Sudden Oak Death

Managing an Invasive Pathogen in Oregon Forests

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Landowners of Curry County

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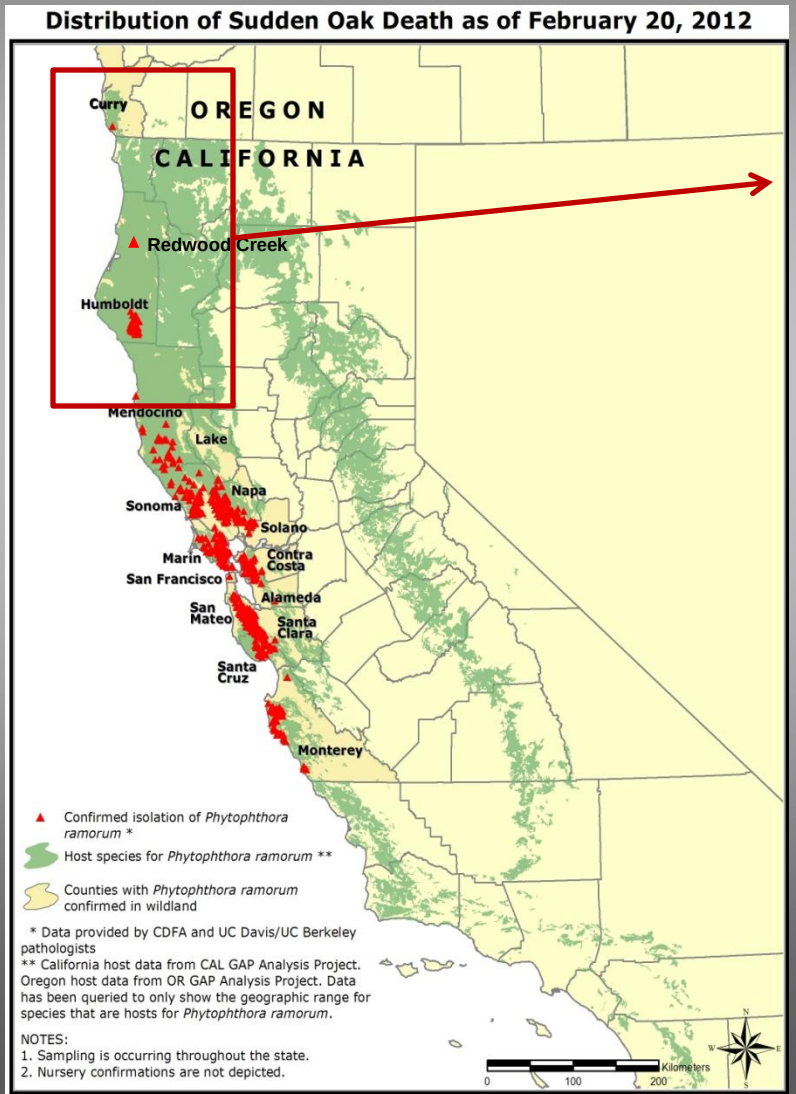
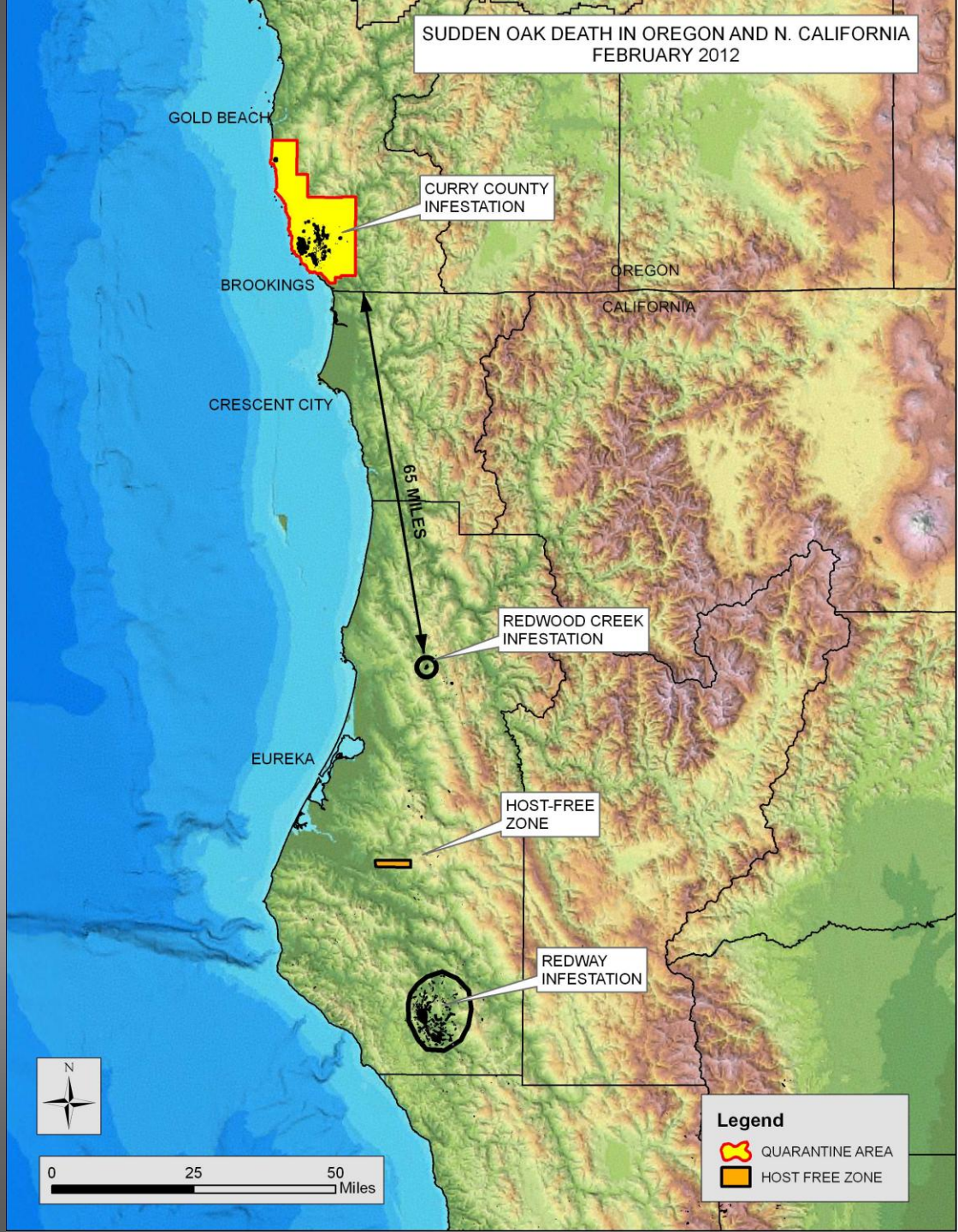
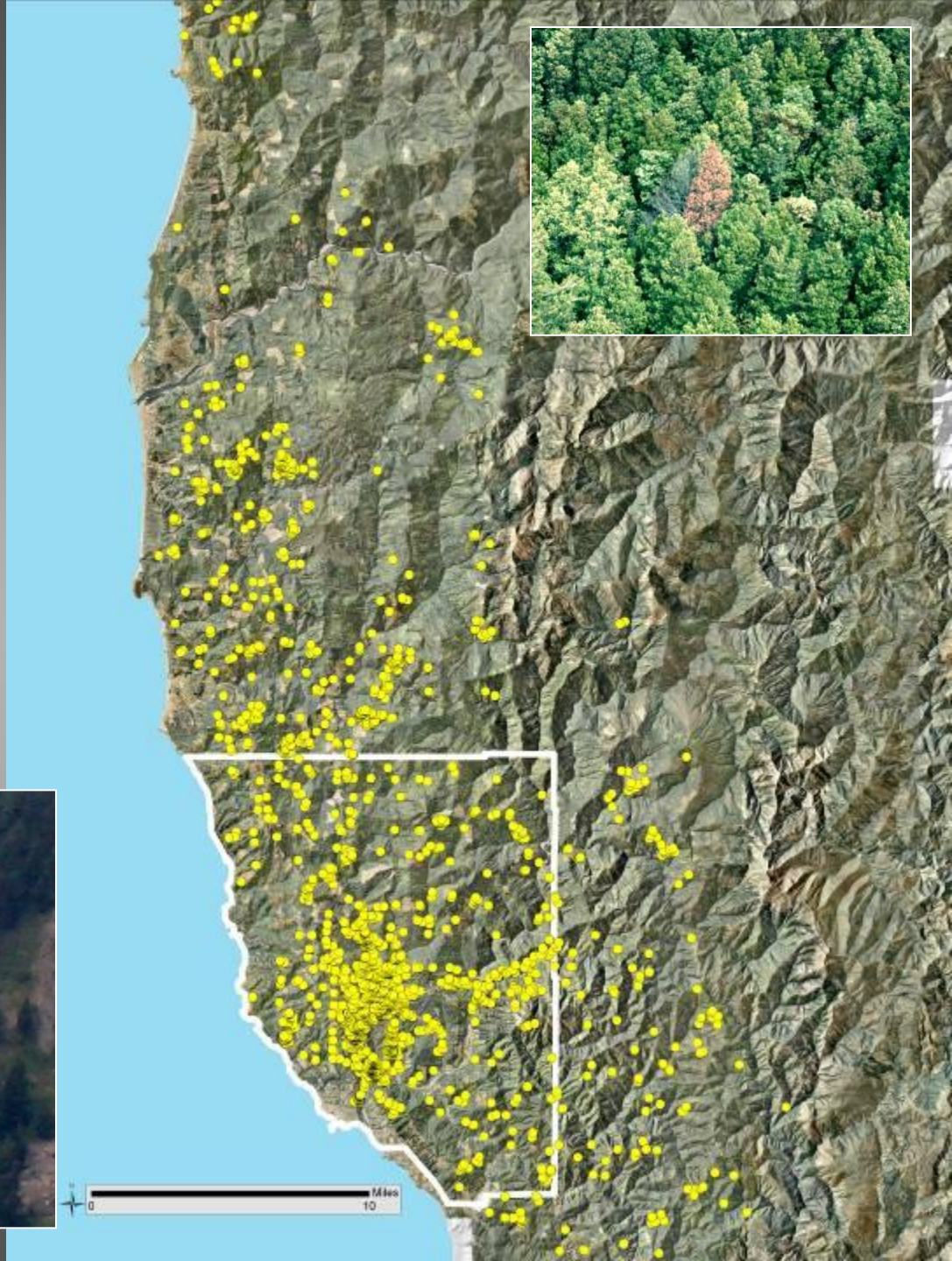
Wild-land Distribution of *P. ramorum*

Oregon: discovered 2001, present since 1998

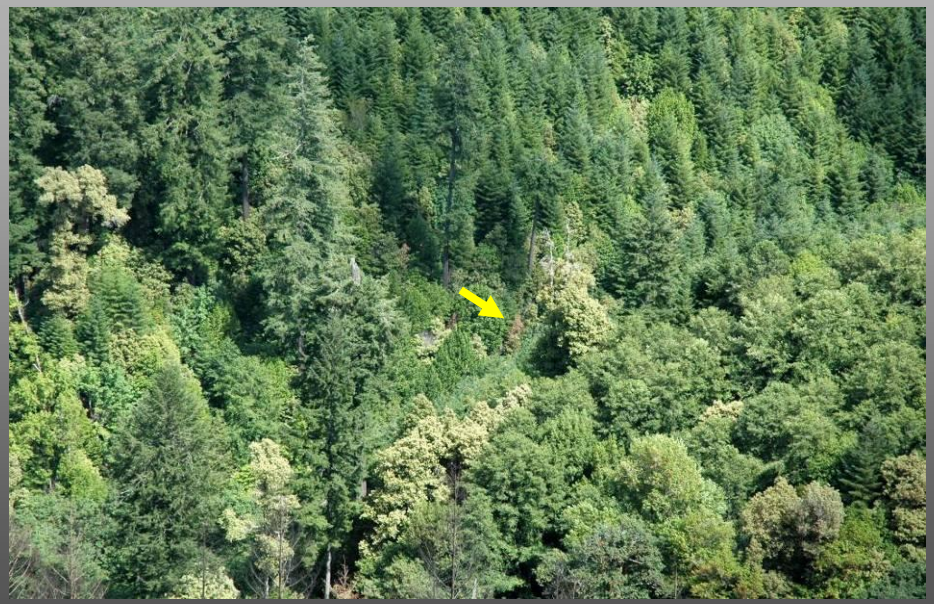




Early detection: Aerial Surveys; ground Checks 4 per year

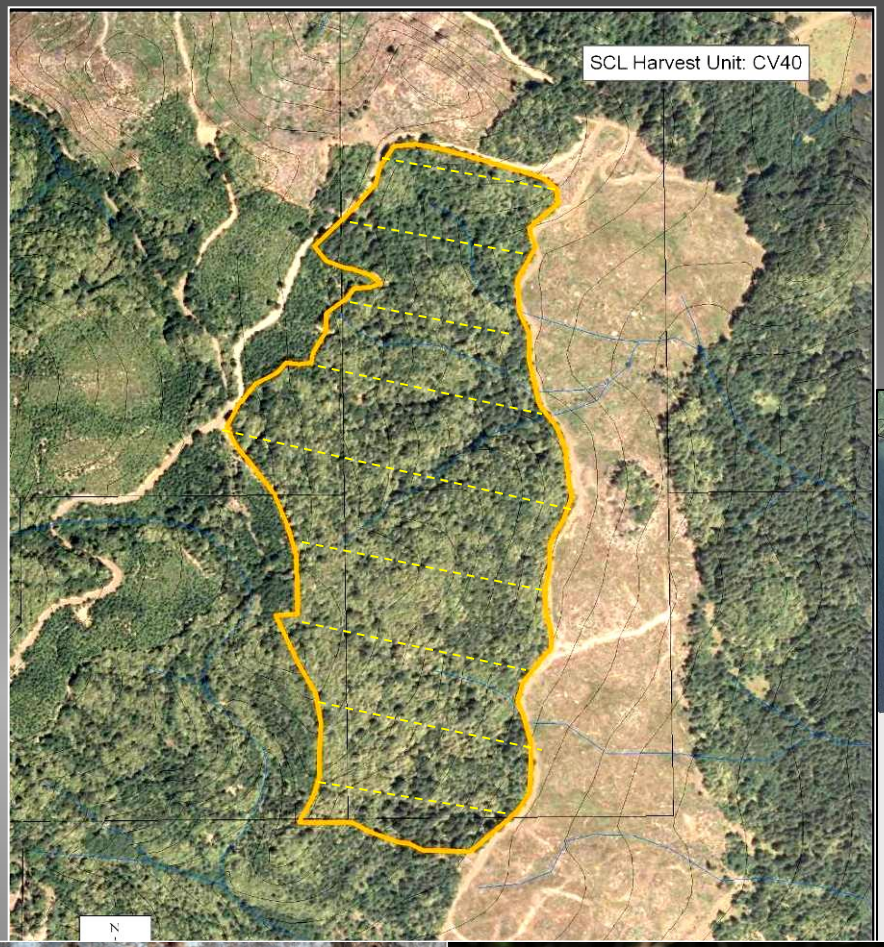


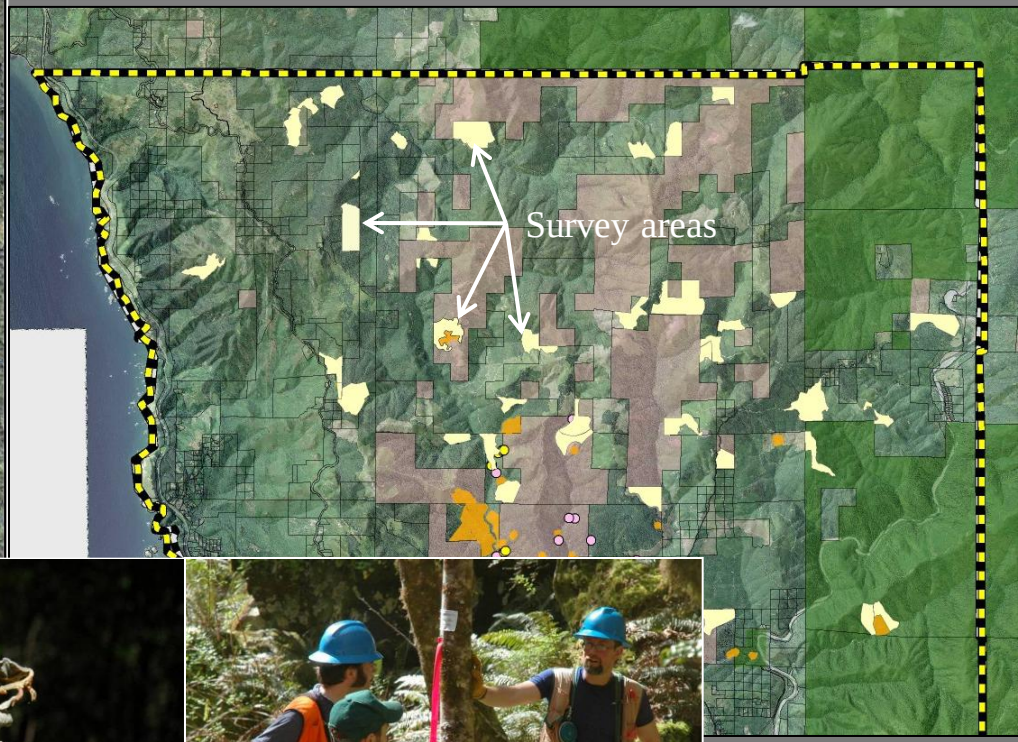
Scouting:
Early symptoms
Sub-canopy trees

