

# **COLUSA COUNTY VOLUNTARY OAK WOODLANDS MANAGEMENT PLAN**



*Photo by Jack Alderson, NRCS-Colusa Field Office*

# Colusa County Oak Woodlands Management Plan

## PROBLEM STATEMENT

Oak woodlands are one of California's most treasured and iconic landscapes. To many, the sight of majestic oaks rising from the state's rolling foothills forms the core of California's natural persona. Oak woodlands are also rich in wildlife and are a favored place for people to recreate, build their homes, and pursue their livelihoods. Unfortunately, oak woodlands are disappearing throughout the state. They are being lost to intensive agriculture, woodcutting, housing and other urban development, and where they remain they may not be regenerating at a rate that will sustain the current stands. The most common species in Colusa County's oak woodlands, the blue oak, is one that has been identified as having regeneration problems (McReary, 2001).

It is estimated that California's population will grow from its current level of 31 million to over 63 million in the next 50 years. California's Central Valley is currently the fastest growing area in California; Colusa County's population is expected to grow by 2.5% per year over the next five years (North Carolina Economic Development Information System, 2008). As the county's population grows, there will be continuing pressure to convert oak woodlands to more intensive uses such as housing and ranchettes. The problems associated with development in oak woodlands often creates infrastructure problems and decreases wildlife habitat values. Fire safety needs increase because a greater population is at risk and because there are more opportunities for wildfire ignition by human activities.

Colusa County contains 92,000 acres of oak woodlands. Eighty-two thousand (82,000) acres of these woodlands are on private lands. The County's geography creates a diversity of oak habitats including shady riparian woodlands along the Sacramento River and extensive oak savannas in the County's western foothills. To conserve this valuable natural heritage, planning processes must identify and address the various land use practices that impact oak woodlands and develop appropriate mechanisms to manage this important resource. Without policies to promote the stewardship of its existing oak woodlands, Colusa County may assume the possibility of the following risks.

- Fragmentation of family ranches
- Degradation of habitat and loss of biodiversity
- The possibility of increased regulatory oversight
- Loss of scenic resources

## PURPOSE

The purpose of Colusa County's Oak Woodland Management Plan is to provide a consistent policy for conservation and use of oak woodlands throughout the county. The document is expected to provide direction to landowners, the Colusa County Planning Department, and developers. The adoption of this plan by a resolution of the County Board of Supervisors will also give the landowners in the county an opportunity to obtain funding through the California Oak Woodlands Conservation Act of 2001. The Act provides funding for projects designed to conserve and restore oak woodlands, oak education, and landowner assistance. It will also provide an important

pathway that brings together ranchers, conservationists and educators who share similar values regarding oak woodlands.

**The goals of this plan are to:**

- Encourage the stewardship of Colusa County's oak woodlands by informing landowners of their value and providing access to voluntary incentives to assist in their conservation.
- Encourage sustainable ranching practices that maintain oaks and related wildlife habitat, clean water and air, and provide a high quality of life.
- Encourage planning that is consistent with oak woodlands conservation.
- Encourage public education and outreach regarding oak woodlands.

**EXISTING POLICIES AND PROGRAMS**

Since 1989, Colusa County's General Plan has included provisions for oak woodlands management and protection (Appendix I). In 1993, the California Board of Forestry mandated that the 41 counties with significant hardwood resources, which includes Colusa County, develop and maintain programs for the protection of this resource. At that time, and continuing today, the potential exists for the California Department of Forestry and Fire Protection to classify oaks as a commercial timber species, resulting in their harvest falling under the requirements of the California Forest Practices Rules.

Senate Bill 1334 (the Oak Woodlands Conservation Act) was passed by the California Legislature in 2004. This legislation adds Section 21083.4 to the Public Resources Code related to oak woodlands conservation. The Act requires the consideration of oak woodlands conversion as part of the California Environmental Quality Act (CEQA). Specifically, SB 1334 requires that a county, in determining whether an environmental impact report, negative declaration, or mitigated negative declaration is prepared; specifically determine whether a project may result in a conversion of oak woodlands that will have a significant effect on the environment. If such a determination of significance is made, the county is required to implement one or more specified alternatives to mitigate the effect of woodlands conversion. Mitigation options include the protection of existing oak woodlands or the planting of trees.

