High Elevation Five-Needle pine forests of the Southern Sierra Mountains

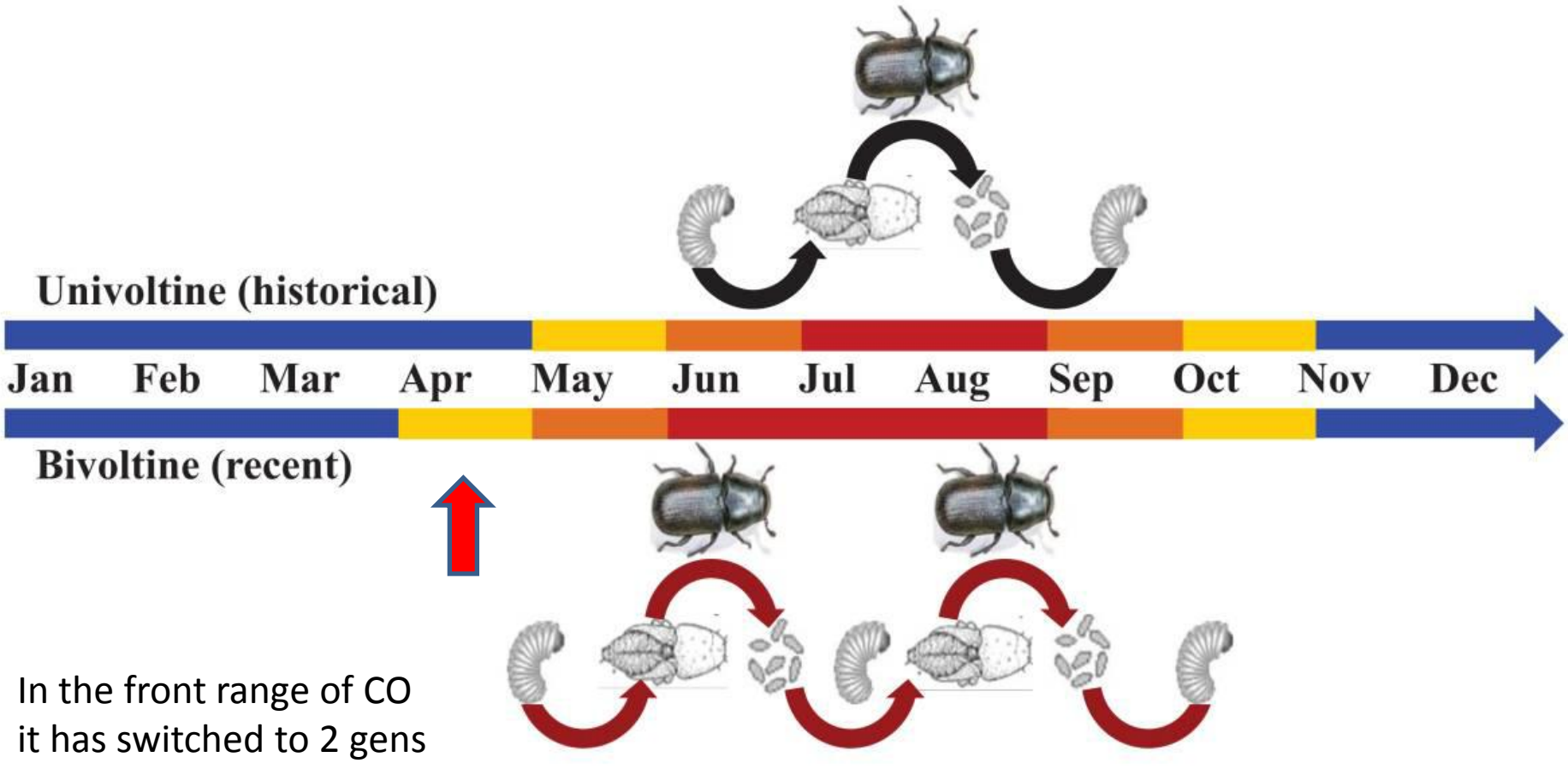
aka the high –five group

The thin red line is WBP killed by MPB (the number one stressor),

If it can do this amount of damage with todays level of changed climate what will it do with tomorrows cc ?

Hilton Lakes Inyo NF

Traditionally MPB has 1 generation per year?



