
Integrated Hardwood Range Management Program 2005



THE UNIVERSITY OF CALIFORNIA
Division of Agriculture & Natural Resources

The Integrated Hardwood Range Management Program (IHRMP) was established in 1986 in response to concern that oaks and oak woodlands in California weren't being managed properly and that the critical ecological values associated with these systems would be irretrievably lost if nothing was done. However, there was not uniform agreement about *what* to do. Some favored establishing statewide regulations that would prevent oak harvesting except under certain conditions. Others pointed out that the problems and concerns facing oaks were different in different parts of the state and should therefore be addressed at the local level. Still others expressed the opinion that nothing was wrong with the way these resources were being managed and there was no need for intervention.

The California State Board of Forestry and the State Legislature decided that the best approach was research and education and the IHRMP was founded. This Program brought together several state institutions including the University of California, the California Department of Forestry, and the California Department of Fish and Game. It was felt that all of these organizations should be part of the solution as the issues facing hardwood range management were complex and multi-disciplinary and the different partner organizations had different strengths and personnel to help address and solve these problems. The University had the Cooperative Extension (CE) system that contained a well-established outreach network. By working with existing CE advisors with established working relationships with many hardwood range owners and managers, new management information could be disseminated rapidly and efficiently and new strategies could quickly be put into practice. This network could also provide feedback from woodland owners to IHRMP personnel as to the most important problems and issues that needed addressing. The University also had the personnel and resources to address many of the research questions. The California Department of Forestry -- now called the California Department of Forestry and Fire Protection or CDF -- had other strengths. They had a network of service foresters familiar with local forestry issues and concerns who could help identify where the greatest threats to hardwoods were occurring. They also had a unit (the Forest Resources Assessment Program) that regularly assessed wildland resources and could help monitor the condition of hardwoods and detect changes and trends. The California Department of Fish and Game (DFG) was also an important player since hardwoods are so critical for wildlife. The DFG contained expertise that could help identify the effects of various hardwood management practices on wildlife and determine what types of management would enhance wildlife habitat value.

When the IHRMP was established its mission was, and continues to be, to *maintain, and where possible, increase acreage of California's hardwood range resources to provide wildlife habitat, recreational opportunities, wood and livestock products, high quality water supply, and aesthetic value.* To carry out this mission, specific objectives were identified including:

- Develop methods to sustain hardwood ecosystems and landscapes;
- Maintain wildlife habitat on hardwood rangelands;
- Restore degraded hardwood rangelands;
- Ensure land-use planning utilizes available information to conserve hardwood range ecosystems;
- Maintain economically viable private hardwood rangeland enterprises;
- Maintain statewide information on trend, condition, and extent of hardwood rangelands;
- Help focus public awareness on the importance of hardwood rangeland habitats.

In 1986, the primary threats facing hardwood rangelands were firewood harvesting in the northern Sacramento Valley, poor natural regeneration of blue and valley oaks, and threats to sensitive watersheds in Monterey County from converting woodlands to straw-

berry plantations. Today the picture has changed. While there may still be excessive firewood harvesting in some locales, most firewood operations today leave a significant number of trees and there is recognition that wholesale clear-cutting not only has negative ecological consequences, but reduces land values as well. Poor natural regeneration is also less of a concern today because there is less tree removal and practices to successfully regenerate oaks have been developed. And there are now rules in most locales to limit agricultural conversions in steep watersheds where water quality could be impacted.

But concerns about hardwoods and their management remain. In the last several years there has been an increase in vineyard conversions as the price of premium quality wine grapes has gone up. Wooded hillsides that were previously thought too expensive to convert have been turned into vineyards in the primary wine-growing regions of the state. Urban encroachment also continues to take a heavy toll on woodlands as people move outside densely populated urban areas and seek the beauty and solitude that California's oak woodlands provide. Planning where this development occurs and where structures are situated is critical to protecting wildland resources and ensuring that the ecological values associated with oak woodlands are conserved. Fire has also been recognized as a major threat as several catastrophic wildfires in oak landscapes have reminded people that the woodlands of California are not immune from severe wildfires, and that steps must be taken if we want to prevent or, more realistically, reduce the devastation that has become a common occurrence. And Sudden Oak Death continues to kill several species of oaks in coastal forests.