**THE IMPORTANCE OF OAK WOODLANDS**

**Grazing**

Large private ranches make up the bulk of the oak woodlands in the foothills located on the west side of Colusa County. Within these oak-covered landscapes, cattle production has become the primary economic activity. With a yearly production value of 12.2 million dollars, the county's cattle industry is the fifth largest contributor to its economy, behind rice, almonds, tomatoes and walnuts (Colusa County Department of Agriculture, 2006). In addition, productive ranches provide many benefits to all county residents including; wildlife habitat, open-space, recreation lands, honey bees forage, fire control, weed management, and remote watersheds that produce abundant clean water.

## **Wildlife**

Oak woodlands harbor a rich diversity of native plant and wildlife species. The combination of the county's mild Mediterranean climate and the abundant food provided by acorns allow many animal species to remain here year-round. The relationship between some bird species and oaks is complimentary: species such as Western Scrub-Jays and Yellow-billed Magpies do not retrieve every cached acorn and thus help disperse oak seedlings across the landscape (Cal PIF 2002). Oak woodlands also provide critical wintertime habitat to migratory species that spend their summers at higher elevations. Because of these qualities, oak woodlands are thought to have the richest wildlife species abundance of any habitat in California (331 species, DFG statistics).

## **Endangered Species**

Colusa County's oak woodlands provide habitat for a number of California's threatened and endangered species. Additionally, many of the state's species of special concern are found within oak woodlands. Because oak woodlands are so widespread, they often form the "background" natural community in which other less common habitats occur. Good stewardship of the County's oak woodlands will help support currently listed threatened and endangered species, as well as reduce the possibility of additional species being listed.

## **ECONOMIC VALUE OF OAK WOODLANDS AND OPEN SPACE**

### **Land Values**

Landowners often weigh the value of their undeveloped property in terms of the opportunity cost of competing land uses such as development, intensive agriculture and rural ranchettes. The value of land for development is a function of location, housing characteristics, improvements, and local amenities. Nearby woodlands can increase the quality of life for residents and contribute to a community's economic and fiscal well being. Woodlands contribute to both an increase in land values and a subsequent increase in property tax revenues.

### **Broadened Market for Rangeland Products**

California livestock prices as well as forage yields can experience significant yearly fluctuations. As a result, ranching operations often experience large variations in total yearly returns and profitability (Standiford 1999;) (Harper et al. 1989). However, many Colusa County ranches contain the aesthetic and habitat values desired by hunters, fishers, campers and equestrians who have significant disposable incomes. Ranchers can soften the impact of unstable cattle markets by incorporating these "paying" non-traditional ranch uses into their ranch operations.

Wood harvesting in oak woodlands also may have the potential to provide additional ranch income. Approximately 70,000 cords of firewood are harvested annually throughout the state. Through careful woodcutting practices, a balance can be maintained between sustainable woodlands management, livestock production, and habitat for game and non-game species. Of importance is an understanding of a property's habitats and how various economic activities will impact them. It must be considered that the removal of oak trees may decrease the habitat potential for game species. In some cases the resulting decrease in potential hunting revenues may be greater than the revenues generated by firewood (Harper et al. 1989;) (Tietje 1996).

## **MECHANISMS TO CONSERVE OAK WOODLANDS' VALUES**

### **Williamson Act**

The California Land Conservation Act of 1965, also known as the Williamson Act, is an agricultural land protection program established to preserve agricultural and open space lands. The act allows private landowners to establish a contract with counties or cities to voluntarily restrict their land to agricultural and compatible open-space uses. These agreements are established for a rolling term of 10 years. In return for the agreement to not develop, parcels are assessed at a rate that reflects their agricultural value, rather than their potential market value as fully developed property. If a contract is not renewed, it terminates in nine years. A contract can be cancelled immediately if the appropriate governing body within the county approves. The landowner must then pay a cancellation fee equal to 12 1/2 percent of the property's unrestricted fair market value (CDC 2004).

### **Conservation Easements**

A conservation easement is a legal agreement between a landowner and a non-profit organization or government agency that limits certain uses of the land covered by the easement in order to protect its conservation values. It allows the landowner to continue to own and use the land and to sell it or pass it on to heirs. Each easement is individually negotiated and only certain rights to the land are purchased or donated. For example, the landowner might give up the right to build additional structures, while retaining the right to ranch or grow crops. Future owners are also bound by the easement's terms. An easement may apply to just a portion of the property, and need not require public access. If an easement is donated and it benefits the public by permanently protecting important conservation resources it may qualify as a tax-deductible charitable donation. Conservation easements can be useful for passing land on to the next generation. By removing the land's development potential, the easement lowers its market value, which in turn lowers estate tax. The landowner continues to pay property taxes that are usually assessed at a similar rate to properties protected under the Williamson Act.

