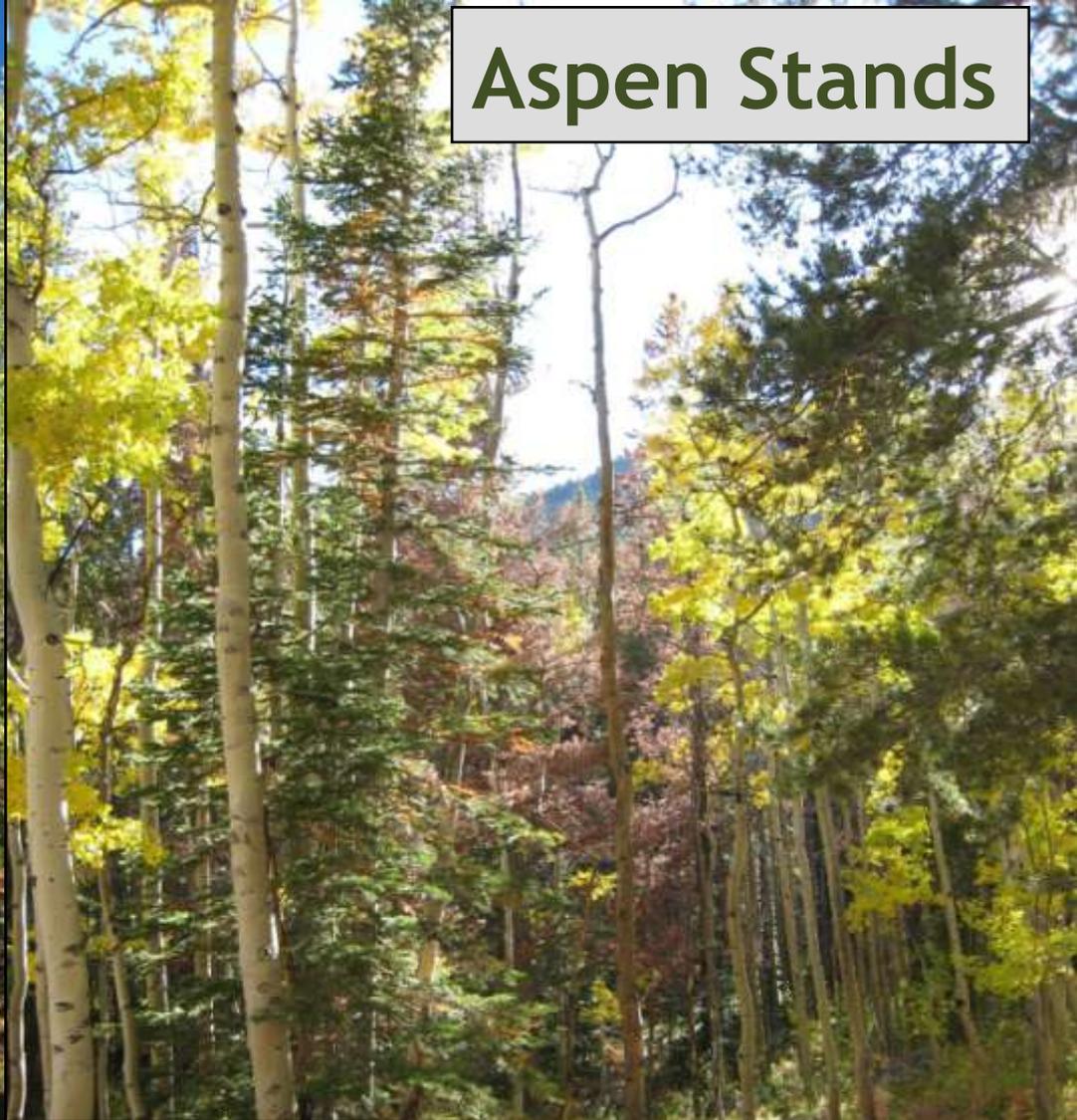


What will the outcome be on the Front Range?