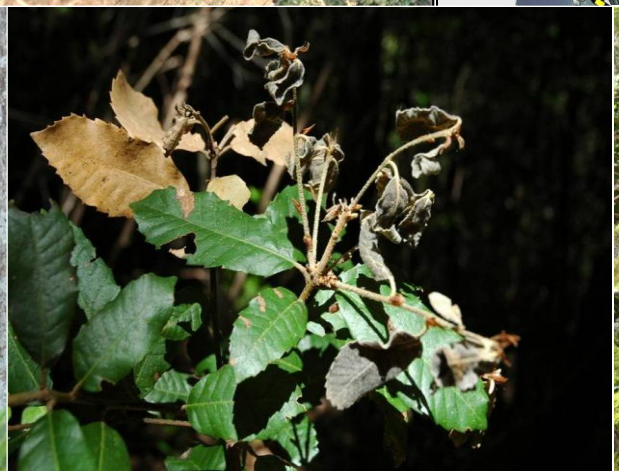


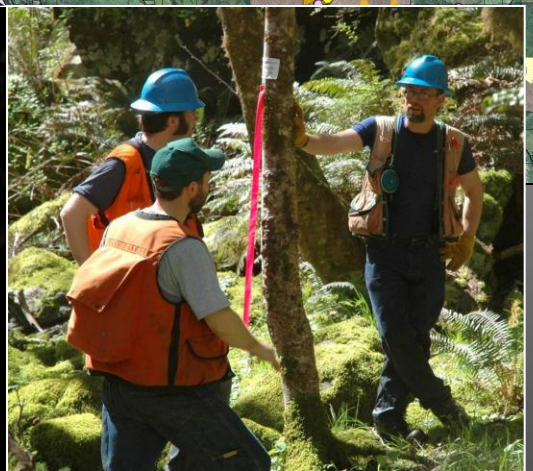
Transect Surveys

- Proposed timber sales (for pest-free certification)
- High risk areas based on risk models

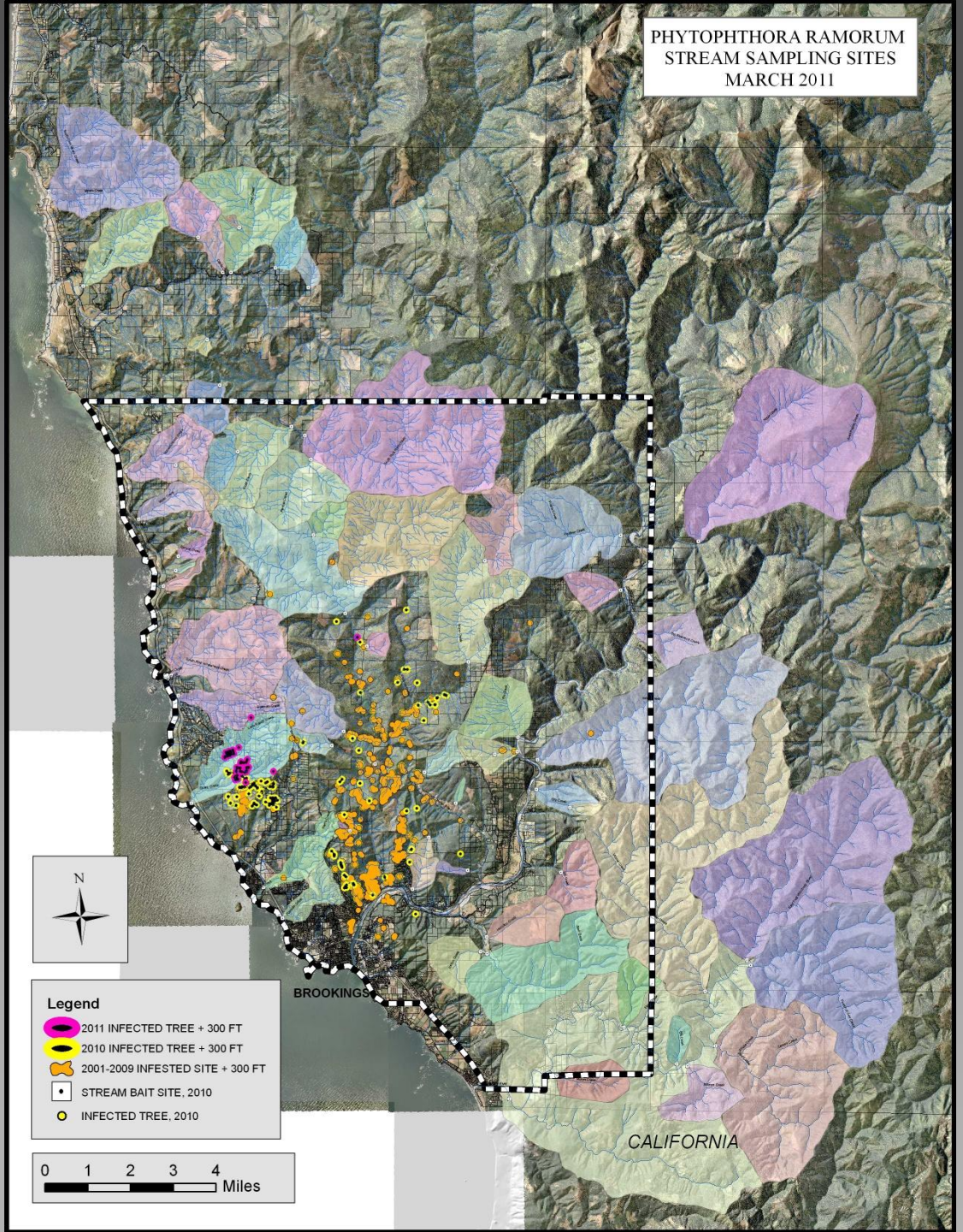


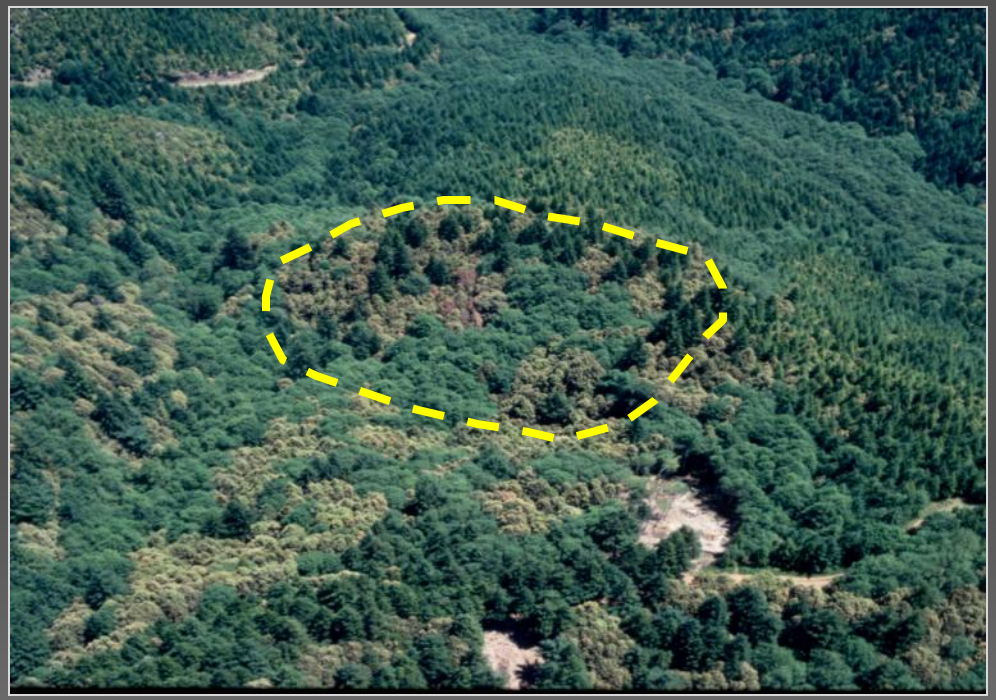






Early Detection:
Stream Baiting (FHM Funding)
52 active sites





Treatment

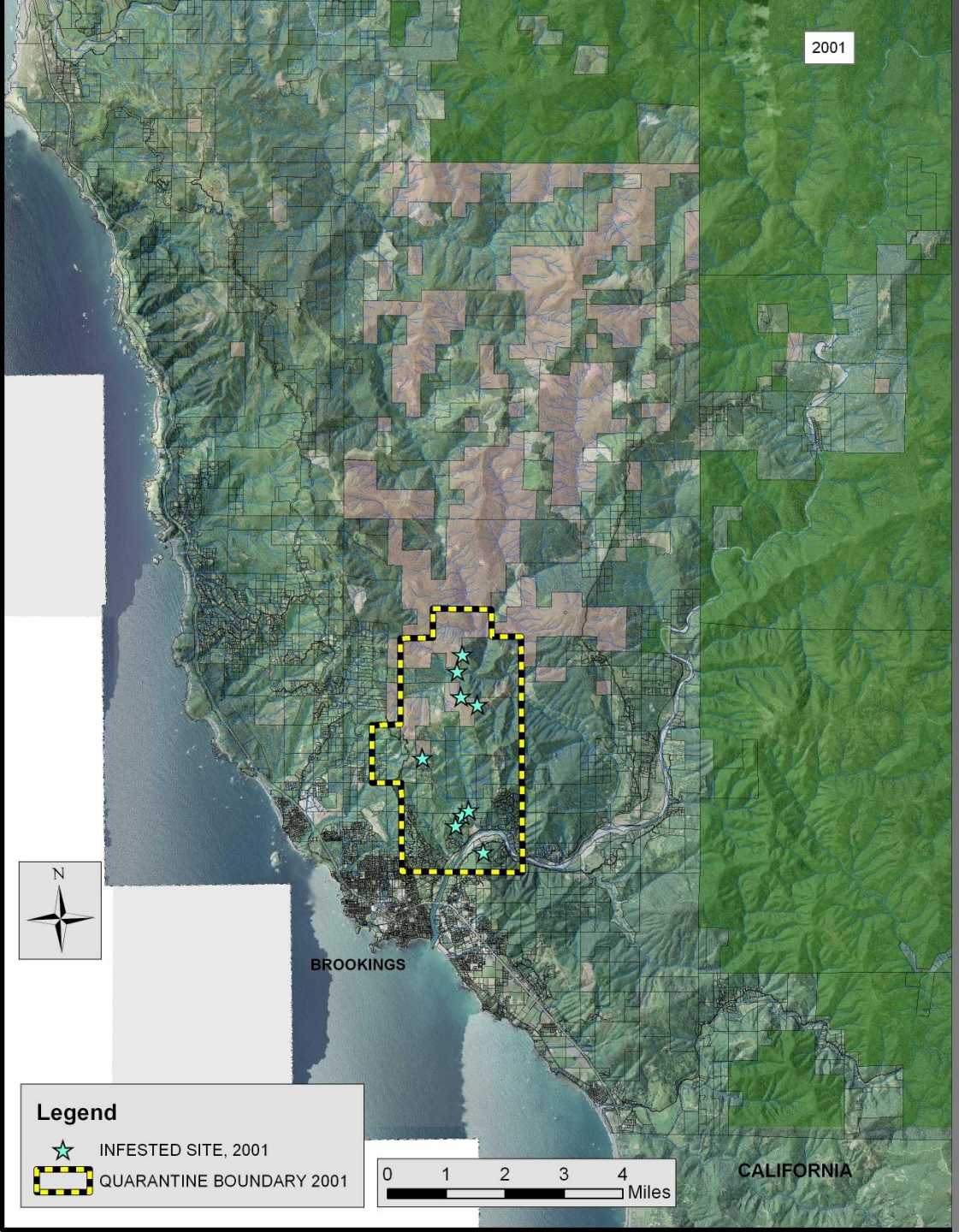
1. Herbicide injection to prevent stump sprouting
2. Cut tanoak, rhododendron, huckleberry, sometimes myrtle.
3. Burn (piles or broadcast)
4. Plant, follow-up treatments
5. No cost to private landowners; <u>this has changed.</u>
6. No compensation for loss

More than 4,000 acres have been treated

Were eradication treatments effective on individual infested sites?

