

TEHAMA COUNTY

VOLUNTARY OAK WOODLAND MANAGEMENT PLAN



Western Tehama County blue oak before bud break. Photo by J.S. Davy

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Tehama County Voluntary Oak Woodland Management Plan Committee

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PROBLEM STATEMENT

Oak woodlands are one of California's most treasured iconic, and ironic 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. Millions of acres of California's oak woodlands have been lost since 1950 along with nearly 90 percent of riparian woodlands statewide. Only about one-third of the 10-12 million acres of oak woodlands that once graced our valleys and hills remain. Vast acres have been lost to intensive agricultural, woodcutting, housing, other urban development, drought, fire, and other natural disasters (Garrison et al. 2000). Eighty percent of the state's hardwood rangelands are privately held (Standiford 1999).

Tehama County's estimated population grew from 63,463 in 2010 to 65,245 in 2022. (U.S. Census Bureau 2022). The county's reasonable cost of living and its attractive rural lifestyle make it a desirable place to live. As the county's population grows, there will be continuing pressure to convert oak woodlands to more intensive uses as housing and ranchettes.

At 633,000 acres, Tehama County contains the third largest acreage of resource rich hardwood rangelands in California, just behind Monterey and San Luis Obispo Counties. The county's unique geography creates a diversity of oak habitats including shady riparian woodland along the Sacramento River and extensive oak savannas in the foothills. The oak woodlands of eastern Tehama County provide the primary winter range for California's largest migratory deer herd (Longhurst et al. 1952; Garrison et al. 2000). To conserve this valuable natural heritage, a planning process must identify and address the various land use practices that impact oak woodlands and develop appropriate mechanisms to achieve lasting conservation. Tehama County's Voluntary Oak Woodland Management Plan (Plan) describes opportunities to protect and conserve its existing oak woodlands and promotes an increased awareness of this valued resource. The Plan was developed to inform and support landowners in oak woodlands to make wise land-use decisions to minimize impacts on the woodlands.

PURPOSE

The purpose of Tehama County's Voluntary Oak Woodland Management Plan is to expand upon, refine, and improve voluntary oak protection guidelines established by the County in 1994 and to provide a consistent policy for conservation and use of oak woodland habitats throughout the County. The document is also expected to provide direction to landowners, the Tehama County Planning Department, and developers. It will also provide an important pathway that brings together ranchers, conservationists, land managers, and educators who share similar values regarding oak woodlands.

The goal of this plan is to encourage:

- The stewardship and conservation of Tehama County's oak woodlands by informing landowners of their value and voluntary incentives to protect them.
- Sustainable ranching practices that maintain wildlife habitat as well as clean water and air to provide a high quality of life.
- Planning that is consistent with oak woodland conservation.
- Public education and outreach regarding oak woodlands.

Types of Oak Woodlands in Tehama County and their Distribution

Oak Woodlands as described in this plan are defined by the California Department of Fish and Wildlife's (CDFW) Wildlife Habitat Relations Classification System (WHR). Tehama County has the following natural oak communities (Mayer and Laudenslayer 1988):

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

A map of the distribution of oak communities is attached as Appendix V and oak identification photos are noted on page 11. A general review of these habitats follows.

Valley Oak Woodland

Valley oaks are only found naturally in California. 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-leveled 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 either rooted down to permanent water supplies or irrigated (Griffin 1973). These woodlands do not persist when groundwater is diminished.

Their primary natural distribution in Tehama County is along the Sacramento River and the lower portions of the river's tributaries. Along the Sacramento River, pure valley oak stands are 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 cottonwood, black walnut, and sycamore. Scattered groves of valley

oaks are 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 Tehama County.

Of all the oak woodland communities found in Tehama County, valley oak woodlands have experienced the most change. It is estimated that over 90% of the original valley oak woodlands in the Central Valley have been removed, primarily due to conversion to irrigated farmland (2004). In places where valley oaks occur, there is also concern they are not regenerating at a rate to ensure long-term populations.

Valley Foothill Riparian

Valley foothill riparian habitats occur in the Central Valley and the lower foothills of Tehama County where deep alluvial soils and a high-water table can be found. 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, yet well aerated. Valley oaks, fremont 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 amphibian and reptile species occur in lowland riparian systems. Many are permanent residents and others are transients or temporary visitors (Brode and Bury 1985). In one study conducted on the Sacramento River, 147 bird species were recorded as nesters or winter visitants (Laymon 1985). Additionally, 55 species of mammals are known to use California's Central Valley riparian communities (Trapp et al. 1985).