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The IHRMP has responded to these new threats by changing the direction and emphasis of its research and outreach efforts. As described later in this report, considerable effort has been focused on addressing the impacts of vineyard and other agricultural conversions and numerous educational materials have been produced and educational programs conducted. We have also promoted planning tools, such as conservation easements and multiple species habitat conservation plans that are designed to conserve oak woodlands and their associated values. The IHRMP has also taken an active role in addressing the issue of fire by preparing a white paper, delivering educational programs, and conducting research. We are also heavily involved in efforts to limit the negative consequences of Sudden Oak Death.

We feel that we have accomplished a great deal in our efforts to conserve hardwood rangelands and the myriad values associated with them, but unfortunately there is still much more to be done. While some of the threats to woodlands have lessened, others have increased. And as long as the population of the state continues to expand, there will continue to be resource conflicts. It is our hope that the efforts of the IHRMP will make a difference and that future generations will look back and be grateful that hardwood rangelands are still an integral part of California's natural landscape.



Fire in Oak Woodlands

Fires in California have become all too common during the past two decades. What is especially troubling is that large, catastrophic wildfires resulting in significant property losses seem to be occurring with increasing regularity. A variety of vegetation communities have burned in recent years, but oak woodlands are certainly one of the plant types that has been, and will no doubt continue to be, affected by these conflagrations. One reason why wildfires are increasing in severity is the build-up of fuels during the last century, at least partially the result of fire-suppression activities. We have vigorously put out fires that do start, including some that would only have consumed ground vegetation, but left trees largely undamaged, if they were left to burn. As a result, there are more fuels on the landscape today, especially in the understory, and the fires that do start are more likely to become large in scope. In 2003, California experienced the largest wildfire ever recorded as dry Santa Ana winds pushed a series of wildfires through oak woodlands and other vegetation communities in Southern California.

In response to these fires and the widespread demand for information from affected residents in the burned areas, the IHRMP developed a White Paper on this subject. An 8-page document, targeted for landowners, resource managers, and policy makers, as well as the interested public, was produced. It provides a broad overview and addresses several subject areas including historical fire patterns, prescribed fire, the effects of fire on oaks and ecological processes in oak woodlands, what can be done to help prevent future fires, and what landowners can do following fire to help the land and associated resources recover. This information will help a variety of people understand fire in oak woodlands and assist them in developing strategies to minimize its negative effects. Hard copies of this publication can be ordered from the IHRMP or it can be viewed and downloaded free on the IHRMP web site (<http://danr.ucop.edu/ihrmp/>). Click on the title of the article under *History of Fire*.

Some of the information in the White Paper is based on IHRMP fire research. For the past 6 years IHRMP Specialist William Tietje has led a study at Camp Roberts in San Luis Obispo County to help determine the impacts of woodland fires on resident animals. This study monitored a variety of terrestrial vertebrates before and after a prescribed fire. Even though fire reduced grass cover by 70% and downed wood and woodrat houses by 30%, there were no substantial or long-term negative impacts to over 150 species of birds, small mammals, amphibians, and reptiles. This study demonstrated that many small, resident vertebrates merely go below ground during a fire and emerge unscathed once the flames have passed; they therefore can readily survive fires. Such information is critical for understanding the effects of low-intensity prescribed burns that may become an important management tool as we try to prevent catastrophic fires in the future.

Other IHRMP research has focused on the impacts of fires to the trees themselves. In 2000, the IHRMP initiated a study that assessed 100 blue oak trees that burned in wildfires in 1999 in the Sierra foothills in Tehama County. This study found that even in relatively hot ground fires, large oaks are rarely killed, as long as the fire is not hot enough to destroy the cambium all of the way around the trees (thus girdling them). The chance of the fire killing the aboveground portion of the tree is inversely related to tree size. Small trees are more susceptible since they have thinner bark, increasing the risk of lethal injury to the cambium. This study found that even in hot fires that kill the tops of the oaks, the vast majority of trees will resprout from their base, initiating shoot growth that often leads to the establishment of new trees.