Recovery of *P. ramorum* (perc		
	2009 (145 plots)	s)
SOIL ONLY		25
PLANTS ONLY		5
SOIL &	12	7
	51	63

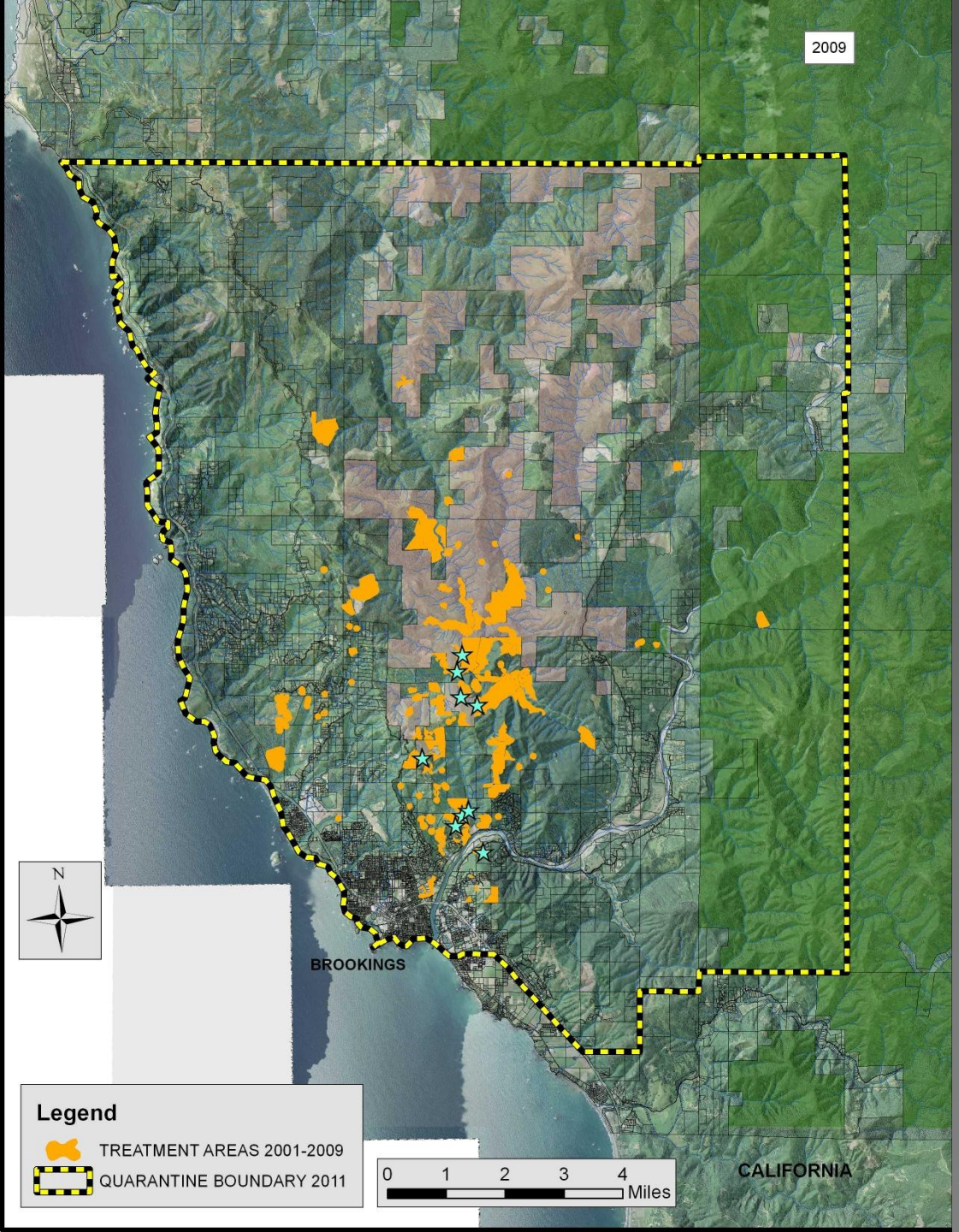
THURSDAY – 3:45 PM, Ellen Goheen



Did the eradication treatments slow or stop spread?

2001

- # of infested sites = 9
- Infested Area = 36 acres
- Treatment Area = 38 acres
- Quarantine area = 9 mi^2



Did the eradication treatments slow or stop spread?

2001

- # of infested sites = 9
- Infested Area = 36 ac
- Treatment Area = 38 ac
- Quarantine area = 9 mi^2

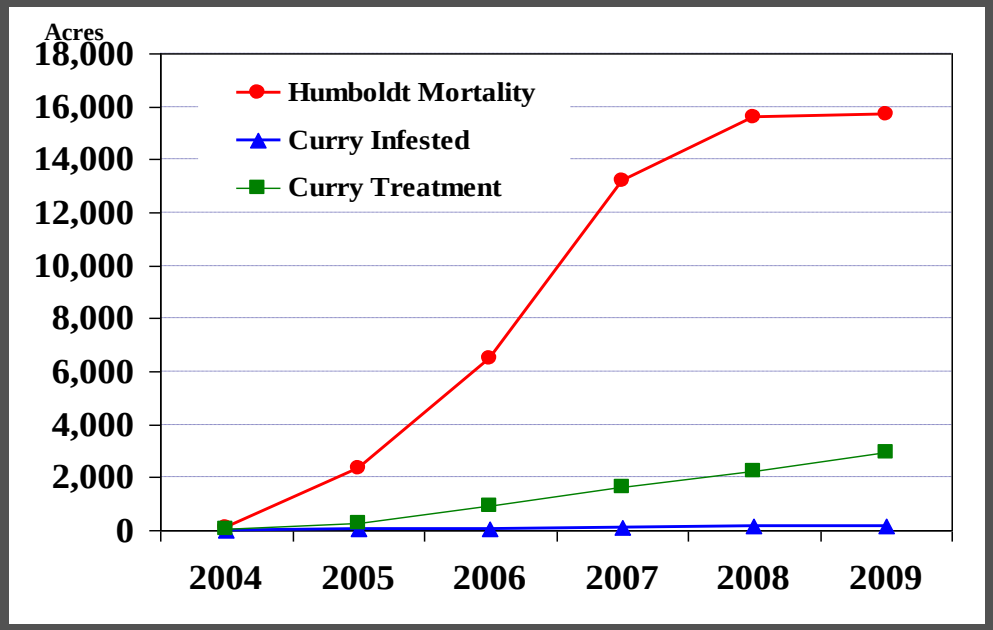
2009

- Treatment Area = 3,000 ac
- Quarantine area = 162 mi^2
- Expansion:
  - North - 5 mi
  - South - 1 mi
  - East - 5 mi
  - West - 3.5 mi

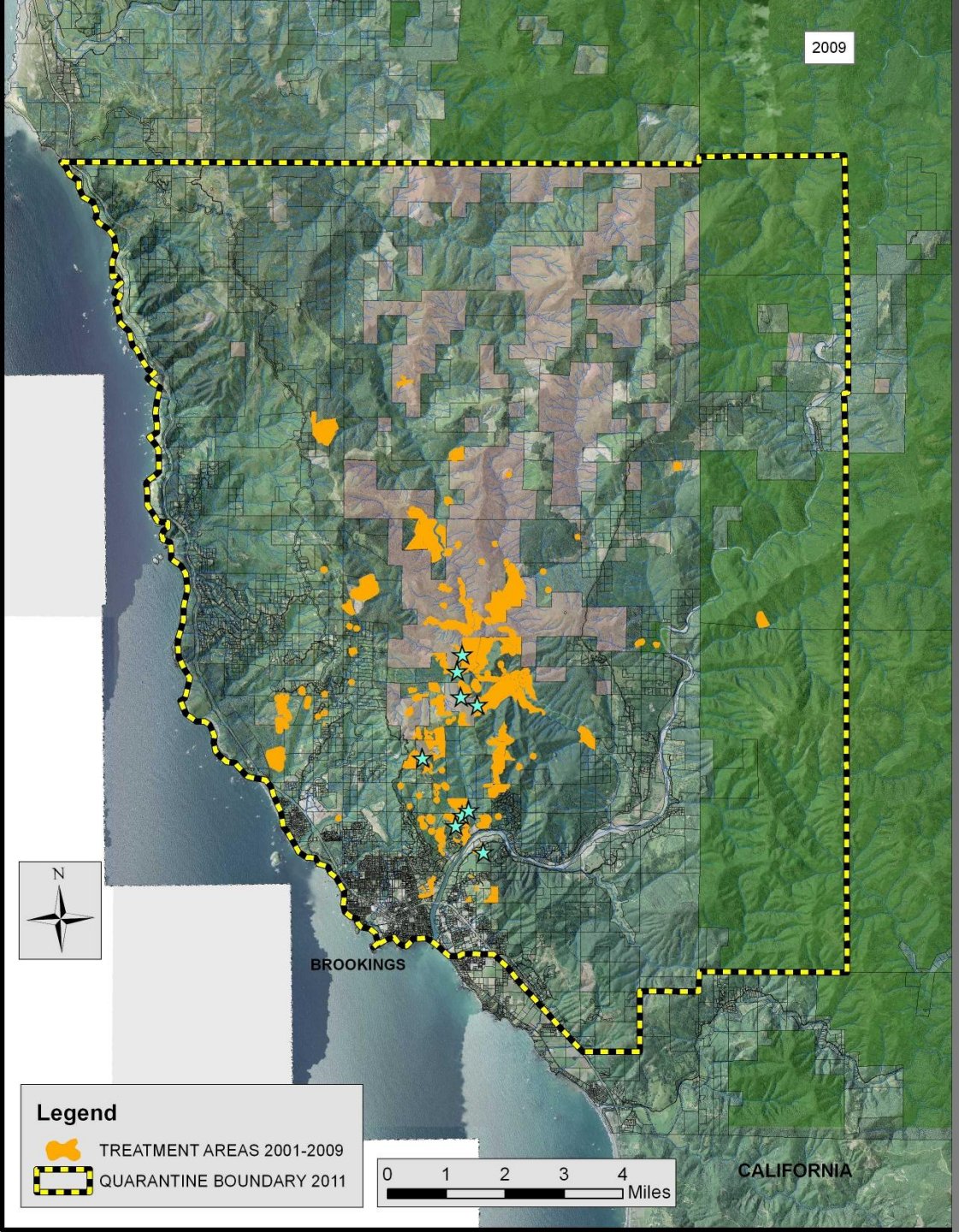
Numerous delays completing treatments

Did Eradication treatments slow spread?

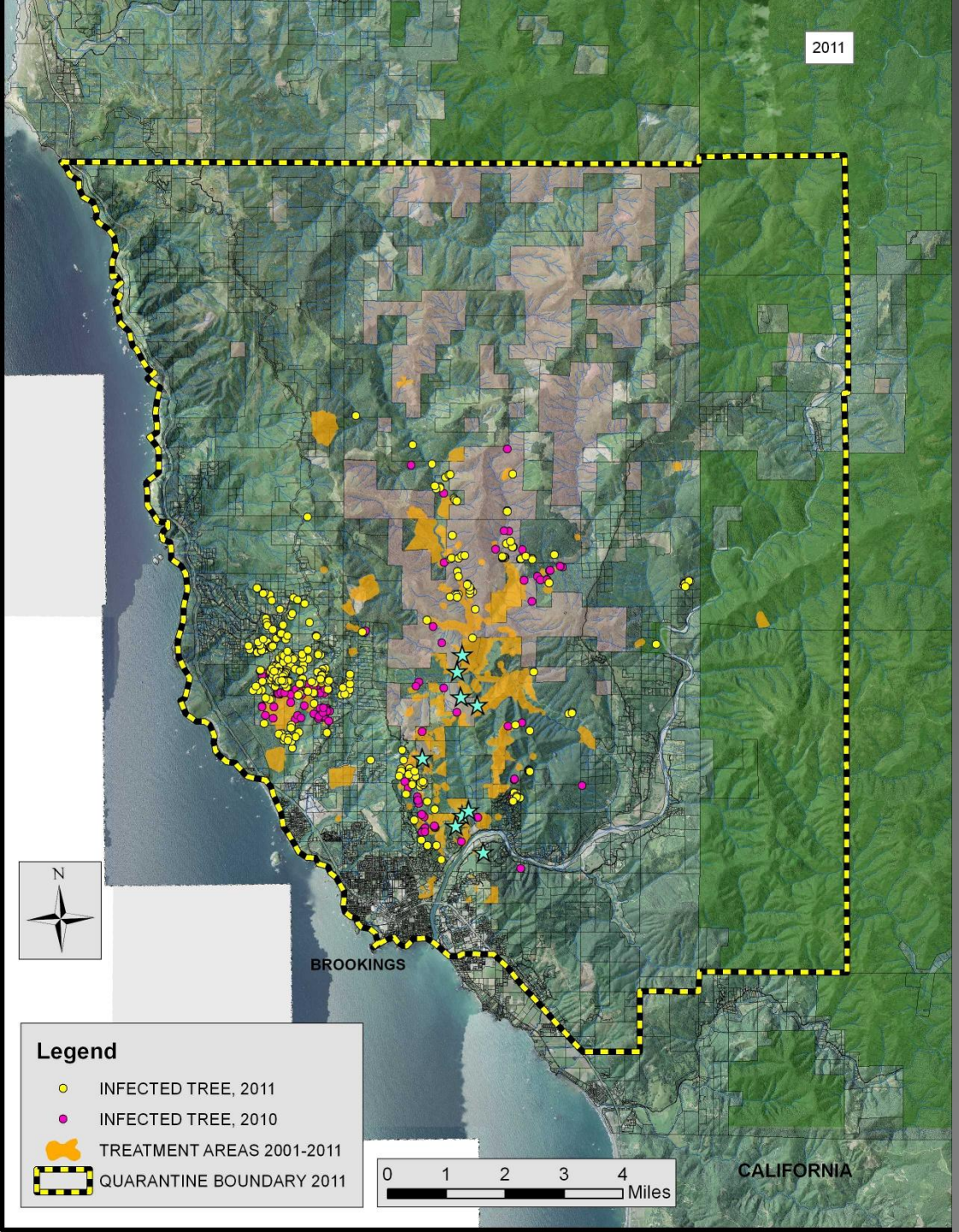
Comparing Brookings & Redway Infestations 2001-2009



- Brookings infestation started in 2001 or earlier.
  Cumulative area treated = 3,000 ac
- Redway infestation started in 2003.
  Cumulative mortality = 15,000 ac
- Brookings climate is more conducive to disease spread than Humboldt.
- CA now has new infestation 50 mi to the north (Redwood creek).



Did the eradication treatments slow or stop spread?



Did the eradication treatments slow or stop spread?

New Infected trees 2010-2011

Disease often occurs near infested sites one or two years following treatment, due to:

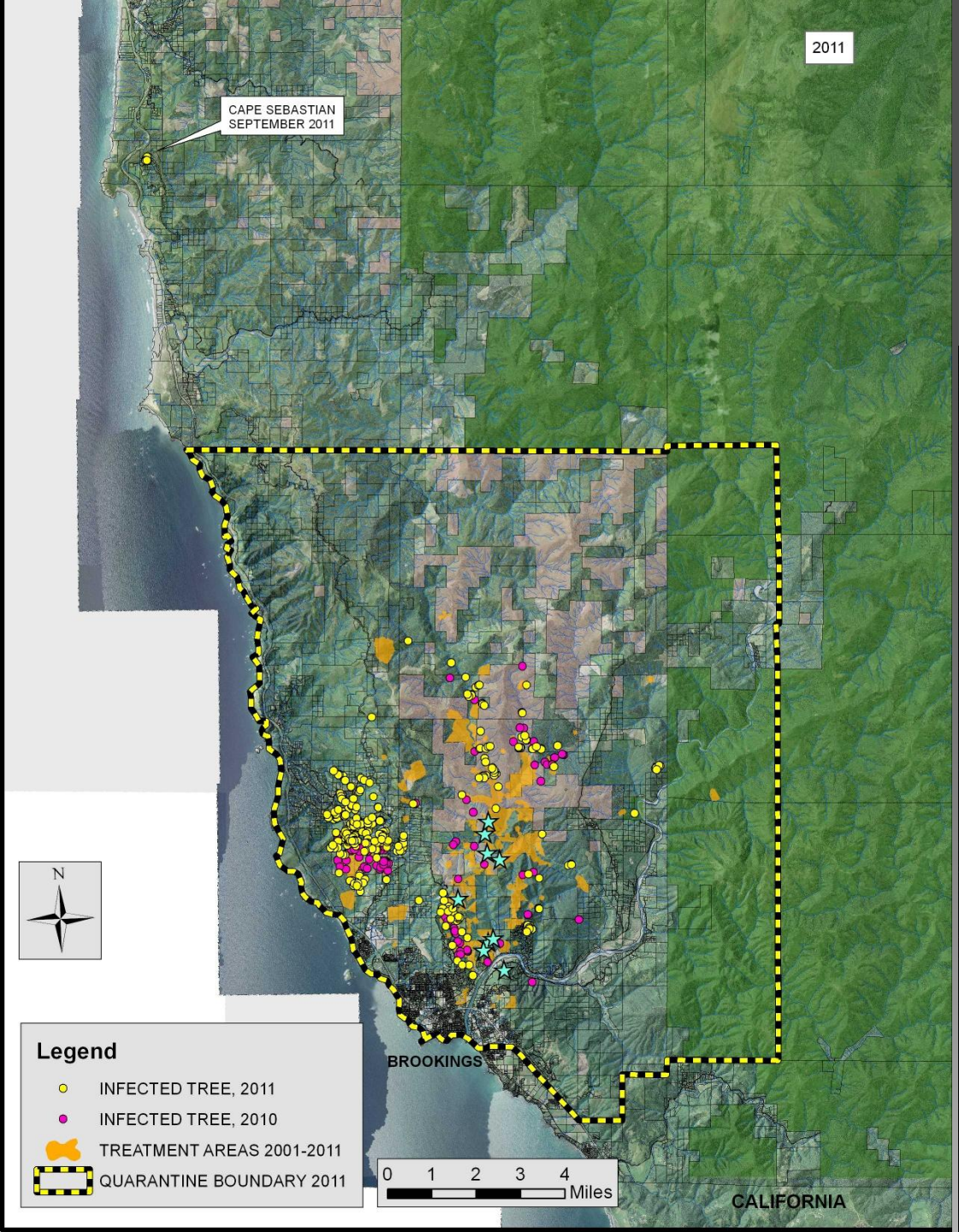
- Latency
- Treatment delays
- Treatment areas too small
- Spread during treatment (?)

