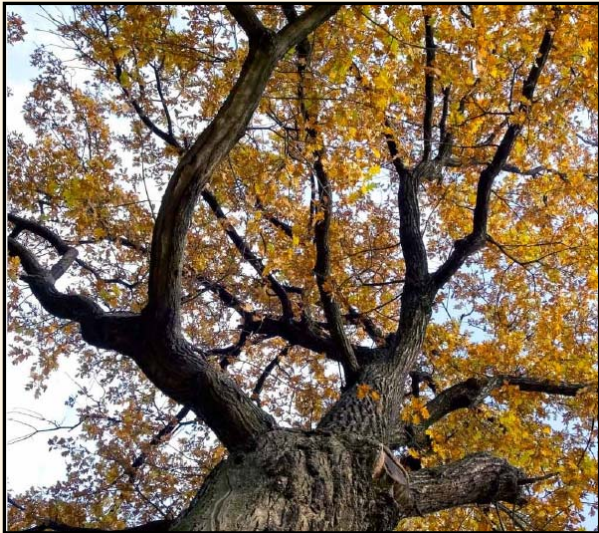


# El Dorado County

## Oak Woodland Management Plan



**April 2008**

Planning Commission Recommended Version



El Dorado County Development Services Department – Planning Services  
2850 Fairlane Court, Placerville, CA 95667

# OAK WOODLAND MANAGEMENT PLAN

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# 1. Introduction

## A. Purpose

The Purpose of this Oak Woodland Management Plan (OWMP) is to outline the County's strategy for conservation of its valuable oak woodland resources. Through the OWMP, the County identifies areas where conservation easements may be acquired from willing sellers as a means to offset and mitigate the loss or fragmentation of oak woodlands in other areas as a result of implementation of the 2004 El Dorado County General Plan (General Plan). Additionally, the OWMP provides guidance for voluntary conservation and management efforts by landowners and land managers. Lastly, the OWMP sets forth further guidance on General Plan Policy 7.4.4.4 Option A, which includes measures designed to encourage retention of existing oak canopy in areas planned for development.

Loss and fragmentation of wildlife habitat, including oaks and oak woodlands, was identified in the 2004 General Plan Environmental Impact Report (EIR) as a significant impact that would result from development under the General Plan. The County identified several mitigation measures which would reduce the severity of these impacts, although not to below a level of significance. These mitigation measures included Policies 7.4.4.4, 7.4.4.5 and 7.4.5.2, and the related implementation Measure CO-P.

Measure CO-P directs the County to develop and adopt an Oak Resources Management Plan that addresses the following:

- Mitigation standards outlined in Policy 7.4.4.4;
- Thresholds of significance for the loss of oak woodlands;
- Requirements for tree surveys and mitigation plans for discretionary projects;
- Replanting and replacement standards;
- Heritage/Landmark Tree protection standards; and
- An Oak Tree Preservation ordinance as outlined in Policy 7.4.5.2.

An Oak Tree Preservation ordinance that incorporates the standards outlined in Policy 7.4.5.2 and Heritage and Landmark Tree protection standards will be developed after the adoption of the OWMP.

At the state level, the Oak Woodlands Conservation Act of 2001 recognizes the importance of private land stewardship in conserving oak woodlands. The legislation established the California Oak Woodlands Conservation Program (COWCP), the mission of which is to "conserve the integrity and diversity of oak woodlands across California's working landscapes through incentives and education." The COWCP provides technical and financial incentives to private landowners to protect and promote biologically functional oak woodlands.

The OWMP serves multiple purposes. It defines the County's conservation strategy for oak woodland resources and implements Option B of Policy 7.4.4.4. It also partially complies with Measure CO-P, and constitutes the oak portion of the County's Integrated Natural Resources Management Plan (INRMP). Finally, it will establish a plan for voluntary conservation that landowners, the County, and others can use to seek grants and cost-sharing from State and Federal programs for oak woodland conservation in El Dorado County.

## B. Goals and Objectives of Plan

The OWMP goals are guided by two General Plan Objectives: Objective 7.4.2 and Objective 7.4.4. General Plan Objective 7.4.2 states: *Identify and Protect Resources*: "Identification and protection, where feasible, of critical fish and wildlife habitat including deer winter, summer, and fawning ranges; deer migration routes; stream and river riparian habitat; lake shore habitat; fish spawning areas; wetlands; wildlife corridors; and diverse wildlife habitat."

General Plan Objective 7.4.4 states: *Forest and Oak Woodland Resources*: "Protect and conserve forest and woodland resources for their wildlife habitat, recreation, water production, domestic livestock grazing, production of a sustainable flow of wood products, and aesthetic values."

The following goals are set forth by the OWMP:

- Mitigate oak canopy removal by providing flexibility through a range of on-site and off-site mitigation alternatives;
- Establish a Conservation Fund In-Lieu Fee that is sufficient to fully fund the mitigation program;
- Identify Priority Conservation Areas (PCAs) within large expanses of contiguous oak woodland habitat where conservation easements may be acquired from willing sellers to offset the effects of increased habitat loss and fragmentation elsewhere;
- Focus conservation easement acquisition efforts within areas not currently fragmented and which are unlikely to become fragmented through implementation of the General Plan;
- When weighing acquisition opportunities for conservation easements, generally maintain the relative acreages of all five oak woodland California Wildlife Habitat Relationship (CWHR) types (Valley Oak Woodland, Blue Oak Woodland, Blue Oak-Foothill Pine, Montane Hardwood Woodland, and Montane Hardwood-Conifer Woodland), but emphasize conservation of Valley Oak Woodlands, considered a "sensitive habitat" due to its relative rarity in the county;
- Encourage voluntary conservation and management of oak woodlands, including sustainable ranching and farming operations within working landscapes;

- Provide incentives (e.g., grants or cost-sharing for fuels/fire risk management) for the voluntary protection of oak woodlands providing superior wildlife values on private land (COWCP legislative goal);
- Provide oak woodland conservation guidance to private landowners and County planners through education and outreach (COWCP goals);
- Enhance oak woodland conservation by connecting acquisitions from willing sellers with existing open space, including publicly-owned lands that are managed for oak woodland habitat values (e.g., ecological preserves, recreation lands, rangelands, or natural resource areas) consistent with the County’s open space conservation goals (Goal 7.6; Policy 7.6.1.1); and
- Establish a database inventory of interested buyers and willing landowners wishing to participate in oak woodland acquisition and management mitigation options (Policy 7.4.2.8).

C. Oak Woodland Habitat in El Dorado County

The term “oak woodland” is defined in the Oak Woodland Conservation Act (Fish and Game Code §1361) as an oak stand with greater than ten percent canopy cover or that may have historically supported greater than ten percent canopy cover. For purposes of this OWMP, the conservation focus is on existing oak woodlands. The General Plan uses the term “oak woodland” interchangeably and in the same context as “oak canopy.” For the purposes of mitigation, measurement of oak canopy shall apply.

The OWMP addresses the same study area (below 4,000 feet elevation) and same categories of oak woodlands (California Fire and Resource Assessment Program, or FRAP) as were addressed in the 2004 General Plan. The General Plan EIR identifies five oak woodland types, which are listed in Table 1 below, along with the acreage of each category found within the OWMP study area. A sixth woodland type is Valley-Foothill Riparian which may include Fremont cottonwood, willow and valley oak. Valley-Foothill Riparian habitats in which valley oaks are the dominant tree species are considered oak woodlands under the OWMP. Both Valley Oak Woodland and Valley-Foothill Riparian are designated as “sensitive habitats” in the General Plan EIR. Less than 3,500 acres of Valley Oak Woodland and none of the Valley Foothill Riparian appears on the FRAP mapping for El Dorado County.

**Table 1: Oak Woodlands in OWMP Study Area**

Oak Woodland Category	Abbreviation	Acreage	% of Total
Blue Oak Woodland	BOW	42,400	(17)
Blue Oak-Foothill Pine	BOP	12,900	(5)
Montane Hardwood Woodland	MHW	155,900	(63)
Montane Hardwood-Conifer Woodland	MHC	34,200	(14)
Valley Oak Woodland	VOW	3,400	(1)
<b>Total Oak Woodland in Study Area</b>		<b>248,800</b>	<b>(100)</b>

A thorough discussion of oak woodland habitat identification and values is contained in Appendix A.

#### D. Economic Activity, Land, and Ecosystem Values of Oak Woodlands

Agriculture and recreation-based tourism are important economic generators in El Dorado County. Oak woodlands provide value for these activities. Oak woodlands provide forage value for ranching, and contribute to the aesthetic qualities of agri-tourism. Oak woodlands contribute to soil retention and provide watershed benefits, which have benefits to the agricultural community. Deer and other game species are dependent on oak woodland habitat and provide recreational hunting opportunities, which can generate revenues for ranching land owners through hunting leases. Oak woodlands contribute to a high-quality visit for recreation tourists, whose activities among oak woodlands could include camping, fishing, hiking, bird-watching, and equestrian trail riding.

Studies have concluded that the presence of oak woodlands on properties enhance property value by providing shade, wind breaks, sound absorption, land use buffers, erosion control, and aesthetic beauty.

Oak woodlands contribute to healthy lands and watersheds. They do this by providing habitat for animals, maintaining water quality, and improving soil characteristics. Oak woodlands have been acknowledged in studies to contributing to the control of climate effects.

More information regarding economic activities, land values, and ecosystem values are available in Appendix A.

#### E. California Oak Woodlands Conservation Act

In September, 2004, the state Public Resources Code was amended to require a county to determine (as part of its CEQA review) whether a project may result in conversion of oak woodlands that will have a significant effect on the environment (PRC 21083.4). If it determines that a project may have a significant effect, a county shall require one or more oak woodland mitigation alternatives “to mitigate the significant effect of the conversion of oak woodlands.” Alternatives include: 1) conserve oak woodlands, 2) plant an appropriate number of replacement trees and maintain those trees for seven years, 3) contribute to the Oak Woodlands Conservation Fund, or 4) other mitigation measures developed by the County. Plantings shall not fulfill more than one half of the mitigation requirements for a project. Where a county adopts, and a project incorporates, one or more of these mitigation measures, the project is deemed to be in compliance with CEQA as it relates to effects on oaks and oak woodlands. This plan incorporates a range of mitigation alternatives which conform to these requirements.

## 2. Policy 7.4.4.4

### A. Applicability and Exemptions

Policy 7.4.4.4 of the 2004 General Plan applies to all new development projects that would result in soil disturbance (see Appendix C for complete policy) on parcels that meet one of the following criteria:

- Less than or equal to one acre with at least 10% total oak woodland canopy cover; or
- Greater than one acre with at least 1% oak woodland canopy cover.

Development, as established by the policy, is any structure requiring a building permit or grading activity requiring a grading permit. Activities that do not require one of these two permit types, such as agricultural grading requiring an agricultural grading permit, tree removal for safety reasons, or the clearing of land for purposes other than construction or grading, do not trigger the provisions of this plan. The following activities are specifically exempted from Policy 7.4.4.4:

- agricultural cultivation, and
- actions pursuant to a County-approved Fire Safe Plan necessary to protect existing structures.

These exemptions are detailed below:

Agricultural Cultivation – The removal of native vegetation, including oaks, for the purposes of producing or processing plant and animal products or the preparation of land for this purpose is exempt. This is consistent with State PRC 21083.4.

Existing Structure Defensible Space/Fire Safe Measures – The intent of this exemption is to exempt oak tree removal from mitigation in the 100-foot defensible space zone around an existing building or structure. Defensible space, for the purposes of this plan, is the 100-foot area around an existing structure, or to the property line, whichever is closer. Defensible space is required pursuant to Public Resources Code (PRC) 4291 and Title 14 California Code of Regulations (CCR) 1299.

Fuel modification actions, inside and outside of the 100-foot defensible space zone, are also exempt from Policy 7.4.4.4 mitigation. Examples are actions to ensure the safety of emergency fire equipment and personnel; to allow evacuation of civilians; to provide a point of attack or defense for firefighters during a wildland fire; to prevent the movement of a wildfire from a structure to the vegetated landscape; and/or the maintenance or creation of fuel breaks for fire safety, where no grading permit or building permit is applicable.

The County encourages the creation of defensible space around existing structures and the provisions of the OWMP are by no means intended to impede the fuels reduction required by law to protect existing structures. However, oak tree removal in the 100-foot defensible space zone, pursuant to PRC 4290 and Title 14 CCR 1270-1276 of the Fire Safe Regulations, and fuel modification actions pursuant to a Fire Safe Plan, inside and outside of



the 100-foot defensible space zone for all new development projects, is not exempt from Policy 7.4.4.4 mitigation. The 100-foot defensible space zone, and fuels modification necessary for a Fire Safe Plan, is part of the project footprint and oak canopy removed shall be counted in the project total oak canopy removal. Any oak trees that can be safely retained, even if separated from the oak woodland, will count as oak canopy retained.

The County further encourages developers and landowners to review the 100-foot defensible space information available from CAL FIRE; specimens of oak trees and native habitat can be retained in the 100-foot defensible space by keeping lower branches of oak trees pruned, removing surface litter, separating trees and shrubs (horizontally), and reducing ladder fuels (vertically separating trees and shrubs). See CAL FIRE’s website or brochures for detailed information.

Because of the ability to safely retain some of the oak canopy within the defensible space, when calculating oak tree canopy loss with new subdivisions and parcel maps, an applicant may assume 20% retention of the oak tree canopy within the defensible space area around building pads or sites.

Additionally, the OWMP provides for reductions to oak canopy mitigation for affordable housing projects as described below and provides for an exemption for public road safety projects and public utility projects.

Affordable Housing – Development projects that propose a minimum of 10 percent of the dwelling units as income restricted affordable units, as defined by California Health and Safety Code §50052.5, 50053, and 50093, shall be granted a reduction in the amount of oak canopy that is required to be protected under Option A, or the amount of fee to be paid under Option B, as set forth in Table 2.

**Table 2: Affordable Housing Reduction**

<b>Affordable Housing Type (Household Income Level)</b>	<b>% Reduction of Oak Canopy Mitigation for portion of project that is income restricted</b>
Very Low	200%
Lower	100%
Moderate	50%

Example: A project proposes 25% of the units to be affordable in the lower income category. The amount of on-site retention or Conservation Fund In-Lieu Fee may be reduced by 25%. A moderate income project that provides all units at that income level may reduce the retention and/or fee by 50%. A project with 20% very low income units would receive a 40% reduction. (Note: PRC §21083.4(d) provides exemptions for affordable housing projects in urbanized areas for lower income households.)

Public Road and Public Utility Projects Exempt from Policy 7.4.4.4 – Oak canopy removal necessary to complete County capital improvement projects are exempt from the canopy retention and replacement standards, when the new alignment is dependent on the existing alignment. This exemption applies to road widening and realignments which are necessary to increase capacity, to protect the public’s health, and to improve the safe movement of

people and goods in existing public road rights-of-way, as well as acquired rights-of-way necessary to complete the project. This exemption shall also apply to removal of oak canopy necessary to comply with the safety regulations of the Public Utilities Commission and necessary to maintain a safe operation of utility facilities. The County shall minimize, where feasible, the impacts to oaks through the design process and right-of-way acquisition for such projects.

This exemption to the oak canopy retention and replacement standards does not apply to new roads or utility installation, or to internal circulation roads within new development.

**B. Replacement Objectives**

When determining the amount of oak canopy replacement on a parcel, consistency can be achieved by a combination of Policy 7.4.4.4 Options A and B. These replacement objectives may be achieved, subject to County approval, by:

1. Replacement planting on-site at a 1:1 canopy surface area ratio; or
2. Contributing to the County’s INRMP/Conservation fund at a 2:1 ratio; or
3. Acquiring an off-site conservation easement on oak woodlands at a 2:1 ratio; or
4. A combination of 1, 2, or 3 above.

**C. Mitigation Option A**

Option A sets forth limitations on the amount of oak canopy that may be removed with each project, based on calculations of the percent of oak canopy existing on the subject parcel. Oak canopy must be retained in the amount established in the Table of Policy 7.4.4.4, provided below as Table 3.

**Table 3: Canopy Retention Requirements from Policy 7.4.4.4**

<b>Percent Existing Canopy Cover</b>	<b>Canopy Cover to be Retained</b>
80 – 100	60% of existing canopy cover
60 – 79	70% of existing canopy cover
40 – 69	80% of existing canopy cover
20 – 39	85% of existing canopy cover
10 – 19	90% of existing canopy cover
1 – 9 for parcels > 1 acre	90% of existing canopy cover

In addition to retention, Option A requires that removed oak canopy be replaced at a 1:1 ratio. The size of the designated replacement area shall equal the total area of the oak canopy cover proposed to be removed. For example, removal of 2 acres of oak canopy requires replacement of 2 acres of oak canopy; removal of 5,000 square feet of oak canopy requires replacement of 5,000 square feet of oak canopy.

#### D. On-Site Mitigation – Replanting and Replacement (Option A)

As provided under Option A, Policy 7.4.4.4, all oak canopy removed for development must be replaced at a 1:1 ratio. In lieu of on-site replacement, where such replacement is not feasible due to soil/habitat considerations and/or land use constraints, off-site mitigation may be substituted for replacement plantings by payment of the Conservation Fund In-Lieu Fee at a 1:1 canopy surface area ratio or dedication of an off-site conservation easement as described in Section 4.C, also at a 1:1 ratio. Off-site replacement at a 1:1 ratio is offered to avoid circumstances that would result in replacement plantings occurring in marginal habitat or at the expense of other existing habitat. The following provisions apply to on-site and off-site replacement:

- Replacement plantings may be accepted if adequate openings exist on-site and the replanting area likely would support oak woodland (e.g., soil type and general environment). The intent is not to remove existing natural habitats for plantings or to create a continuous canopy that would reduce wildlife value or contribute to increased fire hazard. Replacement plantings shall meet the County’s replanting and replacement standards and is subject to County approval.
- Oak canopy replacement plans shall be prepared by a qualified professional (such as a certified arborist, registered professional forester, certified rangeland manager, or biologist, as described in Section 8.A, Appendix A). Replacement plans shall address the following: (For more detailed criteria, please see Appendix E.)
  - An oak planting mitigation plan consistent with the standards established in the 2004 University of California publication, Regenerating Rangeland Oaks in California, How to Grow California Oaks, How to Collect, Store and Plant Acorns, and other publications and protocols that may be established by the University of California Integrated Hardwood Range Management Program.
  - The suitability of the site for oak woodlands shall be demonstrated with soil information, aerial photography, or other resources. The qualified professional shall demonstrate that the replanting plan does not remove existing non-oak woodland and enhances existing oak woodland habitat.
  - The density of replanting shall be determined by the qualified professional, based on accepted practice and current research.
  - The intent of the replacement plan is to provide replacement oak trees or acorns with a similar mix of species as those removed, however, the species may vary based on site specific conditions, as determined by the qualified professional.
  - The source of acorns or saplings for replanting shall be from local sources when available, to maintain local genetic strains.
  - Replacement planting should not be located within the 0-100’ defensible space zone from an existing or proposed structure unless otherwise consistent with CAL FIRE’s defensible space guidelines and fuels reduction requirements mandated under California Public Resources Code (PRC) §4291.
  - Replacement plantings shall be maintained in a manner determined by the qualified professional, based on the site-specific conditions, which may include

weed control, irrigation (if appropriate), herbivory/grazing protection, fertilization, and planting methods.

- The replacement plan shall identify the frequency and methods of maintenance and monitoring, as well as contingencies or alternatives if the success criteria are not met at the end of the monitoring term along with a means to ensure compliance with the replacement plan. The monitoring term shall be seven years (PRC 21083.4).
  - Best Management Practices (BMPs) for protection of retained oaks during and after construction (refer to Appendix D).
  - An estimate of the total costs associated with implementation of the replacement plan.
- An oak tree easement shall be recorded on each property by the County, project applicant, or landowner for all replanting areas approved by the County as mitigation, prior to issuance of a permit.

