

# Appendix A

Draft Oak Resources Management Plan  
Background and Support Information

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**El Dorado County**  
**Draft Oak Resources Management Plan**  
**Background and Support Information**

June 2016



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This Oak Resources Management Plan (ORMP) Background and Support Information appendix is based on currently-available data and research. As new resource data and scientific research becomes available, the ORMP will be updated to incorporate new and relevant information. The planning area covered by the ORMP (ORMP area) is approximately 560,000 acres and is that area bordered by the County’s administrative boundary to the north, west, and south and the 4,000-foot elevation contour to the east.

## **1.0 Oak Resources in El Dorado County**

The term “oak woodlands” is defined in the Oak Woodlands Conservation Act (Article 3.5 (commencing with Section 1360) of Chapter 4 of Division 2 of the Fish and Game Code) as “an oak stand with a greater than ten percent canopy cover or that may have historically supported greater than ten percent canopy cover.” The following sections provide greater detail regarding the oak woodland types and individual tree species present in El Dorado County, as well as state-level oak woodland habitat mapping data that was used in preparation of this ORMP.

### **1.1 Oak Woodland Habitats**

Based on the oak woodland mapping data available via the California Department of Forestry and Fire Protection’s (CAL FIRE) Fire and Resource Assessment Program (FRAP) data set, six oak woodland types are identified within the ORMP area: blue oak woodland (BOW), blue oak-foothill pine (BOP), valley oak woodland (VOW), montane hardwood (MHW), montane hardwood-conifer (MHC), and coastal oak woodland (COW) (CAL FIRE 2015). These oak woodland types are part of the California Wildlife Habitat Relationships (CWHR) classification scheme (Mayer and Laudenslayer 1988) which classifies existing vegetation types important to wildlife and was developed to recognize and logically categorize major vegetative complexes at a scale sufficient to predict wildlife-habitat relationships. The 2002 version of the FRAP data (CAL FIRE 2002) was analyzed in the County’s 2004 General Plan EIR (El Dorado County 2003). A more recent version of the FRAP data (2015) with higher spatial resolution (30 meters, as compared with 100 meters) was used in preparation of this ORMP. The acreage of these oak woodland types within the ORMP area is presented in Table 1-1.

Table 1-1 Acreage of Oak Woodland Types in the ORMP Area (2015 FRAP Data)			
Oak Woodland Type	CWHR Code	Acreage	Percent
Blue oak woodland	BOW	46,521	18.9%
Blue oak-foothill pine	BOP	64,740	26.2%
Coastal oak woodland	COW	2	<0.1%
Montane hardwood	MHW	98,930	40.1%
Montane hardwood-conifer	MHC	32,643	13.2%
Valley oak woodland	VOW	3,970	1.6%
<b>Total:</b>		<b>246,806</b>	<b>100%</b>

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While coastal oak woodland is identified in the 2015 FRAP vegetation data set for the ORMP area, its presence is unlikely given the range of its dominant tree species (coast live oak (*Quercus agrifolia*)). This classification is possibly the result of image processing error encountered during creation of the 2015 FRAP data set. The sole location of coastal oak woodland in the ORMP area (approximately 2 acres) is surrounded by blue oak woodland and blue oak-foothill pine vegetation types and most of the area was previously mapped as montane hardwood or montane hardwood-conifer in the 2002 version of the FRAP data. Given its previous mapping designation, location, and adjacent vegetation types, the coastal oak woodland area included in the 2015 FRAP data is likely montane hardwood or montane hardwood-conifer and will be considered an oak woodland type for the purposes of this ORMP. However, other than the identification of mapped acreage in Table 1-1, coastal oak woodland is not discussed further in this ORMP.

Montane hardwood is the most represented oak woodland type throughout the ORMP area. Blue oak woodland, blue oak-foothill pine, and valley oak woodland are more prevalent below 2,000 feet. Montane hardwood-conifer is more prevalent above 2,000 feet and transitions to conifer-dominated vegetation types. Valley oak woodland is classified as a sensitive habitat by both the California Natural Diversity Database (CNDDDB) and CWHR, and is listed as a high-priority community for inventory by the CNDDDB. Finally, while this ORMP discusses oak woodland habitats as mapped by FRAP, the presence of oak woodlands in other non-oak woodland vegetation types may occur. For example, a stand of oak trees with greater than 10% canopy cover may occur within an area mapped as Sierran mixed conifer (SMC). This may occur due to the scale of the vegetation type mapping data and the remote sensing techniques employed in vegetation type classification. The following sections describe the five CWHR oak woodland vegetation type classifications addressed in this ORMP.

#### **1.1.1 Oak Woodland Types**

##### **1.1.1.1 Blue Oak Woodland (BOW)**

Blue oak woodland is usually associated with shallow, rocky, infertile, well-drained soils. Within the County, BOW usually occurs primarily below 2,000 feet in elevation but can extend up to 3,000 feet. BOW commonly forms open savannah-like stands with little or no shrub understory on dry ridges and gentle slopes. The canopy typically becomes denser on better quality sites. Ground cover in BOW is comprised mainly of annual grasses. Shrubs are seldom extensive and often occur near rock outcrops. Shrub associates include California buckeye, poison oak, hoary coffeeberry, and buckbrush. BOW usually intergrades with annual grasslands and valley oak woodlands at lower elevations and blue oak-foothill pine woodlands at higher elevations. In El Dorado County, BOW and blue oak-foothill pine woodlands tend to be intermixed.

Interior live oak, canyon live oak, California buckeye, and valley oak trees are common associates in blue oak woodland. Interior live oak and canyon live oak trees can be the dominant species where they may be considered as distinct habitats. Interior live oaks are often associated with river floodplains, low foothills, and upland slopes. In low-elevation foothill woodlands, interior live oaks occur as widely spaced trees or clumps that may be concentrated around rock outcrops. Interior live oak becomes a more significant part of the blue oak woodland canopy with

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increasing elevation, particularly on north-facing slopes. Canyon live oaks are found on low foothills, mountain canyons, upland slopes, and exposed ridges.

The CWHR description for BOW can be found [here](#).

**1.1.1.2 Blue Oak-Foothill Pine (BOP)**

Blue oak-foothill pine is typically found on well-drained soils rich in rock fragments, generally in hilly, dry terrain. Compared with BOW, BOP generally is found on steeper and drier slopes with shallower soils. BOP merges with annual grasslands, blue oak woodlands, valley oak woodlands, and mixed chaparral (including the northern gabbroic chaparral). BOP is characterized by a mixture of hardwoods, conifers, and shrubs. Blue oak is usually most abundant with the taller foothill pine dominating the overstory. Foothill pine becomes more prevalent at higher elevations. Associated tree species include interior live oak and California buckeye. Interior live oak becomes more abundant on shallower soils, steeper slopes, and at higher elevations. Canyon live oaks are present on low foothills, mountain canyons, upland slopes, and exposed ridges.

The shrub component associated with BOP is typically composed of several species that tend to clump and are interspersed with annual grasses. Shrub species include buckbrush, whiteleaf manzanita, hoary coffeeberry, poison oak, redbud, and yerba santa. Shrubs are less prevalent at lower elevations.

The CWHR description for BOP can be found [here](#).

**1.1.1.3 Montane Hardwood (MHW)**

Montane hardwood has a relative overstory cover by hardwoods of at least 50% and a relative overstory cover by conifers of less than 25%. Canopy cover ranges from dense to open. This woodland type typically has a poorly developed shrub layer that contains snowberry, wood rose, currant, manzanita, and poison oak. Additionally, MHW typically has a sparse herbaceous layer in its understory. At lower elevations, MHW merges with mixed chaparral. Associated tree species include foothill pine, knobcone pine, tanoak, Pacific madrone, and California laurel. At middle elevations, MHW merges with montane hardwood-conifer or Douglas-fir. Associated tree species at middle and higher elevation include canyon live oak, Douglas-fir, California black oak, and mixed conifer. Steep, rocky south slopes of major river canyons often support MHW, typically dominated by canyon live oak and scattered Douglas-fir. MHW occurs on soils that are rocky, alluvial, coarse-textured, poorly developed, and well-drained.

The CWHR description for MHW can be found [here](#).

**1.1.1.4 Montane Hardwood-Conifer (MHC)**

Montane hardwood-conifer has a relative overstory cover by hardwoods of at least 50% and a relative overstory cover by conifers of at least 25%. MHC is transitional between dense coniferous forests present at upper elevations and montane hardwood, mixed chaparral, or open woodlands and savannahs. MHC often occurs as a closed forest. MHC typically supports

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relatively little understory except in ecotones or following a disturbance such as fire or logging. Common associated tree species include California black oak, bigleaf maple, white alder, dogwood, Douglas-fir, incense-cedar, and ponderosa pine. MHC includes vegetation associated with both coniferous and hardwood habitats. Habitat composition is generally defined as including a minimum of one-third coniferous trees and one-third broad-leaved trees. Typically, conifers dominate the upper canopy, and broad-leaved trees form a sub-canopy.

The CWHR description for MHC can be found [here](#).

#### **1.1.1.5 Valley Oak Woodland (VOW)**

Valley oak woodland is best developed on deep, well-drained alluvial soils and is usually found below 2,000 feet. VOW varies from savannah-like stands to forest-like stands with partially closed canopies. Denser stands typically grow in valley soils along natural drainages. Canopies in VOW are dominated almost exclusively by valley oak. In the foothills, VOW intergrades with blue oak or blue oak-foothill pine woodlands. Near major stream courses, VOW may intergrade with valley-foothill riparian woodlands and can be associated with Fremont cottonwood and willow trees. The shrub understory typically includes poison oak, blue elderberry, California wild grape, toyon, coffeeberry, and California blackberry.

VOW provides food, cover, reproductive sites and corridors for numerous wildlife species. Wildlife commonly found in VOW includes gopher snake, acorn woodpecker, oak titmouse, white-breasted nuthatch, California quail, and western gray squirrel. Valley oak woodland is classified as a sensitive habitat by both the CNDDDB and CWHR, and is listed as a high-priority community for inventory by the CNDDDB. The 2004 General Plan also identifies valley oak woodland as a sensitive habitat (El Dorado County 2003).

The CWHR description for VOW can be found [here](#).

#### **1.1.2 Current Distribution of Oak Woodland Types**

Table 1-1 displays the acreage of each oak woodland type within the ORMP area. The majority of blue oak woodland, blue oak-foothill pine, and valley oak woodland within El Dorado County occurs below 2,000 feet (Figure A-1). Valley oak woodland tends to be found on well-developed soils (Pavlik et al. 1991). Blue oak savannah (canopy cover less than 10%) with few or no shrubs occurs in the low foothills often on low hillocks and exposed, south-facing slopes and transitions into blue oak woodland at higher elevations or north-facing slopes. Blue oak woodland supports a more complex community (Pavlik et al. 1991). Montane hardwood is spread throughout the ORMP area, extending from the annual grasslands in the west to the forested types in the east. Montane hardwood-conifer is most prevalent east of Highway 49.

#### **1.1.3 Historic Distribution**

Vegetation type maps for California were created during the 1920s and 1930s by Albert Wieslander and others. The maps, now known as the Wieslander Vegetation Type Mapping (VTM) collection, were digitized in a geographic information systems (GIS) database providing a valuable tool for comparative analysis of vegetation type change over time (Kelly et al. 2005).

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Based on a comparison between the VTM data from the 1920s and 1930s and the 2015 FRAP data, the distribution of oak woodlands in El Dorado County has changed significantly in approximately 85 years. The spatial extent of oak woodlands in the County has remained generally the same at elevations below approximately 1,500 feet. However the areas above 1,500 feet have seen significant expansion of oak woodland cover, notably in the region south of Placerville and the areas surrounding the communities of Greenwood and Georgetown. These areas were mapped by Wieslander as being dominated by ponderosa pine, and were classified by Kelly et al. (2005; 2008) as the ponderosa pine CWHR type (PPN). Many of these areas, however, are noted as having California black oak as a notable species present. Other areas classified by FRAP (CAL FIRE 2015) as oak woodland were classified by Wieslander as cropland, chaparral, or annual grassland.

In more recent years, oak woodland has been lost or greatly degraded due to urban development, primarily in community centers such as those that occur along the Highway 50 corridor. In areas dedicated to grazing, oak woodland understory is predominantly annual grassland. At the lower elevations of timberland, small areas of oak woodland were converted to conifer plantations. Statewide the primary cause of woodland conversion between 1945 and the early 1970s was rangeland improvement; since the early 1970s, the primary cause has been urban and suburban expansion (Bolsinger 1988). Valley oaks have been lost over the last 150 years to agricultural and residential development in prime lowland real estate (Pavlik et al. 1991).

#### **1.1.4 Existing Threats**

A literature review reveals differing opinions regarding the threats to oak woodlands. The main processes threatening oak woodlands statewide are land clearing for subdivisions, intensive agriculture, and the continued parcelization of large continuous woodland ownerships to exurban development (Giusti et al. 2004). The Wildlife Conservation Board considers threats to oak woodlands in the Sierra Nevada foothills to include development, fragmentation, agricultural development, livestock grazing, low regeneration, and wood cutting. Additional threats identified for the Sierra Nevada above the foothills include high fire risk and water control. A study of oak woodlands in the Sierra Nevada foothills by Frost and Churches (2003) considered threats to oak woodlands to include development, wildfire, harvest, mortality, and thinning.

Impacts vary from complete removal of oak woodland to degradation of the quality of remaining oak woodland due to fragmentation. Fragmentation refers to the breaking up of contiguous land into smaller pieces that are separated by varying distances. Fragmentation results in the degradation of habitat and ecosystem values.

