



Pacific Southwest Region Vegetation Mapping and Monitoring Programs

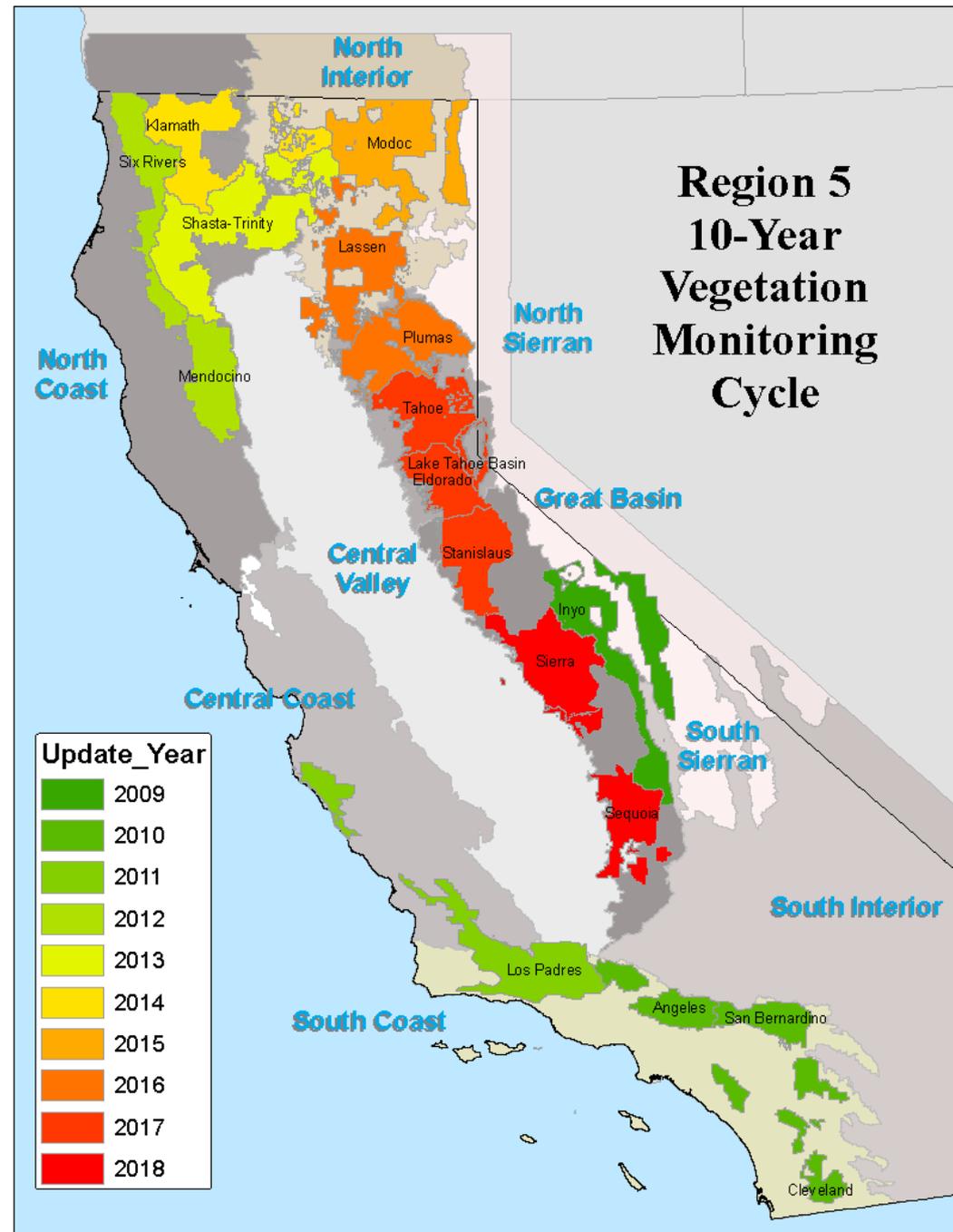
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Lisa Fischer (Forest Health Protection)**

Region 5 USDA Forest Service

October 19, 2009

The Monitoring Cycle

- Step 1 - Imagery Acquisition
- Step 2a - Change Detection and Cause
- Step 2b – Veg Map Updates
- Step 2c – Re-measure FIA plots
- Step 3 – Inventory compilation, AA and reporting



