ANNUAL REPORT
1988–1989

Dennis E. Teeguarden, Director (through November 1988)
Robert Z. Callaham, Program Coordinator

WILDLAND RESOURCES CENTER
Division of Agriculture and Natural Resources
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Report 21
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Introduction

Goals and Objectives

The Wildland Resources Center seeks to stimulate research and to foster extension of knowledge on conservation, management, and utilization of wildland resources with a view to their optimum present and future use. Broad general goals are to:

• enhance the capacities of the University's research and extension work related to wildlands
• improve awareness of the University's programs in research and extension related to wildlands
• provide liaison among the University's academic staff and key people in state and federal agencies and other organizations concerned with wildland resources and problems
• provide coordination among the University's research and extension activities related to wildlands

Objectives for the center are numerous and change as time passes. Current efforts of the center focus on the following objectives:

• increase awareness of administrators and the academic staff of the University about the social, economic, and environmental importance of California's wildlands
• secure financial support for the University's programs in research and extension related to wildlands
• build and maintain directories to expertise and facilities related to wildland resources in California
• inform state and federal agencies and public utilities concerned with wildlands about the interests, capabilities, and efforts of the University's academic staff to solve their problems
• provide information about governmental agencies concerned with wildlands to aid the academic staff in contacting agencies for support and assistance
• assist in planning for research, development, and extension programs to solve wildland problems
• build a program of research and extension to solve problems in managing watersheds

Organization

The Wildland Resources Center operates under the Division of Agriculture and Natural Resources of the University of California. As a multicampus organized research unit, it is supported by and reports to the Agricultural Experiment Station. However, the center is charged to relate not only to research but also to extension and continuing education activities concerned with terrestrial renewable resources.

The director of the center delegates nearly all responsibilities to the Program Coordinator, Dr. Robert Z. Callahan, who independently operates the center. Leaders in the Division of Agriculture and Natural Resources are kept fully informed about all matters affecting the center.

The center is guided in fulfilling its goals and objectives by two kinds of committees. A policy board comprised of 12 members of the academic staff from several locations is the primary advisory body for the center. Technical panels are formed as needed to assist in guiding specific projects. During the past year a technical panel completed work on an action program for increasing water production from Sierra Nevada forests.

Program Coordinator's Report

Notable events during this, the 31st, year of the center were two major publications and first release of a series of leaflet.

A major research and extension program proposal, described in the center's previous annual report, was published early in the fiscal year. Toward managing Sierra Nevada forests for water supply was the final product of an interagency technical team. This publication was timely because of its release during the second year of a serious drought in northern California. It explained in detail a program of demonstrations and research aimed at boosting yields of water for a drought-parched state.

The center's third directory, this one to Wildland Expertise and Facilities in the University of California System, has been well received. Listed in the directory are more than 800 faculty and staff members working in 161 departments and other units on 8 campuses and in 44 county offices. The report also gives a first-ever listing of all of the organized research units, programs, and specialized units within the university that relate directly or indirectly to wildlands.
After a protracted effort, the center produced and distributed 21 leaflets containing information about organizations of federal and state government concerned with California's wildlands. Each leaflet gives facts about organizational mission, structure, key positions, addresses, and telephone numbers. The leaflets are being praised, for they provide essential information that is difficult for members of the academic staff to obtain.

The center began work under its contract from the California Department of Forestry and Fire Protection for a three-year inventory of ongoing activities in research and extension related to wildlands in California. The initial effort was to build a directory to the staffs of state and federal agencies conducting research, developmental work, and extension related to wildland problems in California.

Efforts continued to increase funding for wildland research and extension in the University of California. Once again, the center was successful in convincing the Division of Agriculture and Natural Resources to propose a budgetary augmentation, this one for $800,000, for upland watershed research and extension. Unfortunately the difficult fiscal situation facing the university precluded the inclusion of the proposal within the Regents' budget.

Another disappointment was the failure by the California Assembly, for the second consecutive year, to approve a proposal in the governor's budget for the environmental license plate fund to support the center's forest-tree germplasm conservation project.

A small gift was received from the Pacific Gas and Electric Company, and supplemental funds were obtained for contractual surveys of Townsend's big-eared bat.