Blue Oak Woodland

The Blue Oak Woodland natural community is the most abundant oak woodland in Tehama County. 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 nearly continuous ring around the Central Valley.

Blue Oak woodlands occur in the lower foothill belt of both eastern and western Tehama County. They are usually associated with shallow, rocky/gravelly, infertile, well-drained soils from various parent materials. Blue oaks are well adapted to dry, hilly terrain where the water table is usually inaccessible (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, they are often in large blocks with highly variable canopy coverage.

Blue oaks are relatively slow-growing, long-lived trees. Large blue oaks range in age from 150 to 400 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 demonstrates that estimation of tree age based on Diameter at Breast Height (DBH) measurement is risky because the relationship varies tremendously depending on site quality. Moreover, growth is extremely slow or even ceases after trees reach 65 cm (26in) DBH.

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

In the past there has been concern about regeneration of blue oak 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. Because of this, blue oak regeneration tends to be higher in Tehama County than those further south that receive less rain. If desired, regeneration can be improved, both in growth and survival, through the application of tree shelters and weed control around the base of naturally occurring seedling trees. Tree shelters should only be applied to seedlings outside of older tree canopies as excessive shade will hinder growth (McCreary et al., 2011).

Blue Oak/Foothill Pine Woodland

Blue Oak/Foothill Pine Woodland generally form the upper boundary of blue oak woodlands in Tehama County. This woodland type rings the Central Valley, between 150 and 915 m (300 and 500 ft.) in elevation (Neal 1980). Blue oak and foothill pine (*Pinus sabiniana*) typically comprise the overstory of this habitat, with blue oak usually most abundant. Stands dominated by foothill pine tend to lose their blue oak due to their intolerance of shade. Associated species are the interior live oak, valley oak, and California buckeye (Griffin 1977). Interior live oak sometimes dominates the over story, 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 unusually includes patches of shrubs in addition to annual grasses and forbs. Shrub species include *Ceanothus spp.*, *Manzanitas spp.*, California coffee berry, poison oak, and California redbud. Regeneration of this community has similar concerns as blue oak woodland.

THE IMPORTANCE OF OAK WOODLANDS

Cultural Significance

There is an intimate relationship between humans, landscape, and vegetation. In what is now known as Tehama County, the area is the ancestral grounds of First Nation tribes, such as the Yahai, Yana, and Nomlaki. Oaks were integral to native life as many cultural traditions, rituals, and legends are associated with oak woodlands and their acorns. Few species were as important to these nations as oaks. Acorns were a dietary staple that provided critical nutrients in autumn when most herbs, seeds, and berries were spent. Acorns were widely available, nutritious, and reliable, and stored well for consumption throughout the year. This made them an invaluable provision for both themselves and the animals the natives hunted.

Oak bark, roots, wood, branches, and galls were used for housing, tools, basketry, clothing, dyes and treating ailments. Each tribe developed its own specialized approach to acorn harvesting, storage, hulling, drying, leaching, pounding, and cooking. Second only to salt, oak acorns were among the most frequently traded food items.

Grazing

Large private ranches make up most of the oak woodlands in the foothills on the county's east and west sides. The unique Mediterranean climate offers winter forage grazing, which is rare around the world. Within these oak-covered landscapes, cattle production has become the primary economic activity. With a yearly production value of 32.4 million dollars, the County's cattle industry is a major contributor to the economy (2021 Tehama Crop Report). Oak woodlands positively contribute to forage production by creating islands of fertility around individual trees. Fertility levels surrounding trees are often 1-3 times higher than areas with oaks removed. One study found that clearing of oaks can cause a loss of soil quality leading to a decrease in fertility and forage growth (Dahlgren et al., 2003). A blue oak canopy cover of approximately 30% is often stated as the most optimal to encourage forage production on rangelands.

Many Tehama County residents value the ranching culture that provides much of the County's ambiance and identity. The Red Bluff Roundup and the Bull and Gelding Sale are ranching events which attract national attention. In addition, productive annual rangeland ranches provide many benefits to all county residents including food, wildlife habitat, open-space, recreation lands, fire control, weed management, and support watersheds that produce abundant clean water.

Grazing, monitoring, and conservation planning on forested rangelands (>10% canopy cover) in California by law requires licensing as a Certified Rangeland Manager through the California Department of Forestry and Fire Protection. This is intended to ensure professional competency when recommendations are made on these important rangelands. Exceptions exist for landowners working on their own lands and federal lands.

