Regional Issues Affecting Plant Pests in the Rocky Mountain States

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Mountain pine beetle – Colorado forest issue du jour

Pinyon ips – Colorado forest issue of the early 2000s

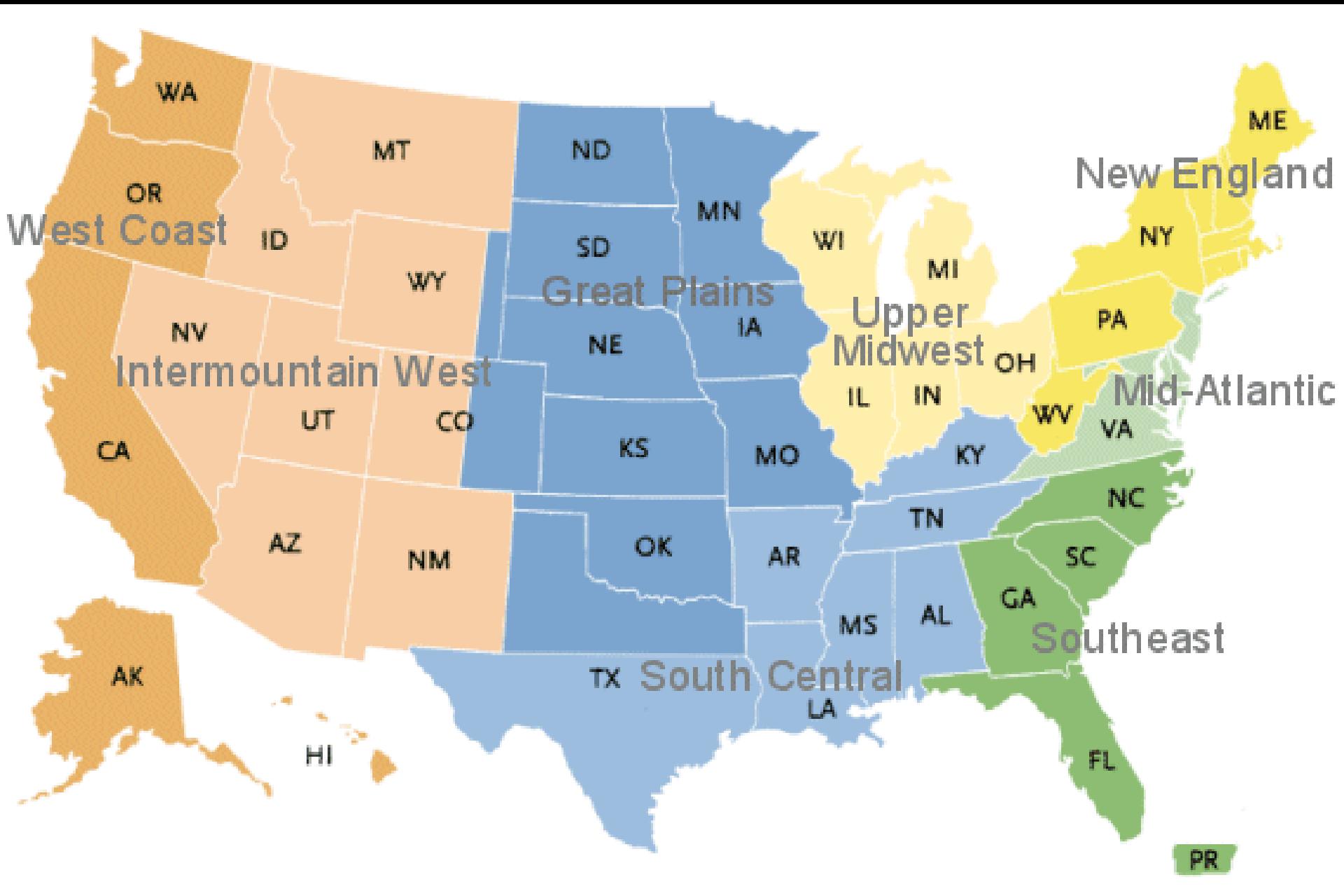
Aspen decline

Spruce bark beetle – Forest crisis of the late 1940s

White pine blister rust – invasive species threat to native 5 needled pines

Key Points affecting pests in the Rocky Mountain States

- Significant ecological/geographic isolation exists in relation to other areas of the US
  - Ecological isolation within region is also present
- Behavior of introduced species may differ within region
- Pest movement pathways have been and continue to be altered and expanded by human-assisted plant introductions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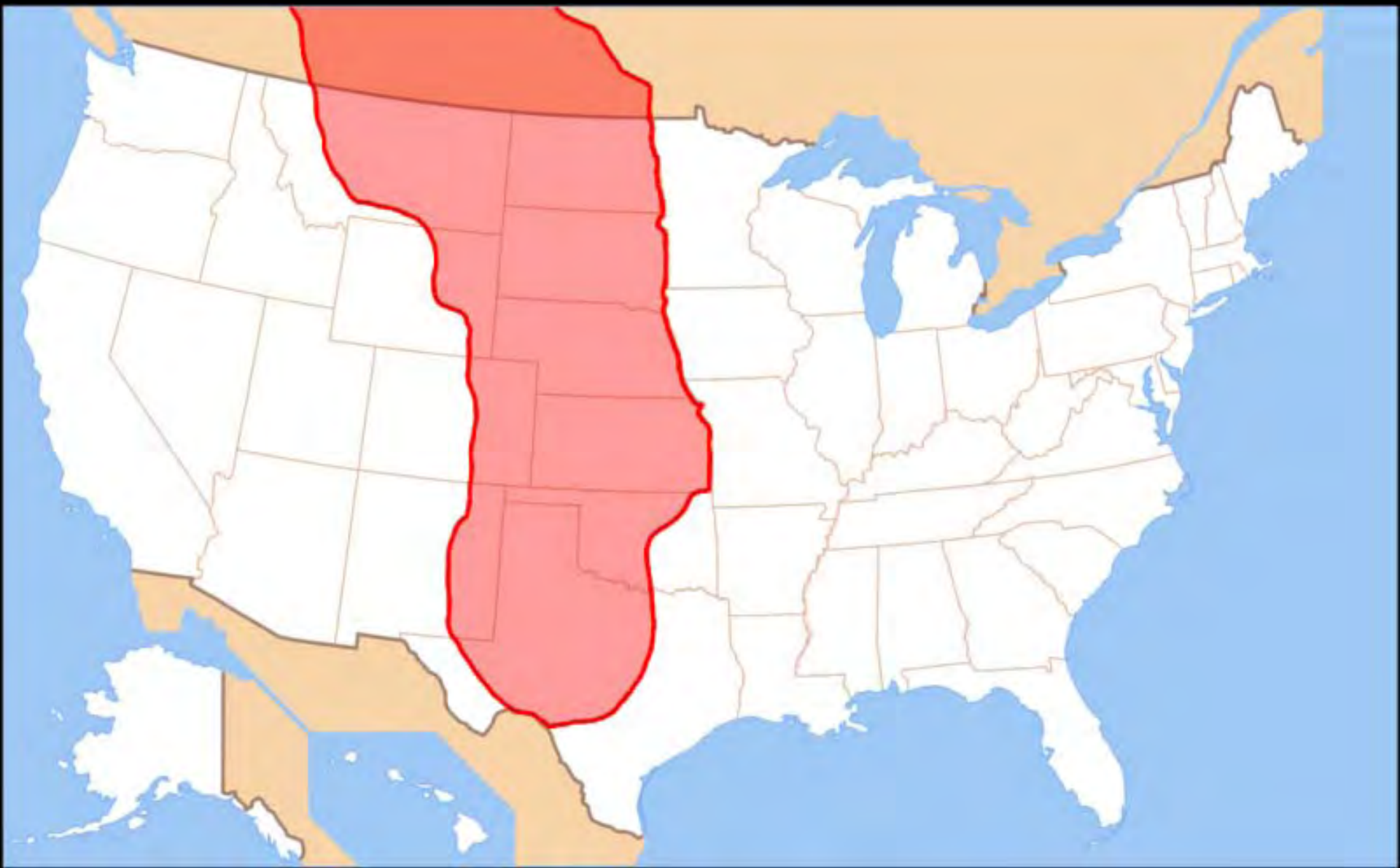
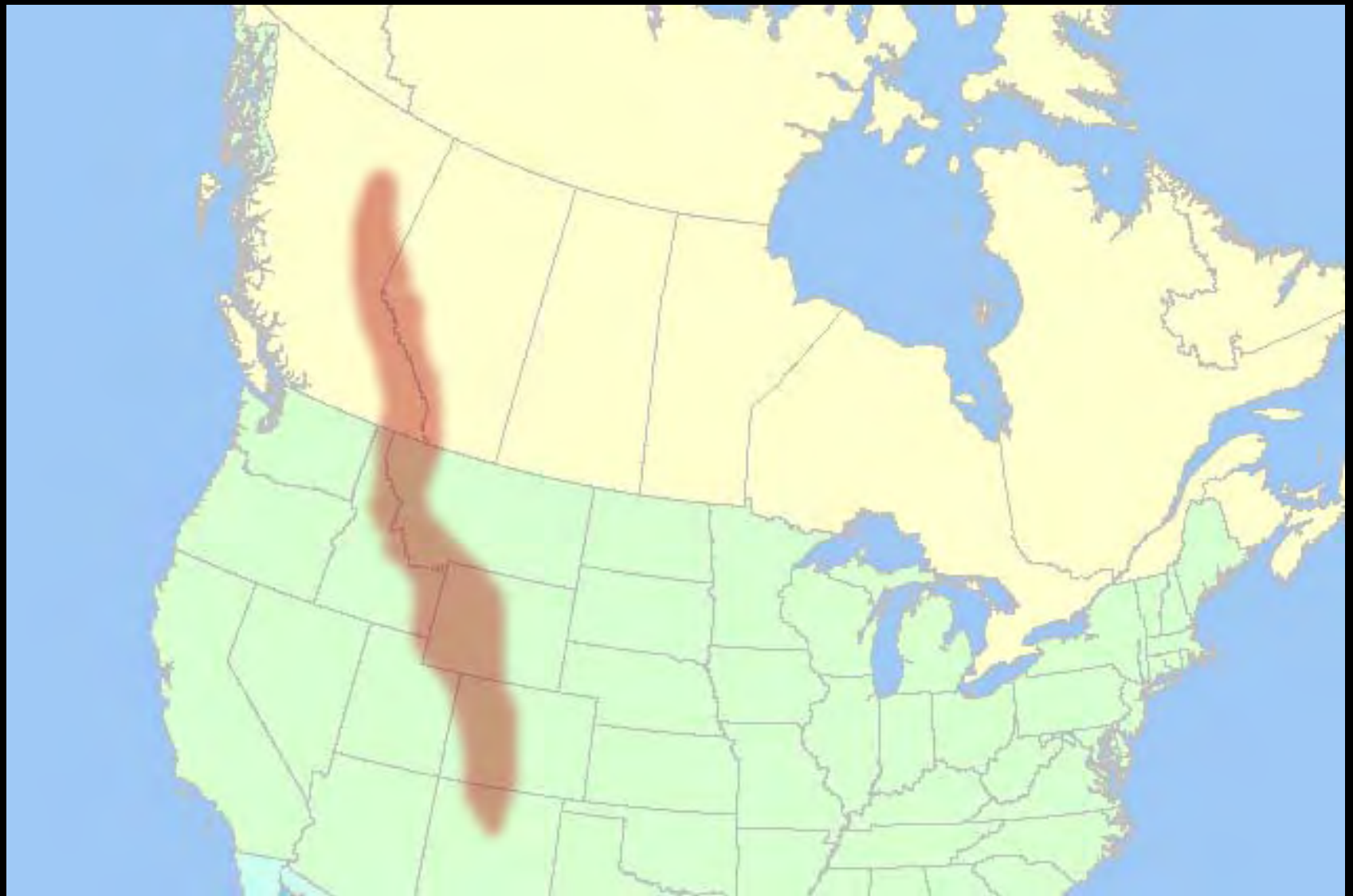
Great Plains
Upper Midwest
New England
Mid-Atlantic
Southeast
South Central

