



## California Oak Mortality Task Force 2001/02 Accomplishments

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This document reviews the accomplishments of the California Oak Mortality Task Force (COMTF) for fall 2001-2002. Overall accomplishments of the entire COMTF are listed first, followed by accomplishments in the following major categories: Regulations; Education; Biomass Utilization; Management & Fire Protection; Monitoring; and Research.

The Task Force is coordinating California's Sudden Oak Death program. *Phytophthora ramorum* poses a serious threat to forests worldwide. Since the pathogen's distribution is limited, an aggressive and comprehensive program is needed to minimize pathogen spread. Individuals, agencies, and businesses, need guidance on how to prevent pathogen establishment and spread, recognize symptoms, practice proper sanitation, and where to go for additional assistance. Communities also need assistance to maintain public safety in infested areas.

For further information, see the California Oak Mortality Task Force 2002/03 Sudden Oak Death Program (December 2002) and other documents at [www.suddenoakdeath.org](http://www.suddenoakdeath.org) or contact the California Oak Mortality Task Force Coordinator, Lucia Briggs, at [lbriggs@nature.berkeley.edu](mailto:lbriggs@nature.berkeley.edu) or 510-642-5938.

### **OVERALL TASK FORCE ACCOMPLISHMENTS**

- Continued to build a coalition for Sudden Oak Death (SOD) in California and coordinated California's SOD program.
- Provided a forum for information exchange and kept members up to date on key SOD issues and findings. Assisted agencies/individuals working on SOD by making sure they had the best available information. Issued a monthly newsletter to the California Board of Forestry and Fire Protection and task force members. Posted monthly update to website.
- Hired new statewide coordinator and two new regional educational coordinators to get SOD information to interested parties.
- Provided technical info on SOD to legislators, reporters, and others. Identified SOD budgets, priorities, and needs for research, management, monitoring, and education.
- Problem-solved and improved relationships between agencies working on SOD.
- Provided a vision of the priorities for SOD in the state, articulated the key tasks needed to meet the needs, and identified appropriate people to handle tasks.
- Coordinated research funding so that limited dollars were targeted at highest priority needs.
- Provided credibility for SOD program that instilled confidence and encouraged additional funding.

## **REGULATIONS**

- Provided summaries, updates, and guidance for enforcement of changing State and Federal quarantines.
- Coordinated federal, state, and county regulatory agencies to work towards harmonization of rules.
- Worked with commodity groups to develop enforceable rules.
- Trained professionals in symptom recognition, sampling protocols, and quarantine requirements.
- Prioritized risks of SOD movement. Provided regulatory agencies with risk matrix for *Phytophthora ramorum*.
- Provided technical assistance to county, state, and federal regulators so regulatory programs were based on best available science.
- Responded to requests for SOD identification and analyzed samples. The California Department of Food and Agriculture (CDFA) lab analyzed over 1000 samples for *Phytophthora ramorum*.
- Continued outreach to local authorities, citizens and businesses on SOD. Coordinated county work plans for enforcement of *P. ramorum* quarantine. Communicated issues raised by industries, environmental groups, and individuals to regulatory agencies.
- Identified regulatory research needs for treatments, delimitation, identification of infectious plant parts and pathogen spread.
- Created a nursery focus group to identify *P. ramorum* issues and needs of nurseries and provide a forum for information exchange for the nursery industry.
- Added a co-chair from USDA-Animal Plant Health Inspection Service (APHIS) so leadership is coordinated between county, state, and federal agencies.

## **EDUCATION**

### *Publications*

- Issued diagnostic guide to diseases caused by *Phytophthora ramorum*. Posted to web, featured in national forestry journal, and utilized by Canada's regulatory program.
- Developed, duplicated, and distributed trailhead posters.
- Developed SOD poster and have used it at various venues including the State Fair.
- Included basic SOD information in Arbor Day packets to California teachers.
- Developed and provided basic SOD information sheet to 5,000 mountain bikers in Monterey County for the Sea Otter Classic mountain bike race.

- Published numerous popular SOD papers (Oaks 'n Folks, International Oak Society Newsletter and Journal, etc.).
- Developed SOD Chronology, briefing papers, budget history.