Classification, Mapping and Inventory Relationships

- Classification provides the **what**
 - Provides the basis for map unit designs, definitions of vegetation map attributes and map legends
 - Time independent
- Mapping is the **where**
 - Provides spatial relationship of map features on the earth surface
 - Time dependent (“snapshot” in time)
- Inventory is the **how much**
 - Provides the estimates of amount and frequency of basic vegetation sampled components
 - Provides information for classification routines
 - Can be the basis for map accuracy
 - Time dependent

Cooperative Projects

- LCMMP

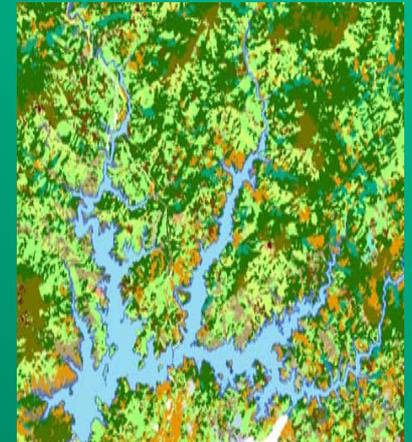
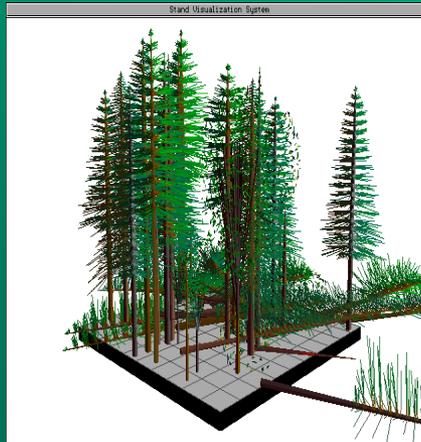
- Statewide vegetation map

- Statewide fuels database



Connected Program Areas

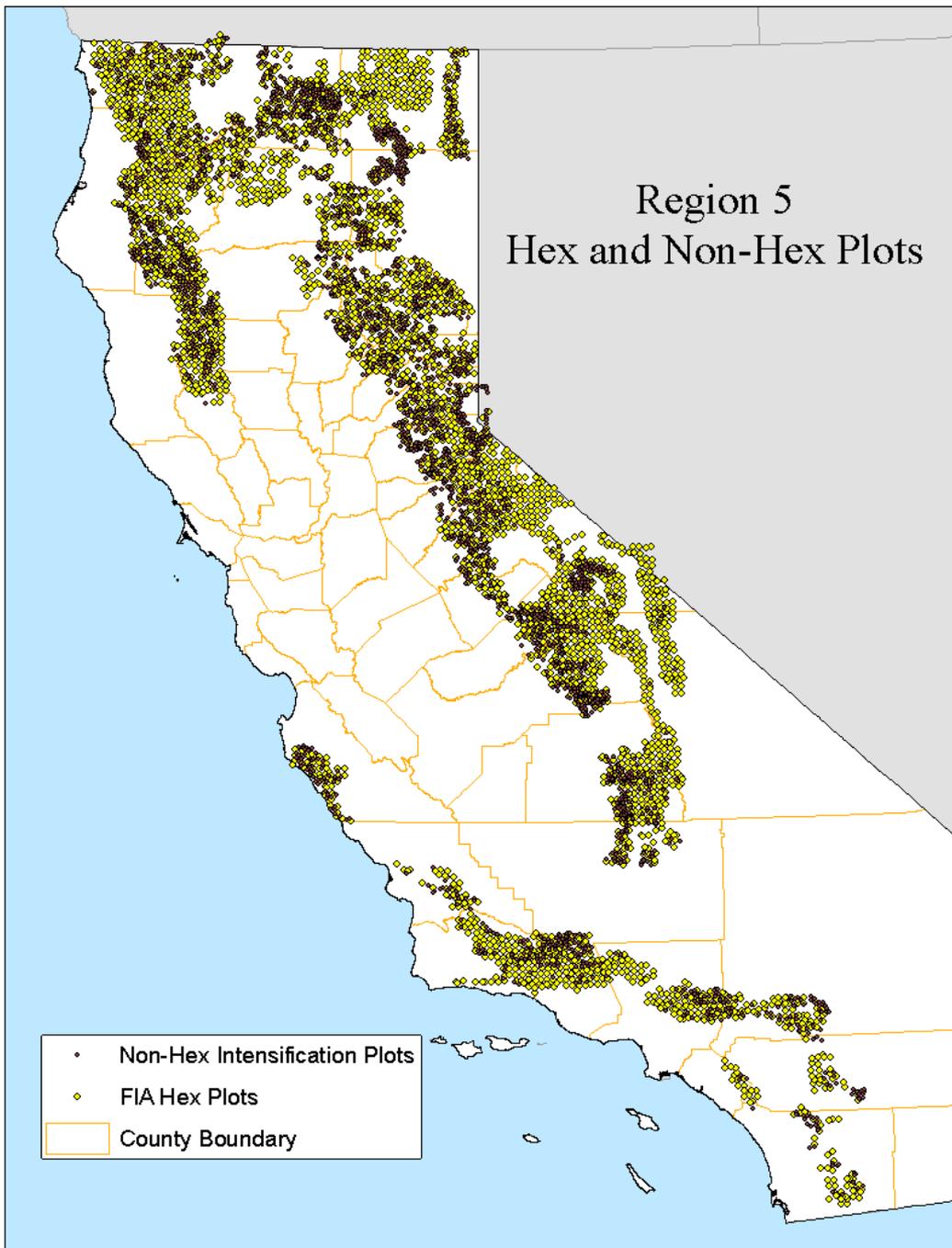
- Forest Inventory - growth, mortality assessment
- Wildlife Habitat – WHR types and structures
- Fire Behavior Model inputs - crown bulk density, height to crown base, tree cover and fuel layers
- Insect and Disease Risk Mapping - forest type and stand density
- Fireshed Analysis – fire behavior, timber values
- Watershed Analysis – baseline conditions
- Forest Plan Monitoring – old growth, TES Habitats, trend analysis, forest health, habitat fragmentation
- Treatment areas - identification of thinning opportunities



