Oak Woodland Conservation in California's Changing Landscape

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The University of California's Role

California's oak woodlands face demands to provide housing infrastructure, agriculture, wildlife habitat, recreation, and preservation. These competing demands were once localized and separated by geography with a slow rate of land-use change, but the exponential growth of the State's population, modernization and mechanization of agriculture and commerce, and the increased public demand for preserving the amenity values of the oak woodlands have created new challenges for planners, landowners, homeowners, and resource management professionals.

Conflicts in land use have led to local, regional and statewide calls for public action, and inquiries for information. To try and meet the challenge of balancing these demands while maintaining and restoring California oak woodlands, the State of California developed the University of California's (UC) Integrated Hardwood Range Management Program (IHRMP), a collaborative program between UC, the California Department of Forestry and Fire Protection and the California Department of Fish and Game. The IHRMP has assimilated information and programs to develop new and innovative strategies to assist Californians in addressing the conservation of oak woodlands since 1986.

During this time, the Program has addressed the challenges facing oak woodland management in California and delivered research-based information on resource conservation. The program has evolved to include research and outreach needs in four areas of land use: (1) interpretation of the economic and ecological outcomes of woodland use and conversion; (2) tracking the extent, values, and consequences of oak policies, regulations, and ordinances, across the state; (3) the integration of hardwood rangelands into regional planning; and (4) the study of oak woodland ecosystems in natural and human-dominated landscapes.

Woodland Use and Conversion

California's oak woodlands have always provided food and fiber. Native Californians and European settlers manipulated the oak landscape to meet their needs.

Following the Gold Rush, Californians began to use and alter their woodlands in dramatic fashions, affecting the biotic composition and the wide range of ecological functions including nutrient cycling, water storage and transport, and wildlife habitat. During the last half of the 20th century oak woodlands experienced a transition from extensive agricultural production (e.g., livestock production) to residential subdivisions, fragmentation of large land holdings into smaller rural residential parcels and intensive agriculture with increased water demands. In many ways California's oak woodlands mirror global concerns for economic viability, sustainable development, deforestation, loss of biodiversity, climate change and extinction of species (CDF-FRAP 2003).

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The information is available in both electronic and hard copy formats of which most is accessible through the IHRMP website http://danr.ucop.edu/ihrmp/.

Forces of Change

The demand for amenity values (second homes, open space, recreational opportunities), and emerging agricultural markets has caused an increase in land values throughout the oak region. These demands in turn have accelerated the conversion of traditional grazing lands to other uses, i.e., residential developments and intensive agricultural. This trend is illustrated in coastal California and parts of the Sierra where both reside ntial developments and vineyard acreages have expanded. For example, in Sonoma County 82% of the new vineyards established between 1990 and 1997 resulted in the loss of 9,505 acres of hardwood rangelands (Merenlender 2000). Similarly, urban development in El Dorado County has prompted decadal population growth rates between 46.8% and 24.0% in the 1980s and 1990s, respectively (Saving and Greenwood 2001). A consequence of land parcelization is that smaller parcels no longer serve as viable economic units for commercial meat and fiber production. For example, data on land values from the Central Coast of California illustrate that grazing may return as little as 10 percent of the economic value for the same land planted to wine grapes, or less than one percent of its value for residential uses. Likewise, land values for grazing may be less than 20 percent of the current land values in the central Sierra Nevada for development (Johnson 1997). As a result of these pressures, over 30,000 acres of oak woodlands are converted each year for residential and commercial uses (Standiford & Scott 2001).

Real estate markets recognize oak woodland amenity values. In a recent UC study, property values were positively correlated with the distance to the nearest stand of native oak trees (Standiford and Scott 2001). A decrease of 10 percent in the distance to the nearest oak stands and to the edge of the permanent open space land resulted in an increase of $4 million in the total home value, and an increase of $16 million in total land value in the community. This study clearly showed that oaks on a parcel, the presence of oaks in a neighborhood, and the presence of hardwood rangeland open space adjacent to a property, all positively affect land and home values. Large blocks of open space may therefore contribute to not only the value of the specific property, but may increase the overall value of an entire community. UC research also estimated that native oak trees on rural subdivisions contribute as much as 27% to the value of the property (Diamond et al. 1987). These studies demonstrate the on-site and off-site benefits of open space areas and native oak woodland stands, and that conservation of oak woodland open space increases overall land and home value of an entire community. As another example of open space values, in the East Bay, residents and public officials have collectively recognized the value of maintaining cattle grazing on Mt. Diablo to address both open space protections and wildfire management concerns.