The IHRMP has also funded some fire-related research through its competitive grant program. In 2000, Dr. Scott Stephens, a fire-ecologist in the Department of Environmental Science, Policy & Management (ESPM) at UC Berkeley, and Dr. Maggi Kelly, a CE Specialist in Remote Sensing, were awarded an IHRMP grant to study the effects of Sudden Oak Death (see sidebar) on fire hazard and fire risk. To date they have found an increase in coarse woody debris in SOD-infested stands, but few changes in smaller fuels. They speculated that this last result may reflect increases in the population of woodrats that utilize smaller diameter material in building their houses.

Another vehicle the IHRMP has used to educate the public about fire in oak woodlands has been to participate in “after-the-fire” workshops. Communities severely affected by devastating wildfires often host educational meetings soon after the smoke has cleared to answer the many questions the

public has, from how to apply for insurance or disaster relief, to how to get new building permits. Residents also often want to know if their trees have been killed and how they should be managed in the fire’s aftermath. Such input by the IHRMP began in 1988 with public meetings following the 49er Fire in Nevada County and have continued almost annually since in communities that have experienced severe wildfires.

Last year UC Berkeley recruited a Cooperative Extension faculty member to focus on wildland fire. Max Moritz was hired as a Fire Ecology and Management Specialist to conduct research on fire dynamics and the relative importance of different mechanisms that drive fire patterns on the landscape. He will also develop educational programs to convey information to those in the state affected by fire, or those interested in using prescribed fire as a management tool. The IHRMP has already begun to work closely with Dr. Moritz, collaborating on research and holding a joint workgroup meeting between the UC Fire Workgroup that he co-chairs, and the UC Oak Woodland Conservation Workgroup.

Fires in California’s oak woodlands will continue to occur and there is no recourse for the residents of the state but to learn to live with fire as best they can. However, there are things that can be done to minimize the negative effects of fire and the IHRMP plans to continue to convey information to the state’s residents about appropriate steps to take. For instance, fuel loads can be reduced; new construction can be located in areas that are easier to protect; homes can be built with more fire-safe materials; and buffer zones can be created around structures by clearing vegetation and other combustible materials. Finally, vegetation in burned-over areas, including oak trees, can be restored. The IHRMP is working to ensure that those living in or managing oak woodlands are aware of these steps. Adopting them will help reduce the loss of life and property that has become all too familiar in our state. It will also help ensure that our native oak woodlands, and the myriad of values they provide, are conserved into the future.

Working Landscapes and Planning Strategies

One of the unique aspects of oak woodlands in California is that the vast majority is privately owned. This contrasts with higher-elevation coniferous forests that are largely in public ownership. The primary economic activity on these rural landscapes continues to be livestock production. These properties provide a productive forage base that supports a livestock industry that has historically produced one of the most important agricultural commodities in the state. These lands also provide a wide range of values to the public at little or no cost. These include watershed protection, scenic beauty, recreational opportunities and critical wildlife habitat. But these lands are at risk because they are desirable places to live and there are enormous pressures – especially in foothill locations relatively close to existing urban centers – to subdivide them into ranchettes or even denser housing developments. Fragmenting these rural landscapes has enormous costs in terms of habitat degradation, potential for erosion, and a reduction in aesthetic values. It also impacts agriculture since once these lands are broken-up, they are no longer viable as working ranches. In light of these threats, the IHRMP has put considerable energy and resources into developing information and strategies on planning so that the threats to these areas can be minimized. We produced *A Planner’s Guide for Oak Woodlands* in 1993, which has been revised and will be reissued in 2005, and recently published a White Paper titled *Oak Woodland Conservation in California’s Changing Landscape*. We also conducted numerous workshops for planners, and funded research to evaluate the effectiveness of current county policies focused on woodland conservation. We were also a partner, with CDF and the USFS, to detect forest and woodland change by identifying differences in plant cover over time (thus providing planners with information about what landscape-level changes were occurring in their respective counties).

The IHRMP has recently identified conservation easements as an important emerging tool to promote woodland conservation. Easements limit certain future activities on properties such as development and subdivision, but usually allow normal management practices such as grazing and even firewood harvesting, if it is conducted on a sustainable basis. The owners of properties that agree to conservation easements help insure that the ecological values of these lands are protected, often in perpetuity. They also receive financial benefits including reduced property taxes, and in some cases, cash payments. The IHRMP was a key partner in establishing the criteria

for implementing the Oak Woodland Conservation Act of 2001 that allocated \$10,000,000 to the Wildlife Conservation Board to purchase easements in oak woodlands and develop educational programs focused on woodland conservation (see sidebar on page 5).