Core Program and Opportunities for Add-ons

- National core
 - Consistent definitions, codes, methods and data recording on all forested lands, and all ownerships, throughout the United States
- Regional add-ons
 - Field measured data items that are of regional interest determined by Station and NFS

FIA Plot Intensification



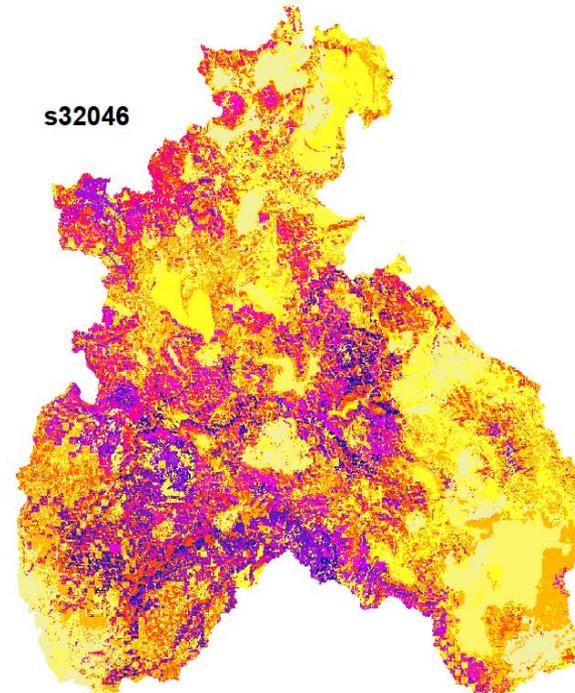
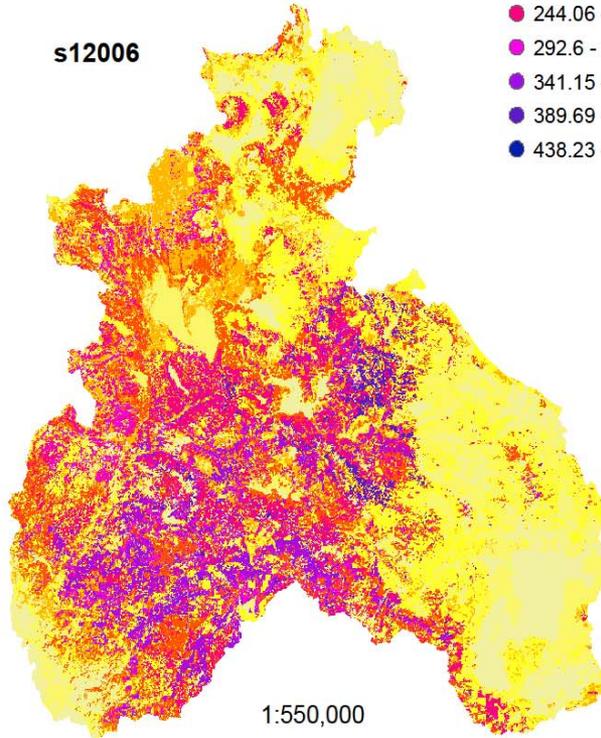
- Rare types
- Ecological significance
- Land management issues