The Great Plains provide a formidable internal barrier in North America to the natural spread of many plant pests.



The Rocky Mountains provide a significant geographic barrier preventing natural spread from east-west spread of many plants and animals

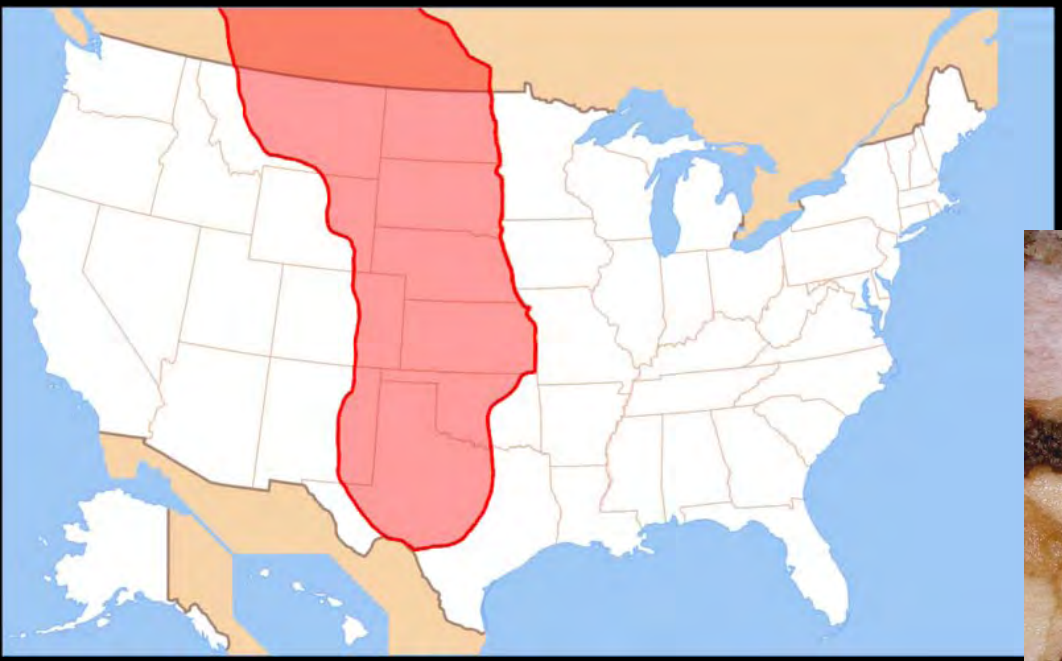



UNITED STATES
Great Plains
CENTRAL LOWLAND
PACIFIC OCEAN
The Great Plains

Emerald Ash Borer

East of the Great Plains emerald ash borer has no geographic barriers to prevent its ultimate spread throughout eastern North America

Through the Great Plains, natural spread of emerald ash borer will be greatly slowed. Natural dispersal alone my be insufficient to allow the insect to reach the Rocky Mountain region.



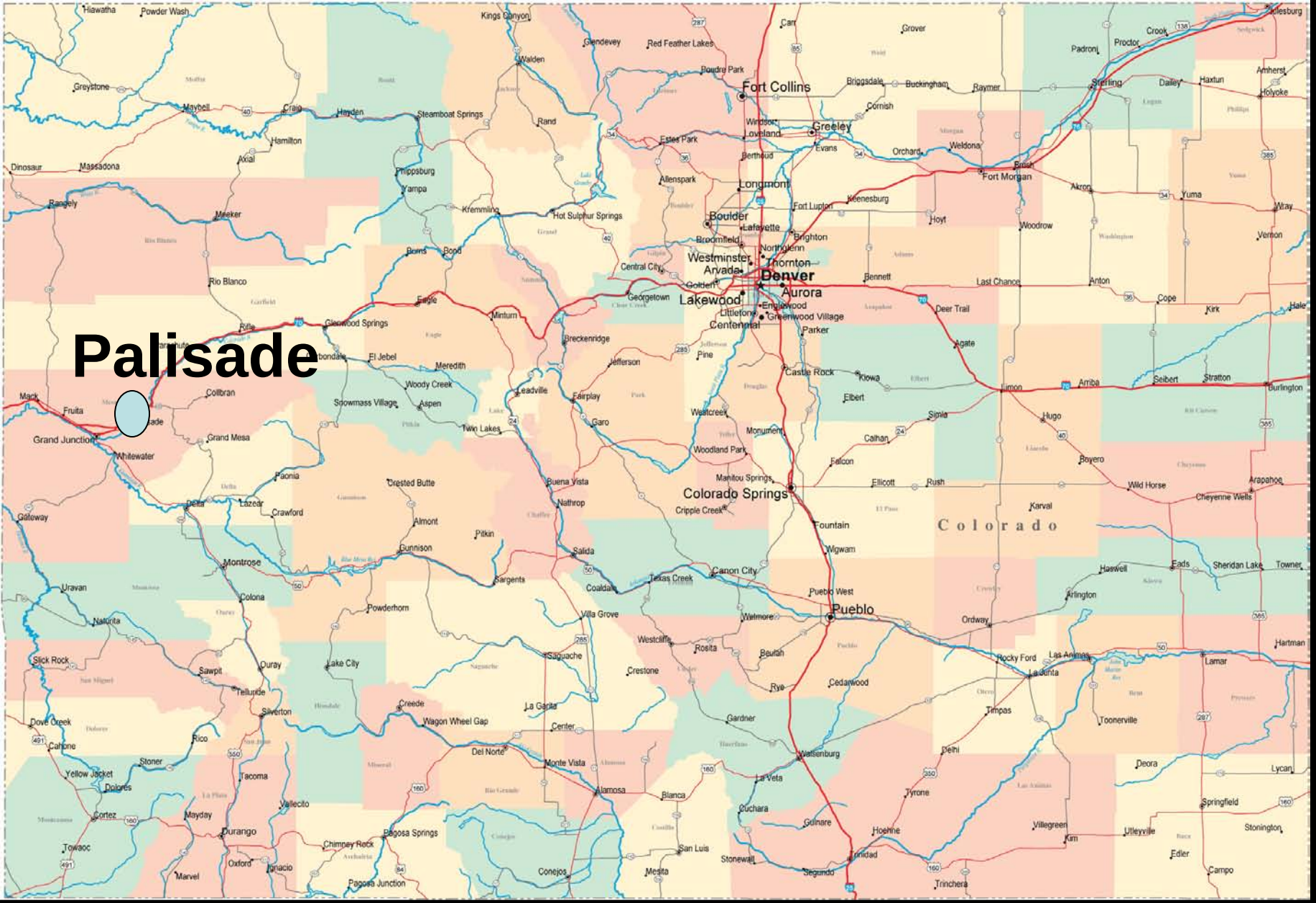
How close is EAB to the Rocky Mountain region?