In 2001, IHRMP personnel were awarded a UC Division of Agriculture and Natural Resources grant on conservation easements to identify how such easements are currently used in California's oak woodlands and to understand how this new conservation tool, which attempts to simultaneously conserve habitat, open space, and working landscapes on private land, could be used in the future. This research, spearheaded by IHRMP Specialist Adina Merenlender brought together campus faculty and specialists, as well as representatives from conservation organizations to evaluate this emerging conservation tool.

Another emerging method for generating additional income to owners of large woodland properties is mitigation banking. This involves setting aside a portion of their property for the enhancement of biologically significant oak-woodland habitats to offset some loss of habitat in another location. The owners of properties whose actions caused the habitat loss pay a fee to the owner of the "banked" property, who agrees to protect these resources in perpetuity. This benefits the ranch owner, but still results in a net loss of woodlands, since this off-site mitigation only protects existing habitat, but does not restore or create any new habitat to replace what was lost.

A final strategy that large landowners can use to increase the economic viability of their ranch operation, and hence make it less likely that they will be forced to sell to developers, is to diversify. Non-livestock activities such as fee-hunting, producing alternative crops, or even charging the public for non-consumptive activities such as photography, camping, or wildlife viewing can often greatly increase ranch income and make the difference between "making it" or being forced to sell. These alternative enterprises, once viewed as conflicting with traditional ranching, are becoming increasingly popular and some ranches today generate more income from these other products and services than they do from livestock. The IHRMP has worked with several large landowners to promote these alternative enterprises. We also produced a publication titled *Guidelines for Managing California's Hardwood Rangelands* that specifically addresses opportunities for generating additional income from such activities. It is hoped that these efforts will help large ranches remain intact, continuing to provide the wide range of benefits so important to the state's residents.



Oak Woodland Conservation Act

In response to the continuing losses of oak woodlands in California, the State Legislature enacted the Oak Woodlands Conservation Act in 2001. This Act specifically recognized the importance of oak woodlands and how oak trees enhance the natural and scenic beauty of this State. Further, it acknowledged the important role oak woodlands play in the economic, social, environmental, and ecological conditions in California. The Act was designed to serve a segment of California's population that is directly associated with the preservation of oak woodlands -- private landowners. It mandated that the Wildlife Conservation Board (WCB) establish a grant program designed to protect and restore oak woodlands using conservation easements, cost-share and long-term agreements, technical assistance, and public education and outreach. This program provides incentives designed to foster the conservation of oak woodlands with an emphasis on sustaining the economic viability of farming and ranching operations. Through developing partnerships and working with private landowners, city and county entities, non-profit organizations, and other state departments, the Act provides an opportunity to reward landowners that implement good stewardship practices and who continue to integrate oak-woodland conservation into their farming and ranching operations. As such, it is an important step in efforts to conserve woodlands and the critical resources they provide by supporting and promoting "Working Landscapes". The IHRMP has actively promoted this Act by assisting in the development of funding guidelines immediately after the Act was passed, and by working with local jurisdictions to develop Oak Management Plans so that they can qualify for funding from the Wildlife Conservation Board. For additional information about this Program visit the WCB web site at:

<http://www.wcb.ca.gov>

Rangeland Watershed Management and Protection

Since 1989, the Rangeland Watershed Program (RWP) -- a cooperative effort between UC Cooperative Extension and the USDA Natural Resource Conservation Service -- has continually developed extension and applied research programs to support the development and implementation of management plans, as well as to increase rangeland resource-manager awareness and understanding of clean-water issues. Development of the RWP Program has occurred with the collaboration and support of the IHRMP.