Differences in BDTs/Ha
between Scenario 1 2006,
Scenario 1 2046, and
Scenario 3 2046

s12046



s12006



s32046

1:550,000

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BDTsPerHa_3Scenarios.mxd

Pacific Southwest Region Forest Health Monitoring Programs



Forest Health Monitoring Programs
Pacific Southwest Region

Forest Health Protection – Forest Health Monitoring Programs

Mission

Integrate state-of-the-art technology including remote sensing, GIS, geospatial modeling, aerial survey and field reconnaissance to deliver products, tools and information to our cooperators in support of forest health monitoring programs

Pacific Southwest Region – Region 5 Forest Health Monitoring Programs

- **Insect and Disease Atlas**
- **Insect and Disease Risk Modeling**
- **Aerial Survey**

Insect and Disease Atlas

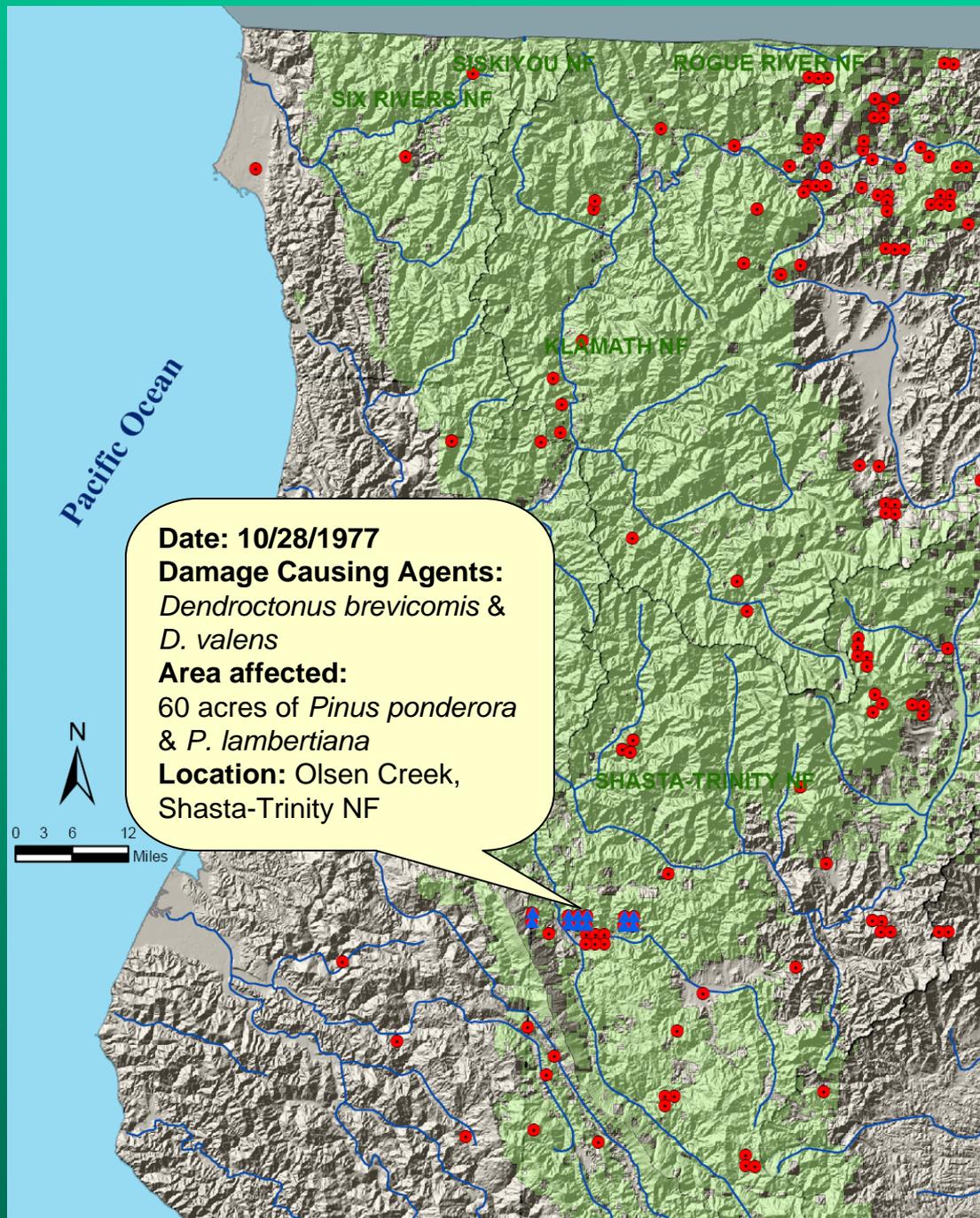
- **GOAL:** develop a geospatial and tabular historic database of insect and disease activity across the state of CA
- Specific objectives include: tracking pest trends, facilitating exploring spatial patterns and assisting with aerial survey accuracy assessments
- Over 7,000 pest records included in database dating back to 1930's
- Part II of the project will add plot data and an annotated bibliography for pathogens and insects throughout state of CA, delivered through a web based interactive map-tool

