Continental Dialogue- 2015




Presented by:

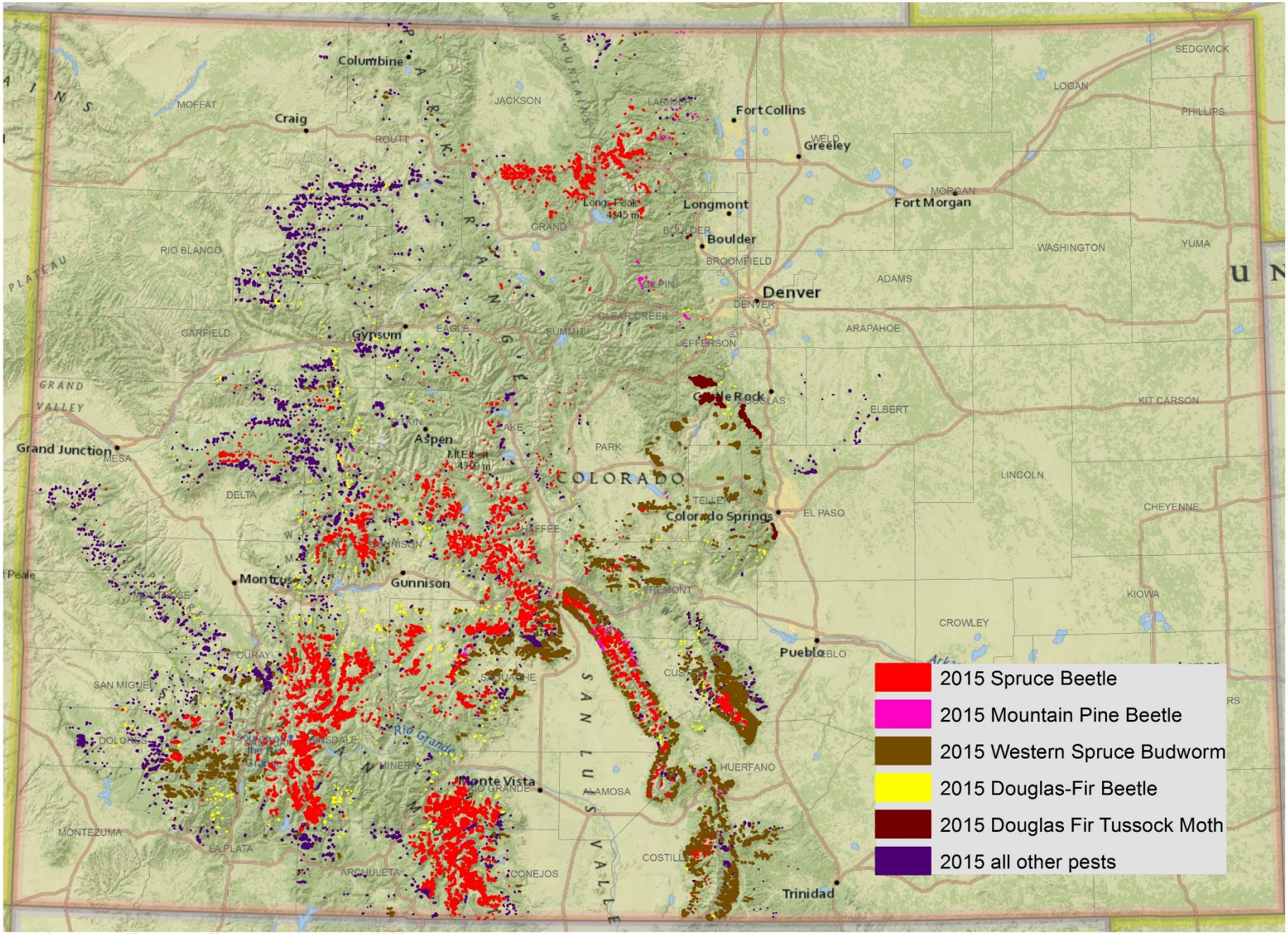
Dan West

Forest Entomologist

Colorado State Forest Service

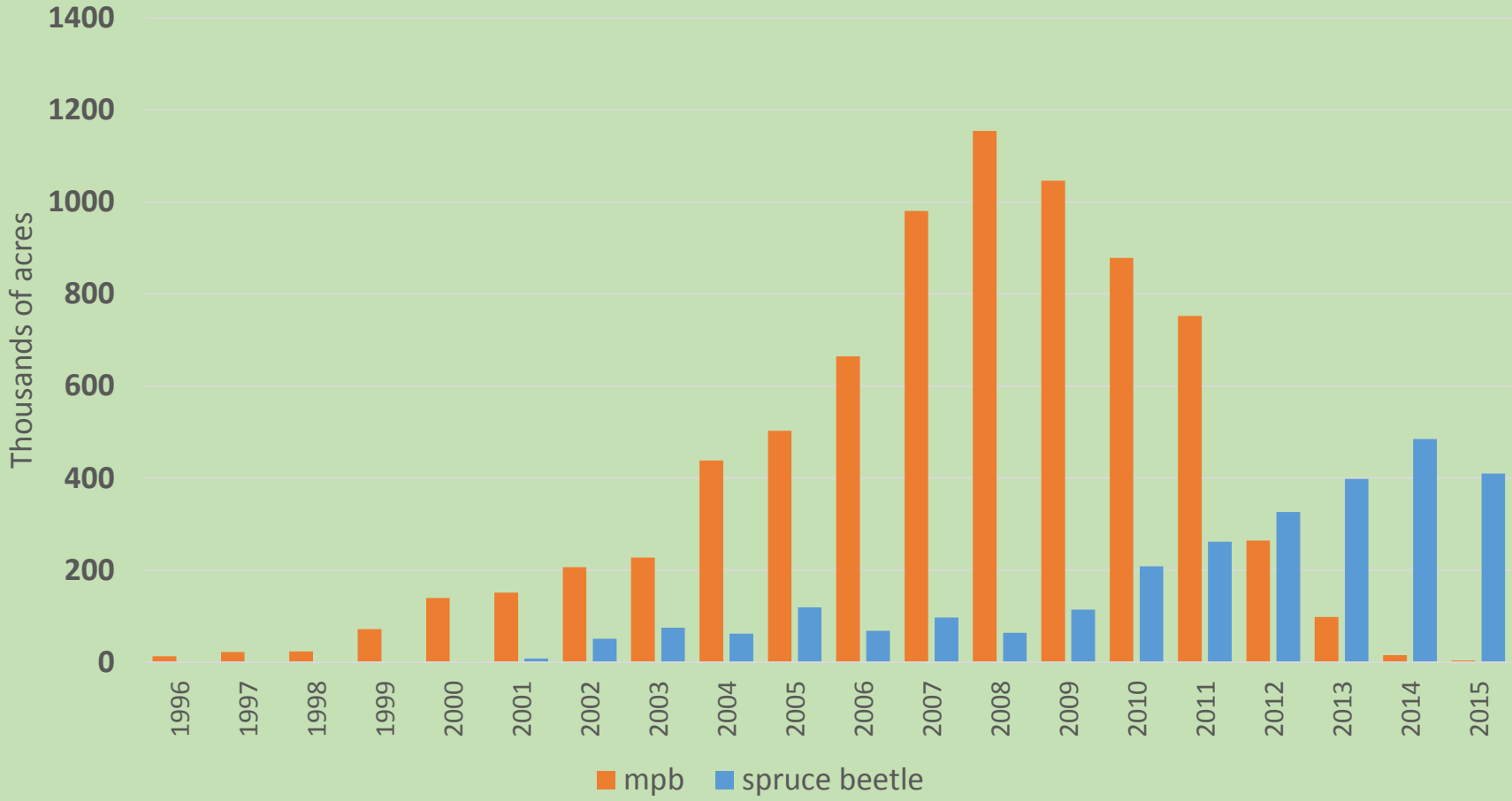
www.csfs.colostate.edu

Major Disturbance Agents in Native Forests - 2015

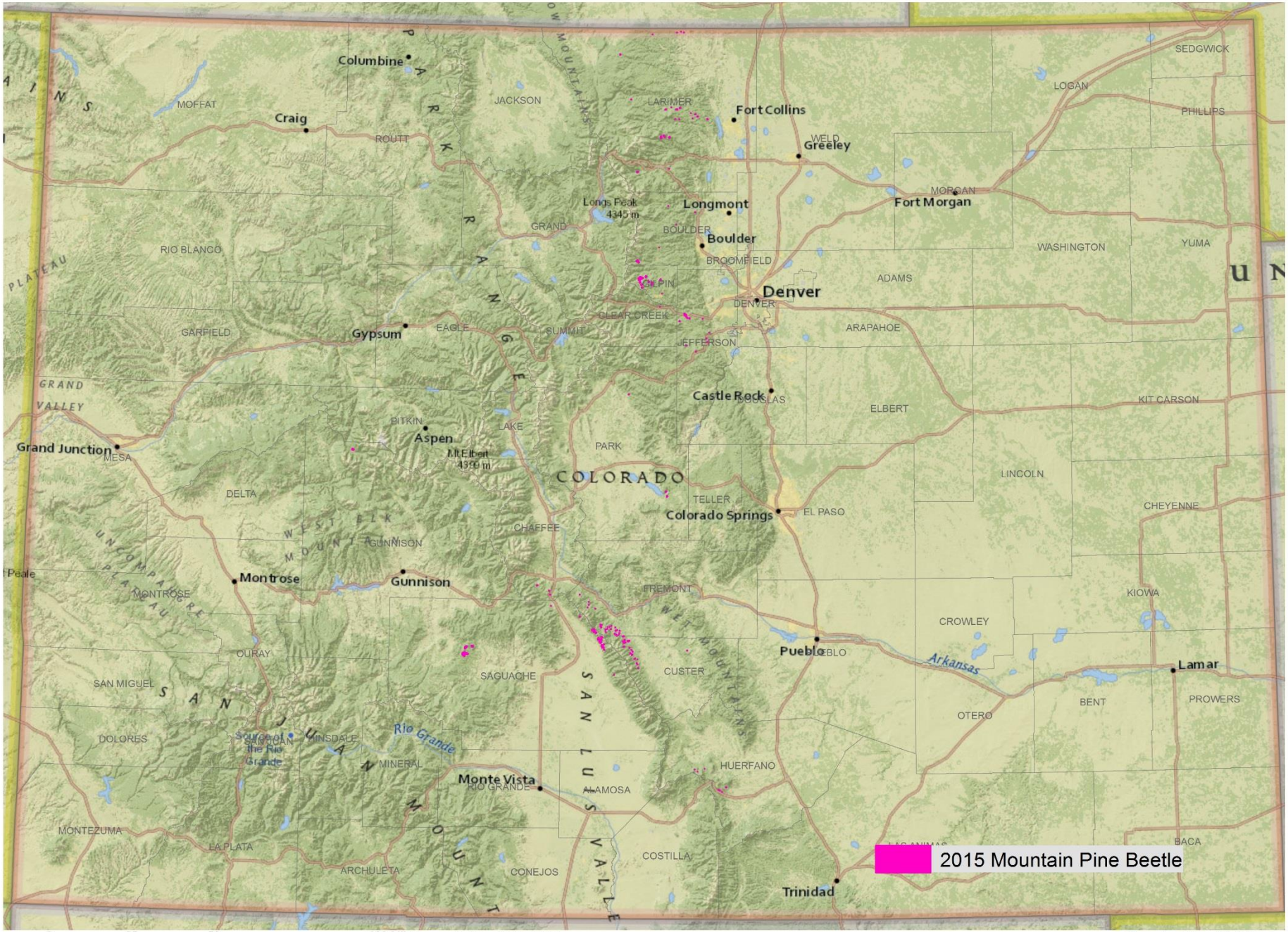


Created by: D. West
Nov 2015

For the fourth straight year, spruce beetle was the most widespread insect pest of Colorado's forests, impacting more than **400,000 acres** of Engelmann spruce forest in 2015.