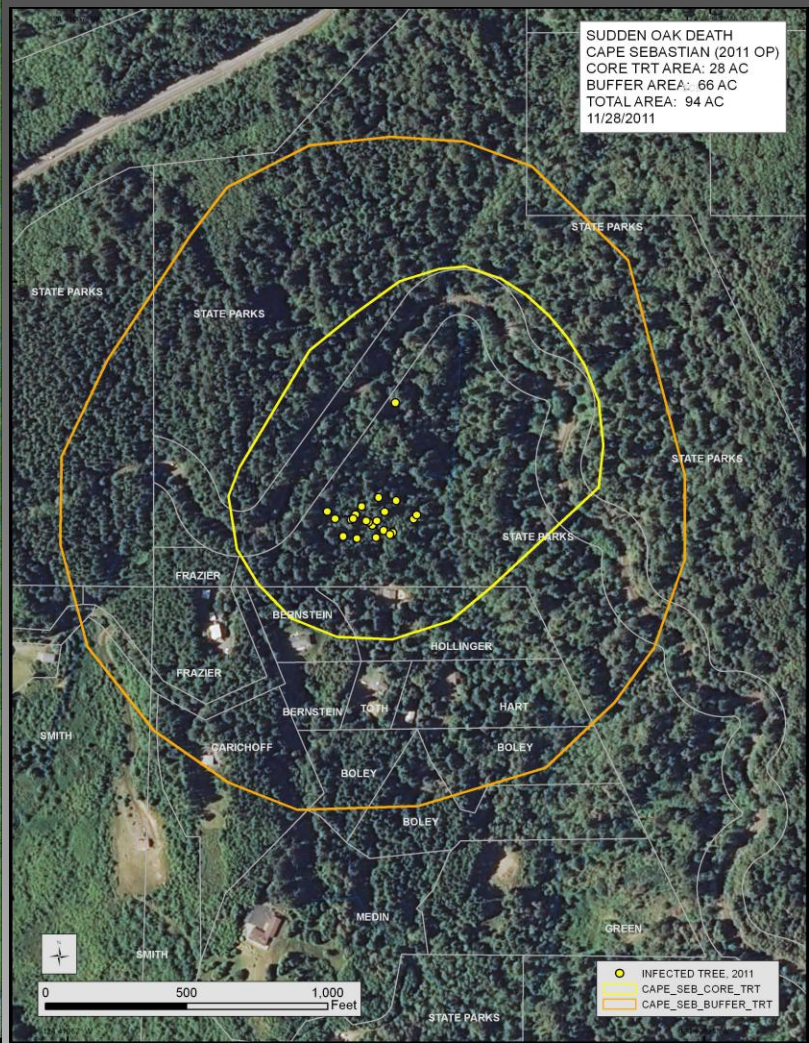
Cape Sebastian Infestation

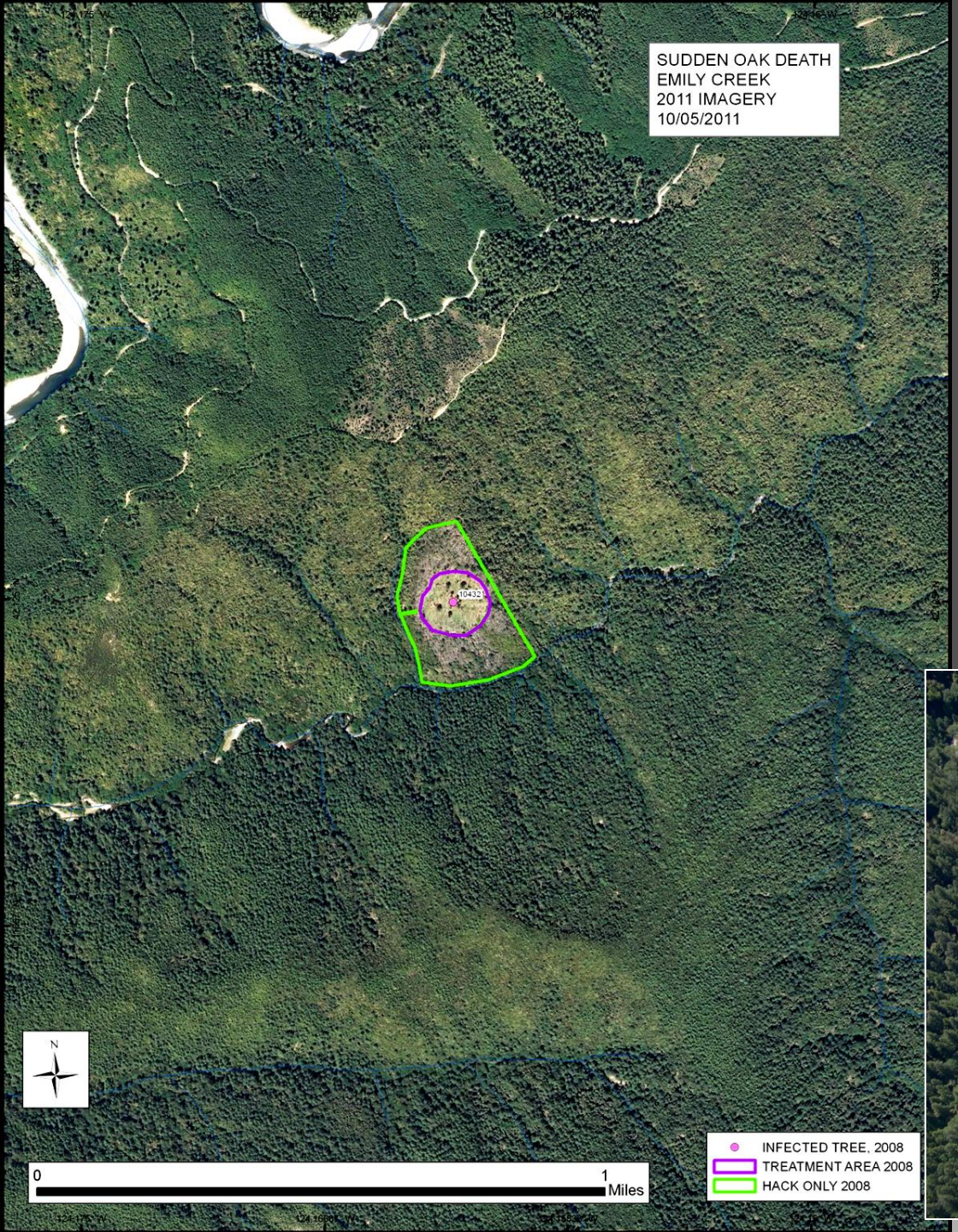
6 miles north of quarantine

12 miles from nearest infested site

Treatment area = 94 acres

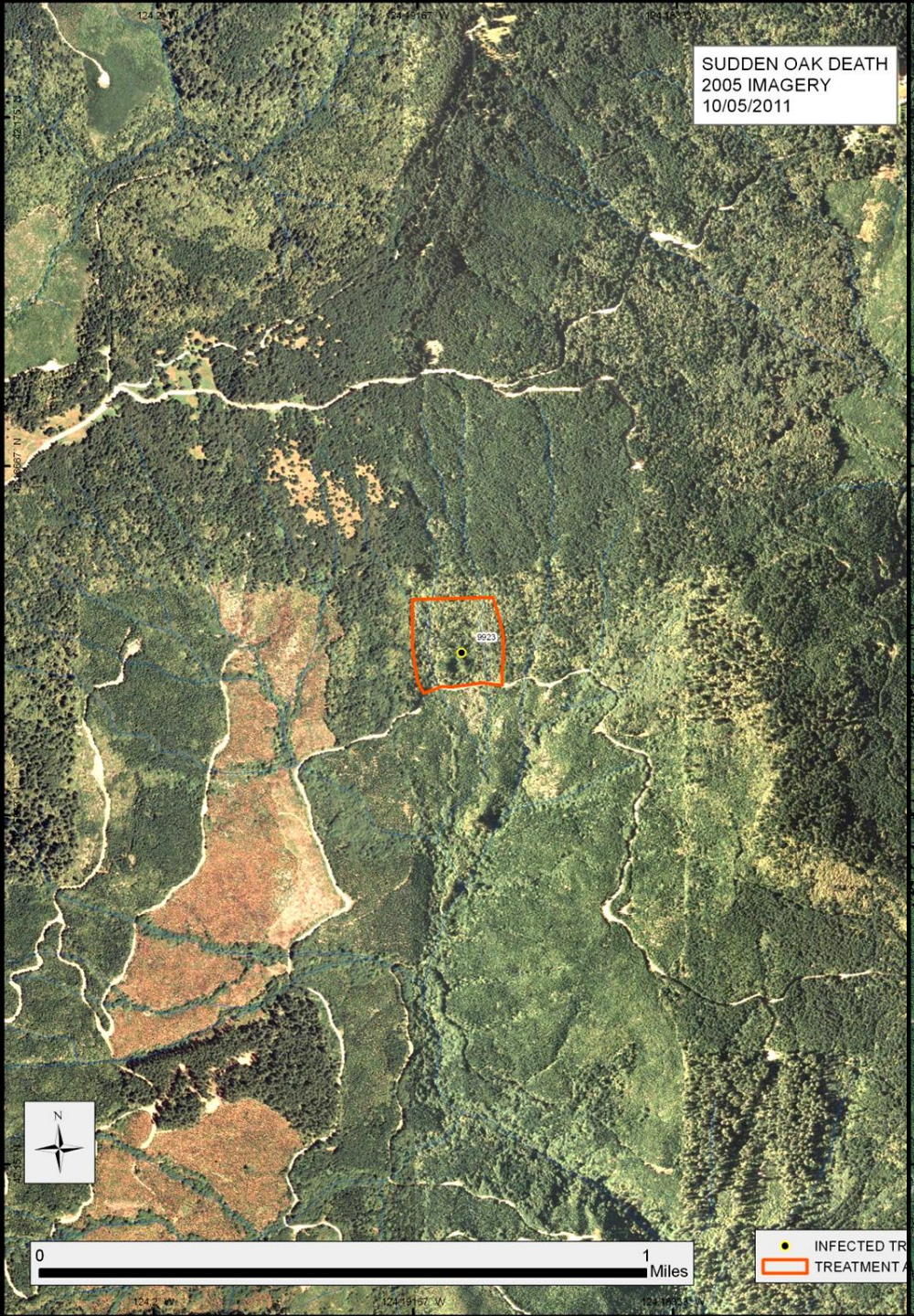


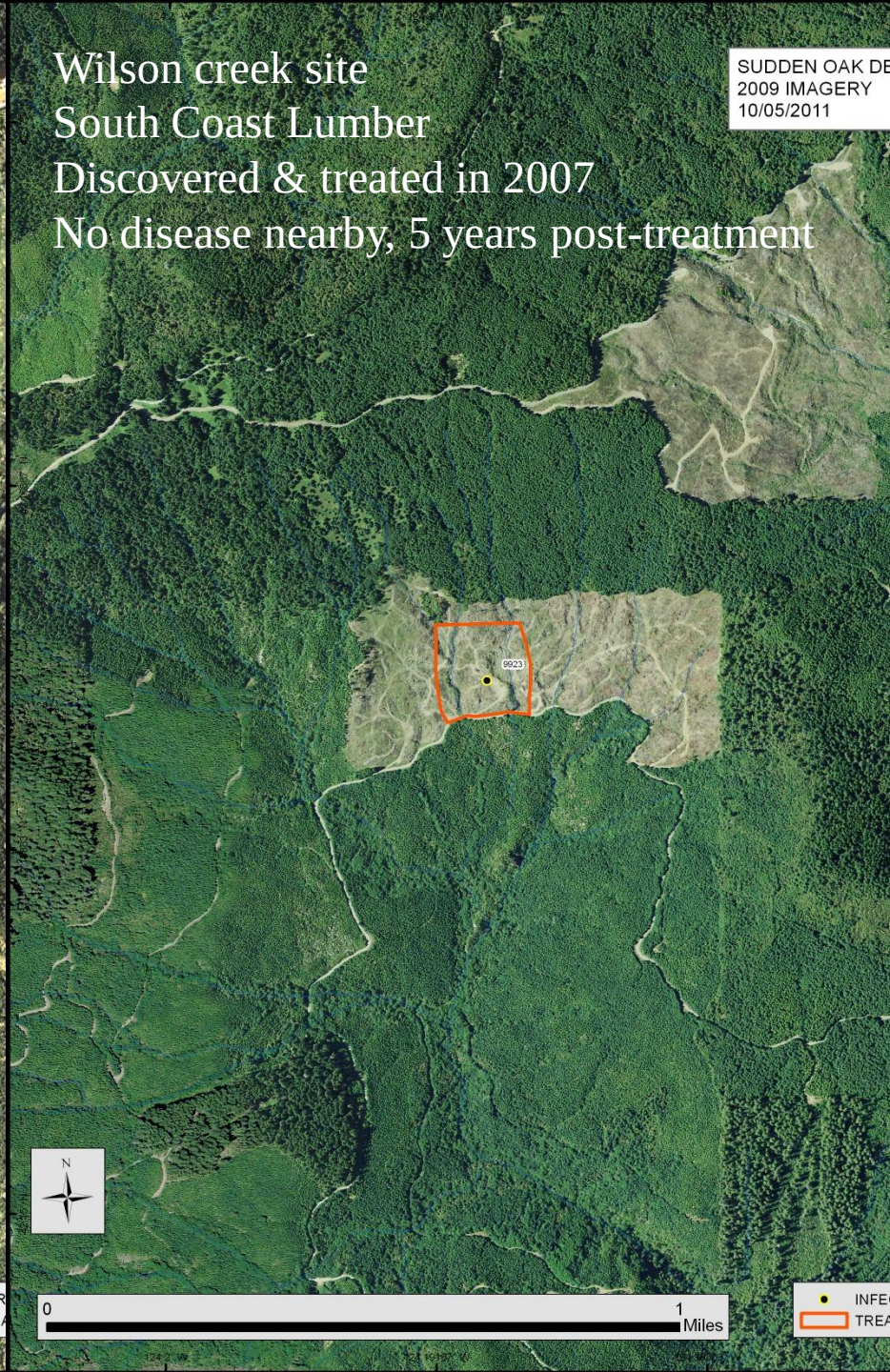


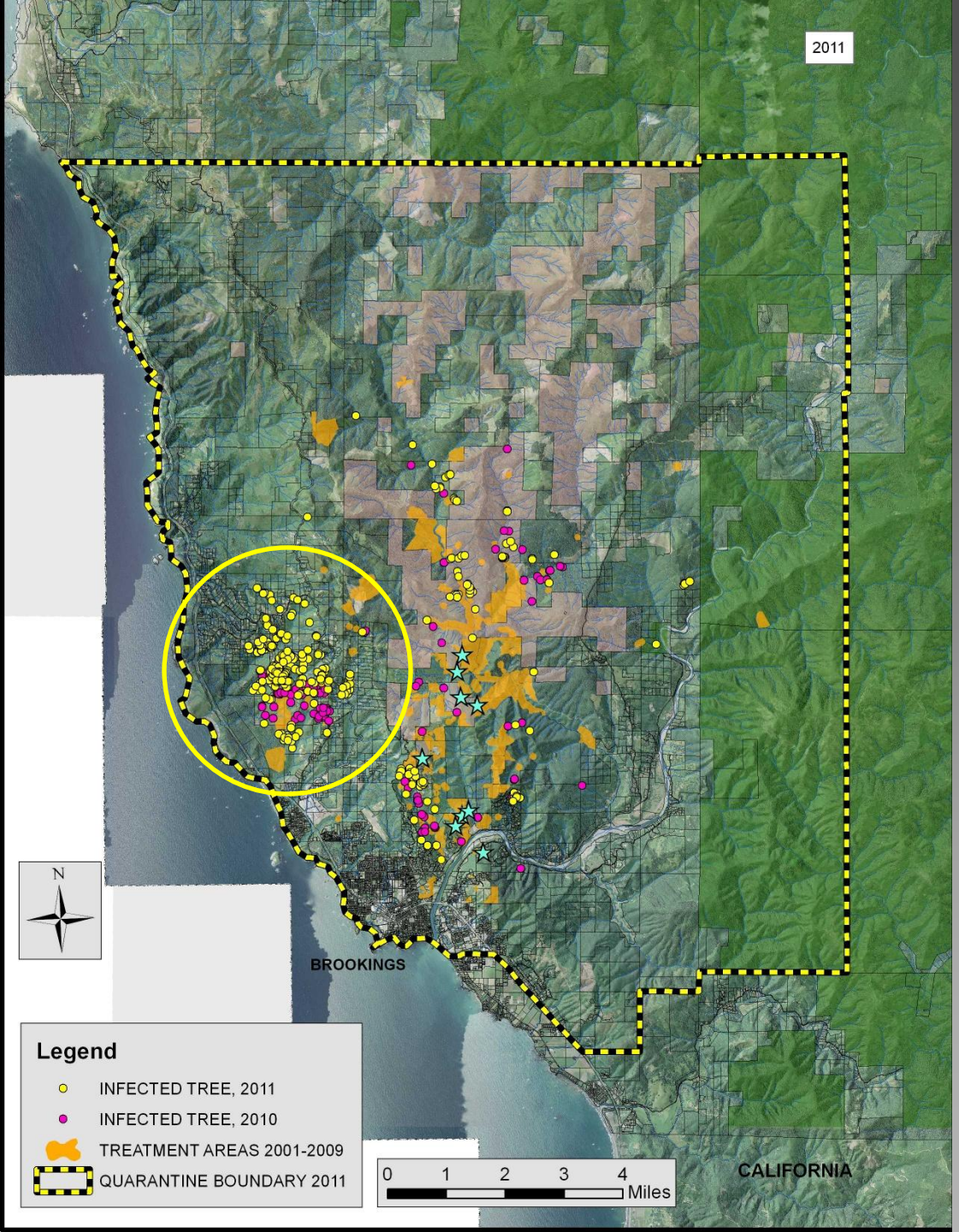


Emily Creek site (USFS)

- Found and treated in 2008
- Core area cut and burned (7 acres)
- Buffer trees killed with herbicide.
- Total treatment area=27 acres
- No disease nearby after 3.5 years


SUDDEN OAK DEATH