Insect and Disease Database Output

Data will be made available online in the following formats:

- ARC Geodatabase
- PDF Maps
- Google Earth
- Google Maps

<http://www.fs.fed.us/fhp>

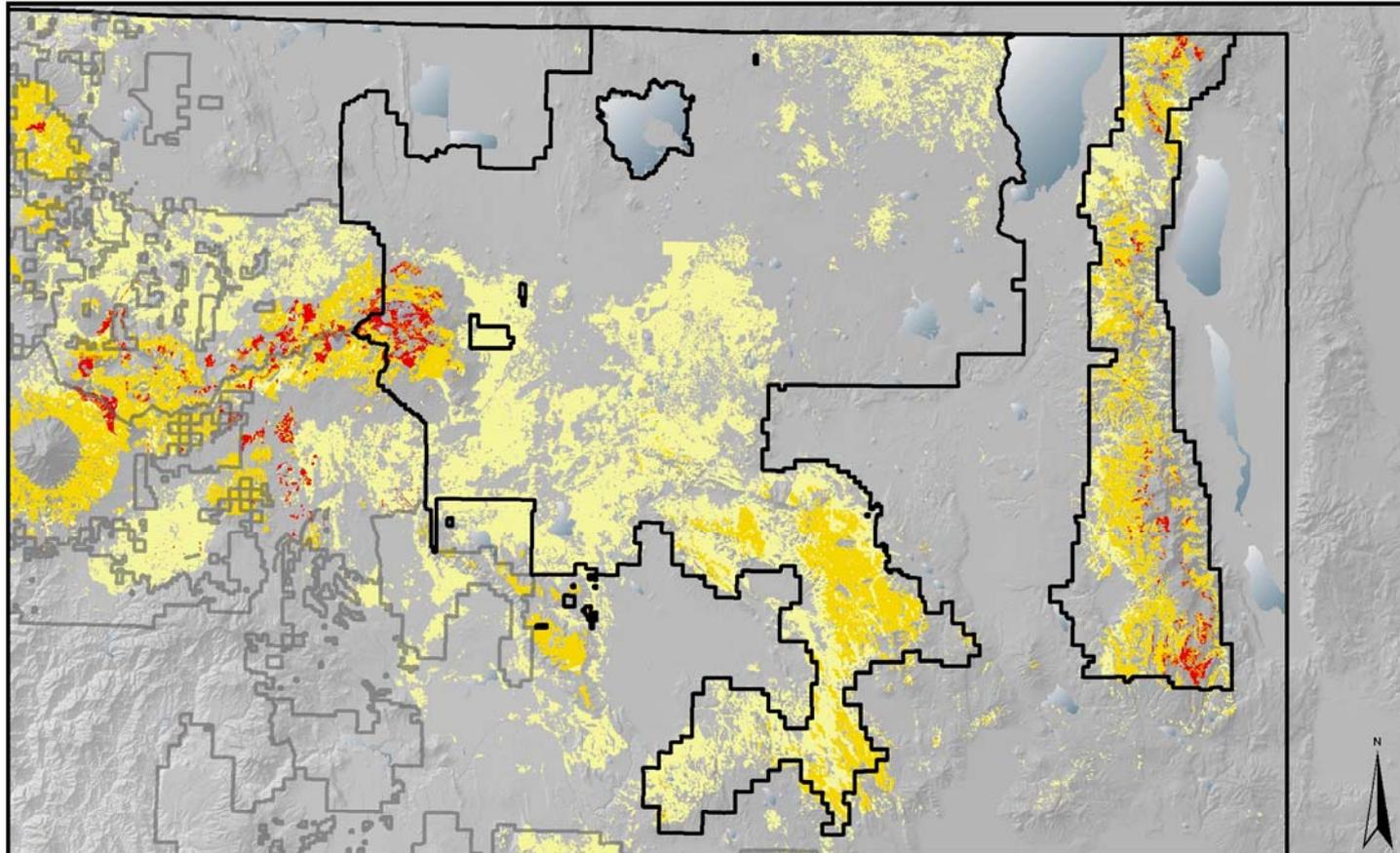


Insect and Disease Risk Modeling

- National level program carried out by all Regions to develop a standardized set of modeled data for insect and disease risk and susceptibility
- National risk maps and models are complete at the 1KM scale, update in process to 30M scale
- Regional risk maps and models complete for all National forests and state and private lands – currently at 30M scale
- Process includes a multi-criterion model, iterative process utilizing plot derived host datasets and other environmental parameters including precipitation, temperature, slope, elevation, etc.