#### E. Mitigation Option B

Option B does not require the retention of a minimum percentage of oak canopy on-site. This mitigation alternative is intended to preserve existing oak woodland canopy of equal or greater biological value as those lost. To compensate for both habitat loss and fragmentation, the preservation mitigation ratio was set at 2:1 based on the acreage of oak canopy affected. For purposes of the fee program, the standard for off-site mitigation under Option B is payment of the Conservation Fund In-Lieu fee at a ratio of 2:1. In other words, for each acre of oak canopy that is lost, the payment is the fee per acre multiplied by two. The Conservation In-Lieu Fee Mitigation Method is described in detail in Appendix B.

Alternatives to the Conservation Fund In-Lieu Fee, including dedication of off-site conservation easements by a landowner/developer as direct mitigation at a 2:1 ratio are considered the functional equivalent of the Option B in-lieu fee, and will be permitted, subject to County approval. While landowners/developers will not have to pay the Acquisition Component of the fee as they are themselves acquiring a conservation easement, they are still required to pay the Management Component and Monitoring Component of the Conservation Fund In-Lieu Fee to provide for the ongoing endowment for management and monitoring.

#### F. Mitigation Program Flexibility

The OWMP provides for flexibility in meeting the oak canopy mitigation requirements. An applicant for a development project may comply with the provisions of Policy 7.4.4.4 by meeting the retention and 1:1 replacement requirements of Option A, providing off-site mitigation through the payment of the OWMP fee as established by the OWMP and the implementing fee ordinance, or a combination of the two provisions. Additionally, off-site mitigation may be accomplished through private agreements between the applicant and another private party consistent with the 2:1 replacement provisions of Option B and subject to approval by the County of the suitability of the oak woodland to be protected. When dedication of off-site conservation easements is proposed by a developer, a biological study shall be required for the

off-site mitigation location to demonstrate that the site is of equal or greater biological value as the oak woodland proposed to be removed. The biological study shall evaluate and demonstrate parity of habitat elements such as snags, large woody debris, and the diversity and structure of the understory between the oak woodlands lost and those being protected. If the off-site conservation easement is to mitigate for Valley Oak Woodland removed, then the easement must be within Valley Oak Woodland of equal or greater biological value. A developer that dedicates a County-approved conservation easement is not subject to the Acquisition Component of the Conservation Fund In-Lieu Fee, but is subject to the Management Component and Monitoring Component of the fee.

### 3. Conservation Fund In-Lieu Fee Methodology

The Conservation Fund In-Lieu Fee is based on the costs of acquisition of conservation easements, along with management, monitoring, and administrative costs. A breakdown of costs per acre is provided in Table 4. Details of the analysis to establish the fee is contained in Appendix B.

**Table 4: Conservation Fund In-Lieu Fee**

Activity	Cost Per Acre
Acquisition <sup>1</sup>	\$ 2,300
Management <sup>2</sup>	\$1,200
Monitoring <sup>3</sup>	\$ 1,200
<b>Total Cost/Fee Per Acre</b>	<b>\$4,700</b>

(1) Conservation easement on rural land acquisition of 125 acres, which is the average parcel size within the PCAs. Acquisition costs include the easement land value (approximately \$1,800, or 40% discount value) and conveyance costs.

(2) Includes biological survey/baseline documentation, weed control and fuels treatment.

(3) Includes endowment for on-going monitoring.

As provided in Option B of Policy 7.4.4.4, off-site mitigation in the form of payment of the fee shall be made at a 2:1 canopy surface area ratio, requiring the payment of \$9,400 for every acre of oak canopy removed in excess of the amount provided in the table of Option A. To meet the Option A 1:1 replacement standard, an applicant may opt to pay the Conservation Fund In-Lieu Fee at the 1:1 rate for that portion of oak canopy removed consistent with the table. If payment into the Conservation Fund is utilized for the replacement portion of Option A, then on-site retention requirements would still apply.

The County shall deposit all Conservation Fund In-Lieu fees into an Oak Woodland Conservation Fund, which shall be used to acquire conservation easements from willing sellers in the PCAs as described below in Section 4. This fund shall also be used for ongoing monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting. The County may provide management services by employees or

contract management and monitoring activities with a qualified firm, individual, outside agency, or non-profit organization. Funding to support the identification of willing sellers, negotiation of the purchase price, and oversight of the land transaction is included in the management component of the Conservation Fund In-Lieu Fee.

As costs for off-site mitigation change over time, there will be a need to adjust the fee to closely match future cost increases or decreases. Appendix B details the fee adjustment approach. A report regarding fee adjustments will be included in an annual report to be submitted to the Planning Commission and Board of Supervisors each March, as described in Appendix A. The first fee adjustment study would occur at least 12 months after adoption of the OWMP.

## 4. Priority Conservation Areas

### A. Identification of Priority Conservation Areas

Figure 1 identifies the areas in which conservation easements shall be acquired from willing sellers using the Oak Woodland Conservation Fund generated by the payment of the Conservation Fund In-Lieu Fee described above. These areas were identified using the FRAP classification of the five oak woodland habitat types in the county. After those areas were mapped, the areas were narrowed down to large expanses consisting of 500 acres or more. Those large expanses were further narrowed to lands where oak woodland habitat would not likely undergo substantial fragmentation and oak woodland conservation would be consistent with the 2004 General Plan land use designations. Areas specifically excluded were lands within Community Regions and Rural Centers and lands designated Low Density Residential. These resulting areas are classified as Priority Conservation Areas (PCAs).

The 500-acre PCAs are generally made up of 40-acre and larger privately owned parcels. A breakdown of parcel sizes within the large expanses is shown in Table 5. A more detailed description of the mapping process and data used to identify PCAs is provided in Appendix G. Figure 1 also shows existing public lands with high-value oak woodlands contiguous to the PCAs.

**Table 5 – PCA Parcel Statistics**

<b>Parcel size (Acres)</b>	<b># of parcels</b>	<b>Acres</b>
40-60	170	7,666.3
60.1-120	155	13,176.7
120.1-340	175	31,674.3
340.1+	29	13,535.5
<b>Total</b>	<b>529</b>	<b>66,052.8</b>
	Avg. Size	<b>124.9</b>
	Median Size	<b>84.3</b>
*Data produced using parcel data from El Dorado County and the PCA shapefile for the Draft Plan (VOWH_PRVT_grtr500ac.shp)		

Oak woodland offered as mitigation must be configured in such a manner as to best preserve the integrity of the oak woodland ecosystem. Priority should be given to conserving oak woodland habitat within PCAs adjacent to existing woodlands under or subject to an Important Biological Corridor, conservation easement, public lands, open space lands, riparian corridors, ecological preserves or other PCAs lying west of the National Forest.

Valley Oak Woodland within the PCAs will be specifically acquired to mitigate for losses of Valley Oak Woodland as a result of new development. Only Valley Oak Woodlands will be targeted this way in order to provide a method ensuring that this General Plan-designated “sensitive habitat” is adequately preserved. If the Valley Oak Woodland habitat within currently designated PCAs becomes insufficient, then additional acreage of this habitat type will be added to the PCAs as necessary upon annual review of the OWMP.

The OWMP establishes an oak woodlands resource base that, when managed for conservation and preservation purposes, conserves a substantial portion of oak woodland habitat to offset the effects of increased habitat loss and fragmentation elsewhere in the county. This approach is considered superior to one that attempts to conserve oak woodlands in areas designated for development. Such areas are less desirable for mitigation lands because they are more expensive, have reduced habitat values, and would conflict with approved General Plan land use designations. Subsequent adoption and implementation of the INRMP, and incorporation of this plan into that document, will ensure connectivity between the PCAs. The INRMP will also address north-south connectivity across Highway 50 and the potential role of oak woodlands less than 40 acres in maintaining connectivity between larger expanses of oak woodlands. Existing public lands, Important Biological Corridors as identified on the 2004 General Plan land use diagram, and stream setback requirements provided under Policy 7.3.3.4 provide sufficient interim connectivity to provide wildlife movement between the PCAs (See Figure 2).

#### B. Management of PCAs

Existing native oak woodland identified as mitigation for project impacts, whether on or off the project site, will be protected from further development through a conservation easement granted to the County or a land conservation group approved by the County. Management activities may include, but are not limited to, one or more of the following activities, as determined through monitoring of the sites: inspections, biological surveys, fuels treatment to reduce risk of wildfire and to improve habitat, weed control, database management, and mapping.

#### C. Conservation Easements

Conservation easements for oak woodlands shall be granted to the County in perpetuity. The easement shall be provided on a form approved by the County and shall be recorded with the County Clerk/Recorder.

## 5. Application of OWMP to Development Review Process

Determination of the applicability of the OWMP to a development project shall be made as follows:




1. Planning staff and applicant determines if oak woodland exists on the parcel and if the proposed project impacts any of the oak canopy.
2. Oak canopy loss is calculated by a consultant hired by the applicant, utilizing either an on-site survey by a qualified professional, aerial photography, or other means acceptable to the County to determine total oak canopy area and the area proposed to be removed as a part of the project. Canopy loss is calculated by identifying all disturbed areas as proposed, including:
  - a. Roads, driveways, and access drives;
  - b. Graded areas for building pads, parking lots and other improvements; and
  - c. Other disturbed areas resulting in tree removal including septic system leach fields and fire safety defensible space vegetation removal for new construction.
  - d. Fire Safe Plans allow for some retention of oak canopy. To simplify the calculation of oak canopy retention in this zone, the OWMP assumes 20% retention. A site specific analysis of tree removal may be utilized instead of the 20% retention assumption.
3. The proposed oak canopy removal is compared with the retention standards provided in the Option A table.
4. If the amount of oak canopy removed is within the retention standards set forth in the Option A table, the applicant may mitigate for the loss by one of the following:
  - a. Planting on-site at a 1:1 canopy surface area ratio the area of oak canopy removed; or
  - b. Paying into the Oak Woodland Conservation Fund an amount equal to 1:1 replacement for the oak canopy removed; or
  - c. Acquire a conservation easement from a willing seller for an area equal to the area (i.e., 1:1 ratio) of removed oak canopy, in an area either within the PCA or other area acceptable to the County; or
  - d. A combination of two or more of the above provisions.
5. If the amount of oak woodland canopy removed exceeds the amount permitted under the Option A retention table, in addition to the provisions of steps 1 through 3, above, the applicant shall do one of the following for oak canopy removed in excess of that permitted under Option A:

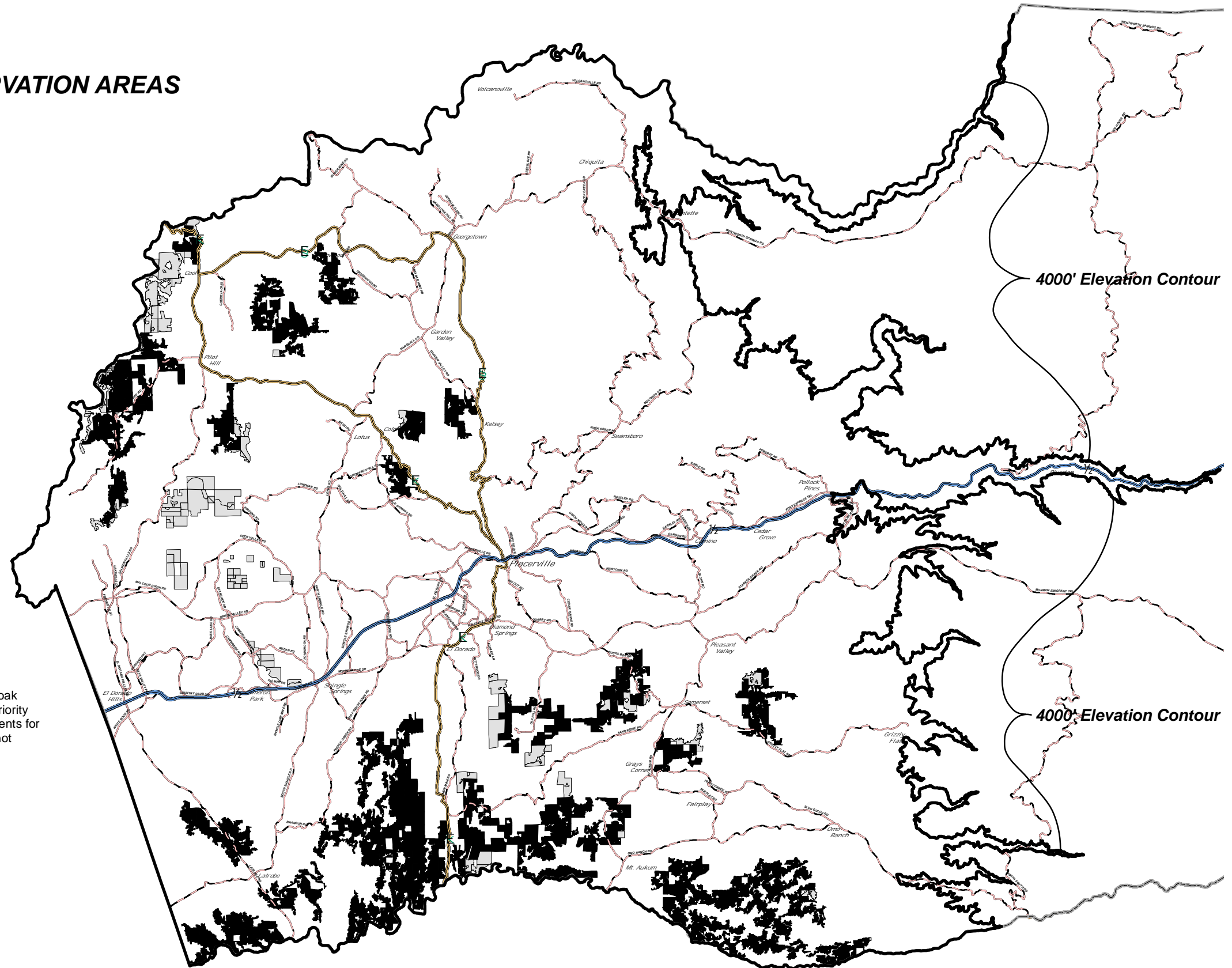


- a. Pay into the County's Oak Woodland Conservation Fund the fee amount based on a 2:1 replacement ratio; or
  - b. Acquire a conservation easement from a willing seller for two times the area of oak canopy removed in excess of that permitted under the Option A table, in an area either within the PCA or other area acceptable to the County, along with fees for management and monitoring; or
  - c. A combination of the above provisions.
6. Payment of applicable fees and granting of any required easements shall be required as a condition of approval of all discretionary permits for which these provisions apply, and shall be completed prior to issuance of a grading or building permit, filing of a parcel or final map, or otherwise commencing with the project. The payment of the fee may be phased to reflect the timing of the tree canopy removal.
  7. Payment of applicable fees and granting of any required easements if necessary shall be completed prior to issuance of a building or grading permit for ministerial projects.

**Figure 1**  
**EL DORADO COUNTY**  
**OAK WOODLAND PRIORITY CONSERVATION AREAS**  
**Public Review**

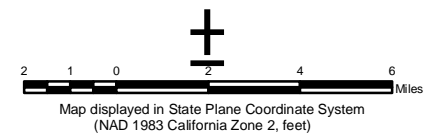
**Legend**

-  OWMP Boundary \*
-  Priority Conservation Areas \*
-  Federal, State and County Lands Containing Oak Woodlands Contiguous To PCAs \*\*



**Note:**

This map displays initial oak woodland habitat where willing landowners could be approached to negotiate General Plan Policy 7.4.4.4 mitigation and other types of oak woodland conservation land acquisition. Identification of oak woodland habitat as priority on this map does not trigger or mandate Policy 7.4.1.6 or Measure CO-U requirements for Policy 7.4.4.4 Option A or Option B unless the oak woodland habitat is within (but not adjacent to) any lands that are already identified as containing threatened, rare, or endangered species.








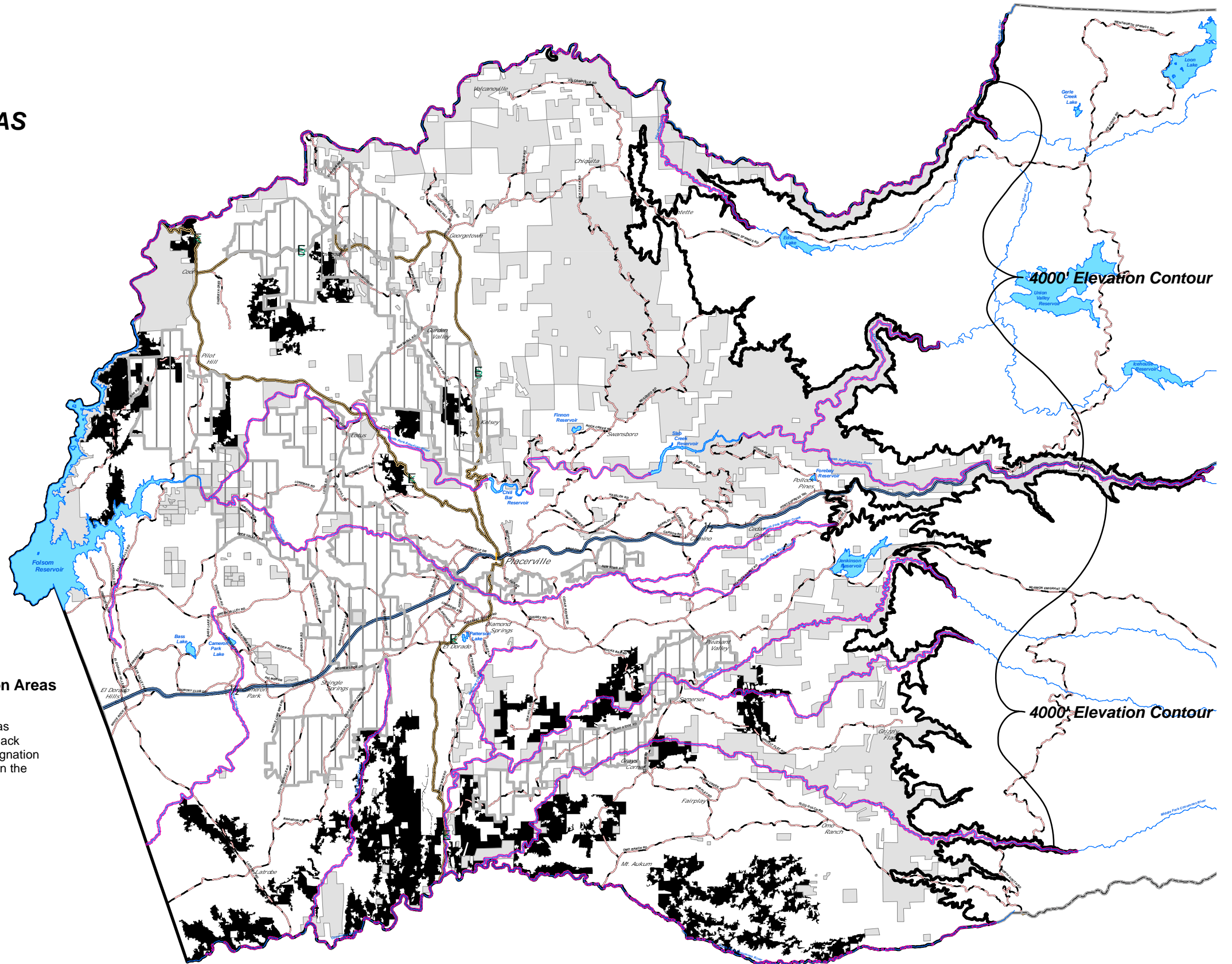
\* DATA SOURCE: EN2  
 \*\* DATA SOURCE: EL DORADO COUNTY

01/29/2008

**Figure 2**  
**EL DORADO COUNTY**  
**EXISTING CONNECTIVITY BETWEEN**  
**PRIORITY CONSERVATION AREAS**  
**Public Review**

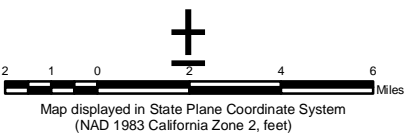
**Legend**

-  OWMP Boundary \*
-  Priority Conservation Areas \*
-  Federal, State and County Lands \*
-  Important Biological Corridor \*\*
-  Stream Setback \*\*



**Existing Areas of Connectivity Between Priority Conservation Areas**

Note:  
 These areas are shown for informational purposes only to identify existing areas that provide connectivity between PCAs, based on public ownership, stream setback requirements of Policy 7.3.3.4, and the Important Biological Corridor overlay designation of the 2004 General Plan. No regulatory requirements other than those existing in the 2004 General Plan are implied by showing these areas on this exhibit.