Saving and Greenwood (2002) modeled projected development of El Dorado County under the proposed 1996 General Plan. They concluded that four percent of oak woodland land cover would be physically lost to development but 40 percent of “rural” oak woodland would be converted to marginal or urban habitat. According to Saving and Greenwood (2002), “...areas that once functioned under a more natural state and presumably provided functional habitat for species are degraded, either due to proximity to urban land uses or by isolation from larger patches of contiguous natural vegetation.” They determined that rural residential development impacts habitat quality through fragmentation more than it impacts the extent (i.e., area) of

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habitat. Clearing for fire protection that occurs with development also leads to the degradation of oak woodlands (Harris and Kocher 2002). The thinning of trees and removal of understory shrubs and trees results in a loss of species and of structural diversity.

#### **1.1.5 Natural Regeneration**

Regeneration is the net effect of individuals added to a population through recruitment and individuals lost through mortality. Successful recruitment depends on several factors: acorn crop, conditions for germination, survival of seedlings, and survival of saplings to mature stages.

Bolsinger (1988) reported on regeneration in oak woodlands as indicated by seedlings and saplings in sample plots across California. Seedlings and saplings were in great abundance in canyon live oak stands and in moderate amounts in interior live oak, California black oak, and Oregon white oak stands. Regeneration was sparse in blue oak stands and almost nonexistent in valley oak stands (although valley oak regeneration was found in stands dominated by other species). The shortage of saplings for oak species (especially blue oak and valley oak), in the long-term, could lead to the gradual loss of oak stands as mature oaks are lost to natural mortality (Standiford and McCreary 1996).

Specific to blue oak, Swiecki et al. (1997) support the concept of advance regeneration. Blue oak seedlings persist for extended periods (up to 15 years) in the understory. Sapling recruitment occurs under appropriate conditions such as an opening in the canopy. In the study by Swiecki et al. (1997), a positive correlation was found between gaps in the canopy and successful sapling recruitment.

Several factors have been implicated in poor oak regeneration (Giusti et al. 2005; Siegel and DeSante 1999; McCreary 2009; Pavlik et al. 1991). These factors include:

- Grazing by livestock (depending on timing and intensity)
- Browsing by deer
- Fire suppression
- Yearly burning
- Conversion of native perennial understory to annual grasses that deplete soil moisture early before oak seedlings can successfully compete for light and nutrients
- Absence of appropriate climatic conditions
- Global warming
- Heavy vehicle use
- Rodent herbivory (rodent populations have increased as their predators have declined)
- Predation by turkey
- Past land management history

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The factor or combination of factors affecting successful oak regeneration varies by geographic region and local conditions. Some writings indicate that poor oak regeneration dates back 100 to 150 years. Deciduous oak regeneration was locally abundant prior to 1900 (Standiford et al. 1996). Few areas are known where successful recruitment of blue oaks has occurred since the late 1800s (Holland 1976). Most oak stands contain numerous individual trees that range in age between 100 and 200 years, but typically contain few very old trees (Bartolome et al. 1987).

As noted in McCreary (2009), three California oak species are reported to have regeneration problems: blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), and Engelmann oak (*Quercus engelmannii*). Blue and valley oaks are present in El Dorado County and, generally the regeneration problem is the lack of shortage of saplings and intermediate-sized trees. Identified causes of poor regeneration for these species include the introduction of Mediterranean annuals, livestock grazing, increased rodent populations, changing fire frequencies, and changing climate (McCreary 2009).

## 1.2 Individual Tree Species

### 1.2.1 Oak Species

The oak woodland types in El Dorado County include six main native oak tree species: blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), interior live oak (*Quercus wislizeni*), canyon live oak (*Quercus chrysolepis*), and Oregon oak (*Quercus garryana*). Additionally, one native hybrid between California black oak and interior live oak exists, known as oracle oak (*Quercus x morehus*). Table 1-2 lists native oak tree species that occur within the ORMP area. Tanbark oak (*Notholithocarpus densiflorus*), which occurs in the Georgetown area, produces acorns but is not considered a “true” oak (Pavlik et al. 1991; Oak Woodlands Conservation Act of 2001).

Table 1-2 Native Oak Tree Species within the ORMP Area	
Species	Common Name
<i>Quercus chrysolepis</i>	Canyon live oak
<i>Quercus douglasii</i>	Blue oak
<i>Quercus garryana</i>	Oregon white oak
<i>Quercus kelloggii</i>	California black oak
<i>Quercus lobata</i>	Valley oak
<i>Quercus wislizeni</i>	Interior live oak
<i>Quercus x morehus</i>	Oracle oak (hybrid of California black and interior live oaks)

Shrub species of oak that occur in the ORMP area include: scrub oak (*Quercus berberidifolia*), leather oak (*Quercus durata*), Nuttall’s scrub oak (*Quercus dumosa*), and Brewer oak (*Quercus*



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*garryana* var. *breweri*) (Calflora 2015). Huckleberry oak (*Quercus vaccinifolia*) is widespread in El Dorado County above the ORMP area with limited distribution below 4000 feet. The following sections present tree species information summarized from Stuart and Sawyer (2001), Pavlik et al. (1991), Bolsinger (1988), Tucker (1980), and Gaman and Firman (2006).

#### 1.2.1.1 Canyon Live Oak

Canyon live oak (*Quercus chrysolepis*) is an evergreen tree that ranges from 15 to 70 feet in height. Canyon live oak is shade and drought tolerant. It is found throughout much of California, except the Central Valley, Great Basin, and Sonoran Desert. Canyon live oak grows on a variety of sites and with a variety of forms. Single-stemmed trees grow on better sites such as in moist forest canyons. Multi-stemmed trees grow on canyon walls, cliffs, and rocky sites while shrubby forms grow on the harshest sites. Repeated fires may convert canyon live oak trees to shrub form. Wildlife use canyon live oak for roosting, nesting, foraging, and cover. Birds and mammals eat the acorns.

#### 1.2.1.2 Blue Oak

Blue oak (*Quercus douglasii*) typically grows as a single-stemmed tree with mature heights ranging from 20 to 60 feet. This deciduous tree can live up to 400 years. The leaf surfaces are bluish green. Blue oak is drought tolerant and shade intolerant. Blue oak occurs naturally only in California. It grows in woodlands and valleys of California's foothills, especially bordering the Central Valley. Blue oak has several adaptations for growing on shallow soils in a hot, dry climate. Roots emerge from the acorns during the fall rains and grow rapidly. Leaves have a waxy, moisture-conserving coating. Blue oak drops its leaves in extremely hot and dry years. It is often associated with foothill pine (*Pinus sabiniana*), California buckeye (*Aesculus californica*), interior live oak, Oregon white oak, and valley oak. Blue oak provides critical winter range for deer and other wildlife. Its foliage is used for browse and many species consume its acorns.

#### 1.2.1.3 Oregon White Oak

Oregon white oak (*Quercus garryana*) typically grows as a single-stemmed tree with mature heights ranging from 25 to 90 feet. This deciduous tree is moderately shade tolerant but can be out-competed by conifers. It sprouts after being injured by fire or cutting. Oregon white oak grows in the central and north Coast Range and in the foothills of the Sierra Nevada and Cascade Ranges. It is an uncommon species in El Dorado County; however, Stuart and Sawyer (2001) report that the largest Oregon white oak in California (over 120 feet in height and eight feet in diameter) grows in El Dorado County. Wildlife and livestock browse its foliage and many species of birds and mammals eat its acorns. Oregon white oak is also listed as a Group B commercial species in the Northern Forest District, as identified in the 2014 California Forest Practice Rules (Title 14, California Code of Regulations, Chapter 4).

#### 1.2.1.4 California Black Oak

California black oak (*Quercus kelloggii*) typically grows as a single-stemmed tree with mature heights ranging from 30 to 80 feet. On infertile sites, its growth form can be shrubby. California

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black oak is initially shade tolerant but becomes shade intolerant as it grows. It sprouts after being injured by fire or cutting. California black oak is widely distributed within woodlands and coniferous forests. Stands dominated by California black oak occur infrequently within lower montane elevations. Many wildlife species use California black oak for forage and cover and eat its acorns. It is the primary commercial hardwood species in California and is listed as a Group B commercial species in the Northern Forest District, as identified in the 2014 California Forest Practice Rules (Title 14, California Code of Regulations, Chapter 4).

#### **1.2.1.5 Valley Oak**

Valley oak (*Quercus lobata*) is typically a single-stemmed, deciduous tree that can reach heights of 30 to 90 feet. It is the largest oak species in California and can live to be 400 to 600 years old. This deciduous tree is intermediate in its shade tolerance and sprouts after being injured by fire or cutting. Valley oak occurs only in California and is found in valley and foothill woodlands in the Central Valley, Sierra Nevada foothills, and the Coast Ranges. Usually found on deep, alluvial soils, it can grow on shallow or stony soils if its roots can reach sufficient moisture. Its vertical root system taps into groundwater with some roots as deep as 80 feet. Although most common below 2,000 feet, it can range above 5,000 feet. Valley oak provides important habitat for wildlife.

#### **1.2.1.6 Interior Live Oak**

Interior live oak (*Quercus wislizeni*) is a broad, densely-branched, evergreen tree that can reach heights of 30 to 75 feet. It is shade tolerant and drought sensitive. Its thick bark is resistant to fire. Trees sprout after fire. In areas with recurring fire, it can form shrubby thickets. Interior live oak grows across the western half of California, including the Sierra Nevada foothills, usually where summers are hot and dry and winters are cool and wet. In the Sierra Nevada, clumps of interior live oak may be concentrated around rock outcrops within blue oak woodlands. With increasing elevation, particularly on north slopes, interior live oak becomes more prevalent and may nearly replace blue oak as the dominant species in a stand. Interior live oak provides important wildlife forage and habitat, although live oak leaves are less palatable to deer than are leaves of deciduous species such as blue oak.

#### **1.2.1.7 Oracle Oak**

Oracle oak (*Quercus x morehus*) is a hybrid of California black oak and interior live oak that is found throughout the Sierra Nevada, the Coast Ranges south of Mendocino County, and the Peninsular and Traverse ranges. Its form is typically a small, upright tree and it can reach heights between 25 and 40 feet, although it can be quite variable due to its nature as a hybrid. Oracle oak is the most widely distributed hybrid oak species in California, having been first described in 1863. Tree form and foliage shape and size are blend of its parent species.

### **1.2.2 Non-Oak Species**

Oak woodlands are comprised of a variety of tree species, including non-oak species. Predominant non-oak tree species found within El Dorado County oak woodlands include foothill pine (*Pinus sabiniana*), knobcone pine (*P. attenuata*), California buckeye (*Aesculus*

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*californica*), ponderosa pine (*P. ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), bigleaf maple (*Acer macrophyllum*), Pacific madrone (*Arbutus menziesii*), and Pacific dogwood (*Cornus nuttallii*). The shrub component can be sparse to dense depending on site conditions and management.

## **2.0 Natural Resource Values of Oak Resources**

The purpose of this section is to introduce the reader to the ecosystem values of oak woodlands. Economic and social values are described in Section 3. Mapping of oak woodlands and priority conservation areas is presented in Section 4.

### **2.1 Wildlife**

Oak woodlands provide many natural resource values. Oak woodlands provide habitat for native wildlife, plants, and insects, some of which are classified as special-status species. Oak woodlands contribute to nutrient cycling, soil quality and erosion control, water quality, and watershed health. Humans benefit from these ecosystem functions of oak woodlands and from the aesthetic and open space values of oak woodlands, which provide many recreational opportunities in El Dorado County. Conversion and fragmentation of oak woodlands result in direct loss of oak woodland or an indirect loss through degradation of remaining oak woodlands.

Oak woodlands provide many values to wildlife including food, cover, and breeding sites. Acorns are an important food source for mule deer, western gray squirrels, acorn woodpeckers, band-tailed pigeons, scrub jays, and many other vertebrate species as well as invertebrate species (Giusti et al. 1996; USDA Forest Service 2001; Tietje et al. 2005). Mule deer migrations are influenced by acorn production (Garrison 1992). Acorn woodpeckers are dependent not only on acorns as a food source but also on trees where they can store acorns in holes (i.e., granaries). Other animals depend on leaves and roots. Oak trees also are sources of fungi, mistletoe, and insects for rodent and bird species. Oak woodlands also provide food in the form of herbaceous plants in the understory.

Cavity trees provide shelter and breeding sites for birds. Deciduous oaks, such as blue oak, California black oak, and valley oak, are particularly important as cavity trees (Tietje et al. 2005). Evergreen trees are important for secondary cavity nesters. Snags (i.e., standing dead trees) provide perching and basking sites as well as roosts. Downed woody material, from limbs to logs, provides resting and reproductive cover for reptiles, amphibians, and birds. Oak woodlands with more complex understories (e.g., seedlings/saplings, understory trees, shrubs, herbaceous vegetation, downed woody material) provide habitat for a greater variety of species, including ground-nesting birds. A diverse structure provides reproductive sites for diverse wildlife communities.

Oaks and other trees also influence stream conditions, such as water temperature and flow rates, which in turn influence the presence and health of fish populations (Tietje et al. 2005). Oaks provide structure through deposition of coarse woody debris in streams and help reduce sedimentation. Some streams that flow through oak woodlands in the Sierra Nevada foothills are identified as special habitat in the CNDDDB (see Table 2-1).

El Dorado County supports resident and migratory populations of mule deer (El Dorado County 2003). The preservation of deer migration corridors has been a concern of the California Department of Fish and Wildlife (CDFW) as urbanized areas expand in the foothills. As a result, CDFW has mapped critical habitat and deer migration patterns for three deer herds (El Dorado

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County 2003). Critical winter range occurs primarily below 4,000 feet and critical summer range, holding areas, and fawning areas occur primarily above 4,000 feet (i.e., outside the ORMP area). Connectivity between the critical winter range and other areas is essential for the long-term health of deer populations.