Mountain Pine Beetle-Caused Mortality - 2015

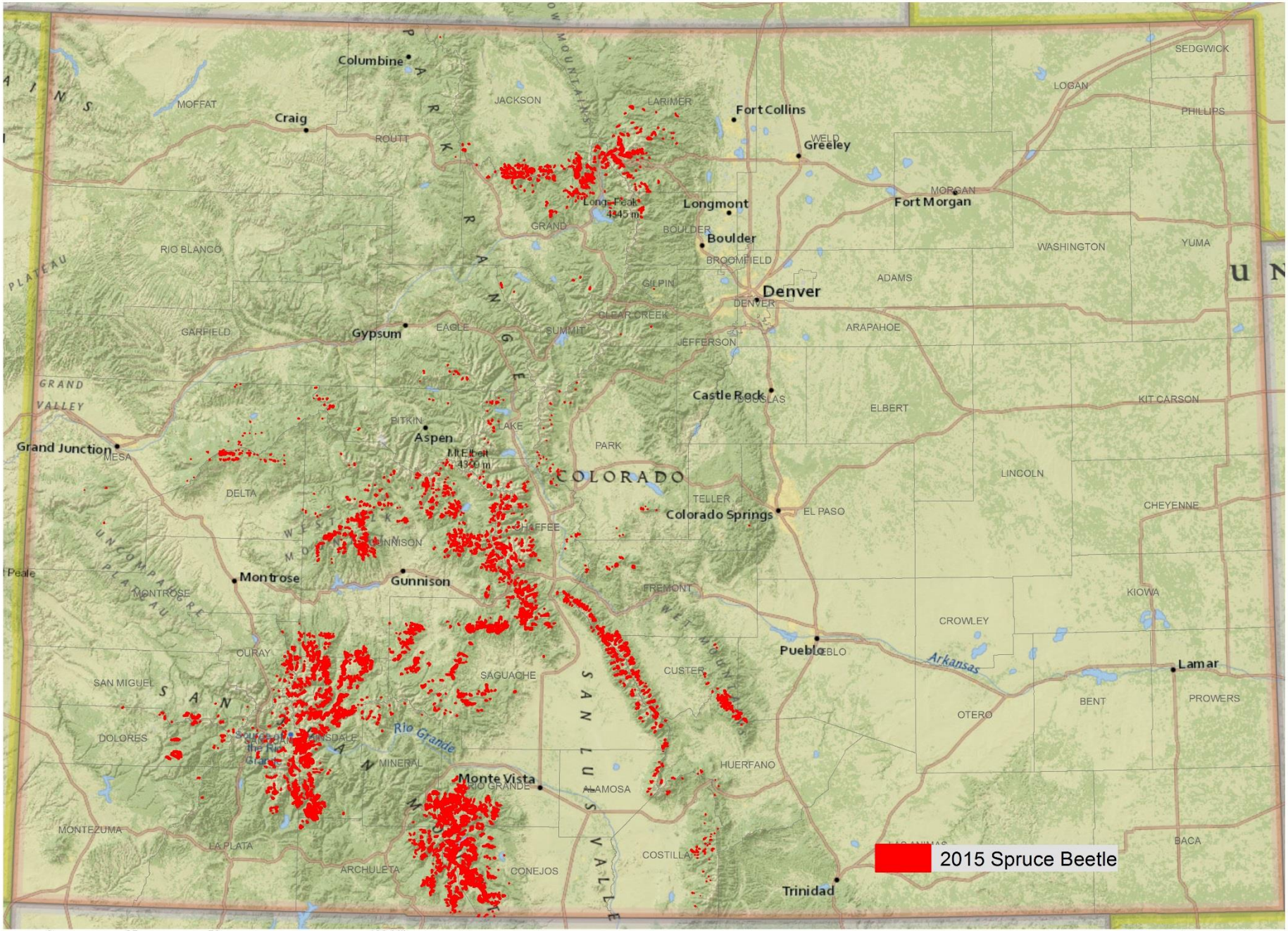


0 25 50 100 Miles

1 in = 36 miles

Created by: D. West
Nov 2015

Spruce Beetle-Caused Mortality - 2015