In the front range of CO it has switched to 2 gens per year

Mitton & Ferrenberg (2012)

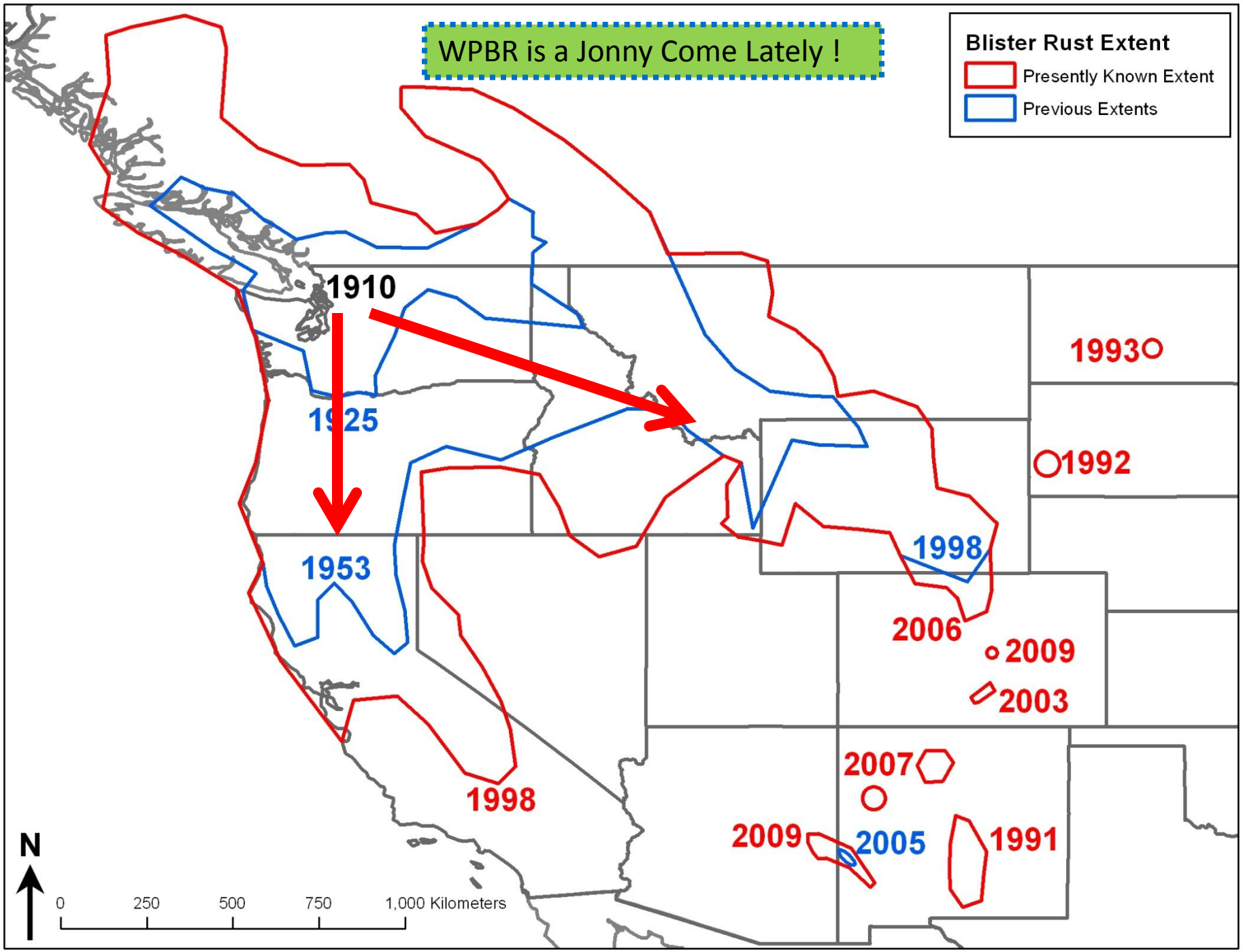
WBP's Californian High-5 Pine Hosts for the # 2 stressor, WPBR.