- \* DATA SOURCE: EN2
- \*\* DATA SOURCE: 2004 EDC General Plan

01/29/2008

# El Dorado County Oak Woodland Management Plan

## Appendices

April 2008

Planning Commission Recommended Version



El Dorado County Development Services Department – Planning Services  
2850 Fairlane Court, Placerville, CA 95667

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# El Dorado County Oak Woodland Management Plan

## Appendices

April 2008

Planning Commission Recommended Version



El Dorado County Development Services Department – Planning Services  
2850 Fairlane Court  
Placerville, CA 95667

*In association with:*



463 Main Street, Suite A/P.O. Box 2260  
Placerville, CA 95667



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# Oak Woodland Management Plan

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# Appendix A

## Oak Woodland Management Plan Background and Support Information

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# El Dorado County

## Oak Woodland Management Plan

### Background and Support Information

April 2008

Planning Commission Recommended Version



El Dorado County Development Services Department – Planning Services  
2850 Fairlane Court  
Placerville, CA 95667

*In association with*



463 Main Street, Suite A/P.O. Box 2260  
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**Oak Woodland Management Plan Background and Support Information**

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## Appendix A

### Oak Woodland Management Plan Background and Support Information

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The Oak Woodland Management Plan (OWMP) Background and Support Information appendix (Appendix A) is based on current research. The OWMP has been intended to be an adaptive management plan; therefore, as research changes and new findings are made, the OWMP will be updated periodically to reflect current conclusions.

The planning area covered by the OWMP is that area bordered by the County's administrative boundary to the north, west, and south and ending at the 4,000-foot elevation to the east.

## 1. El Dorado County Oak Woodlands

### A. Introduction to Oak Woodlands

The term "oak woodland" is defined in the Oak Woodland Conservation Act (PRC §21083.4, Fish and Game Code §1361) as an oak stand with greater than ten percent canopy cover or that may have historically supported greater than ten percent canopy cover. The General Plan uses the term "oak woodland" interchangeably and in the same context as "oak canopy."

Oak woodlands are comprised of a variety of tree species. Non-oak tree species include foothill pine, knobcone pine, California buckeye, ponderosa pine, Douglas-fir, bigleaf maple, Pacific madrone, and Pacific dogwood. The shrub component can be sparse to dense depending on site conditions and management.

Five main oak woodland types are identified within the planning area: Blue Oak Woodland (BOW), Blue Oak-Foothill Pine (BOP), Valley Oak Woodland (VOW), Montane Hardwood (MHW), and Montane Hardwood-Conifer (MHC). A sixth type, Valley Foothill Riparian (VRI), has a limited distribution in the County. These types are part of the CWHR classification scheme (Mayer and Laudenslayer, 1988) and were analyzed in the General Plan EIR (EDAW, 2003). The oak woodland types are dominated by one or more of five main native oak tree species: blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), interior live oak (*Quercus wislizeni*), and canyon live oak (*Quercus chrysolepis*).

Montane hardwood is the most represented oak woodland type throughout the planning area. Blue oak woodland, blue oak-foothill pine, and valley oak woodland tend to be more prevalent below 2,000 feet. Montane hardwood-conifer becomes more prevalent above 2,000 feet and transitions to conifer-dominated types.

**Appendix A**  
**Oak Woodland Management Plan Background and Support Information**

---

**B. Oak Species**

Several species of oak are native to El Dorado County. Table 1-1 lists native oak tree species that occur within the planning area of the OWMP. Tanbark oak (*Lithocarpus 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).

<b>Table 1-1</b>	
<b>Native oak tree species that occur within the OWMP planning area of El Dorado County</b>	
<b>Oak Tree Species</b>	<b>Common Name</b>
<i>Quercus chrysolepis</i>	Canyon live oak, maul oak
<i>Quercus douglasii</i>	Blue oak
<i>Quercus garryana</i>	Oregon oak, 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 planning area are scrub oak (*Quercus berberidifolia*), leather oak (*Quercus durata*), and Brewer oak (*Quercus garryana* var. *breweri*). Huckleberry oak (*Quercus vaccinifolia*) is widespread in El Dorado County above the planning area with limited distribution below 4000 feet.

The following tree species information is summarized from Stuart and Sawyer (2001), Pavlik et al. (1991), Bolsinger (1988), and Gaman and Firman (2006).

**Canyon live oak (*Quercus chrysolepis*).** Canyon live oak 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; shrubby forms grow on the harshest sites. Repeated fires will convert canyon live oak to shrubs.

Wildlife use canyon live oak for roosting, nesting, foraging, and cover. Birds and mammals eat the acorns.

## Appendix A

### Oak Woodland Management Plan Background and Support Information

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**Blue oak (*Quercus douglasii*).** Blue oak grows as a single-stemmed tree 20 to 60 feet tall. 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 interior 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 californicus*), 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.

**Oregon white oak (*Quercus garryana*).** Oregon white oak grows as a single-stemmed tree 25 to 90 feet tall. 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 Range. 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. Many species of birds and mammals eat its acorns.

**California black oak (*Quercus kelloggii*).** California black oak grows as a single-stemmed tree 30 to 80 feet tall. On infertile sites, it can grow as a shrub.

California black oak is initially shade tolerant but becomes shade intolerant as it grows. It sprouts after being injured by fire or cutting. This deciduous tree can live 500 years. It is the primary commercial hardwood species in California.

California black oak is widely distributed within woodlands and coniferous forests. Stands dominated by California black oak occur infrequently within lower montane elevations. Oracle oak is a hybrid of California black oak and interior live oak that is found in El Dorado County.

Many wildlife species use California black oak for forage and cover and eat its acorns.

**Valley oak (*Quercus lobata*).** Valley oak is a single-stemmed, deciduous tree that grows 30 to 90 feet tall. 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. It sprouts after being injured by fire or cutting.

Valley oak occurs only in California. It 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

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### Oak Woodland Management Plan Background and Support Information

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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.

**Interior live oak (*Quercus wislizeni*).** Interior live oak is a single-stemmed tree that grows 30 to 75 feet tall. It is shade tolerant and drought sensitive. Its thick bark is resistant to fire. Trees sprout after fire. In areas with recurring fire, it forms 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 cool and wet. In the Sierra Nevada, clumps of interior live oak may be concentrated around rock outcrops within blue oak woodland. With increasing elevation, particularly on north slopes, interior live oak becomes more prevalent and almost replaces blue oak.

Interior live oak provides important wildlife forage and habitat. Live oak leaves are less palatable to deer than are leaves of deciduous species such as blue oak.

#### C. Oak Woodland Habitats

Several vegetation classification systems or oak woodland habitat descriptions exist but most have not been mapped for El Dorado County. Existing mapping of California Wildlife Habitat Relationship (CWHR) types from the CWHR Habitat Classification Scheme (Mayer and Laudenslayer, 1988) is readily available. The CWHR types were adopted for the OWMP, which is consistent with the General Plan EIR. Online updates of CWHR types are available from the California Department of Fish and Game website ([http://www.dfg.ca.gov/whdab/html/wildlife\\_habitats.html](http://www.dfg.ca.gov/whdab/html/wildlife_habitats.html)).

Five CWHR woodland types that were identified in the General Plan EIR are described as oak woodland types for the intent of the OWMP. The CWHR types are Valley Oak Woodland (VOW), Blue Oak Woodland (BOW), Blue Oak-Foothill Pine (BOP), Montane Hardwood (MHW), and Montane Hardwood-Conifer (MHC). All types have at least 10 percent canopy cover of oak trees. A sixth type is Valley-Foothill Riparian (VRI), which may include Fremont cottonwood, willow, and valley oak as dominant tree species.

Both VOW and VRI were identified as sensitive habitats in the General Plan EIR based on a review of CNDDDB and FRAP (EDAW, 2003). Valley oak forest and woodlands have been identified as high priority for CNDDDB inventory (CDFG, 2003). VRI was not quantified from the FRAP mapping because it is difficult to distinguish using remote-sensing imagery (EDAW, 2003).

Other CWHR types that are not oak woodland types but occur within the planning area may contain greater than 10% oak tree canopy cover. These types include Ponderosa Pine (PPN), Douglas Fir (DFR), and Sierran Mixed Conifer (SMC). Because these types are dominated by

## Appendix A

### Oak Woodland Management Plan Background and Support Information

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conifers and not deemed oak woodland types, they are not considered in the OWMP. The following CWHR woodland types are addressed in the OWMP [descriptions follow the General Plan EIR (EDAW, 2003) and CDFG's California WHR System ([http://www.dfg.ca.gov/whdab/html/wildlife\\_habitats.html](http://www.dfg.ca.gov/whdab/html/wildlife_habitats.html)) and are supplemented by the IHRMP website (<http://danr.ucop.edu/ihrmp/wildhab.html>) ]:

**Blue oak woodland (BOW)** is usually associated with shallow, rocky, infertile, well-drained soils. Within the County, BOW usually occurs below 2,000 feet in elevation but can extend up to 3,000 feet. BOW commonly forms open savanna-like stands with little or no shrub understory on dry ridges and gentle slopes. The canopy becomes denser on better quality sites. The ground cover is comprised mainly of annual grasses. Shrubs are seldom extensive and often occur on 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 are common associates in blue oak woodland. Interior live oak and canyon live oak can be the dominant tree 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 increasing elevation, particularly on north-facing slopes. Canyon live oaks are found on low foothills, mountain canyons, upland slopes, and exposed ridges.

**Blue oak-foothill pine (BOP)** 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 dryer 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 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.

**Montane hardwood (MHW)** 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. The poorly developed shrub layer contains snowberry, wood rose, currant, manzanita, and poison-oak. The herbaceous layer is sparse. At lower elevations MHW merges with mixed chaparral. Tree associates are foothill pine, knobcone pine, tanoak, Pacific madrone, and

## Appendix A

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California laurel. At middle elevations MHW merges with montane hardwood-conifer or Douglas-fir. Middle and higher elevation associates are canyon live oak, Douglas-fir, California black oak, and mixed conifer. Steep, rocky south slopes of major river canyons often support MHW, particularly canyon live oak and scattered Douglas-fir. MHW occurs on soils that are rocky, alluvial, coarse-textured, poorly developed, and well-drained.

**Montane hardwood-conifer (MHC)** 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 of upper elevations and montane hardwood, mixed chaparral, or open woodlands and savannahs. MHC often occurs as a closed forest. MHC typically supports relatively little understory except in ecotones or following a disturbance such as fire or logging. Common associates 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. In the northern Sierra Nevada, MHC is found between 1,000 and 4,000 feet elevation.

**Valley oak woodland (VOW)** is best developed on deep, well-drained alluvial soils and is usually found below 2,000 feet. VOW varies from savanna-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 woodland and be associated with Fremont cottonwood and willow. The shrub understory 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 listed as a high-priority community for inventory by the CNDDDB and a sensitive habitat by El Dorado County (EDAW, 2003).

**Valley foothill riparian (VRI)** is best developed on deep alluvial soils with a high water table. VRI is associated with low velocity flows, floodplains, gentle topography, and a substrate of coarse, gravelly or rocky soils. VRI is found in the lower foothills, below 2,000 feet. Valley oak or cottonwood can be the dominant species with white alder, box elder, and Oregon ash as subcanopy trees. Canopy cover ranges from 20 to 80 percent. Valley oak-dominated riparian systems may require more than 75 years to reach maturity. VRI was not mapped in El Dorado County because remote sensing imagery could not distinguish it (EDAW, 2003).

VRI provides food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for many wildlife species. As well as bird and mammal species, amphibians and reptiles utilize VRI.

**Appendix A**  
**Oak Woodland Management Plan Background and Support Information**

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1. Current Distribution of Oak Woodland Types

Table 1-2 displays the acreage of each oak woodland type within the planning 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 IV-1 of Appendix A). Valley oak woodland tends to be found on well-developed soils (Pavlik et al., 1991). Blue oak savanna with few or no shrubs occurs in the low foothills often on low hillocks and exposed, south-facing slopes. Blue oak savanna grades into blue oak woodland on sites with more rainfall or north-facing slopes. Blue oak woodland supports a more complex community (Pavlik et al., 1991). Montane hardwood is spread throughout the planning 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.

<b>Table 1-2</b>		
<b>Acreage of oak woodland in El Dorado County based on</b>		
<b>2002 FRAP mapping</b>		
<b>Oak Woodland CWHR Type</b>	<b>CWHR Type</b>	<b>Acreage</b>
Blue oak woodland	BOW	42,400
Blue oak-foothill pine woodland	BOP	12,900
Montane hardwood	MHW	155,900
Montane hardwood-conifer	MHC	34,200
Valley oak woodland	VOW	3,400
Total		248,000

2. Historic Distribution

The historic distribution of oak woodland within El Dorado County is not known. Likely the distribution in 1848 is similar to the current distribution but the structure of oak woodland has been altered through mining, grazing, and development. In community centers such as occur along the Highway 50 corridor, oak woodland has been lost or greatly degraded due to urban development. The understory has been modified in grazing lands and some oak woodland likely was converted to 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).



## **Appendix A**

### **Oak Woodland Management Plan Background and Support Information**

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#### 3. Existing Threats

A literature review reveals differing opinions regarding the threats to oak woodlands. The main processes influencing 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. “...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 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 result in a loss of species and of structural diversity.

#### 4. Status of Natural Regeneration and Growth Trends

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).

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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 their study, they found a positive correlation between gaps in the canopy and sapling recruitment.

Several factors have been implicated in poor oak regeneration (Giusti et al., 2005; Siegel and DeSante, 1999; McCreary, 2001; 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 compete and that 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 management history

The factor or combination of factors affecting oak regeneration likely varies by geographic region and by local conditions.

Some writings indicate that poor 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 (CWHR). Most surviving stands of valley oak woodland appear to be 100 to 300 years old (CWHR).

#### Growth Trends

In general, blue oak woodland and blue oak-foothill pine woodland grow at slower rates than valley oak woodland or montane hardwood (IHRMP). Low regeneration in the blue oak habitat types has created concern. The effectiveness of tree planting to mitigate habitat loss in blue oak woodlands was modeled from data derived from a 10-year-old blue oak plantation (Standiford, McCreary, and Frost, 2002). Stand attributes for every 10-year interval was modeled using blue oak age and stand structure data. The model varied tree density and management intensity. With high intensity management and a planting density of 200 trees per acre, oak canopy cover could reach the minimum requirement for oak woodland (i.e., 10 percent canopy cover) after 10 years (depending on site conditions).

The study raised questions regarding the adequacy of planted stands for mitigating the loss of mature oak woodlands. After 50 years (a young age for oak woodland), the same stand would reach only 17 percent canopy cover. The wildlife species composition would shift from species

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that utilize acorns, cavities, and downed wood associated with mature oak woodlands to species associated with open grasslands.

## **2. Natural Resource Values of Oak Woodlands**

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.

### **A. Natural Resource Values to Wildlife**

Oak woodlands provide many natural resource values. Oak woodlands provide habitat for native wildlife, plants, and insects, some of which have special-status. 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 ecosystem.

Cavity trees provide shelter and breeding sites for birds. Deciduous oaks, such as blue oak, black oak, and valley oak, are particularly important as cavity trees (Tietje et al., 2005). Evergreen trees are important for secondary cavity nesters. Snags 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., tree understory, 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.

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Oaks and other trees influence stream conditions, such as water temperature and flow, 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 California Natural Diversity Database (CNDDDB); refer to Table 2-1.

El Dorado County supports resident and migratory populations of mule deer (EDAW, 2003). The preservation of deer migration corridors has been a concern of the California Department of Fish and Game (CDFG) as urbanized areas expand in the foothills. As a result, CDFG has mapped critical habitat and deer migration patterns for three deer herds (EDAW, 2003). Critical winter range occurs primarily below 4,000 feet. Critical summer range, holding areas, and fawning areas occur primarily above 4,000 feet (i.e., outside the OWMP planning 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 corridor that can be utilized 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).

#### **B. Special-Status Species**

A query of the CNDDDB identified 38 special-status species and three unique natural communities in the planning area (Table 2-1). Eight of the 10 vertebrate species in Table 2-1 are associated with oak woodland habitats (Garrison, 1996). Fifteen of the 17 plant species occur in oak woodland habitats (Shaffer, 1996; CNPS, 2006).

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<b>Table 2-1: Special-status species and habitats in the OWMP planning area.</b>		
<b>In Oak Types</b>	<b>Scientific Name</b>	<b>Common Name</b>
	<b>Birds</b>	
x	<i>Accipiter gentilis</i>	northern goshawk
	<i>Agelaius tricolor</i>	tricolored blackbird
x	<i>Haliaeetus leucocephalus</i>	bald eagle
	<b>Amphibians</b>	
x	<i>Rana aurora draytonii</i>	California red-legged frog
x	<i>Rana boylei</i>	foothill yellow-legged frog
	<b>Reptiles</b>	
x	<i>Emys (=Clemmys) marmorata marmorata</i>	northwestern pond turtle
x	<i>Phrynosoma coronatum</i> (frontale population)	Coast (California) horned lizard
	<b>Mammals</b>	
x	<i>Lasionycteris noctivagans</i>	silver-haired bat
x	<i>Myotis yumanensis</i>	Yuma myotis
	<b>Invertebrates</b>	
	<i>Ammonitella yatesi</i>	tight coin (=Yates' snail)
	<i>Andrena blennospermatis</i>	
	<i>Andrena subapasta</i>	
	<i>Banksula californica</i>	
	<i>Branchinecta lynchi</i>	vernal pool fairy shrimp
x	<i>Cosumnoperla hypocrena</i>	A Spring Stonefly
x	<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle
	<i>Monadenia mormonum buttoni</i>	Button's Sierra sideband (snail)
	<i>Nebria darlingtoni</i>	South Forks ground beetle
x	<i>Orobittacus obscurus</i>	gold rush hanging scorpionfly
	<i>Rhyacophila spinata</i>	spiny rhyacophilan caddisfly
	<b>Plants</b>	
x	<i>Allium jepsonii</i>	Jepson's onion
x	<i>Arctostaphylos nissenana</i>	Nissenan manzanita
x	<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	big-scale balsamroot
	<i>Calochortus clavatus</i> var. <i>avius</i>	Pleasant Valley mariposa lily
x	<i>Calystegia stebbinsii</i>	Stebbins's morning-glory
x	<i>Ceanothus roderickii</i>	Pine Hill ceanothus
x	<i>Chlorogalum grandiflorum</i>	Red Hills soaproot
x	<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegee's clarkia
x	<i>Fremontodendron decumbens</i>	Pine Hill flannelbush
x	<i>Fritillaria eastwoodiae</i>	Butte County fritillary
x	<i>Galium californicum</i> ssp. <i>sierrae</i>	El Dorado bedstraw
	<i>Helianthemum suffrutescens</i>	Bisbee Peak rush-rose
x	<i>Horkelia parryi</i>	Parry's horkelia
x	<i>Packera layneae</i>	Layne's ragwort
x	<i>Phacelia stebbinsii</i>	Stebbins's phacelia
x	<i>Viburnum ellipticum</i>	oval-leaved viburnum
x	<i>Wyethia reticulata</i>	El Dorado County mule ears
	<b>Habitat</b>	
x	Central Valley Drainage Hardhead/Squawfish Stream	Central Valley Drainage Hardhead/Squawfish Stream
x	Central Valley Drainage Resident Rainbow Trout Stream	Central Valley Drainage Resident Rainbow Trout Stream
x	Sacramento-San Joaquin Foothill/Valley Ephemeral Stream	Sacramento-San Joaquin Foothill/Valley Ephemeral Stream

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The California red-legged frog (CRLF) is federally listed as a threatened species. In 2006 the U.S. Fish and Wildlife Service issued new critical habitat designations for the CRLF. One critical habitat unit for CRLF occurs in El Dorado County. This unit surrounds Spivey Pond, one of five known breeding populations of CRLF in the Sierra Nevada. The 8,388-acre critical habitat unit supports montane hardwood and montane hardwood-conifer as well as smaller areas of other oak woodlands.