One of these very important programs has been the ranch water quality short course. Since 1997, more than 1000 producers have attended 60 ranch water quality short courses in 31 counties in California. Two-thirds of those attending short courses completed water-quality plans for their ranches totaling more than 1.3 million acres. Two-thirds of the survey respondents also implemented Best Management Practices (BMPs). There was a significant relationship between plan completion and BMP implementation and 90% of those who implemented BMPs had also completed plans. The majority of the respondents managed ranches less than 5,000 acres in size and half of them raised beef cattle. The survey revealed that respondents initially took the course to avoid regulation, but upon short course completion, they became more proactively involved in controlling non-point source pollution through BMP implementation, at least in part because they found pollution sources during their self-assessment.

Watershed and water-quality research has been conducted for many decades in California's oak woodlands. In 1952 a study established that moderate grazing was the key to protecting soil against erosion. In the early 50's research at UC's Hopland Field Station demonstrated that the amount of mulch or residual dry matter left in the fall determined the amount and composition of forage the following year. Currently, there are several on-going studies in oak woodlands. A 5-year study of impacts of grazing on stream channel, bare ground, and erosion and a 3-year study on cattle-trail erosion on intermittent streams at the San Joaquin Experimental Range were carried out. These evaluated intermittent stream channels draining oak-woodland watersheds. Though the concentration of cattle along stream banks resulted in a significant increase in bare ground, there was no detectable stream-bank erosion resulting from any of the grazing treatments. However, cattle trails were an important mode of sediment transport into stream channels. While cattle trails are common on grazed rangelands, excessive trailing often indicates that stock watering points are too far away.

A 10-year study of grazing effects on spring-fed wetlands within oak-woodland landscapes is being conducted at the Sierra Foothill Research and Extension Center and has been partially funded by an IHRMP grant. Plant composition, diversity, cover, channel morphology, water quality, aquatic insects and greenhouse gasses are being studied. Lightly and moderately grazed wetlands have exhibited lower insect family richness than ungrazed springs. Plant cover was maintained for the first 7 years of grazing, and plant diversity was not significantly affected. At the same time, removal of grazing decreased emissions of the greenhouse gas methane, and increased nitrate levels in spring waters. The results reveal important management tradeoffs relative to key response variables. In general, light cattle grazing within oak-woodland spring areas appears to be desirable from an ecosystem perspective.

Over the last several years a paired watershed study has been used to determine the watershed-scale effects of fire and grazing intensity on water quality, hydrology, nutrient cycling and plant community dynamics on hardwood rangelands. The study sites have also been extensively used as field classrooms for extension (30 field days in past 8 years) and university-classroom (6 courses) education. This study has found that only the highest-intensity grazing treatment (500 lb/acre residual dry matter) displayed increased fecal coliforms, *E. coli*, and nitrate concentrations; there was no increase in suspended sediments. Following fire, soils under oak canopies developed hydrophobic conditions at or near the soil surface, while most grassland soils showed minimal water repellency. Preliminary data suggest that the only consistent effects of the prescribed fire on water quality are an increase in sulfate and *E. coli* concentrations. This study demonstrates that proper grazing practices and low-intensity prescribed fire in oak woodlands result in minimal impact on nutrient, sediment and microbial pathogen export from watersheds.

Numerous people have worked on the studies described above and provided input for this report. In addition to IHRMP personnel Royce Larsen, James Bartolome and Neil McDougald, the following individuals also contributed to this research: B. Allen-Diaz, E. Atwill, R. Dahlgren, K. Fulgham, M. George, J. Gerlach Jr., J. Harper, R. Jackson, S. Larson, D. Lewis, L. Oates, A. O'Geen, and K. Tate.

Agricultural Conversions in Oak Woodlands

Since Europeans first came to California, oak woodlands have been impacted by agriculture. The Spanish Missionaries brought livestock into the state, along with introduced Mediterranean annual grasses and forbs that spread rapidly, displacing native perennial bunch grasses in many woodland locations. Accompanying the Gold Rush in the mid-19th century and the large influx of people, extensive areas were cleared to grow food. Probably the hardest hit vegetation types were the riparian forests along the major



rivers in and around the Central Valley. Often the principal tree species in these forests were valley oaks that grew to enormous size in the deep, fertile, alluvial soils there. But the settlers soon discovered that the soil and moisture conditions that supported

these rich and productive forests, were also ideal for growing orchards and row crops. The trees were cut down and burned to clear the land and facilitate the planting of food crops. Today, only a small remnant of these gallery riparian forests dominated by valley oaks remain in the state.