### **California Oak Woodland Conservation Program**

In 2001, the California Legislature passed the California Oak Woodland Conservation Act (COWCA). The Act acknowledged the positive impact that oak woodlands have on the monetary and ecological values of property within these environments. As a result of the COWCA, the Oak Woodland Conservation Program was established within the Wildlife Conservation Board (WCB). The program is designed to provide \$10 million to help local jurisdictions protect and enhance their oak woodland resources. It offers landowners, conservation organizations, cities, and counties and opportunity to obtain funding for projects designed to conserve and restore California's oak woodlands. It authorizes the WCB to fund land protection, land improvements, oak education, and restoration. The Act requires that at least 80 percent of program dollars be used for grants that fund land protection, restoration or enhancement projects within oak woodlands. The remaining 20 percent of the funds can be used for public education and outreach efforts by local governments, park and open space districts, resource conservation districts, and nonprofit organizations. Within the 20 percent category, funds can also be used for grants designed to provide technical assistance and to develop and implement oak conservation elements in local general plans (McCreary 2004;) (CWCB 2001).

A requirement for program funding under The Oak Woodlands Conservation Act is the preparation of an oak management plan. This document has been written to satisfy the Act's requirements, once it has been adopted by the Colusa County Board of Supervisors through a formal resolution.

## WOODLAND RESOURCES CLASSIFICATION

### Oak (*Quercus*) Species in Colusa County

The oak species represented in Colusa County (Calflora, 2008) are:

- Interior Live Oak (*Q. wislizeni*)
- Canyon Live Oak (*Q. chrysolepis*)
- Black Oak (*Q. kelloggii*)
- Scrub Oak (*Q. berberidifolia*)
- Valley Oak (*Q. lobata*)
- Oregon White Oak (*Q. garryana*)
- Blue Oak (*Q. douglasii*)
- Leather Oak (*Q. durata*)
- Huckleberry Oak (*Q. vaccinifolia*)
- Palmer's Oak (*Q. Palmeri*)

### Types of Oak Woodlands in Colusa County and their Distribution

Oak Woodlands as described in this plan are defined by the California Department of Fish and Game's Wildlife Habitat Relations Classification System (CWHR). Colusa County has the following oak woodland communities:

- Valley Oak Woodland
- Valley Foothill Riparian
- Blue Oak Woodland
- Blue Oak / Foothill Pine Woodland

A map of the distribution of Colusa County oak woodland communities is attached as Appendix III. A general review of these habitats follows.

### Valley Oak Woodland

Valley oaks are endemic to California. At the present time, there are approximately 137,000 acres of these woodlands remaining within the state and 1,000 acres within Colusa County (CDF 2002). They are generally associated with the deep alluvial soils of the Central Valley. This habitat varies from savanna-like to forest-like stands with partially closed canopies, comprised mostly of winter-deciduous, broad-leaved species. Denser stands typically grow in valley soils along natural drainages. Tree density decreases with the transition from lowlands to the less fertile soils of drier uplands. Most large, healthy valley oaks are probably rooted down to permanent water supplies (Griffin 1973). Their primary natural distribution in Colusa County is along the Sacramento River and the lower portions of the River's tributaries. Along the Sacramento River pure stands of valley oaks are most often found growing in groves on the upper river terraces (older deposits). Closer to the River, they are often mixed in with other riparian tree species such as Fremont's cottonwood, black walnut and sycamore. Scattered groves of valley oaks as well as individual trees can be found up to elevations of 2500 feet in places where deep soils can be found, including lands converted to agricultural uses. These scattered groves form a well-recognized landscape

throughout the lowlands of Colusa County.

Of all the oak woodland communities found in Colusa County, valley oak woodland has experienced the most change. It is estimated that over 90 percent of these woodlands in the Central Valley have been removed, primarily due to conversion to farmlands and orchards (COF 2004). In Colusa County almost all of the remaining valley oak woodland occurs in the hills west of the Sacramento Valley. There is also concern that valley oaks in the remaining groves are not regenerating at a rate to ensure long term populations survive in the future.

### **Valley Foothill Riparian**

Valley Foothill riparian habitats occur in the Central Valley and the lower foothills of Colusa County where deep alluvial soils and a high water table can be found. There are approximately 4,000 acres of these woodlands in the county. They are often found on sloping alluvial fans, and are generally associated with low velocity flows, flood plains, and gentle topography. The substrate is often coarse, gravelly or rocky soils that are close to ground water, and well aerated. Valley oaks, Fremont's cottonwood, and Sycamore, often dominate this community.