#### *Outreach*

- Provided field training for over 600 professionals in disease recognition, sampling protocols, and regulations. Assisted in the coordination and implementation of numerous training events, including those for Registered Professional Foresters and arborists.
- Assisted in coordination and implementation of Task Force meetings.
- Assisted with the Art of Saving Oaks SOD educational event.
- Assisted local groups (Marin Releaf) with SOD-themed events.
- Provided numerous presentations and handouts on SOD to various audiences including: the Society of American Foresters, the National Association of State Foresters, USDA-Forest Service tribal program managers, culturists, and timber management officers, California legislators, County supervisors, University of California, College of Natural Resources, Pesticide Applicators Professional Association, Whiskeytown National Recreation Area, Humboldt, Mendocino and Sonoma Counties, Western International Forest Disease Work Conference, California Native Plant Society, Girl Scouts, students at Santa Rosa Junior College, City College of San Francisco, neighborhood groups, and many others.

#### *Acquisitions*

- Hired web designer and completed substantial work to revise website.
- Acquired outdoor display cases to be used at Pfeiffer Big Sur State Park and China Camp State Park solely for SOD information.
- Secured Northern and Southern Regional Coordinators for next year.

### **BIOMASS UTILIZATION**

- Developed SODBusters project, gained approximately \$1 million in funding, working with UC Forest Products Lab to implement project to utilize and contain infested plant materials.
- Convened a hearing of concerns with the regulatory agencies, moving toward greater utilization of biomass from SOD as well as furthering the understanding federal regulators have to the problems faced from this pathogen.
- Developed a cogeneration-plant-risk assessment and encouraged further work in risk assessment for biomass.

- Highlighted the potential for biomass utilization via composting and burning at the May 2002 COMTF meeting.
- Worked with Fire Safe Marin to complete photo-mapping of dead trees in Marin County.
- Worked with UC-Forest Products Laboratory to provide log material for utilization project.
- Assisted in the development of Best Management Practices for handling of SOD materials.

### **MANAGEMENT & FIRE PROTECTION**

- Restoration Guidelines developed and approved –  
“RESTORATION OF OAK WOODLANDS IMPACTED BY SOD”.
- Homeowner's Guidelines developed and published –  
“SOD - CONSIDERATIONS FOR HOMEOWNERS AND OTHERS WHO LIVE IN INFESTED AREAS AND ARE CONCERNED ABOUT THEIR OAK TREES”.
- Revision of the Interim Management Guidelines –  
“INTEGRATED PEST MGMT GUIDELINES FOR SOD”.
- Assisted in development of Forest Practice Best Management Practices for sites with SOD.
- Assisted in the development of Best Management Practices for handling SOD-infected material.
- Helped establish criteria for and reviewed County Hazard Tree Assessment, Removal, and Restoration plans.
- Reviewed SOD delimitation and eradication options, developed draft guidelines, and initiated dialogue with state and federal regulators regarding these issues.
- Sudden Oak Death Fire Behavior Study: Compiled pre- and post-fire observations, analyzed data, and presented results at December 2002 SOD Science Symposium.
- Assisted in development of Fire Protection Measures for preventing the spread of SOD for the USDA-Forest Service and California Department of Forestry and Fire Protection.

### **MONITORING**

- Maintained up-to-date spatial database of SOD.
- Provide access to up-to-date spatial database via:
  - Maps
  - Web (OakMapper site)
  - Text reports

- Develop survey for determining presence of SOD in California
  - *Spatial Analysis*:
    - Risk Assessment and Mapping;
    - Remote Sensing;
    - Aerial survey to detect mortality areas;
  - *Ground-based surveys*:
    - Forest Inventory and Analysis (FIA) Plots;
    - Systematic ground-based surveys for distribution of *P. ramorum* on leaf spot or twig dieback hosts;
    - Nursery Survey;
    - Statewide Urban Areas Survey;
    - Early Detection in the Sierra Nevada.
  - *Diagnostic, GIS database and map support*:
    - Field and laboratory diagnostic support;
    - GIS database and map support;
    - Host maps.
  
- Coordinate survey completion

## RESEARCH

The Task Force coordinated research funding so limited dollars were targeted at highest priority needs. Below is a partial list of funded projects to date.

The Task Force also collaborated on the Sudden Oak Death Science Symposium, held in December 2002 in Monterey.