#### **C. 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 OWMP study 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. 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 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.

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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.

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 Upper Cosumnes River Project Area encompasses 1,200 acres in conservation easements and 280 acres in fee to protect riparian habitat throughout the Upper Cosumnes River Basin (American River Conservancy, 2006). This project protects oak woodlands in open space and provides connectivity with adjacent public lands.

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 nonnative 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.

#### **D. 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

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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 OWMP planning area received the two highest ratings for risk; sub-basins outside the planning 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 in the OWMP planning area and where most urban development has occurred. This risk assessment highlights the importance of maintaining the functions of oak woodlands to protect watersheds.

#### **E. 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.

#### **F. 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 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.



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Because fires have been suppressed, fuels have accumulated in some oak woodlands. The increase in fuel loadings increases the risk of high-intensity fires. Consequences of higher intensity fires 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).

The California Department of Forestry and Fire Protection administers a Vegetation Management Program to assist with fuels management. 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.

#### **G. 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).

##### 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 also are 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 habitat 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. 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 woodland changes from large to small

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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 an altered landscape such as development. 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 influencing 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 remaining 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 (Marose, 1997). Marose (1997) projected fragmentation of oak woodland during full build-out of the 1996 general plan, predicting that remaining oak woodland would consist of smaller fragments with greater distance among 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 (EDAW, 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, fragments 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 drainages (Scott, 1996). When oak woodlands are imbedded within other land uses, their biological values decline as adjoining habitats are lost. Barriers such as housing alter wildlife movement between stands and then populations decline.

In El Dorado County, Highway 50 presents a major barrier to north-south wildlife dispersal (EDAW, 2003; Saving and Greenwood, 2002). The Oak Woodland Technical Advisory Committee that was formed in the County in 1996 “concluded that connectivity of woodlands from north to south was an important value to preserve and that it was at risk from future development” (Georgetown Divide Resource Conservation District, 2004). The Weber Creek drainage is the only north-south corridor allowing passage of wildlife across the Highway 50 corridor and needs to be maintained as an important existing corridor. Opportunities to establish additional north-south corridors across Highway 50 may exist at other sites (e.g., drainages from Slate Creek to Indian Creek).

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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 (EDAW, 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.

#### **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 increase for 3 to 4 years following vegetation conversion (Larsen et al., 2005).

Sediment concentrations also increase in streams following vegetation conversion (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. Economic Value of Oak Woodlands**

This section summarizes research regarding the economic values of oak woodlands.

The natural resources values of 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. If agri-tourism and recreation are to continue to contribute to El Dorado County's economic development, the underlying resources that support those industries must be maintained.

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. Economic values associated with these functions are described below.

#### **A. Support of Important Economic Activities**

Agriculture and recreation-based tourism are important industries in El Dorado County. According to the 2006 El Dorado and Alpine Counties Agricultural Crop and Livestock Report

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produced by the Agricultural Commissioner, the impact of agriculture on El Dorado County's economy was estimated at \$502 million in 2006. According to the California Department of Conservation (2006), much of the area on the west slope – 195,957 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 \$3.9 million in 2006.

In addition to agricultural operations, oak woodlands support many recreation activities in El Dorado County. With more than 25% of its lands under Forest Service jurisdiction, 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.

#### **B. Contribute 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 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 landmark 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.

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**C. Contribute to Ecosystem Functions**

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 and Tol 2005) examined the contribution that oak woodlands make to regulating carbon dioxide, a key contributor of harmful greenhouse gases. According to these studies, the carbon sequestration services that oak woodlands provide are valued at between \$33 and \$83 per acre per year of oak woodlands.

## **4. Mapping of Oak Woodlands**

To establish an effective oak woodland program that fulfills the 2004 General Plan policies for mitigation (Policy 7.4.4.4) and conservation (Policy 7.4.2.8) purposes, locations need to be identified that meet the Goals and Objectives presented in the OWMP. 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 and objectives listed in the OWMP, the OWMP analyzed oak woodland habitats by:

- 1) using the best geographic information on oak woodlands that is currently available for the entire planning area;
- 2) considering oak woodland habitat evaluation criteria based on the adopted 2004 General Plan policies; and

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- 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 OWMP.

The County mapping process concluded by identifying the Priority Conservation Areas (PCAs) shown in Figure 1 of the OWMP. The mapping was conducted in two general phases:

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

Figure 1 of the OWMP 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 mapping was based on Geographic Information System (GIS) data available from State and County sources in the ESRI ArcMap environment. The data, processes, and many of the intermediate maps that led to Figure 1 are described below.

#### **A. Mapping/OWMP Study Boundary**

The OWMP addresses the same study area (unincorporated areas of western El Dorado County below 4,000 feet elevation) and same categories (California Fire and Resource Assessment Program, or FRAP) of oak woodlands as were addressed in the 2004 General Plan EIR. The 2004 General Plan EIR identifies five main oak woodland types, which were included in the initial inventory and mapping of oak woodlands for the OWMP. A sixth woodland type is Valley-Foothill Riparian which may include Fremont cottonwood, willow and valley oak. Valley-Foothill Riparian habitats in which valley oaks are the dominant tree species are considered oak woodlands under the OWMP. Both Valley Oak Woodland and Valley Foothill Riparian are designated as “sensitive habitats”. “Sensitive habitats” were identified through a review of the California Natural Diversity Database (CNDDDB) (California Department of Fish and Game 2002) and land cover data (California Department of Forestry FRAP 2002). Approximately 3,400 acres of the Valley Oak type and none of the Valley Foothill Riparian type appears on FRAP mapping for El Dorado County.

The County boundary shapefile was acquired from El Dorado County GIS (Surveyors Office). Elevation data was acquired from the USGS 30m Digital Elevation Model that was also supplied by the County GIS department. The County polygon was then clipped with the 4000-foot contour to produce the OWMP boundary layer.

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**B. Mapping Databases**

The existing vegetation coverage is a mosaic of the USDA Forest Service (USFS) Remote Sensing Lab's (RSL) existing vegetation data (CALVEG) Tiles 19, 20, and 21. Information on the data can be found at: <http://www.fs.fed.us/r5/rsl/clearinghouse/gettiles.shtml>. This data was chosen as it has the highest resolution of any existing vegetation data that covered the entire OWMP study area. The tiles were merged and then clipped with the OWMP boundary layer to create vegetation coverage of the entire OWMP area.

Community Centers, Rural Regions, parcels, land use, and street centerlines are taken from the El Dorado County GIS department. The USFS boundary is from the USFS Pacific Southwest Region GIS Clearinghouse. The water bodies and hydrology layer is from the California Spatial Information Library (CaSIL).

**C. Oak Woodlands Resources**

The mapping for the OWMP concentrates on the five largest categories of oak woodlands as mapped by FRAP. The categories and rounded acreages for each are detailed in Table 4-1. Figure IV-1 in this section (FRAP CWHR Oak Woodland Types Map) illustrates the distribution of oak woodlands in El Dorado County. The oak woodlands shown in Figure IV-1 are based on 2002 data and are the same oak woodlands analyzed in the 2004 General Plan EIR.

<b>Table 4-1</b> <b>Oak Woodlands in OWMP Study Area</b>			
<b>Oak Woodland Category</b>	<b>Abbreviation</b>	<b>Acreage (%) of Oak Woodland</b>	
Blue Oak Woodland	BOW	42,400	(17)
Blue Oak-Foothill Pine	BOP	12,900	(5)
Montane Hardwood Woodland	MHW	155,900	(63)
Montane Hardwood-Conifer Woodland	MHC	34,200	(14)
Valley Oak Woodland	VOW	3,400	(1)
<b>Total Oak Woodland in Study Area</b>		<b>248,800</b>	<b>(100)</b>

Figure IV-1 (FRAP CWHR Oak Woodland Types) displays a selection of the mosaic vegetation data that were determined to be "Oak Woodlands". This was achieved by a simple selection from RSL vegetation data where WHRTYPE = Blue Oak Pine (BOP), Blue Oak Woodland (BOW), Valley Oak Woodland (VOW), Montane Hardwood (MHW), and Montane Hardwood Conifer (MHC). Valley Foothill Riparian is not included as it does not appear in the data set for this region. The selected polygons were then exported as a new "Oak Woodlands" layer. Acreages were calculated and summarized for all CWHR types.

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#### **D. 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 “Large Expanse of Oak Woodland” layer. The map displays this layer over a background of all “Oak Woodlands”.

Large 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. Total acreage of the large expanses is 219,494.

#### **E. Priority Conservation Areas**

As discussed in Section 2.A, 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, Priority Conservation Areas (PCAs) were developed.

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

The following subsections discuss the technical mapping that occurred to determine the final maps.

#### **F. Initial Mapping of Priority Conservation Areas**

Early modeling of oak woodland corridors represented an early attempt to create a Priority Conservation Areas (PCA) map. That mapping effort further reduced large expanse areas and modeled narrowly defined oak woodland habitat plus all other BOP and BOW. All other BOP and BOW were included at this point to provide those CWHR types an increased conservation emphasis due to their reported low rate of regeneration. This version of the model qualifies all areas with a score  $\geq 10$ . The scoring criteria are as follows:

-Areas of Large Expanses of Oak Woodland = 5 pts

-Areas of ‘undeveloped land’ (defined as having a USECDTYPE value of “VAC” in the County parcel database) = 5 pts.

-Parcel Size: see Table 4-2 below.



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-Land Use Designation: see Table 4-3 below.

<b>Table 4-2: Parcel Size</b>	
<b>Parcel Size (Acres)</b>	<b>Score (pts.)</b>
< 5	1
≥ 5 < 10	2
≥ 10 < 20	3
≥ 20 < 40	4
≥ 40	5

<b>Table 4-3: Land Use Designation</b>		
<b>Land Use Code</b>	<b>Description</b>	<b>Score</b>
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 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

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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. For public discussion and planning consideration, the IBC layer was added to this map to assess the geographic relationship of IBCs to PCAs.

#### **G. Narrowing of Priority Conservation Areas**

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, undeveloped parcels with oak woodlands that are 10 acres or larger and all VOW, 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 layer any areas that did not qualify and then adding back in all VOW.

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, 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 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 OWMP 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, Figure 1 in the OWMP, 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 OWMP.

#### **H. Oak Woodlands in Priority Conservation Areas**

Figure 1 in the OWMP titled “El Dorado County Oak Woodland Priority Conservation Areas” illustrates those PCAs where Conservation Fund In-Lieu Fee mitigation will be targeted for oak woodland conservation easements from willing sellers. The estimated acreages of oak woodland types within the PCAs are shown below in Table 4-4.

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<b>Table 4 -4: Oak Woodlands in OWMP-Recommended PCAs</b>	
<b>Oak Woodland Type</b>	<b>Priority Conservation Areas (Acres)</b>
BOW	11,000
BOP	1,600
MHW	24,300
MHC	2,900
VOW	300
<b>Total Oak Woodland Area</b>	<b>40,100</b>

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Placeholder for Figure IV-1 FRAP Map

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## **5. Thresholds of Significance for the Loss of Oak Woodlands**

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. This review will include potential effects to the oak woodland resources as addressed in this plan. Once the extent and severity of the impacts are determined, the mitigation standards of PRC §21083.4 and Policy 7.4.4.4 Option A and /or Option B will be applied as described in the OWMP. With respect to oaks and oak woodlands, compliance with the OWMP will constitute mitigation.

## **6. Mitigation for the Loss of Oak Woodlands**

El Dorado County's 2004 General Plan and EIR identify mitigation standards and requirements for projects that remove oak woodlands. The OWMP 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, statewide requirements for evaluation and mitigation of impacts to oak woodlands have also been established. The OWMP reviews both the State- and County-level requirements for oak woodland mitigation standards.

The effectiveness of plantings for mitigation is limited, as demonstrated in a study that used data from 10-year-old plantings to model the development of blue oak stand structure attributes over 50 years (Standiford et al., 2002). After 50 years, trees in planted stands were still small and the wildlife habitat quality was not equivalent to that of mature oak woodland. This study emphasizes the need for a comprehensive approach to mitigation and the necessity to not rely solely on replacement of oak woodlands for mitigation. However, replanted stands of oak trees may have more intrinsic habitat value than fragmented or no oak woodland plantings. PRC §21083.4 requires that only 50 percent of mitigation be in the form of replanting. Option A of the County General Plan Policy 7.4.4.4 complies with state law as 50 percent of the mitigation is in retention of oak canopy, and 50 percent is replacement planting of oak canopy.

Detailed mitigation standards for implementation of Policy 7.4.4.4 (Option A and/or Option B) are outlined in Section 2 of the OWMP. The methodology for the Conservation Fund In-Lieu Fee is detailed in Appendix B.

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## **7. 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.

Wildland fire in the urban interface and urban intermix can produce catastrophic dangers to the public, firefighters, and to the vegetated landscape, which includes oak woodlands. California State Law requires landowners to maintain defensible space around a building or structure. PRC §4291 requires 100 feet of defensible space (or to the property line, whichever is nearer) around all buildings and structures. Fire inspection officials under PRC §4119 and Title 14 CCR 1299 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 (PRC §4290) address emergency access, signing and building numbering, emergency water standards, and fuel modification standards. These plans are documents written by a registered professional forester 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. The Fire Safe Plans are reviewed and approved by the local fire district where the project is being planned as well as by CAL FIRE. Often, the Fire Safe Plan incorporates the requirements of defensible space measures of PRC §4291 while also making recommendations for vegetation modification outside of the 100 foot defensible space zone. The fuel modification standards outside the realm of PRC §4291 are required to ensure the safety of emergency fire personnel and equipment, and evacuating civilians during a wildland fire, in addition to providing a point of attack or defense for firefighters during a wildland fire. Fire Safe Plans reduce the threat of wildfire to county oak woodlands.

Information from CAL FIRE regarding Defensible Space (PRC §4291) and Fire Safe Plans (PRC §4290) can be obtained from the CDF website listed in Appendix F. Defensible space information and fire safety planning resource information is also available through these resources:

- Guidelines for defensible space (State Board of Forestry and Fire Protection, 2006);
- A Homeowner’s Guide to Fire Safe Landscaping (<http://californiaagriculture.ucop.edu/0701JFM/pdfs/OakAge.pdf>);
- Wildfire protection plan guidebook (Katelman, et al., 2007); and
- Fire Safe Council of El Dorado County website (<http://www.edcfiresafe.org>).

## **8. Monitoring and Reporting**

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

1. The status of replacement plantings in satisfaction of Policy 7.4.4.4 Option A mitigation requirements; and
2. An annual report to the Board of Supervisors concerning the status of oak woodland conservation activities, as a component of the INRMP identified in Policy 7.4.2.8.

### **A. Replacement Plantings under Option A**

Project specific monitoring and reporting requirements for replacement plantings under Option A will be outlined in project specific Mitigation Plans developed pursuant to Section 2.C of the OWMP. The Mitigation Plan will include quantifiable success criteria for the replacement plantings, and will require periodic reports which will compare the success of the replacement plantings to the success criteria. Generally, the Mitigation Plan will provide for the following reports:

1. A summary report prepared by a qualified professional upon completion of the replanting activity. The primary purpose of this report shall be to confirm that the replanting has been completed in compliance with the Mitigation Plan.
2. A final report at the end of the seventh year following completion of the replanting to address whether the success criteria have been met.

A qualified professional is one of the following:

**Certified Arborist** is a person certified by the International Society of Arboriculture (ISA), American Society of Consulting Arborists (ASCA), or other recognized professional organization of arborists that provides professional advice and licenses professionals to do physical work on trees.

**Certified Rangeland Manager** is a person licensed by the State of California through the California State Board of Forestry. Certified Rangeland Managers apply scientific principles to the art and science of managing rangelands and are recognized by the California Section, Society for Range Management as meeting the education, experience, and ethical standards for professional rangeland managers (University of California Agriculture and Natural Resources website).

**Qualified Biologist** is a person who meets qualifications as determined by the Director of Development Services. A qualified biologist has a BA/BS or advanced degree in biological sciences or other degree specializing in the natural sciences, professional or academic experience as a biological field investigator, taxonomic experience and knowledge of plant and animal ecology, familiarity with plants and animals of the area including species of concern, and



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familiarity with the appropriate county, state and federal policies and protocols related to special-status species and biological surveys (El Dorado County, 2006).

**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; forest health; wildfire; soils, geology, and hydrology; wildlife and fisheries biology, and other forest resources (California Licensed Foresters Association website).

Projects that utilize replanting for mitigation require an oak tree conservation easement. An oak tree conservation easement will be recorded on each property by the County, project applicant, or landowner prior to the final permit issuance. The record will address the following:

- Mitigation measures to be implemented, including, for example:
  - Location and amount of acreage to be conserved and/or replaced
  - Numbers, types, and spacing of saplings, seedlings, and/or acorns to be planted per acre
- Aerial photograph or parcel map with mitigation area delineated. If more than one type of mitigation (e.g., conservation or replacement) will occur, then the area of each type of mitigation will be delineated
- A schedule describing the type and duration of maintenance (e.g., weed control, irrigation)
- Required protection measures (e.g., tree shelters, fencing)
- Best management practices
- Contingency measures such as guidelines for replanting or other activities if criteria are not met (e.g., survivorship of planted trees is less than 90%)
- Contact person(s) responsible for mitigation area monitoring activities
- Schedule for reporting requirements and duration
- Reporting to the County
- Party that is financially responsible for mitigation
- Transfer of responsibilities with property should ownership change
- Mitigation fee with escalation schedule if landowner chooses to discontinue mitigation (e.g., switch from Option A to Option B)
- Compliance/enforcement measures, which may include “stop” work orders, revocation of project approval, and/or performance bonds
- Permission for a County representative to enter the property with at least 10 days advance notice to monitor the mitigation.

Additional reporting requirements may be identified in the project-specific Mitigation Plan. The Mitigation Plan may incorporate a checklist to be used to simplify the reporting requirements of this section. Reports will be completed by the property owner or the agent of the property owner who has performed the work, and will be delivered to the County Planning Department.

If success criteria are not met, additional replacement plantings will be required to compensate for the difference between the goal met and that not met. (Note: Natural regeneration of oaks that occurs within planted sites is included in measures of canopy cover and may be

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compensated one-per-one for planted oaks that did not survive.) Reporting requirements will restart subsequent to the additional replacement plantings. The applicant will have the option, subject to the County's approval, of contributing to the County conservation mitigation fund instead of replanting.