Valley Foothill riparian habitats provide food, water, migration and dispersal corridors, escape, nesting, and thermal cover for an abundance of wildlife. At least 50 amphibians and reptiles occur in lowland riparian systems. Many are permanent residents and others are transient or temporal visitors. In one study conducted on the Sacramento River, 147 bird species were recorded as nesters or winter visitants (Laymon 1984). Additionally, 55 species of mammals are known to use California's Central Valley riparian communities (Trapp et al. 1984).

Valley Foothill riparian communities need active floodplains to regenerate. On regulated streams and rivers, where peak winter flood flows are removed, regeneration is often lacking. Extensive studies are being conducted on the Sacramento River by CALFED and other agencies to determine the winter pulse flows and the spring draw down timing needed for regeneration of these riparian communities. The oak stands in these communities can provide an environmental corridor linking the riparian habitats along the Sacramento River with upland ecosystems for miles thus allowing species to efficiently move between habitat types.

### **Blue Oak Woodland**

The Blue Oak Woodland natural community is the most abundant oak woodland in Colusa County and presently totals about 77,000 acres (CDF 2002). These woodlands occur along the western foothills of the Sierra Nevada-Cascade Ranges, the Tehachapi Mountains, and in the eastern foothills of the Coast Range, forming a nearly continuous ring around the Central Valley. Blue oak woodlands occur in the foothills of western Colusa County. They are usually associated with shallow, rocky, infertile, well-drained soils from a variety of parent materials. Blue oaks are well adapted to dry hilly terrain where the water table is usually unavailable (Griffin 1973). Blue oaks have an unusual tolerance of severe drought, even shedding their leaves during periods of extreme moisture stress. This survival trait contributes to its pattern of distribution, as it competes most successfully with other tree species on drier sites. When they occur on gentle slopes blue oaks are often in large blocks with highly variable canopy coverage. On steeper ground they occur in smaller patches interspersed with other habitats such as annual grasslands and chaparral.

Blue oaks are relatively slow-growing, long-lived trees. Large blue oaks range in age from 153 to 390 years; however, age studies in the Coast Range indicate that most blue oak stands are currently 80 to 120 years in age (Pillsbury and De Lasaux 1983). Research shows that estimation of tree age based on diameter measurements is risky because the relationship varies tremendously depending on site quality. Moreover, growth is extremely slow or even ceases after trees reach 65 cm (26 in).

Verner and Boss (1980) give data on wildlife use in blue oak savannas of the western Sierra Nevada. They indicate that 29 species of amphibians and reptiles, 57 species of birds, and 10 species of mammals find mature blue oak woodland suitable or optimum for breeding, assuming that other special habitat requirements are met.

At the present time, there is concern about regeneration of blue oaks across their range. Regeneration tends to be better in areas of higher rainfall, on north slopes and in areas where competition with introduced grasses is low. In other areas, however, the regeneration rate may not be sufficient to maintain existing stands.

#### **Blue Oak / Foothill Pine Woodland**

Blue Oak / Foothill Pine Woodland generally form the upper boundary of blue oak woodlands in Colusa County and currently total approximately 10,000 acres (CDF 2002). This woodland type rings the Central Valley, between 150 and 915 meters (500 and 3000 ft) in elevation (Neal 1980). Blue oak and foothill pine typically comprise the overstory of this habitat, with blue oak usually most abundant. Stands dominated by foothill pine tend to lose their blue oak, which is intolerant of shade. Associated species are the coast live oak, valley oak, and California buckeye (Griffin 1977). Interior live oak sometimes dominates the overstory, especially in rocky areas and on north-facing slopes at higher elevations (Neal 1980). At lower elevations, where blue oaks make up most of the canopy, the understory tends to be primarily annual grasses and forbs. At higher elevations where foothill pines sometimes comprise the canopy, the understory usually includes patches of shrubs in addition to the annual grasses and forbs. Shrub species include *Ceanothus spp.*, *Manzanita spp.*, California coffeeberry, poison oak, and California redbud. Regeneration of this community faces similar concerns as those facing blue oak woodland.

## CONSERVATION GOALS & POLICIES

### WORK COOPERATIVELY WITH PRIVATE LAND OWNERS

**GOAL:** Encourage voluntary education and protection programs that assist private landowners in the management of their oak woodlands.