### **Sudden Oak Death Funded Research Projects to Date**

<b>Topic</b>	<b>Investigator</b>	<b>Amt./Agency</b>
Mechanism of long and short range spread of sudden oak death	Keyt Fischer, Wildlife Conservation Society	2002-3: \$45,000; 1 yr., PSW/CDF
Studies on treatment for the prevention, management, and sanitation of sudden oak death disease, with particular emphasis on chemical treatments and composting	Matteo Garbelotto, UC Berkeley	2002-3: \$152,000; 2 yr., PSW/CDF
Detection and identification of decay and pathogenic fungi directly from wood. A novel approach for the assessment of decay and disease in trees affected by sudden oak death	Matteo Garbelotto, UC Berkeley	2002-3: \$40,107; 1 yr., PSW/CDF
Biology and epidemiology of <i>P. ramorum</i> in Oregon	Everett Hansen, Oregon State Univ.	2002-3: \$118,000; 1 year, PSW/CDF
Ecological impacts of SOD on coast live oak and tanoak/redwood ecosystems	Kevin O'Hara, UC Berkeley	2002-3: \$35,000; 1 yr., PSW/CDF
To study a method of potential transmission of sudden oak death by birds	C.J. Ralph, USFS-PSW	2002-3: \$74,000; 1 yr., PSW/CDF
Disease progression and sporulation potential of <i>P. ramorum</i> on non-oak hosts	Dave Rizzo, UC Davis	2002-3: \$210,000; 3 yr., PSW/CDF
Epidemiology, biology and impact of <i>P. ramorum</i> in the	Dave Rizzo, UC Davis	2002-3: \$210,000; 3

Sierra Nevada		yr., PSW/CDF
Interactions of bark and ambrosia beetles with <i>P. ramorum</i> in coast live oaks and their role in tree failure	Richard Standiford, UC Berkeley	2002-3: \$75,000; 2 yr., PSW/CDF
<i>P. ramorum</i> canker in coast live oak and tanoak: factors affecting disease risk, disease progression and failure potential	Ted Swiecki; Phytosphere Research	\$50,415; 1 yr., PSW/CDF
Relationships between tree failure potential and <i>P. ramorum</i> canker	Ted Swiecki; Phytosphere Research	2002-3: \$49,000; 1 yr., PSW/CDF
Evaluation of fungicides for the control of <i>P. ramorum</i> infecting containerized Rhododendron spp.	Steve Tjosvold, UC Coop. Ext.	2002-3: \$18,000; 1 yr., PSW/CDF
<b><i>Phytophthora ramorum</i> pathology/ecology:</b> (1) Determine the mechanisms of survival, spread, and intensification of SOD; (2) determine the population structure, mating genetics, and species status of the new <i>Phytophthora</i> ; and (3) determine the susceptibility of host species within and beyond California.	Dave Rizzo, UC Davis	2001-2: \$270,000; 2 years, PSW
<b><i>Phytophthora ramorum</i> evolution and diagnosis:</b> 1) Determine the phylogenetic placement and evolutionary history of this new <i>Phytophthora</i> ; and (2) develop methodologies for quick and accurate diagnosis of the new <i>Phytophthora</i> .	Matteo Garbelotto, UC Berkeley	2001-2: \$305,000; 2 years, PSW
<b>Coast live oak thinning plots:</b> Collect and analyze volume, growth, yield, and economic data from a series of thinned and unthinned permanent oak dominated plots established in 1984 in Monterey, San Luis Obispo, and Santa Clara counties (all counties with positive ID of SOD). Starting this year these plots will also be assessed for the presence, incidence, and effect of SOD on thinned and unthinned plots throughout the study areas.	Norm Pillsbury, Cal Poly SLO	2001-2: \$52,000; 3 years, PSW