- Possible that 95% of mature (>3" diameter) lodgepole pine will be infested in next 3-10 yrs
- Uncertainty about what the impacts will be to lower elevation ponderosa pine forests
- Boulder County's current infestation- winter 2009
 - 42,000 acres of lodgepole pine infested - 50% of lodgepole forest acres in the County have some activity
 - 1,600 acres in ponderosa pine infested



Aspen Stands



Near Fourth of July Trailhead

Boulder County
Land Use Department



Nederland High School



Hillsides of trees hit near Moffat Tunnel



What happens after?

Safety & Infrastructure Issues

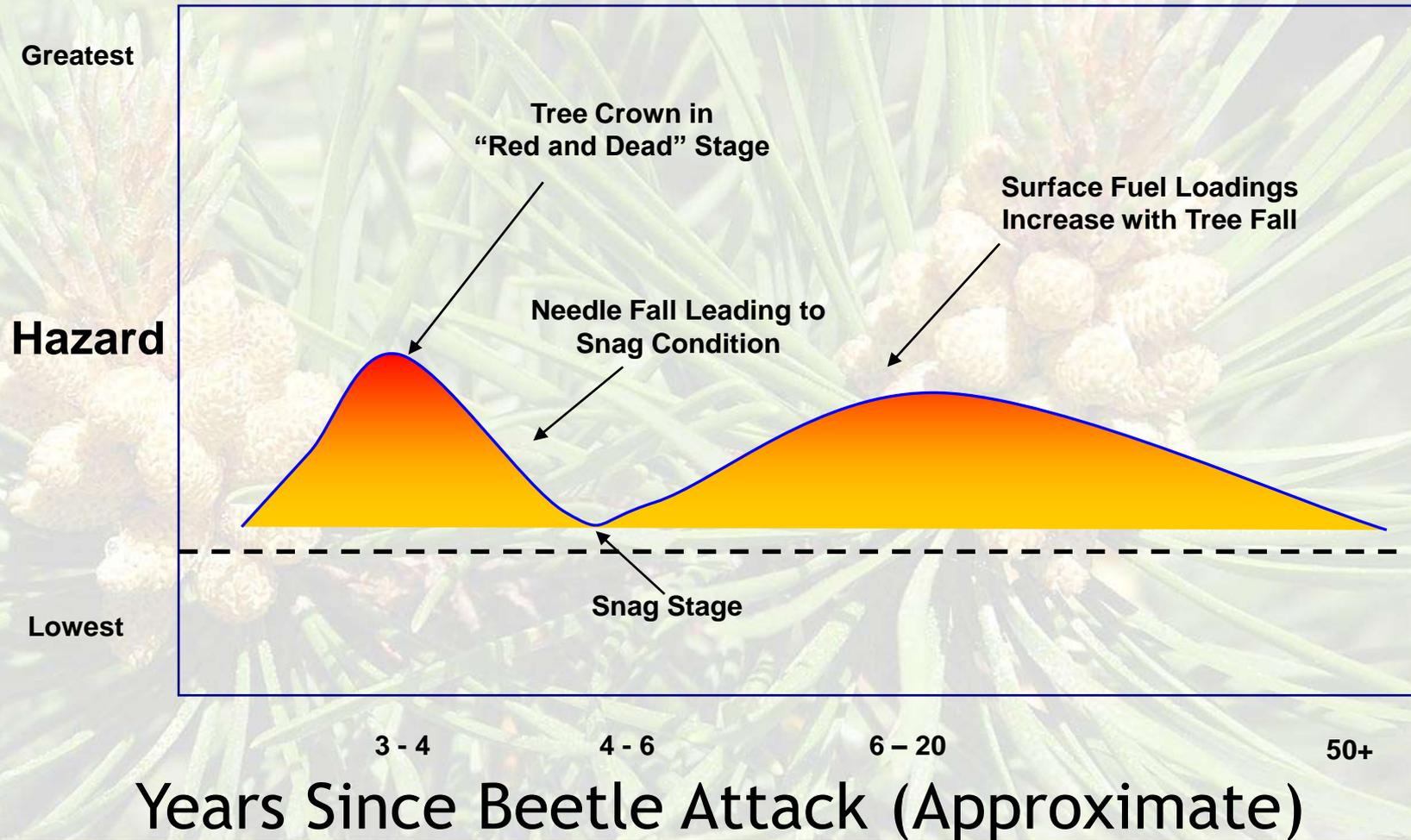
In 4 - 10 years after death trees will start falling

Winds on the Front Range will play a major factor

- Public safety is of primary concern
- Damage to personal property such as homes, driveways, propane tanks...
- Damage to infrastructure such as utility lines, roads, buildings, & watersheds...
- Damage to trails, trailheads, & campgrounds
- And of course fire....



