PLACER COUNTY OAK WOODLAND MANAGEMENT PLAN

PROBLEM STATEMENT

More than a third of all oak woodlands have been lost since the settlement of California by Europeans; of an estimated 10-12 million acres, only some seven million remain. Of the remaining oak woodlands, most have been modified or degraded, and only about four percent are formally protected. Oak woodlands cover approximately 10 percent of the state's total land area, and are the most biologically diverse habitat in California, with over 300 vertebrate species relying on these areas. Most of the recent loss of oak woodlands has been due to the ever-increasing urban, suburban and rural residential growth of California, as evidenced in Placer County which is the one of the fastest growing counties in the state.

California has one of the most rapidly growing human populations in the world. The state's population has grown from less than 100,000 people in 1850, to over 31 million people today (an average annual rate of growth of 3.4 percent) to a projected 63 million people in the next 50 years. Placer County's population over this same period of time is expected to increase from nearly 230,000 people to over 560,000 residents. This is resulting in considerable increase in new home construction, some of which is concentrated in Placer County's oak woodlands. Statewide over 30,000 acres of oak woodlands are converted each year to residential and commercial land uses. As new home construction expands into oak woodlands, many of the habitat values of oak woodlands are lost as extensively managed large blocks of grazing land are fragmented into smaller blocks. The urban interface with oak woodlands, once confined to the major population centers of the San Francisco Bay, Sacramento, and the Los Angeles basin, now extends throughout the entire state.

In spite of this growth and due to its unique geography, Placer County contains a wide variety of habitat dominated by oak woodlands. These woodland habitats include the valley oaks of the Central Valley, the riparian areas along the stream and river corridors, through the broad band of blue oak woodland habitat in the Sierra Nevada foothills and the mixed hardwood of the montane forest. The unincorporated areas contain the majority of the Placer's oak woodland habitat, the majority of which is privately owned.

Land use designations associated with oak woodland resources range from agricultural to rural residential to urban in character. Each of these land use types brings its own land management and land development activities that have the potential to detrimentally impact oak woodland resources. The County has long sought to address the impacts of development through implementation of a range of mitigation requirements under the CEQA and the County's Tree Preservation Ordinance. The manner in which these mitigation measures have been implemented has varied widely project-by-project and area-by-area.

PURPOSE

The purpose of Placer County's Oak Woodland Management Plan is to provide a consistent policy for oak woodland habitats throughout the County and compliment programs and policies including: 1) projects subject to an environmental assessment under the California Environmental Quality Act (CEQA); 2) projects subject to the Placer County Tree Ordinance; and (3) projects evolving out of The Placer Legacy. Ultimately the goal of this plan will be to mitigate the impact of the loss of oak woodland communities, and provide guidance on the conservation of the oak woodland communities. The management plan also takes into consideration other trees and plants associated with the oak woodland-dominated natural communities and the value these communities provide to wildlife, air quality, water quality, and quality of life.

Placer County's Oak Woodlands Management Plan will give the County the opportunity to obtain funding for projects designed to conserve and restore Placer's oak woodlands. While the Plan is countywide in nature, it provides opportunities to address oak woodland issues on a project priority basis to achieve oak woodland protection. More importantly, this Plan will provide a mechanism to bring ranchers and conservationists together in a manner that allows both to achieve that which is so valued, -- sustainable ranch and farming operations and healthy oak woodlands.

Recognizing the importance of oak woodlands and the critical role private landowners have in the conservation of oaks, Placer County created the Oak Woodlands Management Plan Program with the expressed intent the Plan accomplish the following:

- > Support and encourage voluntary, long-term private stewardship and conservation of Placer County oak woodlands by offering landowners incentives to protect and promote biologically functional oak woodlands;
- ➤ Provide incentives to protect and encourage farming and ranching operations that are operated in a manner that protect and promote healthy oak woodlands;
- ➤ Provide incentives for the protection of oak trees providing superior wildlife values on private land, and;
- Encourage planning that is consistent with oak woodlands preservation.
- ➤ Identify appropriate methods to mitigate oak woodland losses.

Importance of Oak Habitats for Wildlife

Placer County acknowledges oak woodlands provide habitat for some 331 species of wildlife, moderate temperature extremes, reduce soil erosion and sustain water quality. Moreover, Placer County believes oak woodlands facilitate nutrient cycling and provide forage for numerous wildlife species. Oak woodlands are thought to have the richest wildlife species abundance of any habitat in California, as some 331 species depend on

this habitat to varying degrees. The key connection between much of the wildlife and oak woodlands is through the oak's production of acorns. Forests with at least some oaks have higher average vertebrate species diversity than similar forests without oaks. This difference is due both to acorn production and the increased cavity-nesting sites afforded by large oak trees in the landscape. Large oak trees in oak woodland habitats are important for cover, nesting sites, as well as caching sites for birds storing acorns.

The Economic Importance of Oak Woodlands

Placer County recognizes forests such as oak woodlands are important assets, and their economic and social value to the state is well documented. The Oak Woodlands Conservation Act of 2001 recognizes the importance of California's oak woodlands, how they enhance the natural and scenic beauty of California, the critical role of the private landowner and the importance of private land stewardship. Placer County similarly shares these values and further acknowledges how oak woodlands increase the monetary and ecological value of real property and promote ecological balance. Wood is perhaps one of the world's most environmentally friendly raw materials. The timberland regions of California supply nearly 20 percent of the nation's lumber needs and continue to be a significant employer in eastern Placer County. Moreover, the potential of oak woodlands as a resource for higher-valued wood specialty products is yet to be tapped into. Placer County's oak woodlands could not adequately supply large-scale commodity markets, but small-scale niche markets could be developed. Economic value of various oak species and tanoak found in Placer County:

- Blue oak: fuel and acorns for livestock
- Canyon Live oak: furniture, tools, farm implements, and shade tree
- California Black Oak: fuel wood and furniture, livestock browse the foliage
- Interior Live oak: fuel and shade tree
- Valley oak: acorns for live stock, shade tree
- Tanoak: tannin and furniture

In addition to wood products, oak woodland resources are a vital component of wildlife and plant ecosystems, water quality, recreation, and esthetic needs of Placer County. Eco-tourism is one of the fastest growing industries globally and is particularly significant in the eastern reaches of the county.