Wildlife

Oak woodlands harbor a rich biodiversity of native plant and wildlife species. The mild Mediterranean climate and abundant food provided by acorns allow many animal species to remain year-round. The relationship between bird species and oaks is complimentary. Species such as California scrub-jays and yellow-billed magpies do not completely retrieve cached acorns and thus disperse oak seedlings across the landscape (CalPIF 2002). Oak woodlands also provide critical wintertime habitat for 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, CDFW statistics).

Eastern Tehama Deer Herd

The Eastern Tehama Deer Herd is the largest migratory herd in California. The herd's annual migration takes over 25,000 animals (Furnas et al. 2018) from the high elevation pine and fir forests around Lassen Volcanic National Park to their winter habitat in the open oak woodland savannas of eastern Tehama County (Hill and Figura 2020).

Some animals travel over 75 miles from five California counties to complete their journey (CDFW unpublished data). As browsers and prey for mountain lions, black bears, coyotes, bobcats, and wolves, deer are an integral component of the food web (Longhurst et al. 1952). In addition, recreational hunting

is an important component of the rural economy and the proceeds from hunting leases help keep ranches in the region viable.

Endangered Species

Numerous endangered species live or migrate into Tehama County's oak woodlands. Since oak woodlands are so widespread, they often form the "background" natural community in which less common habitats occur. For this reason, it is not surprising that they support many species that are declining in other parts of California. For example, oak woodlands in Tehama County border important riparian corridors that are breeding habitat for declining bird species such as yellow-breasted chat and yellow warbler. Also embedded in the oak woodlands are aquatic habitats. Springs and seeps provide habitat for threatened species such as red legged frogs. Oak woodlands also encompass the principal watersheds supporting critical habitat for endangered fish. For example, Mill, Deer, Battle, and Cottonwood Creeks support much of California's best remaining habitat for State and federally threatened spring run Chinook Salmon.

Wildlife habitats, particularly those of endangered and threatened species, are severally altered when oak woodlands are developed. A study in the developing woodlands of Placer County showed some breeding bird populations decreased in developed areas. Other bird species were less sensitive if blocks of oak remained (Stralberg and Williams 2002). Aquatic habitats are also degraded when development in woodlands requires the diversion of water, more septic systems, and roads. It is likely that the protection of oak habitats will reduce the chance that woodland species will be listed as threatened or endangered, thereby lessening the need for regulatory action by state and federal authorities. Appendix IV lists some important endangered, threatened, and declining animal species in Tehama County.

ECONOMIC VALUE OF OAK WOODLANDS AND OPEN SPACE

Land Values

Landowners often weigh the value of their underdeveloped property with the opportunity cost of completing land use like 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 an increase in land values and property tax revenues.

In addition, lots containing native oaks have been found to be valued at a 27% premium over properties having no trees. Individual trees of large size and landmark status within a community were found to yield an additional \$18,000 to \$50,000 each (Standiford 1999). Finally, studies comparing tree populations and property values indicate that approximately 40 trees per acre generally provides optimal lot coverage and yields the highest market value premium (roughly 22% to 27%) over bare land (Standiford 1999).

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 (Harper et al. 1989; Standiford 1999). However, many Tehama 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 in their ranch operations. Fee hunting, for example, can increase the value of a ranching operation up to 183% (Standiford and Tinnin 1996).

Wood harvesting in oak woodlands had the potential to provide additional ranch income. Approximately 70,000 cords of firewood are harvested annually throughout the state. Historically, over 50% of this volume has been removed in Shasta and Tehama Counties which together contain roughly 10% of the state’s Harwood acreage (Standiford et.1996). Through careful woodcutting practices, a balance can be maintained between sustainable woodland management, livestock production, and 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 revenue generated by firewood (Harper et al. 1989) (Tietje 1996).

EXISTING POLICIES AND PROGRAMS

Since 1983, Tehama County’s General Plan has included provisions for oak woodland management and protection (Appendix I). In 1993, the California Board of Forestry mandated that the 41 counties with significant hardwood resources, including Tehama County oak woodlands, develop and maintain programs for the protection of this resource. At the 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. Current policy is that black oaks, white oaks, and tan oaks are classified as commercial species if growing with group A species (soft woods such as Douglas Fir and Ponderosa Pine). In response to potential onerous regulation that this classification could have placed on Tehama County landowners, the Board of Supervisors passed Resolution # 57-1994 (Appendix II) which formally established a Hardwood Advisory Committee to study the situation and make recommendations that would steer the county towards sound oak woodland management. The resolution also calls for the adoption of a preliminary set of voluntary oak woodland management guidelines (Appendix III). The committee was then asked to continue their involvement by assessing the effectiveness of the guidelines in sustaining oak woodland habitat in Tehama County.