One truckload away

Ecological isolation occurs within the region

This can provide opportunities for containment

Japanese Beetle in western Colorado – A story of a uniquely successful eradication



Palisade, CO – Only site where Japanese beetle became established on the West Slope

JB Eradication in Palisade

- Involved a relatively isolated population
  - Potential to spread to regional fruit crops a big concern
  - Impact on regional commodity exports a big concern
- Eradication efforts coordinated with widespread community cooperation
- Eradication successful with a decade-long effort

JB Eradication in Palisade

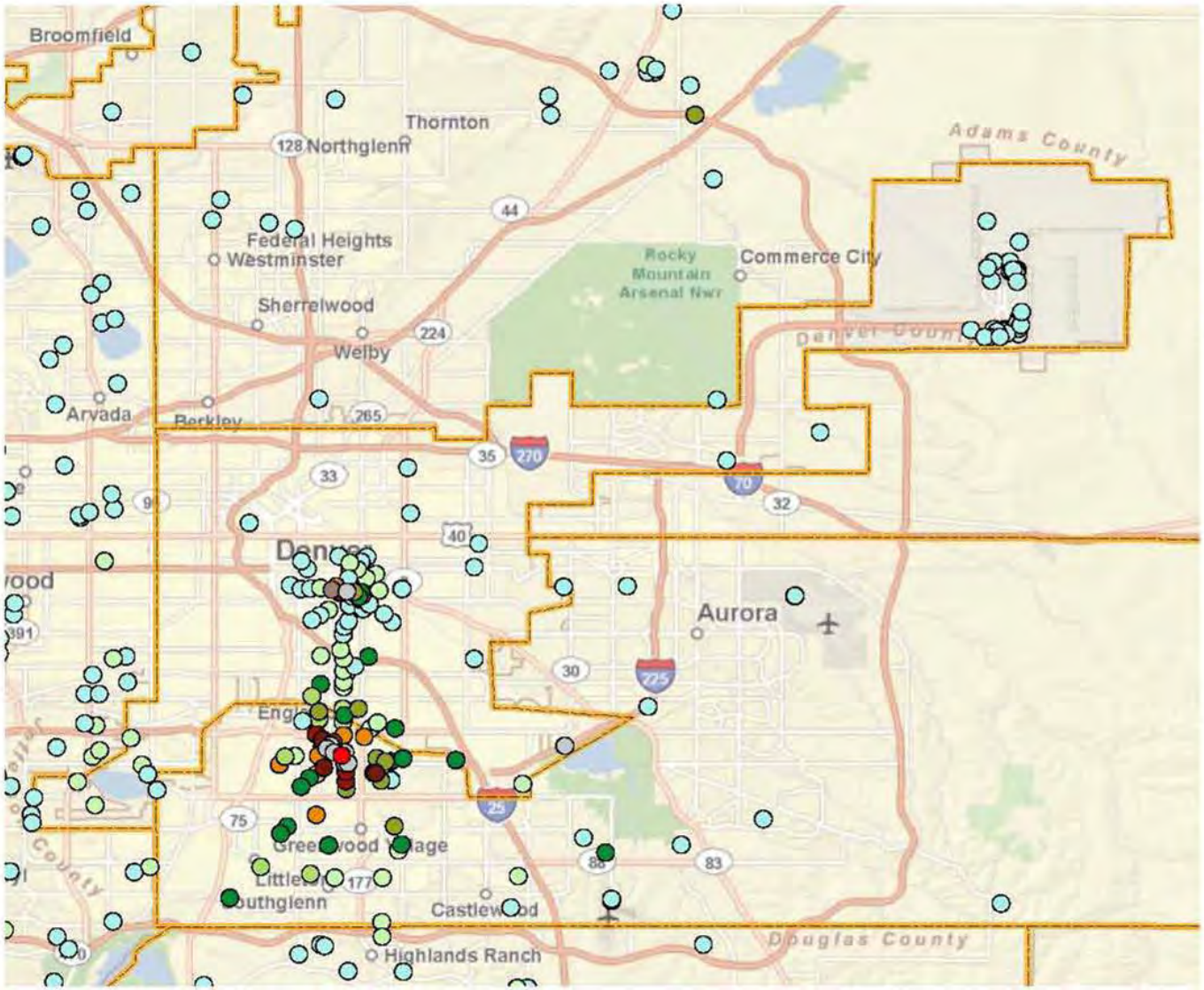
- Mass trapping
- Area-wide treatment of lawns for larval control
- Promoted reduced irrigation during critical period of egg hatch/early larval stages

Japanese Beetle in Colorado

USDA
United States Department of Agriculture

Colorado Japanese Beetle Counts 2008
DRAFT Data not QCed 100% - Grid Denver County

Animal and Plant Health Inspection Service



Japanese Beetle Trap
Total Count

- 0
- 1 - 9
- 10 - 20
- 21 - 50
- 51 - 99
- 100 - 200
- 201 - 300
- 301 - 500
- 501 - 1,000
- 1,001 - 2,000
- 2,001 - 5,000
- 5,001 +
- County Boundary

N

Miles
0 1 2

USDA APHIS PPQ
3950 N Lewiston Street, Suite 330
Aurora CO 80011

Coordinate System: WGS 84
Geographic

Data Sources: APHIS, National Atlas, and ESRI.

File Path: D:\GIS_Projects\2008_June_forward\JBCO\MapFiles\MXD\Traps\Nov4thMeeting\CO_JB_Traps_2008_atlas_Counties_110308.mxd, Computer: COAUPQDAHOFER, Date: November 3, 2008 12:50:28 PM

Dutch elm disease in the Rocky Mountain states – **A success story of containment**

St. Paul, MN – before Dutch elm disease

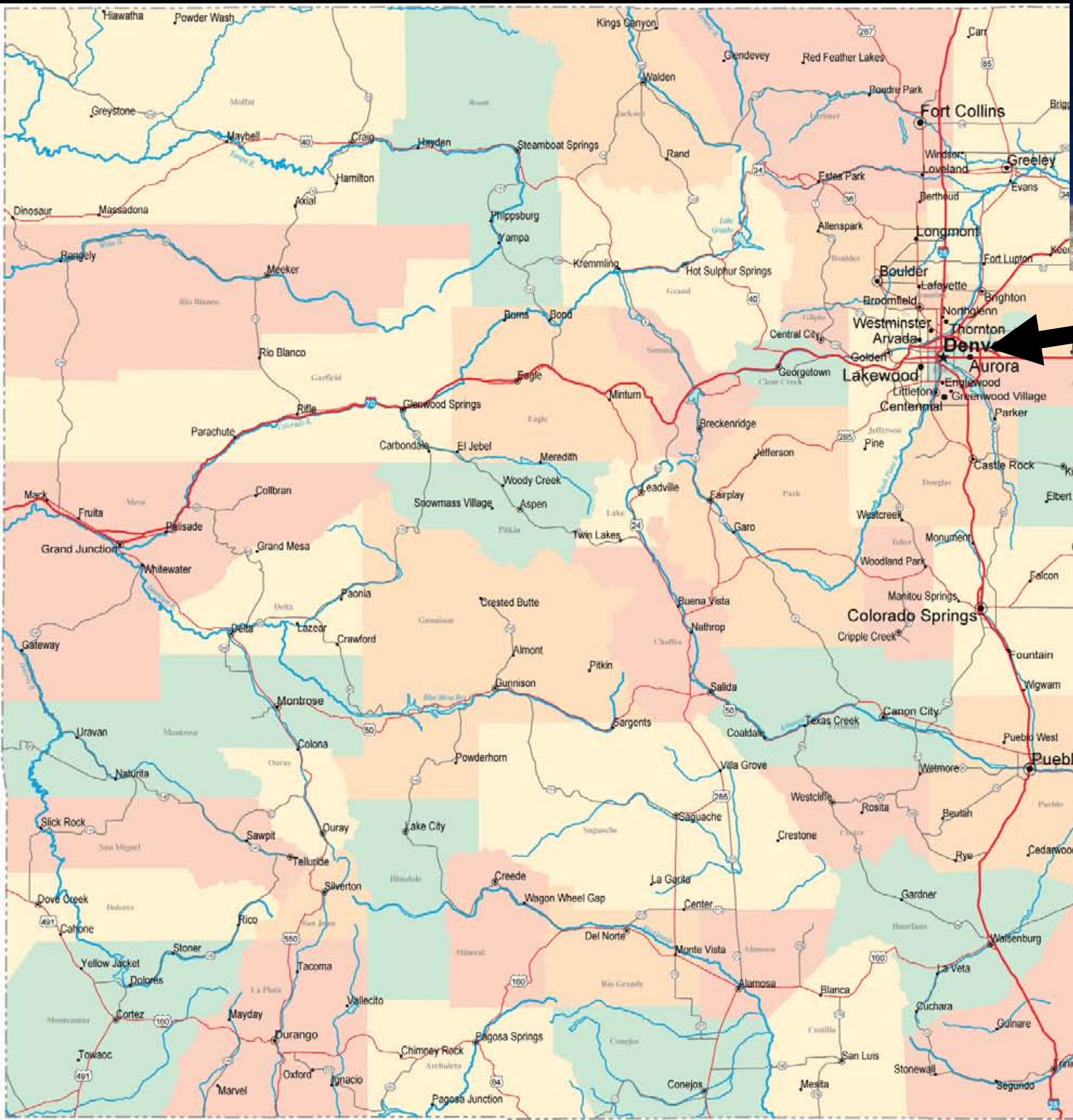
Such American elm stands still exist in many Colorado communities