Furthermore, a recent study by Richard B. Standiford of the University of California-Berkeley and Thomas Scott of the University of California-Riverside showed how real dollar pricing could be used to evaluate the relative value of open space on individual house and land prices, as well as its overall community value. The regression equation used to determine the economic value of open space was based on the idea that households maximize their utility by equating the marginal willingness to pay for an additional unit of each characteristic to the marginal aesthetic price of that characteristic. It was hypothesized that housing and land value is a function of the characteristics of the housing (size, number of rooms, presence of swimming pools, etc.), location of the units (access to job location, condition of roads), the improvements at the site (roads, fencing, utilities), and the amenity aspects of the area (view, vegetation type, access to open space). Multiple regression analysis was used to break down the relative contribution of these variables to the overall value of the property.

It was found that the open space land has the effect of increasing the overall value of the entire community. In addition to providing important conservation values for an area, the overall value of all the land in the area increases. The effect of increasing the amount of open space land (decreasing the distance to the open space area) on an individual's land value can be investigated by applying the results of the regression analysis.

By using a regression model with a aesthetic price as the primary variable, it was determined that a 10 percent decrease in the distance to the nearest oak stands and to the edge of the permanent open space land resulted in an increase of over \$20 million in the total land and home value of 4,800 parcels immediately surrounding The Nature Conservancy oak woodland reserve on the Santa Rosa Plateau in Riverside County California. Private owners receive a premium by being located adjacent to land that will remain as dedicated open space. Moreover, this 10 percent decrease in the distance to open space land and oaks also results in additional tax revenue of \$160,000 annually, with a present value of \$3.2 million (at a 5% percent real discount factor).

In addition, previous work has shown that native oak trees on rural subdivisions may contribute as much as 27 percent to the value of the property. It is clear that natural resources in a broad geographic area contribute to the economic value of real property. This increased value provides an economic incentive for investing in oak woodland conservation. The increasing scarcity of natural resources in rapidly urbanizing areas is resulting in economic values that are reflected in both individual and community economic values promising results that can be used to evaluate how public and private investments in conservation and restoration can be justified in economic terms.

EXISTING POLICIES AND PROGRAMS

The County has recognized the value of native trees over the years through the adoption of both policy language and ordinances. The 1994 Placer County *General Plan Policy Document* and numerous community plans contain policy language, which is explicitly written to protect woodland habitat. Moreover, in 1987, Placer County adopted a tree ordinance (Chapter 12, Article 12.16 PCC). In addition, Placer County has developed the Placer Legacy Open Space and Agricultural Conservation Program to protect and conserve open space and agricultural lands. Placer Legacy has identified oak woodlands as natural communities with the single greatest opportunity for large-scale conservation. Placer County is working with landowners through easement agreements and education to protect our oak woodland resources.

County staff has applied a range of conditions for mitigation standards on individual projects. These standards generally represent the nexus between a project's impacts and the degree to which these impacts must be mitigated for a project to meet its CEQA obligations, Tree Ordinance requirements, and to be consistent with General Plan policy.

In addition to the standard conditions the staff routinely applies other standards generally derived from the negotiation on individual projects. These standards are typically developed as mitigation measures during environmental review for tree losses. They have been applied to other woodland resources, but more often than not the focus has been on individual trees or grouping of trees. This policy for the most part, focused on individual tree replacement and has not taken into account tree size, age, species type, and relationship to other ecological factors. This Plan will codify all existing oak woodland protection efforts into one program. Greater consistency and coordination of effort will ensue, resulting in a cooperative more efficient conservation strategy.

WOODLAND RESOURCES CLASSIFICATION

The classification system of woodland resources in Placer County identified in this policy is based upon the Wildlife Habitat Relationship (WHR) system used by the California Department of Fish and Game (DFG). In Placer County, the WHR system identifies a total of 36 different natural communities. Statewide, WHR identifies 52 different natural communities. Therefore, as a single county we possess 69% of all natural communities in the state.

Oaks are in the plant family Fagaceae. The members of this family include *Lithocarpus* (tanoaks, the majority of species (ca. 300) are in Asia), *Castanopsis* (now more frequently referred to as *Chrysolepis*) (the chinquapins), *Castanea* (chestnuts), and *Quercus* (oaks). All produce hardened fruits. *Lithocarpus* is considered the most plesiomorphic ("primitive") while *Quercus* is considered the most apomorphic ("advanced"), as evidenced from floral morphology.

There is a long history of classification of present vegetation in California (see review in Sawyer and Keeler-Wolf 1995). Holland (1986) identified 18 natural communities dominated by oaks in California. Six are forest communities (e.g., coast live oak riparian forest), four are chaparral communities (e.g., scrub oak chaparral), and eight are woodland and savanna communities (e.g., blue oak woodland and Oregon oak woodland).

Thus, for our purposes, we define oak woodlands as simply those forests or woodlands where oaks (or tanoaks) are common or predominate. We wish instead to emphasize that for wildlife, including the bird community, the key issue of oak woodlands is not so much in the detail of which oak species are present, but rather that all oaks (and tanoaks) produce acorns. Acorns are perhaps the most important food product for wildlife produced in California's many diverse habitats. That said, for management plan purposes we have identified 4 oak habitat types within the County as follows: Valley oak woodland, valley foothill riparian, blue oak woodland, and montane hardwood.