2005 IMAGERY
10/05/2011
9923
N
0
1
Miles
INFECTED TR
TREATMENT A


Wilson creek site
South Coast Lumber
Discovered & treated in 2007
No disease nearby, 5 years post-treatment
SUDDEN OAK DE
2009 IMAGERY
10/05/2011
9923
N
0
1
Miles
INFE
TREA



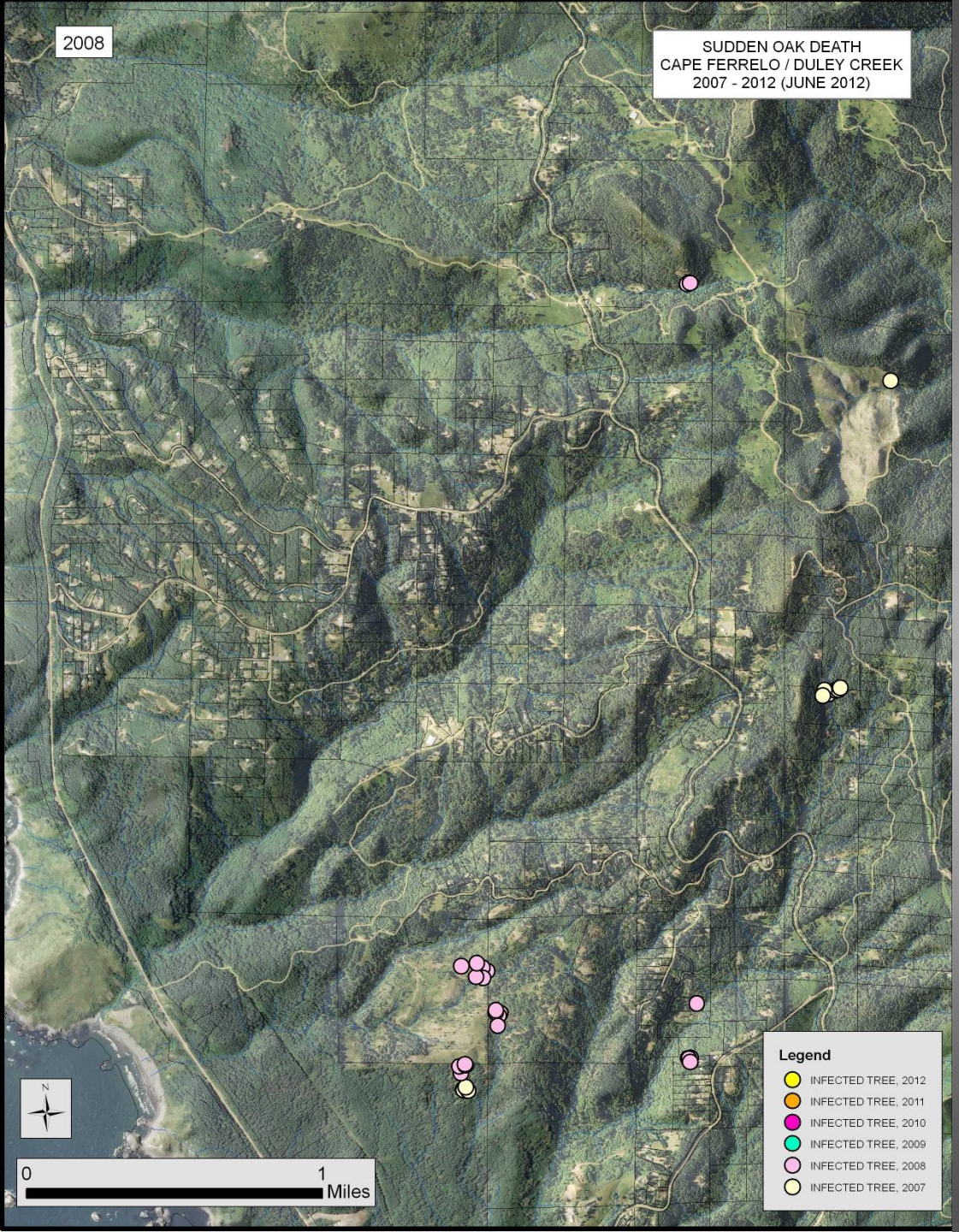
Cape Ferrelo / Duley Creek Area

Treatments not completed promptly

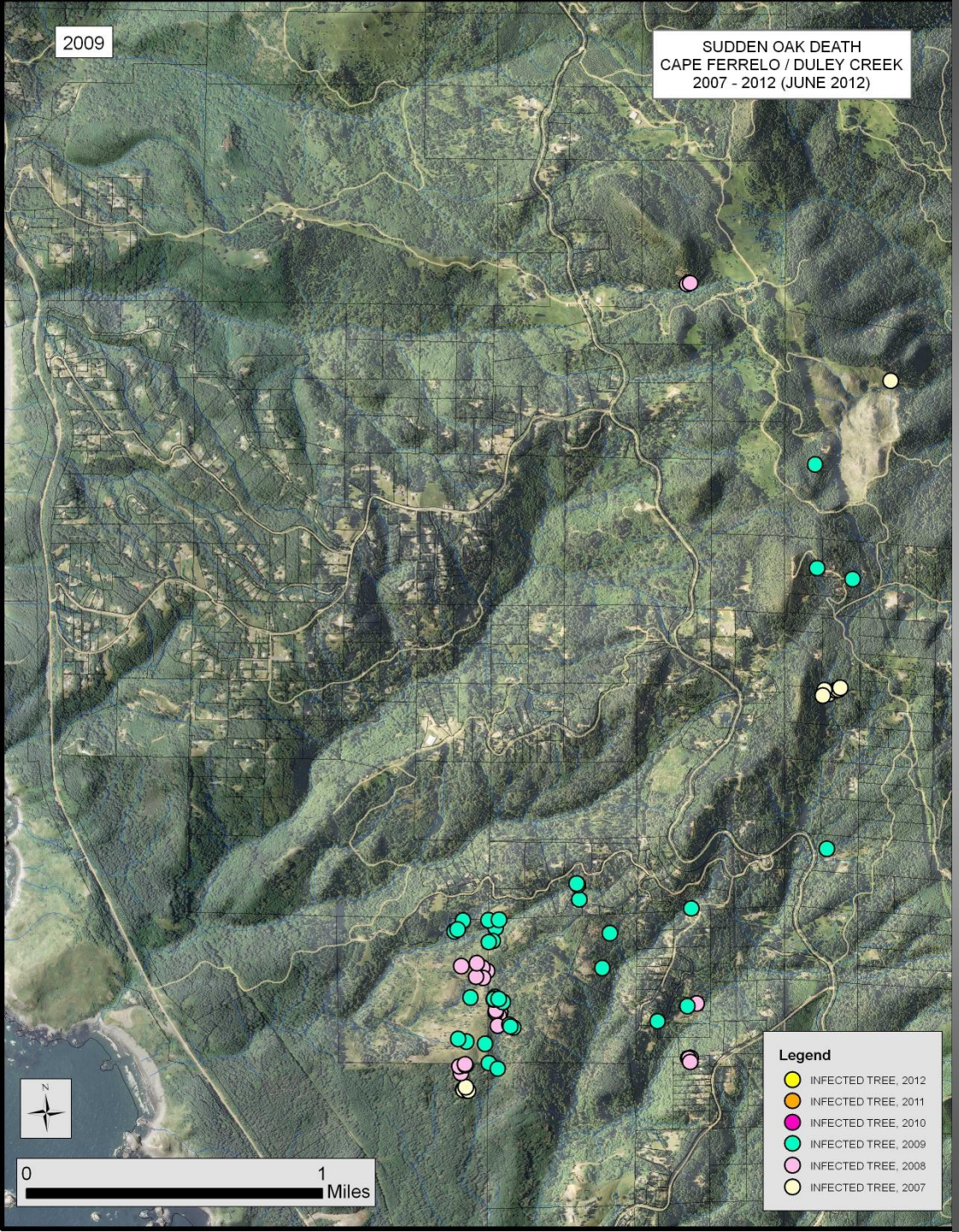
Stoppages :

- Jan-May 2008
- April-September 2009

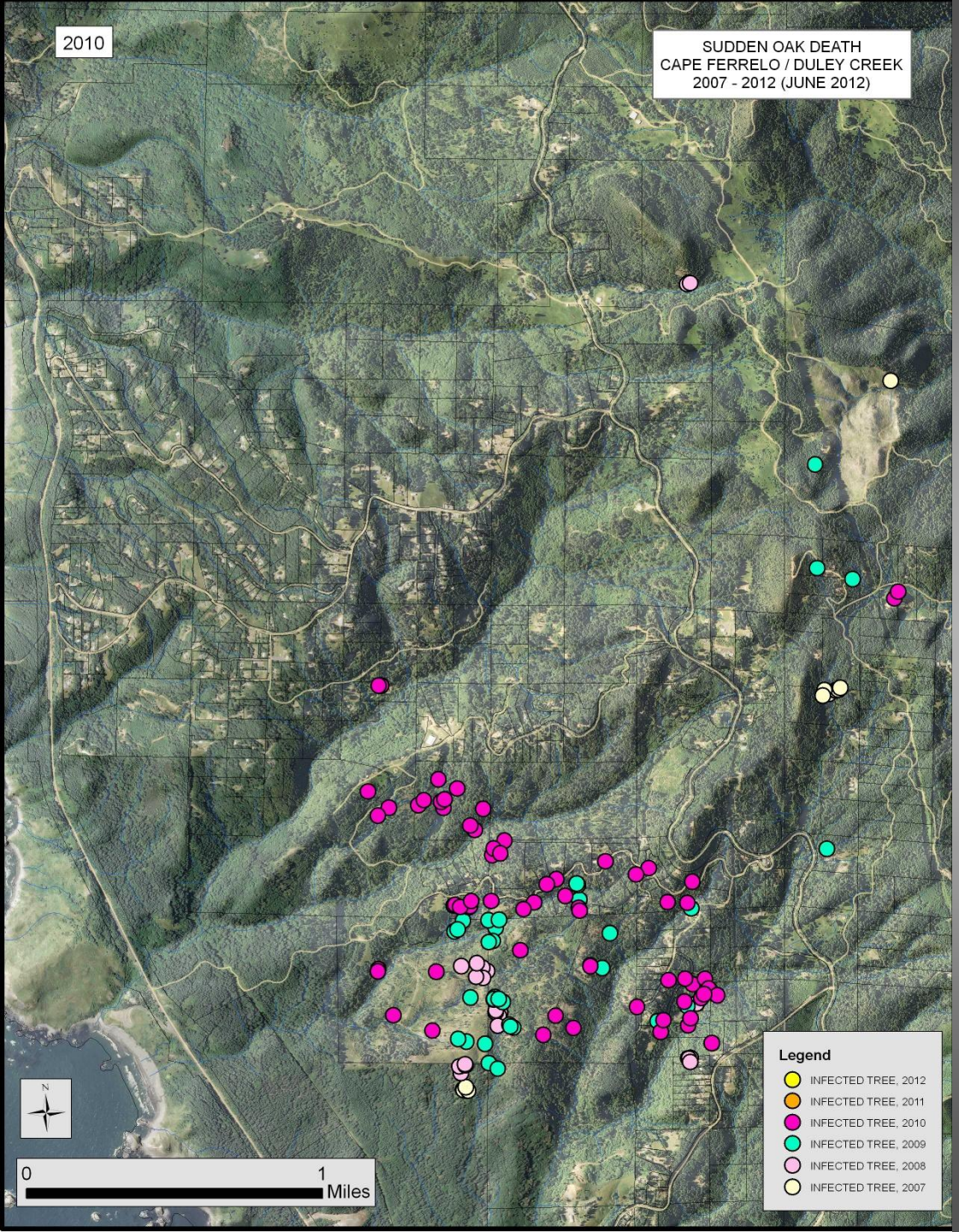
Sudden Oak Death
Cape Ferrelo / Duley Creek
2007