Key to DED Management –
Early detection/prompt eradication of infested trees

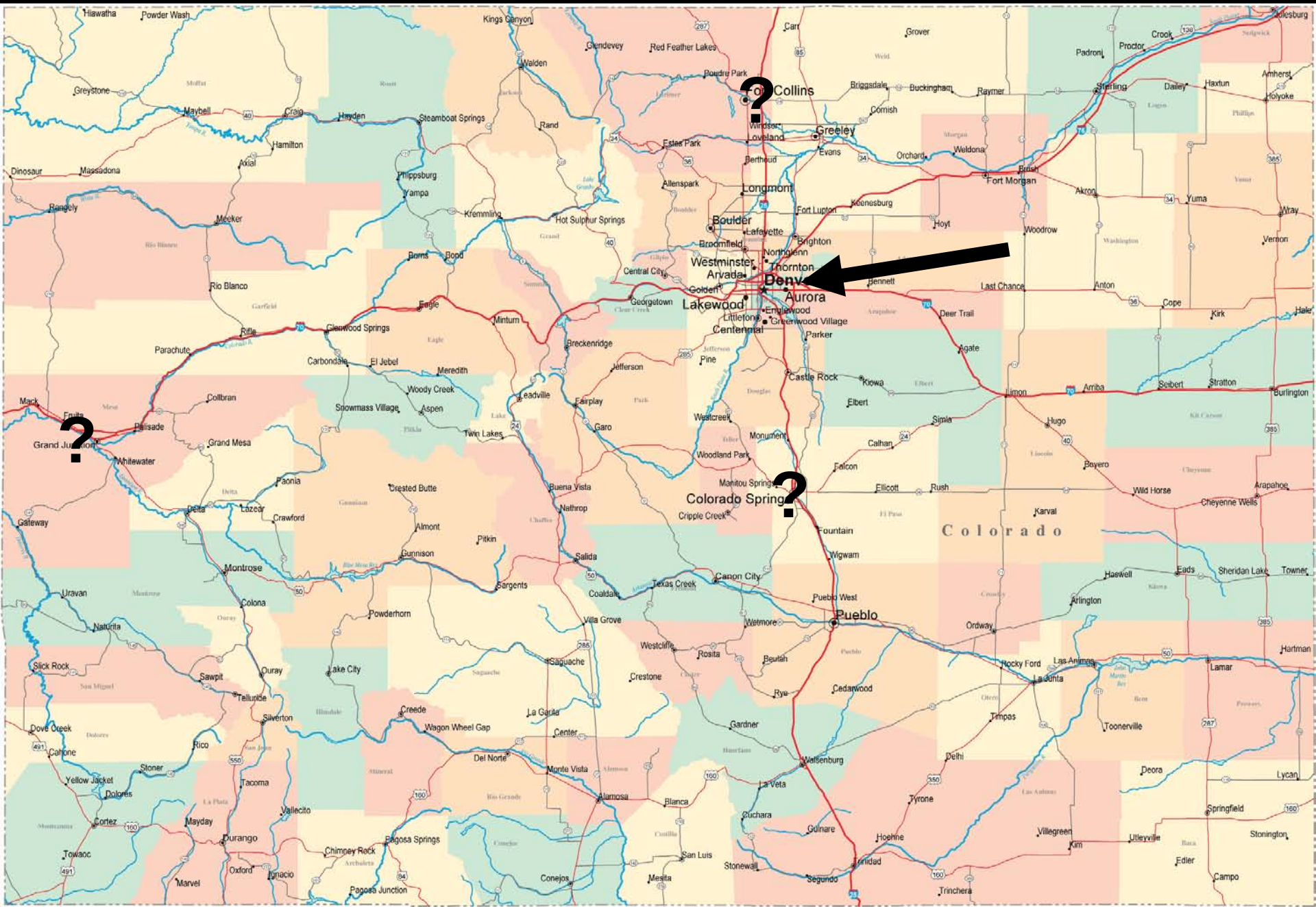
Why DED management can be so successful – lack of untreated reservoirs of the pathogen

Uninterrupted stands of *Fraxinus* in eastern North America allow unrestricted opportunity of EAB spread

Hypothetical – EAB establishes in Denver



Hypothetical – EAB establishes in Denver

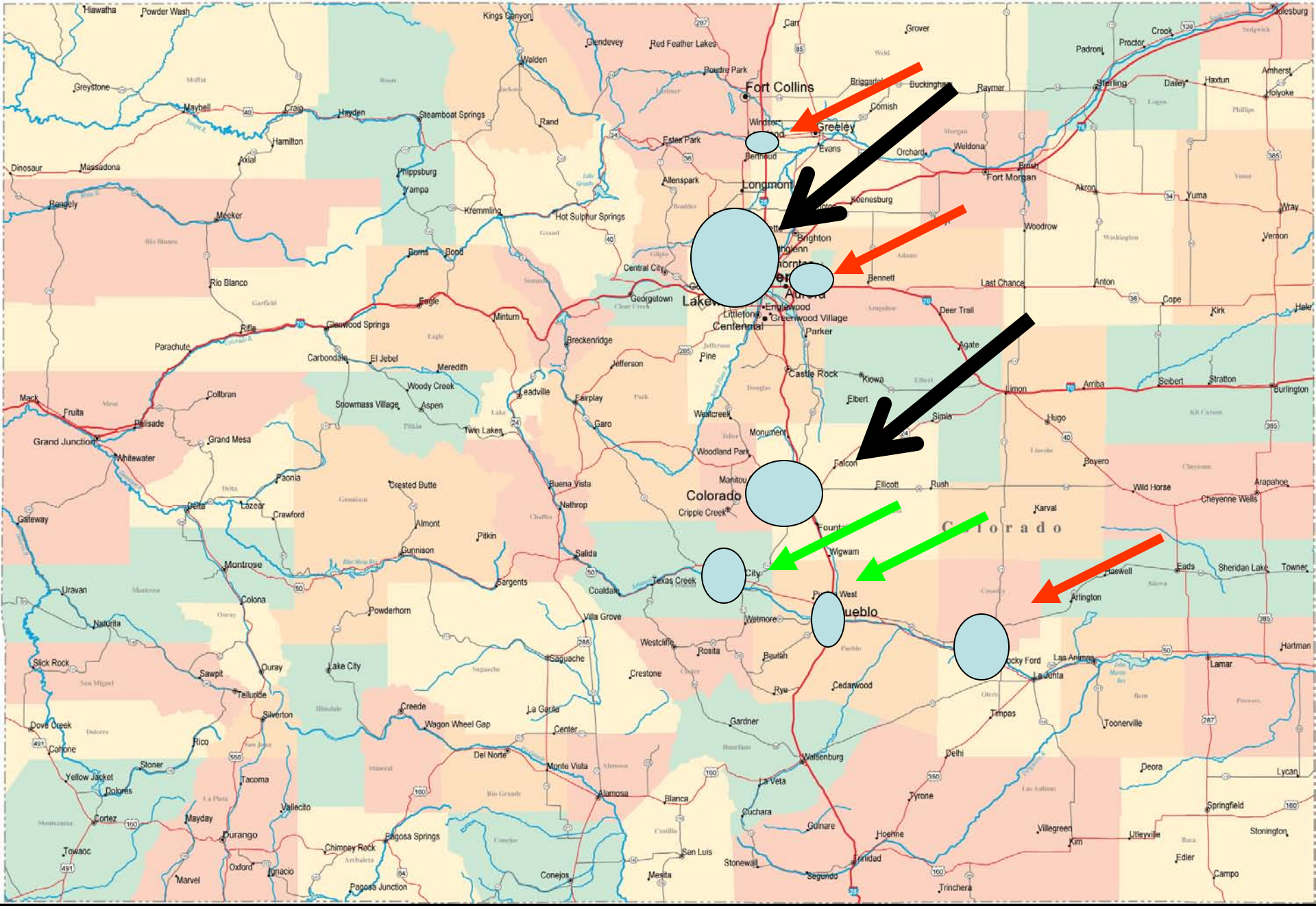


How close is EAB to Fort Collins or Grand Junction or Colorado Springs – after introduction into Denver?