Created by: D. West
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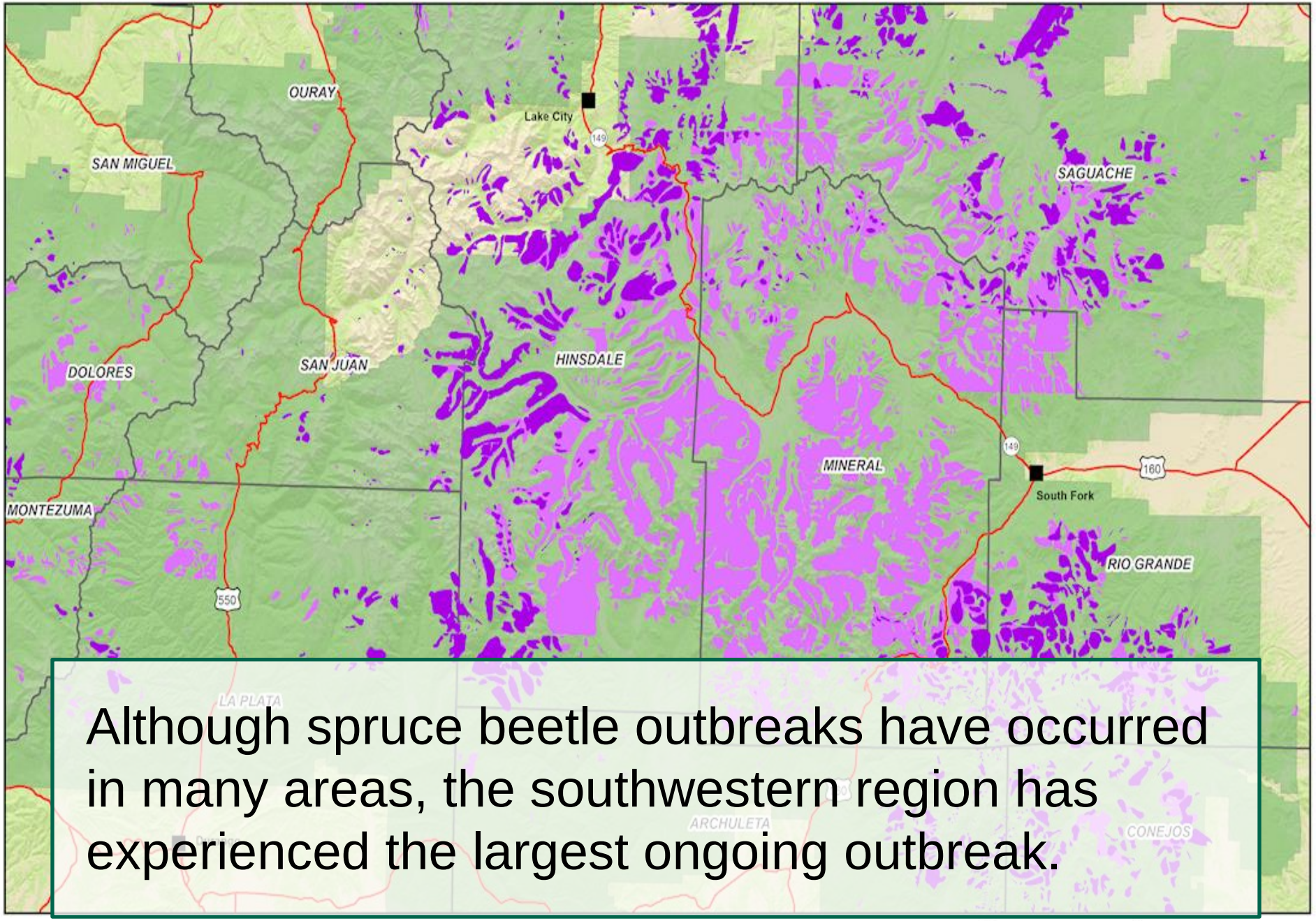
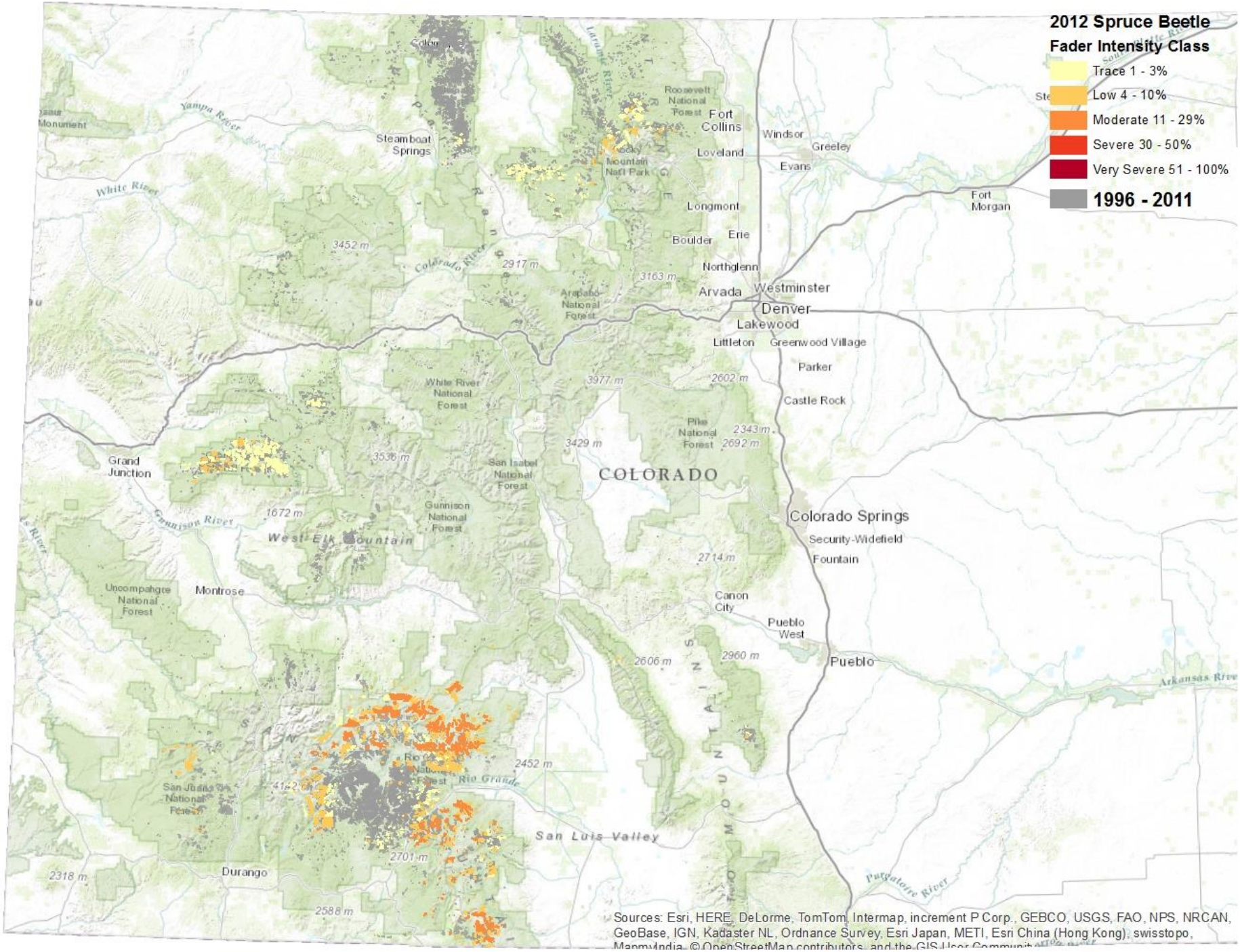
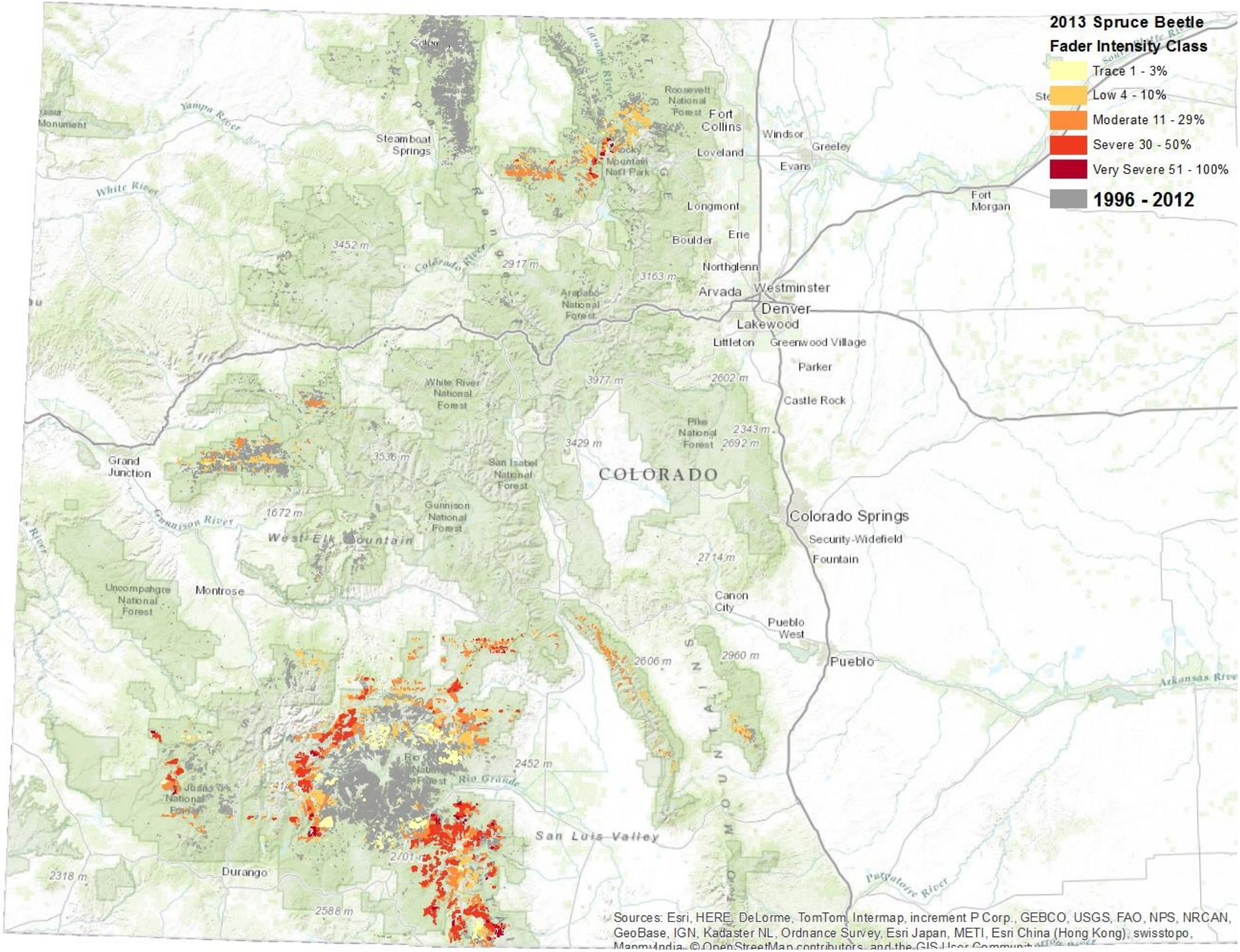