After World War II many oaks on drier rangeland sites, especially in the Northern Sacramento Valley, suffered a similar fate. Because approximately 80% of the oak woodlands in California are privately owned and the principal economic activity on these lands is livestock grazing, management practices that benefited livestock production were encouraged. The federal government, realizing that trees often compete with understory forage plants for moisture, nutrients, and light, developed cost-share programs to assist landowners increase forage production on their properties by removing the trees. Between 1945 and the early 1970s nearly two million acres of shrubland and oak forests were cleared in the state. Today we realize that, in general, the benefits of this clearing were relatively small and short-lived, while the costs, in terms of wildlife habitat degradation, soil erosion, and decreased aesthetics, were very high. As a result, there is almost no rangeland clearing practiced in California today, and even in areas where significant amounts of firewood are harvested, a portion of the trees is usually retained. The IHRMP has worked to promote good stewardship during firewood harvesting operations by publishing several documents that encourage selective harvesting including *Harvesting Firewood for Sustained Yield on Oak Rangelands* and *Guidelines for Managing California's Hardwood Rangelands*.

Since the 1980s the picture has changed. Today the principal threat to oak woodlands from agriculture is vineyard conversion. These conversions are especially common in the central coastal counties of San Luis Obispo and Santa Barbara and in the northern coastal counties of Napa, Sonoma, Mendocino and Lake. One of the reasons for the recent increase in vineyard development was the sharp rise in the price of wine grapes in the 1990s, stimulating accelerated investment in vineyards. For instance, the California Agricultural Statistical Service estimated that between 1990 and 1999 the wine grape acreage doubled statewide. By the late 1990s, the IHRMP had recognized that vineyard conversions were a serious threat to the integrity and value of oak woodland habitats in certain areas of the state and undertook efforts to understand this threat and to initiate programs to minimize its negative impacts. IHRMP Specialists Adina Merenlender and William Tietje took the lead in addressing this issue. Both hosted a number of workshops for vineyard owners and operators to share with them the latest information about the impacts of vineyard conversions on ecological values such as wildlife habitat, water quality, and biodiversity, as well as to provide them with guidelines that promote retention of trees and their associated values during vineyard construction. Dr. Merenlender also published a brochure in 1999 titled *Vineyards in an Oak Landscape* that describes how vineyards can be integrated into a production system that protects adjacent natural resources. She also spearheaded a study in Sonoma County that assessed the extent of vineyard development before and after 1990. She found that between 1990 and 1997,

SOD Update

Sudden Oak Death, or SOD, is a growing concern in the state and an issue that the IHRMP has been very involved in addressing. SOD is a relatively new disease (first observed in California in 1995) that is lethal to four species of oaks growing along the coast. It also attacks dozens of other plant species, but generally symptoms only include foliage damage and most plants aren't killed. In 2002 the IHRMP co-hosted an International Research Symposium on this disease in Monterey and is co-hosting a second Symposium in January 2005. IHRMP personnel have also played important roles in establishing and coordinating activities of the California Oak Mortality Task Force (COMTF), the multi-agency organization that is overseeing efforts to understand and manage this potentially devastating disease. Doug McCreary is on the COMTF Board of Directors and Rick Standiford is Co-chair of the Research Committee. IHRMP personnel are also active in researching this disease: Specialist Bill Tietje is part of a team investigating the possible ecological effects of SOD on coastal woodland communities and Rick Standiford is evaluating stand structure changes, rates of mortality and tree failure, and symptom progression in stands affected by SOD.

Currently, SOD is found in wildland areas as far south as Monterey County. However, in 2004, SOD was also found in nurseries in Los Angeles and San Diego Counties. Sabrina Drill, UC Extension Advisor and IHRMP member, developed a tour in wildland/urban interface areas in Los Angeles County to assess the potential for SOD occurrence in the area. SOD experts from the northern part of the state were familiarized with coast live oak ecosystems in Southern California, and land managers from federal, state, and local agencies were trained in identifying SOD on coast live oak and bay laurel. IHRMP will continue to work with local personnel to monitor SOD in southern California.