The conservation objective described for each of the four oak woodland communities provides the foundation from which conservation opportunities will be identified and what mitigation standards will be created. The conservation objective will encourage the development of new programs with two complementary goals: (1) make it easier for private landowners to foster oak regeneration on their property, (2) make it more difficult

for large-scale clearing of oak woodland to take place without adequate mitigation, and (3) promote the passage of oak preservation ordinances and smart-growth planning initiatives at the local (city and county) level.

Descriptions of the four oak woodland types located in Placer County are provided below. The following information on woodlands was summarized from *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988).

1. Valley Oak Woodland

This natural community is dominated by valley oaks (*Quercus lobata*) and varies from savanna-like to forest-like stands with partially closed canopies. (WHR type – Valley Oak Woodland)

Vegetation Composition and Structure

Valley oaks dominate this savannah like habitat. Associated tree species in the Central Valley include California sycamore (*Platanus racemosa*), California black walnut (Juglans californica), California boxelder (Acer negundo), Oregon ash (Fraxinus latifolia), interior live oak (Quercus wislizeni), California buckeye (Aesculus californica), and blue oak (Quercus douglasii). At low elevations close to water, valley oak is associated with Fremont cottonwood (*Populus fremontii*) and willows (*Salix* spp.). Valley oak woodlands vary from open savannahs to closed canopy forests. Dense stands occur along natural drainages in deep soils. Tree density tends to decrease as one moves from lowlands to uplands. The understory shrub layer can be dense along drainages and very sparse in uplands. The shrub understory can consist of poison oak (Toxicodendron diversilobum), California wild grape (Vitis californica), toyon (Heteromeles arbutifolia), California coffeeberry (Rhamnus californica), and Himalayan blackberry (Rubus discolor). Understory grasses and forbs are mostly introduced annuals such as Italian ryegrass (*Lolium multiflorum*), ripgut brome (*Bromus diandrus*), Mediterranean barley (Hordeum marinum), yellow star thistle (Centaurea solstitialis), wild oats (Avena sp.), and tarweed (Hemizonia fitchii). Mature valley oaks have well-developed crowns and reach maximum heights of 50 to 120 ft. The massive trunks (often up to 6 feet DBH) and branches of mature trees are characteristic of valley oak woodlands.

General Locational Characteristics

Valley oaks are endemic to the state, meaning that they are found only in California. They occur in a patchy distribution throughout most major lowland valleys including the Sacramento-San Joaquin and those valleys occurring in the Coast Range and Transverse Range. Many valley oak woodlands occur as isolated stands in areas where surrounding habitats have been modified by agricultural, urban, and suburban activities. Annual grasslands, riparian forests, and other oak woodland types occur adjacent to valley oak woodlands. Conversion of valley oak woodlands to irrigated agricultural land uses has had the largest effect on the acreage decline of this community.

Physical Characteristics

Valley oak communities generally occur on deep, well-drained alluvial soils found in valleys and foothills below 2,400 feet above mean sea level (MSL).

Distribution in Placer County

In Placer County, valley oaks are typically associated with riparian corridors. A large intact woodland remains on the Bear River and other small stands are associated with major creek drainages in western Placer County (e.g., Auburn Ravine, Coon Creek and Dry Creek).

The majority of valley oaks were presumably cleared for fuel wood and to clear lands for farming activities. Today, the greatest threats to valley oak woodlands are lack of regeneration and continued losses due to agricultural practices and land development. The failure of valley oak regeneration seems to be related to competition for soil nutrients and moisture between oak seedlings and introduced annuals, consumption of acorns and seedlings by wild and domestic animals, and flood control projects. Valley oaks are tolerant of flooding while other components of the community that are potential predators or competitors are not. Fire suppression has encouraged live oak and pine invasion in upland valley oak sites.

Conservation/Restoration Objectives

The remaining valley oak woodlands should be protected and restoration should be a priority. Impacts to valley oaks should be avoided particularly when they are part of larger unfragmented woodlands or connected to other unfragmented ecological landscape. Where impacts occur, prior to issuance of a tree permit, County staff should analyze the connection of onsite woodlands to adjacent woodlands. Impacts resulting in woodland fragmentation should be avoided. If impacts to valley oak woodlands are unavoidable, mitigation priority should be given to restoration of onsite woodlands when existing habitat value can be maintained or enhanced or restoration at an offsite location supporting valley oak woodland where a fragmented condition can be improved, habitat value can be enhanced, or where connectivity can be achieved.

2. Valley Foothill Riparian

Valley foothill riparian habitats are those plant communities supporting woody vegetation found along rivers, creeks and streams in western Placer County in the lower foothills of the Sierra Nevada and on the floor of the Sacramento Valley. Riparian habitat can range from a dense thicket of shrubs and low growing trees to a closed canopy of large mature trees covered by vines. (WHR type – Valley foothill riparian)

Vegetation Composition and Structure

This habitat has three distinct structural layers: canopy cover of 20-80 percent, subcanopy layer, and an understory shrub layer. Valley oaks, blue oak, Fremont cottonwood and California sycamore are the dominant woody vegetation types along major streams. The sub-canopy trees include willows, Oregon ash, and white alder (*Alnus rhombifolia*). The understory shrub layer consists mostly of willows, wild rose (*Rosa californica*), Himalayan blackberry, and poison oak. Herbaceous vegetation including sedges, rushes, and grasses are also associated with the understory. The valley foothill riparian

community provides resources that make it the most bio-diverse, densely populated habitat in the western United States, and it plays a crucial role in the migration and dispersal of wildlife as they use these riparian habitats for movement corridors (Rogers et al., 1996).