Policy:

- A. Promote economic studies on the value of alternative and sustainable rangeland products such as fee hunting, eco-tourism and wild herb production.
- B. Utilize available resources and expertise such as the Colusa County Economic Development Corporation and the Central Sacramento Valley Resource Conservation and Development Area Council to promote non-traditional low intensity business ventures within the oak woodlands of Colusa County.
- C. Educate county landowners on the economic benefits of maintaining and restoring oak woodlands.
  - When harvesting oaks for fuel or range improvement, encourage land owners to maintain an average leaf canopy of at least 30 percent (Standiford and Tinnin 1996).
  - Retain trees of all sizes and species represented at the site prior to any disturbance.
  - When safety permits, leave old hollow trees and those actively being used for nesting, roosting and feeding.
  - Where low fire risk and aesthetics allow, pile limbs and brush to provide wildlife cover.
  - Where commercial or extensive harvest is being contemplated, seek professional advice from such resources as UC Cooperative Extension (Farm Advisor), USDA Natural Resource Conservation Service (NRCS), California Department of Forestry and Fire Protection (CAL FIRE) and private consultants.
- D. When building is proposed within oak woodlands encourage landowners to:
  - Consider the impact of construction practices on the long-term management of oaks found on their property.
  - Cluster houses to promote wildlife corridors and habitats.
  - Protect existing oaks during construction.
  - Avoid root compaction by limiting heavy equipment in the root zone.
  - Carefully plan roads, cuts and fills, building foundations and septic systems to avoid damage to tree roots.
  - Design roads to minimize erosion and sedimentation to downstream resources.
  - Avoid landscaping which requires or allows irrigation and runoff within the drip line of oak trees.
  - Consider replacing trees, whose removal during construction is unavoidable, with native tree species.
  - Remove dead and rotting trees from areas immediately adjacent to homes and other structures.
- E. Inform private landowners regarding the value of well-managed oak woodlands.
  - Educate landowners about existing and potential threats to this resource.

- Seek funding that supports outreach to private landowners through the Colusa County RCD, the NRCS, UC Cooperative Extension, Wildlife Conservation Board as well as others.

### **ENCOURAGE HABITAT CONSERVATION**

**GOAL:** Encourage landowners to voluntarily manage oak woodlands through good stewardship for future generations.

Policy:

A. Conserve large working ranches with significant oak woodlands

- Recognize sites according to landscape variables (size, shape, and connectivity to other habitats such as riparian) that support sustainable wildlife populations
- Recognize sites where prescribed fire can be safely used as a management tool
- Recognize sites that may warrant certain types of voluntary management action

B. Encourage the voluntary management of oak woodlands through these and other options:

- Development of sustainable ranching and farming operations
- Partnerships between government and non-profits
- Establishing Williamson Act contracts
- Conservation easements and other forms of real estate transactions

### **RESTORE DEGRADED OAK WOODLANDS**

**GOAL:** Encourage the restoration of oak woodlands that suffer from lack of regeneration and exotic species invasions.

Policy

A. Restore oak woodlands that lack regeneration.

- In areas where oaks have been removed and are not regenerating, promote voluntary tree planting programs and measures that provide protection of oak seedlings from browsing and weeds.
- Participate in state and federal cost share programs and grants.

B. Control invasive weed species in oak woodlands.

- In coordination with the Colusa, Glenn, Tehama County Weed Management Area seek funding to map the location and abundance of target weeds in oak woodlands.
- Where possible introduce prescribed fire and other methods to help control the spread of medusahead grass, yellow starthistle, barbed goatgrass, and other invasive wildland weed species.

C. Reestablish native understory species.

- Encourage restoration of native plants as an alternative to exotic grasses. (Native plants will reduce weeds and may provide a longer grazing season for livestock.)

- Encourage diverse understory vegetation including shrubs. (Habitat with multiple layers of vegetation provide habitat for many bird species.)

#### **MONITOR COLUSA COUNTY'S OAK WOODLANDS**

**GOAL:** Establish a monitoring program to evaluate the success of this plan.

#### Policy

- A. Request that the Colusa County Resource Conservation District (CCRCD) periodically evaluate the state of oak woodlands using available data sources such as the California Department of Forestry and Fire Protection's FRAP (Fire and Resource Assessment Program) data.
- B. Increase communication between land managers, ranchers, and scientists regarding the management of oak woodlands.
  - Encourage workshops, symposiums, field trips and other methods of outreach regarding oak woodlands.
- C. Encourage research on oak woodland habitats.
  - Encourage studies which evaluate oak regeneration in Colusa County.
  - Encourage studies that evaluate the effects of changing land uses on oak woodlands' current values (wildlife, ranching, water, economics, etc.).
  - Encourage studies that provide Colusa County ranchers with better and more specific information about sustainable management of oak woodlands.