Senate Bill 1334, (The Oak Woodland Conservation Act) was passed by the California Legislature in 2004. This legislation adds Section 21083.4 to the Public Resources Code related to oak woodland conservation. The Act requires the consideration of oak woodland conservations 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; specially 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 woodland conservation. Mitigation options include the protection of existing oak woodland or the planting of trees.

MECHANISMS TO CONSERVE OAK WOODLAND 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 contact between counties or cities to voluntarily restrict their land to agriculture and compatible open space uses. These agreements are established for a rolling term of 10 years. In return for the agreement to put off development, parcels are assessed at a rate which reflects their agricultural, rather than their potential market value as fully developed property. As first authored, California was to pay each county the difference between actual tax assessment and the amount that would have been charged prior to the act's passing. If a landowner contract is not renewed, it terminates in nine years unless the appropriate governing body within the county approves a formal cancellation. The landowner must then pay a cancellation fee equal to 12 ½ percent of the property's unrestricted fair market value (CDC 2004). Unfortunately, the state has discontinued the paying of lost tax revenues to the county, which makes it unlikely that properties that fall out of this program will ever be accepted to reenroll. The return of this funding to the county would help encourage even more use of this tool for oak woodland conservation.

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 to protect its conservation values. It allows the landowner to continue to own and use 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

The Oak Woodland Conservation Program was established within the Wildlife Conservation Board (WCB) in 2001. The program was designed to provide funding to help local jurisdictions protect and enhance their oak woodland resources. It offered landowners, conservation organizations, cities and counties an opportunity to obtain funding for projects designed to conserve and restore California's oak woodlands. It also authorized the WCB to fund land protection land improvements, oak education, and restoration.

The Act required 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 could 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 would

also be used for grants designed to provide technical assistance and to develop and implement an oak conservation element in local general plans (CWCB 2001; McCreary 2004).

OAK SPECIES IN TEHAMA COUNTY

True oaks are those species included in the taxonomic genus *Quercus*. They include both evergreen and deciduous species. Tan oak, not being a true oak, is included in the Genus *Lithocarpus*. The major oak species represented in Tehama County are:

- Interior Live Oak (*Q. wislizeni*)
- Canyon Live Oak (*Q. chrysolepis*)
- Black Oak (*Q. kelloggii*)
- Scrub Oak (*Q. berberidifolia*)
- Valley Oak (*Q. lobate*)
- Oregon White Oak (*Q. garryana*)
- Blue Oak (*Q. douglasii*)
- Tan Oak (*L. densiflorus*)

Oak Tree Species identification

Species	Leaves	Fruit
Blue Oak		
Valley Oak		
Oregon White Oak		
Engelman Oak		

<p>Coast Live Oak</p>		
<p>Interior Live Oak</p>		
<p>Canyon Live Oak</p>		
<p>California Black Oak</p>		

CONSERVATION GOALS & POLICIES

WORK COOPERATIVE WITH PRIVATE LANDOWNERS

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

Policy:

- A. Promote economic studies on the value of alternative and sustainable rangeland products such as fee hunting, eco-tourism, and firewood production.
- B. Utilize the resources and expertise of the Tehama County Economic Development Corporation and the Tehama Local Development Corporation to promote non-traditional low intensity business ventures within the oak woodlands of Tehama County.
- C. Educate county landowners on the economic benefits of maintaining and restoring oak woodlands.
- D. Promote the funding of valuable land conservation programs such as the Williamson Act.
- E. Encourage state funding for oak regeneration.

ENCOURAGED HARVEST PRACTICES FOR PRIVATE LANDOWNERS

- When harvesting oak for fuel or range improvements, encourage landowners 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.
- When safety permits, leave old hollow, 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 (CDF) and private consultants.

ENCOURAGED BUILDING PRACTICES IN OAK WOODLANDS:

- Consider the impact of construction practices on the long-term management of oaks found on their properties.
- Cluster houses to preserve 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 foundation and septic systems to avoid damage to tree roots.
- Design roads to minimize erosion and sedimentation to downstream resources.
- Avoid landscaping which requires or allow irrigation and runoff within the drip line of blue oak trees. Educate landowners on methods of regenerating oak populations Weed Control, Tree shelters, Planting acorns, and limiting browsing.
- 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.