Riparian systems are one of our most important renewable natural resources. While small in total area when compared to California's size, they are of special value as wildlife habitat. Over 135 species of California birds such as the willow flycatcher, yellow-billed cuckoo and red-shouldered hawk either completely depend upon riparian habitats or use them preferentially at some stage in their life history. Another 90 species of mammals, reptiles, fish, invertebrates and amphibians, including sensitive species such as California red-legged frog, Valley elderberry longhorn beetle and riparian brush rabbit, depend on California's riparian habitats. Riparian habitat provides food, breeding habitat, cover, and migration corridors for wildlife. This community also provides riverbank protection, erosion control and improved water quality, as well as numerous recreational and esthetic values.

General Locational Characteristics

The Valley Foothill Riparian community occurs along the California coast and inland to about 3,000 feet MSL. It is often associated with valley bottoms along slow moving streams with deep alluvial soils and a high water table. It can also be associated with incised channels in steeper canyons but in these cases it is generally limited to the area immediately along the stream corridor.

Physical Characteristics

These are communities that usually consist of one or more species of deciduous trees plus an assortment of shrubs and herbs, many of which are restricted to the banks and flood plains of these waterways. The extent of the vegetation away from the watercourse depends on the size and nature of the banks and the flood plains, the amount of water carried by the stream or present in the lake, and very importantly on the depth and lateral extent of subterranean aquifers. Additionally, historical patterns of land use often determine the actual extent of the riparian corridor. Along small stream channels a riparian community may form a very narrow band, whereas along larger streams or in broad valleys with meandering stream courses, the riparian woodland or forest areas may be quite extensive. Rates of precipitation are consistent with those found in the blue oak woodland community (i.e., 20 to 60 inches annually).

Distribution in Placer County

Valley foothill riparian habitat in Placer County, like most regions in California, has seen a significant reduction in acreage since European settlement of the region. Clearing for agricultural practices, flood control, infrastructure development, road construction and land development have eliminated much of the riparian forests of western Placer County. Remaining habitat is associated with major stream corridors and the American and Bear Rivers. Auburn Ravine, Dry Creek and Coon Creek contain the largest expanses of contiguous valley foothill riparian in Placer County today. Other more seasonal streams include patches of fragmented riparian habitat. With the continued levels of current

urban/suburban development, which result in increases in annual urban runoff, opportunities are created for valley foothill riparian habitat creation and restoration.

Conservation/Restoration Objectives

The first priority for valley foothill riparian is to avoid generating direct or indirect impacts on the resource. Where impacts cannot be avoided and habitat is degraded or lost by road crossings, infrastructure extensions or flood control, onsite, in-kind replacement of habitat is to be encouraged including the reestablishment of a viable multi-story community structure. Typically, mitigation should occur at the location of the impact. When reviewing valley foothill riparian mitigation plans, staff should evaluate whether offsite mitigation may result in greater ecological benefits than onsite mitigation. Offsite mitigation should be considered if the offsite location could improve corridor connectivity, increase habitat value, or restore a significantly diminished resource.

3. Blue Oak Woodland

This natural community is generally dominated by blue oaks (*Quercus douglasii*). It is associated with the blue oak-foothill pine community as well. (WHR types – Blue oak woodland and blue oak-foothill pine)

Vegetation Composition and Structure

Blue oak woodlands are highly variable. Typically blue oak comprises 80-100 percent of the trees present. Foothill pine (*Pinus sabiniana*), California buckeye, valley oak, interior live oak, canyon live oak (*Quercus chrysolepsis*), and California black oak (*Quercus kelloggii*) are common associates of blue oak throughout its elevational distribution. Non-native annual grasses, similar to those found in valley oak woodlands, form most of the understory in open woodlands. Characteristic shrub species in this community include poison oak, California coffeeberry, and several species of ceanothus (*Ceanothus* spp.) and manzanita (*Arctostaphylos* spp).

Blue oak-foothill pine woodlands support a diverse mix of hardwoods, conifers, and shrubs. Blue oak interspersed with scattered foothill pine typically forms most of the canopy of this highly variable habitat type. In the Sierra Nevada foothills, interior live oak and California buckeye are often associated with this community. Interior live oak becomes more abundant on steeper slopes, shallower soils, and at higher elevations. Characteristic shrub associates include several ceanothus and manzanita species, poison oak, and western redbud (*Cercis occidentalis*).

Blue oaks are relatively slow-growing, long-lived trees. Most blue oak stands exist as groups of medium to large trees with few or no young oaks. In Placer County it is common to find even-aged stands due to the cessation of clearing activities that followed the decline in fruit orchard production in the mid-20th century. Acorns provide a food source for insects, livestock, and wildlife; however, increased consumption or damage of acorns may be a contributing factor to lower levels of successful oak regeneration. In heavily grazed areas, regeneration is rare due to the consumption of seedlings by cattle.

General Locational Characteristics

Blue oak woodlands form a nearly continuous band along the Sierra Nevada-Cascade foothills of the Sacramento-San Joaquin Valley. As a natural community, the blue oak woodland is not broadly distributed throughout the state but it is prevalent throughout the Sierra Nevada foothills. Because of existing and projected growth and development in the foothill region, ongoing fragmentation and direct loss is anticipated to significantly impact this resource.

Physical Characteristics

Blue oak woodlands occur on a wide range of soils that are often shallow, rocky, infertile, but well drained. Blue oak woodlands occur in dry, hilly terrain where the water table is usually unavailable to trees. Over the range of blue oaks, there is considerable climatic variation. Climates are typically Mediterranean, with mild wet winters and hot dry summers. Average annual precipitation ranges from 20 to 60 inches annually.