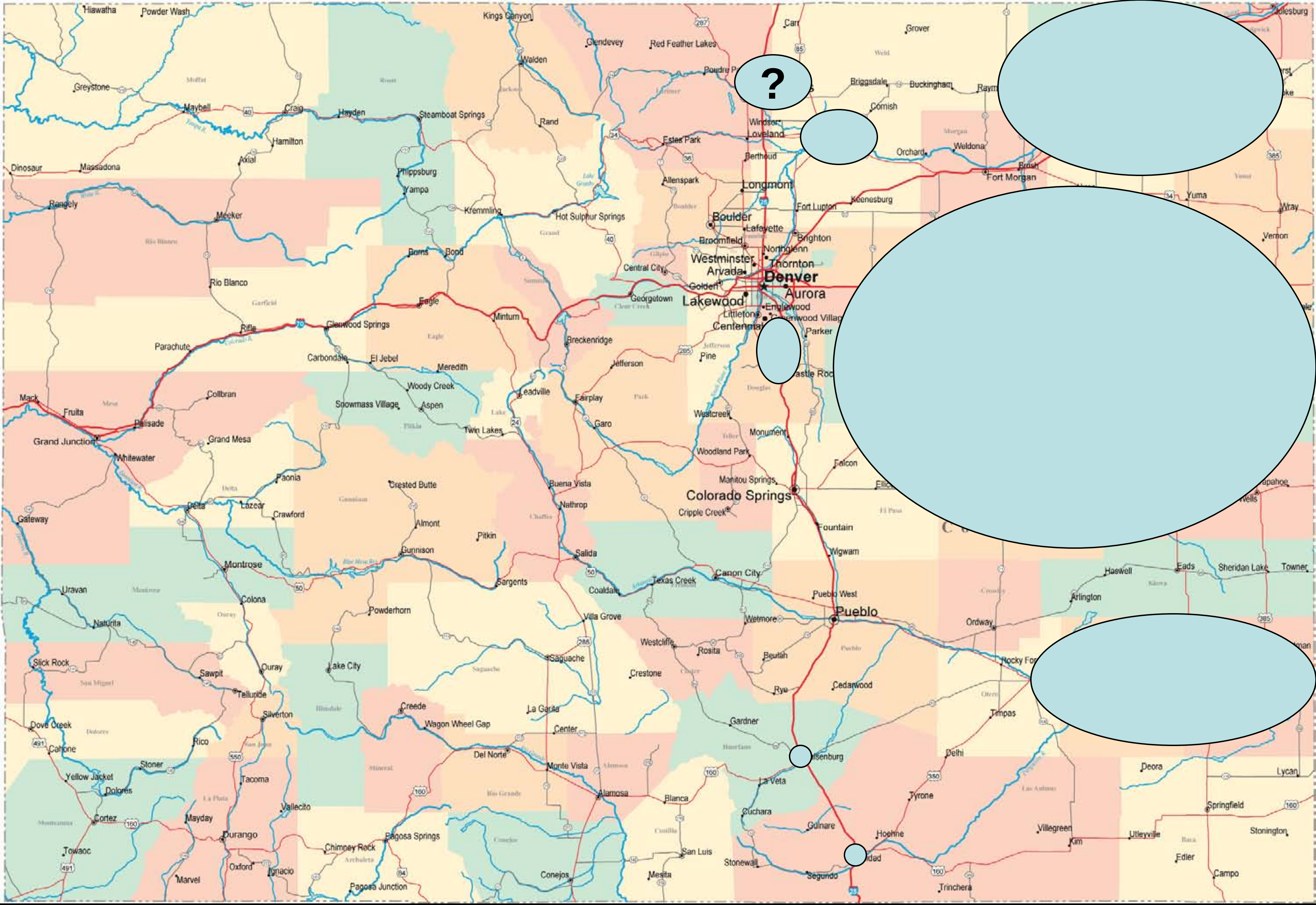
One truckload away

Thousand Cankers Disease (TCD)

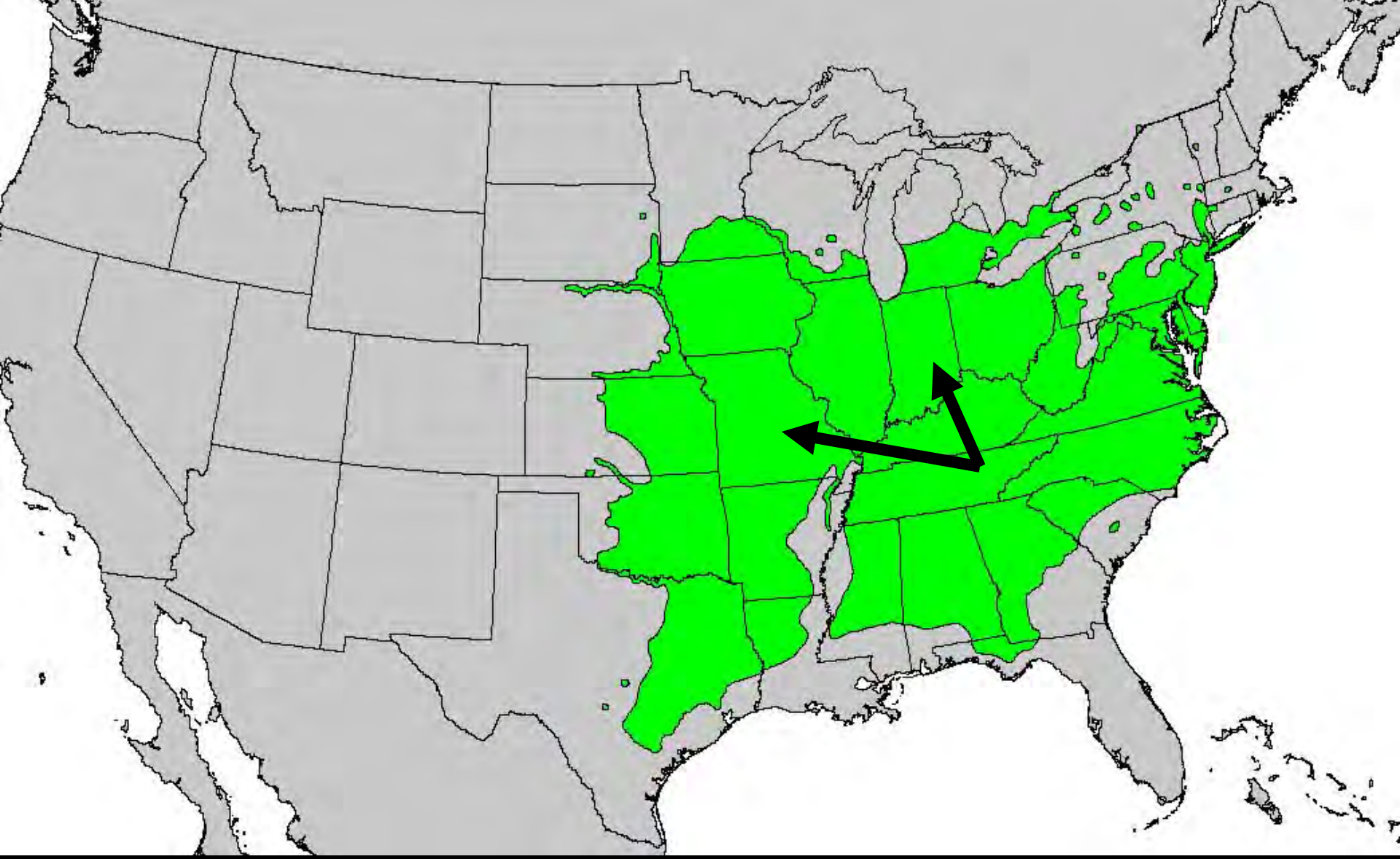
– An Insect/Fungal Disease Complex affecting some *Juglans* spp.