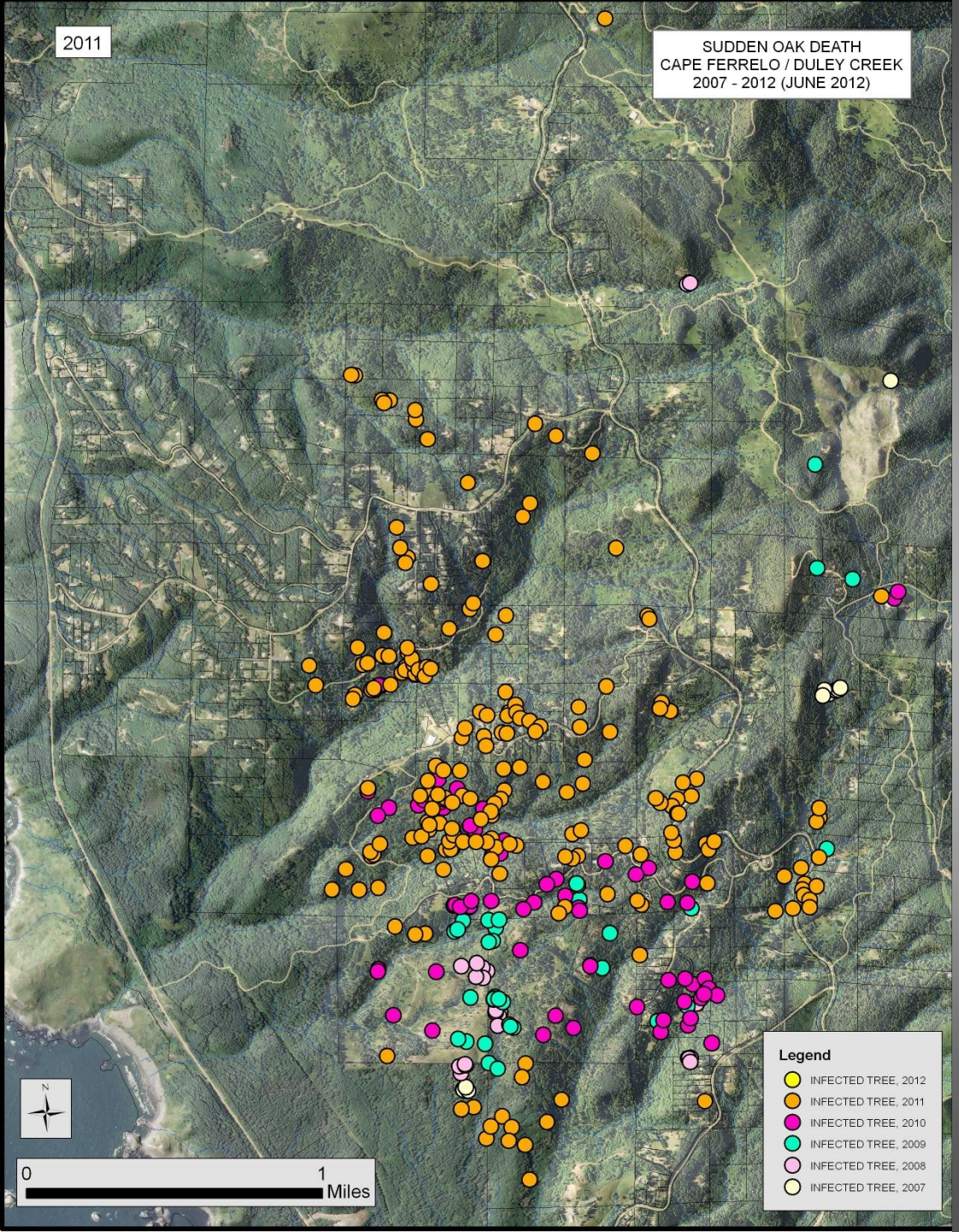
Sudden Oak Death
Cape Ferrelo / Duley Creek
2008



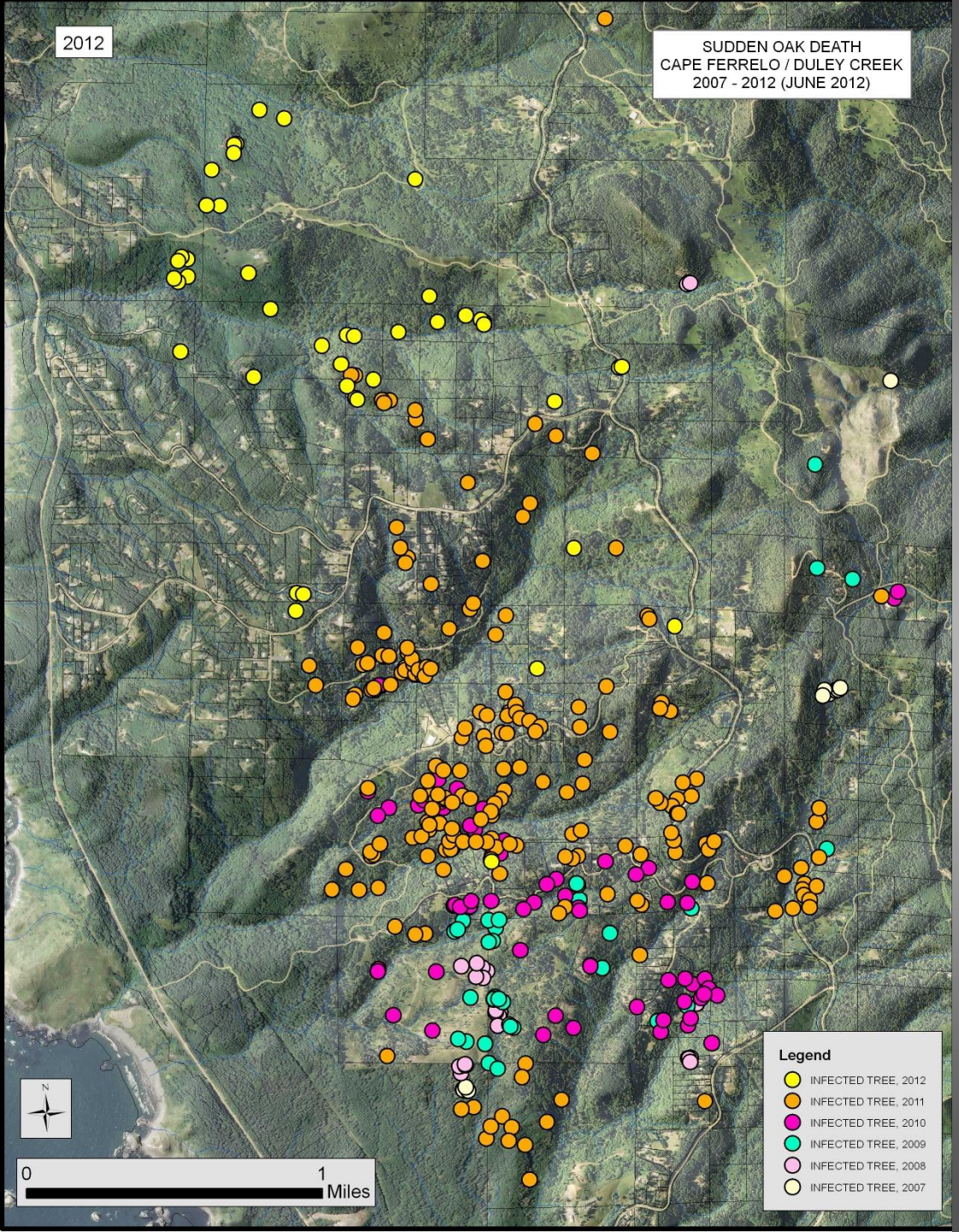
Sudden Oak Death
Cape Ferrelo / Duley Creek
2009



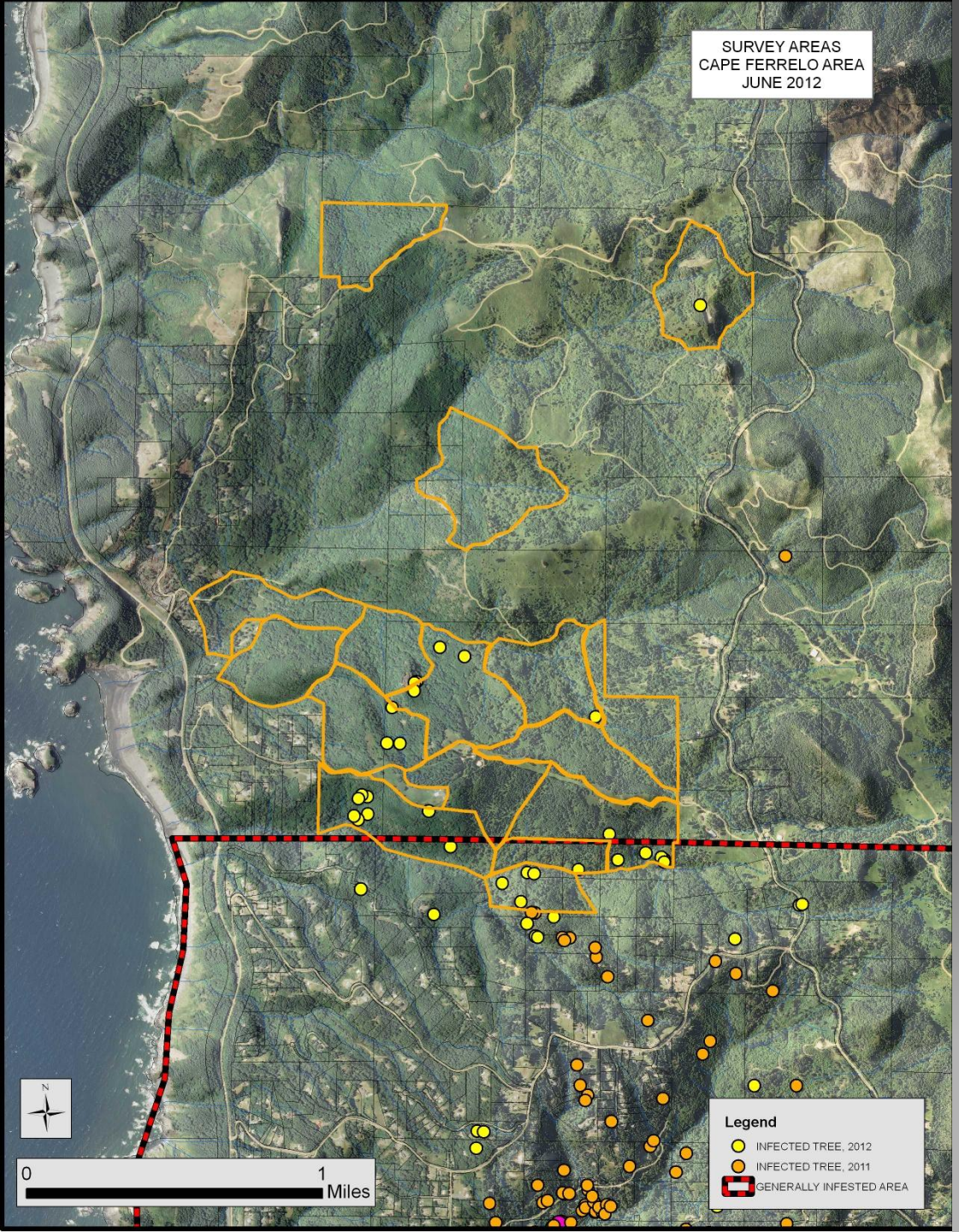
Sudden Oak Death
Cape Ferrelo / Duley Creek
2010



Sudden Oak Death
Cape Ferrelo / Duley Creek
2011



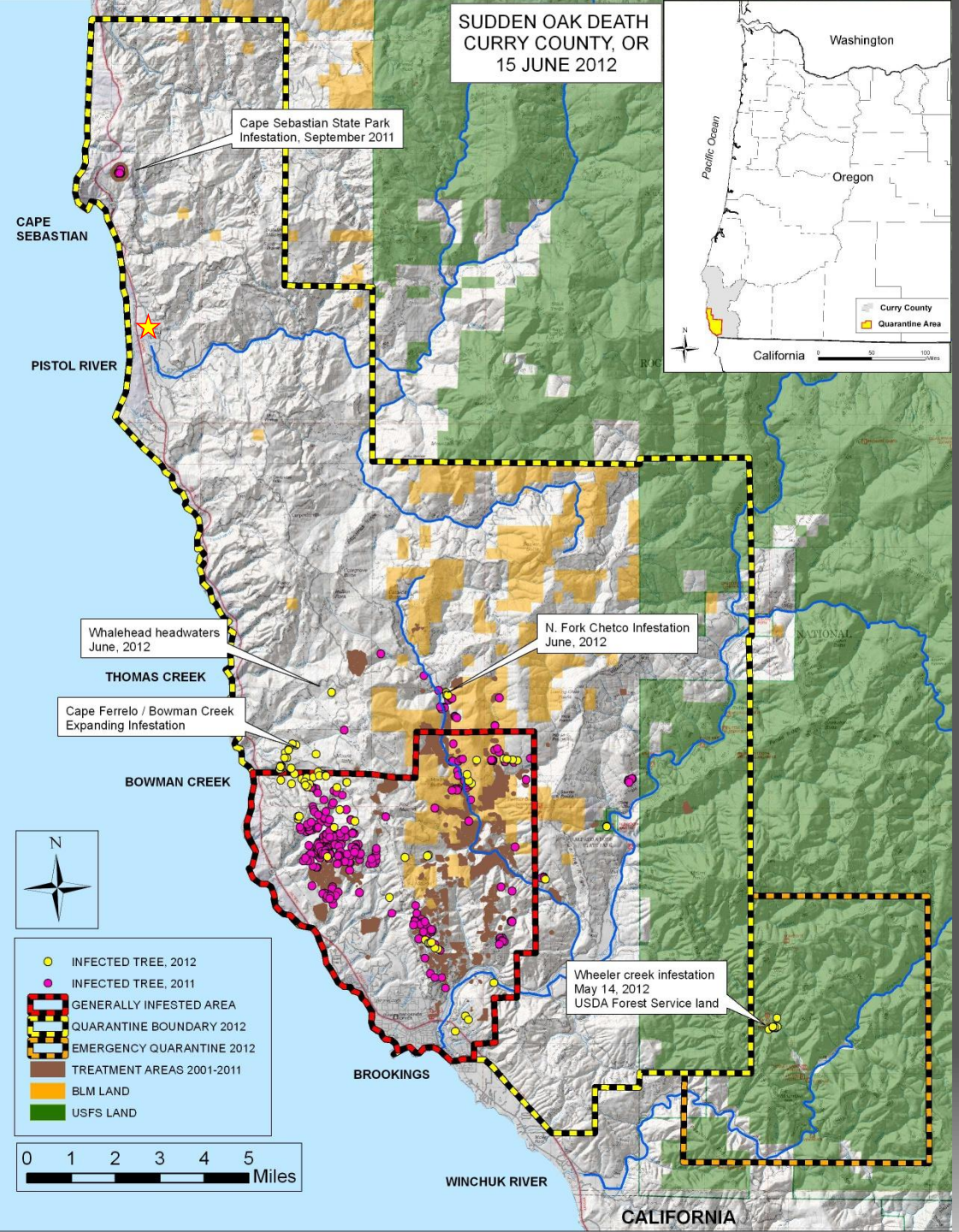
Sudden Oak Death
Cape Ferrelo / Duley Creek
2012