Connectivity touches on larger values of oak woodlands. In addition to needing sufficient space to provide for food, shelter, and social structures, wildlife need connectivity of habitats. Oak woodlands are one type of habitat that can be utilized as corridors by wildlife. Corridors are essential for dispersal of young animals, migration routes, and gene flow. Corridors allow dispersers (including plants, fungi, insects, and other organisms) from one area to recolonize another area that may have experienced local extirpations (e.g., from a catastrophic wildfire). All organisms within a community cannot use the same corridors equally. Species with limited mobility will not be able to utilize long corridors. For species sensitive to edge effects, corridors must be wide enough to retain core habitat. Relative intact native vegetation is an important component of corridors (Hilty et al. 2006).

Oak woodlands function most effectively and provide the greatest habitat value in large contiguous expanses. Both size and configuration are important. Larger areas of oak woodland (especially with greater connectivity) tend to support more species. The rate of local extinction increases with smaller patch size; however, species also are lost from larger (250 acres) fragments (Hilty et al. 2006). The species composition within California oak woodland changes from large to small areas and with decreasing distance from urban settings. Merenlender and Heise (1999) reported that the percent of neotropical birds was significantly higher in undeveloped oak woodlands of 500 acres or more in California than in ranchettes (10-40 acres) and suburban lots (0.5-2.5 acres).

## **2.2 Special-Status Species**

A query of the CNDDDB (CDFW 2016) and CNPS (CNPS 2016) identified 66 special-status species and three unique natural communities in the ORMP area (Table 2-1 and 2-2). Five of the 35 vertebrate species in Table 2-2 are associated with oak woodland habitats (Garrison, 1996). Eleven of the 29 plant species in Table 2-1 occur in oak woodland habitats (Shaffer, 1996; CNPS, 2016).

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**Table 2-1. Special-Status Plants Occurring or Potentially Occurring in the ORMP Area**

Species	Habitat	CNPS	CDFW	USFWS
Jepson's Onion <i>Allium jepsonii</i>	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 900-4,300 feet	1B	--	--
Nissenan manzanita <i>Arctostaphylos nissenana</i>	Closed-cone coniferous forest, chaparral/rocky; elevation 1,500-3,600 feet	1B	--	--
big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite; elevation 300-4,600 feet	1B	--	--
watershield <i>Brasenia schreberi</i>	Marshes and swamps, freshwater; elevation 100-7,200 feet	2	--	--
Pleasant Valley Mariposa lily <i>Calochortus clavatus</i> var. <i>avius</i>	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland/usually serpentinite, clay, rocky; elevation 200-4,300 feet	1B	--	--
Stebbins' morning-glory <i>Calystegia stebbinsii</i>	Chaparral (openings), cismontane woodland/serpentinite or gabbroic; elevation 600-2,400 feet	1B	CE	FE
Van Zuurk's morning glory <i>Calystegia vanzuurkiae</i>	Gabbro, serpentinite, chaparral, cismontane woodland; elevation 1600-3,900 feet	1B	--	--
Shore sedge <i>Carex limosa</i>	Bogs and fens, lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest; elevation 3,900-8,900 feet	2	--	--
Pine Hill ceanothus <i>Ceanothus roderickii</i>	Chaparral, cismontane woodland/serpentinite or gabbroic; elevation 900-2,100 feet	1B	CR	FE
Red Hills soaproot <i>Chlorogalum grandiflorum</i>	Chaparral, cismontane woodland, lower montane coniferous forest/serpentinite or gabbroic; elevation 800-3,300 feet	1B	--	--
Oregon fireweed <i>Epilobium oreganum</i>	Bogs and fens, lower montane coniferous forest, upper montane coniferous forest/mesic; elevation 1,600-7,300 feet	1B	--	--
Pine Hill flannelbush <i>Fremontodendron decumbens</i>	Chaparral, cismontane woodland/gabbroic or serpentinite, rocky; elevation 1,400-2,500 feet	1B	CR	FE
El Dorado bedstraw <i>Galium californicum</i> spp. <i>sierrae</i>	Chaparral, cismontane woodland, lower montane coniferous forest/gabbroic; elevation 300-1,900 feet	1B	CR	FE
American manna grass <i>Glyceria grandis</i>	Bogs and fens, meadows and seeps, marshes and swamps (streambanks and lake margins); elevation 50-6,500 feet	2	--	--
Parry's horkelia <i>Horkelia parryi</i>	Chaparral, cismontane woodland/especially lone formation; elevation 300-3,000 feet	1B	--	--
Saw-toothed lewisia <i>Lewisia serrata</i>	Broadleaved upland forest, lower montane coniferous forest, riparian scrub; elevation 3,000-	1B	--	--

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Species	Habitat	CNPS	CDFW	USFWS
	4,700 feet			
broad-nerved hump moss <i>Meesia uliginosa</i>	Bogs and fens, meadows and seeps, subalpine coniferous forest, upper montane coniferous forest; elevation 3,900-9,200 feet	2	--	--
Northern adders-tongue <i>Ophioglossum pusillum</i>	Marshes and swamps (margins), valley and foothill grassland (mesic); elevation 3,300-6,600 feet	2	--	--
Layne's ragwort <i>Packera layneae</i>	Chaparral, cismontane woodland/serpentine or gabbroic, rocky; elevation 650-3,500 feet	1B	CR	FT
Stebbins' phacelia <i>Phacelia stebbinsii</i>	Cismontane woodland, lower montane coniferous forest, meadows and seeps; elevation 2,000-6,600 feet	1B	--	--
Sierra blue grass <i>Poa sierrae</i>	Lower montane coniferous forest, openings; elevation 1,200-4,900 feet	1B	--	--
Nuttall's pondweed <i>Potamogeton epihydrus</i>	Marshes and swamps (assorted shallow freshwater); elevation 1,300-6,200 feet	2	--	--
brownish beaked-rush <i>Rhynchospora capitellata</i>	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest; elevation 150-6,600 feet	2	--	--
Sanford's arrowhead <i>Sagittaria sanfordii</i>	Marshes and swamps (assorted shallow freshwater); elevation 0-2,100 feet	1B	--	--
water bulrush <i>Schoenoplectus subterminalis</i>	Bogs and fens, marshes and swamps (montane lake margins); elevation 2,400-7,400 feet	2	--	--
marsh skullcap <i>Scutellaria galericulata</i>	Lower montane coniferous forest, meadows and seeps (mesic), marshes and swamps; elevation 0-6,900 feet	2	--	--
slender-leaved pondweed <i>Stuckenia filiformis ssp. alpina</i>	Marshes and swamps (assorted shallow freshwater); elevation 990-7,100 feet	2	--	--
oval-leaved viburnum <i>Viburnum ellipticum</i>	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 700-4,600 feet	2	--	--
El Dorado mule-ears <i>Wyethia reticulata</i>	Chaparral, cismontane woodland, lower montane coniferous forest/clay or gabbroic; elevation 600-2,100 feet	1B	--	--

**Status:**

*Federal*

FE Federally listed as "Endangered"

FT Federally listed as "Threatened"

*State*

CE State listed as "Endangered"

CT State listed as "Threatened"

CR State "Rare"

*Other*

CNPS: Rare Plant Rank

1B.1 Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California

1B.2 Plants rare, threatened, or endangered in California and elsewhere, fairly threatened in California

2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Sources: CDFW 2015, CNPS 2016

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**Table 2-2. Special-Status Wildlife Potentially Occurring in the ORMP Area**

Species	Habitat	CDFW	USFWS
<b>INVERTEBRATES</b>			
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	Endemic to vernal pools and swales associated with valley and foothill grasslands. Elevation range 30 to 5,600 feet.	--	FT
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	Elderberry shrubs, usually in streamside habitats, but also found in isolated elderberry bushes. Elevation range from sea level to 3,000 feet.	--	FT
<b>FISH</b>			
hardhead <i>Mylopharodon conocephalus</i>	Undisturbed areas of larger middle- and low-elevation streams. Elevation range from 30-4,800 feet	CSC	--
Lahontan cutthroat trout <i>Oncorhynchus clarkii henshawi</i>	Coldwater lakes and streams. Elevation range from sea level to 10,000 feet.	--	FT
steelhead- central valley DPS <i>Oncorhynchus mykiss irideus</i>	Found in cool, clear, fast-flowing permanent streams and rivers with ample cover from riparian vegetation or undercut banks. Elevation range from sea level to 10,000 feet.	--	FT
steelhead- Klamath Mountains Province DPS <i>Oncorhynchus mykiss irideus</i>	Found in cool, clear, fast-flowing permanent streams and rivers with ample cover from riparian vegetation or undercut banks. Elevation range from sea level to 10,000 feet.	CSC	--
<b>AMPHIBIANS AND REPTILES</b>			
California tiger salamander <i>Ambystoma californiense</i>	Vernal pools and seasonal ponds in valley and foothill grasslands. Elevations range from sea level to 3,200 feet.	CT/CSC	FT
northwestern pond turtle <i>Emys marmorata marmorata</i>	Streams and ponds with suitable upland habitat for nesting. Elevation range from sea level to 4,700 feet.	CSC	--
northern leopard frog <i>Lithobates pipiens</i>	Generally prefers permanent water with abundant aquatic vegetation. One known population near Lake Tahoe. Elevation range from sea level to 7,000 feet.	CSC	--
foothill yellow-legged frog <i>Rana boylei</i>	Partly shaded, shallow streams with a rocky substrate. Elevation range from near sea level to 6,370 feet.	CSC	--
California red-legged frog <i>Rana draytonii</i>	Breeding habitat includes marshes, springs, permanent and semi-permanent natural ponds, and ponded and backwater portions of streams. Adult frogs prefer dense, shrubby or emergent riparian vegetation near deep, still or slow moving water. Elevation range from sea level to 5,000 feet.	CSC	FT
Sierra Nevada yellow-legged frog <i>Rana sierrae</i>	Lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada Mountains. Elevation range from 1,000 feet to	CT/CSC	FE



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Species	Habitat	CDFW	USFWS
	12,000 feet.		
<b>BIRDS</b>			
Northern goshawk <i>Accipiter gentilis</i>	Prefers middle and higher elevations and mature, dense conifer forest. Elevation range from 1,000 to 10,800 feet.	CSC	--
tricolored blackbird <i>Agelaius tricolor</i>	Colonial species that requires emergent marsh, blackberry bushes, or other dense cover near open water for nesting. Elevation range from sea level to 3,300 feet.	CE	--
golden eagle <i>Aquila chrysaetos</i>	Nests on cliff edges or in large trees near grasslands and open forests and woodlands. Elevation range from sea level to 10,000 feet.	CFP	--
burrowing owl <i>Athene cunicularia</i>	Grasslands and agricultural fields at lower elevations, but can occur sporadically at higher elevations. Elevation range from sea level to 12,000 feet.	CSC	--
Vaux's swift <i>Chaetura vauxi</i>	Prefers redwood and Douglas-fir habitat with nest sites in large hollow trees and snags. Elevation range from 1,500 to 4,500 feet.	CSC	--
northern harrier <i>Circus cyaneus</i>	Grasslands, agricultural fields, marshes and other open habitats in valleys and foothills. Elevation range from sea level to 10,000 feet.	CSC	--
olive-sided flycatcher <i>Contopus cooperi</i>	Found in a variety of forest and woodland habitats. Elevation range from sea level to 10,500 feet.	CSC	--
black swift <i>Cypseloides niger</i>	Nests in moist crevices and cliffs behind or adjacent to waterfalls in deep canyons. Elevation range 3,000 feet to 10,000 feet.	CSC	--
yellow warbler <i>Dendroica petechial brewsteri</i>	Breeds in riparian habitats, montane chaparral and coniferous forests with dense shrub layers. Elevation range from sea level to 9,000 feet.	CSC	--
white-tailed kite <i>Elanus leucurus</i>	Open grasslands, woodlands and savannas; generally avoids areas with extensive winter freezes. Elevation range from sea level to 5,000 feet.	CFP	
willow flycatcher <i>Empidonax traillii</i>	Thickets of low, dense willows. Elevation range from sea level to 8,000 feet.	CE	--
bald eagle <i>Haliaeetus leucocephalus</i>	Uses conifer snags and other large trees near large water bodies for nesting. Elevation range from sea level to 6,500 feet.	CE/CFP	--
yellow-breasted chat <i>Icteria virens</i>	Breeds in riparian scrub and riparian woodland. Elevation range from sea level to 5,000 feet.	CSC	--
loggerhead shrike <i>Lanius ludovicianus</i>	Open habitats with scattered shrubs and trees. Elevation range from sea level to 7,500 feet.	CSC	--
bank swallow <i>Riparia riparia</i>	Colonial nester that requires vertical earthen banks or cliffs near rivers or lakes. Elevation range from sea level to 7,000 feet.	CT	--

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Species	Habitat	CDFW	USFWS
great gray owl <i>Strix nebulosa</i>	Forest habitat adjacent to meadows or bogs. Elevation range from 3,000 to 8,000 feet.	CE	--
California spotted owl <i>Strix occidentalis occidentalis</i>	Nests in dense, multilayered evergreen forest. Elevation range from 1,000 to 8,500 feet.	CSC	--
yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	Occur as migrants in grasslands, croplands, or savanna. Elevation range from sea level to 8,000 feet.	CSC	--
<b>MAMMALS</b>			
pallid bat <i>Antrozous pallidus</i>	A wide variety of habitats at lower elevations, including grasslands, shrublands, woodlands and forests. Elevation range from sea level to 8,000 feet.	CSC	--
Sierra Nevada mountain beaver <i>Aplodontia rufa californica</i>	Rivers, lakes, ponds and streams with nearby dense understory of small deciduous trees and shrubs	CSC	--
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	All but subalpine and alpine habitats, and may be found at any season throughout its range. Elevation range from sea level to 9,500 feet.	CCT/CSC	--
California wolverine <i>Gulo gulo</i>	A variety of high elevation habitats including subalpine and montane forest. Elevation range from 1,600-10,800 feet.	CT/CFP	--
southwestern river otter <i>Lontra canadensis sonora</i>	Rivers and large streams. Elevation range from sea level to 10,000 feet.	CSC	--
fisher- west coast DPS <i>Pekania pennanti</i>	Coniferous or deciduous-riparian forest with high percentage canopy cover. Elevation range from sea level to 8,500 feet.	CCT/CSC	FCT
American badger <i>Taxidea taxus</i>	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Elevation range from sea level to 12,000 feet.	CSC	--

**Status:**

*Federal*

FE Federally listed as "Endangered"

FT Federally listed as "Threatened"

FCT Candidate for federal listing as "Threatened)

*State*

CE State listed as "Endangered"

CT State listed as "Threatened"

CCT Candidate for State listing as "Threatened"

CFP State designated "Fully Protected" or "Protected"

CSC State designated "Species of Special Concern"

Source: CDFW 2015

## **2.3 Recreation and Open Space**

A major incentive for people to move into the Sierra Nevada foothills is the open space. As the population has grown, so has the desire to maintain areas of open space for recreational purposes or aesthetic values. El Dorado County supports an expanding network of trails for hikers, bicyclists, and equestrians. These lands designated for recreation (e.g., Cronan Ranch Regional Trails Park) help to maintain large expanses of oak woodland. The benefits of supporting oak woodland habitat and providing wildlife habitat are enhanced when recreational areas connect with other open space, such as under agricultural and natural resources land use designations.