**B. Annual Reports to the Board of Supervisors**

Annual reports on the status of oak woodland conservation activities will be prepared and delivered to the Board of Supervisors. These reports should provide information concerning 1) Conservation Fund fees collected; 2) oak woodlands protected through Conservation Fund In-Lieu fee expenditures; 3) oak canopy replacement area planted as mitigation under Option A; and 4) oak canopy removed by new development. A fee study will be conducted to determine if a fee adjustment is necessary to update Conservation Fund In-Lieu fees. This information should be reported both for the current reporting period as well as the cumulative totals since beginning implementation of the 2004 General Plan.

Upon completion of the INRMP, the reporting requirements under General Plan Policy 7.4.2.8 will change to focus on monitoring impacts to and protection of important habitats (as those are defined through the INRMP process). The Board of Supervisors may elect to continue this separate reporting on oak woodland conservation activities apart from reports relating to identified important habitat under Policy 7.4.2.8.

**C. Adaptive Management**

The success of the OWMP 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 OWMP and the mitigation fee. If the Goals of the OWMP are not being met, then the County will review and revise the Plan as necessary.

This OWMP comprises the first phase (the oak woodland portion) of the INRMP. During development of the INRMP, if revisions to the OWMP are determined to be necessary, those revisions may be incorporated into the INRMP.

## **9. Administration of Oak Woodland Conservation Program**

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

- 1) A County maintained database for the separate accounting of oak woodland conservation grants and Option B 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 OWMP. 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. Education and Outreach**

The OWMP has been developed considering extensive public input. Many public meetings, workshops and hearings were held over the period beginning in mid-2006 and ending with the adoption of this plan.

One component of the OWMP provides for the voluntary conservation or management of oak woodlands within working landscapes. The sale of oak tree conservation easements on properties identified as Priority Conservation Areas (PCAs) is entirely 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 OWMP. 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. Partnering to Achieve Goals of the OWMP**

This section identifies specific opportunities for the County to partner with others to achieve the Goals of this OWMP. 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 OWMP 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 oak woodland acquisition (PCAs) areas that fulfill the purposes described in the OWMP. 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 OWMP. One such program includes grant funding for conservation easement acquisitions available under the Oak Woodlands Conservation Program. To qualify for funding consideration 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 OWMP. In order to facilitate and expedite, where feasible, such grant funding applications, the County will develop an OWMP 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 OWMP.

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 major roadways, i.e. the Weber Creek crossing at Highway 50.

Projects which would be inconsistent with this OWMP 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.

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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.
- ✓ 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.”

Much of the following information was taken from various websites. Those marked with an asterisk (\*) represent the highest priority opportunities.

#### **A. Governmental Partners**

1. Wildlife Conservation Board (WCB)\*  
[http://www.wcb.ca.gov/Pages/wcb\\_brief\\_overview.htm](http://www.wcb.ca.gov/Pages/wcb_brief_overview.htm)

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

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### Oak Woodland Management Plan Background and Support Information

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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.

2. Georgetown Divide Resource Conservation District (RCD) and El Dorado County RCD\*  
<http://carcd.org/wisp/georgetown/index.htm>

The Georgetown Divide RCD was organized to address resource management problems and promote sound management of natural resources in El Dorado County. It works with landowners on a voluntary basis to promote good stewardship. The RCD is continuously looking to develop partnerships that lead to good resource management and has studied the South Fork of the American River basin and the Upper Cosumnes River basin. The District's work could be a major source of data for implementation of the OWMP, particularly in the conservation of woodlands in and adjacent to riparian areas.

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 (CDF/CAL FIRE)\*  
<http://www.fire.ca.gov/rsrc-mgt.php>

The Resource Management Program within CDF 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 CDF 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, CDF is actively involved in timberlands that contain much of the County's Black Oak population. In

## Appendix A

### Oak Woodland Management Plan Background and Support Information

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addition, CAL FIRE's responsibility includes fire prevention enforcement of PRC §4290 (Fire Safe Plans) and PRC §4291 (Defensible Space).

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

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 Folsom 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 Folsom Field Office has completed a Sierra Draft Resource Management Plan (RMP) that will guide the management of all public lands under the jurisdiction of the Folsom 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."

The BLM lands along the major rivers and streams of El Dorado County will be critical in developing/maintaining large areas of oak woodlands and the needed linkages. Conservation of blue oak woodland is an objective in the draft RMP.

6. United States Department of Agriculture, Forest Service  
<http://www.fs.fed.us/r5/eldorado/>

The Eldorado National Forest (ENF) extends into the eastern boundary of the OWMP planning area. Black oaks are emphasized in the Forest 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)\*  
<http://ceeldorado.ucdavis.edu/>

The Natural Resources Program provides research and education in areas specific to forestry, water and air quality, watershed resources, wildlife, land use issues and range, and oak woodlands management.

The Program's 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 position are private landowners; resource management professionals working on private, State, and Federal lands; and other groups such as users of public lands, conservation organizations, and the agriculture and forest products industries.

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The extension service is frequently the source of many of the articles and publications about oak woodlands. Bill Frost, our County Director, has been a major contributor to the scientific knowledge about oaks in our area.

8. City of Placerville  
<http://ci.placerville.ca.us/>

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 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>

Placer County, adjacent to El Dorado County along our northern county line, 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 Priority Conservation Areas 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/depts/amadorgeneralplan/>

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.



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11. El Dorado Hills Community Service District  
<http://www.edhcsd.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 woodland types. Some opportunities for oak planting or enhancement of existing stands may exist.

13. El Dorado County Agriculture Department\*  
<http://www.co.el-dorado.ca.us/ag/programs.html>

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 General Services – Airports, Parks and Grounds Division\*  
<http://www.co.el-dorado.ca.us/parks/index.html>

The General Services Department, through the Airports, Parks and Grounds Division, 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 Airports, Parks and Grounds Division 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

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### **Oak Woodland Management Plan Background and Support Information**

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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.

15. El Dorado County Department of Transportation\*  
<http://www.co.el-dorado.ca.us/DOT/index.html>

General Plan Circulation Element assigns to the Department of Transportation (DOT) the responsibility of coordinating the planning and implementation of roadway improvements to ensure safe movement of people and goods, and to maintain adequate levels of service. The County CIP Program sets forth the plan for delivery of these projects. DOT understands its role as stewards of the environment and intends to be held to the same reasonable standards as other development projects. DOT is seeking compatible opportunities and solutions for preservation and protection of trees and their habitat that will, at the same time, not unreasonably interfere with the use of the streets, street facilities, utilities, or public safety.

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.

#### **B. Public Utility Partners**

1. El Dorado Irrigation District (EID)\*  
[http://www.eid.org/about\\_EID/district.html](http://www.eid.org/about_EID/district.html)

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.

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### Oak Woodland Management Plan Background and Support Information

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#### 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/>

Currently no opportunities for partnerships have been identified.

### **C. Private Partners**

The General Plan anticipates citizen involvement in the development and implementation of the OWMP. Section 10 (Education and Outreach) discusses public involvement in the OWMP'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.

### **D. Non-profit Partners**

The implementation of the oak woodland management plan 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 OWMP.

## **12. Consistency with the General Plan and State Law**

This OWMP fulfills 2004 General Plan Measure CO-P, and as such replaces the Policy 7.4.4.4 Interim Interpretative Guidelines. The OWMP also comprises the oak woodland portion of the INRMP required by Policy 7.4.2.8 and Measure CO-M.

### **A. OWMP as the First Component of the INRMP**

Preparation of this OWMP has been consistent with the requirements of the INRMP. The OWMP:

- Includes the initial inventory and mapping of oak woodland resources throughout the County (Figure IV-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 for mitigation assistance through Policies 7.4.4.4, Option A and the Option B fee, and provides flexibility to allow combinations of these Options where appropriate;
- 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 OWMP;
- Establishes reporting requirements for restoration activities 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.

### **B. Consistency with Measure CO-P**

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

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**C. Compliance with Fish & Game Code Section 1366(a)**

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

**D. Compliance with PRC 21083.4**

The OWMP, 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.

**E. Effect of Future Amendments to General Plan**

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

### **13. List of Preparers**

The OWMP was prepared under the direction of El Dorado County Planning Services. Early development of the plan was under the direction of Steven Hust, Principal Planner, with the assistance of Monique Wilber, Senior Planner, and the County staff TAC. In July 2007, development of the plan became the responsibility of Peter Maurer, Principal Planner, also with the assistance of Monique Wilber.

The OWMP TAC was made up of the following individuals:

Greg Fuz, Director of Development Services  
El Dorado County Development Services Department

Larry Appel, Deputy Director of Planning Services  
El Dorado County Planning Services

Steven Hust, Principal Planner  
El Dorado County Planning Services

Peter Maurer, Principal Planner  
El Dorado County Planning Services

Monique Wilber, Senior Planner  
El Dorado County Planning Services

Bill Stephans, Agricultural Commissioner  
El Dorado County Agriculture Department

Bill Frost, County Director/Natural Resources Advisor  
University of California Cooperative Extension

Janet Postlewait, Principal Planner  
El Dorado County Department of Transportation

Geney Terry, GIS Analyst II  
El Dorado County Surveyor's Office

Table 13-1 identifies the EN2 Resources, Inc., Pacific Municipal Consultants, Inc., and TCW Economics consultant team staff who prepared the OWMP.

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<b>Table 13-1: List of Preparers</b>		
<b>Name, Title, and Firm</b>	<b>Education</b>	<b>Role on Project</b>
Rick A. Lind President EN2 Resources, Inc.	M.A., Geography (Water Resources), U.C. Davis  B.A. Geography (Natural Resources), CSU Sacramento	Project Director
Susan Durham Ecologist EN2 Resources, Inc.	A.B., Zoology, U.C. Berkeley  Post Bacc., Natural Resources, Humboldt State University	Senior Associate
Derek Wong Municipal Finance Manager Pacific Municipal Consultants, Inc.	M.B.A., California Polytechnic State University  B.S. Environmental Policy Analysis and Planning, U.C. Davis	Task Director
John DeMartino GIS Specialist Pacific Municipal Consultants, Inc.	B.S. Geology, CSU Northridge  B.S. Economics, FSU Tallahassee	GIS/ Graphics Analyst II
Joyce Hunting Director, Biological Resources Pacific Municipal Consultants, Inc.	M.S., Advanced Candidate Biological Sciences, Conservation Biology Concentration, CSU Sacramento  B.A., Biology and Zoology, Humboldt State University	Task Director
Robert Smart Registered Professional Forester Subconsultant to EN2 Resources, Inc.	Master of Forestry, University of Idaho  B.S., Forest Management, University of Idaho	Task Director
Thomas Wegge Natural Resources Economist TCW Economics	M.S., Environmental Economics, CSU Fullerton  B.A., Urban Studies, University of Southern California	Task Director
Ethan Koenigs Land/Natural Resources Analyst EN2 Resources, Inc.	MS, Horticulture and Agronomy, U.C. Davis  MS, Entomology, U.C. Davis  BS, Biology, CSU Sacramento	GIS/ Graphics Analyst
Megan Buchanan Administrative Services Manager EN2 Resources, Inc.	A.A., Human Services (in progress), Folsom Lake College	Document Editing and Production

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**14. Acronyms**

<b>AL</b>	Agricultural Lands
<b>AP</b>	Adopted Plan
<b>ASCA</b>	American Society of Consulting Arborists
<b>BLM</b>	Bureau of Land Management
<b>BLS</b>	Bureau of Labor Statistics
<b>BMPs</b>	Best Management Practices
<b>BOP</b>	Blue Oak-Foothill Pine
<b>BOW</b>	Blue Oak Woodland
<b>C</b>	Commercial
<b>CALVEG</b>	Classification and Assessment with Landsat of Visible Ecological Groupings
<b>CDF</b>	California Department of Forestry and Fire Protection
<b>CDFG</b>	California Department of Fish and Game
<b>CEQA</b>	California Environmental Quality Act
<b>CFIP</b>	California Forest Improvement Program
<b>CNDDB</b>	California Natural Diversity Database
<b>COWCP</b>	California Oak Woodlands Conservation Program
<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>DOT</b>	Department of Transportation
<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>IHRMP</b>	Integrated Hardwood Range Management Program
<b>INRMP</b>	Integrated Natural Resources Management Plan
<b>IRS</b>	Internal Revenue Service
<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>MLS</b>	Metro Listing Service



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<b>NR</b>	Natural Resources
<b>NRCS</b>	Natural Resources Conservation Service
<b>OS</b>	Open Space
<b>OWMP</b>	Oak Woodland Management Plan
<b>PAR</b>	Property Analysis Record
<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
<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>TAC</b>	Technical Advisory Committee
<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

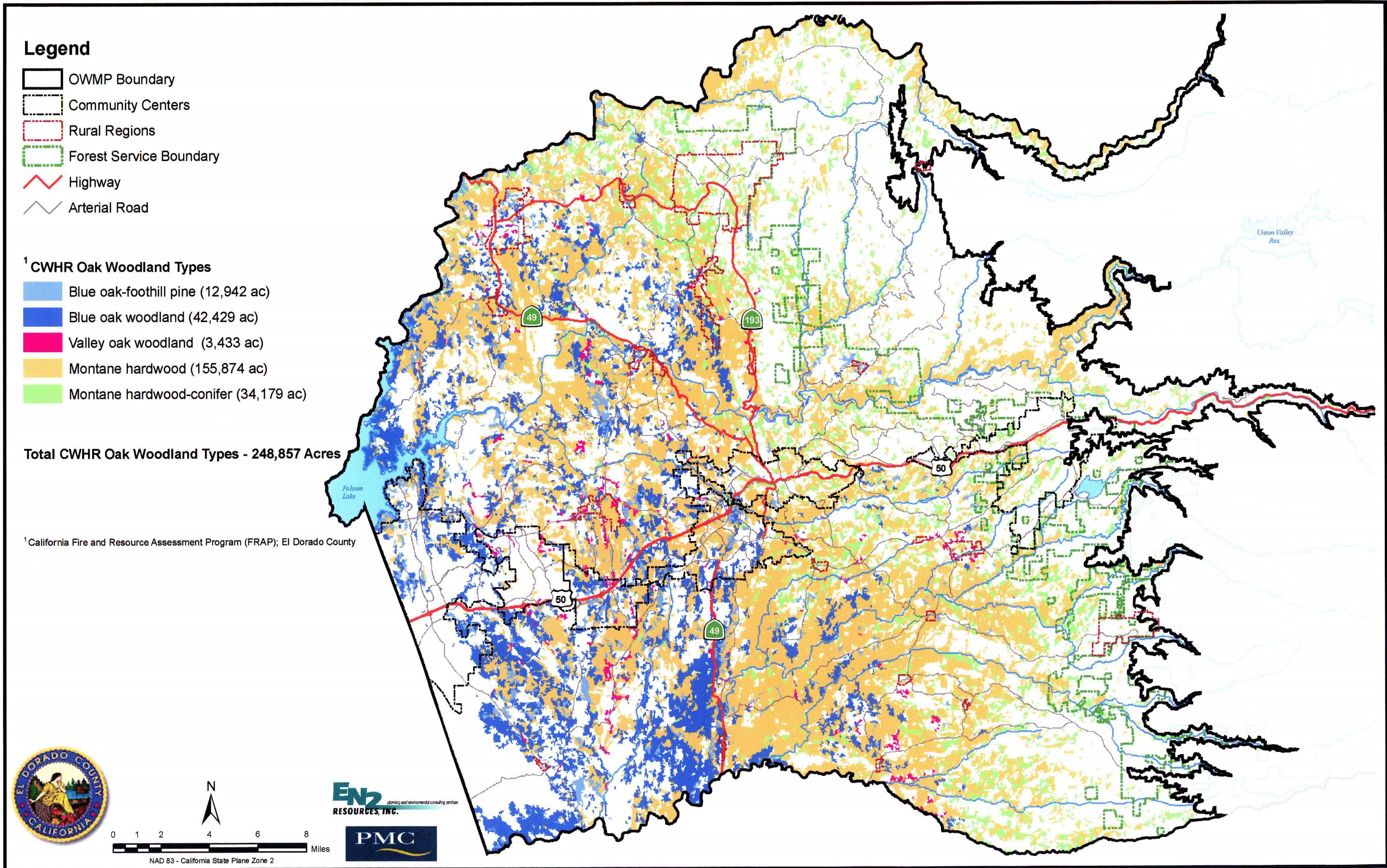


Figure IV-1. FRAP CWHR Oak Woodland Types

**PUBLIC REVIEW DRAFT**

# Appendix B

## Conservation Fund In-Lieu Fee Mitigation

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**Appendix B**  
**Option B – Mitigation Fee**

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**Appendix B – Conservation Fund In-Lieu Fee Mitigation**  
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**Option B – Mitigation Fee**

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## Appendix B Conservation Fund In-Lieu Fee Mitigation

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### 1. INTRODUCTION

The purpose of this Appendix report is to describe the development of the Conservation Fund In-Lieu Fee mitigation which meets the requirements of 2004 El Dorado County General Plan Policy 7.4.4.4, which specifies an Option B Mitigation Fee. The intent of the Option B mitigation fee is to provide compensation for impacts resulting from the loss of habitat and fragmentation of oak woodlands due to development. In order to describe the development of the fee, and the foundation for the 2:1 mitigation ratio, it is essential to understand the history of oak woodland mitigation measures developed during the completion of the 2004 General Plan EIR and General Plan.

The El Dorado County Board of Supervisors adopted the previous County General Plan in 1996. The Draft Environmental Impact Report (DEIR) of the 1996 General Plan was subject to a legal challenge over the proposed changes in land use, traffic congestion, water resources, and the oak woodland canopy (*El Dorado County Taxpayers for Quality Growth et al. v. El Dorado County Board of Supervisors et al.* – Case No. 96 CS 01290). The challenge alleged that the DEIR's canopy cover retention standards did not adequately address impacts to the oak woodland canopy. The basis for woodland conservation in the County under the 1996 General Plan was oak canopy retention and open-space policies. The canopy retention standards applied to discretionary projects involving parcels with an oak woodland canopy cover of at least ten percent (EDAW, 2003, Page 5.12-40). In addition, the practice of planting to mitigate oak trees proved problematic, since trees were inappropriately planted on-site and there have been few opportunities to assess how oak woodland habitats develop over time from areas planted (EDAW, 2003, Page 5.12-31). In 1999, the Sacramento County Superior Court issued a Writ of Mandate that ruled the 1996 General Plan DEIR deficient and placed a moratorium on development in the county until another General Plan could be adopted.

In response to the 1999 Writ of Mandate, the County adopted a new General Plan and certified an EIR for the General Plan in July 2004. A Motion for Review of County's Return to the Writ was subsequently filed with the Superior Court in August 2005. The Court ruled that the County went well beyond the direction of the 1999 Writ by providing an alternative to the retention requirements in the form of compensatory funding (Court Ruling, Page 5).

This alternative funding is found in the 2004 El Dorado County General Plan Policy 7.4.4.4, which specifies an Option B Mitigation Funding in lieu of replacement and retention requirements of Option A. The full text of Option B reads as follows:

*“The project applicant shall provide sufficient funding to the County's INRMP conservation fund, described in Policy 7.4.2.8, to fully compensate for the impact to oak woodland habitat. To compensate for fragmentation as well as habitat loss, the preservation ratio shall be 2:1 and based on the total woodland acreage onsite directly impacted by habitat loss and indirectly impacted by habitat fragmentation. The costs associated with acquisition, restoration, and management of the habitat protected shall be included in the mitigation fee. Impacts on woodland habitat and*

## **Appendix B**

### **Option B – Mitigation Fee**

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*mitigation requirements shall be addressed in a Biological Resources Study and Important Habitat Mitigation Plan as described in Policy 7.4.2.8.”*

## **2. CONSERVATION FUND IN-LIEU FEE METHODOLOGY**

A series of steps and analyses were applied to document and develop the fee, which accounts for the full cost of mitigation, including acquisition, monitoring, and management. The steps to develop the fee included the following:

- Clarification of the Option B Mitigation Ratio Policy, including defining full mitigation as it applies to the fee, and clarifying the mitigation ratio of 2:1;
- Identification of Potential Mitigation Alternatives for Acquisition, Restoration, Management and Monitoring;
- Evaluation of mitigation alternatives and development of specific alternative fee strategies;
- Estimating the costs (and fee) of acquiring, restoring and managing oak woodlands; and
- Methods for annual adjustments to the fee.