Although spruce beetle outbreaks have occurred in many areas, the southwestern region has experienced the largest ongoing outbreak.


2012 Spruce Beetle
Fader Intensity Class
Trace 1 - 3%
Low 4 - 10%
Moderate 11 - 29%
Severe 30 - 50%
Very Severe 51 - 100%
1996 - 2011
Fort Collins
Loveland
Windsor
Greeley
Evans
Fort Morgan
Longmont
Boulder
Erie
Northglenn
Arvada
Westminster
Denver
Lakewood
Littleton
Greenwood Village
Parker
Castle Rock
Colorado Springs
Security-Widefield
Fountain
Pueblo West
Pueblo
Canon City
Steamboat Springs
Grand Junction
Montrose
Durango
COLORADO
San Luis Valley
Rio Grande
Colorado River
Gunnison River
White River
Yampa River
Arkansas River
Purgatoire River
Roosevelt National Forest
Rocky Mountain Nat'l Park
Arapaho National Forest
White River National Forest
San Isabel National Forest
Gunnison National Forest
Pike National Forest
Uncompahgre National Forest
San Juan National Forest
Rio Grande National Forest
West Elk Mountain
Sangre de Cristo Mountains
3452 m
2917 m
3163 m
3977 m
2602 m
2343 m
2692 m
3429 m
3536 m
1672 m
2714 m
2606 m
2960 m
2452 m
2701 m
2318 m
2588 m
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community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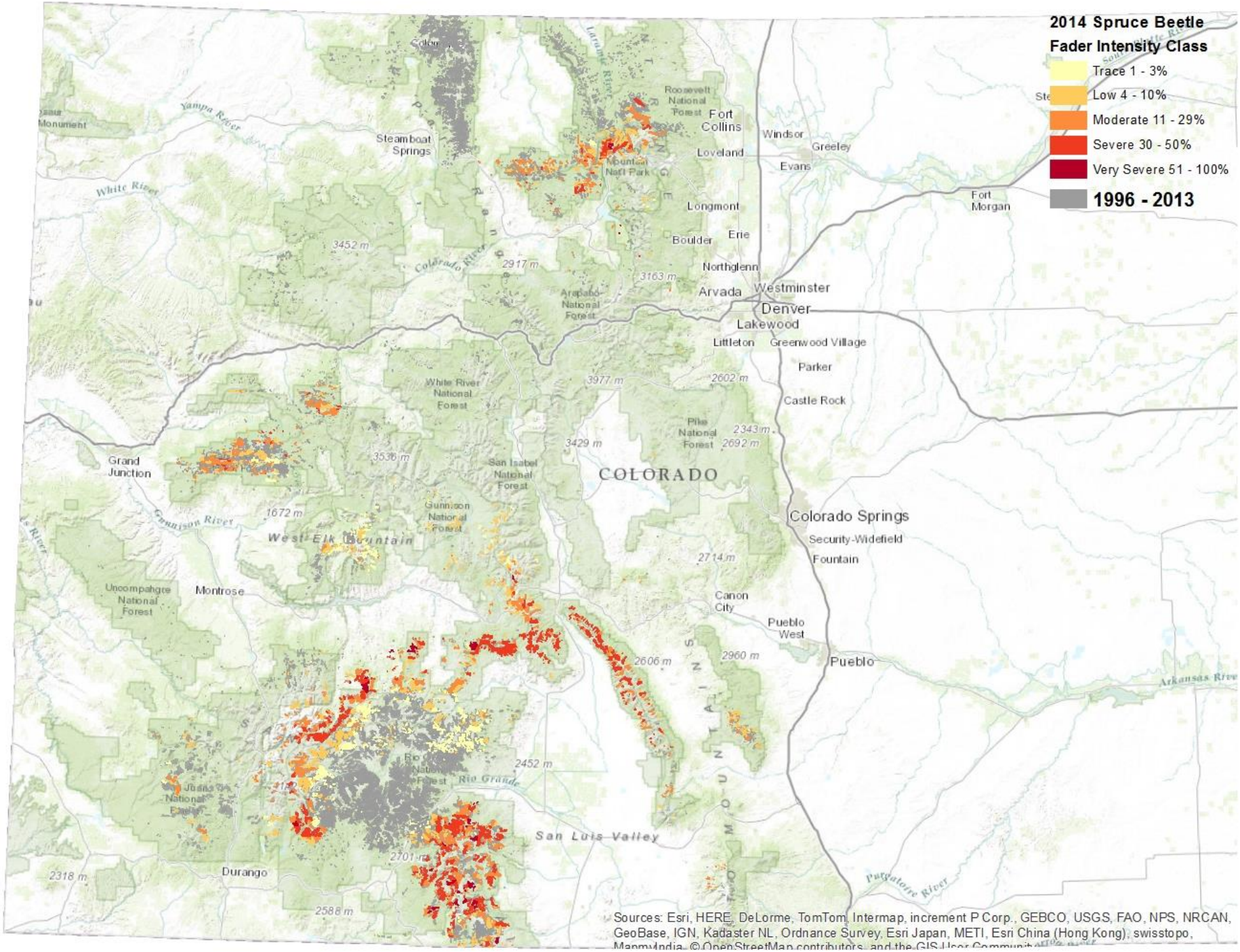
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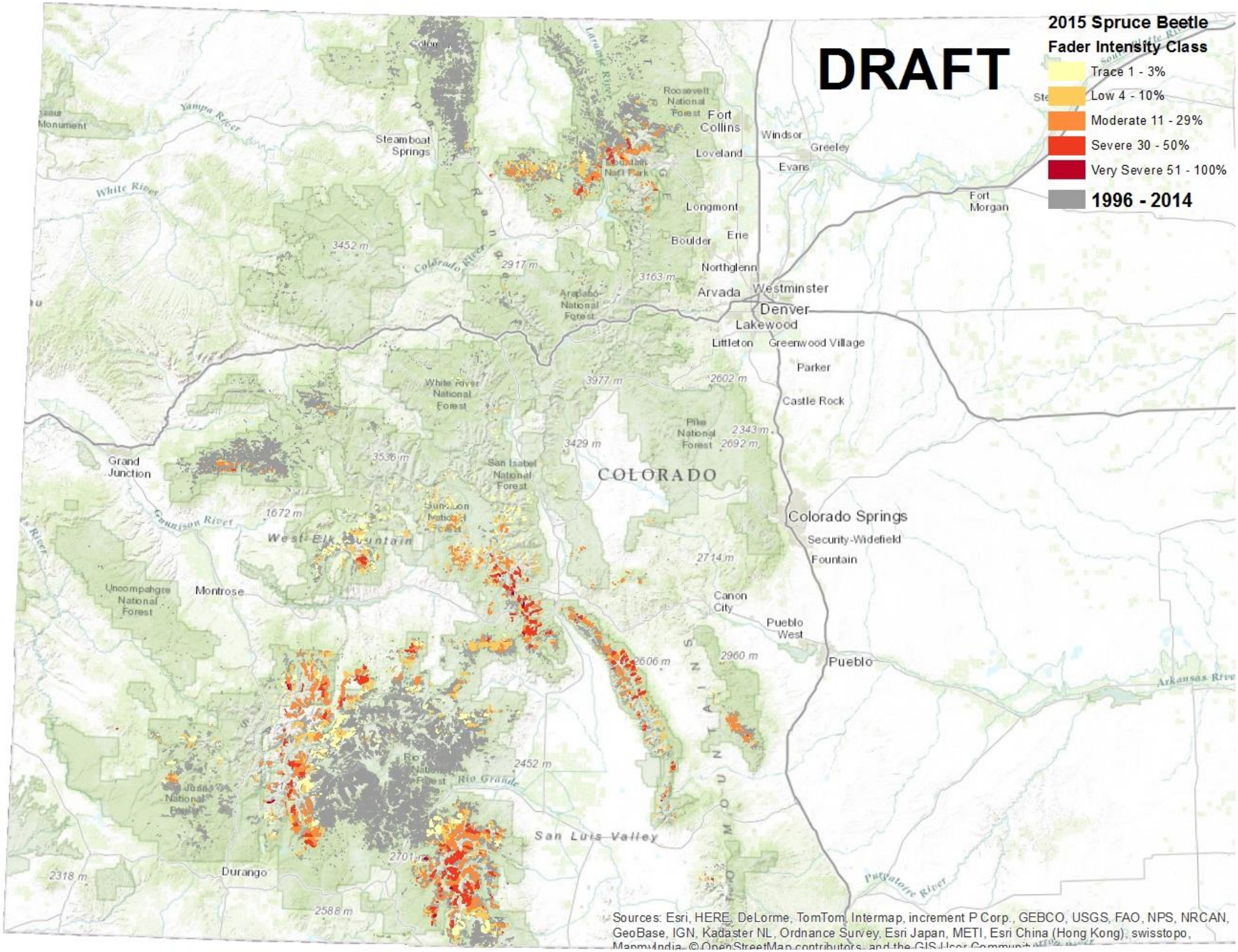
DRAFT
2015 Spruce Beetle
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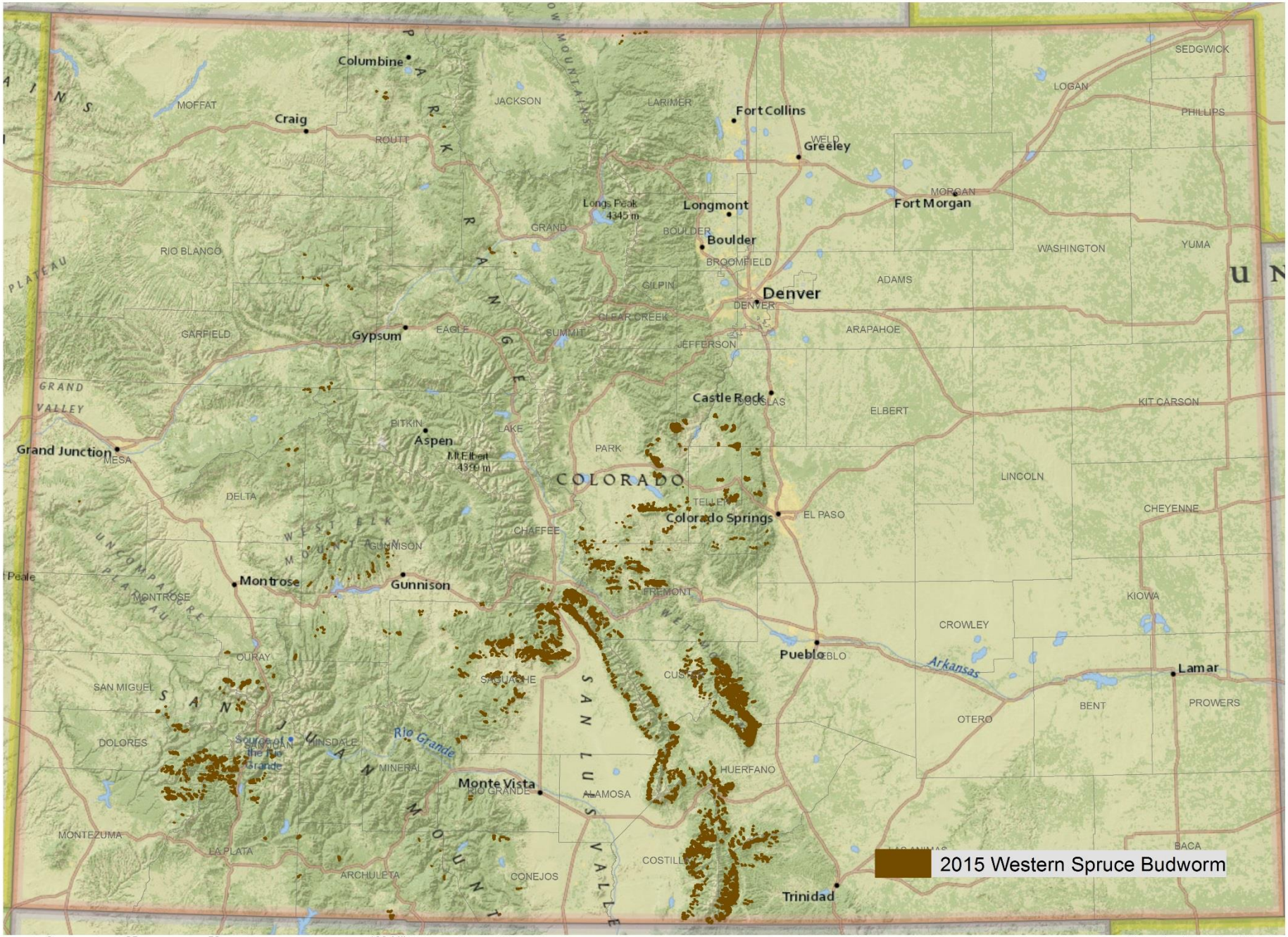
This Engelmann spruce forest, located in Slumgullion Pass near Lake City, was **healthy and vigorous** in 2006.