*Special acknowledgement and appreciation to  
Tehama County  
for the use of the  
Tehama County Voluntary Oak Woodland Management Plan  
to develop the  
Colusa County Voluntary Oak Woodland Management Plan.*

## LITERATURE CITED

California Partners in Flight (Cal PIF 2002). 2002. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodlands habitats and associated birds in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, CA <http://www.prbo.org/capif/plans.html>.

California Department of Conservation (CDC 2004). 2004. Williamson Act Basic Contract Provisions California Department of Conservation Division of Land Resource Protection. Sacramento, CA. [http://www.consrv.ca.gov/DLRP/lca/basic\\_contract\\_provisions/index.htm](http://www.consrv.ca.gov/DLRP/lca/basic_contract_provisions/index.htm)

California Department of Fish and Game. 2008. CNNDDB – Plants & Animals. [http://www.dfg.ca.gov/biogeodata/cnnddb/plants\\_and\\_animals.asp](http://www.dfg.ca.gov/biogeodata/cnnddb/plants_and_animals.asp)

California Department of Forestry (CDF 2002) 2002. Habitat Data: Forest and Range 2002 Assessment. [http://www.frap.cdf.ca.gov/projects/frap\\_veg/tables/V2\\_2002\\_Fveg\\_02\\_2g.pdf](http://www.frap.cdf.ca.gov/projects/frap_veg/tables/V2_2002_Fveg_02_2g.pdf)

Calflora. 2008. Species Information. <http://www.calflora.org/>

California Oak Foundation (COF 2004). 2004. Oak Woodlands Conservation Fund Update California Oak Foundation Current Issues, Oakland, CA [http://www.californiaoaks.org/html/oak\\_report\\_04-04.html](http://www.californiaoaks.org/html/oak_report_04-04.html)

California Wildlife Conservation Board (CWCB 2001). 2001. The Oak Woodlands Conservation Act of 2001 Program Application and Guidelines. State of California Resources Agency, Sacramento, CA.

Krug, Harry. 2006. Colusa County Department of Agriculture, 2006 Crop Report.

Garrison, B.A., and R.B. Standiford. 1997. Effects of Wood Cutting on Wildlife Habitat in Blue Oak Woodlands in the Northern Sacramento Valley. Oaks and Folks Volume 12, Issue 1 February 1997 Integrated Hardwood Range Management Program University of California, Berkeley, CA

Griffin, J. R. (Griffin 1973).1973. Xylem sap tension in three woodland oaks of central California. Ecology 54:152-159.

Griffin, J. R. (Griffin 1977. Oak Woodland. Pages 383-415 In M. G. Barbour and J. Major, eds. Terrestrial vegetation of California. John Wiley and Sons, New York.

Harper, J.M., R.B. Standiford, J.W. LeBlanc (Harper et al. 1989). 1989. A Dynamic Ranch Model of Harwood Rangeland. Integrated Hardwood Range Management Program Oak Fact Sheet #33, University of California, Berkeley.

Laymon, S. A.(Laymon 1984). 1984. Riparian bird community structure and dynamics: Dog Island,

Red Bluff, California, Pages 587-597 In R. E. Warner and K. M. Hendrix, California riparian systems: ecology, conservation and productive management. Univ. of California Press, Berkeley.

McReary, D. D. 2001. Regenerating Rangeland Oaks in California. University of California Agriculture and Natural Resources Publication 21601.

McCreary, D. (McCreary 2004). 2004 Oak Woodland Conservation Program Up and Running. Oaks 'n Folks, University of California, Integrated Hardwood Range Management Program, 20 (1) University of California, Berkeley.

Neal, D. L. (Neal 1980). 1980. Blue oak-digger pine. Pages 126-127 In F. H. Eyre, ed. Forest cover types of the United States and Canada. Soc. Amer. Foresters, Washington, D.C.

North Carolina Economic Development Information System. 2008. County Profile: Colusa County (CA), 4<sup>th</sup> Quarter, 2007. <https://edis.commerce.state.nc.us/countyProfile/CA/06011.pdf>

Pillsbury, N. H., and M. J. DeLasaux (Pillsbury and DeLasaux 1983). 1983. Site, growth, and yield equations for blue oak and coast live oak in Monterey and San Luis Obispo Counties, California. Unpubl. Memo. Nature. Res. Manage. Dept., California Polytechnic State Univ., San Luis Obispo.