<p><b>Utilization of Wood Products:</b> Research is aimed at: (1) analyzing the technical feasibility of using <i>Phytophthora</i>-infected material for wood products including composite, solidwood, and fuel and firewood (chips, firewood, and densified fuel); (2) assessing the risk of pathogen survival in processed products; and (3) testing control methods for wood products including heat, chemical and other typical wood pathogen control methods, i.e., heat sterilization and the effect of temperature and its correlation with wood thickness and moisture content, and the effectiveness of sodium borates. In addition the Forest Products Laboratory will provide PSW with a SOD Research Program Coordinator whose responsibilities include: (1) development of a program of research through partnerships with academia, state and other private and public entities; (2) recruitment and negotiation of research agreements; (3) tracking progress of PSW funded research; (4) representing PSW at all appropriate local, regional, national, and international meetings concerning SOD; (5) providing assistance to the PSW management team to effectively utilize appropriated funds; (6) ensuring Forest Service recognition of research efforts; and (7) initiate and organize meetings of research cooperators to coordinate research and utilization of research sites.</p>	<p>Frank Beall, UC Forest Products Lab</p>	<p>2001-2: \$216,000; 2 years, PSW</p>
<p><b>A Cytological/Histological Study of <i>Lithocarpus</i> spp. and <i>Quercus</i> spp. infected with <i>P. ramorum</i></b> (1) Study the infection process of <i>P. ramorum</i> in <i>Lithocarpus densiflorus</i> and <i>Quercus</i> spp.; (2) Gather cytological and histological data to facilitate answering the following questions: (a) What is the portal of entry into the host? (b) What is the sequence of tissue infection?</p>	<p>Edwin R. Florence, Biology Dept., Lewis &amp; Clark College, Portland, OR</p>	<p>2001-2: \$15,000; 1 year, PSW</p>
<p><b>PSW Research Station Post-Doctoral Plant Pathologist.</b> Salary and overhead support for the position will come from PSW research appropriations, the SOD program will provide operating funds, starting with \$70,000. The incumbent's primary research responsibility is to develop the necessary protocols for testing laboratory susceptibility and field infection rates of SOD on various species of oaks, both those native to California and elsewhere in the United States. The incumbent will be given a term appointment and be housed in the laboratory of Dr. Rizzo, University of California, Davis, which has the necessary equipment and expertise to guide this research.</p>	<p>PSW/UC Davis</p>	<p>2001-2: \$70,000 per year, PSW</p>
<p><b>Tree Physiology, Disease Progression and Risk</b> The objectives of this research are to (1) remeasure stem water potentials of symptomatic and non-symptomatic coast live oak and tanoak to document any changes in water stress over this period and asses the relationship between water stress and disease progress; (2) reassess</p>	<p>Ted Swiecki, Phytosphere Research, Vacaville, CA</p>	<p>2001-2: \$33,924; 1 year, PSW</p>

<p>disease occurrence and severity of coast live oak and tanoak subject trees and plot trees one year after initial evaluations to document disease progression; (3) collect data on additional selected plot and tree variables that may be related to disease;(4) refine statistical models that relate disease risk with water stress and plot variables and develop disease progress models.</p>		
<p><b>Oak Genetic Architecture and Possible Resistance</b>  The objectives of this research are to (1) assess genetic architecture of tanoak, coast live oak, California black oak and Shreve oak using AFLP molecular markers; (2) look for correlated genetic markers and disease resistance in the 4 species; (3) develop rapid methods of genetic fingerprinting for identifying resistant genotypes; (4) determine whether populations with low genetic diversity are at higher risk of loss from disease (4) predict the risk of disease in populations net yet infected.</p>	<p>Richard Dodd, UC Berkeley</p>	<p>2001-2: \$135,922; 2 years, PSW</p>
<p><b>Long-term Disease and Symptom Progression</b>  The objectives of this research are to (1) detect newly infected trees in plots where year 2000 baseline conditions are known; (2) place intensive monitoring plots in areas of infected forests in both the northern and southern limits; (3) determine the sequence of symptom appearance for each tree species and the time from initial seeping canker observation to the development of additional symptoms i.e. bark beetle attack, appearance of fruiting bodies of <i>Hypoxylon thouarsianum</i>, foliage death;(4) follow the physical breakdown of infected trees after death; (5) correlate the infection status of trees determined through ground-level inspection with remote-sensed multi-spectral reflectance; (5) develop predictive models for tree infection and mortality as a function of tree populations.</p>	<p>Richard Standiford and N. Maggi Kelly, UC Berkeley</p>	<p>2001-2: \$51,542; 1 year, PSW</p>
<p><b>Ecological Impacts of SOD</b>  The objectives of this research are to (1) compare and contrast stand structure, species composition and environmental characteristics in coast live oak woodlands in currently infected and non-infected stands in Marin, Napa, Alameda, and Contra Costa counties; (2) use historic Vegetation Type Map data to locate additional plots to examine historic vegetation change in coast live oak communities; (3) determine the relationship of spatial patterns of individual stems to patterns of disease spread; (4) reconstruct height and diameter development of stands under various levels of infections; (5) establish thinning and burning plots to assess the effect of alterations in stand structure on disease spread; (6) determine if the composition and relative abundance of birds, mammals, and herpetofuana is affected by SOD and associated stand structure;(7) determine the effects of an change in stand</p>	<p>Barbara Allen-Diaz, Donald Dahlsten, Kevin O'Hara, Scott Stephens, William Tietje, UC Berkeley</p>	<p>2001-2: \$340,305; 2 years; PSW</p>