PROMOTE EDUCATION THAT HELPS LEAD TO WELL MANAGED OAK WOODLANDS

- Educate landowners about potential threats to this resource.
- Encourage landowners and managers to seek education sources for advice on oak woodland management. UC ANR has compiled websites detailing management practices for homeowners, planners, and ranchers. <https://oaks.cnr.berkeley.edu/>. There are also multiple manuals and publications available at the UC Cooperative Extension office.
- Seek funding that supports outreach to private landowners through the Tehama County RCD, the NRCS, UC Cooperative Extension, Wildlife Conservation Board, and others.

ENCOURAGE HABITAT CONSERVATION

GOAL: Encourage landowners to protect oak woodlands 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 rich sustainable wildlife populations.

- Recognize sites where prescribed fire can be safely used as a management tool.
 - Recognize sites that warrant voluntary protection according to threat and funding potential.
- B. Encourage the voluntary protection of woodlands through these and other voluntary options:
- Development of sustainable ranching and farming operations.
 - Partnerships between government and non-profits.
 - Establishing and funding 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 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.
 - Explore the possibility of enhancing natural regeneration by identifying and protecting natural or volunteer seedlings to enhance their growth to the sapling stage. Tree shelters are an excellent tool for enhancing natural regeneration.
- B. Control invasive weed species in oak woodlands.
- Controlling invasive weed species surrounding oak seedlings that are less than two years old can be beneficial by lessening competition for nutrients, sunlight, water, and by limiting impacts from wildlife such as voles.
 - A 4-foot treatment to control weeds around the seedling was found to be optimal for weed control.

- Mowing is of limited benefit in preventing competition but can discourage voles that can cause damage to seedlings if done in early summer.
- Herbicides such as glyphosate can be highly effective for weed control, but care must be taken to avoid accidental spray contact to leaves and buds of oak seedlings resulting in non-target damage. The best herbicide timing is early spring. Where herbicides are not desired, organic mulches can prevent weed germination and lessen evapotranspiration which will encourage growth.

MONITOR TEHAMA COUNTY'S OAK WOODLANDS

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

Policy:

- A. Request that the Tehama County Hardwood Advisory Committee periodically evaluates 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 protection and 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 Tehama County.
 - Encourage studies that evaluate the effects of changing land uses on oak woodland's current values (wildlife, ranching, water, economics, etc.).
 - Encourage studies that provide Tehama County ranchers with better and more specific information about sustainable management of oak woodlands.

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APPENDIX I

Table 1

<p>Resources Element, 1983</p>	<p>The Resources Element article goals of preserving environmentally sensitive and significant lands for their plant and wildlife habitat and affording protection to critical riparian zones (WR1/2).</p> <p>RIPARIAN CORRIDORS: Significant Creek Corridor land use subcategories should be used to afford protection to riparian corridors on 50 feet on either side of a stream. Significant creek side corridors shall be designated on zoning maps (WR-c).</p> <p>WILDLIFE HABITAT: Significant wildlife habitats shall be protected through designations under the Natural Resource Conservation Land Use Classifications. Future land division applications within this classification or within 1 mile of a rare or endangered plant or wildlife habitat shall be referred to the CDFW for review and comment.</p> <p>Natural habitat resources shall be designated on General Plan Maps. Other significant plant communities, including rare or endangered species, shall be protected through designation under the "Habitat Resource" subcategory. Development siting conditions may also be required to maintain plant habitat integrity. Deer migration corridors located in Eastern and Western Planning Ahead will have residential development limited to avoid significant environmental impacts. Resource lands policy shall be implemented by the revised General Plan and Zoning Code.</p>
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<p>Zoning Ordinance, 1983</p>	<p>Natural Resource Lands classification is applied to properties to be preserved in a natural state and/or to provide open space buffer areas in which uses are restricted. Uses permitted include measures to promote conservation of soil, water and vegetation and reduce fire and erosion hazards and one-family dwelling among others. Minimum parcel size is 40 acres.</p>
<p>Voluntary Oak Woodland Management Guidelines, 1994</p>	<p>Landowners are encouraged to maintain a canopy leaf area of 30%, retain trees of all sizes and species, leave wildlife trees, limbs and brush in plies when harvesting oaks for fuel or range improvement, and seek professional advice when contemplating extensive harvesting. When building within oak woodlands, landowners should cluster houses, protect existing oaks during construction, avoid root compacting by limiting heavy equipment, and planning roads, cuts, fills, foundations, and septic systems. Landscaping that requires irrigation should be avoided within 10' of the trunk of an oak. Trees damaged during construction should be replaced. All landowners with 40 acres or more will receive a copy of the guidelines and those who want to harvest should develop a management plan. The Hardwood Advisory Committee will meet semiannually.</p>

APPEDIX II

County of Tehama Board of Supervisors Resolution No. 57-1994. Adopted by majority vote, May 10 1994.