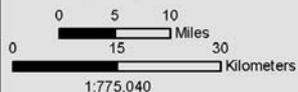
Insect and Disease Risk Modeling

Modoc and Surrounding Forested Area



Insect and Disease Risk, Modoc National Forest

Risk is defined as a 25 percent or more volume loss over the next 15 years including background mortality.



Aerial Detection Survey

- National program to detect current year mortality, includes special surveys as needed
- Fly approximately 44 million acres of state, private, and federal lands annually
- Support Del Norte County with SOD surveys and assist the Cal Poly SLO SOD survey
- Conduct special projects including mapping oak and aspen decline on the Eagle Lake and Almanor R.D.s
- Data available within 1 week of flight on web
- Produce an annual report available in hardcopy and on the web

Bark Beetles in White Pine and Lodgepole Modoc National Forest



Aerial Detection Survey Data: Google Maps

Lake Tahoe Basin Mortality, 2007 - Google Maps - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://maps.google.com/maps?f=q&hl=en&geocode=&time=&date=&type=&q=http://www.fs.fed.us/r5/spt/thp/thm/aerial/2007/ltbmu_07.kmz Janice pronounce

iGoogle

State and Private Forestry - Welcome! Lake Tahoe Basin Mortality, 2007...

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Google Maps

e.g., "10 market st, san francisco" or "hotels near lax"

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Search the map Find businesses

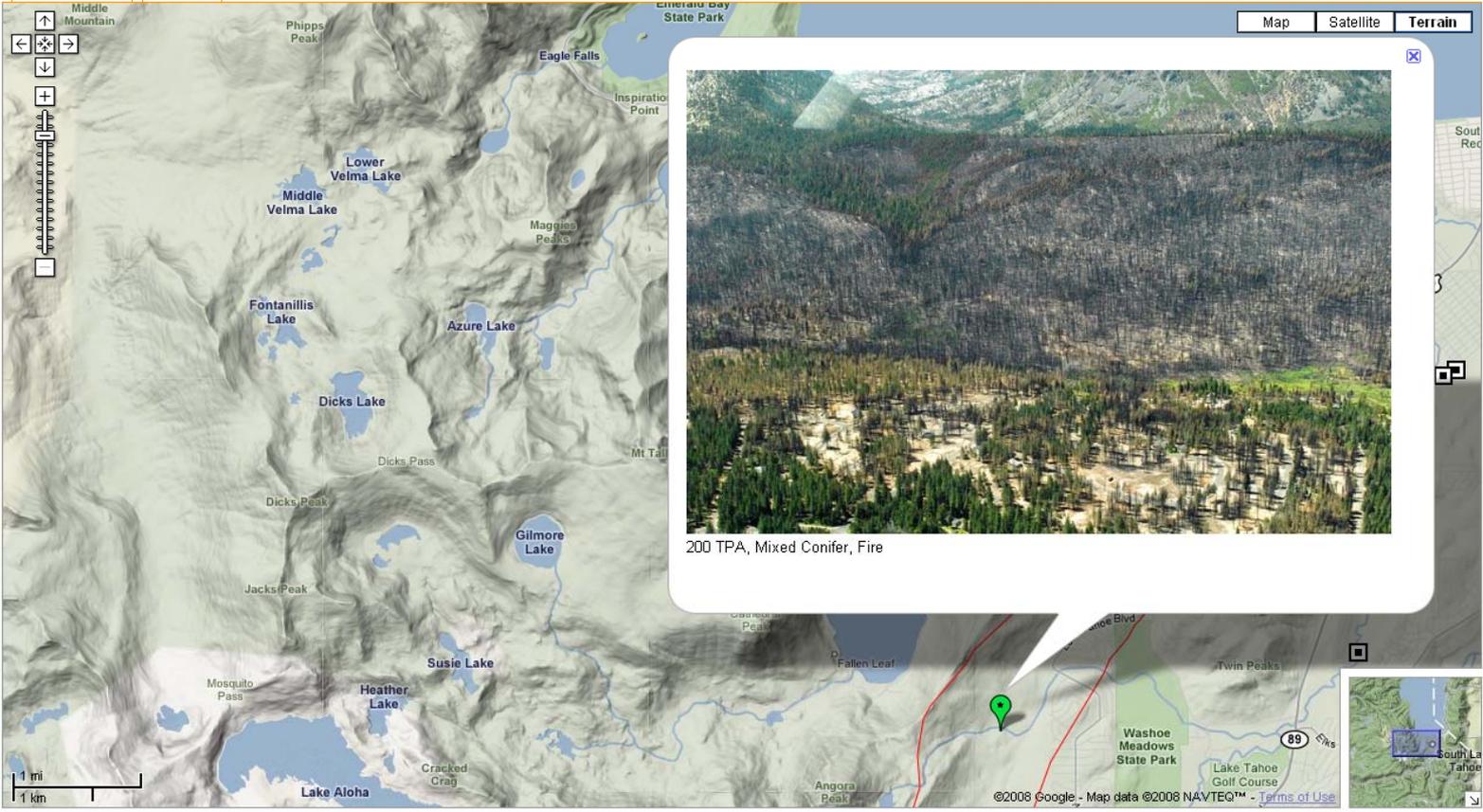
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Map Satellite Terrain