GROUND SURVEYS
Cape Ferrelo / Duley Creek
2012

Low density of canopy tanoak

Most detections not yet visible from air



REVISED QUARANTINE 2012

Establishes a Generally Infested Area (GIA)

Eradication treatments <u>not required</u> within the GIA

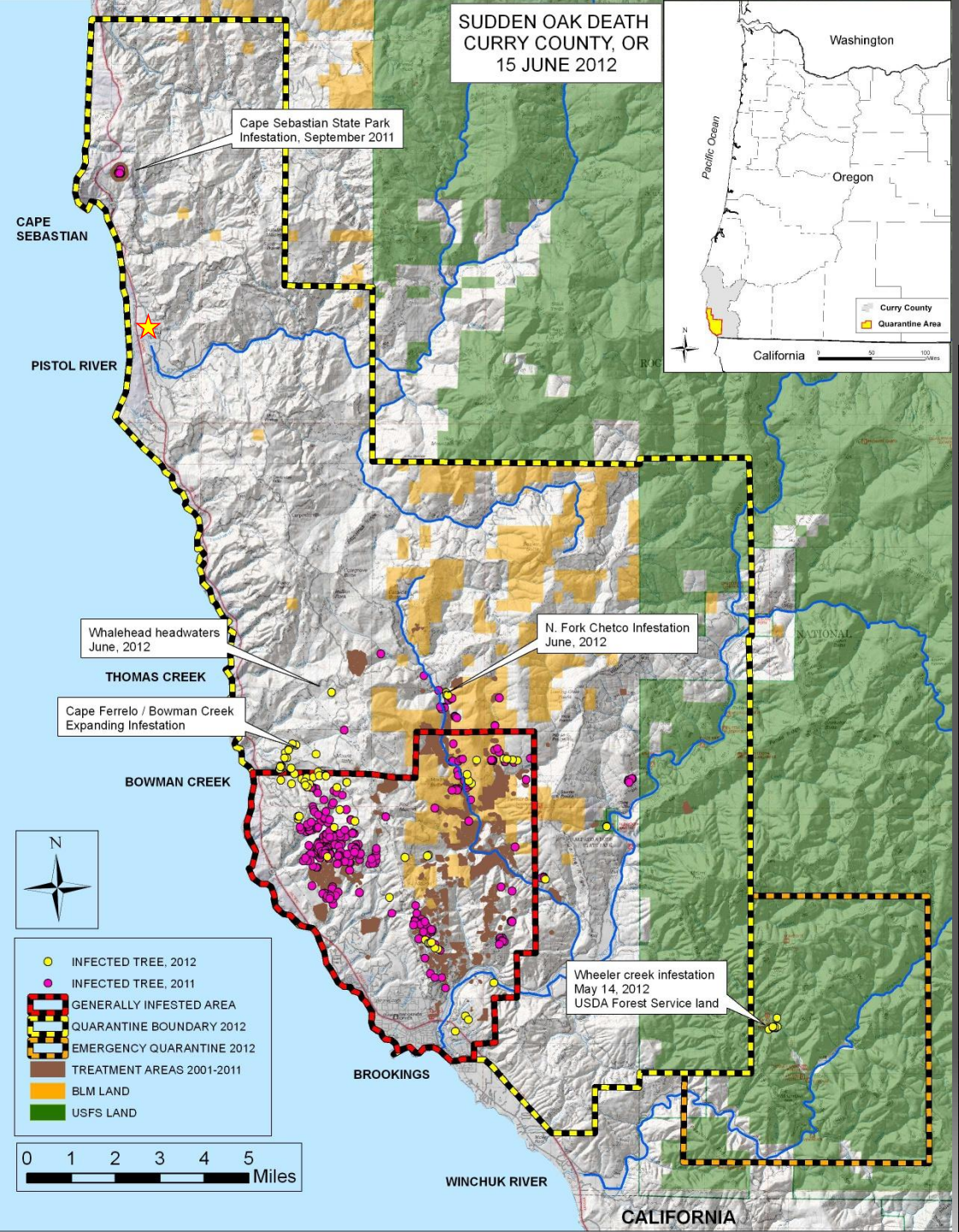
Eradication treatments <u>required</u> outside of GIA

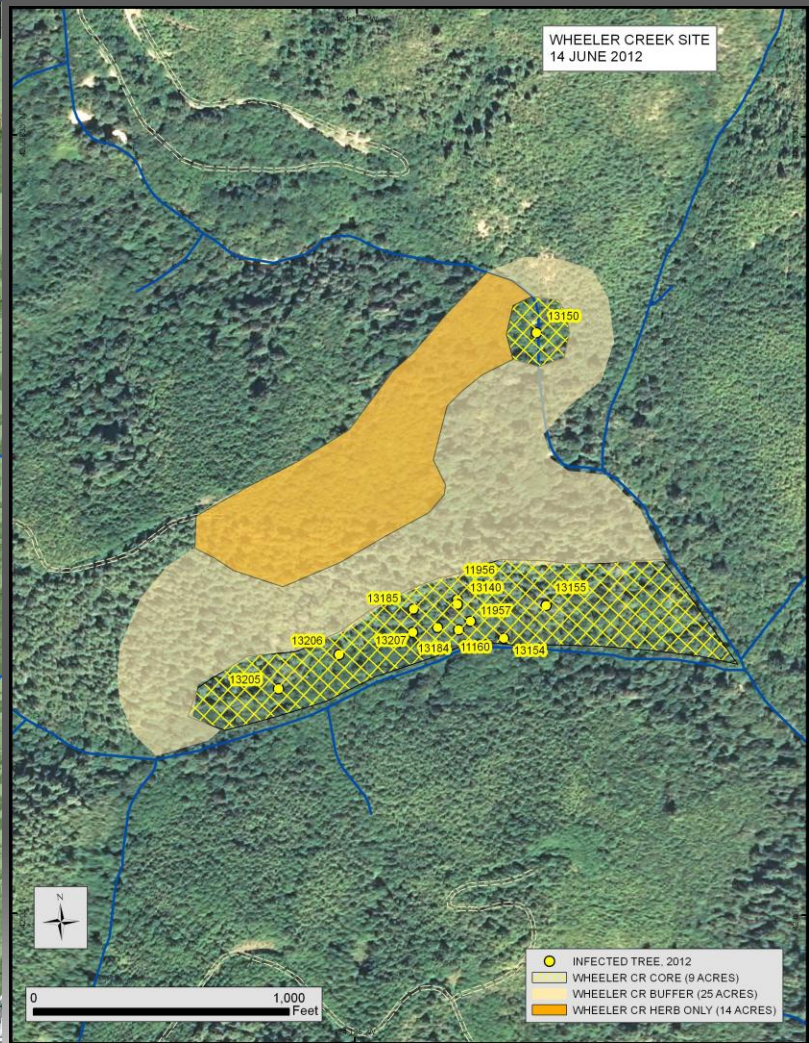
SOD task force determines treatment priorities and adjusts boundaries of the GIA

Disease-free certification: site must be >1/4 mile from GIA or other infested site and found disease-free by survey

EMERGENCY QUARANTINE
May 2012

Wheeler Creek Infestation (USFS)

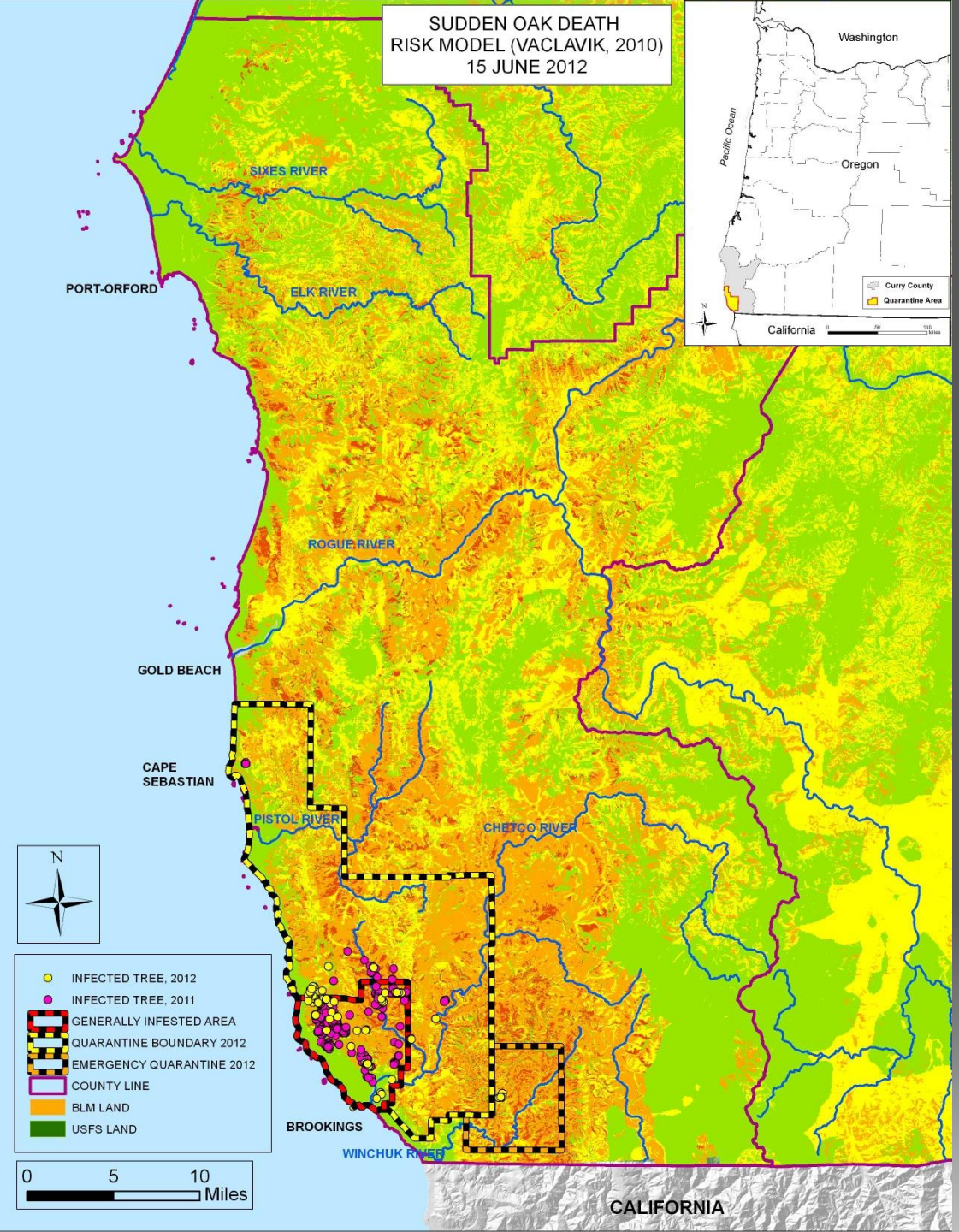




A sustainable program to slow spread of *P. ramorum* and delay economic and environmental impacts

1. Continue early detection and delimitation surveys
2. Treat highest priority sites for slowing disease spread (Type 1 sites)
3. BLM and USFS will treat <u>all</u> sites on their ownerships
4. Reduce inoculum within the GIA through cost-share for treatments (Type 2 sites) and best management practices (BMP)
5. Prevent long-distance spread through education, enforcement of quarantine regulations, BMPs
6. Encourage tanoak utilization in areas where disease spread is likely
7. Annual budget (detection surveys and treatments): $1-1.2 million (?)

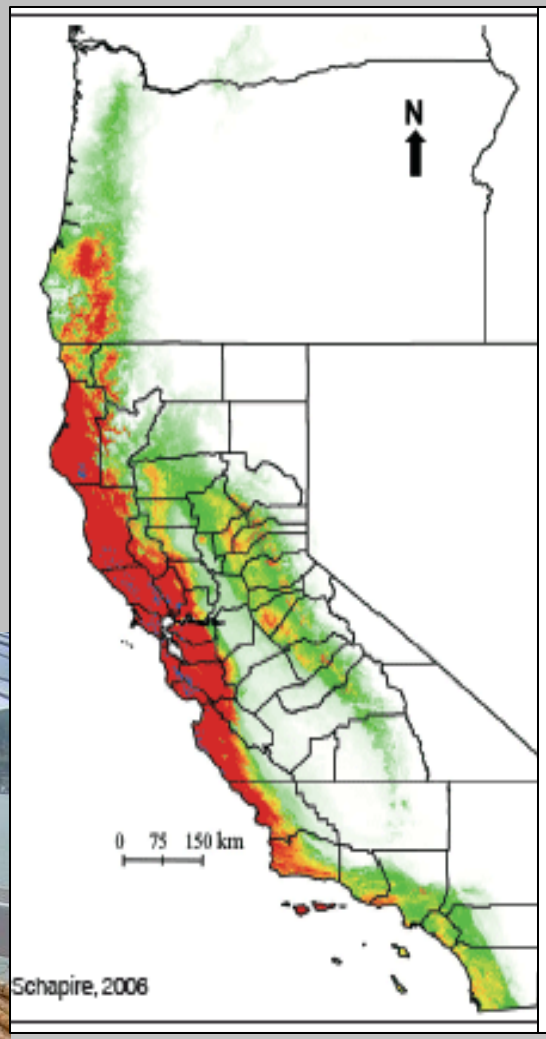
Risk Model (Vaclavik et al , 2010)

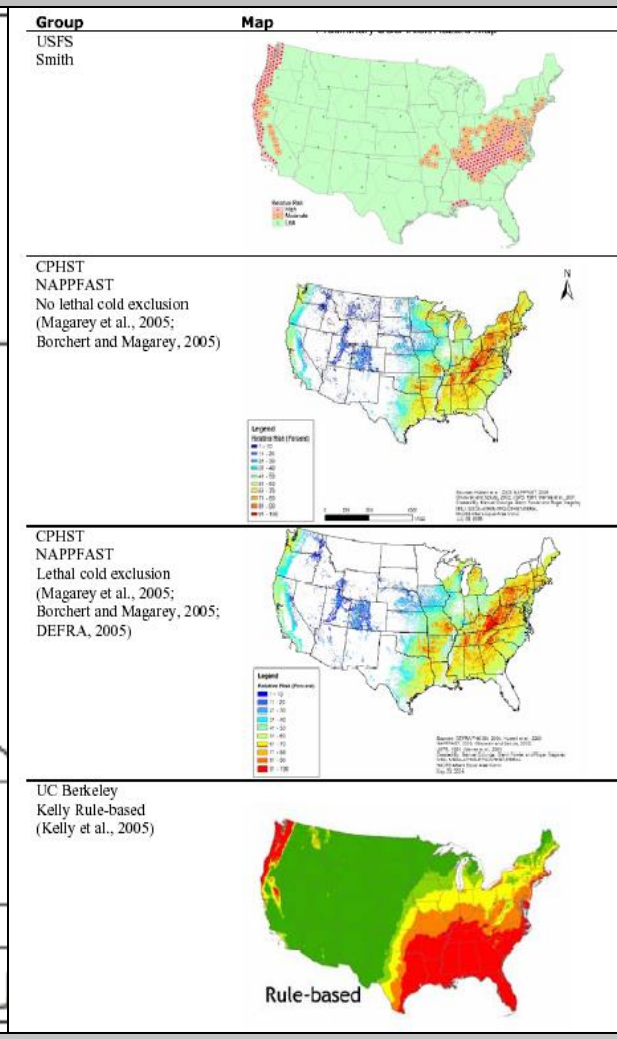


What is at risk?