structure on the abundance, species composition, productivity, roosting, and foraging of secondary cavity nesting birds, and on the predators of these birds;(8) compare the diets of insectivorous birds in infected areas to those of in non-infected areas; (9) determine how insect species of particular importance to the diet of secondary cavity nesting birds respond in areas affected by SOD.		
<b>Botanical Composition of SOD-infested stands</b> Collect vegetation and other ecological data on UC-Berkeley oak/tanoak decline plots at Mt Tamalpais (Marin Municipal Water District) and China Camp State Park. Put the data into Excel or other electronic format and integrate with the mortality data collected at those plots.	Dennis Odion	2000-1: \$5,000; 1 year; USDA-FS R5
<b>Field Survey of Possible Infection Sites</b> Provide pathological and entomological follow-up to the roadside survey for tanoak/oak decline being done in Summer, 2000. Sample a percentage of the tanoak/oak decline GIS database and determine what microorganisms are associated with oak and tanoak death and collect additional ecological data as needed.	Dave Rizzo, UC Davis	2000-1: \$25,000; 1 year; USDA-FS R5
<b>Pathology Isolations and Inoculations</b> Provide pathological isolation work on tanoak/oak decline. Do follow-up isolation work from samples collected in website reporting. Perform Koch's postulates on suspected agents and perform other pathological investigations.	Steve Koike, UC Coop. Extension, Monterey Co.	2000-1: \$10,000; 1 year; USDA-FS R5
<b>Field Permanent Plots and Disease Progression</b> Install additional plots in Santa Cruz and Big Sur, provide entomological observations and information for roadside survey and educational publications. Carryout investigations into the role of insects in tanoak and oak decline.	Brice McPherson, UC Berkeley	2000-1: \$10,000; 1 year; USDA-FS R5
<b>GIS Database and Website</b> Set-up and maintain a GIS database and website services for oak/tanoak decline. Take data from roadside survey, plots, and web observations and provide GIS database, map, answer queries, etc. Provide system for website reporting.	N. Maggi Kelly; UC Berkeley	2000-1: \$10,000; 1 year; USDA-FS R5
<b>DNA Identification of Phytophthora</b> Provide DNA based identification for fungi associated with oak and tanoak decline. Perform additional pathological investigation of suspect pathogens.	Matteo Garbelotto; UC Berkeley	2000-1: \$5,000; 1 year; USDA-FS R5
<b>Risk Assessment</b> Provide additional pathological investigations to support a risk assessment for the new Phytophthora species associated with Sudden Oak Death in coastal California. Perform laboratory analysis to determine if the new Phytophthora species associated with dying oaks is soil-borne, airborne, or in water; and whether it survives in	Dave Rizzo, UC Davis	2000-1: \$35,000; 1 year; USDA-FS R5