Consequences of These Changes

Rural residential areas developed at low-density housing (1 unit per 5 acres or 10 acres) intended to retain oak trees and habitats appear superficially similar in structure to native woodlands. With time, however, these communities can impact water quality and quantity, wildlife and fisheries, altering both the woodland environment and the amenity value of the properties. The consequences are both economic and ecological, creating risks to both humans and wildlife (wildland fuels, water quality, disease transmission). In 2003 wildland fires claimed 29 lives and more than 2500 homes, primarily in wildland settings.

A study in Sonoma County illustrated the impacts of subdividing oak woodlands on native biological diversity (Merenlender 1998). Exotic plants were more common on rural residential lots from 10 to 40 acres in size as compared to relatively undeveloped larger ownerships. Certain bird species were found to be restricted to large parcels as well. Impacts to bird communities from residential development in California's oak woodlands have also been clearly demonstrated in the Sierra foothills (Stralberg and Williams 2002), the Bay Area (Blair 1996), and in Southern California (Bolger et al. 1997).

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Riparian oak woodlands represent a special case of land use, because of their disproportionate importance to wildlife (Hilty and Merenlender 2004). For example, Giusti and others (2003) have identified 81 species of resident and migratory birds that utilize oak woodland riparian areas. The presence of water makes these habitats more productive than the surrounding landscapes, and surface water is a critical summer resource and habitat element. The hydrology of riparian areas constrains the width of woodlands along the creeks, thereby making them disproportionably sensitive to human impacts and disturbance.

Large-scale conversions not only impact wildlife distributions, but also can result in long lasting changes to watershed processes and ecosystem services. Soil erosion in particular is often the most glaring impact of vegetation removal and is particularly difficult to mitigate on hillsides. An example of large-scale land clearing and the resultant political reaction can be seen in Napa County where local regulations were developed in response to soil erosion and stream channel aggradations on cleared hillsides following vineyard expansion. Though the land managers did not intentionally try and create a problem, poor decisions and injudicious reaction to a booming commodity market resulted in both ecological and political consequences.

Subtle Impacts of Change

Land-use activities that results in sudden and extensive tree loss often elicit strong negative responses from the public, while more subtle land-use change often go unnoticed even though it can have equally long-lasting environmental consequences. In the latter example, while the landscape may still be relatively wooded, these subtle changes can impact water quality and quantity, wildlife and fisheries habitat, and may lead to a buildup of wildland fuels.

Recent research funded by the Integrated Hardwood Range Management Program demonstrated a fundamental shift in land use has occurred over the last several decades in Nevada County (Walker and Fortmann 2003). The median parcel size decreased from 550 acres in 1957 to just nine acres in 2001, changing the predominant land use from agriculture to rural housing. Woodlands used as working landscapes for food and fiber production are now transitioning into an amenity for ranchette housing, creating a cascade of change in resource use, protection, and management. The transition produces fundamental change in society's demands and attitudes about oak woodlands, because the number and distribution of new homes ultimately challenge the very amenities that brought new residents into woodlands. Perhaps more important to resource policy and planning considerations, these transitions are often unrecorded by available technologies and can go undetected for long periods of time.

Two published UC surveys of California oak woodland owners showed that the majority of all owners now live less than 5 miles from a subdivision (Huntsinger and Fortmann 1990; Huntsinger et. al. 1997) exemplifying the urbanization of the state's woodlands. These surveys also showed that approximately one-third of the properties changed owners between 1985 and 1992, and 5 percent were subdivided for residential development. The urban interface with oak woodlands, once confined to the major population centers of San Francisco Bay, Sacramento and Southern California now extends throughout the state.