Thousand Cankers Colorado “hot spots” - 2011

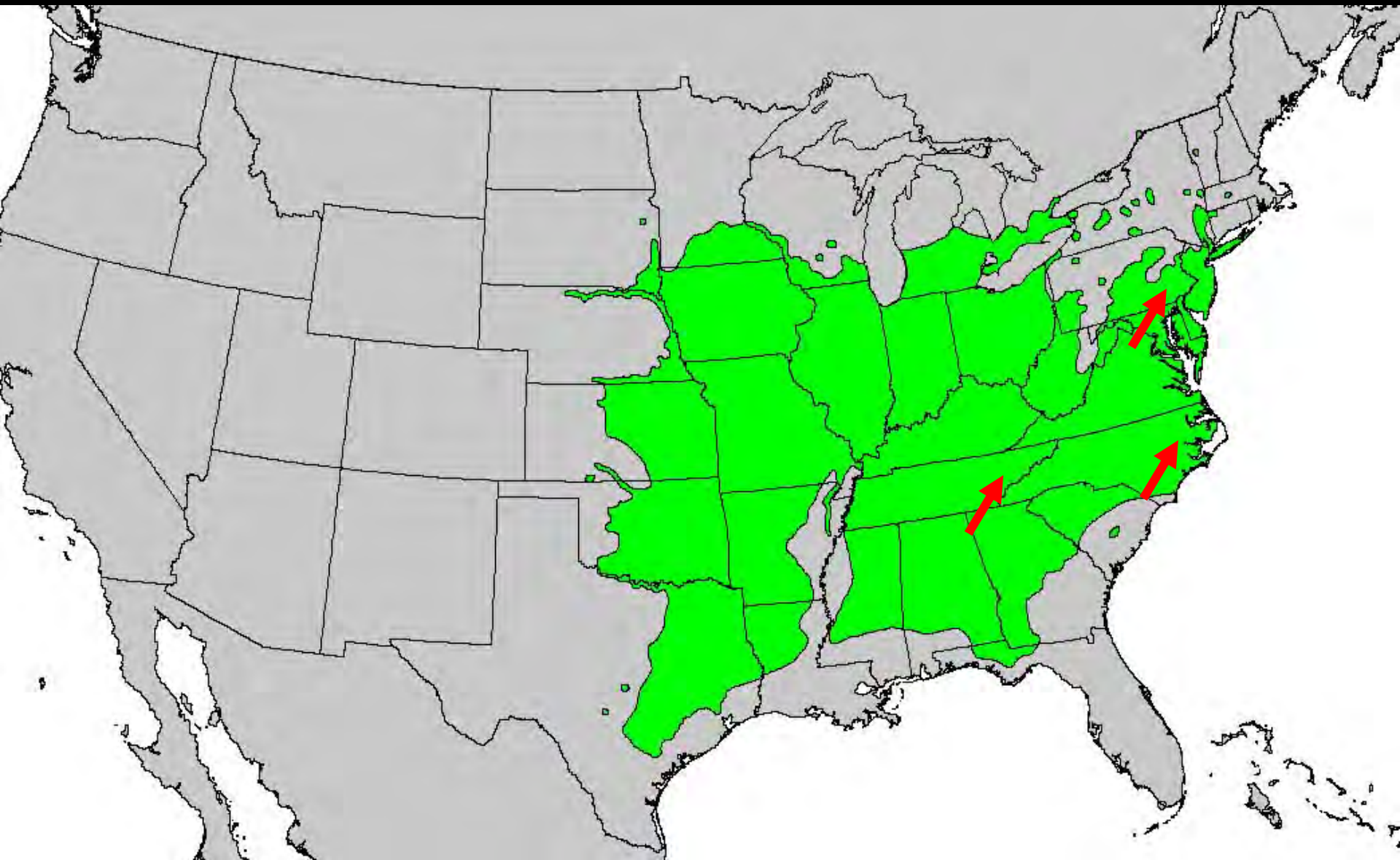


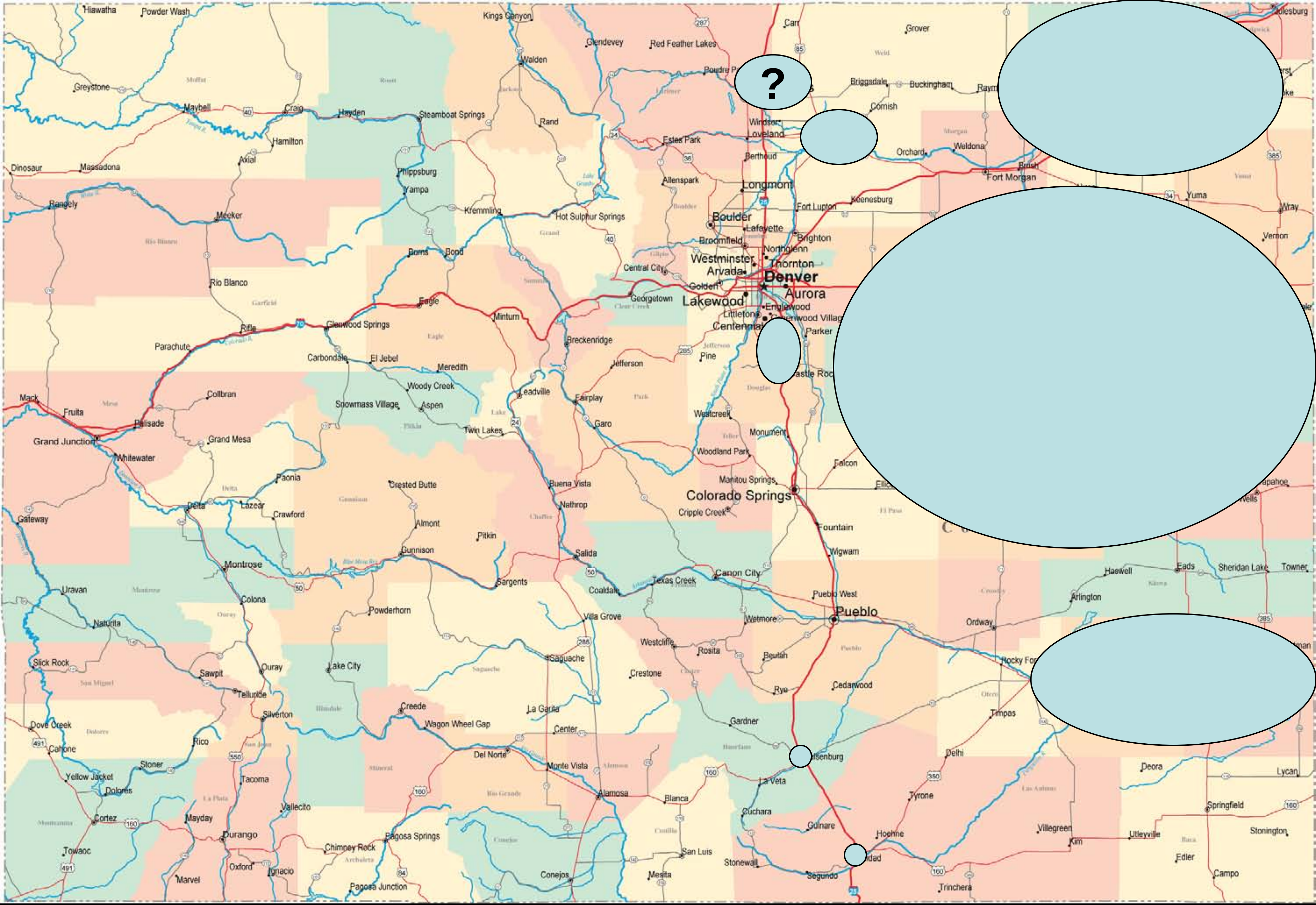
Thousand Cankers NOT spots - 2011



Thousand cankers is now within the native range of black walnut

2011 TCD Spread – Add Richmond, VA and Bucks County, PA





Thousand Cankers NOT spots - 2011

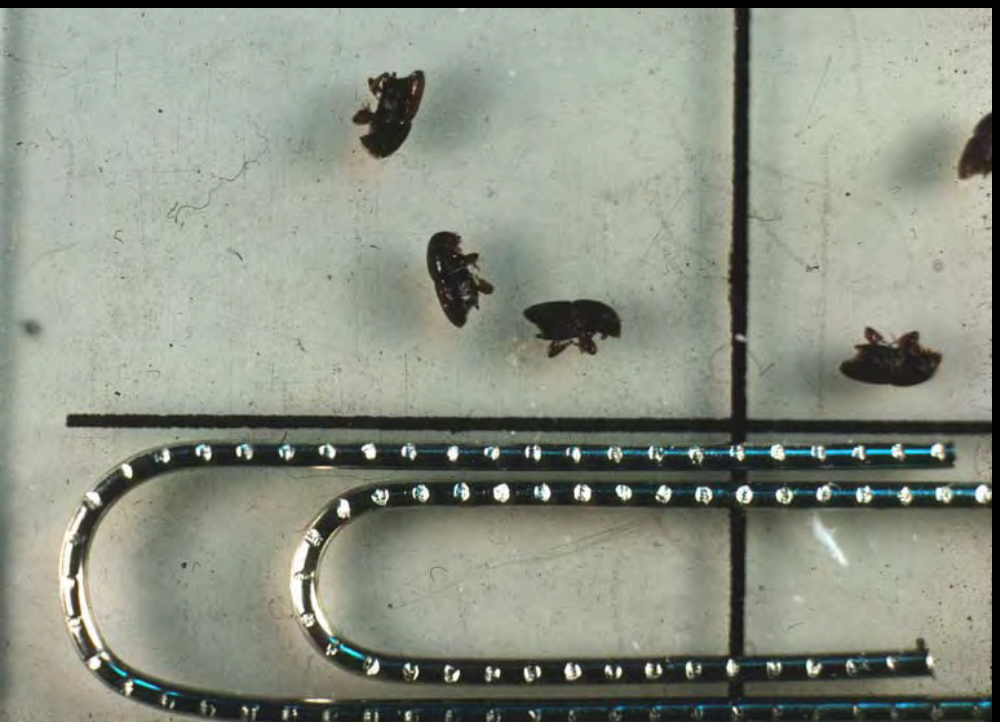
Behavior of introduced species in the Western States may differ due to climate, regional ecology