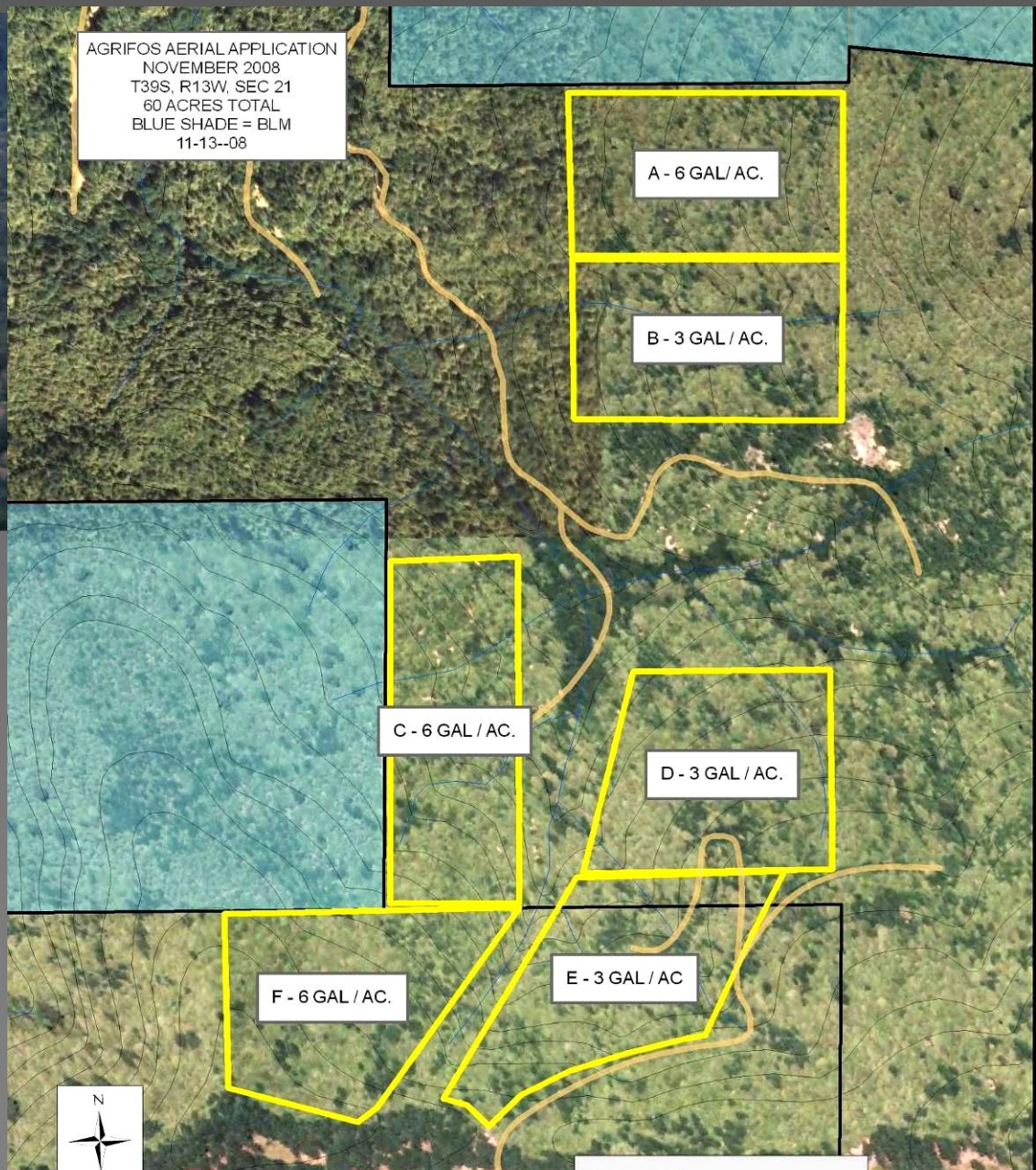
- Tanoak & other ecosystems
- Nursery and forest products industries:
  - Increased production costs due to regulations
  - Loss of domestic and international markets

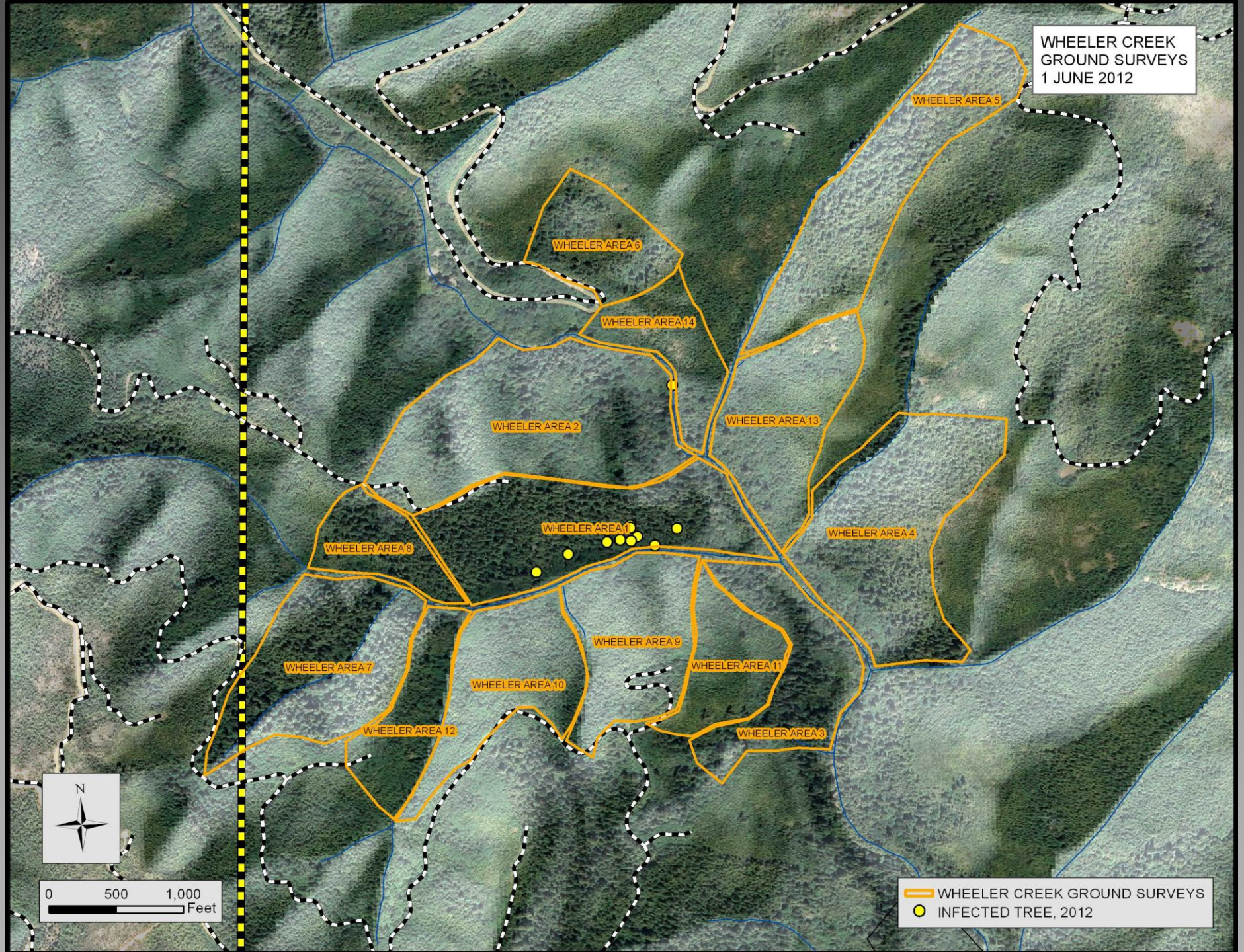
Courtesy of John Browning, Weyerhaeuser Company





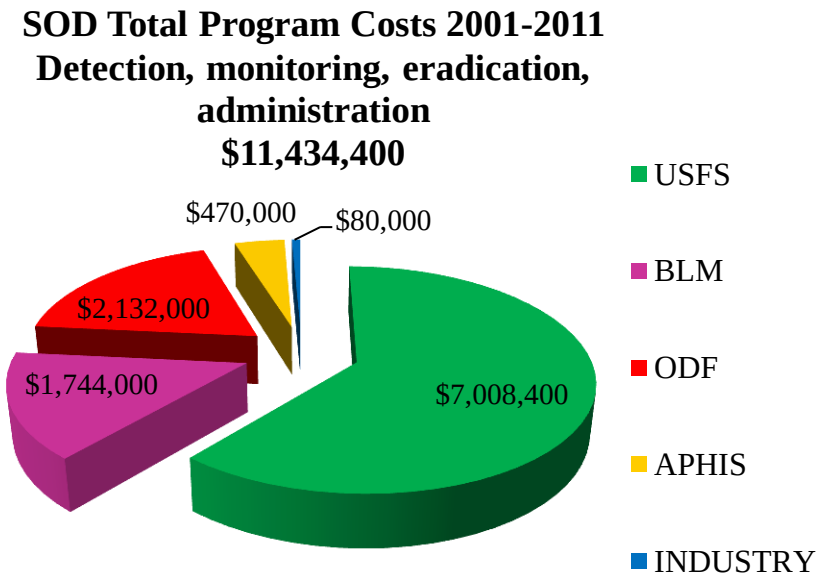
AgriFos 400 (phosphonate) Aerial application

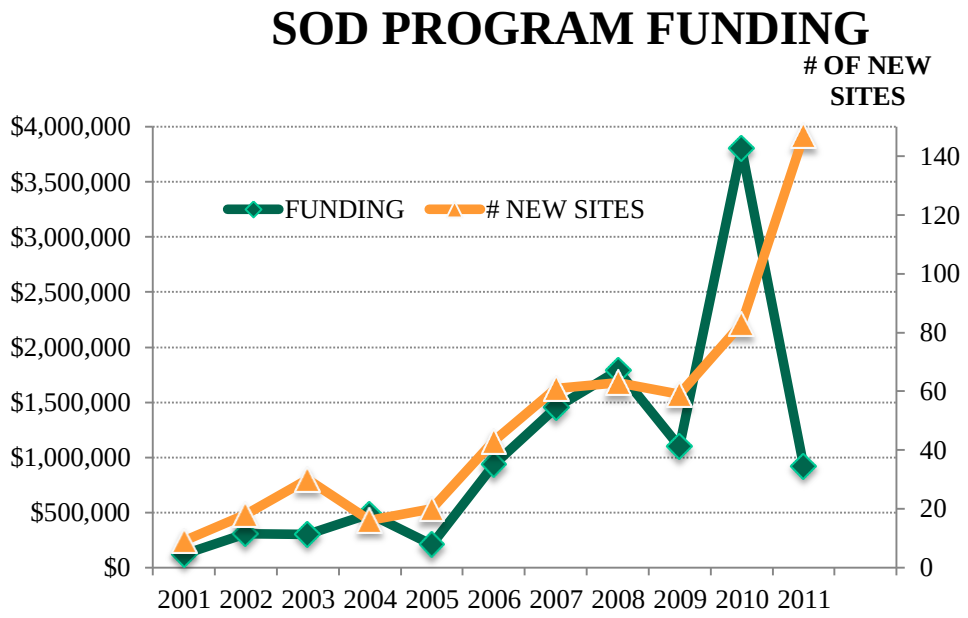


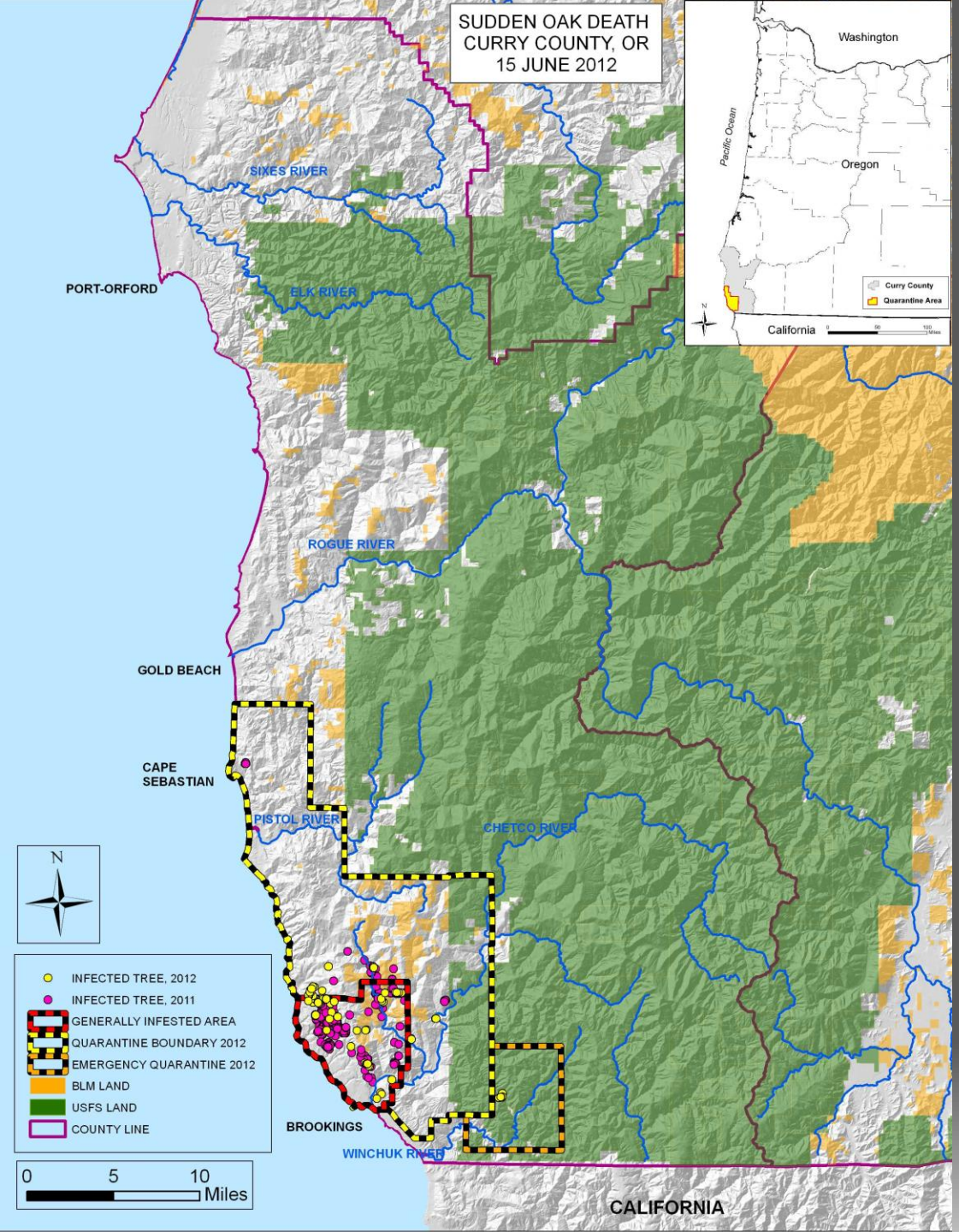

WHEELER CREEK
GROUND SURVEYS
1 JUNE 2012
WHEELER AREA 5
WHEELER AREA 6
WHEELER AREA 14
WHEELER AREA 2
WHEELER AREA 13
WHEELER AREA 1
WHEELER AREA 4
WHEELER AREA 8
WHEELER AREA 9
WHEELER AREA 7
WHEELER AREA 11
WHEELER AREA 10
WHEELER AREA 12
WHEELER AREA 3
N
0
500
1,000
Feet
WHEELER CREEK GROUND SURVEYS
INFECTED TREE, 2012

Turning point

- The disease is intensifying and spreading in several areas
- Funds currently available and anticipated will not be sufficient to treat all sites.
- Quarantine regulations have been revised (effective March 20, 2012)





Does not include OSU research or the nursery program

REVISED QUARANTINE