Policy Directions

With over 80% of California's oak woodlands in private ownership, and widespread interest in developing conservation strategies, it should come as no surprise that the debate over woodland management, planning and conservation is often contentious and intense. Despite the difficulties, various groups have responded and are actively working to protect oak woodlands in California. There are hundreds of locally active watershed groups, biodiversity councils, Fire Safe Councils, Coordinated Resource Management Planning (CRMPs) groups, Resource Conservation Districts, and other special districts that are addressing resource issues. In addition, more traditionally recognized

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conservation and commodity groups are also playing a direct role in statewide and local planning and resource conservation activities. These groups include the California Farm Bureau Federation, the California Oak Foundation, the California Cattlemen's Association, The Sierra Club of California, the California Woolgrowers Association, the Rocky Mountain Elk Foundation, and the California Native Plant Society.

One of the major issues affecting land fragmentation results from estate taxes and inter-generational transfer of land. The financial burdens associated with inheritance, threatens the ability of families to keep large tracts of intact oak woodlands in their families. Without adequate estate planning, the resultant taxes following the death of a woodland owner can often cause families to sub-divide their property just to meet their financial obligations. This subtle, but very real, incentive to sell and/or subdivide woodland landscapes can potentially alter the structure and composition of oak woodlands, further exacerbating the ability of these systems to deliver the ecological services that most Californians currently enjoy.

Incentive Based Conservation

There are economic values associated with the conservation of native habitats. Since the public benefits of oak woodlands are often not reflected in the land markets, it follows that a prudent conservation strategy includes shared financing of local oak conservation efforts, and the purchase of development rights for permanent open space or extensively managed working landscapes. Many land trusts have formed with the explicit purpose of providing compensation for landowners willing to conserve natural and agricultural resources on their land. According to the Land Trust Census of 2000, there are 132 land trusts in existence within the state protecting 1.25 million acres of forest, agricultural lands and rangelands (The Land Trust Alliance). These institutions use a mixture of private and public funding to secure full and partial ownership of land for conservation purposes (for a full review see Merenlender et al. 2004).

In order to assist landowners with the costs of sustainable management and woodland restoration, there are several publicly funded programs. These include federally funded Forest Legacy and Stewardship programs, Natural Resource Conservation Service (NRCS) conservation programs, and the State Wildlife Conservation Board programs which all provide short-term agreements with landowners to support land stewardship.

Another type of incentive-based conservation is to relieve landowners from environmental regulations. This is particularly popular when dealing with endangered species considerations because of the potential penalties associated with the "takings" clause under the Endangered Species Act. The U.S. Fish and Wildlife Service has developed the Multi-Species Habitat Conservation Plan (MSHCP) to address the Federal Endangered Species Act and allow "take" under prescribed conditions for certain species. The Natural Communities Conservation Plan (NCCP), administered by the State's Department of Fish and Game, is focused on developing long-range planning mechanisms identifying reserve areas over a broad landscape to ensure the sustainability of natural communities. Both the MSHCP and NCCP can be applied to any habitat type. Given the extent of oak woodlands in California, they have been used to conserve oak resources in a number of counties including San Diego, Riverside, Merced, Contra Costa and Placer.

Land-Use Policies

Land use in California is mainly administered by cities and counties with some state and federal oversight. Cities historically have emphasized land development, capital facility improvements (e.g., roads, water systems, sewers) and public services, delegating environmental quality to state and federal agencies. Unfortunately, local land-use policies and state environmental regulations are not necessarily coordinated, and have led to incompatible land uses and practices in oak woodlands (Giusti and Merenlender 2002). Developing local capacity to manage oak woodlands has been an ongoing state concern; both from an issue of consistency across counties to the problem of statewide conservation goals applied to individual landowners. The IHRMP continues to work for creative solutions to the issues of local sovereignty and state oversight in oak land-use policies (Giusti, Standiford and McCreary *in press*), but there is no single solution to land-use policy across the diverse woodlands and counties of the state.