The mandatory retirement in November, 1988 of the center’s director, Professor Dennis E. Teeguarden, necessitated that a search be undertaken to recruit his successor.

Teeguarden Retires as Director

Having come to the end of his second term of office, Professor Teeguarden was obliged by policies of the university to retire from the position of director of the Wildland Resources Center. He had served as director continuously since November, 1978 except for a brief absence during the period January, 1981 through June, 1982. During his tenure, and primarily as a result of his initiatives, the center was revitalized and became an effective multicampus organized research unit.

During many years of Teeguarden's service as director, he also served as chairman of the Department of Forestry and Resource Management. In that capacity, he assured that the Department met the center's needs for vital business services and back-stopped the centers staff during periods of peak workload.

Professor Teeguarden now has returned to full-time teaching and research. Effective July 1, 1989, he was appointed to the S. J. Gall Chair in Forest Economics.

Directories to Expertise and Facilities

The center’s third directory, Wildland Expertise and Facilities in the University of California System, was distributed early in 1989. Copies are in the hands of nearly 1,100 specialists working in the UC and CSU systems. They should be useful in identifying and communicating among peers and in coordinating among researchers and extension specialists working on related topics. Free copies will be widely distributed within agencies of state and federal government and are being sold to the public. The purpose is to enable people to find scientists and specialists in the UC system who have expert knowledge related to problems in managing wildlands and natural resources.

This directory describes interests and expertise of 840 members of the academic staff. They work in 161 departments or other organized units on 8 campuses and in 44 county offices of Cooperative Extension. Scientists are listed under 350 keywords. These display a spectrum of individual interests associated with more than 300 keywords ranging from "acid fog and precipitation" through "youth education."

A new section of this directory lists and describes the functions of 71 organized research units, programs, and specialized facilities within the University of California. All of these units relate directly or indirectly to wildlands. This
section displays some of the great wealth and diversity of the University's resources.

A final part of the directory briefly describes the field facilities operated by the University for research, extension, and teaching related to wildlands. Included are 2 agricultural field stations, 8 research stations, and 27 natural reserves.

Leaflets Describe Governmental Organizations

One of the goals of the Wildland Resources Center is to provide liaison among the University's academic staff and state and federal agencies concerned with wildlands. An immediate objective is to provide information that will aid the academic staff in contacting governmental agencies for support and assistance.

More than two dozen governmental agencies are involved with wildlands or with research and extension related to wildlands in California. Several agencies manage public lands or carry out regulatory programs through complex field organizations. Other agencies conduct sophisticated research and development programs in laboratories and at scattered field stations. Some agencies provide grants or contracts for research and developmental work related to wildlands. The bureaucracies and organizational intricacies of these agencies often make it difficult for the university's academic staff to seek assistance or information.

Recognizing this problem, the center has worked for several years on a series of leaflets containing information about federal and state governmental agencies concerned with California's wildlands. Each leaflet gives facts about the mission, structure, key positions, addresses, and telephone numbers for an agency or one of its geographic units. For some larger agencies, as many as four leaflets have been prepared to describe units that would be of interest to faculty members, extension specialists, or farm advisors.

To ascertain whether these leaflets will meet the needs of the academic staff, the center prepared a series of 21 leaflets and distributed a sample of those that are available during the spring of 1989. A list of leaflets, that served as an order form, plus seven selected leaflets were mailed to more than 800 persons listed in the center's directory to wildland experts working in the UC system. The packet illustrated the nature of the leaflets and gave the academic staff an opportunity to request specific leaflets having greatest value.

Early responses to that mailing indicated that the leaflets fill a real need. The leaflets are being praised, for they provide essential information that is difficult for members of the academic staff to obtain. Therefore, the center will endeavor to produce those leaflets for which there is the greatest demand.

Inventory of Research and Extension Work

Through a contract from the California Department of Forestry and Fire Protection (CDF), the center is conducting a statewide inventory of all current research and extension work related to California's forestlands and rangelands. The project during its first year was financed by funds from CDF and contributions from UC through the center's annual budget.