Distribution in Placer County

In Placer County, blue oak woodlands cover broad areas of the lower western slope foothills of the Sierra Nevada. Typically, blue oak woodlands are found below 3,000 to 4,000 feet. At lower elevations on gentle slopes, blue oak woodlands occur as large blocks with highly variable canopy cover. On steeper ground, blue oak woodlands occur in small patches interspersed with other habitats such as annual grasslands, chaparral, riparian forests, and other types of oak woodlands. When found with extensive stands of foothill pine, blue oaks are associated with steeper, dryer slopes with shallower soils than blue oak woodlands. At lower elevations on gentle slopes, these two communities intermix with grasslands and valley oak woodlands. At higher elevations on steeper slopes, the communities are mixed with grasses and shrubs. Riparian woodlands may bisect these natural communities along permanent and intermittent watercourses.

In addition to continued fragmentation, there is a concern over blue oak recruitment. Poor blue oak recruitment from acorns may be occurring for several reasons. Introduced annual grasses out-compete blue oak seedlings for soil moisture. In addition, acorns and seedlings are eaten or damaged by insects, domestic livestock, and wildlife. Blue oak is also somewhat intolerant of shady conditions, and is unable to survive under a dense canopy. Disturbances creating small openings in the canopy may be needed for seedlings to survive and grow sufficiently to promote a broader age class distribution. Furthermore, reduction in annual grass biomass through fire, limited grazing, or weeding may increase seedling growth and survival.

Conservation/Restoration Objectives

Conservation of large blocks of unfragmented habitat is a high priority for this natural community. The greatest percentage of historic blue oak woodland habitat in Placer County was first eliminated for firewood, fuel wood and agricultural clearing. Regeneration has occurred but largely in a fragmented rural residential setting where habitat values are severely diminished. Active management of blue oak woodlands has increased regeneration in some areas. Recruitment enhancement techniques include reducing the intensity and duration of browsing pressure on woody vegetation, using fire

to manipulate the understory, creating gaps in the canopy, and minimizing livestock use until regenerating blue oak saplings are taller than the browse level. For maintaining biodiversity in oak woodlands it is also necessary to conserve important habitat elements such as snags and downed wood.

There are extensive areas of unfragmented blue oak woodland remaining in the unincorporated area of Placer County, mostly near the Bear River between Meadow Vista and Camp Far West Reservoir. These areas are contiguous to other similar large unfragmented habitat patch segments in Nevada and Yuba Counties near the Spenceville Wildlife Area. Where possible efforts should be made to protect these and other large unfragmented communities, particularly where such areas also include valley foothill riparian habitat. Project sites supporting blue oak woodland should be evaluated to determine whether project-related impacts would result in fragmentation of a contiguous stand either on the site or in adjacent parcels. The conservation of this community should be a priority.

4. Montane Hardwood

This natural community is dominated by a variety of hardwood species with black oak and canyon live oak being the dominant oak species. The hardwood forest will mosaic with forests typical of the Sierran mixed conifer. (WHR types – Montane hardwood, montane hardwood-conifer and aspen)

Vegetation Composition and Structure

The montane hardwood forests of the Sierra Nevada are one of the most variable of any California hardwood type. The dominant species vary by topography, soils, and elevation. The canopy is often dense and bi-layered with a limited understory. One notable characteristic of montane hardwood forests is the lack of blue oaks and valley oaks. The characteristic oaks are canyon live oak, interior live oak, and California black oak.

Canyon live oak often forms almost pure stands on steep canyon slopes and rocky ridge tops throughout the Sierra Nevada. Such stands are prevalent in Placer County as well as along the many steep canyon lands of the west slope. These habitats are characteristic of steep, rocky, south-facing slopes of major river canyons and interface with mixed hardwood-conifer, ponderosa pine, and Sierran mixed-conifer habitats. Canyon live oak trees have tremendously variable growth forms, ranging from shrubs with multiple trunks on rocky, steep slopes, to 60 to 70 foot tall trees on deeper soils in moister areas.

Interior live oak occurs with canyon live oak or alone on steep canyon slopes and rocky, steep slopes throughout the Sierra Nevada. Its growth form varies much like canyon live oak. Both of these evergreen oaks have dense canopies.

Throughout the same range, California black oak tends to dominate on gentle topography at higher elevations. It grows to heights of 70 to 80 feet at maturity, with long, straight trunks in closed canopy situations. In open forests, California black oak has larger, spreading branches.

Bigleaf maple (*Acer macrophyllum*) also occurs in this community in cool areas, near low mountain streams and in alluvial river bottoms. Bigleaf maple generally prefers moist, gravelly and rich soils. It is also found on sites that have been disturbed due to fires or logging.

Associates of montane hardwood communities at higher elevations include ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), Pacific madrone, Jeffrey pine (*Pinus jeffreyi*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*), white fir (*Abies concolor*) and quaking aspen (*Populus tremuloides*). At lower elevations and poor soils with steep slopes, associates include foothill pine, knobcone pine (*Pinus attenuata*), tan oak (*Lithocarpus densiflorus*), and Pacific madrone (*Arbutus menziesii*). Understory shrub species include poison oak, ceanothus, manzanita, mountain mahogany (*Cercocarpus* sp.), coffeeberry, wild currant (*Ribes* spp.), and mountain misery (*Chamaebatia foliolosa*). Forbs and grasses are not as prevalent as on lower elevation hardwood rangeland types. Montane hardwood forests have a pronounced hardwood tree layer with poorly developed shrub and herbaceous layers.

General Locational Characteristics

Montane hardwoods range throughout California from 300 feet near the coast to almost 9,000 ft in southern California. Surrounding habitats include conifer-dominated types, chaparral types, blue oak and valley oak woodlands, and exotic annual grasslands.

Physical Characteristics

Wide ranges of physical characteristics affect montane hardwood forests. Slopes range from gentle to steep. Soils are mostly rocky, coarse, and poorly developed. However, relatively large California black oak stands occur in mountain valleys on alluvial soils. Exposures tend to be south, west, and east, while conifers tend to dominate on northern exposures. Climates are typically Mediterranean but extremely variable given the wide distribution of this type. Average summer temperatures are moderate, while average winter temperatures range from near freezing to the mid-40's. Snow occurs in the winter at higher elevations, but does not remain as long as on adjacent conifer-dominated habitats.