By 2014, most mature Engelmann spruce were killed

Slumgullion Pass, July 2015

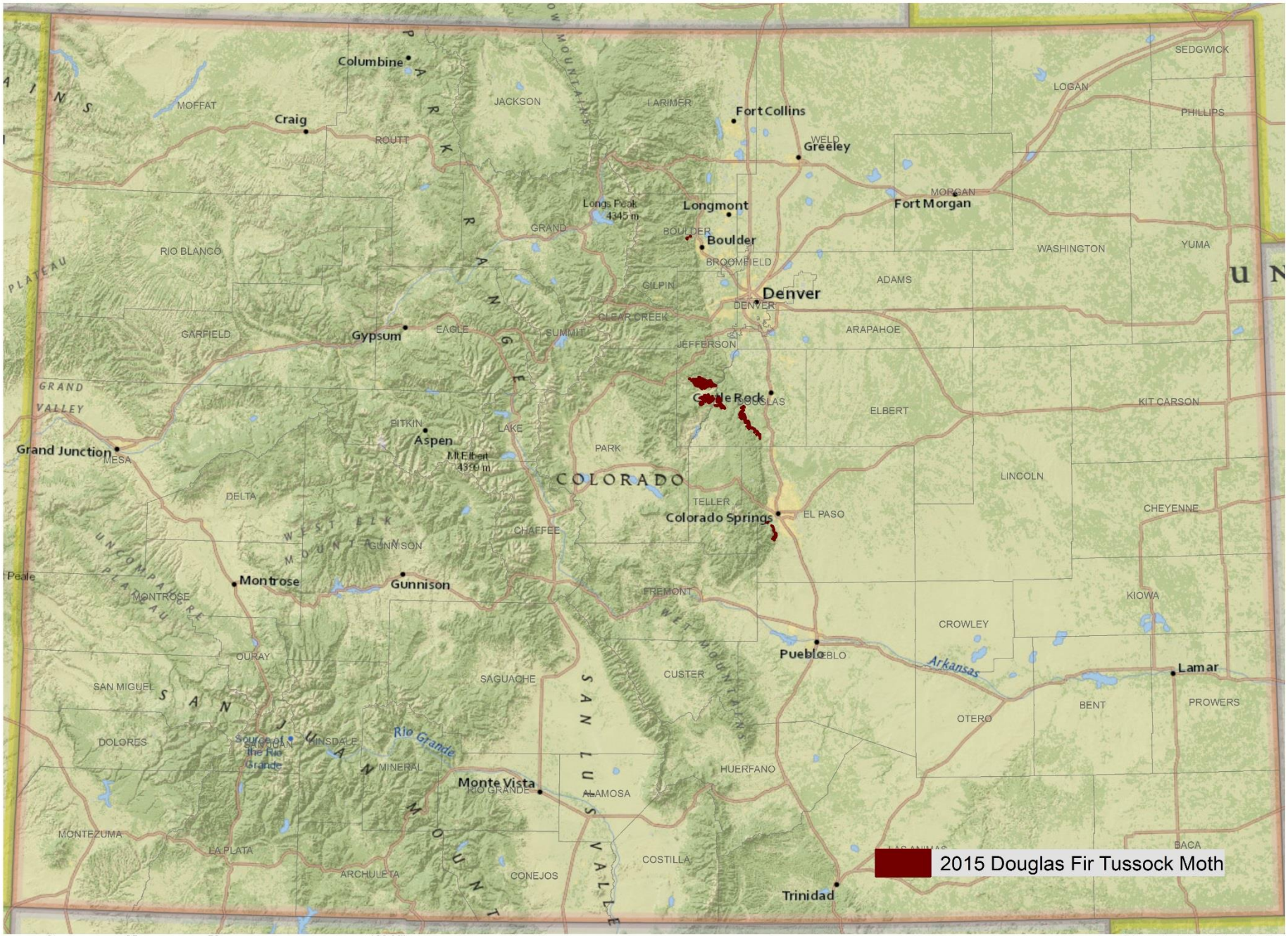
Wolf Creek Pass, March 2015

Western Spruce Budworm Defoliation - 2015



Western Spruce Budworm Defoliation - 2015

Douglas-Fir Tussock Moth Defoliation - 2015



Valley View, Larkspur Area
2015

Perry Park, Larkspur Area 2015

Perry Park Area, Larkspur 2015

Valley Park – Sept 2015

Valley Park – Sept 2015

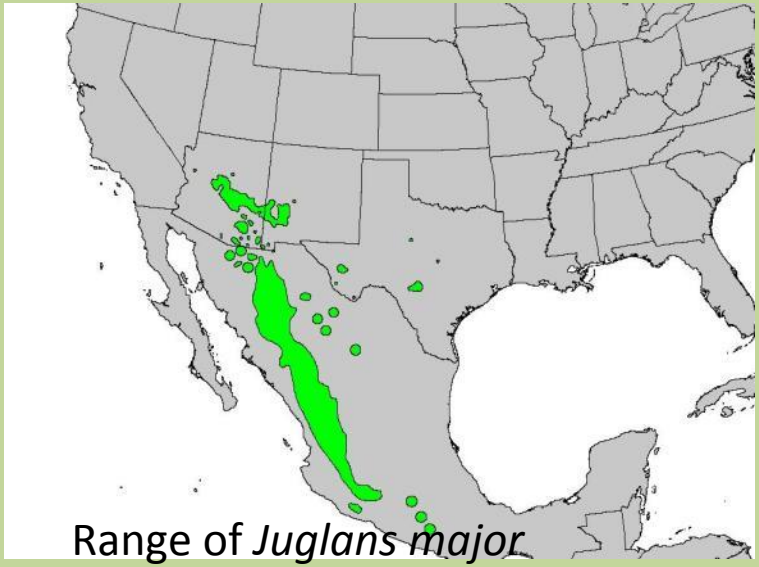

Light – Moderate Defoliation (June 2015)


Severe Defoliation (June 2015)