Elm bark beetle hand-off

Smaller European elm bark beetle

Scolytus multistriatus

SEEBB



Banded elm bark beetle,
Scolytus schevyrewii

BEBB

Most behaviors and aspects of life history of the BEBB are similar to SEEBB

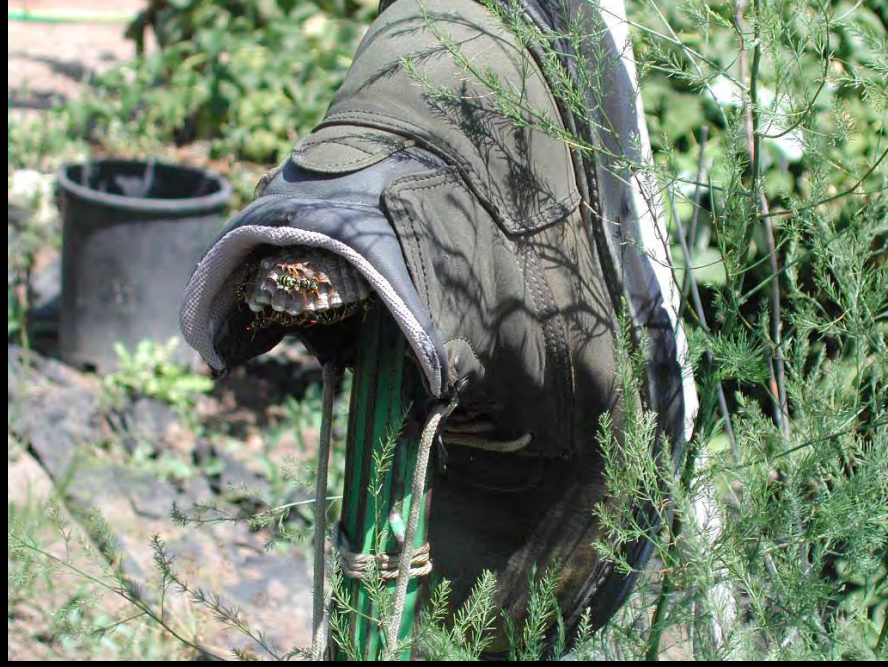
Banded elm bark beetle vs. Smaller European elm bark beetle

- **Both species occupy same ecological niche**
- **BEBB spring emergence is ahead of SEEBB**
- **BEBB summer generation is ahead of SEEBB**
- ***Banded elm bark beetle wins!***

European Elm Flea Weevil

Became regionally dominant within 3 years of introduction

Elm leaf beetle –
Formerly dominant, presently very rare



European Paper Wasp

Polistes dominula

Established in Colorado ca 1998 (west) – 2001 (east)

Focus on Japanese beetle – are we missing bigger potential threats?

European Chafer – Greatest potential threat to Colorado turfgrass??

Larvae thrive on dry sites – JB limited to moist areas

European chafer grubs also may damage roots of trees and shrubs

How close is European chafer to the Rocky Mountain region?

One truckload away

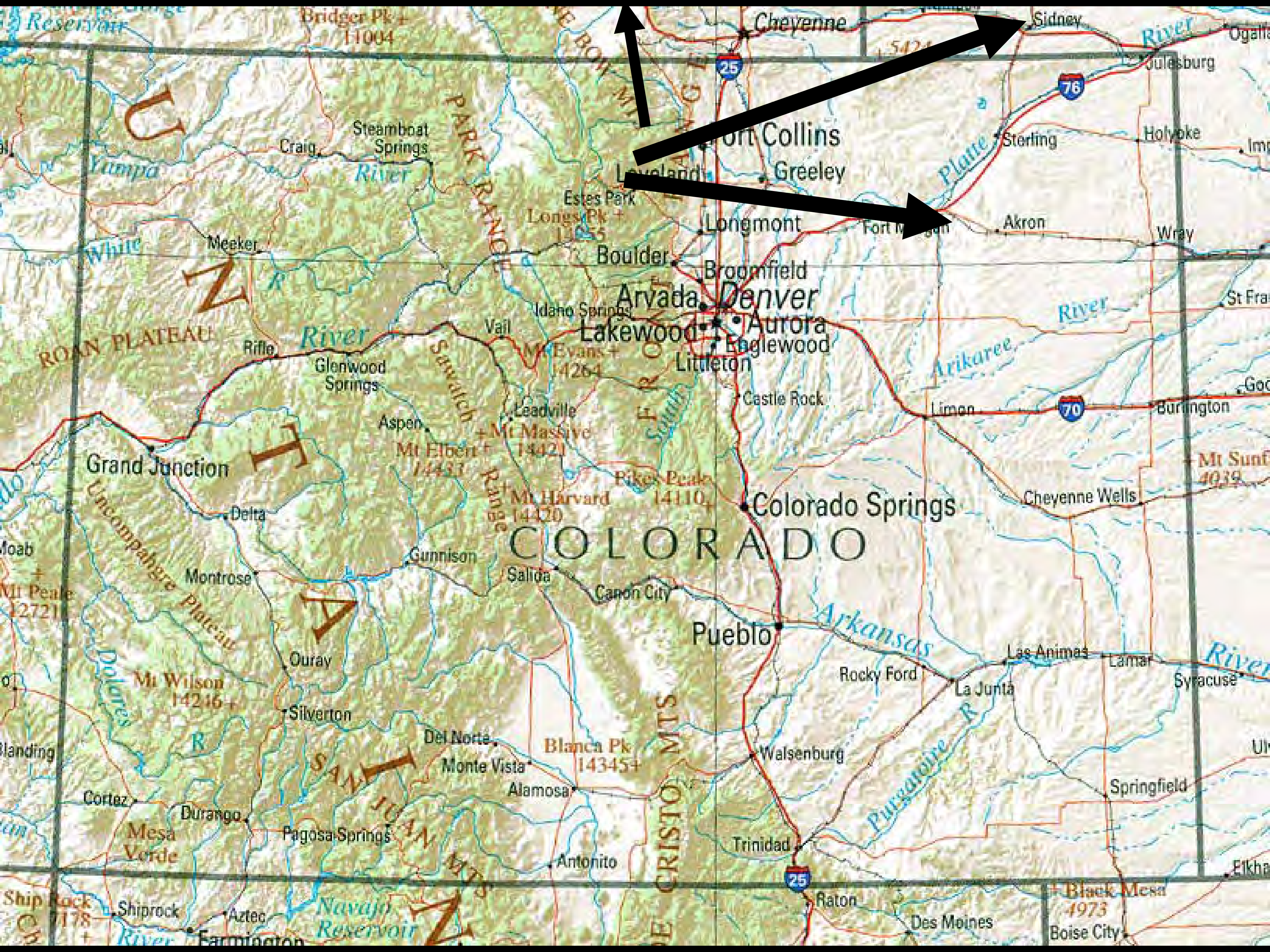
Mountain Pine Beetle

Mountain Pine Beetle

Dendroctonus ponderosae

Mountain pine beetle blow-out

August 2008:
Mountain pine beetle blowout colonizes a swath of NE Colorado!