Each of these steps is described in this appendix.

## **3. CLARIFICATION OF OPTION B MITIGATION RATIO**

Mitigation is required for impacts resulting from the loss of habitat and fragmentation of oak woodlands due to development. The Option B policy states that compensation be applied to oak woodlands “...*directly impacted by habitat loss and indirectly impacted by habitat fragmentation. The costs associated with acquisition, restoration, and management of the habitat protected shall be included in the mitigation fee.*” Option B further references General Plan Policy 7.4.2.8, which relates to the Integrated Natural Resources Management Plan (INRMP) conservation fund. Subsection C of Policy 7.4.2.8 describes that a program be established “...*to facilitate mitigation of impacts to biological resources resulting from projects approved by the County that are unable to avoid impacts on important habitats.*” For the OWMP to be consistent with the INRMP, mitigation needs to address, at a minimum, the biological resources associated with oak woodland habitats.

As contained in the Option B policy, full mitigation for the impacts is expressed at a 2:1 compensatory fee ratio. However, the policy does not make clear how this ratio is applied, whether using a unit measurement (e.g., per tree, per acre, dbh, etc.) or basing it on a valuation or performance measurement (e.g., canopy cover) approach. The next section provides research into the clarification of the mitigation fee ratio.



## Appendix B Option B – Mitigation Fee

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### **HISTORIC REFERENCE AND CLARIFICATION OF OPTION B MITIGATION FEE RATIO**

This section reviews the history of the County’s Option B mitigation fee ratio policy as described in the 2004 General Plan/DEIR, the CEQA Statement of Overriding Considerations, and the Motion for Review of County’s Return to Writ of Mandate-Ruling. The intent of the mitigation ratio policy is to provide compensation for impacts resulting from the loss of habitat and fragmentation of oak woodlands due to development. The mitigation ratio policy is included in the Oak Woodland Management Plan (OWMP), which serves as the “oak woodland portion” of the Integrated Natural Resources Management Plan (INRMP) in accordance with General Plan Policy 7.4.2.8, General Plan Implementation Measure CO-P, and implementing Option B of General Plan Policy 7.4.4.4 (i.e., oak tree mitigation fees).

### **REGULATORY GUIDANCE & POLICY**

As described earlier, regulatory guidance for the OWMP is derived from several sources. At the State level, SB1334 (Kuehl) (codified as PRC §21083.4) addresses the issue of oak woodlands’ environmental impacts under CEQA and provides a list of acceptable mitigation measures including, but not limited to, new plantings, conservation, and funding to the Oak Woodlands Conservation Fund.

On the local level, the policies of the 2004 General Plan and DEIR reflect the County’s commitment to providing an in-lieu payment alternative as noted in the Court Ruling. The related General Plan policies and measures are summarized in the following table:

The 2004 General Plan DEIR contains analyses of impacts to oak woodlands and provides mitigation measures. The mitigation measures provide direction for policies contained in the Conservation and Open Space Element of the General Plan and for the development of an INRMP. General Plan Policy 7.4.4.4 of the Conservation and Open Space Element presents two mitigation alternatives including Option B, which allows for an in-lieu contribution to a conservation fund at a 2:1 ratio. However, none of the policies and measures referenced above provides a clear interpretation or methodology of the mitigation ratio.

### **POSSIBLE RATIONALE FOR THE MITIGATION RATIO METHODOLOGY**

Neither the DEIR nor the General Plan directly contains a particular methodology for how the 2:1 ratio was formulated. Nevertheless, a *possible* rationale for determining such a ratio is found in the DEIR. The DEIR states, “As with policies in the Conservation and Open Space Element, much of the focus of the measures in the implementation program is on identification of important biological resources and reduction of impacts on those resources.” “Given the amount of habitat that is expected to be removed and fragmented by 2025, a substantial amount of compensatory mitigation (e.g., habitat purchased by the County to be preserved in perpetuity) would be needed in addition to avoidance and

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minimization measures to reduce this impact to a less-than-significant threshold” (EDAW, 2003, Page 5.12-48). Therefore, it appears that the 2:1 ratio was derived in large part to provide sufficient funding for the Conservation Fund to implement mitigation that would reduce impact from General Plan implementation to less than significant levels.

#### **ATTEMPTS TO CLARIFY THE MITIGATION RATIO**

Further attempts to clarify the mitigation ratio as reflected in the 2004 General Plan/DEIR, Master Responses to Comments of the 2004 General Plan, the CEQA Statement of Overriding Considerations, and the Motion for Review of County’s Return to Writ of Mandate-Ruling are presented below:

##### 2004 El Dorado County General Plan

The most specific reference to the mitigation ratio found in the General Plan is expressed in Option B of Policy 7.4.4.4. The full text of Option B reads as follows:

*The project applicant shall provide sufficient funding to the County’s INRMP conservation fund, described in Policy 7.4.2.8, to fully compensate for the impact to oak woodland habitat. To compensate for fragmentation as well as habitat loss, the preservation ratio shall be 2:1 and based on the total woodland acreage onsite directly impacted by habitat loss and indirectly impacted by habitat fragmentation. The costs associated with acquisition, restoration, and management of the habitat protected shall be included in the mitigation fee. Impacts on woodland habitat and mitigation requirements shall be addressed in a Biological Resources Study and Important Habitat Mitigation Plan as described in Policy 7.4.2.8.*

The General Plan policy, derived from Mitigation Measure 5.12-1(f) in the DEIR, calls for compensation for habitat loss and fragmentation at a 2:1 ratio. This ratio is based upon the total woodland acreage onsite directly impacted by habitat loss and indirectly impacted by habitat fragmentation. While the policy does not offer any clear interpretation of how the impacted woodland acreage would be assessed at the 2:1 ratio, an assumption could be made that the mitigation fees paid could reflect double the costs associated with acquisition, restoration, and management of habitat.

##### Master Responses to Comments of the 2004 General Plan

A number of comments to the General Plan addressed the issue of oak tree canopy protection and related policies and mitigation measures proposed in the DEIR. Master Response #18 included specific statements about Option B. The response stated that the intent of this option is “to preserve (through acquisition or conservation easements) existing woodlands of equal or greater biological value as those lost.” The response goes on to include that “Option B... is designed to facilitate the preservation of larger blocks

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of contiguous habitat, generating at least twice as much funding for habitat protection as Option A.” This appears to indicate that the mitigation ratio is designed to achieve a substantial amount of compensatory mitigation given the amount of habitat that is expected to be removed and fragmented in the future.

### Motion for Review of Return to Writ of Mandate

The Sacramento County Superior Court affirmed PRC Section 21083.4(b) (3), which allows for the establishment of mitigation fees for oak woodland habitat preservation. *The Motion for Review of County’s Return to Writ of Mandate - Ruling* (Superior Court of California, County of Sacramento dated August 31, 2005) found that “*the current DEIR proposed an alternative to the retention requirements, ‘Option B’, which allows the County to require a project applicant to provide funding for woodland preservation in lieu of on-site canopy retention. The preservation would be at 2:1 ratio and would allow the County to pool funds and apply them towards acquisition and restoration projects that would preserve larger contiguous blocks of habitat*” (Court Ruling, Page 5).

The Court Ruling upholds the General Plan’s policy of establishing an in-lieu mitigation fee as reflected in Option B of Policy 7.4.4.4. Like the General Plan, the Court Ruling references the 2:1 mitigation ratio and describes the intent of the ratio as a means to fund habitat acquisition and restoration projects. However, the ruling does not offer any specific interpretation of the ratio.

### CEQA Statement of Overriding Considerations

The CEQA Statement of Overriding Considerations associated with the adoption of the 2004 General Plan does not directly mention the 2:1 mitigation ratio. Under Environmental and Biological Considerations section, it does refer to “standards for development and implementation of countywide Integrated Natural Resources Management Plan” and “minimum mitigation ratios for loss of important biological habitat.” However, this document does not offer any further direction or interpretation of the mitigation policy.

In sum, both the 2004 General Plan/DEIR and the Court Ruling provide policy direction for the implementation of the 2:1 mitigation ratio, which would include funding for habitat acquisition, restoration, and management. The CEQA Statement of Overriding Considerations only refers to a minimum mitigation ratio for loss of habitat without referencing a specific compensatory ratio. None of the aforementioned sources provides a clear interpretation of the mitigation ratio.

## CONCLUSION

The County of El Dorado has established policies in its 2004 General Plan that not only address the retention and replacement of oak woodlands, but which also direct the establishment of a compensation fund based upon a 2:1 mitigation ratio. Option B references the mitigation ratio in terms of total acreage impacted on-site, but does not

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offer a clear interpretation of how such impacts would be assessed for the purposes of determining a mitigation fee structure. The findings contend that the project proponent would compensate for the full costs of mitigation based upon the total impacted acreage (direct and indirect) and the costs associated with the acquisition, restoration, management and monitoring of oak woodland habitat. For consistency with the General Plan language, the implementation of the fee would be based on total acreage impacted on-site, with the fee structured on a per acre basis. For each acre of oak woodland that is lost, the mitigation ratio of 2:1 would require payment of twice the fee per acre.

#### **4. ACQUISITION AND MANAGEMENT ALTERNATIVES**

There are a number of potential alternatives for acquiring and managing oak woodlands. Primary mechanisms for acquiring lands are to either gain control of land outright through fee title, or to restrict the use of land that remains in private ownership through voluntary conservation easement. In either case, the purpose of acquisition is to preserve land in perpetuity for conservation from willing sellers.

Management activities help to ensure the viability of the land to support oak tree growth and habitat functions. Depending on the existing condition of the land, the purpose and intensity of uses, and habitat quality, different levels of management would be needed. Activities include biological surveys, weed control, and fuels treatment.

Monitoring involves determining the on-going success of the off-site mitigation sites. Monitoring activities include annual field visits, photo documentation, tracking of oak tree mortality rates, and database management.

#### **5. COSTS OF THE MITIGATION PROGRAM**

The costs for acquisition and management of oak woodlands were estimated using information from a variety of sources, including research by institutions such as the UC Integrated Hardwood Range Management Program (IHRMP); existing habitat conservation fee programs implemented by local jurisdictions; discussions with local land trusts including the American River Conservancy (ARC) that manage conservation easements; case studies compiled by the Center for Natural Lands Management; and land sales data provided by the El Dorado County Assessor. The information obtained assisted with developing the estimated costs for each mitigation component (acquisition, management and monitoring).

A cost spreadsheet model was developed that incorporates the cost for each program element. The spreadsheet model is an adaptation of the Property Analysis Record (PAR) model developed by Center for Natural Lands Management, which is an industry accepted tool to derive mitigation costs that are applicable to the mitigation site. The model divides the cost variables into those costs that are considered initial capital costs (one time), and those that are considered on-going (annual) costs. The annual costs are

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dependent on the frequency or regularity of the on-going activities (e.g., annual monitoring versus less than annual monitoring).

There are key considerations and program cost assumptions that provide the underpinnings for the oak woodlands mitigation fee. They are listed below:

#### Key Oak Woodlands Program Considerations

- Provide compliance flexibility by allowing affected landowners to contribute to the offsite mitigation fund or to meet mitigation requirements by preserving comparable habitat.
- Designate areas for preservation or conservation of oak woodlands with high biological value.
- Establish an endowment that provides for on-going management/monitoring of mitigation sites. The endowment would ensure funds are available in perpetuity (assuming a minimum investment rate of return) for these activities and that inflation cost adjustments are accounted for.

#### Program Costs And Fee Development Assumptions

- Basic fee unit: acreage.
- Cost categories for management include: biotic surveys; noxious weed control; and fuels treatment.
- Cost categories for monitoring include: site monitoring and field reporting; office and field equipment cost allocation, and endowment processing.
- Contingency and administrative overhead expressed as percentages of total costs (e.g., 10% for contingency and 15% for administration).
- Actual land sales data within rural county properties provided by the County Assessor's Office..
- Conservation easement discount values assumed 80 percent of land values before the easement, based on recent transactions by ARC.
- Annual adjustment to the fee using appropriate indices, including changes in assessed land valuation recorded by the County Assessor, and wage rate changes in forestry and conservation related employment reported by the Federal Bureau of Labor Statistics (BLS) for California.

Total cost of the off-site mitigation program is based on the acreage that is designated as priority conservation area multiplied by the mitigation cost per acre.

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Model Inputs

The cost spreadsheet model includes certain types of costs that are associated with long term stewardship of conservation property. These costs include consideration of the elements in Table B-1.

<b>Table B-1</b>		
<b>Costs Associated with Long Term Stewardship of Conservation Property</b>		
<b>Expenditure</b>	<b>Specification</b>	<b>Unit Type</b>
<b>Acquisition</b>		
Conservation Easement	Parcel	Acre
Legal Contract and Review	Easement Contract	Item
Site Inspection, coordination between County & landowner	Preserve manager	Labor hours
Survey by Land Surveyor	Report & Map	Item
Appraisal	Report by MAI Certified Appraiser	Item
County Survey Map Processing	Government Services	Labor hours
<b>Biotic Surveys</b>		
Qualified Professional	Species Surveys	Labor hours
Project Management	Supervision/Coordination	Labor hours
Survey Equipment	Equipment	Item
<b>Habitat Management</b>		
Weed Control	Herbicide Treatment	Labor hours
Fuels Treatment	Fuels Treatment Activities	Acre
<b>Reporting/Monitoring</b>		
Database Management	Report	Labor hours
Aerial Photos	Photos	Item
Photo documentation	Field Survey/Site Evaluation	Labor hours
<b>Office Maintenance</b>		
Office Equipment/Computers	Desktop Computer Allocation	Item
<b>Field Equipment</b>		
Vehicle	Fuel & Maintenance	Mileage
Binoculars	Binoculars	Item
<b>Operations</b>		
Endowment	Process Endowment	Labor hours

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Costs for management activities take into account such factors as the estimated hours of labor to provide the service, as well as an allocation of the use of a piece of equipment. For example, the cost of field and office equipment can be shared over a given number of mitigation projects. Therefore, only a marginal cost is applied to any single project. Hours of labor are estimated from case studies of other habitat conservation efforts and from discussions with local land trusts including ARC.

Cost of mitigation includes annual site monitoring. The cost model annualizes costs for activities that are undertaken at given intervals, such as every year, every 5 years, 10 years, etc. For example, an activity that costs \$100 and is conducted every 5 years will have an annual cost of \$20 in the model.

Fuels treatment needs to be a cost component of oak woodland acquisition if the desire is to sustain the oak woodland landscape. According to the USDA Forest Service, wildfires are the largest single causal agent in changing oak woodlands in the Sierra Nevada foothills. Fuels treatments in oak savannah landscapes that have been and will continue to be heavily grazed could cost as little as \$425 per acre for prescribed burning. On steep slopes along the rivers and on lands that have high fuel loading, the costs can easily exceed \$4,500 per acre. Treatment on these lands will involve a variety of techniques such as mastication, hand treatments, animal grazing, and prescribed burning. To minimize risk of intense stand killing fires, fuel treatment measures need to be repeated approximately every 10-15 years. No endowment has been established for these expected treatments because of the uncertainty of which lands will be acquired. The need for follow up treatment and adjustments to the Option B fee for fuel treatment costs should be assessed during annual monitoring and reporting activities.

Because of all the uncertainties associated with the locations, type, and condition of conservation easement acquisitions, fuels treatment costs are estimated as being \$900 per acre.

Management costs are derived from case studies and provide estimated labor hours and itemized costs to provide these activities. To ensure that fee revenues are available to pay for on-going costs in perpetuity, an endowment fund was included in the monitoring cost. The endowment fund accounts for a substantial portion of the monitoring component of the fee because funding of the endowment must be sufficient to generate interest every year to avoid drawing down the principal investment to pay for on-going costs. In addition, the endowment must generate interest that is reinvested with the principal to account for future cost increases due to inflation. The assumed interest rate of return in the fee structure is six percent (3 percent allocated toward on-going costs, and 3 percent reinvested for inflation adjustment).

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To maintain flexibility in the implementation of the Option B program, costs were estimated separately for each mitigation component (acquisition, management and monitoring). This cost structure would enable an applicant to undertake certain mitigation activities on their own if they choose, and then pay only the remaining fee components. For example, the landowner/developer could acquire off-site land for mitigation, subject to County approval, in-lieu of paying the acquisition portion of the fee. The landowner/developer would then pay the County the balance of the fee for management and monitoring.

Summary of Costs/Fees

For a project proponent to compensate for the full costs of mitigation, the direct costs for the total impacted acreage plus the indirect costs associated with the acquisition, management, and monitoring of the replacement acreage must be taken into account. To be consistent with the General Plan, the fee is structured on a per acre basis. Table B-2 exhibits the (Policy 7.4.4.4 Option B) Conservation Fund In-Lieu Fee per acre. For each acre of oak canopy that is lost, the mitigation ratio of 2:1 would require payment of twice the fee per acre. For each acre of oak canopy removed, therefore, the project proponent would pay \$9,400 into the Conservation Fund.

**Rural PCA Land Acquisition (Cost per Acre)**

<b>Table B-2</b>	
<b>CONSERVATION FUND IN-LIEU FEE</b>	
	<b>Cost Per Acre</b>
Acquisition <sup>1</sup>	\$2,300
Management <sup>2</sup>	\$1,200
Monitoring <sup>3</sup>	\$1,200
<b>Total Cost/Fee Per Acre</b>	<b>\$4,700</b>

- (1) Assumes conservation easement on rural land acquisition of 125 acres which is the average parcel size within the PCAs. Acquisition costs include the easement land value (approximately \$1,800, or 40% discount value) and conveyance costs (legal contract, land survey, appraisal by a MAI certified appraiser, and County map processing)
- (2) Includes biological survey/baseline documentation, weed control and fuels treatment.
- (3) Includes endowment for on-going monitoring.
- (4) 10% Contingency and 15% administration costs added to each cost component.



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**6. COST COMPONENTS OF THE IN-LIEU FEE MITIGATION PROGRAM**

Fee Components.

Acquisition: Acquisition costs consist of the actual cost of the conservation easement; legal contract of the conservation easement; a site inspection; a survey by a land surveyor; an appraisal by a MAI certified appraiser; and County survey map processing.

Land values in the PCAs were estimated using actual sales data recorded by the County Assessor since January 2005. The Assessor provided sales data for more rural areas of the County and divided the data by various parcel size ranges. Provided that the average parcel size within the PCA is about 125 acres, with a median size of 84 acres, the Assessor's parcel range of between 60 acres and greater than 120 acres was used. The low and high values from this range were from \$3,000 to \$6,000 per acre, or an average of \$4,500 per acre.

Data on conservation easement values was collected from local area land trusts including the American River Conservancy, Amador Land Trust, Sacramento Valley Conservancy, Solano Land Trust, Yolo Land Trust, and Wildlife Heritage Foundation. ARC provided recent easement transaction information for parcels within the County, including within or near the PCA (along Rattlesnake Bar Road in Pilot Hill). The easement cost per acre for this recent transaction was about \$3,400, or 80 percent of the land value before the easement. The value and timing of other conservation easements held by ARC varied. Two very large easements along the Cosumnes River (Garibaldi Ranch 1,178 acres secured in year 2001, and Morales Ranch 1,815 acres secured in 2004) cost on average \$1,500 per acre. However, other smaller easements had a higher cost per acre (Chili Bar \$90,000 per acre for 4 acres in 2004, Williams \$7,600 per acre for 92 acres in December 2007, and Udvardy \$5,600 per acre for 96 acres in March 2007). Easement costs are driven by the zoning type and development potential on the property as valued by a qualified appraiser (MAI certified) for the purchase of the development rights. The parcels within the PCAs generally are zoned agriculture exclusive, and/or residential agriculture districts.

