CALIFORNIA

FOREST SERVICE RESEARCH AND DEVELOPMENT

STATE FUNDING HISTORY	Enacted FY 2002 ($)	Pres. Budg. FY 2003 ($)	Pres. Budg. FY 2004 ($)
ALBANY			
PSW-4502 Chem Ecol/Mgmt of Forest Insects	819,000	1,337,000	3,292,000
PSW-4651 Pacific Northwest Forest Plan	853,000	522,000	0
PSW-41XX Sim Forest	0	1,700,000	0
ALBANY TOTAL	**1,672,000**	**3,559,000**	**3,292,000**
ARCATA			
PSW-4251 Timber/Wildlife Interactions	1,296,000	1,226,000	1,883,000
PSW-4351 Hillslope Processes and Fisheries	1,173,000	1,198,000	1,529,000
ARCATA TOTAL	**2,469,000**	**2,424,000**	**2,412,000**
DAVIS			
PSW-4103 Institute of Forest Genetics	1,851,000	1,592,000	1,901,000
PSW-4202 Sierra Nevada Research Center	2,999,000	*4,589,000	3,180,000
PSW-4952 Effects of Urbanization on Forest Ecosys	547,000	491,000	562,000
DAVIS TOTAL	**5,397,000**	**6,672,000**	**5,643,000**
FRESNO			
PSW-4202 Sierra Nevada Research Center	0	*0	0
REDDING			
PSW-4155 Ecol/Mgmt of Western Forests	**2,581,000**	**0**	**2,651,000**
RIVERSIDE			
PSW-4401 Meteorology for Forest/Brushland Mgmt	432,000	**0	0
PSW-4402 Wildland Fire Mgmt RD&A Prog	465,000	487,000	921,000
PSW-4403 Prescribed Fire and Fire Effects	1,833,000	1,664 ,000	1,247,000
PSW-4451 Air Pollution/Global Change Impacts	1,360,000	1,140,000	1,397,000
PSW-4902 Wildland Rec/ Urban Cultures	735,000	751,000	755,000
RIVERSIDE TOTAL	**4,825,000**	**4,042,000**	**4,320,000**
CALIFORNIA TOTAL	**16,944,000**	**16,697,000**	**19,318,000**

* *Increase in PSW-4202 at Davis results from merger of the PSW-4202 funds at Fresno with the Sierra Nevada Research Center at Davis for administrative purposes. The Fresno lab location remains intact.*

*** Increase in PSW-4402 results from merger of PSW-4401 funds and personnel into PSW-4402.*

RESEARCH & DEVELOPMENT, a division of the USDA Forest Service (FS R&D), serves society by developing and communicating the scientific information and innovative technology required to manage, protect, use and sustain our nation's forests. Among the world's leaders in forest conservation research, results produced by division scientists contribute to the stewardship of land, real property and society by providing more affordable housing, creating jobs, and improving the health of trees, forests and forest ecosystems. Innovative research applications permit the Forest Service and other public and private land managers to monitor and manage forest responses to environmental change, contributing immeasurably to the sustainability of the nation's forests and rangelands and improving human health.

FS R&D operates six research stations, Forest Products Laboratory, and the International Institute of Tropical Forestry in Puerto Rico. It employs 524 scientists and hundreds of technical and support personnel at 66 field sites throughout the nation. The FY 2004 President's Budget includes $252,170,000 for Forest and Rangeland Research.

The **Pacific Southwest Research Station** is responsible for research development and applications in California and Hawaii; the Station's headquarters is in Albany, CA. Research is conducted in 13 Research Work Units, 12 of which are in California. The FY 2004 President's Budget for the Pacific Southwest Research Station is $22,428,000, a net increase of $3,529,000 from FY 2003. This includes a $3,564,000 increase for research on sudden oak death, Hawaiian invasive species and forest restoration, and fuel treatment/wildlife interactions. A station-wide increase of $523,000 in fixed costs was accommodated by a reduction of $558,000 in lower priority research.

ALBANY

PSW-4502, Chemical Ecology and Management of Forest Insects. Scientists investigate the ecological roles and impacts of insects affecting western forests and deterioration of wood. In 2003 the unit will initiate a new research program on the cause, spread, and mitigation of Sudden Oak Death.

ARCATA

PSW-4251, Timber Management/Wildlife Interactions. Research addresses wildlife distributions, habitat requirements, monitoring strategies, and influence of land-management on wildlife in the Coastal and Intermountain West.

PSW-4351, Management Effects on Hillslope Processes, Fisheries, and Stream Environments. Research in this unit provides improved understanding of natural and human-caused disturbances on land stability and hillslope processes and the effects on aquatic ecosystems at the scale of river basins, watersheds, and individual sites.

DAVIS

PSW-4103, Institute of Forest Genetics. This unit identifies and describes genetic functions of

forest plants to increase the yield of trees, and protect and enhance biological diversity.

PSW-4202, Sierra Nevada Research Center. In FY 2002, Unit PSW-4355 was combined with PSW-4202 to improve coordination, focus, and research efficiency for the Sierra Nevada. The Center seeks to ensure the biological integrity and ecological sustainability of ecosystems in the Sierra Nevada through an adaptive management strategy. Scientists describe linkages among biological, physical, and human components of forest ecosystems, and evaluate forest management strategies aimed at sustaining plant, animal, and fish communities.

PSW-4952, Western Center for Urban Forest Research and Education. This unit conducts research to describe urban forest structure and the derived benefits and costs, such as improved community energy efficiencies, reductions of carbon dioxide, and improvements in air quality.