Western White

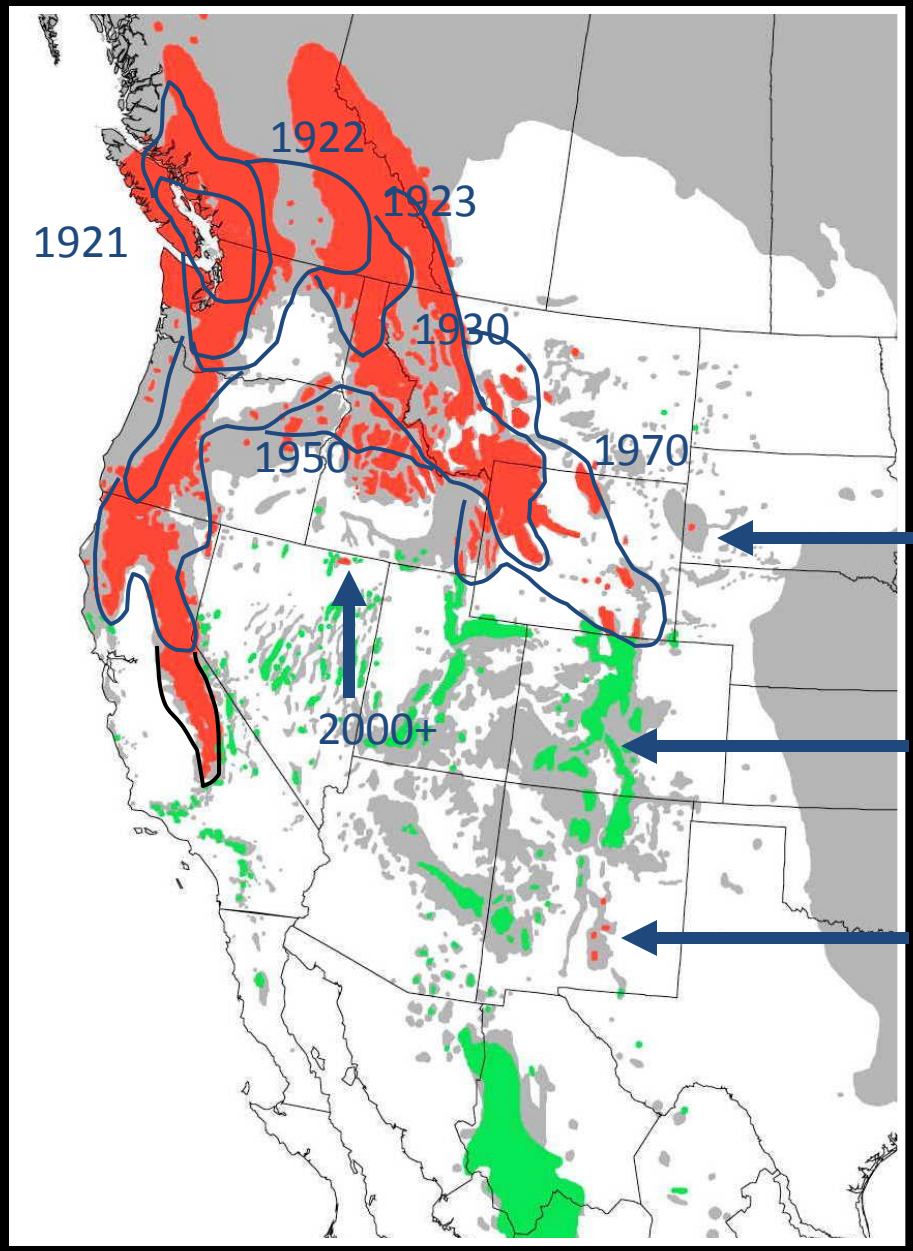
Whitebark

Foxtail

Excluded are sugar and bristlecone


WPBR is a Jonny Come Lately !
Blister Rust Extent
Presently Known Extent
Previous Extents
1910
1925
1953
1998
1993
1992
1998
2006
2009
2003
2007
2009
2005
1991
N
0
250
500
750
1,000 Kilometers

Western North American spread



Dates of detection
Distribution by
Eric Smith, 2003

2000+

2004- Bristlecone pine

1998 southwestern
white pine

June Mountain Inyo NF

When MPB finishes with the WBP, it dines on the Lodgepole

But all is not lost !