It is clear that SOD will be in California for years to come and will impact coastal oak forests. But it also seems likely that with proper management, including restrictions on the movement of plants and soil outside of infected areas, the spread of SOD can be curtailed and its impacts reduced. Everyone in the IHRMP is working to this end.

Award Winning Web Site Developed

Thomas Scott, a Natural Resources Specialist with the IHRMP, has been working on planning issues in Riverside County since he first went there as an original member of the IHRMP in 1986. Riverside County is one of the fastest growing regions in the state, but also contains a wide range of threatened and endangered plants and animals. As a result, there have been numerous conflicts and litigation regarding land use, development, and impacts to flora and fauna. Recently Dr. Scott has been part of a team developing and implementing a Multiple Species Habitat Conservation Plan (MSHCP) designed to both protect critical natural resources, and to help land managers, including developers, design long-range planning strategies without fear of future litigation. As part of this process, Tom took the lead in designing a web page listing plants and animals in western Riverside County. This page shows the distribution of species covered in the Plan (there are currently over 13,000 records), including detailed information about their status, habitat requirements, threats, and special biological considerations. As such, it is a clearinghouse for biological information on the Western Riverside County Multiple Species Habitat Conservation Plan and is an important tool planners can use to locate and design habitat reserves that will be pivotal in protecting threatened natural resources. This website, which includes many colorful maps and pictures, was awarded the "Best Educational Project" by the Inland Empire Section of the American Planning Association. The address of the site is <http://ecoregion.ucr.edu>. When the MSHCP web page was released, the website received peak use of 13,000 hits in one week. The site currently receives about 4,000 hits a week and, in addition to planners, is used by homeowners checking the distributions of wildlife in their areas, professionals writing environmental reports, and students (k-12) conducting information searches on endangered species.

approximately 11,600 acres of new vineyards were created in the county, many on hillsides that previously supported oak woodlands. This represented not only a sharp increase in the level of vineyard development in general, but an even sharper increase in the loss of oak woodlands to such conversions. Such information is vital for county planners who are wrestling with what is the best planning approach that both supports and encourages agriculture, but also protects vital natural resources. Such protection is especially critical if there is a likelihood that converted vineyards may be abandoned in the future if commodity conditions change and vineyards are no longer economically viable.

In summary, the IHRMP recognizes that there are land-use conflicts between agriculture and habitat protection and there is no "right" way to address these conflicts that fits all situations. In some places, agricultural production may be the best use of woodland properties, while in other locations, it may be critical to protect the habitat. In any case, it is vital to have up-to-date information about the resources and to evaluate various alternatives so that the critical values that oak woodlands provide can be protected and conserved.

IHRMP Publications Available

The IHRMP offers a number of different educational publications on various aspects of managing and conserving California's oak woodland resources. These are listed below and on the IHRMP web site. Single copies of many of these are free. Please log onto the IHRMP web site (<http://danr.ucop.edu/ihrmp/>) to view a brief description of each publication, its price, and ordering instructions. Free publications can be ordered via e-mail.

- *White Paper: Fire in California's Oak Woodlands*
- *White Paper: Oak Woodland Conservation in California's Changing Landscape*
- *Guidelines for Managing California's Hardwood Rangelands*
- *A Planner's Guide for Oak Woodlands* (Revised 2004)
- *Landscape Conservation Planning: Preserving Ecosystems in Open Space Networks*
- *Living Among the Oaks*
- *Wildlife Among the Oaks*
- *How to Grow California Oaks*
- *Vineyards in an Oak Landscape*
- *Oaks 'n Folks Newsletter*

In addition, the following two publications can be ordered by contacting UC Communication Services: (800) 994-8849; email danrcs@ucdavis.edu

- *Regenerating Rangeland Oaks in California*
- *Oak Woodland Invertebrates: The little things count*

Revised Planner's Guide Available Soon

A Planner's Guide for Oak Woodlands – 2nd Edition - by Giusti, McCreary and Standiford (eds), has completed an extensive peer-review process and is now in the production phase. This second edition of the highly popular reference has been in the works for the past several years and promises to provide planners, civil engineers, land-management consultants, and others with the latest thinking in the area of oak woodland planning and conservation. It should be available in early 2005. The new edition has been expanded to nine chapters and is over 200 pages.