Walnut Twig Beetle

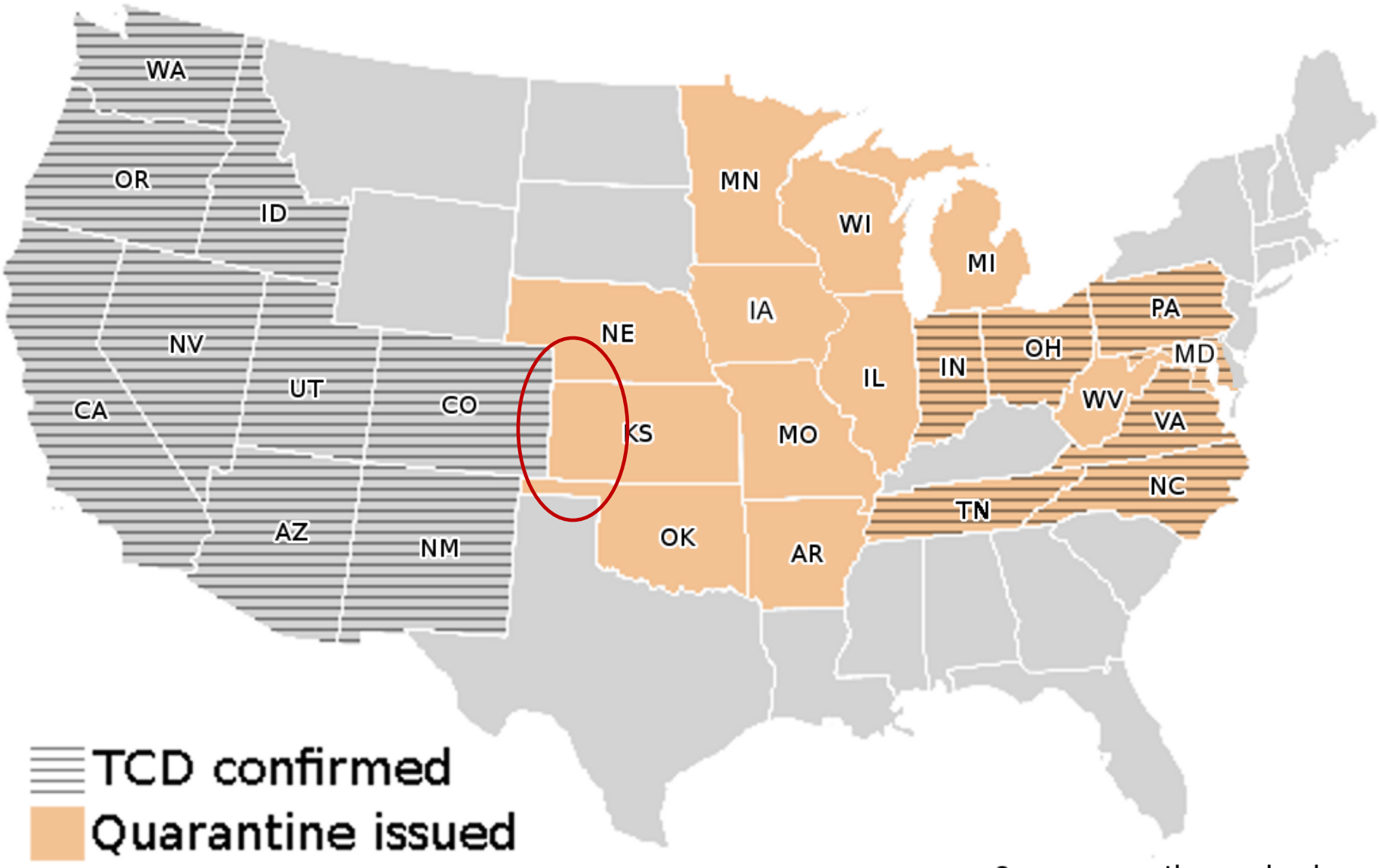
Pityophthorus juglandis

- Twig beetles normally attack small, weakened twigs
- <u>BUT</u> in CO and other states found attacking large diameter boles
- In CO, WTB has caused significant mortality in black walnuts



Range of *Juglans major*

Distribution of Thousand Cankers Disease as of April 20, 2015



Source: www.thousandcankers.com

Future Insect Pests

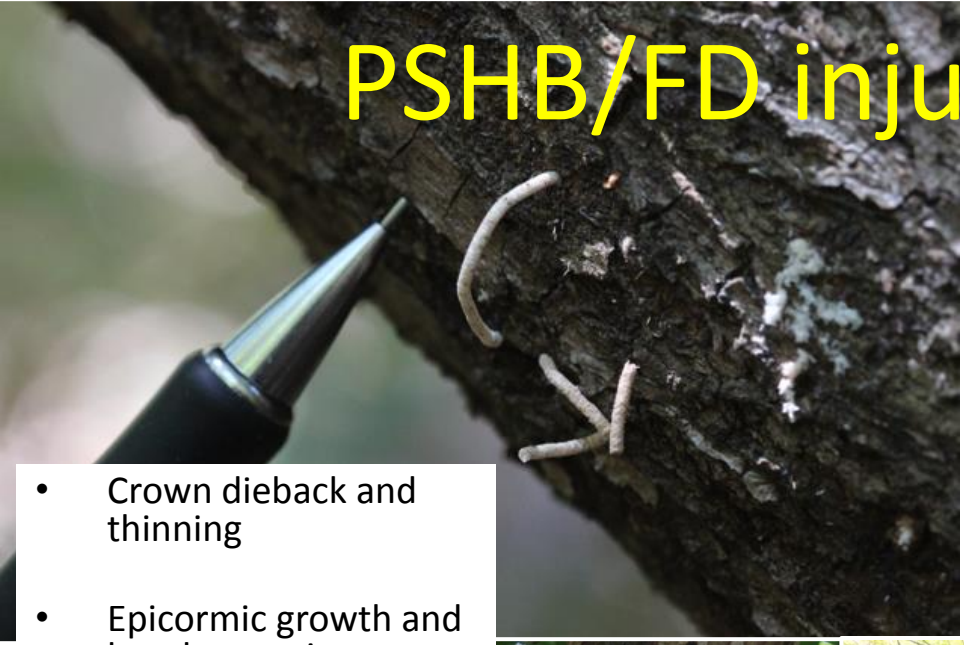
- Exotics
  - Gypsy moth ?
  - Asian long horned beetle ?
  - Polyphagous Shot Hole Borer ?
  - White Pine Blister Rust
  - Emerald ash borer

Polyphagous shot hole borer and Fusarium dieback

- Exotic insect-disease complex
- Sex ratio skewed to females
- Siblings mate in galleries
- Males are flightless and not commonly seen outside of the galleries
- Several generations/yr
- Carries three fungi
  - *Fusarium euwallaceae*

PSHB/FD injury symptoms

- Crown dieback and thinning
- Epicormic growth and basal sprouting



PSHB known host species

Table 1. Known reproductive hosts, agricultural crop hosts and native species hosts of the polyphagous shot hole borer/fusarium dieback disease complex as of February 2014[a].

	Reproductive Hosts	Agricultural Crop Hosts	Native Species Hosts
1.	Box elder (*Acer negundo*)	Avocado (*Persea americana*)	California box elder (*Acer negundo* var. *californicum*)
2.	Castor bean (*Ricinus communis*)	Japanese persimmon (*Diospyros kaki*)	Coast live oak (*Quercus agrifolia*)
3.	Avocado (*Persea americana*)	Olive (*Olea europa*)	California sycamore (*Platanus racemosa*)
4.	English oak (*Quercus robur*)	Macadamia (*Macadamia integrifolia*)	Big leaf maple (*Acer macrophyllum*)
5.	Coast live oak (*Q. agrifolia*)	Mulberry (*Morus* spp.)	Red willow (*Salix laevigata*)
6.	California sycamore (*Platanus racemosa*)	Hazelnut (*Corylus colurna*)	Valley oak (*Q. lobata*)
7.	Big leaf maple (*A. macrophyllum*)	Loquat (*Eriobotrya japonica*)	Blue palo verde (*Parkinsonia florida*)
8.	Mimosa (*Albizia julibrissin*)	Peach (*Prunus persica*)	Engelmann oak (*Q. engelmanii*)
9.	Coral tree (*Erythrina corallodendron*)	Grape (*Vitis vinifera*)	White alder (*Alnus rhombifolia*)
10.	Titoki (*Alectryon excelsus*)	Sweet orange (*Citrus sinensis*)	Canyon live oak (*Q. chrysolepis*)
11.	Blue palo verde (*Parkinsonia florida*)	Cassava (*Manihot esculenta*)	California bay laurel (*Umbellularia californica*)
12.	Tortuosa (*Salix matsudana*)		Desert fan palm (*Washingtonia filifera*)
13.	Weeping willow (*S. babylonica*)		California buckeye (*Aesculus californica*)
14.	Red willow (*S. laevigata*)		Velvet ash (*Fraxinus velutina*)
15.	Trident maple (*A. buergerianum*)		Coffee berry (*Rhamnus californica*)
16.	Japanese maple (*A. palmatum*)		
17.	Evergreen maple (*A. paxii*)		
18.	Chinese holly (*Ilex cornuta*)		
19.	Brea (*Cercidium sonorae*)		
20.	Black bean (*Castanospermum australe*)		
21.	Camellia (*Camellia semiserrata*)		
22.	Cork oak (*Q. suber*)		
23.	Red flowering gum (*Eucalyptus ficifolia*)		
24.	Engelmann oak (*Q. engelmanii*)		
25.	Palo verde (*P. aculeata*)		
26.	Sweetgum (*Liquidambar styraciflua*)		