REDDING

PSW-4155, Ecology and Management of Western Forests Influenced by Mediterranean Climate. Scientists in this program conduct silviculture, fire and soils research. They are dedicated to improving the scientific basis and understanding of how forest management practices affect composition, growth, and development of forest vegetation, and how management can be applied to reduce fire risk. Their research addresses how site characteristics, soil factors, and soil processes interact to influence forest productivity; including research on the effects of fire, insects, pathogens, and other disturbance factors on the sustainability of forest ecosystems.

RIVERSIDE

PSW-4402, Wildland Fire Management. Scientists in this unit develop methods to reduce costs of fighting wildfires by analyzing firefighting situations and costs, and developing guidelines to improve efficiencies in planning, deployment, and directing firefighting activities. In addition, they conduct research to develop weather prediction systems for fire management, planning, and response at national, regional, and local scales.

PSW-4403, Prescribed Fire and Fire Effects Research. Scientists develop methods to aid land managers in measuring, modeling, predicting, and mitigating fire behavior and the effects of prescribed fire, wildfire, and other disturbances on southwestern ecosystems.

PSW-4451, Air Pollution and Global Change Impacts on Western Forest Ecosystems. Scientists in this unit develop methods to measure and assess the effects of air pollution and climate change on individual tree species and forest ecosystems, and propose strategies for mitigation.

PSW-4902, Wildland Recreation and Urban Cultures. Scientists evaluate the needs and interests of recreational users, and develop options to meet these needs, while protecting natural resources in high-use wildland recreation areas.

FIRE RESEARCH SUPPORTING THE NATIONAL FIRE PLAN.

PSW receives an additional $5,540,000 of National Fire Plan funds each year that are distributed to various locations in California to conduct fire research. These include:

- Arcata - $500,000 for ecosystem risk assessment tools for managers;
- Davis - $1,625,000 for developing fire wise urban landscapes, and assessing fuel reduction effects;
- Riverside - $3,415,000 for fire weather forecasting, initial attack planning in wildland fires, remote sensing of fire properties, fire behavior in live fuels, fire impacts on recreation, fire effects on erosion, and post-fire rehabilitation measures.

SUDDEN OAK DEATH (SOD).

Sudden Oak Death (caused by a previously undescribed pathogen, *Phytophthora ramorum*) first appeared in the U. S. in the San Francisco Bay Area in 1995. It is presently known to affect 22 hosts and occurs in 12 counties in California and one in Oregon. Additionally, two stalwarts of eastern hardwood forests (northern red oak and pin oak) are susceptible in laboratory tests. Little is known of the disease, what are the threats and risks, or how to control it. In FY 2001, PSW received $3,000,000 in emergency funds to begin studies. In FY 2003 PSW redirected $500,000 of its internal program to continue this research and congress appropriated approximately $1.5 million for SOD research. PSW Station managers and scientists, working with the California Oak Mortality Task Force and associated agencies, research organizations, nonprofit, and private interests, have provided research leadership to address the many unknowns of this expanding problem. Priorities have been identified and research projects are in place to produce critical response information.

FY 2004 PROPOSED PROGRAM CHANGES:

- **Sudden Oak Death (SOD)** The 2004 PSW Station budget proposes an increase of $2.5 million for Sudden Oak Death research, bringing the Station's total to $3.0 million. Over the next 5 years the proposed research will: (a) produce a better understanding of the pathogen, infection processes, and threats to additional hosts, (b) develop and evaluate diagnostic, management, and suppression practices, and (c) describe and evaluate ecological and socio-economic impacts. This research will be conducted in collaboration with other Forest Service research stations and universities; and other state, federal, and private interests.
- **Fuel Treatment / Wildlife Interactions** An increase of $300,000 will fund field data collection and analysis targeted at the response of old forest species of concern to treatments intended to reduce fuels and fire severity. Accelerated management activities to address hazardous fuels loadings in the Sierra Nevada poses some measure of increased risk to certain wildlife species. Land managers need information to guide future management decisions regarding treatment methods and intensity. PSW is working closely with Region 5 to address these needs.

SIGNIFICANT RESEARCH PRODUCTS:

- **Research in Support of the National Fire Plan** has produced a fire weather forecasting

model that provides monthly predictions of fire danger which are posted on the web bi-weekly. Other products include a real time aircraft based fire mapper that displays fire temperature geographically, a prototype firewise landscape design tool for community protection, and a sediment cost analysis that emphasizes the importance of post-fire soil stabilizing.

- **Science Support for Land Management Planning.** PSW scientists have worked closely with Forest Service planners and decision makers in the Sierra Nevada to deliver scientifically defensible analytical and technical support addressing complex land management issues. Recently initiated research activities are aimed at the uncertainties surrounding response of ecosystem features, including species of concern, to forest management practices related to fuels management and silvicultural options for ecological stability. Specific contributions include collaboration in the design and evaluation of proposed forest management actions, assessing viability of plant and animal species under proposed scenarios, projecting ecological responses and effects of management actions, and developing scientifically-sound study plans for adaptive management. Results will develop a stronger scientific foundation for future national forest planning and management.
- **Sudden Oak Death Cause Identified.** Scientists working with the Station have identified the agent, begun to identify transmission routes, discovered new hosts and potential chemical control agents, and provided this information to managers who have established control and quarantine policy and implemented actions to control Sudden Oak Death.
- **Shade Guides for Parking Lots Developed.** Research based guidelines for shading of parking lots have been adopted by EPA to provide standards for shading ordinances which can be used by local communities in developing their local ordinances. The standards are already being used by a number of cities in California and elsewhere.

SOME CLIENTS/ COLLABORATORS:

National Forests
Bureau of Land Management
Agricultural Research Service
National Marine Fisheries Service
USGS Biological Resources Division
USDOI Fish and Wildlife Service
National Park Service
California Department of Natural Resources
Environmental Protection Agency
Bureau of Reclamation
University of California
California State University