A partial list of areas in the ORMP area that provide recreational and/or open space values are described below. This list is not exhaustive, but helps to identify potential opportunities to maintain large expanses of oak woodland and to provide connectivity among the woodlands.

- The Cronan Ranch Regional Trails Park, east of Coloma, is managed by the Bureau of Land Management and includes a 62-acre parcel owned by El Dorado County. Plans exist to connect this area with the South Fork American River corridor trail that will run from Greenwood Creek to Salmon Falls. This park contains oak woodlands.
- The Folsom Lake State Recreation Area provides trails, camping, and open space around Folsom Lake.
- The Auburn State Recreation Area provides trails through oak woodland habitats near the confluence of the north and middle forks of the American River and in the community of Cool. Corridors are maintained along the north and middle forks of the American River.
- Marshall Gold Discovery State Historic Park in Coloma has the Monroe Ridge and Monument trails and other open space in oak woodland habitats near the South Fork of the American River.
- The Sacramento-Placerville Transportation Corridor (SPTC), as discussed in Section 11, includes 28 miles of the corridor within El Dorado County, much of which passes through oak woodland.
- The El Dorado Trail is jointly owned by the City of Placerville and El Dorado County. It winds through oak woodland habitats from Placerville to Camino. The El Dorado Trail eventually will connect the SPTC and the National Pony Express Trail Route. Potential may exist to expand the sections through oak woodlands to enhance oak woodland conservation and to meet the need for trails
- Lands along Weber Creek that are part of the El Dorado Irrigation District's (District) Texas Hill properties contain large expanses of oaks. Potential partnering between the District and the County could meet water storage needs and oak conservation goals.
- The Dave Moore Nature Area provides a small recreation area with oak woodland habitat along the South Fork of the American River.
- The Red Shack Trail passes through a 131-acre property supporting oak woodland habitat to reach the South Fork of the American River.

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- The Bureau of Land Management (BLM) manages over 3,100 acres in the Pine Hill Preserve network that serves to protect rare plants that occur on gabbroic soils (<http://www.pinehillpreserve.org/index.htm>). The Pine Hill Preserve consists of five separate units in northern gabbroic mixed chaparral and oak woodland.
- The American River Conservancy has protected 3,910 acres of critical riparian habitat throughout the Upper Cosumnes River Basin. Protection of the river basin is guided by the Upper Cosumnes River Basin Strategic Plan, which serves as a blueprint for acquisitions and easements that will eventually protect thousands of acres of sensitive riverfront lands, and connect them with existing public lands throughout the watershed. (American River Conservancy 2016).
- Peavine Point Research Natural Area on the Eldorado National Forest encompasses 1,098 acres about two miles northeast of Pollock Pines at an elevation range of 2,080 to 3,854 feet (USDA Forest Service undated). Although the primary target element for designating this site as a research natural area is old-growth ponderosa pine, the secondary target element is black oak, which dominates the middle canopy.

Maintaining and expanding open space is not a panacea for encroaching development and the effects from loss of oak woodland habitat and fragmentation. Human activities within open space affect biological values. The introduction of non-native species, wildlife harassment by pets, and trampling of vegetation are examples of factors that impair biodiversity values (Hilty et al. 2006). Open space that provides for human activities should be used as one component of a comprehensive approach to preserving oak woodland habitats in the County.

#### **2.4 Health and Function of Local Watersheds**

Oak woodlands contribute to the health of watersheds in several ways. Organic debris from oaks is important for soil building and maintenance of water quality (USDA Forest Service 2001). Oak woodlands contribute organic matter to the soil and thereby provide soil cover and nutrients to enhance soil fertility, as well as reducing bulk density. Soil structure, increased infiltration rates, and reduction of soil erosion and sedimentation are functions present in oak woodlands, which can contribute to better water quality.

In a study of blue oak stands, soil quality and fertility were enhanced beneath oak canopies as compared to adjacent grassland (Dahlgren et al. 2003). Oak woodlands remove more water from the soil profile than do grasslands and this water is released through evapotranspiration. Because the loss of water through evapotranspiration reduces the leaching intensity beneath oak woodland canopy, more nutrients are retained within the soil and fewer nutrients are leached into streams and creeks.

A Watershed Assessment was completed for the South Fork of the American River (Georgetown Divide Resource Conservation District 2004). A water quality risk was assigned to each sub-basin in the watershed. Eleven sub-basins in the ORMP area received the two highest ratings for risk; sub-basins outside the ORMP area had lower risk. High risk was associated with high density of roads, structures, and impervious cover in the lower reaches of the watershed, which is

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in the ORMP area and where most urban development has occurred. This risk assessment highlights the importance of maintaining the functions of oak woodlands to protect watersheds.

## **2.5 Soil and Water Retention**

Leaves and other organic matter on the ground in oak woodlands absorb water from precipitation and reduce evaporation from the soil (USDA Forest Service, 2001). Organic matter from oak woodlands reduces bulk density and improves soil structure (Dahlgren et al., 2003). The improved soil structure increases infiltration rates and reduces soil erosion and sedimentation. When litter and organic matter are burned in wildfires, infiltration can be reduced and runoff increased (McCreary 2004). Giusti et al. (2004) stated that soil erosion “is often the most glaring impact” from removal of oak woodland vegetation.

## **2.6 Reduction of Fuel Loads**

Fire in oak woodland habitats was used by Native Americans and then by ranchers until the 1950s (Standiford and Adams 1996). In a fire history study near Diamond Springs in El Dorado County, Stephens (1997) determined that the mean fire interval in blue oak woodland from 1850 to 1952 was approximately 8 years. Fires have largely been suppressed since the early part of the 1900s (McCreary 2004).

Oak woodlands are not only adapted to fire, but fire is critical to their ecology (Standiford and Adams 1996). Mature oaks are resistant to low-intensity ground fires; seedlings and saplings may resprout after being top-killed by fire. Germination of some plant species within oak woodland is stimulated by fire. Oak recruitment events in Sierra Nevada have been associated with fire.

Because fires have been suppressed, fuels have accumulated in some oak woodlands. The increase in fuel loading results in an increased risk of high-intensity wildfires. Consequences of high-intensity wildfires include increased run-off and erosion, increased sedimentation into streams, reduction in water quality, loss of wildlife habitat and loss of oak woodlands that had been resilient under an earlier low-intensity fire regime (Standiford and Adams 1996; McCreary 2004).

CAL FIRE administers a Vegetation Management Program (VMP) to assist with fuels management, which includes prescribed burning on private property. The use of prescribed fire is complicated by development in oak woodlands, air quality considerations, increased hazard from greater fuel accumulations, and liability for escaped fires.

## **2.7 Effects from Loss of Oak Woodlands**

Loss of oak woodlands affects many natural resource values. The loss of oak woodlands affects wildlife habitat, plant species diversity, soils, and the function of watersheds. Not only is habitat lost when oak woodlands are removed, but fragmentation of the remaining oak woodlands diminishes the quality of the remaining habitat (Saving and Greenwood 2002; Scott 1996).

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#### **2.7.1 Wildlife Habitat**

Loss of oak woodlands affects wildlife habitat both directly and indirectly. When oak woodlands are removed, food (e.g., acorns, insects, and fungi), cover, cavities, and nesting sites are removed, reducing the overall amount of available habitat. Downed woody debris and snags that provide shelter are also removed.

Indirect effects from loss of woodlands may be more subtle. Remaining habitat may be small and lack some of the components that wildlife requires. Barriers may be established that prevent wildlife from safely accessing and utilizing all of the habitat components that they need (e.g., water sources or breeding areas). Isolated, small patches may not support the metapopulations or metacommunities necessary for long-term viability.

#### **2.7.2 Fragmentation**

Fragmentation is the breaking up of contiguous land into smaller pieces that are separated by varying distances. Degradation of habitat and ecosystem values increases with increasing fragmentation.

Oak woodlands function most effectively and provide the greatest habitat value in large contiguous expanses. Both size and configuration are important. Larger fragments (especially with greater connectivity) tend to support more species. The rate of local extinction increases with smaller patch size; however, species also are lost from larger (250 acres) fragments (Hilty et al. 2006). The species composition within California oak woodlands changes from large to small areas and with decreasing distance from urban settings. Merenlender and Heise (1999) reported that the percent of neotropical birds was significantly higher in undeveloped oak woodlands in California than at ranchettes (10-40 acres) and suburban lots (0.5-2.5 acres).

Natural resource values are maximized when the interior or core area is greater in relation to the edge. Round shapes have greater core to edge area; more irregularly shaped areas or linear areas have greater edge to core area. Edge effects are least significant when the edge transitions to other natural vegetation and is most intense when the edge transitions to a developed landscape. As edge habitat increases, oak woodland is more subject to invasion by exotic species such as invasive weeds and domestic animals.

Giusti et al. (2004) identified two main processes impacting oak woodlands in California: 1) land clearing for subdivisions and intensive agriculture and 2) the parcelization of large continuous woodland ownerships for exurban development. Impacts vary from complete removal of oak woodland to degradation of the quality of retained oak woodland.

Rural residential development, which erodes habitat quality, has been a particular concern in several studies such as Saving and Greenwood (2002) and Merenlender and Heise (1999). The majority of oak woodland habitats in El Dorado County are privately owned rural lands (Saving and Greenwood 2002). Saving and Greenwood (2002) projected fragmentation of oak woodland during full build-out of the 1996 General Plan, predicting that remaining oak woodland would

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consist of smaller fragments with greater distance between them. Large contiguous habitat and connectivity would be lost.

High-intensity land uses (up to and including low-density residential) result in fragmentation and loss of the majority of the existing habitat. Medium-intensity land uses (including rural residential) result in removal and fragmentation, but to a lesser extent (El Dorado County 2003). With medium-intensity land uses, some habitats would continue to be viable but the quality of the habitat would be diminished and biological diversity would be reduced. With increasing fragmentation, retained habitats may become too small to support viable populations of species.

When oak woodlands are converted to urban landscapes, some woodlands remain because of oak protection ordinances or because they occur on steep slopes or within drainages (Scott 1996). When oak woodlands are embedded within other land uses, their biological values decline as adjoining habitats are lost. Barriers such as housing alter wildlife movement between stands, resulting in potential population decline.

In El Dorado County, Highway 50 presents a major barrier to north-south wildlife dispersal (El Dorado County 2003; Saving and Greenwood 2002). The connectivity of north and south habitats across Highway 50 was identified as at-risk from future development and was an important value to preserve (Georgetown Divide Resource Conservation District, 2004). The Weber Creek drainage is the only north-south corridor allowing passage of wildlife across the Highway 50. Opportunities to establish additional north-south corridors across Highway 50 may exist at other sites (e.g., drainages from Slate Creek to Indian Creek).

The Saving and Greenwood study identified the need to maintain large contiguous areas of oak woodland that function under a more natural state. The study also emphasized the need for a program that focuses on critical areas of connectivity such as habitat corridors. The General Plan EIR (El Dorado County 2003) discussed the importance of preserving connectivity in the form of riparian corridors, canyon bottoms, and ridgelines and also by maintaining a landscape that contains a network of multiple pathways for wildlife movement.

### **2.7.3 Retention of Soil and Water**

A study in the northern Sierra Nevada foothills examined changes to soil quality following blue oak removal (Camping et al. 2002). Significant reduction in carbon, nitrogen, and other nutrients occurred within 5 to 15 years. Nutrient concentrations in streams increased for 3 to 4 years following vegetation removal (Larsen et al. 2005).

Sediment concentrations also increase in streams following vegetation removal (Larsen et al. 2005). In the Sierra Nevada foothills, conversion of 90 percent of an oak-dominated watershed to grassland led to an almost two-fold increase in sedimentation. Loss of vegetation from development also reduces the retention of soils and water. Increased surface runoff leads to increased water velocity and erosion (Larsen et al. 2005). Rates of sedimentation and non-point source pollution increase with increased run-off.

### **3.0 Economic Value of Oak Resources**

This section summarizes research regarding the economic values of oak woodlands. The natural resources values of oak woodlands presented in Section 2 underlie the economic values described in this section. Therefore, community economics will be affected as the extent and quality of the resource diminishes. Oak woodlands in El Dorado County provide economic value to landowners and the community at large. In addition to providing a source for firewood and other wood products, oak woodlands support important economic activities such as grazing and recreation, enhance land values, and play a critical role in the healthy functioning of aquatic and terrestrial ecosystems throughout the County.