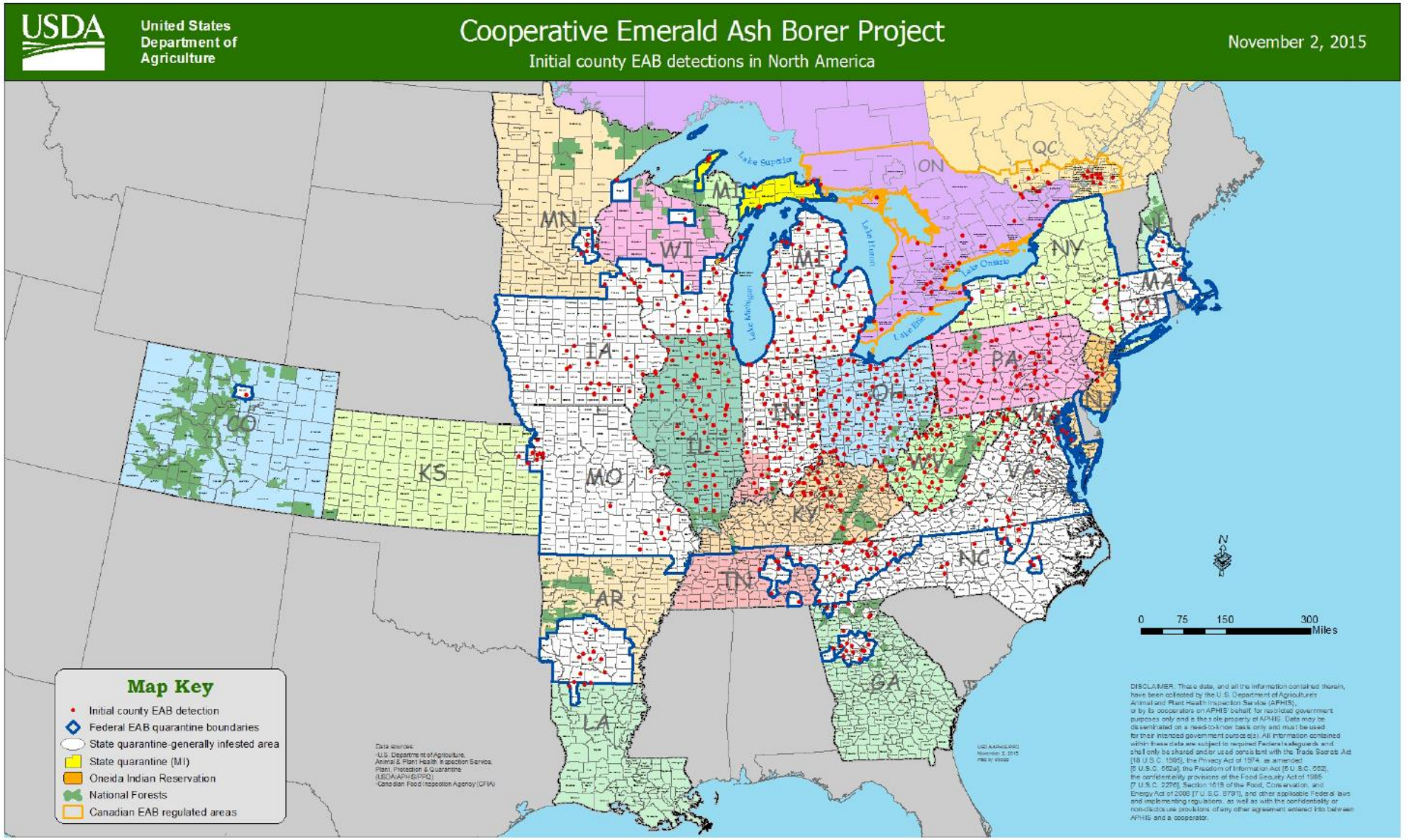
[a]For a complete list of all host species see: Eskalen et al. 2013. Plant Disease 97(7):938-951.

Exotic Pests Update

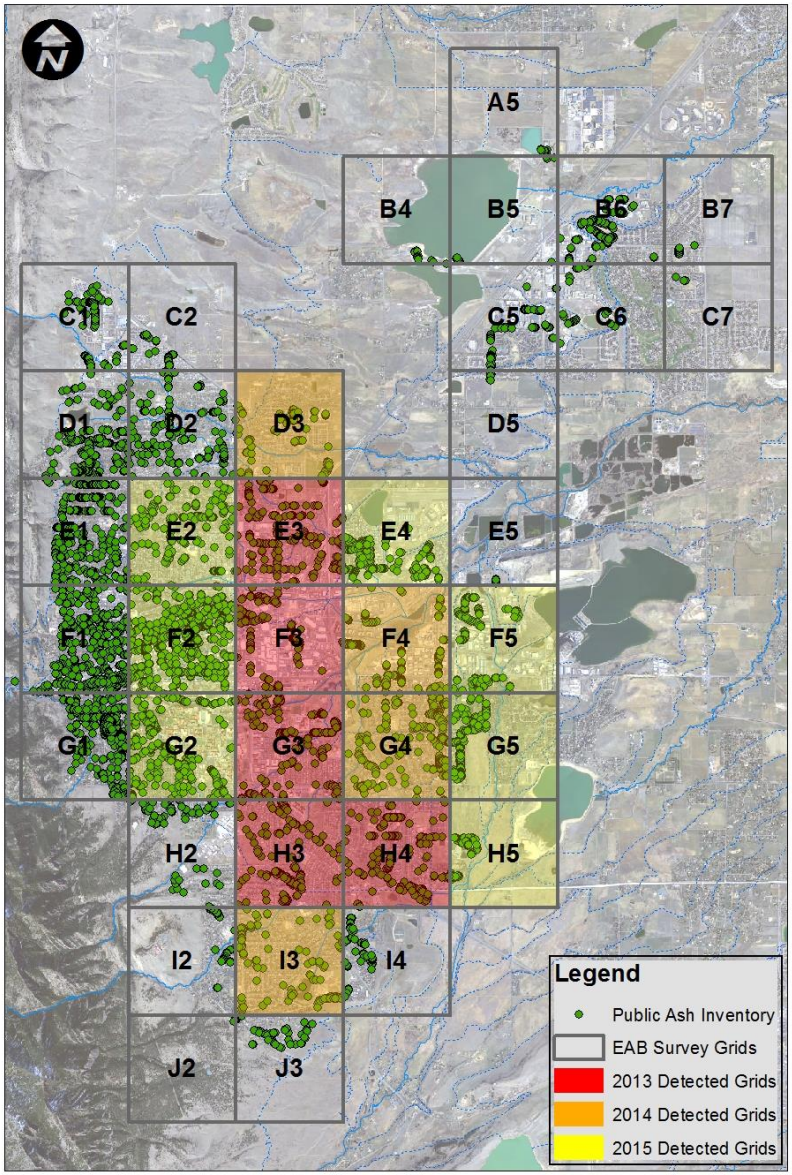
- Asian long-horned beetle
  - Confirmed in Ohio, Massachusetts, New York
  - Several Colorado look-a-likes
    - White spotted pine sawyer
    - Cottonwood borer

Emerald Ash Borer

National Detections & Quarantines



City of Boulder
Emerald Ash Borer Detection



City of Boulder, Forestry Division
5200 Pearl St
Boulder, CO 80301
Author: Kendra Nash
August 3, 2015

2015 Highlights

- Monitoring – cease monitoring end of 2015 – presumed infested
- Pesticide apps – treat 25% of public trees (approx. 6,000 public ash: treat ~1500 on a 3 year rotation so approximately 500 trees per year – most will be treated with TREE-age)
- Removals – remaining public ash will be removed as they get infested (no pre-emptive removal of healthy ash)
- Enforcement – enforcing removal of dead/dying private ash that threaten public property only (not those that only threaten other private property)

Thank You!

Questions?

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Colorado State FOREST SERVICE

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