Height 23 inches

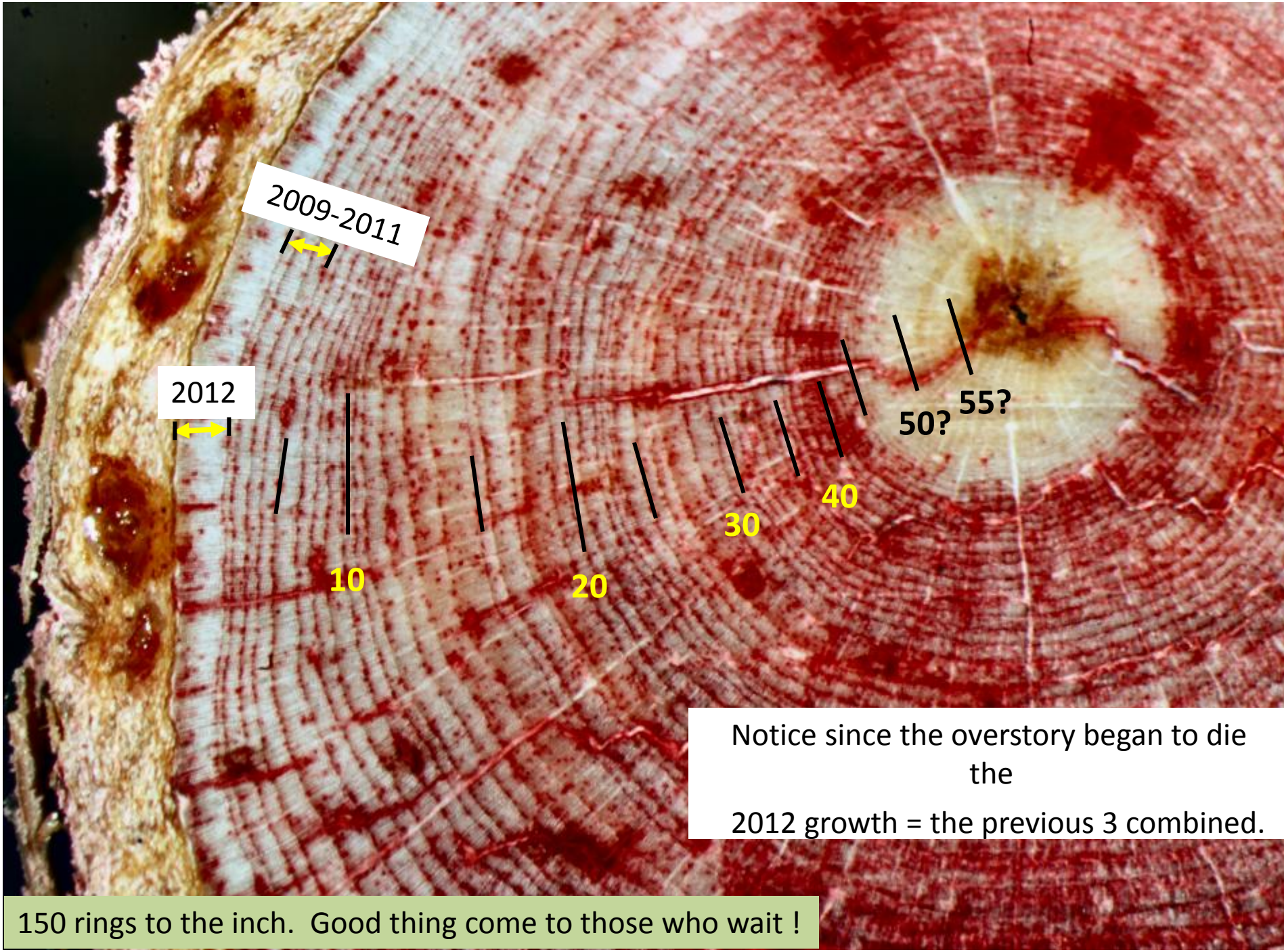
Span 21 inches

Number of stems in cluster 2

Largest diameter 0.79 in.

55 years to make 2 ft.

100+ to make B.H. ?


2009-2011
2012
10
20
30
40
50?
55?
Notice since the overstory began to die the
2012 growth = the previous 3 combined.
150 rings to the inch. Good thing come to those who wait !

Mrs. Clark, the mascot of the Sierra Whitebark Pine Foundations

If you wish to contribute to welfare of this bird,
please send your tax-deductible monies to your foundation
the Sierra WBP foundation PO Box ####

Vulnerabilities

Mountain Pine Beetle

White pine blister rust

Climate interactions

Others

Changes in fire regime

Nitrogen deposition

Encroachment/range expansion

Current objectives

Maintain self-sustaining populations of whitebark pine populations

Maintain native biodiversity

Maintain communities within historic variation

Retrofitted objectives

Ensure persistence of whitebark pine populations

Manage for Persistence (resist/resilience)

Conserve genotypic diversity

Encourage recruitment (fire, sowing seeds, thinning)

Contain spread of pest/pathogen (Early action)

Selective thinning in whitebark “woodlands”

(Note: thinning in krummholz not a great idea)

Manage for change

Investigate historic range of whitebark; facilitate migration

Define and defend refugia

Cache seeds to preserve diversity/genome/populations

Manipulating genotypes for resistance to WPBR
(provenance studies; genetic manipulation)

Adopt-a-tree program with Clark's Nutcracker as mascot

Constraints and tradeoffs

Limited tool set with big knowledge gaps
(relying on Rocky Mt example)

Laws and policies (ESA, wilderness)

Jurisdictional limits (NPS vs NF)

Costs in time and money

Lack of public interest

Thematic Strategies

Early monitoring to better evaluate vulnerability

Managing expectations

Capitalize on opportunity to prepare and evaluate potential strategies