COLORADO
Cheyenne
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Julesburg
Fort Collins
Greeley
Loveland
Sterling
Holyoke
Estes Park
Longs Pk
Longmont
Fort Morgan
Akron
Wray
Boulder
Broomfield
Arvada
Denver
Aurora
Lakewood
Englewood
Littleton
Castle Rock
Limon
Burlington
Colorado Springs
Pikes Peak
14110
Cheyenne Wells
Pueblo
Canon City
Salida
Gunnison
Rocky Ford
La Junta
Las Animas
Lamar
Syracuse
Walsenburg
Springfield
Trinidad
Raton
Des Moines
Boise City
Black Mesa
4973
Steamboat Springs
Craig
Meeker
Rifle
Glenwood Springs
Vail
Idaho Springs
Mt Evans
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Leadville
Aspen
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Mt Harvard
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Delta
Montrose
Ouray
Silverton
Mt Wilson
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Cortez
Durango
Mesa Verde
Pagosa Springs
Del Norte
Monte Vista
Alamosa
Antonito
Blanca Pk
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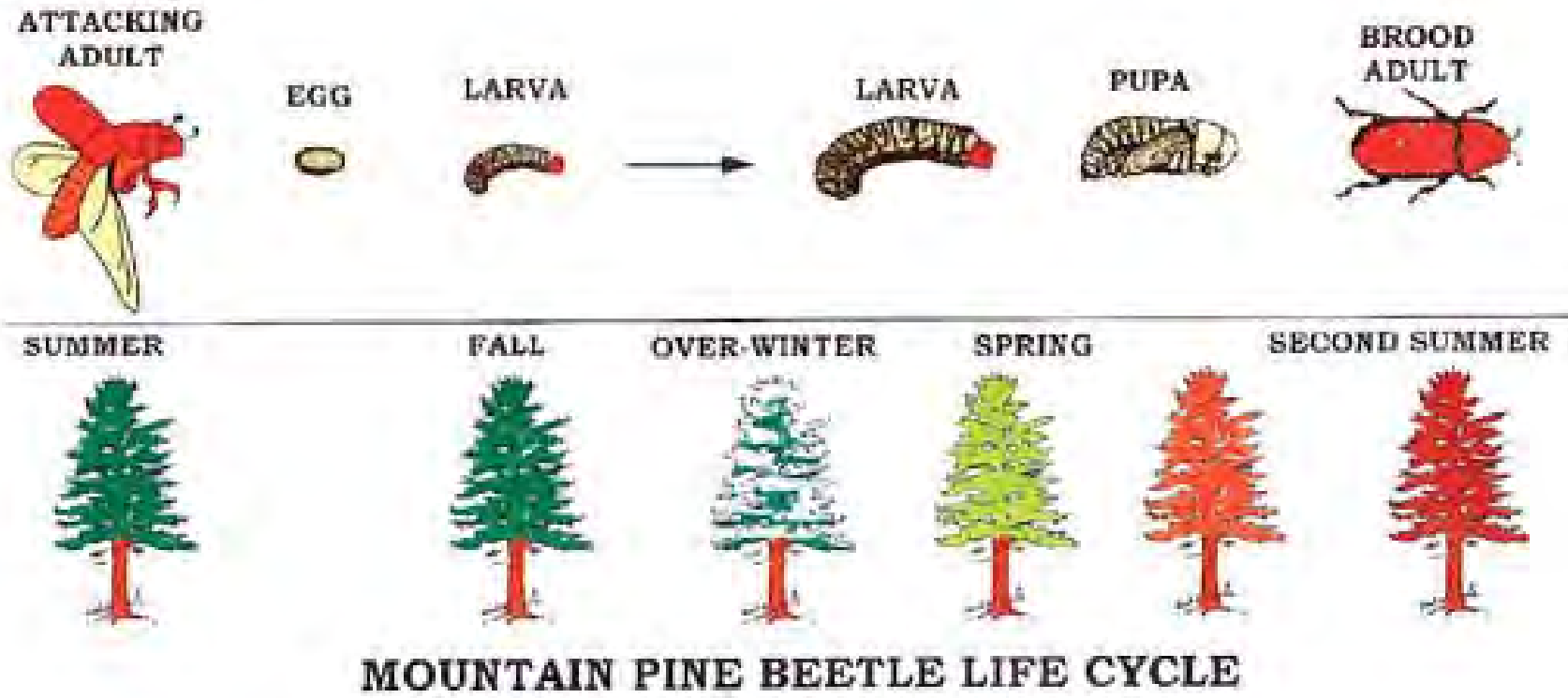
Shiprock
Aztec
Farmington
Navajo Reservoir
Ship Rock
7178
Moab
Mt Peale
12721
Bridger Pk
11004
ROAN PLATEAU
Uncompahgre Plateau
PARK RANGE
Sawatch Range
SAN JUAN MTS
UTAH
Yampa River
White R
River
Platte
Arikaree
Arkansas
Purgatoire R
Dolores R
Mt Sunflower
4039

Scots pine were highly preferred. The majority of attacks occurred on this species.

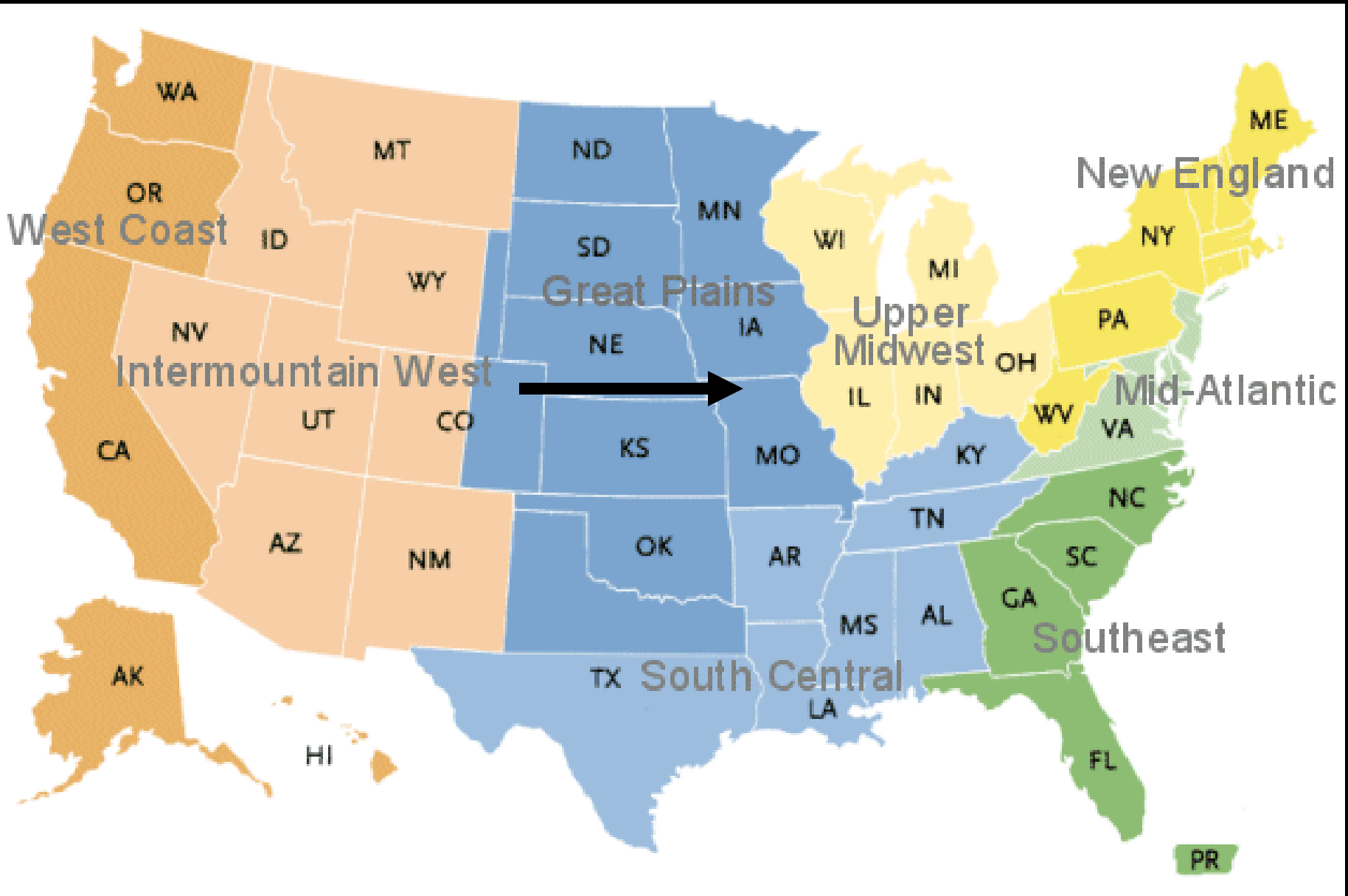
Mountain Pine Beetle Life History at Lower Elevations

Acceleration of development?



(USFS)

Do plantings of pine on the Great Plains now allow spread of MPB to the east?



Summary Points

- **The Great Plains and Great Basin provide significant ecological barriers to natural spread of pests into (and out of) the Rocky Mountain region**
  - **These natural barriers should be utilized as a means to retard introductions of pest species**

Summary Points

- **Internal geographic barriers within the Rocky Mountain region may help to isolate introductions of pest species**
  - **Containment strategies of introduced pests can have increased chance of success where isolation is present**

Summary Points

- **Effects of introduced species into the Rocky Mountain region may differ substantially from effects of the species in other regions**
  - **Regional climate and ecological differences make prediction of potential pests difficult**

Summary Points

- **Human introductions of plant materials have provided major new pathways for establishment and spread of pest species**
  - **Creation of corridors for pest movement should be considered when introducing new plant species into areas**

The Rocky Mountain West

A region of unique pest concerns and unique pest management possibilities