The center gathered and summarized information from all federal and state agencies conducting research, developmental work, or extension that relates to wildlands in California. Telephone calls and directories from governmental agency were used to identify over 1,000 scientists and specialists working as civil servants in California and adjacent states. Computerized databases are being constructed, so the information being compiled may be used by others.

Pierson Surveys Townsend's Big-Eared Bat

During the fiscal year the center received two additional increments of funding to extend the geographic scope of surveys to determine the status of Townsend's Big-Eared Bat, *Plecotus townsendii*. This is a species of special concern in California and a candidate for listing as a federal endangered species. The survey is being conducted by the center under a contract from the California Department of Fish and Game. An independent consultant, Dr. Elizabeth D. Pierson, is estimating current population levels and comparing past and current population levels at historic sites of maternity roosts and of winter hibernacula. During this fiscal year the survey was extended to the foothills of the Sierra Nevada and to the most northern counties in California. Negotiations were started for funding of the third phase of the survey in portions of the California Desert in San Bernardino, San Diego, and Los Angeles Counties.
Conifer Germplasm Conservation Project

The Conifer Germplasm Conservation Project continued in its fourth year. The project has grown to include many lines of forest-genetic conservation research, education, and application. During the last two years, the project operated cooperatively with the Pacific Southwest Forest and Range Experiment Station of the USDA Forest Service and has been directed by Dr. Constance I. Millar, who is a research geneticist employed by the station. The expanded project will be completely transferred to the station in late 1989. It will then operate with a permanent staff and a dedicated mission under a new name, Institute of Forest Genetics Conservation Laboratory (IFGCL).

The isozyme laboratory of the project, currently housed in Mulford Hall at the Berkeley campus, operated at full capacity during the past year, with a full-time staff research associate and laboratory assistant, several temporary assistants, and six part-time undergraduate assistants. Several graduate students and visiting scholars have been tutored in the laboratory. Included were researchers from California Polytechnic State University, at San Luis Obispo, U.S. Forest Service, Florida Nature Conservancy, and University of California. Collaborative studies have included research with the Canadian Forestry Service, Center for Plant Conservation, and the Nature Conservancy.

The backbone of research in the project during 1988-1989 has been genetic analysis by protein electrophoresis of the genus *Cupressus* from the southwestern United States. More than 50 percent of the cypress species growing in the world are found in this region. Included are several species that are either federally listed or potentially threatened and endangered. The goal of the project is to determine the genetic composition of populations of each species and to generate useful information for genetic conservation of both endemic and widespread species. Seeds were collected from more than 60 populations from 14 species. Laboratory analyses of the seed tissues were nearly completed. Statistical analysis revealed several important new and unexpected patterns of relationship among the populations and species. Such information will allow more efficient decisions about conservation of cypress germplasm.

A similar major study on genetic structure in three California oaks also neared completion. As part of the research conducted by the California Hardwood Range Management Program, the project investigated genetic (isozyme) variability in more than 40 populations of valley oak, blue oak, and coast live oak. Prior work had been done on the California oaks. The information generated contributes to unraveling the complex taxonomy of oaks and to decisions about movement of seeds during artificial regeneration of valley and blue oaks.

Several new studies were begun this year. Included was an investigation of effects of diverse silvicultural treatments on natural genetic diversity in Jeffrey pine. This work takes advantage of a large research natural area that contains old-growth Jeffrey pine and is surrounded by land managed under different harvest and regeneration systems. Information from this study will not only guide silvicultural decisions regarding biodiversity on managed land, but also decisions about design and location of nature preserves.

Another study compares genetic diversity in operational seed lots of ponderosa pine. Taking advantage of a heavy crop, cones were collected in unusually high numbers to provide seed lots for operational reforestation. The genetic composition of each tree from the many stands in one seed collection zone will be analyzed. Effects of seed-lot size and number of seed trees in achieving a desired level of genetic diversity will be assessed. This information will be helpful to modify guidelines for collecting cones from commercial conifers.

A research and application project on conservation of sugar pine is just beginning for the Calaveras State Park. Although sugar pines in the park are not yet affected by white pine blister-rust, the disease will soon reach this area. This is an effort to stay ahead of this killing disease by studying genetic variation in the park's sugar pines. Blister-rust screening techniques and clonal hedging will be used to provide blister-rust resistant sugar pines for the park when the disease strikes.