Some of the acquisition costs could be categorized more as flat rate costs per transaction. These include the legal contract for the easement (assuming no extraordinary circumstance), land survey and appraisal. However, to develop a per acre cost, these flat costs were divided by the average parcel size. Table B-3 exhibits the disaggregated Acquisition Fee component of the Conservation Fund in-lieu fee, both on a per acre basis and total cost for acquisition.

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<b>Table B-3</b> <b>ACQUISITION FEE COMPONENT</b> <b>Disaggregation per Acre</b> <b>(figures rounded to nearest whole dollar)</b> <b>(based on 125 acres)</b>		<b>Initial Cost</b>
Conservation Easement Value	\$1,800	\$224,700
Legal Contract	\$8	\$1,000
Site Inspection	\$11	\$1,375
Survey by Land Surveyor	\$12	\$1,500
Appraisal	\$34	\$4,250
County Survey Map Processing	\$8	\$1,000
<b>SUBTOTAL</b>	<b>\$1,873</b>	<b>\$233,825</b>
10% contingency/15% administration	\$500	\$62,000
<b>TOTAL</b>	<b>\$2,373</b>	<b>\$295,825</b>
(rounded to):	<b>\$2,300</b>	

Management: Management costs consist of biotic surveys and baseline documentation, weed control and fuels management. A biotic survey in drafting conservation easements is necessary to establish the natural resource value and to establish a baseline condition of the property at the time of the conveyance. Fuels management lessens the risk of catastrophic wildfire, as vegetation removal and management keeps landowners, nearby residents, firefighters, and oak woodlands in a safer condition, which also reduces liability on the land trust and County. The average cost for fuels management is spread on a per acre basis; however, the degree of treatment could vary. The Conservation Fund in-lieu fee assumes a one time fuels treatment application cost, with no assumed recurring costs.<sup>1</sup> Table B-4 exhibits the disaggregated Management Fee component of the Conservation Fund in-lieu fee.

<b>Table B-4</b> <b>MANAGEMENT FEE COMPONENT</b> <b>Disaggregation per Acre</b> <b>(figures rounded to nearest whole dollar)</b> <b>(based on 125 acres)</b>		<b>Initial Cost</b>
Qualified Professional	\$32	\$4,000
Project Management	\$11	\$1,375
Survey Equipment	\$1	\$125
Weed Control	\$14	\$1,750
Fuels Treatment*	\$900	\$112,400
<b>SUBTOTAL</b>	<b>\$957</b>	<b>\$119,650</b>
10% contingency/15% administration	\$300	\$31,700
<b>TOTAL</b>	<b>\$1,257</b>	<b>\$151,350</b>

<sup>1</sup> An adaptive management program assumes recurring fuels management perhaps every 10 to 15 years. To help address this issue, the contingency component of the Monitoring Fee Component is already included in the fee and would grow along with the endowment to help offset additional fuels treatment costs.

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(rounded to):	<b>\$1,200</b>	
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\* Cost for fuels treatment based on the following activities: prescribed burning, mastication, pruning, and fuel breaks within PCAs.

**Monitoring:** Monitoring costs consist of site monitoring, reporting, and endowment processing. Monitoring and reporting include database management, aerial photos, and photo documentation. Land trusts monitor their conservation easements to ensure long-term protection of the resource. Land trusts assume the legal obligation to carry out the donor’s desires by upholding the terms of the easement in perpetuity. In order to carry out these on-going liabilities, an endowment is necessary for easement upkeep. Table B-5 exhibits the disaggregated Monitoring Fee component of the Conservation Fund in-lieu fee.

<b>Table B-5</b>		<b>Initial Cost</b>
<b>MONITORING FEE COMPONENT</b>		
<b>Disaggregation per Acre</b>		
<b>(figures rounded to nearest whole dollar)</b>		
<b>(based on 125 acres)</b>		
Endowment	\$ 1,131	\$ 141,375
Database Management/ Reporting	\$ 7	\$ 875
Aerial Photos	\$ 8	\$1,000
Photo Documentation	\$ 6	\$ 750
Office Equip./Computers	\$ 1	\$ 125
Vehicle	\$ 1	\$ 125
Binoculars	\$1	\$ 125
Endowment Processing	\$ 5	\$ 625
SUBTOTAL	\$ 1,160	\$ 145,000
10% contingency/ 15% administration (excluding endowment)	\$ 8	\$ 1,000
TOTAL	\$ 1,168	\$ 146,000
(rounded to):	<b>\$ 1,200</b>	

**Total Cost/Fee per Acre:** The total cost/fee per acre includes 10% contingency and 15% administrative costs (overhead and administration of the land trust and County management and oversight cost), which are built into the individual cost components. The percentages are typical standards in the PAR model.

**Endowment and Adjustments:**

An endowment for on-going monitoring is necessary to ensure County compliance on both project and County-wide levels.

Adjustments to the fee in future years would need to be made to account for expected cost increases to acquire land and for land management activities. The land acquisition fee, for instance, would be adjusted based on the annual or five-year change in land value for property uses similar to those in the PCAs recorded by the County Assessor’s Office,

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using the Assessor’s Property System Use Codes. Similar adjustments would need to be made for the other cost components of the fee.

**7. ADJUSTMENTS TO THE FEE**

As costs for off-site mitigation grow over time, there would be a need to adjust the fee to closely match future cost increases. Provided that the fee structure is divided among the mitigation components (acquisition, management and monitoring), adjustments can be made according to appropriate measures that pertain to each of the components. For instance, the acquisition portion of the fee can be adjusted annually by the year-to-year change (or five or ten-year average change) in assessed valuation of County land as recorded by the County Assessor using the Property System Use Codes. Land uses excluded from the OWMP (e.g., commercial/industrial, community regions and rural centers, and low density residential) would not be included in the assessed valuation determination. According to the County Assessor data, from 1996 through 2006, total assessed land valuation for rural residential and farmland security zones increased on average by seven percent per year over the past ten years, and by nine percent over the past five years (2001 through 2006). The table below shows the change in assessed valuation for rural residential and farmland security zones.

**Table B-6: Assessed Valuation for Rural Residential and Farmland Security Zones  
1996 – 2006**

<b>Year</b>	<b>Valuation</b>	<b>Percent Change</b>
1996	1,192,722,423	
1997	1,213,220,701	2%
1998	1,240,161,432	2%
1999	1,287,669,871	4%
2000	1,345,818,292	5%
2001	1,438,363,826	7%
2002	1,505,076,338	5%
2003	1,626,184,599	8%
2004	1,725,828,197	6%
2005	1,992,765,153	15%
2006	2,236,419,067	12%
Avg.		7%

Notes: Total valuation using Assessor Property System Use Codes 21-26, and 55.

Source: El Dorado County Assessor

Adjustments to the management and monitoring fees can be made according to the change in the State’s mean wage rate for forestry and conservation related employment

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reported by the BLS. Provided that on-going management and monitoring costs are generally labor driven, changes in wage rates is an appropriate measure for the fees.

Five forestry and conservation related occupations reported by the BLS are identified and can be tracked for the change in wages for these occupations. The occupations include: Conservation scientists; Foresters; Forest and conservation technicians; First-line supervisors/managers of forestry workers; and Forest and conservation workers. According to BLS data specific to California, from 2000 through 2006, the average change in wages for these occupations was 2.2 percent per year.<sup>2</sup> The table below shows the change in wages for these related professions.

**Table B-7: Change in Wage Rates for Forestry and Conservation Related Employment 2000 - 2006**

Conservation Scientists			
Occupational Code 19-1031			
Year	Hourly Wage	Salary	% Change
2000	\$ 26.45	\$ 55,010	
2001	\$ 26.67	\$ 55,470	0.8%
2002	\$ 27.01	\$ 56,180	1.3%
2003	\$ 27.74	\$ 57,700	2.7%
2004	\$ 28.71	\$ 59,720	3.5%
2005	\$ 30.74	\$ 63,930	7.0%
2006	\$ 31.43	\$ 65,370	<u>2.3%</u>
Average			2.9%

Foresters			
Occupational Code 19-1032			
Year	Hourly Wage	Salary	% Change
2000	\$ 24.79	\$ 51,570	
2001	\$ 25.80	\$ 53,660	4.1%
2002	\$ 25.67	\$ 53,390	-0.5%
2003	\$ 27.71	\$ 57,640	8.0%
2004	\$ 28.69	\$ 59,670	3.5%
2005	\$ 23.16	\$ 48,160	-19.3%
2006	\$ 26.83	\$ 55,810	<u>15.9%</u>
Average			1.9%

Forest and Conservation Technicians			
Occupational Code 19-4093			

<sup>2</sup> The BLS contains separate wage data for Natural Scientists located in the Sacramento/Yolo area. However, this occupational heading is broad and does not specifically reflect forestry and conservation related professions.

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Year	Hourly Wage	Salary	% Change
2000	\$ 15.51	\$ 32,260	
2001	\$ 15.88	\$ 33,040	2.4%
2002	\$ 15.92	\$ 33,110	0.2%
2003	\$ 14.01	\$ 29,140	-12.0%
2004	\$ 14.77	\$ 30,720	5.4%
2005	\$ 15.21	\$ 31,640	3.0%
2006	\$ 16.93	\$ 35,220	<u>11.3%</u>
Average			1.7%

First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers Occupational Code 45-1011			
Year	Hourly Wage	Salary	% Change
2000	\$ 16.49	\$ 34,300	
2001	\$ 16.71	\$ 34,750	1.3%
2002	\$ 16.86	\$ 35,070	0.9%
2003	\$ 17.15	\$ 35,670	1.7%
2004	\$ 16.62	\$ 34,570	-3.1%
2005	\$ 15.62	\$ 32,490	-6.0%
2006	\$ 15.99	\$ 33,270	<u>2.4%</u>
Average			-0.5%

Forest and Conservation Workers Occupational Code 45-4011			
Year	Hourly Wage	Salary	% Change
2000	\$ 8.30	\$ 17,270	
2001	\$ 9.46	\$ 19,670	13.9%
2002	\$ 9.88	\$ 20,540	4.4%
2003	\$ 10.24	\$ 21,290	3.7%
2004	\$ 10.72	\$ 22,300	4.7%
2005	\$ 11.05	\$ 22,980	3.0%
2006	\$ 10.93	\$ 22,730	<u>-1.1%</u>
Average			4.8%

Average Wage Growth of All Occupations: 2.2%

Source: Federal Bureau of Labor Statistics (BLS).

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Appendix B Exhibits

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## Appendix B Option B – Mitigation Fee

### Estimated Cost of Conservation Easement within PCAs

Expenditure	Specification	Unit Type	Unit Count	Unit Cost	Initial & Capital Years	Initial & Capital Costs	Ongoing Years	Ongoing Costs
<b>Acquisition</b>								
Conservation Easement	Parcel	Acre	125	\$1,800	1	\$224,754	0	\$0
Legal Contract and Review	Easement Contract	Item	1	\$1,000	1	\$1,000	0	\$0
Site Inspection, coordination between County & landowner	Preserve Manager	L. hours	16	\$85	1	\$1,360	0	\$0
Survey by Land Surveyor	Report & Map	Item	1	\$1,500	1	\$1,500	0	\$0
Appraisal	Report by MAI Certified Appraiser	Item	1	\$4,250	1	\$4,250	0	\$0
County Survey Map Processing	Government Services	L. Hours	12	\$80	1	\$960	0	\$0
<b>Biological Surveys/Baseline Documentation</b>								
Qualified Professional	Species Surveys	L. Hours	50	\$80	1	\$4,000	10	\$400
Project Management	Supervision/Coordination	L. Hours	16	\$85	1	\$1,360	10	\$136
Survey Equipment	Equipment	Item	0.1	\$1,000	1	\$100	10	\$10
<b>Habitat Maintenance</b>								
Weed Control	Herbicide Treatment	L. Hours	50	\$35	1	\$1,750	5	\$350
Fuels Treatment	Fuels Treatment	Acre	125	\$900	1	\$112,377	0	\$0
<b>Reporting/Monitoring</b>								
Database Management/Reporting	Report	L. Hours	24	\$35	1	\$840	1	\$840
Aerial Photos	Photos	Item	1	\$1,000	1	\$1,000	5	\$200
Photodocumentation	Field Survey/Site Evaluation	L. Hours	20	\$35.00	1	\$700	1	\$700
<b>Office Maintenance</b>								
Office Equipment/Computers	Computer, printer, materials	Item	0.1	\$1,500	1	\$150	5	\$30
<b>Field Equipment</b>								
Vehicle	Fuel & Maintenance	Mileage	150	\$0.50	1	\$75	1	\$75
Binoculars	Binoculars	Item	0.1	\$400	1	\$40	5	\$8
<b>Operations</b>								
Endowment	Process/Administer Endowment	L. hours	20	\$30	1	\$600	1	\$600
<b>Subtotal Conservation Easement</b>						\$356,817		\$3,349
<b>Contingency @ 10%</b>						\$35,682		\$335
<b>Administration @ 15%</b>						\$58,875		\$553
<b>Total Conservation Easement</b>						<b>\$451,373</b>		<b>\$4,236</b>
<b>Total Conservation Easement per Acre</b>						\$3,615		\$34

#### Endowment Amount

Endowment Amount	\$141,216	\$1,131	Cost/acre
Capitalization Rate	3.0%		
Inflation	3.0%		
Investment Return	6.0%		
	Year 1 (After Funding)	Per Acre	
Starting endowment	\$141,216	\$1,131	
Investment Earnings	\$8,473	\$68	
Annual expenditure	\$4,236	\$34	
Inflation re-invested into endowment	\$4,236	\$34	
Ending endowment balance	\$145,453	\$1,165	

Assumptions: Capitalization Rate is investment return less inflation.

<b>Fee Per Acre for Conservation Easement (rounded)</b>	<b>\$4,700</b>
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#### Notes:

Assumes 125 acres per transaction, based on average parcel size within PCAs.

Rural land prices based on Assessor's recorded parcel sales for parcel size ranges between 60 and greater than 120 acres.

Conservation Easement discount factor is 40% of value before easement, based on recent purchase transactions undertaken by ARC.

10% Contingency and 15% Administration Cost applied to all direct costs.

**Appendix B**  
**Option B – Mitigation Fee**

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# Appendix C

## General Plan Policies Applicable to OWMP

**Appendix C**  
**General Plan Goals, Measures, and Policies Applicable to the OWMP**

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**Appendix C**  
**General Plan Goals, Measures, and Policies Applicable to the OWMP**

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**MEASURE CO-P**

Develop and adopt an Oak Resources Management Plan. The plan shall address the following:

- Mitigation standards outlined in Policy 7.4.4.4;
- Thresholds of significance for the loss of oak woodlands;
- Requirements for tree surveys and mitigation plans for discretionary projects;
- Replanting and replacement standards;
- Heritage/landmark tree protection standards; and
- An Oak Tree Preservation Ordinance as outlined in Policy 7.4.5.2.

[Policies 7.4.4.4 and 7.4.5.2]

Responsibility:	Planning Department
Time Frame:	Within two years of General Plan adoption.

**GOAL 7.4: WILDLIFE AND VEGETATION RESOURCES**

Identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value.

**OBJECTIVE 7.4.4: FOREST AND OAK WOODLAND RESOURCES**

Protect and conserve forest and woodland resources for their wildlife habitat, recreation, water production, domestic livestock grazing, production of a sustainable flow of wood products, and aesthetic values.

**Policy 7.4.4.4**

For all new development projects (not including agricultural cultivation and actions pursuant to an approved Fire Safe Plan necessary to protect existing structures, both of which are exempt from this policy) that would result in soil disturbance on parcels that (1) are over an acre and have at least 1 percent total canopy cover or (2) are less than an acre and have at least 10 percent total canopy cover by woodlands habitats as defined in this General Plan and determined from base line aerial photography or by site survey performed by a qualified biologist or licensed arborist, the County shall require one of two mitigation options: (1) the project applicant shall adhere to the tree canopy retention and replacement standards described below; or (2) the project applicant shall contribute to the County's Integrated Natural Resources Management Plan (INRMP) conservation fund described in Policy 7.4.2.8.

**Appendix C**  
**General Plan Goals, Measures, and Policies Applicable to the OWMP**

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Option A

The County shall apply the following tree canopy retention standards:

Percent Existing Canopy Cover	Canopy Cover to be Retained
80–100	60% of existing canopy
60–79	70% of existing canopy
40–59	80% of existing canopy
20–39	85% of existing canopy
10-19	90% of existing canopy
1-9 for parcels > 1 acre	90% of existing canopy

Under Option A, the project applicant shall also replace woodland habitat removed at 1:1 ratio. Impacts on woodland habitat and mitigation requirements shall be addressed in a Biological Resources Study and Important Habitat Mitigation Plan as described in Policy 7.4.2.8. Woodland replacement shall be based on a formula, developed by the County, that accounts for the number of trees and acreage affected.

Option B

The project applicant shall provide sufficient funding to the County's INRMP conservation fund, described in Policy 7.4.2.8, to fully compensate for the impact to oak woodland habitat. To compensate for fragmentation as well as habitat loss, the preservation mitigation ratio shall be 2:1 and based on the total woodland acreage onsite directly impacted by habitat loss and indirectly impacted by habitat fragmentation. The costs associated with acquisition, restoration, and management of the habitat protected shall be included in the mitigation fee. Impacts on woodland habitat and mitigation requirements shall be addressed in a Biological Resources Study and Important Habitat Mitigation Plan as described in Policy 7.4.2.8.

**Policy 7.4.4.5**

Where existing individual or a group of oak trees are lost within a stand, a corridor of oak trees shall be retained that maintains continuity between all portions of the stand. The retained corridor shall have a tree density that is equal to the density of the stand.

**OBJECTIVE 7.4.5: NATIVE VEGETATION AND LANDMARK TREES**

Protect and maintain native trees including oaks and landmark and heritage trees.

**Appendix C**  
**General Plan Goals, Measures, and Policies Applicable to the OWMP**

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**Policy 7.4.5.1**

A tree survey, preservation, and replacement plan shall be required to be filed with the County prior to issuance of a grading permit for discretionary permits on all high-density residential, multifamily residential, commercial, and industrial projects. To ensure that proposed replacement trees survive, a mitigation monitoring plan should be incorporated into discretionary projects when applicable and shall include provisions for necessary replacement of trees.

**Policy 7.4.5.2**

It shall be the policy of the County to preserve native oaks wherever feasible, through the review of all proposed development activities where such trees are present on either public or private property, while at the same time recognizing individual rights to develop private property in a reasonable manner. To ensure that oak tree loss is reduced to reasonable acceptable levels, the County shall develop and implement an Oak Tree Preservation Ordinance that includes the following components:

- A. Oak Tree Removal Permit Process. Except under special exemptions, a tree removal permit shall be required by the County for removal of any native oak tree with a single main trunk of at least 6 inches diameter at breast height (dbh), or a multiple trunk with an aggregate of at least 10 inches dbh. Special exemptions when a tree removal permit is not needed shall include removal of trees less than 36 inches dbh on 1) lands in Williamson Act Contracts, Farmland Security Zone Programs, Timber Production Zones, Agricultural Districts, designated Agricultural Land (AL), and actions pursuant to a Fire Safe plan; 2) all single family residential lots of one acre or less that cannot be further subdivided; 3) when a native oak tree is cut down on the owner's property for the owner's personal use; and 4) when written approval has been received from the County Planning Department. In passing judgment upon tree removal permit applications, the County may impose such reasonable conditions of approval as are necessary to protect the health of existing oak trees, the public and the surrounding property, or sensitive habitats. The County Planning Department may condition any removal of native oaks upon the replacement of trees in kind. The replacement requirement shall be calculated based upon an inch for inch replacement of removed oaks. The total of replacement trees shall have a combined diameter of the tree(s) removed. Replacement trees may be planted onsite or in other areas to the satisfaction of the County Planning Department. The County may also condition any tree removal permit that would affect sensitive habitat (e.g., valley oak woodland), on preparation of a Biological Resources Study and an Important Habitat Mitigation Program as described in Policy 7.4.1.6. If an application is denied, the County shall provide written notification, including the reasons for denial, to the applicant.