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

WHEREAS, those lands described as oak woodlands within Tehama County provide multiple benefits, including commercial livestock production, wildlife habitat, fuelwood harvesting and land development; and,

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

WHEREAS, the County of Tehama recognizes responsible stewardship by landowners is necessary to sustain oak woodlands resources;

NOW, THEREFOR, BE IT RESOLVED, that the Tehama County Board of Supervisors does herby adopt the following recommendation for the sustained management of oak woodland resources.

1. All landowners with 40 acres or more, located in oak woodland habitat, shall be provided with a copy of the Tehama County Oak Woodland Management Guidelines adopted by the Board of Supervisors.
2. All landowners who wish to harvest oaks are hereby encouraged to develop their own management plan for properties in Tehama County. Landowners are encouraged to contact private and public sources for expert assistance and to use the Tehama County Oak Harwood Management Program guidelines and information provided by the Integrated Hardwood Guidelines in the development of their plans.
3. The Tehama County Hardwood Advisory Committee shall meet semiannually. The committee shall meet to evaluate and substantiate the progress of educational programs of hardwood management and the effectiveness of the Tehama County Oak Woodland Management Guidelines in sustaining oak woodland habitat in Tehama County.

BE IT FUTHER RESOLVED, that the Tehama County of Supervisors does hereby direct that the University of California Cooperative Extension, Tehama County to coordinate with local government agencies and/or private organizations to offer workshops on oak woodland management and conservation to landowners, realtors, developers, and community organizations.

APPENDIX III

TEHAMA COUNTY OAK WOODLAND MANAGEMENT GUIDELINES

Adopted 1994

1. When Harvesting Oaks for Fuel or Range Improvement, Plan Harvest to:

- Maintain an average leaf canopy of 30 percent.
- Retain trees of all sizes and species represented at the site.
- When safety permits, leave old hollow trees and those actively being used for nesting roosting of 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 Soil Conservation Services (SCS), California Department of Forestry and Fire Protection (CDF) and private consultants.

2. When Building Within Oak Woodlands:

- Cluster houses to preserve 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 foundation 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 within (10) feet of the trunk of an oak tree.
- Consider replacing trees whose removal during construction was unavoidable.

APPENDIX IV

Examples of Endangered or Special Concern (SC) Animal Species within Tehama County Oak Woodlands.

FISH	FEDERAL	STATE
California Central Valley DPS Steelhead Trout <i>Oncorhynchus mykiss irideus</i>	FT	
Spring-Run Chinook Salmon <i>Oncorhynchus tshawytscha</i>	FT	ST
Winter-Run Salmon <i>Oncorhynchus tshawytscha</i>	FE	SE
NON-RAPTOR BIRDS		
Bank Swallow <i>Riparia riparia</i>		ST
Loggerhead Shrike <i>Lanius ludvicianus</i>		CSC
Western Yellow-billed Cuckoo <i>Coccyzus americanus occidentalis</i>	FT	SE
Yellow-breasted Chat <i>Icteria virens</i>		CSC
Yellow Warbler <i>Setophagapetechial</i>		CSC
RAPTORS		
American Peregrine Falcon <i>Falco peregrinus anatum</i>		FP
Burrowing Owl <i>Athene cuniculata</i>		CSC

Northern harrier <i>Circus hudsonius</i>		CSC
White-tailed Kite <i>Elanus leucurus</i>		FP
MAMMALS		
Pallid Bat <i>Antrozous pallidus</i>		CSC
Townsend's Big-Eared Bat <i>Corynorhinus townsendii</i>		CSC
Ringtail <i>Bassariscus astutus</i>		FP

AMPHIBIANS, REPTILES, INSECTS		
Foothill Yellow-legged Frog <i>Rana boylei</i>		CSC
Western Pond Turtle <i>Actinemys marmorata</i>		CSC
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i>	FT	
Red-legged Frog <i>Rana draytonii</i>		CSC

GSC- Federal Species of Concern

FT- Federal Threatened

CSC- California Species of Concern

FE- Federal Endangered

ST- State Threatened

FP – Fully Protected

APPENDIX V