COMTF 2001-2002 ACCOMPLISHMENTS

dead wood (including firewood), chips and mulch.		
<b>Field Survey for SOD and Other Hosts</b> Determine the geographical extent of the current epidemic in oaks and other native plants. Field surveys will be developed in conjunction with other field personnel to sample for Phytophthora throughout the range of known hosts. Garey Slaughter (technician) will be the lead on the tree pathology. Shannon Murphy (graduate student) will work on other hosts (e.g., Vaccinium). Identification of Phytophthora species will be based on molecular and cultural attributes.	Dave Rizzo, UC Davis	2000-1: \$50,000; 1 year; USDA-FS R5
<b>Molecular Diagnosis and Fungicides</b> For evaluation of treatments for Sudden Oak Death and molecular work needed to support monitoring activities. Field evaluation of fungicides showing promise in lab and sapling study.	Matteo Garbelotto, UC-Berkeley	2000-1: \$45,000; 1 year; USDA-FS R5
<b>GIS Database and Monitoring</b> Maintain GIS and other monitoring activities related to Sudden Oak Death.	N. Maggi Kelly, UC Berkeley	2000-1: \$22,000; 1 year; USDA-FS R5
<b>Diagnosis and Monitoring</b> Diagnostics and monitoring in Santa Cruz and Monterey Co.	Steve Tjosvold and Steve Koike, UC Coop Extension, Monterey, Santa Cruz Co.	2000-1: \$20,000; 1 year; USDA-FS R5
<b>Role of Insects in SOD Complex</b> For evaluation of the role of insects in spread of Sudden oak death, acceleration of mortality and tree deterioration of Phytophthora infested trees. Funding is also for extension and coordination activities.	Andrew Storer, UC Berkeley	2000-1: \$10,000; 1 year; USDA-FS R5
<b>Diagnosis and Survey Methods</b> Special Technology Development project to develop diagnostic and survey methodologies for Phytophthora species associated with oak and related species in forest and woodland plant associations in the western United States.	M. Garbelotto, UC Berkeley; D. Rizzo, UC Davis; Everett Hansen, Ore. State Univ.	2000-1: \$132,000; 2 years; USDA-FS R5
<b>SOD Phytophthora in rhododendron and azaleas</b> Evaluate rhododendron and azalea cultivars for susceptibility to the SOD Phytophthora. Survey for SOD Phytophthora in native rhododendron in Monterey and Santa Cruz Counties. Evaluate fungicides for prevention and control of SOD Phytophthora on rhododendron and azalea.	Steve Tjosvold, UC Coop. Extension, Santa Cruz and Monterey Co.	2000-1: \$20,000; 1 year; USDA-FS R5
<b>Evaluation of promising fungicides.</b> Fund field trials and other costs associated with research to demonstrate the efficacy of promising fungicides to retard the Sudden oak death Phytophthora.	Matteo Garbelotto, UC Berkeley	2000-1: \$10,000; 1 year; USDA-FS R5

<p><b>Mapping and Monitoring Sudden Oak Death.</b> Use remotely sensed digital imagery analysis, integrate results with risk model from Marin County, create map of mortality distribution in Northern California.</p>	N. Maggi Kelly, UC Berkeley	2000-1: \$22,500; 1 year; USDA-FS R5
<p><b>Mortality Mechanism</b> Field sample collection and laboratory analysis of sudden oak death; development of field permanent plots</p>	S. Koike, S. Tjosvold, R. Standiford	2000-1: \$16,000; 1 year; UC DANR
<p><b>Remote Sensing</b> Use ADAR imagery to test remote sensing as evaluation methodology in Marin Co.; correlate remote sensing with field plots</p>	N. Maggi Kelly, UC Berkeley	2000-1: \$30,000; 1 year; UC DANR
<p><b>Field Plots and Disease Progression</b> On-going evaluation of 20 field plots in Marin County on quarterly basis to evaluate disease symptoms and progression, mortality rates</p>	Rick Standiford, UC Berkeley	2000-1: \$36,000; 1 year; UC DANR
<p><b>Models of Fire Risk from SOD</b> Develop models of fire behavior and probability of high intensity wildfires in areas with variable levels of SOD; assess fuel availability and moisture conditions</p>	Scott Stephens, UC Berkeley	2001-5: \$100,000; 4 years; UC IHRMP
<p><b>SOD in Oregon</b> Survey of the Sudden Oak Death Phytophthora in Oregon. Survey for and identify similar Phytophthora species in wildlands.</p>	Everett Hansen, Oregon State University	2001-2: \$10,000; 1 year; USDA-FS R5
<p><b>California Oak Disease and Insect Database Update</b> This database catalogs all insects and diseases ever reported on oaks in CA. It is in a DOS format and needs to be converted so the data can be assessed easily on a website. Monies would also cover maintenance and addition of new information for one year. This is an important educational tool to help professionals understand what they are observing in oak woodlands. If possible a GIS reference will be included with locations of each insect or pathogen. Will be posted to the USFS-R5 FHP website.</p>	Ted Sweicki, Phytosphere Research, Vacaville	2001-2: \$15,600; 1 year; USDA-FS R5
<p><b>Field Plots – Redwood Tanoak Stands</b> Develop sampling method for tanoak mortality, and establish long-term permanent plots to assess mortality and disease progression at the Sequel Demonstration State Forest, Santa Cruz Co.</p>	Rick Standiford, N. Maggi Kelly, UC Berkeley	2001-2: \$30,000; 2 years; CDF