#### **3.1 Support of Important Economic Activities**

Agriculture and recreation-based tourism are important industries in El Dorado County. According to the 2014 El Dorado and Alpine Counties Agricultural Crop and Livestock Report produced by the Agricultural Commissioner (El Dorado County 2014), the impact of agriculture on El Dorado County's economy was estimated at \$433 million in 2014. According to the 2012 Field Report from the California Department of Conservation's Farmland Mapping and Monitoring Program (California Department of Conservation 2014), much of the area on the west slope – 193,794 acres or 36% of the county – is categorized as grazing land. Oak woodlands provide shade, forage, and sources of water for livestock. The economic value of pasture and rangeland (crops only, not including the value of livestock) was about \$5.77 million in 2014 (El Dorado County 2014).

In addition to agricultural operations, oak woodlands support many recreation activities in El Dorado County. With more than 25% of its lands owned by the U.S. Forest Service, El Dorado County provides substantial recreation opportunities. The extensive public land, as well as privately owned orchards, wineries, recreation facilities, and timberlands, combine to create a major scenic and recreational attraction for tourism in the County. The scenic beauty of the County's oak woodlands is an important part of the attraction. In addition, deer and other game species that depend on oak woodland habitat contribute to recreational hunting opportunities on public lands and through hunting leases on private lands, which in turn generate revenues for land owners that help keep many ranches viable.

Oak woodlands also support other recreation activities such as camping, fishing, hiking, bird-watching and equestrian activities that contribute to a high quality of life for residents and attract visitors. Businesses that depend on and directly benefit from recreation-based tourism include recreation services, lodging, food services, restaurants, service stations, and retail trade. Tax revenues generated by recreation activities and agri-tourism help support governmental operations in El Dorado County.

#### **3.2 Contribution to Land Value**

Property values are a function of location, improvements, and other amenities. Numerous studies have shown that the presence of oak woodlands enhance land values by providing shade (energy conservation) and wind break benefits, absorbing sound, serving as a land use buffer, providing



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erosion control and contributing to aesthetic beauty. A study by Standiford and Scott (2001) in Riverside County quantified how aesthetic and environmental values of adjacent oak woodland open space are captured in parcel sales prices. The project determined that natural resources in a broad geographic area contribute to the economic value of real property and the overall value of an entire community. This increased value provides an economic incentive for investing in conservation.

Standiford (1999) and Giusti et.al. (2005) also show that oak trees can offer higher real estate market yields over bare land. Standiford's study also illustrated that individual oak trees of large size and heritage status have been found to contribute to the value of parcels. Increases in property values contribute to increases in property tax revenues for a county. Conversely, however, a conservation easement permanently reduces the development potential on a parcel and therefore potential tax revenue that could result from the highest developable use allowed on the property.

### **3.3 Contribution to Ecosystem Function**

As discussed in Section 2 (Natural Resource Values of Oak Woodlands), oak woodlands contribute to the healthy functioning of both aquatic and terrestrial ecosystems. Important ecosystem functions to which oak woodlands contribute include providing habitat, maintaining water quality and supporting water supplies, and providing other watershed services such as improving soil structure, increasing infiltration rates, reducing soil erosion and sedimentation, and enhancing nutrient cycling and soil fertility. Although placing a monetary value on these services is challenging and imprecise, recent research has made strides in better understanding the importance and value of these services to society.

One study recently conducted by the Spatial Informatics Group (Troy and Wilson 2006) on the value of services provided by oak woodlands suggests that the habitat value of oak woodlands is about \$117 per acre per year. This value reflects society's willingness to pay for maintaining oak woodland habitat that supports healthy populations of species that depend on oak woodlands. Although monetary values for other ecosystem functions, such as watershed services, to which oak woodlands contribute are not available, the value of the services, including infiltration and control of erosion and sedimentation (in terms of the avoided cost to society of having to duplicate these services by alternative means such as water treatment), is certainly substantial.

Lastly, the role of oak woodlands in contributing to climate effects should be acknowledged. Two studies (Birdsey 1992, Tol 2005) examined the contribution that oak woodlands make to regulating atmospheric carbon dioxide, a greenhouse gas. According to these studies, the carbon sequestration services that oak woodlands provide are valued at between \$33 and \$83 per acre per year.

## **4.0 Priority Conservation Areas**

To establish an effective oak resources management program that fulfills the 2004 General Plan policies for oak resources mitigation and conservation purposes, locations need to be identified that meet the Goals and Objectives presented in the ORMP. Areas for conservation easements need to possess the oak woodland habitat characteristics summarized in Section 2 (Natural Resource Values of Oak Woodlands). Furthermore, to develop an in-lieu fee, the potential locations of conservation lands need to be known to estimate the costs of acquisition.

From the goals identified in the ORMP, oak woodland habitats were analyzed by:

1. Using the best geographic information on oak woodlands that is currently available for the entire ORMP area;
2. Considering oak woodland habitat evaluation criteria based on the adopted 2004 General Plan policies; and
3. Completing a mapping process that is objective, replicable, and supportable for the intended purpose of identifying oak woodlands that will receive priority for the mitigation and conservation purposes of this ORMP.

The County mapping process concluded by identifying the Priority Conservation Areas (PCAs) shown in Figure 2 of the ORMP. Figure 2 of the ORMP was the result of dozens of mapping exercises and criteria. Overall, the approach was to start with the resource (oak woodlands) and then identify which areas would be most consistent with the policies and land use designations of the 2004 General Plan.

The ORMP is an updated version of the plan adopted by the El Dorado County Board of Supervisors on May 6, 2008. While other sections of the ORMP present oak woodland habitat coverage based on 2015 FRAP data, the PCAs were not updated in preparation of this ORMP. Therefore, the discussion of data sets and methods presented Section 4.1 are taken directly from the 2008 version of the ORMP and are based on the 2002 FRAP oak woodland data set. Since the extent of oak woodland habitat in the ORMP area changed only slightly between the 2002 and 2015 FRAP data sets, the PCAs identified in the 2008 ORMP are considered to still be viable and are incorporated into this plan. Section 4.1 below summarizes the efforts taken to develop the PCAs, while Section 4.2 presents the extent of oak woodlands in PCAs, as calculated from the 2015 FRAP data set. Finally, Section 4.3 discusses criteria for identifying oak woodland conservation areas that lie outside of the PCAs identified herein.

### **4.1 Priority Conservation Area Mapping**

Priority Conservation Area mapping was conducted in two phases:

- Phase 1 (Identifying Oak Woodland Resources): Considering all oak woodland types in the ORMP area, resource and habitat mapping criteria were considered, selected, and

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then applied. Large expanses of oak woodlands greater than or equal to ( $\geq$ ) 500 acres were identified; and

- Phase 2 (Prioritizing Conservation Areas): Using parcel size information from the Phase I results, and land use designations from the 2004 General Plan, the large expanses of oak woodlands were narrowed to those lands where: 1) oak woodland habitats would not likely undergo substantial fragmentation; and 2) oak woodland conservation would be largely consistent with the 2004 General Plan land use designations. These large expanses were classified as PCAs.

PCA mapping was based on GIS data available from state and county sources in ESRI ArcMap-compatible format. A discussion of the data sets, processes, and intermediate mapping efforts are described below.

#### 4.1.1 Mapping Data Sets

##### 4.1.1.1 Oak Woodland Data

The existing vegetation coverage data used in defining the PCAs is a mosaic of the USDA Forest Service (USFS) Remote Sensing Lab's (RSL) existing vegetation data (CALVEG) Tiles 19, 20, and 21. The tiles were merged and then clipped with the ORMP area boundary layer to create a vegetation coverage data set for the entire ORMP area. To determine oak woodland areas, a selection from the RSL vegetation data set was made where the attribute field 'WHRTYPE' equaled blue oak-foothill pine (BOP), blue oak woodland (BOW), valley oak woodland (VOW), montane hardwood (MHW), and montane hardwood-conifer (MHC). The 'WHRTYPE' attribute field correlates directly to the CWHR classifications discussed previously in this ORMP. Valley foothill riparian was not included as it did not appear in the data set for this region. The selected polygons were then exported as a new "Oak Woodlands" layer.

##### 4.1.1.2 Other Relevant Data

In addition to the oak woodlands data set, other GIS data was necessary to create the PCA boundaries. Community Regions, Rural Centers, parcels, land use, street centerline, and County boundary data sets were provided by the El Dorado County GIS department. The USFS boundary was obtained from the USFS Pacific Southwest Region GIS clearinghouse. The water bodies and hydrology layers was obtained from the California Spatial Information Library (CaSIL). Elevation data was acquired from a United States Geological Survey (USGS) 30-meter Digital Elevation Model (DEM) that was also supplied by the El Dorado County GIS department. The County boundary polygon was clipped with the 4,000-foot contour to produce the ORMP area boundary layer.

#### 4.1.2 Large Expanses of Oak Woodland

Initial Mapping of Large Expanses of Oak Woodland was created by dissolving the Oak Woodlands layer that removed boundaries between contiguous polygons. An acreage calculation was applied to the new aggregate polygons and a selection of all polygons  $\geq$  500 acres was made. This selection was then exported to a "Large Expanse of Oak Woodland" layer. Large

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Expanses of Oak Woodlands identification was a first step towards a resource-based approach to begin identifying areas that could be considered a priority for conservation or mitigation. The total acreage of the Large Expanses of Oak Woodlands was 219,494.

**4.1.3 Initial Mapping of Priority Conservation Areas**

As previously discussed, oak woodland functions most effectively and provides the greatest habitat value in large contiguous expanses. In order to select the most effective areas to target for acquisition of oak woodland conservation easements from willing sellers, PCAs were developed. Early modeling of oak woodland corridors represented an attempt to create a PCA map. That mapping effort further reduced large expanse areas and modeled narrowly defined oak woodland habitat plus all other BOP and BOW habitats. All other BOP and BOW habitats were included at this point to provide those CWHR habitat types an increased conservation emphasis due to their reported low rate of regeneration. This version of the model qualified all areas with a score  $\geq 10$ . The scoring criteria were as follows:

- Areas of Large Expanses of Oak Woodland = 5 pts
- Areas of ‘undeveloped land’ (defined as having a USECDTYPE attribute value of “VAC” in the County parcel database) = 5 pts
- Parcel Size = variable (see Table 4-1 below)
- Land Use Designation = variable (see Table 4-2 below)

Parcel Size (Acres)	Score (pts.)
< 5	1
$\geq 5 < 10$	2
$\geq 10 < 20$	3
$\geq 20 < 40$	4
$\geq 40$	5

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Table 4-2: Land Use Designation		
Land Use Code	Description	Score
AL	Agricultural Lands	5
AP	Adopted Plan	1
C	Commercial	1
HDR	High Density Residential (1-2/ac)	1
I	Industrial	1
LDR	Low Density Residential (5-10 acres)	2
MDR	Medium Density Residential (1-5 acres)	1
MFR	Multi-Family Residential (5 units/ac)	1
NR	Natural Resources	5
OS	Open Space	5
PF	Public Facilities	1
RD	Research and Development	1
RR	Rural Residential (10-160 acres)	4
TR	Tourist Recreational	1

The layers were converted to a raster format with a cell size of 100 feet. The cell values were then recalculated to reflect their model scores. All layers were then added together using raster math to create a model output with possible scores of 2 to 20. Any cell with a value greater to or equal to 10 was qualified. Any BOW or BOP polygons that did not already have a score  $\geq 10$  were then added back in to create the initial PCA layer.

To calculate the PCA acreage under County jurisdiction, State and Federal lands (in the Government Ownership (1997) shapefile obtained from CaSIL) were then clipped from the PCA layer and the calculation was performed. Then, all of the State and Federal lands were removed from the map to assess their importance in identifying PCAs.

As the mapping progressed, an increasing effort was made to narrow PCAs to those areas that are most consistent with the 2004 General Plan land use designations. Because the General Plan concentrates land development within the Community Regions and Rural Centers (CR/RC) where oak woodland impacts and fragmentation are most likely, potential PCA designations were removed from these areas. The distribution of PCAs with the CR/RC removed was then reviewed. The IBC layer was added to this map to assess the geographic relationship of IBCs to PCAs.

#### **4.1.4 Finalization of Priority Conservation Areas**

After the final round of mapping, it was determined that PCAs are designed to be large expanses of oak woodland greater than 500 acres and coincident with parcels greater than 40 acres. The General Plan concentrates land development within the Community Regions and Rural Centers (CR/RC) where oak woodland impacts and fragmentation are most likely, so potential PCA designations were removed from these areas, as well as from land uses designated for

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commercial and industrial development. Additional oak woodlands were removed as potential PCAs where the 2004 General Plan designates Low Density Residential (LDR) land use.

A map titled “Revised Priority Conservation Areas (without Corridors) without Commercial or Industrial Lands” displayed a later iteration of the large expanses of oak woodland habitat model. This version included Large Expanses of Oak Woodlands, undeveloped parcels with oak woodlands that are 10 acres or larger and all VOW habitat, but it excluded “commercial” and “industrial” designated lands in the County’s land use database, and State and Federal lands. Because there was no scoring, this model was created not by raster math as the previous model, but instead by simply clipping from the Large Expanses of Oak Woodlands layer any areas that did not qualify and then adding back in all VOW habitat.

A later map titled “Revised Priority Conservation Areas (without Corridors) – Parcels 40 Acres and Larger” identified PCAs as any large expanses of oak woodland on undeveloped parcels 40+ acres in size, plus all VOW habitat, and excludes CR/RC, and all State and Federal lands. This was displayed over a backdrop of all CWHR oak woodland types. This map was also created by clipping selected layers against the Large Expanses of Oak Woodlands layer.

A map (El Dorado County Oak Woodland Habitat) was developed by County staff and presented at the June 25, 2007 Board of Supervisors workshop on the status of the ORMP mapping. The map represented the prior map described, with additional PCAs removed where the 2004 General Plan designates Low Density Residential land use.