The project staff has made a considerable effort to transfer genetic knowledge to land managers and planners. This was achieved by sponsoring a symposium on forest biodiversity, a workshop on biodiversity for land managers, and by speaking and writing frequently to audiences of land managers.
Announcing Sources of Funds

During the past year, 40 announcements of sources of funds for grants and contracts were distributed to 5,195 addressees on UC's academic staff at eight campuses and many county offices of Cooperative Extension. Most of the disseminated information was provided by the Sponsored Projects Office on the Berkeley campus. However, this year, nine of the announcements of opportunities came from other sources. The California Department of Forestry and Fire Protection, in particular, has utilized the center's unique capability to send announcements to keyword-targeted audiences.

The center's keyword dictionary is proving to be a powerful tool for getting information to selected audiences. The number of keywords used in dispersing announcements ranged from 1 to 19 and averaged 4.7.

Keywords used frequently this year related to atmospheric pollution and climatic change, biomass and wind as sources of energy, management of toxic substances and wastes, photosynthesis and plant stress, and urban forests and wildlife. As in previous years, several announcements related to the scientific and technical problems associated with management of hardwood rangelands and oaks.

Responses from those receiving the announcements continue to be affirmative and complimentary. The service is proving to be both useful and appreciated.

Gifts and Contracts

A fourth annual gift to the center from the Pacific Gas and Electric Company (PG&E) provided funding for two projects. Dr. Lawrence S. Davis, Department of Forestry and Resource Management at Berkeley, received $20,000 for the second phase of case studies in forest management and harvest scheduling. The center’s program coordinator received $27,600 for a workshop to critique watershed demonstration areas in western North America.

Contractual extensions by the California Department of Fish and Game provided another $13,537 to extend surveys of Townsend's big-eared bat. These funds were used for surveys of populations of this sensitive species in the Sierra Nevada region. Negotiations were completed for another extension of the contract for surveys of populations in southern California.

The Conifer Germplasm Conservation Project received a gift of $3,000 from Dr. Lawrence A. Riggs, President of Genetic Resource Consultants, for research on the variability of California oak species.

Financing

Expenditures during the fiscal year for the center's regular program of work amounted to $75,921.75. Funds were provided from regular appropriations for the Agriculture Experiment Station. Funds provided by extramural contracts were expended in the amounts of $6404.79 for germplasm conservation of Port Orford cedar and big-cone Douglas-fir; $66,456.74 for germplasm conservation of cypresses; $14,052.65 for the survey of Townsend's big-eared bat; and $7607.60 for an inventory of federal and state research and extension related to wildlands in California.

New funds received from extramural sources during the fiscal year provided $13,537 for the third and fourth amendments to the contract for research on Townsend's big-eared bat.

A fourth gift of $47,600 from PG&E was directed to two intended recipients: a faculty member on the Berkeley campus and the center’s program coordinator.

Income from the sale of publications amounted to $72.50.

Policy Board

The center's policy board (listed on the last page) met twice at Berkeley—November 10, 1988 and May 25, 1989—to review the program, activities, and finances of the center: at Berkeley, November 10, 1987, and at Santa Barbara, June 2, 1988. Activities of the center were reviewed. Decisions were made on new work to be undertaken by the center and on priorities for completing action on past undertakings. The policy board also recommended on procedures to be followed in recruitment of a new director for the center.

The 12 current policy board members represent 6 campuses plus Cooperative Extension. Retiring members from the Berkeley campus were replaced by new members from that campus, and a retiring member, who is a specialist at Davis in Cooperative Extension, was replaced by CE's director in San Diego County.
Staff and Facilities

Dennis E. Teeguarden  
*Director (through November, 1988)*

Robert Z. Callaham  
*Program Coordinator (0.5 FTE)*

Shirley Stuart  
*Program Assistant II (0.75 FTE)*

Alan G. Stangenberger  
*Associate Specialist (0.04) FTE)*

Diane Delaney  
*Staff Research Associate (1.00 FTE)*

Martha Costas-Lippmann  
*Laboratory Assistant II (1.00 FTE)*

The center's office is in room 164 Mulford Hall on the campus at Berkeley. The 150 square-foot office houses work stations for three persons; the center's microcomputer, for word processing and desk-top publication; and a terminal directly connected to the University's UNIX mainframe computer. Laboratory space for the Conifer Germplasm Conservation Project occupies a portion of room 111 Mulford Hall. That laboratory is specially equipped for biochemical analyses by enzyme electrophoresis and for storage of seeds at very low temperatures.