Fire Hazard Associated with Mountain Pine Beetle Mortality



Management Strategies to Reduce the Spread

- May be too late for lodgepole, but active management in ponderosa may be beneficial
- Vigilant detection & removal of infested trees in ponderosa forests
- Active forest management; re-introduction of disturbances to create a more diverse forest
 - Thinning in lower elevation ponderosa pine forests
 - Patch cuts in higher elevation lodgepole pine forests
- Chemical treatments



Chemical Preventatives



Mark McGregor, USDA Forest Service, Bugwood.org



USDA Forest Service, Bugwood.org

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Preventatives Spraying

Carbaryl, Permethrin, Bifenthrin- labeled pesticides

- Spraying is not recommended on a large scale- please don't spray your whole forest.
- Only spray 5-10 trees that you can't live without.
- Hire a licensed pesticide applicator
- Spray every year in May or June for the entire epidemic - which could last more than a decade.
- The entire trunk of the tree on all sides must be saturated (to the point of runoff) with pesticides.
- Do not spray within 35ft of water!
- Please spray with caution- we all live downstream.
- Remember these are pesticides that kill good and bad insects.
- When spraying occurs: close windows, keep pets & children inside and warn your neighbors



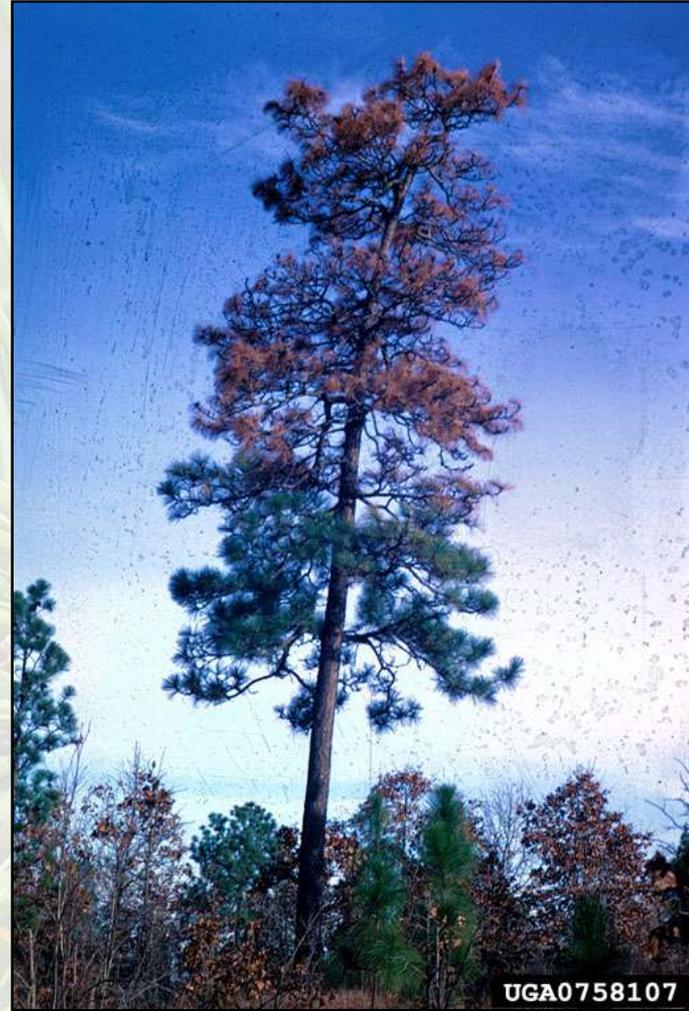
Pheromones

Verbenone Pouch

- Verbenone does not kill bark beetles. It is a pheromone that signals to beetles the tree is full and the beetles should look for a home elsewhere.
- Studies suggest that it can be effective when beetle populations are low but the effectiveness drops when large populations of beetles are present.
- This product is meant to be used as part of an integrated pest management system. To be effective you must identify and remove beetle infested trees on your property.
- Unfortunately, this product doesn't appear to be the silver bullet that will completely protect your trees from harm - but it may buy you some time.