Consequently, oak woodland land-use practices are administered through

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county-initiated programs that vary widely across the state (Harris and Kocher 2002). These programs are generally not coordinated between counties. An array of policy approaches are utilized, including tree ordinances, zoning restrictions, voluntary guidelines, heritage tree registry programs, as well as other programs. (See the IHRMP web site http://danr.ucop.edu/ihrmp/county for a complete list and review of these local policies.) There is currently no regional or statewide strategy to conserve oak woodlands. The inconsistent application of environmental laws between different habitat types and counties makes the policy arena extremely complex and has generated dissatisfaction among landowners especially in regions where they are subjected to different levels of regulatory oversight and subsequent costs.

Oak Tree Forestry

Many people do not know that most oak species and most of the State's oak woodlands are currently not recognized as commercial species by the Z'Berg-Nedjedly Forest Practice Act of 1973 and therefore conversion or harvest of oak woodlands are not regulated by the Board of Forestry and the California Department of Forestry and Fire Protection (Giusti and Merenlender 2002).

Equally confounding to most are California's licensing requirements currently in place regarding tree harvests. In order to "practice forestry" in California, a person must be licensed as a Registered Professional Forester (RPF). However, "practicing" forestry is not synonymous with cutting trees. Therefore, even those counties that require discretionary CEQA (California Environmental Quality Act) review for development projects affecting oaks are not required by statue to have the oak conversion be administered by an RPF. There currently do not exist statutory licensing requirements for consultants who develop Environmental Impact Reports (EIR) under CEQA for projects impacting oaks unless they engage in activities that are considered "forestry" related.

CEQA and Oaks

The California Environmental Quality Act (CEQA) requires agencies to disclose any significant impacts that their projects (or discretionary permits) will have on California's environmental quality, including oak woodlands. In many cases oak woodlands are handled as a diffuse resource with cumulative, but seldom significant, impacts identified during the CEQA process. The IHRMP has played a role in defining the relative impact of woodland conversions and in helping counties define significance under CEQA. Nevertheless, at the present time, CEQA has played a minor role in oak woodland conservation across many areas of California.

Recently, Senate Bill 1334, titled Oak Woodlands Conservation: Environmental Quality, and authored by Senator Kuehl, D-Los Angeles, passed both the State Senate and Assembly in early August and was sent to Governor Schwarzenegger's desk for signature. He signed it on August 24, 2004, and it will become law on January 1, 2005. The bill outlines oak woodland mitigation options for counties to achieve feasible and proportional habitat mitigation under CEQA. The bill requires that if a county determines that there may be a significant effect to oak woodlands from a project, then the county shall require one or more of the following oak woodland's mitigation alternatives:

1. Conserve oak woodlands through the use of conservation easements;
2. Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees;
3. Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements;
4. Other mitigation measures developed by the county.

Certain activities are exempt from this Act, including projects undertaken pursuant to an approved Natural Community Conservation Plan, affordable housing projects, or conversion of oak woodlands on agricultural land.

As with any new legislation, it is not yet clear what impact this bill will have on oak woodland conservation. Proponents are optimistic that woodland conversions that may otherwise have been exempt from regulatory oversight will now require some degree of scrutiny, as well as mitigation activities to offset their impacts.

Summary

The two main processes influencing oak woodlands today are land clearing for subdivisions and intensive agriculture and the continued parcelization of large continuous woodland ownerships for exurban development. It is imperative that California focuses its limited resources on minimizing negative environmental and social impacts by investing in sustainable development in order to conserve California's oak woodlands. This will require policy adjustments at the local and State scales of governance, continued support of incentive-based conservation programs that assist landowner involvement and expansion of collaborative efforts to address landscape-level issues. Planning approaches to minimize habitat fragmentation due to exurban development will require creative policies. Trading development rights to protect large tracts of land in exchange for

more clustered rural development implementation of urban growth boundaries to contain sprawl; and perhaps even planting guidelines to minimize the extent of exotic and noxious plants in rural residential landscapes are two examples. We know that California's population will continue to grow into the foreseeable future and all Californians must work on all fronts to promote both sustainable development, agriculture, and conservation. We welcome the opportunity to work with all Californians to conserve California's signature landscape for future generations.

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