**Appendix C**  
**General Plan Goals, Measures, and Policies Applicable to the OWMP**

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- B. Tree Removal Associated with Discretionary Project. Any person desiring to remove a native oak shall provide the County with the following as part of the project application:
- A written statement by the applicant or an arborist stating the justification for the development activity, identifying how trees in the vicinity of the project or construction site will be protected and stating that all construction activity will follow approved preservation methods;
  - A site map plan that identifies all native oaks on the project site; and
  - A report by a certified arborist that provides specific information for all native oak trees on the project site.
- C. Commercial Firewood Cutting. Fuel wood production is considered commercial when a party cuts firewood for sale or profit. An oak tree removal permit shall be required for commercial firewood cutting of any native oak tree. In reviewing a permit application, the Planning Department shall consider the following:
- Whether the trees to be removed would have a significant negative environmental impact;
  - Whether the proposed removal would not result in clear-cutting, but will result in thinning or stand improvement;
  - Whether replanting would be necessary to ensure adequate regeneration;
  - Whether the removal would create the potential for soil erosion;
  - Whether any other limitations or conditions should be imposed in accordance with sound tree management practices; and
  - What the extent of the resulting canopy cover would be.
- D. Penalties. Fines will be issued to any person, firm, or corporation that is not exempt from the ordinance who damages or destroys an oak tree without first obtaining an oak tree removal permit. Fines may be as high as three times the current market value of replacement trees as well as the cost of replacement, and/or replacement of up to three times the number of trees required by the ordinance. If oak trees are removed without a tree removal permit, the County Planning Department may choose to deny or defer approval of any application for development of that property for a period of up to 5 years. All monies received for replacement of illegally removed or damaged trees shall be deposited in the County's Integrated Natural Resources Management Plan (INRMP) conservation fund.



# Appendix D

## Best Management Practices for Oak Woodlands

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## Appendix D Best Management Practices

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Information on building around oaks and oaks in the home garden can be found in the Integrated Hardwood Range Management Program's (IHRMP) leaflet, Living Among the Oaks. Additional information on disturbance around oaks and protecting trees from construction impacts can be found in the UC Cooperative Extension's (UCCE) handout, Disturbance Around Oaks (Frost, 2001) and the California Department of Forestry's (CDF) Tree Notes, Protecting Trees from Construction Impacts (Sanborn, 1989). Information on the care of oak trees is also available through the California Oak Foundation (<http://www.californiaoaks.org/ExtAssets/oakcaresec.pdf>). Qualified professionals and interested persons should contact the local El Dorado County UCCE Advisor and the IHRMP and other sources for the most recent research.

The following are general guidelines or best management practices for tree protection during construction activities, taken from some of the above sources:

- The root protection zone (RPZ) is roughly one-third larger than the drip line (or outermost edge of the foliage based on the longest branch).
- Install high visibility fencing around the RPZ of any tree or cluster of trees with overlapping canopy that are identified on an approved grading plan as needing protection. The fencing should be four-feet high and bright orange with steel t-posts spaced 8 feet apart.
- Do not grade, cut, fill or trench within the RPZ.
- Do not store oil, gasoline, chemicals, other construction materials, or equipment within the RPZ.
- Do not store soil within the RPZ.
- Do not allow concrete, plaster, or paint washout within the RPZ.
- Do not irrigate within the RPZ or allow irrigation to filter into the RPZ.
- Plant only drought tolerant species within the RPZ.

The following are general guidelines for protecting oak trees in gardens and yards.

- Avoid summer irrigation.
- Disturb the zone within six feet of the trunk as little as possible. The base of the tree should be kept dry.
- Limit plantings beneath oak trees to drought-tolerant species that do not require summer irrigation.
- Landscape beneath oak trees with non-living plant materials such as wood chips.
- Refer to Living Among the Oaks or contact the El Dorado County Master Gardener Program (through the UCCE office) for more information on oaks in the home garden.

**Appendix D**  
**Best Management Practices**

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# Appendix E

Guidelines for Maintenance, Restoration,  
and Rehabilitation of Oak Woodlands

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## **Appendix E**

### **Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Woodlands**

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The following recommendations for the maintenance, restoration, and rehabilitation of oak woodlands are taken directly from Regenerating Rangeland Oaks in California, University of California Agriculture & Natural Resources Publication 21601 (McCreary, 2001). How to Grow California Oaks (<http://danr.ucop.edu/ihrmp/oak04.htm>) and How to Collect, Store, and Plant Acorns (<http://www.californiaoaks.org/ExtAssets/HowToAcorns07.pdf>) have additional information. Qualified professionals and interested persons are encouraged to consult these resources and other current sources of information.

#### Recommended Acorn Collection and Storage Procedures

- Collect acorns in the fall, several weeks after the first ones have started to drop and when those remaining on the tree can be easily dislodged from the acorn cap by gentle twisting.
- If possible, collect acorns directly from the branches of trees, rather than from the ground.
- If acorns are collected from the ground, place them in a bucket of water for several hours, and discard floaters.
- Stratify acorns from the black oak group (e.g., black oak, interior live oak) by soaking them in water for 24 hours and then storing them in a cooler or refrigerator for 30 to 90 days before sowing.
- Store acorns in a cooler or refrigerator in loosely sealed plastic bags, but do not store acorns from the white oak group (e.g., valley oak, blue oak, Oregon white oak) for more than 1 or 2 months before planting to ensure greatest viability.
- If acorns start to germinate during storage, remove and plant them as soon as possible.
- If mold develops during storage, and acorns and radicles are discolored and slimy, discard acorns.

#### Recommended Methods for Sowing Acorns of Rangeland Oaks in the Field

- Sow acorns in the fall and early winter, as soon as soil has been moistened several inches down.
- If possible, pregerminate acorns before planting and outplant when radicles are ¼ inch to ½ inch (1/2 cm to 1 cm) long.
- Cover acorns with ½ to 1 inch (1 to 2 ½ cm) of soil.
- If acorn depredation is suspected as a serious problem (high populations of rodents are present), plant deeper, up to 2 inches (5cm).
- If acorns begin to germinate during storage, outplant as soon as possible with the radicle pointing down. Use a screwdriver or pencil to make a hole in the soil for the radicle.
- If radicles become too long, tangled, and unwieldy to permit planting, clip them back to ½ inch (1 cm) and outplant.

## **Appendix E**

### **Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Woodlands**

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- If acorn planting spots have aboveground protection (treeshelters), and acorns have not been pregerminated, plant two or three acorns per planting spot and thin to the best seedling after 1 year.
- Keep planting pots free of weeds for at least 3 years after planting.

#### Recommended Procedure for Planting Rangeland Oaks

- Plant oak seedlings early in the growing season, soon after the first fall rains have saturated the soil; do not plant after early March unless irrigation is planned.
- Make sure seedlings are not frozen, allowed to dry out, or physically damaged before, during, or after planting.
- Plant seedlings at proper depth, making sure they are not J-rooted, and eliminate air pockets in soil adjacent to seedling roots
- In hard, compacted soils, break up soil (using a shovel, auger or posthole digger) through the compacted zone prior to planting to promote deeper rooting. If planting holes are augered, make sure that the sides of the holes are not glazed.
- Select microsites for planting that afford some natural protection and provide the most favorable growing conditions.
- Plant in a natural pattern, avoiding straight, evenly spaced rows.

#### Recommended Weed Control Procedures

- Select method of weed control (herbicides, physical weed removal, or mulching) based on environmental, fiscal, and philosophical considerations.
- Maintain a weed-free circle that is 4 feet (1.2m) in diameter around individual seedlings or acorns for at least 2 to 3 years after planting; if using herbicides to control weeds, remove weeds in circle with a diameter of 6 feet (1.8m)
- Initiate annual weed control by early spring to ensure that weeds do not become established and deplete soil moisture before oak roots can penetrate downward.
- Visit planting sites at least twice annually to remove both early- and late-season weeds that may have grown through mulch.
- If using postemergent herbicides, make sure that chemicals do not come in contact with foliage or the expanding buds of seedlings.
- After weed control is discontinued, visit plantings regularly to make sure vole populations and damage to seedlings have not increased. If increases are observed, remove thatch.

#### Methods of Protecting Trees from Animals

- Fences and large cages are effective only if livestock and deer are the only animals of concern. Fences require a large initial investment and result in fenced areas being removed from livestock production. Fences and cages must be maintained regularly.



## **Appendix E**

### **Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Woodlands**

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- Screen cylinders provide adequate short-term protection against insects, rodents, and deer but are ineffective against livestock, insects, or small rodents. Shoots that grow through the sides of tubes are vulnerable to browsing.
- Treeshelters have proven very effective in protecting rangeland oak seedlings from a wide range of animals and stimulating rapid, above-ground growth. They are relatively expensive but can greatly reduce the time required for seedlings to grow to sapling stage.
- Habitat modification can reduce damage from grasshoppers and some rodents, but it is ineffective for larger ranging animals, such as deer. Care must be taken to monitor the regrowth of vegetation or animals will quickly reoccupy site.

#### Recommended Procedures for Treeshelter Installation

- Select the size of treeshelter based on the browsing height of animals that are a threat.
- Install shelters so that they are upright and secure them to stakes using plastic ratchet clips or wire; make sure that seedlings are not damaged when shelters are secured to posts.
- When treeshelters are used, plant in an aesthetic, “natural” arrangement rather than in regular, evenly spaced rows.
- Utilize stakes that are durable enough to last the length of time treeshelters will be in place and pound them at least 1 foot (31 cm) into the ground before planting seedlings.
- Make sure that the tops of stakes are lower than the tops of shelters to prevent access by rodents that can climb stakes and damage to seedling shoots from rubbing against stakes.
- To prevent seedling desiccation, install shelters with the base buried in the ground.
- To prevent bird access, install plastic shelters with the base buried in the ground.
- If treeshelters are placed in pastures grazed by livestock, secure the shelters to metal posts using wire and thread flexible wire through the top instead of using plastic netting.

#### Recommended Treeshelter Maintenance Procedures

- Visit shelters at least once each year to make sure they are upright, attached to the stake, buried in the ground, and functioning properly.
- Keep a 4-foot (1.2 m) diameter or larger circle around shelters free of weeds for at least 2 years after planting, and remove weeds that grow inside shelters.
- Replace flexible netting that has blown off shelter tops.
- Replace stakes that have rotted or broken.
- Leave shelters in place for at least 3 years after seedlings have grown out the tops, longer if shelters are still intact and are still intact and are effectively protecting seedlings.

**Appendix E**  
**Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Woodlands**

- Remove shelters if they are restricting growth or abrading seedlings; to remove solid shelters, slice down the sides with a razor or knife, being careful not to damage the seedling inside.

Fertilization, Irrigation, and Top Pruning

- Place .74-ounce (21-g), slow release fertilizer tablets (20-10-5) 3 to 4 inches (7.5 to 10 cm) below planted acorns or seedlings.
- Irrigation in many situations is not necessary if there is timely and thorough weed control.
- If irrigation is needed for established and the terrain is steep or percolation of water through soil is slow, construct earthen irrigation basins.
- Provide irrigation in the form of infrequent, deep irrigations rather than frequent, shallow irrigations; time irrigations to extend the rainy season.
- Always control competing vegetation, even in situations where supplemental irrigation is provided.
- Top-prune seedlings at the time of planting if they are too tall and are out of balance with root systems; prune small, liner stock back to a 6-inch (15 cm) top.

# Appendix F

## Resources

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## Appendix F Resources

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### **California Cattleman's Association**

1221 H. Street, Suite 101  
Sacramento, CA 95814  
(916) 444-0845

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

### **California Department of Forestry and Fire Protection (CDF / CAL FIRE)**

1416 Ninth Street  
Sacramento, CA 95814  
(916) 227-2657

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

### **California Farm Bureau Federation**

1601 Exposition Boulevard  
Sacramento, CA 95815  
(916) 561-5500

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

### **California Native Plant Society**

2707 K Street, Suite 1  
Sacramento, CA 95816

<http://www.cnps.org>

### **California Oak Foundation**

1212 Broadway, Suite 810  
Oakland, CA 94612  
(510) 763-0282

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

### **California Oak Mortality Task Force**

<http://nature.berkeley.edu/comtf/>

### **California Wildlife Conservation Board, Oak Woodlands Conservation Program**

[http://www.wcb.ca.gov/Pages/oak\\_woodlands\\_program.htm](http://www.wcb.ca.gov/Pages/oak_woodlands_program.htm)

### **El Dorado County U.C. Master Gardeners**

311 Fair Lane  
Placerville, CA 95667  
(530) 621-5512

The office is staffed 9 a.m. to noon, Monday through Friday.

[http://ucce.ucdavis.edu/counties/ceeldorado/Master\\_Gardener/](http://ucce.ucdavis.edu/counties/ceeldorado/Master_Gardener/)

## Appendix F Resources

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### **The Nature Conservancy**

785 Market Street  
San Francisco, CA 94103  
(415) 777-0487  
<http://nature.org/>

### **University of California Integrated Hardwood Management Program**

<http://danr.ucop.edu/ihrmp/>

### **University of California Cooperative Extension**

Bill Frost, Ph.D.  
Director for El Dorado County  
311 Fair Lane  
Placerville, CA 95667  
(530) 621-5509  
Fax: (530) 642-0803  
<http://ceeldorado.ucdavis.edu>  
**Email:** [wefrost@ucdavis.edu](mailto:wefrost@ucdavis.edu)

### **University of California Cooperative Extension's Livestock and Natural Resources**

<http://danr.ucop.edu/uccehr/uccehr.htm>

### **SPECIFIC RESOURCE ARTICLES:**

*Blue oak seedling age influences growth and mortality*

<http://californiaagriculture.ucop.edu/0701JFM/pdfs/OakAge.pdf>

*Blue Oaks: Forage Production and Quality*

<http://danr.ucop.edu/ihrmp/oak32.htm>

*Exclosure size affects young blue oak seedling growth*

<http://californiaagriculture.ucop.edu/0701JFM/pdfs/OakEnclosures.pdf>

*Factors affecting blue oak sapling recruitment and regeneration*

[http://www.phytosphere.com/publications/Factors\\_affecting\\_blue\\_oak\\_sapling\\_recruitment\\_and\\_regeneration.pdf](http://www.phytosphere.com/publications/Factors_affecting_blue_oak_sapling_recruitment_and_regeneration.pdf)

*How to grow California oaks*

<http://danr.ucop.edu/ihrmp/oak04.htm>

## Appendix F Resources

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### *Managed Grazing and Seedling Shelters*

#### *Enhance Oak Regeneration on Rangelands*

<http://calag.ucop.edu/0504OND/pdfs/OakRegeneration.pdf>

### *Modeling the Effectiveness of Tree Planting to Mitigate Habitat Loss in Blue Oak Woodlands*

<http://danr.ucop.edu/ihrmp/proceed/standiford.pdf>

### *Oak Seedlings Can Be Established on Grazed Rangelands*

<http://ucanr.org/delivers/impactview.cfm?impactnum=539>

### *PRC §21083.4*

<http://info.sen.ca.gov/cgi-bin/displaycode?section=prc&group=21001-22000&file=21080-21098>

### *Recommendations to reduce deer grazing*

<http://www.dfg.ca.gov/hunting/deer/gardenersguide.pdf>

### *Restoring Oak Woodlands in California: Theory and Practice*

<http://www.phytosphere.com/restoringoakwoodlands/oakrestoration.htm>

### *Rotational Grazing with Cattle to Restore Oak Savanna/Woodland Structure*

<http://cias.wisc.edu/wicst/pubs/oaksavarticle.htm>

### *Small-Parcel Landowner's Guide to Woodland Management*

<http://anrcatalog.ucdavis.edu/pdf/8263.pdf>

## **NURSERIES:**

Inclusion on this list does not indicate a recommendation but a possible resource. Acorns and seedlings from local sources are better adapted for local conditions and using them will improve the chances for successful plantings. The source should be identified for any purchase.

### **Local Nurseries that may sell native plants**

Camino Garden Center  
3400 Carson Court  
Camino

DeVorss Landscape Nursery Inc.  
334 Green Valley Road  
El Dorado Hills

## Appendix F Resources

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El Dorado Nursery & Garden Inc.  
3931 C Durock Road  
Shingle Springs

Front Yard Nursery  
5801 Mother Lode Drive  
Placerville

Golden Gecko Garden Center  
4665 Marshall Road  
Garden Valley

Lotus Valley Nursery & Garden  
5606 Petersen Lane  
Lotus

### **Native Plant Nurseries**

Identified through the California Native Plant Society (CNPS) website at  
<http://www.cnps.org/cnps/horticulture/nurseries.php>

Bitterroot Restoration, Inc.  
55 Sierra College Boulevard  
Lincoln, CA 95648  
(916) 434-9571  
[www.bitterrootrestoration.com](http://www.bitterrootrestoration.com)  
*Wholesale and custom growing*

California Native Plant Society plant sales  
<http://www.eldoradocnps.org/chapterPages/home.html>  
*Held twice a year, CNPS often offers local native oaks for sale.*

Cornflower Farms  
P.O. Box 896  
Elk Grove, CA 95759  
(916) 689-1015  
[www.cornflowerfarms.com](http://www.cornflowerfarms.com)  
*Container plants, 80%-90% natives, revegetation and restoration. Open for retail sales the 2nd Saturday of each month from March to November from 7:30 am - 2:00 pm.*



## Appendix F Resources

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### Floral Native Nursery

2511 Floral Avenue

Chico, CA 95973

(530) 892-2511 (phone/fax)

[www.floralnativenursery.com](http://www.floralnativenursery.com)

*Dedicated to growing California Native plants for landscaping and restoration.*

*Wholesale and retail.*

### Forest Seeds of California

1100 Indian Hill Road

Placerville, CA 95667

(530) 621-1551

*Mail order tree & shrub seeds, contract collect.*

### Hartland Nursery

13737 Grand Island Road

Walnut Grove, CA 95690

(916) 775-4021

[www.hartlandnursery.com](http://www.hartlandnursery.com)

*Specializes in growing plants that are native to Northern California's Central Valley.*

### Intermountain Nursery

30443 N. Auberry Road

Prather, CA 93651

(559) 855-3113

*Specialize in drought tolerant CA native plants for the central valley floor up into the central Sierra Nevada. Retail hours are Friday and Saturday 8am-5pm, Sunday 10am until 4pm. Also do contract growing and wholesale.*

### Native Springs Nursery

P.O. Box 4071

Yankee Hill, CA 95965

Butte County

(530) 514-8578

[www.nativespringsnursery.com](http://www.nativespringsnursery.com)

*Specializes in native conifers and other native CA plants. Mail order encouraged.*

## Appendix F Resources

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Park Place Gardens Nursery

P.O. Box 789

Loomis, CA 95650

(916) 276-8225

[www.ppgn.com](http://www.ppgn.com)

*Wholesale nursery specializing in landscape trees and shrubs, adaptable to Northern California and including many natives.*

# Appendix G

## Literature Cited

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