Distribution in Placer County

Montane hardwood forests cover a wide area of Placer County on the westerns slopes of the Sierra Nevada. Because it intermixes with coniferous forests and the blue oak woodland communities, at times it can be hard to distinguish as a separate community. It is most prevalent as a distinct community in the steep canyon lands of the river systems of the western slope (e.g., Bear River, Rubicon River and North/Middle Fork American River).

Conservation/Restoration Objectives

The large number of hardwood and conifer species allows this type to occupy many environments and locations. The general inaccessibility of these habitats has protected them from many of the human-induced disturbances such as intensive agricultural,

residential and commercial development, grazing, and woodcutting. However, impacts are still anticipated largely from rural residential development, and some clearing for road building and logging. Other impacts can be anticipated with catastrophic loss due to fire. Between fuel load accumulations and the increasing amount of wildland/rural residential interfaces, the likelihood of catastrophic fires increases each year.

CONSERVATION GOALS & POLICIES

An implementation strategy for the Placer County Oak Woodland Management Plan is in development. It will include the engagement of local, bioregional conservation efforts to better define bioregional priorities for acquisition, restoration, and focused conservation efforts. The implementation process will eventually include a series of local workshops and public outreach to:

- Familiarize local organizations with the Management Plan and the implementation ideas.
- > Identify local initiatives, projects, and organizations capable of working as local partners to achieve habitat conservation and restoration targets.
- Develop conservation and restoration acreage objectives based on inventory, assessment and biological need.

Specific policy goals for conservation action are offered here as a point of discussion. Each goal is accompanied by a brief discussion of the scientific evidence that supports it. These goals cover actions in several areas:

- > Habitat protection and restoration
- > Land management
- > Monitoring and research
- > Policy

Many of these goals follow those made by other organizations, or complement them. The objective of these goals is to facilitate the protection and restoration of oak woodland habitat, including the successful recruitment of new oaks for future generations of the wildlife that depend on them. Only by restoring the processes involved in oak regeneration can oak woodland dependent species be secured a future, and thus avoid their listing as threatened or endangered species. Likewise, restoring oak regeneration will contribute to preserving sustainable working landscapes.

These goals are to serve as a guide, which can be evaluated through biological research, monitoring, and adaptive management. This process will allow the continuing refinement of these policy goals and the development of more effective management and restoration strategies. It is our hope that these policy goals will help galvanize and guide Placer County's oak woodland management program, provide funding to support habitat restoration and land acquisition, and support the conservation actions of private and public land managers.

Working Cooperatively with Private Landowners

GOAL 1: In private commercially managed oak woodland habitats (i.e. vineyards, agricultural fields, and housing developments), maintain habitat characteristics sufficient to support native flora and fauna populations.

Policy

1(a) Inform private landowners of the imminent decline of oak woodlands due to habitat loss and lack of regeneration, and of the subsequent effect on wildlife populations.

Support active outreach to private landowners through established programs such as local Resource Conservation Districts, the Natural Resources Conservation Service, UC Cooperative Extension, and Placer County Legacy.

- 1(b) Retain connected oak patches within managed landscapes.
- Developed or agricultural areas may still provide habitat for some oak woodland species if oak patches are retained.
- 1(c) Retain oak trees in addition to herbaceous, grass or scrub understory. Oak removal has historically been recommended to increase forage production for livestock. However, research suggests that removing blue oaks results in little or no improvement in forage production in areas receiving less than 20 inches of rain per year Rangeland experts also recommend that areas where oaks are thinned should retain oak canopies of at least 25-35% to help maintain soil fertility, minimize soil erosion, and provide wildlife habitat.
- 1(d) Maintain oaks around residences and other landscaped areas by avoiding soil compaction and over-watering.

Native oaks are valued parts of many yards and parks, and may be harmed by soil compaction or inappropriate irrigation.

1(e) Retain patches of chaparral, riparian or grassland habitats adjacent to patches of retained oaks.

The presence of these habitats adjacent to oak patches may improve conditions for native fauna.

1(f) Seek opportunities to work with landowners.

Work cooperatively with agricultural researchers to encourage farm operations and vineyard operations adjacent to existing oak woodlands to be more "native flora and fauna friendly". In addition, influence the layout of new vineyards and farm operations located in oak woodlands, to ensure that oak harvest or reduction conforms as much as possible to the above polices.

Habitat Conservation

GOAL 2: Prioritize oak woodland sites for protection.

Policy

2(a) Prioritize sites with intact oak regeneration and decay processes.

One of the greatest threats to oak woodland habitat in California is the lack of oak regeneration, specifically in blue, interior live, and valley oak communities. Prioritizing sites that are presently demonstrating healthy oak regeneration constitutes a step towards insuring viable habitat. Conservation efforts should use the most recent information regarding the present quality of habitat and wildlife populations to prioritize the acquisition and protection of sites. Moreover, protecting sites with a diverse age structure of oak trees will provide a continuum of seeding phenologies, preventing synchronous or wide-scale acorn crop failures. Maintaining large old oaks within a diverse age structure will provide decaying limbs necessary for bird nesting sites in addition to high output acorn production.

2(b) Prioritize sites to represent a diversity of oak woodland types.

The full range of variation in oak woodland habitat types (and associated animal species) can be protected by: 1) protecting a diverse portfolio of sites located in different parts of the geographic and elevation range of oak woodlands, and 2) protecting individual sites that contain a variety of oak woodland types. Protecting the variety of oak woodland types may help protect the various species that are associated with different types of oak woodland habitats.

2(c) Prioritize sites according to surrounding land use.

Certain uses of land adjacent to oak woodland habitat may negatively impact the quality of that habitat for wildlife.