For the final map, some data clean-up and further analysis was needed to link the PCAs. PCAs are designed to be large expanses of oak woodland greater than 500 acres and coincident with parcels greater than 40 acres. However, the above ‘filtering’ left many smaller fragments of oak woodland areas. Acreage calculations were therefore made on each remaining block of oak woodland and the blocks were grouped by size class. Isolated fragments less than 10 acres were removed from subsequent analysis. Areas greater than or equal to 500 acres were selected to be the final proposed “Priority Conservation Areas” for the Public Review Draft ORMP. This final proposed PCA map was subsequently adopted with the 2008 ORMP and represents the current extent of PCAs presented in this ORMP.

#### **4.2 Current Oak Woodland Acreage in Priority Conservation Areas**

Figure 2 in the ORMP titled “Priority Conservation Areas, Oak Woodlands, and Public Lands in El Dorado County” illustrates those PCAs where Conservation Fund In-Lieu Fee mitigation will be targeted for oak woodland conservation easements from willing sellers. Based on a comparison of the PCA extents and the 2015 FRAP oak woodland habitat data, the estimated acreages of oak woodland types within the PCAs are shown below in Table 4-3.

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Table 4-3: Oak Woodlands in Priority Conservation Areas	
Oak Woodland Type	Priority Conservation Areas (Acres)
Blue oak woodland (BOW)	11,032
Blue oak-foothill pine (BOP)	10,272
Montane hardwood (MHW)	11,752
Montane hardwood-conifer (MHC)	2,232
Valley oak woodland (VOW)	410
<b>Total Oak Woodland Area</b>	<b>35,698</b>

### **4.3 Criteria for Conservation Outside of Priority Conservation Areas**

The PCAs have been delineated to prioritize the acquisition of land or oak woodland conservation easements either by the County (using the funds collected in the County’s Oak Woodland Conservation Fund) or privately by developers. However, acquisition of land or oak woodland conservation easements outside of the PCAs may also occur. The following criteria shall be used for selecting potential oak woodlands conservation lands or easements outside of PCAs, consistent with General Plan Policy 7.4.2.8 (D):

- Location within IBCs;
- Location within other important ecological areas as identified in the Initial Inventory and Mapping (June 2010);
- Woodlands with diverse age structure;
- Woodlands with large trees and dense canopies;
- Opportunities for active land management to be used to enhance or restore natural ecosystem processes;
- Potential to support special-status species;
- Connectivity with adjacent protected lands;
- Parcels that achieve multiple agency and community benefits;
- Parcels that are located generally to the west of the Eldorado National Forest; and
- Parcels that would preserve natural wildlife movement corridors such as crossings under major roadways (e.g., U.S. Highway 50 and across canyons).

Land or conservation easement acquisition as mitigation of oak woodland impacts that occurs outside of PCAs shall occur on minimum contiguous habitat blocks of 5 acres (the acquired land or conservation easement shall be contiguous to or shall create a contiguous area of no less than 5 acres of oak woodland in conserved or open space status (e.g., parks, national forest, other conserved oak woodlands on private property). For transactions where land is acquired or a conservation easement outside of the PCAs is negotiated between a developer and a private seller, an analysis of the proposed oak woodland conservation area shall be performed by a qualified professional to demonstrate that the proposed conservation area is of equal or greater

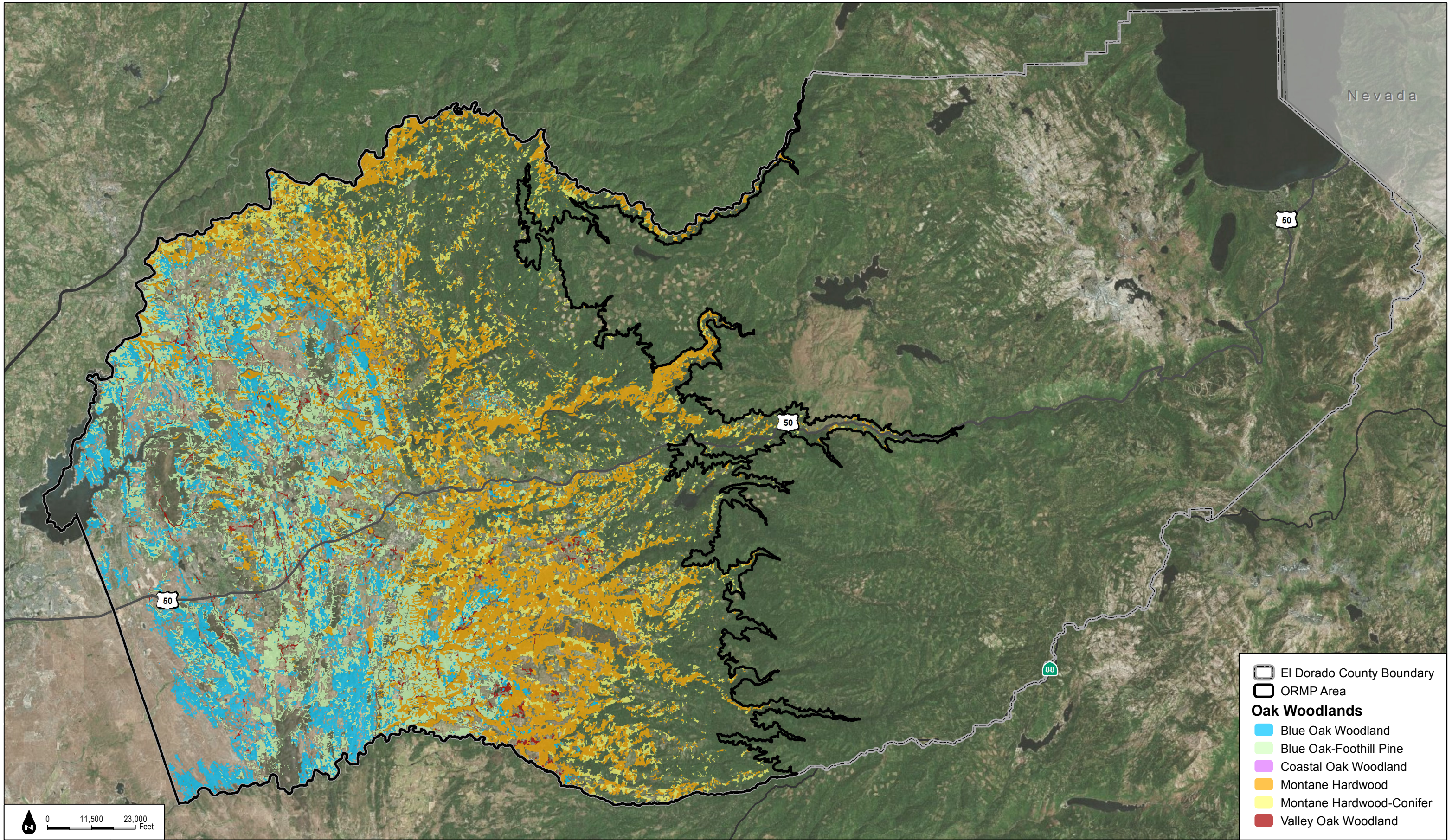
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biological value as the oak woodland proposed to be removed. The analysis of conservation areas shall be included as a component of an oak resources technical report.

Should the County elect to purchase land or oak woodlands conservation easements outside of PCAs using funds from its Oak Woodland Conservation Fund, an analysis of the proposed oak woodland conservation area shall be performed by a qualified professional to determine its suitability in meeting the criteria listed above.





- El Dorado County Boundary
- ORMP Area
- Oak Woodlands**
- Blue Oak Woodland
- Blue Oak-Foothill Pine
- Coastal Oak Woodland
- Montane Hardwood
- Montane Hardwood-Conifer
- Valley Oak Woodland

0 11,500 23,000 Feet

SOURCE: Bing Maps 2016; FRAP 2015

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**FIGURE A-1**  
Oak Woodland Distribution in ORMP Area

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## **5.0 Thresholds of Significance for the Loss of Oak Resources**

Upon receipt of an application for a permit or other discretionary approval, the County is required to determine whether the project would potentially have a significant effect on the environment. If the County determines that the project could potentially have a significant effect, the County is required to conduct a review of the proposed project, pursuant to the California Environmental Quality Act (CEQA). Part of this review requires the County to determine whether a proposed project within its jurisdiction may result in a conversion of oak woodlands that may have a significant effect on the environment (PRC §21083.4). PRC §21083.4 also identifies four mitigation options for projects that result in significant impacts to oak woodlands. This ORMP identifies mitigation options that are consistent with PRC §21083.4 and the County's General Plan policies. Specifically, once the extent and severity of oak woodland impacts are determined at a project level, the mitigation standards of the ORMP, which have been developed to be consistent with PRC §21083.4, will be applied as described in the ORMP. With respect to oak woodlands, compliance with the ORMP will constitute mitigation.

This ORMP also identifies mitigation requirements and options for impacts to individual oak trees that lie outside of oak woodlands, as well as specific mitigation for Heritage Trees. Mitigation is required for all trees meeting the definition of a Heritage Trees, whether or not the tree occurs in an oak woodland that is already subject to oak woodland mitigation requirements.

## **6.0 Mitigation for the Loss of Oak Resources**

El Dorado County's General Plan policies identify mitigation standards and requirements for projects that impact oak woodlands and oak trees, including specific mitigation for Heritage Trees. This ORMP provides a comprehensive approach for project-level oak woodland mitigation and simultaneously considers 'landscape level' conservation goals. Subsequent to adoption of the County's General Plan, several policies related to oak resources and special-status species were updated. This ORMP incorporates those policy updates and maintains consistency with current state-level requirements for oak woodland mitigation.

Mitigation options for impacts to oak woodlands have been identified in this ORMP and include options for on- or off-site conservation, on- or off-site tree planting, and/or in-lieu fee payment. Mitigation options for impacts to individual trees (including Heritage Trees) have also been identified in this ORMP and include options for on- or off-site tree planting and/or in-lieu fee payment. Consistent with PRC §21083.4, tree planting used to mitigate impacts to oak woodlands may not exceed 50 percent of the required mitigation.

Detailed mitigation standards for implementation of Policy 7.4.4.4 are outlined in Section 2 of the ORMP. The methodology for the developing the Conservation Fund In-Lieu Fee is detailed in Appendix B.

## **7.0 Resources**

“Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Woodlands and How to Grow California Oaks” (Appendix E; McCreary 1995) may be helpful in developing a tree replacement plan.

The UC Cooperative Extension can provide information to assist revegetation and restoration activities. Appendix F (Resources) provides contact information for this and other sources of information.

Wildfire in the wildland urban interface (WUI) and wildland urban intermix can produce catastrophic dangers to the public, firefighters, and to the vegetated landscape, which includes oak woodlands. California Public Resources Code (PRC) Section 4291 requires a person who owns, leases, controls, operates, or maintains a building or structure adjoining land covered with flammable material to maintain defensible space. Specifically, PRC §4291 requires 100 feet of defensible space (or to the property line, whichever is nearer) to be maintained around all buildings and structures. Fire inspection officials under PRC §4119 are given the authority to enforce PRC §4291. This authority allows fire inspection officials to enforce defensible space measures that involve vegetation modification and removal.

Fire Safe Plans are identified in General Plan Policy 6.2.2.2, which states:

The County shall preclude development in areas of high and very high wildland fire hazard or in areas identified as “urban wildland interface communities within the vicinity of Federal lands that are a high risk for wildfire,” as listed in the Federal Register of August 17, 2001, unless such development can be adequately protected from wildland fire hazard, as demonstrated in a Fire Safe Plan prepared by a Registered Professional Forester (RPF) and approved by the local Fire Protection District and/or California Department of Forestry and Fire Protection.

Fire Safe Plans address emergency access, signing and building numbering, emergency water standards, and fuel modification standards. These plans are equivalent to Fire Protection Plans, defined in Chapter 47 of the California Fire Code as:

“A document prepared for a specific project or development proposed for a Wildland Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure.”

As noted, Fire Safe Plans in El Dorado County are documents written by a Registered Professional Forester (RPF) that address basic wildland fire protection standards of the California Board of Forestry and Fire Protection in relation to a proposed project or parcel split. The authority for these regulations is found within PRC §4290 and Title 14 CCR 1270-1276. These regulations have been adopted with amendments by El Dorado County. Fire Safe Plans are reviewed and approved by the local fire district where the project is being planned as well as by CAL FIRE. Fire Safe Plans incorporate the defensible space requirements of PRC §4291 and

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may make recommendations for fuel (vegetation) modification outside of the 100 foot defensible space zone. Such fuel modification recommendations outside that required under PRC §4291 are designed to modify fire behavior such that the safety of emergency firefighting personnel is heightened, and the evacuation of civilians during a wildland fire is expedited. Fuel modification or defensible space zones provide a point of attack or defense for firefighters during a wildland fire.

Information from CAL FIRE regarding defensible space requirements (PRC §4291) can be obtained from the CAL FIRE website listed in Appendix F. Defensible space information and fire safety planning resource information is also available through these resources:

- CAL FIRE's Defensible Space information: [http://www.readyforwildfire.org/defensible\\_space/](http://www.readyforwildfire.org/defensible_space/)
- El Dorado Fire Safe Council: <http://www.edcfiresafe.org>

## **8.0 Monitoring and Reporting**

Two types of monitoring and reporting will be required under this ORMP:

- The status of replacement tree plantings in satisfaction of oak woodland or individual native oak tree mitigation requirements; and
- Status reporting on conserved oak woodlands managed by the County or land conservation organization.