Specific Management for Ips



William M. Ciesla, Forest Health Management International, Bugwood.org



Specific Management for Ips Beetle

1. Encourage vigorous forests through active management to reduce density, favoring the healthiest trees of all age classes, seek professional advice.
2. Remove or treat freshly cut material
3. If possible limit cutting during beetle flight
 - But don't let fears of Ips beetles stop forest management
 - When cutting during flight season- take Ips into account- take steps to mitigate impact
4. Don't stack green wood next to live trees



Sanitation/Treatment of Infested Wood

- Identify currently infested trees & sanitize/treat before flight time (mid-July)
 1. Peeling Bark
 2. Chipping/Grinding
 3. Solar Treatment
 4. Community Forestry Sort Yard
- Just cutting and dropping the tree does not kill the beetles- the infested wood needs to be treated!



Peeling Bark

- Very labor intensive but a cheaper option
- Good option for material deep in the backcountry
- Teenage kids and volunteers with drawknives can accomplish a lot
- Dries out and kills beetles



Chipping or Grinding



- Kills most beetles or they won't fly straight again
- Spread chips evenly across forest floor no deeper than 2-3" or haul away - a deep chip layer may inhibit aspen and grass regeneration



Solar Treatment

- Solar treatment requires a good site
 - sunny, south facing
- Single layer of logs
- Cover in clear 6mm plastic
 - completely seal edges with dirt
- Minimum of 1.5 months of exposure
- Not very effective...without a focused effort



Community Forestry Sort Yards

- A public service for county residents
- Provides a location to dispose of wood from forestry projects
- Promotes proactive forest stewardship
 - Facilitates defensible space around homes and structures
 - Encourages removal of dead trees to protect homes, utility lines, roads, trails and parking areas
 - Enhances future forest health
- Increase reutilization of forest products
 - Compliments County sustainability goals
 - Working with PeaktoPeakWood.org to find local wood markets



For additional information about locations and hours of operation of sort yards please visit: www.bouldercounty.org/foresthealth



Peak to Peak WOOD
Elevating Front Range Sustainability

The goal of this project is to increase and stabilize the utilization of woody biomass and cost-effective wood for Colorado's Forest Range markets.

The Peak to Peak WOOD Project directly supports the goals of the Colorado Forest Products (CFP) Marketing Program.

Look for this brand when looking for locally sourced products that carry locally sustainable forest management best practices and have maximum utility to Colorado.

For a full list of products go to: www.peaktoppeakwood.org

Powered by the state through a USDA Forest Service Working Agreement, thank you!

BIOMASS COLLECTION SITE AND SORT YARD

Hours of Operation:

Site Rules and Regulations

- Material drop-off only while site is open and staffed
- Hours of operation as posted or visit: www.peaktoppeakwood.org
- Only woody material from forest management, wildlife reduction or forest improvement work
- Do not pile infested wood between July 1 and Oct. 1 - loads will be rejected

Project Partners:
Colorado State Forest Service
Boulder County
Boulder County Forest Health
Boulder County Forestry
Boulder County Parks & Recreation
Boulder County Public Works
Boulder County Sheriff's Office
Boulder County Transportation
Boulder County Utilities
Boulder County Water

Logos: Colorado Forest Products, Boulder County, Peak to Peak WOOD

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The Future Forests of Boulder County



Feel free to contact me if you are interested in setting up a bark beetle and forest management presentation for your community or if you have additional questions.

Ryan Ludlow

Forestry Education and Outreach Coordinator

Boulder County Land Use

email: pinebeetle@bouldercounty.org

720-564-2641

For additional information visit:

www.BoulderCounty.org/ForestHealth

or

www.FrontRangePineBeetle.org

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