2(d) Prioritize oak woodland sites adjacent to intact chaparral, grassland, pine or and riparian habitats.

Diversity of habitat communities in proximity to oak woodlands will greatly benefit species diversity and survivability. Edge habitat connectivity is critical to most wildlife species.

2(e) Prioritize sites according to landscape variables (patch size, shape, and connectivity) that adequately support the desired populations of oak woodland-dependent species.

Large, unfragmented, and connected areas of oak woodland should have high priority for protection, for a number of reasons including species composition and breeding success, both of which can be altered by habitat fragmentation.

2(f) Prioritize sites according to management options.

Sites in which management can be used to restore natural ecosystem processes should be given a high priority for protection. For example, sites in which a natural fire regime can be re-established might be assigned a higher priority than sites in which there is a need for strong fire suppression. Sites in which the impacts of grazing can be strictly managed may also be priorities for protection.

2(g) Prioritize sites based on conservation threats and opportunities for protection.

The above guidelines are useful for identifying the highest quality oak woodland sites in the state, however, not all of these sites will be equally threatened by imminent habitat loss and degradation, nor will they be available for preservation. Therefore, an analysis of impending threats and conservation funding potential should be included in the prioritization process. Habitat quality, vulnerability, and conservation potential all must be considered in designing the best conservation strategies.

Planning & Conservation Tools

GOAL 3: Increase acreage of protected oak woodland.

Policy

3(a) Using the guidelines described in Policies 1(a) - 1(g), a variety of planning & conservation tools should be applied to increase the acreage of oak woodland in Placer County that is managed for birds and other wildlife.

These tools include: in perpetuity and term conservation easements, stewardship payments, tree ordinance, zoning and land use planning, fee ownership of preserves, Williamson Act, partnerships between government agencies and nonprofits, sustainable forestry and ranching, and woodland grass banking. Future versions of this plan will contain quantitative goals for oak woodland protection.

Ecological Restoration Priorities

GOAL 4: Prioritize oak woodland sites for restoration.

Policy

4(a) Prioritize restoration sites according to their proximity to existing high quality sites.

Restoration sites may be more likely to be colonized by wildlife, in particularly birds, if they are close to areas of high quality habitat that can serve as sources of immigrants.

4(b) Prioritize restoration sites according to likely success of regeneration and transplanted oak viability.

Restoration sites should be prioritized according to their regenerative potential. This includes not only sites with adequate acorn production and dispersal capabilities, but also with adequate biophysical (conditions e.g., soil, water table, etc.) to support seedling growth and cultivated transplants. A GIS-based system for evaluating site suitability would aid this process.

Ecological Restoration

GOAL 5: Restore protected oak woodland systems to benefit wildlife populations.

Policy

5(a) Restore oak woodlands to promote oak regeneration.

Regeneration is a problem in oak woodlands with a large amount of oak mortality and not enough growth of seedlings and saplings to replace dying trees. In these areas, Placer County will encourage landowners to promote regeneration by protecting young trees from grazing and browsing animals or by planting acorns or seedlings. Because planting oaks requires intensive effort, it may be more efficient in some sites to protect seedlings and saplings where they are already present. Small oak trees may need protection from grazing animals until they have grown taller than the browse line.

5(b) Restore understory components of oak woodland systems.

Many oak woodland wildlife species are associated with grassland and shrub components of oak woodlands. Oak woodlands with a shrubby understory and downed woody material support greater numbers of small vertebrates and the presence of shrubs and brush piles in the understory of oak woodlands may also help promote the survival of oak seedlings.

5(c) Replace non-native annual grasses with native perennial grasses in oak woodland systems.

Re-establishing or conserving native perennial grasses in oak woodlands will benefit oak regeneration, because non-native annual grasses tend to out compete young oak seedlings for soil moisture. Also, some birds, such as the Lark Sparrow, will benefit from the presence of native grasses

5(d) Restore upland oak woodland habitats in conjunction with adjacent riparian restoration.

Many wildlife species use both riparian and upland oak habitats for different parts of their life cycle. For example, birds that breed in oak woodland habitat may use

riparian habitat as corridors for the dispersal of juveniles and non-breeding adults. Riparian habitat may also be used for foraging and as migratory stopover grounds.

- 5(e) Restore natural fire regimes in oak woodlands whenever possible. Higher fire frequencies in the era before widespread fire suppression (before the 1950's) may have created conditions that favored oak regeneration. Thus, restoring natural fire frequencies may contribute to improved oak recruitment. Also, low-intensity prescribed burns may help reduce fuel levels and prevent large, higher intensity fires that destroy oak stands. However, oak woodlands may also be damaged when fire frequency is too high. Therefore, our plan recommends an adaptive management approach for oak woodlands, which requires monitoring of the effects of different prescribed burning regimes on oak woodland plants, birds, and other wildlife.
- **5(f)** Restore a mosaic configuration of a diversity of oak woodland types. The full range of variation in oak woodland habitat types (and associated animal species) can be protected by: 1) protecting a diverse portfolio of sites located in different parts of the geographic and elevation range of oak woodlands, and 2) protecting individual sites that contain a variety of oak woodland types. Protecting the variety of oak woodland types may help protect wildlife species that are associated with different types of oak woodland habitats.
- **5(g)** Restore oak woodlands to meet the requirements of cavity-nesting birds. Cavity-nesting birds make up a large proportion of the bird species and a majority of the individual birds breeding in oak woodlands (Wilson et al. 1991). Therefore restoration programs should give special consideration to meeting the habitat requirements of this guild, including both primary and secondary cavity nesters.
- **5(h)** Plant multiple species of oak tree when restoring oak woodlands. Sites with more than one species of oak present are more likely to support stable populations of acorn-consuming species, because high oak species diversity helps to ensure that acorns will be available from at least one type of oak in a given year.