### **8.1 Replacement Tree Plantings**

Project specific monitoring and reporting requirements for replacement plantings will be outlined in project specific oak resources technical reports developed pursuant to Section 2.5 of the ORMP and prepared by a qualified professional. The oak resources technical reports will include quantifiable success criteria for the replacement plantings, and will require that monitoring reports shall be submitted to the County at least annually during the 7-year maintenance and monitoring period and documentation of replacement planting success shall be provided to the County at the end of the 7-year monitoring and maintenance period (final monitoring report). Specific details regarding the replacement planting guidelines are included in Section 2.4 of the ORMP.

A qualified professional is an arborist certified by the International Society of Arboriculture (ISA), a qualified wildlife biologist, or a registered professional forester (RPF), as described below.

**Registered Professional Forester (RPF)** is a person licensed by the State of California to perform professional services that require the application of forestry principles and techniques to the management of forested landscapes. RPFs have an understanding of forest growth, development, and regeneration; soils, geology, and hydrology; wildlife and fisheries biology and other forest resources. RPFs are also trained in fire management and, if involved in timber harvesting operations, have expertise in both forest road design and application of the various methods used to harvest (California Board of Forestry and Fire Protection 2016a, California Board of Forestry and Fire Protection 2016b).

**Certified Arborist** A person certified by the International Society of Arboriculture (ISA) that provides professional advice regarding trees in the County.

**Qualified Wildlife Biologist** is a professional with a BA or BS or advanced degree in biological sciences or other degree specializing in the natural sciences; professional or academic experience as a biological field investigator, with a background in field sampling design and field methods; taxonomic experience and knowledge of plant and animal ecology; familiarity with plants and animals of the area, including the species of concern; and familiarity with the appropriate county, state, and federal policies and protocols related to special status species and biological surveys.

## **8.2 Status Reports to the Board of Supervisors**

The County shall deposit all oak woodland in-lieu fees into its Oak Woodland Conservation Fund, which shall be used to fund the acquisition of land and/or conservation easements from willing sellers. A portion of the fund shall also be used for ongoing monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting. Reporting shall be to the Board of Supervisors no less than every other March and shall address the status of conserved oak woodlands in the County and whether adjustments to the oak resources in-lieu fee are necessary to reflect current acquisition and operating costs.

## **8.3 Adaptive Management**

The success of the ORMP in meeting goals and objectives of the 2004 General Plan will be measured through the Monitoring and Reporting program. The County will implement adaptive management by: 1) revising guidelines for projects as necessary, and 2) revising the ORMP and the mitigation fee. If the Goals of the ORMP are not being met, then the County will review and revise the ORMP as necessary.



## **9.0 Administration of the Oak Woodland Conservation Program**

Following the Board of Supervisors' adoption of this plan, the County will implement the components of the ORMP. The major components of the administration program will include:

- 1) A County maintained database for the separate accounting of oak woodland conservation grants and in-lieu fees, and the separate tracking of acreages of oak woodland impacts and conservation/preservation and restoration for annual review and reporting by the County. This database will be used to track the monitoring and reporting information described in Section 8; and
  
- 2) One or more entities approved by the Board of Supervisors to assist in the management, maintenance, monitoring or restoration of oak woodlands acquired for any purpose authorized under this ORMP. In this context, oak woodlands are considered "acquired" if the lands are acquired in fee, or subject to oak tree conservation easements for the purpose of oak woodland conservation.

## **10.0 Education and Outreach**

The 2008 version of the ORMP was developed with public input gathered between mid-2006 and May 2008. This ORMP update also incorporated public input gathered at a series of Board hearings between January 13 and September 30, 2015.

One component of the ORMP provides for the voluntary conservation or management of oak woodlands within working landscapes. The sale of oak tree conservation easements on properties in identified Priority Conservation Areas (PCAs) is voluntary and depends upon the availability of a pool of willing sellers. An education and outreach program to inform landowners of the opportunities for oak woodland conservation will be essential to the success of the ORMP. The education and outreach program should identify the economic, aesthetic, agricultural and natural resource/biological values of oak woodland conservation.

The County will maintain, and make available to the public, a list of sources of information and other resources concerning oak woodland conservation, replanting and successful maintenance of oak woodlands as part of working landscapes. A partial listing is provided in Appendix F.

## **11.0 Partnering to Achieve Goals of the ORMP**

This section identifies specific opportunities for the County to partner with others to achieve the Goals of this ORMP. To the extent that partnerships can be established, the County's residents will benefit both in the conservation achieved and in the reduced costs for ORMP actions. No partnerships will be sought for activities related to mitigation; such costs will be solely the responsibility of the landowners or developers responsible for oak woodland impacts. Partnering opportunities may include governmental agencies, public utilities, non-profit organizations or private entities.

This plan identifies PCAs for oak woodlands that fulfill the purposes described in the ORMP. One of the purposes is to provide a landscape-level planning document for the long-term conservation of oak woodlands for reasons other than mitigation for development. These include joint planning efforts with non-profit organizations, resource agencies, and other land management agencies (e.g., Placer and Amador counties, Wildlife Conservation Board, and land trusts) that are seeking to coordinate regional-level oak woodland conservation. Joint efforts by the County with these organizations and willing landowners can increase and help to maximize the value of available funds for broader-scale goals that will meet many other conservation goals and policies of the 2004 General Plan.

As a part of an application for grant funding for certain activities, such as acquisition of conservation easements, some programs may require the County to certify that the proposed project is consistent with this ORMP. One such program includes grant funding for conservation easement acquisitions available under the Oak Woodlands Conservation Program. To qualify for such grant funding by the Wildlife Conservation Board (WCB), the County agrees, pursuant to Section 1366 (f) of the Fish and Game Code, to certify that individual proposals are consistent with the County's ORMP. In order to facilitate and expedite, where feasible, such grant funding applications, the County will develop an ORMP Consistency Certification process. This process will include an application form and may contain a list of criteria or examples of projects which would be consistent or inconsistent with this ORMP.

The WCB's criteria are as follows:

“To qualify for funding consideration for a restoration, enhancement, purchase of an oak conservation easement or long-term agreement, projects must meet one or more of the following criteria, must contain an appropriate management plan to assure project goals are maintained and the oak stand must have greater than 10 percent canopy:

- The project is of sufficient size to provide superior wildlife values.
- The project area contains a diverse size-class structure of oak woodlands and/or a diversity of oak species that will promote the sustainability and perpetuation of oak woodlands.
- The property is adjacent to other protected areas or will promote the sustainability and perpetuation of oak woodlands.

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- The property is adjacent to other protected areas or will contribute toward ease of wildlife movement across ownerships.
- The project contributes toward regional or community goals, provides scenic open-space, protects historic or archeological values, or contains unique geologic features.
- The property is a working landscape. The landowners have implemented or agree to implement stewardship practices that recognize and incorporate the ecological requirements of oak woodlands and associated habitats, thus promoting the economic and resource sustainability of the farming and ranching operation.
- The property removes or reduces the threat of habitat conversion from oak woodlands to some other use.
- The project has the potential to serve as a stewardship model for other landowners.”

Examples of projects which would be consistent and therefore encouraged would include acquisition of conservation easements from willing sellers which enhance connectivity of PCAs to one another or to existing protected lands, or which provide or preserve wildlife corridors across 4-lane roadways, or larger.

Projects which would be inconsistent with this ORMP might include acquisition of conservation easements or other interests in land which would interfere with the provision of public infrastructure such as major roads or other transportation projects, water storage and transmission lines, wastewater treatment facilities, schools sites and sites designated as locations for higher density residential land uses which have the potential to provide housing affordable to lower and moderate income households.

The following sections present potential partners with which El Dorado County may collaborate on oak woodland conservation projects.

## **11.1 Governmental Partners**

1. Wildlife Conservation Board (WCB)  
<https://www.wcb.ca.gov/Programs/Oaks>

The WCB is a separate and independent Board with authority and funding to carry out an acquisition and development program for wildlife conservation. The WCB's three main functions are land acquisition, habitat restoration, and development of wildlife oriented public access facilities. These activities are carried out under the following eight programs: Land Acquisition Program, Public Access Program, Habitat Enhancement and Restoration Program, Inland Wetlands Conservation Program, California Riparian Habitat Conservation Program, Natural Heritage Preservation Tax Credit Program, Oak Woodlands Conservation Program, and The Rangeland, Grazing Land and Grassland Protection Program.

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2. El Dorado County and Georgetown Divide Resource Conservation Districts (RCD)  
<http://www.eldoradorcd.org/>

The El Dorado County and Georgetown Divide RCDs are grassroots government organizations that advise and assist individual landowners and public agencies in planning and implementation of conservation practices for the protection, restoration, or development of land, water, and related natural resources. RCDs are a local government entity and can work with any local, state or federal agency through simple cooperative agreements. RCDs advise and assist individual landowners and public agencies in planning and implementation of conservation practices for the protection, restoration, or development of land, water, and related natural resources.

3. Natural Resources Conservation Service (NRCS)  
<http://www.nrcs.usda.gov/partners/>

The NRCS is the federal agency that works hand-in-hand with the American people to conserve natural resources on private lands. Formerly the Soil Conservation Service, NRCS brings 60 years of scientific and technical expertise to the Partnership.

Locally, the El Dorado County and Georgetown Divide Resource Conservation Districts are co-located with the NRCS and are normally the point of contact.

4. California Department of Forestry and Fire Protection (CAL FIRE)  
[http://calfire.ca.gov/resource\\_mgt/resource\\_mgt.php](http://calfire.ca.gov/resource_mgt/resource_mgt.php)

The Resource Management Program within CAL FIRE has a goal of maintaining the sustainability of natural resources. Several programs under the Resource Management Program can help to protect oak woodlands. The Vegetation Management Program (VMP) is a cost-sharing program that focuses on the use of prescribed fire, and mechanical means, for addressing fire fuel hazards. The VMP allows private landowners to enter into a contract with CAL FIRE to use prescribed fire to accomplish a combination of fire protection and resource management goals. The Forest Legacy Program (FLP) is a voluntary program to protect working forests, including oak woodlands. The FLP promotes the use of conservation easements to maintain traditional forest benefits as timber production, wildlife habitat, watershed protection and/or open space. The California Forest Improvement Program (CFIP) is a forestry incentive program whose purpose includes the protection, maintenance, and enhancement of forest resources. The CFIP is a cost-share program that can fund preparation management plans, RPF supervision, and oak tree planting, thinning, and pruning activities. While meeting its responsibilities under The Forest Practice Act, CAL FIRE is actively involved in timberlands that contain much of the County's California black oak population. In addition, CAL FIRE's responsibility includes review of Fire Safe Plans (General Plan Policy 6.2.2.2) and enforcement of PRC §4291 (defensible space).

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5. Bureau of Land Management (BLM)  
<http://www.blm.gov/ca/st/en/fo/folsom.html>

The BLM has a long history of collaborating with communities to manage public lands for multiple uses in three broad categories: commercial activities, recreation, and conservation. The Mother Lode Field Office is directly responsible for approximately 230,000 acres of Public Land scattered throughout fourteen Central California counties from Yuba County (in the north), to Mariposa County (in the south). Most of the acreage, with the exception of Cosumnes River Preserve in southern Sacramento County, is within the historic Mother Lode region of the Sierra Nevada Range.

The Mother Lode Field Office has adopted a Sierra Resource Management Plan (RMP) that will guide the management of all public lands under the jurisdiction of the Mother Lode Field Office for years to come. The RMP contains goals, objectives, and land-use allocations, as well as specific rules and regulations for different activities. It is literally that office's "blueprint for action." Acquisition of blue oak woodlands that meet county objectives for habitat conservation is identified as a management action in the adopted RMP.

6. United States Department of Agriculture, Forest Service  
<http://www.fs.usda.gov/eldorado/>

The Eldorado National Forest (ENF) extends into the eastern boundary of the ORMP area. California black oaks are emphasized in the Land and Resource Management Plan as important components of the ecosystem. Opportunities to develop cooperative efforts with the ENF may exist.

7. University of California Cooperative Extension (UCCE) – Central Sierra  
[http://cecentralsierra.ucanr.edu/Natural\\_Resources/](http://cecentralsierra.ucanr.edu/Natural_Resources/)

The Natural Resources Program provides forestry, wildlife, rangeland, watershed management and other natural resource related information to a wide variety of county residents and visitors. The goal is to promote sound management and conservation of the region's natural resources, through research, educational activities, and good working relationships with a broad range of people. The main clientele for this program are private landowners, resource management professionals working on private, State and Federal lands, users of public lands, conservation organizations, and the agriculture and forest products industries. The Natural Resources Program examines forest resources and hardwood rangeland including soil, water, vegetation and wildlife.

8. City of Placerville  
<http://www.cityofplacerville.org/>

The City of Placerville General Plan identifies the retention of tree canopy, which includes oaks, as important. The City currently is contemplating a comprehensive plan for Hangtown Creek, which is a major tributary of Weber Creek. Placerville and the County share land management

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planning responsibilities for very critical oak woodland along Weber Creek and several other major tributaries of the South Fork of the American River.

9. County of Placer Community Development Resource Agency  
<http://www.placer.ca.gov/departments/communitydevelopment>

Placer County, adjacent to El Dorado County along its northern boundary, has two programs designed to address natural plant communities, which include oak woodlands.

Placer Legacy is a countywide, science-based open space and habitat protection program. Placer Legacy will result in a comprehensive open space plan for Placer County that preserves the diversity of plant and animal communities in the County and addresses a variety of other open space needs, from agriculture and recreation to urban edges and public safety. Placer Legacy will help maintain the County's high quality of life and promote economic vitality. It is totally voluntary - only willing buyers and willing sellers participate. It is based on the existing County General Plan and community plans, so it doesn't require land-use or zoning changes. It is non-regulatory - no new regulations are adopted to meet the objectives of the program.

The Placer County Conservation Plan is intended to address the impacts associated primarily with unincorporated growth in west Placer and growth associated with the buildout of Lincoln's updated General Plan. Development in western Placer County will require the preservation of approximately 54,300 acres of land between now and 2050.