Standiford, R. 1999. California's Hardwood Rangelands: Production and Conservation values. Oaks 'n Folks, University of California, Integrated Hardwood Range Management program, 14 (2). University of California Berkeley.

Standiford, R., and P. Tinnin (eds). (Standiford and Tinnin 1996). 1996. Guidelines for Managing California's Hardwood Rangelands. Publication of the Integrated Hardwood Management Program, University of California, Berkeley.

Stenson, S. 1999 A new tool for Conserving Oak Woodlands: The California Rangeland Trust. Oaks 'n Folks, University of California, Integrated Hardwood Range Management program, 14 (1). University of California Berkeley.

Tietje, W. 1996. Wildlife Among the Oaks: A Management Guide for Landowners. Integrated Hardwood Range Management Program, University of California, Berkeley.

Trapp, G. R., G. L., Linck, and E. D. Whisler (Trapp et al.1984). 1984. The status of ecological research on the mammal fauna of California's central valley riparian communities. Pages 942-949 In R. E. Warner and K. Hendrix, eds. California riparian systems: ecology, conservation, and productive management. Univ. of California Press, Berkeley.

Verner, J., and A. S. Boss 1980. California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. (Berkeley, Calif.), Gen. Tech. Rep. PSW-37.

## APPENDIX I

The Colusa County General Plan adopted in 1989 includes language that could pertain to oak woodlands. The following table represents polices included in Colusa County General Plan as identified by a July 2003 review conducted for the Integrated Hardwood Range Management Program.

Element	Description
Land Use 1989	The land use element establishes Resource Conservation zoning to ensure conservation of existing fish and wildlife habitat in the county, while facilitating its expansion. The RC designation is applied to forests and forested rangelands under federal ownership, to watershed lands requiring management and protection, and to the National Wildlife Refuges. In addition to forestry, acceptable uses on private parcels including grazing, mining, non-intensive recreation and low density residential uses.
Conservation, 1989	Land uses within Resource Conservation areas shall be regulated only to the degree necessary to achieve protection of the resource. Very low-density single-family residences, low intensity recreation uses, and agricultural uses may be permitted to the extent that critical habitats are not disrupted (Co-21).
Open Space, 1989	Land designated as Resource Conservation (R-C) should be preserved in open space uses for the duration of the planning period unless development of these areas is consistent with applicable community plans or land use policies.
Zoning Ordinance, 1991	The zoning ordinance establishes the Upland Conservation Zone for mountain and upland foothill areas for forestry, mining, grazing and recreation use and protection of watershed lands from fire, erosion, and pollution. Minimum parcel size is 10 acres. Development standards for hillside areas include a requirement that the design of building sites within the Hillside zone shall avoid excessive disturbance of terrain and natural vegetation. Excessively long roads and driveways shall be avoided by design. Excessive cuts and fills and land clearing shall not be allowed

The General Plan language does not contain specific provisions to address oak tree retention and replacement, oak protection during construction, heritage tree protection, riparian vegetation protections, and oak canopy retention and does not contain an oak woodland conservation program. However, there is a specific ordinance in place that provides development standards for hillside areas prohibiting excessive disturbance of terrain and natural vegetation.

APPENDIX II

**COUNTY OF COLUSA BOARD OF SUPERVISORS  
RESOLUTION NO. \_\_\_\_\_**

**ADOPTED BY MAJORITY VOTE ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_,  
2008.**

**WHEREAS**, the California State Board of Forestry has taken the position to support woodland protection through local efforts; and,

**WHEREAS**, those lands described as oak woodlands within Colusa County provide multiple benefits, including commercial livestock production, wildlife habitat, fuel wood harvesting and potential for land development; and,

**WHEREAS**, the County of Colusa recognizes the importance of private property rights and endorses the concept that landowners be provided the maximum right of self-determination; and,