Land Management Policies

GOAL 6: Protect, enhance or recreate natural oak woodland processes and characteristics.

Policy

6(a) Maintain diverse age structure of oak trees.

Protecting sites with a diverse age structure of oak trees will provide a continuum of seeding phenologies, preventing synchronous or wide-scale acorn crop failures. Maintaining large old oaks within a diverse age structure will provide decaying limbs

necessary for bird nesting sites in addition to high output acorn production. McDonald (1990) demonstrated that Black Oaks must reach 30 years before producing viable acorns and seldom produce large quantities of acorns until they reach 80-100 years. Good acorn producing trees can continue abundant production up to 200 years.

6(b) Protect seedling and sapling trees to enhance oak recruitment.

Oak seedlings and saplings remain vulnerable to damage by herbivorous animals, including grazers, browsers, and small mammals, until they have grown taller than the grazing line (usually about 5 feet). Mangers may want to consider placing protective structures around these young trees.

6(c) Retain decaying or dead oak trees, limbs, snags and mistletoe.

Some cavity nesting birds nest primarily in natural cavities. Therefore, the injured and decaying trees in which these cavities often form are an important habitat element for these species. An analysis using the California Wildlife Habitat relationships System (CWHR) estimated that over 50 species of birds use snags for breeding, feeding and/or cover (Guisti et al. 1996). Mistletoe is known to be an important winter food for Western Bluebirds.

6(d) Retain large oak trees whenever possible.

Large oak trees also produce more acorns than smaller trees, providing both a source of oak recruitment and food for wildlife. Therefore, in the absence of any data on actual acorn production, the largest trees should be retained. Also, certain individual trees may produce more acorns, have more large branches and produce larger snags and logs for wildlife use than other trees. Therefore, these especially valuable individual trees can be identified and retained to benefit birds and other wildlife. The acorn production of individual trees can be visually estimated in early fall. It would still be beneficial to retain those trees that produce the most acorns in any given year, because the same individual trees tend to be good producer from year to year.

6(e) Utilize thinning of oak woodlands as a replacement for complete oak removal in rangelands.

Work with landowners to adopt thinning or controlled burns as methods of fuel load reduction as opposed to the complete removal of oak stands in rangelands

6(f) Manage or influence management at the landscape level.

Managing at the landscape level means taking into account interactions among the different habitat patches and ecosystems that make up a region. The presence and abundance of fauna in a patch of oak woodland can be influenced by characteristics of the habitat mosaic surrounding the patch, as well as by characteristics of the individual patch. Linking and buffering large sections of oak woodland and associated habitats may for instance restore top predators, such as coyotes or bobcats, to the oak woodland system. These predators may, in turn, reduce populations of avian nest predators such as skunks, raccoons, and snakes. Implementing landscape level management often will require cooperation with regional organizations such as

regional fire councils, weed abatement districts, watershed conservancies, and Resource Conservation Districts.

Monitoring

GOAL 7: Establish a monitoring program to evaluate the success of Placer County's Oak Woodland Management Plan.

Policy

7(a) Study edge effects in oak woodland habitats.

Research into how oak woodland habitat edges relate to bird use, nest predation and cowbird parasitism is needed. There is some evidence suggesting that nest predation rates are lower at "soft" habitat edges than at abrupt, "hard" edges. However, no research on this subject has been conducted in western oak woodlands. Given that many of our protected oak woodlands may border unprotected or developed lands, it is important to know if edges can be managed or restored so as to minimize negative edge effects.

7(b) Compare areas heavily affected by Sudden Oak Death with those that are not, with attention to effects on acorn production, and how that affects the food chain.

Though Sudden Oak Death is not yet a problem in Placer County, we believe our management plan needs to address the potential impacts of this disease. Sudden Oak Death might affect fauna populations through changes in forest structure and resulting changes in acorn supply and invertebrate numbers, which could potentially spread throughout the food web. Because the effects of SOD on bird populations will probably develop over a long time period, long-term, large-scale monitoring as well as shorter-term, intensive research efforts are needed. Bird monitoring projects in oak woodlands should routinely include the standardized collection of data on stand structure, including numbers of dead or dying trees, along with other habitat data.

7(c) Monitor the effectiveness of progressive grazing regimes for increasing the rate of successful oak tree regeneration.

It has been suggested that rotational grazing on subdivided pastures can increase the vigor of native grass species, reduce weeds, and promote oak regeneration, but little research has yet been done to evaluate this management technique in oak rangelands. The effects of specific grazing management strategies on oak regeneration and wildlife should be studied in an adaptive management framework.

7(d) Study the effectiveness of prescribed fire to reduce non-native annual grasses and facilitate germination and growth of oak seedlings.

As outlined in above, fire is a natural process that influences oak recruitment and oak woodland structure. More research on issues such as fire timing and frequency is needed to understand how prescribed fire can best be used to promote oak regeneration, while also benefiting oak woodland dependent wildlife.

GOAL 8: Maximize the effectiveness of ongoing monitoring and management efforts.

Policy

8(a) Increase communication and coordination between land managers and specialists hired to implement specific projects or conduct monitoring.

Adaptive management is given much attention and is widely discussed, but land managers rarely have adequate time to evaluate the effects of their projects. When managers work with specialized experts, they have an excellent opportunity to conduct "adaptive management" on an informal basis. Experts, such as those conducting endangered species or biodiversity inventories, should be consulted and included as part of project implementation teams. By doing so, managers can quickly and easily access a wealth of detailed information about local birds, other wildlife, and their responses to management activities.

8(b) Use standardized monitoring protocol.

By standardizing monitoring techniques, researchers ensure that results can be compared across space and time. Standardized methods for measuring habitat variables, such as vegetation structure and composition also should be developed and adopted. Oak woodland databases should also be standardized to facilitate the sharing of Geographic Information System (GIS) datasets.

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