Opportunities may exist to collaborate to create PCAs across administrative county lines, and to share information that affects oak woodlands in the Sierra foothill region.

10. Amador County  
<http://www.co.amador.ca.us/departments/planning/current-general-plan-document>

Amador County is updating its general plan. Opportunities may exist to collaborate to create Priority Conservation Areas across administrative county lines, and to share information that affects oak woodlands in the Sierra foothill region.

11. El Dorado Hills Community Service District  
<http://www.eldoradohillscsd.org/>

The El Dorado Hills Community Service District has an extensive network of greenbelts. Opportunities may exist to plant small areas of oaks and to conduct fuels treatment activities within the greenbelts.

12. Cameron Park Community Service District  
<http://www.cameronpark.org/>

Several of the largest preserves in El Dorado County exist within or adjacent to the Cameron Park Community Service District boundary. The preserves support a mixture of chaparral and

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woodland types. Some opportunities for oak planting or enhancement of existing stands may exist.

13. El Dorado County Agriculture Department  
<https://www.edcgov.us/Ag/>

The Agriculture Department's mission is to protect, enhance and promote the preservation of agriculture and the environment while sustaining the public health, safety and welfare of all citizens, and to provide consumer and marketplace protections through the fair and equitable enforcement of laws and regulations.

Through other General Plan objectives and policies, the Department can help identify ways to maintain or to establish links between oak stands in agricultural areas.

14. El Dorado County Department of Parks and Trails  
<https://www.edcgov.us/Parks/>

The Parks and Trails Department manages the River Management Plan on the South Fork of the American River. The Plan overlaps important oak woodland corridors along the river. The Department is responsible for the development of regional parks and smaller parks within the County. An objective of the 2004 General Plan includes acquisition and development of regional parks. Opportunities to establish major regional parks may be combined with conservation of major oak woodlands. A new Master Plan for Parks and Recreation should be started in 2007. This new plan should identify the needs and possibly some locations for regional parks. The Department of Parks and Trails is currently charged with managing the portion of the Sacramento-Placerville Transportation Corridor (SPTC) that is within the County. The SPTC was purchased by El Dorado County, the County of Sacramento, the Sacramento Regional Transit District, and the City of Folsom under a joint powers agreement in 1996. This agreement covers a 53-mile corridor of the old Southern Pacific Railroad and stretches from 65<sup>th</sup> Street in Sacramento to approximately Ray Lawyer Drive/Forni Road in Placerville. Twenty-eight miles of the corridor within El Dorado County ranges in width from 66 feet to 200 feet. Along the corridor are excellent examples of oak types in the County. This corridor offers a great core area that could be widened to 500 feet as feasible and expanded to enhance oak woodland conservation and also help meet the critical needs for regional parks. The Department also manages three parks (Bradford Park in Shingle Springs, Henningsen Lotus Park in Lotus, Pioneer Park in Somerset, and Forebay Park in Pollock Pines), two trails (Rubicon Trail and El Dorado Trail), and the South Fork of the American River below Chili Bar Dam.

15. El Dorado County Department of Long Range Planning  
<https://www.edcgov.us/LongRangePlanning/>

The Department of Long Range Planning manages the General Plan Circulation Element and is responsible of coordinating the planning and implementation of roadway improvement to ensure safe movement of people and goods and to maintain adequate levels of services. The Department



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of Long Range Planning carries the responsibility of carrying out well-informed planning while informing the public, facilitating Board-adopted plan, ordinances, and policies, and ensuring that impartial analysis is conducted to meet the needs of the community.

16. Sierra Nevada Conservancy\*

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

The Sierra Nevada Conservancy (SNC) was established as a new State agency in 2004 to initiate, encourage, and support efforts that improve the environmental, economic, and social well-being of the Sierra Nevada Region, its communities, and the citizens of California (PRC Sections 333000 et. Seq.). Proposition 84, the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coast Protection Bond Act of 2006, includes \$54 million for the SNC to distribute to eligible organizations for the protection and restoration of rivers, lakes and streams, their watersheds and associated land, water, and other natural resources. The SNC offers grants for acquisition and/or site improvement/restoration projects under two programs, the Competitive Grant program and the Strategic Opportunity Grant (SOG) program.

## **11.2 Public Utility Partners**

1. El Dorado Irrigation District (EID)\*

<http://www.eid.org>

EID has expressed interest in participating with the County as a partner in oak woodland conservation. EID has several small parcels through the planning area that could help in the perpetuation of oaks. EID also has lands along Weber Creek (roughly between Big Cut Road and Cedar Ravine or “Texas Hill”) that has potential for water storage in the future. The Texas Hill properties contain large expanses of oaks. Potential partnering between EID and the County could meet EID’s water storage needs and oak conservation goals.

2. Georgetown Divide Public Utility District

Currently no opportunities for partnerships have been identified.

3. Sacramento Municipal Utility District (SMUD)

<http://www.smud.org/>

In 2006, SMUD and El Dorado County reached an agreement on the Upper American River Project (UARP). The South Fork of the American River is the key component of the UARP. In addition, SMUD has reached agreements with the County, Federal and State agencies, and private interests regarding the operation of the UARP. Details of the agreements are still being developed, but opportunities may exist for conserving or enhancing oak woodlands.

4. Pacific Gas and Electric (PG&E)

<http://www.pge.com/>

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Currently no opportunities for partnerships have been identified.

### **11.3 Private Partners**

The General Plan anticipates citizen involvement in the development and implementation of the ORMP. Section 10 (Education and Outreach) discusses public involvement in the ORMP's preparation to date. Public participation will continue to be encouraged at the County Planning Commission, Agricultural Commission, and Board of Supervisors' workshops and hearings as the plan is finalized for adoption. Currently, no opportunities for specific partnerships have been identified, but opportunities exist for private acquisition and management of oak resources. Oak nurseries and management of oak woodlands within planned communities are examples. In addition, it is expected that advisory committees will be established as needed.

The El Dorado County Association of Realtors might be a starting point for exploring opportunities and mechanisms to establish a privately managed clearinghouse of landowners potentially interested in selling conservation easements to others (public and private) seeking oak woodland mitigation or conservation lands. Similar to other environmental programs (e.g., air quality trading credits), oak woodlands within the PCAs could be categorically organized and offered on the open market as opportunities for oak woodland mitigation or other conservation programs.

### **11.4 Non-profit Partners**

The implementation of the ORMP will require land use easements. Section 9 (Administration of the Oak Woodland Conservation Program) identifies potential roles of non-profit organizations. Land trusts and conservancies are expected to play key roles in assisting the County with the goals, objectives, and implementation of various components of the ORMP.

## **12.0 Consistency with the General Plan and State Law**

This ORMP fulfills 2004 General Plan Measure CO-P, and as such replaces the Policy 7.4.4.4 Interim Interpretative Guidelines. The ORMP outline the County's strategy for oak woodland conservation and functions as the oak resources component of the County's biological resources mitigation program, identified in General Plan Policy 7.4.2.8.

### **12.1 ORMP as the Oak Resources Component of the County's Biological Resources Mitigation Program**

Preparation of this ORMP has been coordinated with biological resources policy updates The ORMP:

- Includes inventory and mapping of oak woodland resources throughout the County (Figure A-1);
- Inventories and identifies large expanses of native oak woodland vegetation as Priority Conservation Areas (PCAs);
- Concentrates conservation efforts on PCAs that connect to one another or to existing protected (state and federal) lands through a system of regulatory constraints, such as the IBC overlay, riparian corridors, or open space/natural resource lands;
- Describes a strategy for protecting contiguous blocks of PCAs through coordinated acquisition of conservation easements and management of acquired lands;
- Provides standards for conservation of oak woodlands outside of PCAs;
- Provides for a framework for mitigating impacts to oak resources, provides flexibility to allow combinations of mitigation options, and retains consistency with PRC 21083.4;
- Will identify habitat acquisition opportunities involving willing sellers through the education and outreach program, and through partnering with other organizations;
- Identifies alternatives for management of lands acquired and for restoration activities on those lands, where appropriate;
- Incorporates a monitoring program for lands acquired through this ORMP;
- Establishes reporting requirements for replacement tree planting as well as the progress of county-wide oak woodlands conservation;
- Was developed with significant opportunities for public participation throughout the process; and
- Will ensure a source of funding to the County's conservation fund for impacts to oaks and oak woodlands resulting from implementation of the 2004 General Plan.

### **12.2 Consistency with Measure CO-P**

The ORMP partially satisfies the requirements of Measure CO-P, which provides for the development of an Oak Resources Management Plan.

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### **12.3 Compliance with Fish & Game Code Section 1366(a)**

The Oak Resources Management Plan is adopted pursuant to the requirements of California Fish and Game Section 1366(a). The ORMP, together with applicable General Plan policies, meets or exceeds the requirements of state law relative to conservation of oaks and oak woodlands.

### **12.4 Compliance with PRC 21083.4**

The ORMP, together with applicable General Plan policies, meets or exceeds the requirements of state law PRC 21083.4 relative to conservation of oaks and oak woodlands.

### **12.5 Effect of Future Amendments to General Plan**

Nothing contained in this Oak Resources Management Plan would preclude an amendment to the County's General Plan, however future General Plan amendments may require a modification of this ORMP.

### **13.0 List of Preparers**

This Oak Resources Management Plan (ORMP) is an updated version of the Oak Woodland Management Plan adopted by the El Dorado County Board of Supervisors on May 6, 2008 (El Dorado County 2008). It incorporates more recent oak resources mapping data for the County and reflects policy language changes made during the General Plan Biological Policy Review project conducted in 2015. This ORMP incorporates relevant information included in the 2008 Plan (prepared by EN2 Resources, Inc., Pacific Municipal Consultants, Inc., and TCW Economics, in coordination with County staff), where applicable, and was prepared in coordination with El Dorado County Community Development Agency, Long Range Planning Division staff. It also incorporates public input gathered during project-focused hearings and direction given by the El Dorado County Board of Supervisors.

County staff involved in preparation of this ORMP includes:

Shawna Purvines, Principal Planner, El Dorado County Community Development Agency

Dave Defanti, Assistant Director, El Dorado County Community Development Agency

Roger Trout, Director, El Dorado County Development Services Department

The Dudek consultant team involved in preparation of this ORMP includes:

Cathy Spence-Wells, Principal (Dudek)

Scott Eckardt, Registered Professional Forester/Certified Arborist (Dudek)

Katherine Waugh, Senior Planner (Dudek)

Sherri Miller, Principal Biologist (Dudek)

Mark McGinnis, GIS Manager (Dudek)

Isabel Domeyko, Managing Member (New Economics & Advisory)

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## 14.0 Acronyms

<b>AL</b>	Agricultural Lands
<b>AP</b>	Adopted Plan
<b>BLM</b>	Bureau of Land Management
<b>BOP</b>	Blue Oak-Foothill Pine
<b>BOW</b>	Blue Oak Woodland
<b>C</b>	Commercial
<b>CAL FIRE</b>	California Department of Forestry and Fire Protection
<b>CALVEG</b>	Classification and Assessment with Landsat of Visible Ecological Groupings
<b>CDFW</b>	California Department of Fish and Wildlife
<b>CEQA</b>	California Environmental Quality Act
<b>CFIP</b>	California Forest Improvement Program
<b>CNDDB</b>	California Natural Diversity Database
<b>CR</b>	Community Regions
<b>CRLF</b>	California red-legged frog
<b>CWHR</b>	California Wildlife Habitat Relationship
<b>DBH</b>	Diameter at Breast Height
<b>DEIR</b>	Draft Environmental Impact Report
<b>EID</b>	El Dorado Irrigation District
<b>EIR</b>	Environmental Impact Report
<b>ENF</b>	Eldorado National Forest
<b>FLP</b>	Forest Legacy Program
<b>FRAP</b>	Fire and Resource Assessment Program
<b>GIS</b>	Geographic Information System
<b>HDR</b>	High Density Residential
<b>I</b>	Industrial
<b>IBC</b>	Important Biological Corridor
<b>ISA</b>	International Society of Arboriculture
<b>LDR</b>	Low Density Residential
<b>MDR</b>	Medium Density Residential
<b>MFR</b>	Multifamily Residential
<b>MHC</b>	Montane Hardwood-Conifer
<b>MHW</b>	Montane Hardwood
<b>NR</b>	Natural Resources
<b>NRCS</b>	Natural Resources Conservation Service
<b>OS</b>	Open Space
<b>ORMP</b>	Oak Resources Management Plan
<b>PCA</b>	Priority Conservation Area
<b>PF</b>	Public Facility
<b>PG&amp;E</b>	Pacific Gas and Electric
<b>PRC</b>	Public Resources Code
<b>RC</b>	Rural Centers

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<b>RCD</b>	Resource Conservation District
<b>RD</b>	Research and Development
<b>RMP</b>	Resource Management Plan
<b>RPF</b>	Registered Professional Forester
<b>RPZ</b>	Root Protection Zone
<b>RR</b>	Rural Residential
<b>SMC</b>	Sierran Mixed Conifer
<b>SNC</b>	Sierra Nevada Conservancy
<b>SMUD</b>	Sacramento Municipal Utility District
<b>SPTC</b>	Sacramento-Placerville Transportation Corridor
<b>TR</b>	Tourist Recreational
<b>UARP</b>	Upper American River Project
<b>UCCE</b>	University of California Cooperative Extension
<b>USDA</b>	United States Department of Agriculture
<b>USDI</b>	United States Department of the Interior
<b>USFS</b>	USDA Forest Service
<b>VMP</b>	Vegetation Management Plan
<b>VOW</b>	Valley Oak Woodland
<b>VRI</b>	Valley-Foothill Riparian
<b>WCB</b>	Wildlife Conservation Board
<b>WHR</b>	Wildlife Habitat Relationship