Publishing

The center published three reports this year:

**Toward managing Sierra Nevada forests for water supply.** Jeff Romm, Robert Z. Callaham, and Richard C. Kattelmann. (Report 17, 500 copies at a printing cost of $494)


**Wildland expertise and facilities in the University of California System.** Robert Z. Callaham and Alan G. Stangenberger. (Report 19, 2,000 copies at a printing cost of $5,475)

Complete List of Publications

*Conserving wildland resources through research: Introductory report from the Wildland Research Center.* October 1, 1959. 64 p.


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*Publication no longer available.*


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<th>Term Expires</th>
<th>Name, Title, Address</th>
<th>Telephone</th>
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<tr>
<td>1989</td>
<td>Philip W. Rundel, Professor Laboratory of Biomedical &amp; Environmental Sciences 12-217 Warren Hall, UC Los Angeles, 90024</td>
<td>(213) 825-4072 ATSS 725-4072</td>
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<tr>
<td>1989</td>
<td>Robert R. Curry, Professor Environmental Geology, College Eight 215 Clark Kerr Hall, UC Santa Cruz, 95064</td>
<td>(408) 429-4061 ATSS 529-4061</td>
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<tr>
<td>1989</td>
<td>Jeff Dozier, Professor Department of Geography 5712 Ellison Hall, UC Santa Barbara 93106</td>
<td>(805) 961-2309 ATSS 649-2309</td>
</tr>
<tr>
<td>1989</td>
<td>E. Lee Fitzhugh, Extension Wildlife Specialist Wildlife Extension 8 Briggs Hall, UC Davis, 95616</td>
<td>(916) 752-1496 ATSS 477-1496</td>
</tr>
<tr>
<td>1990</td>
<td>Sylvia Broadbent, Professor Department of Anthropology 1327 Watkins Hall, UC Riverside 92521</td>
<td>(714) 787-3844</td>
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<tr>
<td>1990</td>
<td>John W. Menke, Professor Department of Agronomy &amp; Range Sciences 249 Hunt Hall, UC Davis, 95616</td>
<td>(916) 752-0568 ATSS 477-0568</td>
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<tr>
<td>1990</td>
<td>David M. Olszyk, Asst. Research Plant Physiologist Statewide Air Pollution Center UC Riverside, 92521</td>
<td>(714) 787-5131 ATSS 787-5136</td>
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<tr>
<td>1990</td>
<td>Jeffrey M. Romm, Associate Professor Department of Forestry &amp; Resource Management 145 Mulford Hall, UC Berkeley, 94720</td>
<td>(415) 642-6499 ATSS 582-6499</td>
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<tr>
<td>1990</td>
<td>Ronald O. Skoog, Program Director Natural Resources, Wildlife Extension Briggs Hall, UC Davis, 95616</td>
<td>(916) 752-6191 ATSS 477-6191</td>
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<tr>
<td>1991</td>
<td>Mary K. Firestone, Associate Professor Department of Plant &amp; Soil Biology 17 Hilgard Hall, UC Berkeley 94720</td>
<td>(415) 642-3677 ATSS 582-3677</td>
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<tr>
<td>1991</td>
<td>Alexander J. Horne, Professor Department of Civil Engineering 609 Davis Hall, UC Berkeley 94720</td>
<td>(415) 642-1089 231-9449 ATSS 582-1089</td>
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<tr>
<td>1991</td>
<td>B. Diane Wallace, County Director Cooperative Extension, UC 5555 Overland Avenue, San Diego, 92123</td>
<td>(619) 694-2864</td>
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