200 TPA, Mixed Conifer, Fire



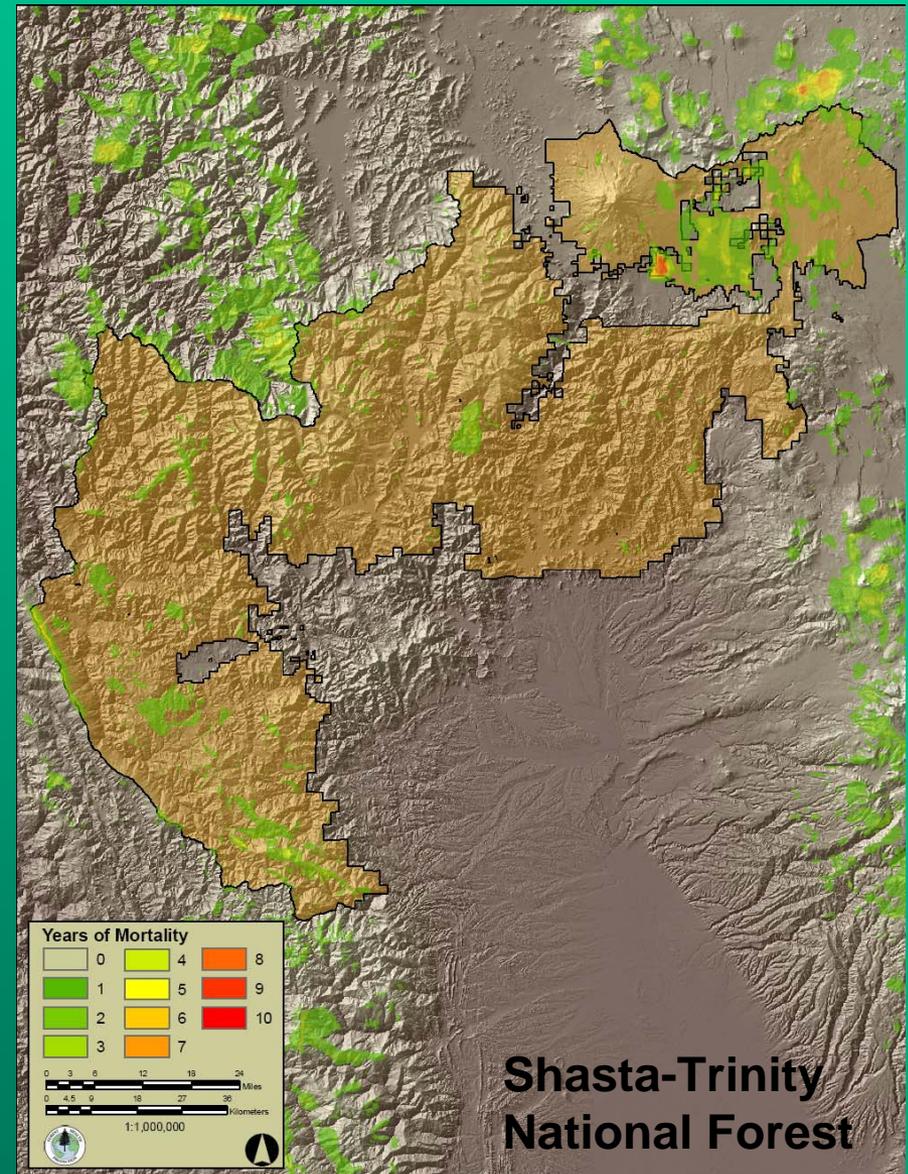
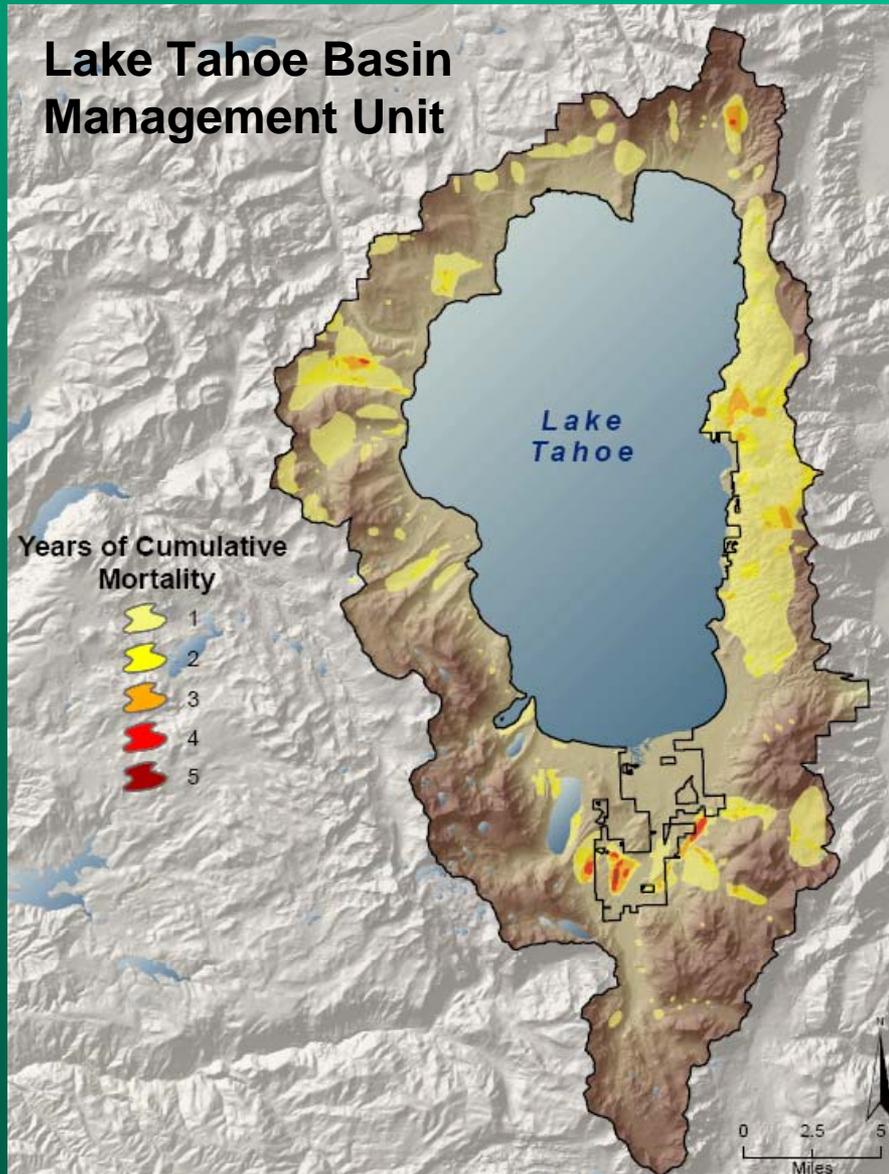
1 mi
1 km

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Done

Idle

Cumulative tree mortality detected aerially (1995-2006)



Aerial Survey Ground Checks

- **Goal:** Conduct ground surveys to provide quality assurance / quality control of aerial observations and to make reasonable adjustments to the Aerial Detection Survey data
- National standardized protocols have been field tested and implemented for follow-up ground surveys
- Work with Shared Service Areas to visit areas where significant events have been identified

Reporting

- **Annual Reports:**
 - Pest Conditions Report
 - Forest Health Highlights
 - Aerial Survey Reports
 - Special Interest Reports
 - Pest Alerts
 - Western Bark Beetle Report
 - National Pest Events Database
 - Website – www.fs.fed.us/r5/spf/fhp.htm