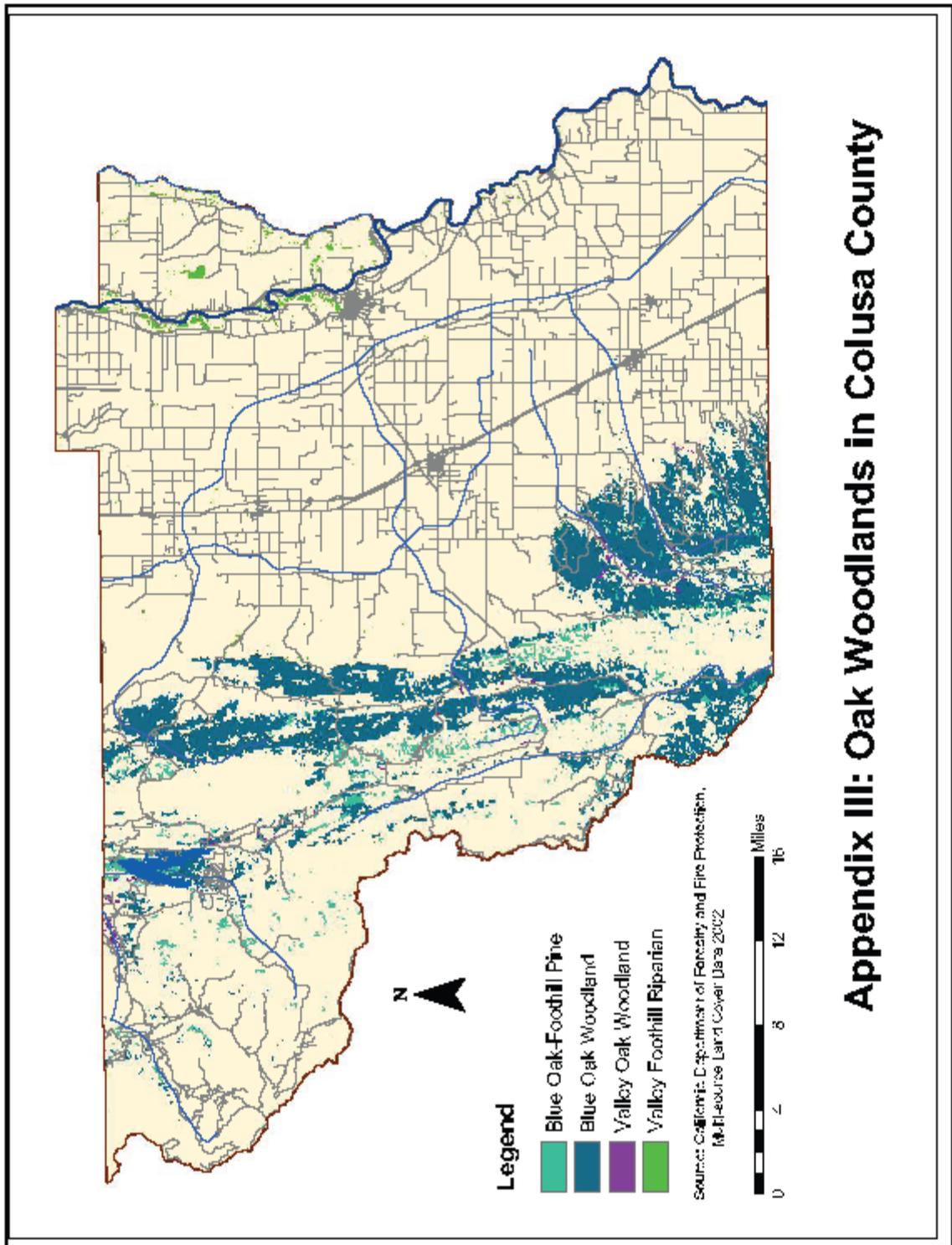
**WHEREAS**, the economic viability of agricultural enterprises operating within these oak woodlands must be protected; and,

**WHEREAS**, the County of Colusa recognizes responsible stewardship by landowners is necessary to sustain oak woodland resources;

**NOW, THEREFORE, BE IT RESOLVED**, that the Colusa County Board of Supervisors does hereby adopt the following recommendation for the sustained management of oak woodland resources.

1. All landowners of oak woodlands within Colusa County shall have access to the Colusa County Oak Woodlands Management Plan adopted via the Colusa County Resource Conservation District
2. All landowners who wish to harvest oaks are hereby encouraged to develop a specific oak management plan for land within Colusa County. Landowners are encouraged to contact private and public sources for expert assistance in the development of their plans.

**BE IT FURTHER RESOLVED**, that the Colusa County Board of Supervisors does hereby direct that the Colusa County Resource Conservation District coordinate with local government agencies and/or private organizations to offer workshops on the management of oak woodlands.



**Appendix III: Oak Woodlands in Colusa County**

**APPENDIX III, Colusa County Oak Woodlands Map**