El Dorado County
Oak Resources
Management Plan

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El Dorado County Planning and Building Department
Planning Division – Long Range Unit
2850 Fairlane Court, Placerville, CA 95667

OAK RESOURCES MANAGEMENT PLAN

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1.0 Introduction

This Oak Resources Management Plan (ORMP) updates and revises the Oak Woodland Management Plan adopted by the El Dorado County Board of Supervisors on May 6, 2008 (El Dorado County 2008). It incorporates more recent oak resources mapping data for the County and reflects policy language changes made during the General Plan Biological Policy Review project conducted in 2015. This ORMP incorporates relevant information included in the 2008 Plan, where applicable, and was prepared in coordination with El Dorado County Community Development Agency staff. It also incorporates public input gathered during project-focused hearings and direction given by the El Dorado County Board of Supervisors. Additionally, it incorporates further amendments to the Oak Resources Conservation Ordinance (Chapter 130.39 of the County Ordinance Code) adopted by the El Dorado County Board of Supervisors on July 22, 2025 (Ordinance No. 5235). All relevant terms and definitions are located in Section 6.0 (Definitions) of this Plan.

1.1 Purpose

The purpose of this ORMP is to define mitigation requirements for impacts to oak resources (oak woodlands, individual native oak trees, and Heritage Trees) and to outline the County's strategy for oak woodland conservation. This ORMP functions as the oak resources component of the County's biological resources mitigation program, identified in General Plan Policy 7.4.2.8. This ORMP identifies standards for oak woodland and native oak tree impact determination, mechanisms to mitigate oak woodland and native oak tree impacts, technical report submittal requirements, minimum qualifications for technical report preparation, mitigation monitoring and reporting requirements, and projects or actions that are exempt from mitigation requirements. This ORMP also establishes an in-lieu fee payment option for impacts to oak resources, identifies Priority Conservation Areas (PCAs) where oak woodland conservation efforts may be focused, and outlines minimum standards for identification of oak woodland conservation areas outside the PCAs. Requirements for maintenance and monitoring of conserved oak woodland areas and identification of allowable uses within conserved oak woodland areas are also included in this ORMP. Lastly, the ORMP establishes a plan for voluntary conservation that landowners, the County, and others may use to seek grants and cost-sharing from state programs for oak woodland conservation in El Dorado County.

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 a less than significant level. 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. During the General Plan Biological Policy Review project conducted in 2015, these policies were edited and consolidated into one single policy (Policy 7.4.4.4). Implementation Measure CO-P was also modified during this process. The revised language in Policy 7.4.4.4 states that mitigation requirements for impacts to oak resources (oak woodlands, individual native oak trees, and Heritage Trees) shall be outlined in this ORMP. Revised Implementation Measure CO-P directs the County to develop and adopt an ORMP that addresses the following:

- Mitigation standards for oak resources impacts;
- Definitions of exempt projects and actions;
- Technical report requirements;
- Oak resources mitigation options and standards;
- Heritage Tree mitigation standards; and
- Oak resources mitigation monitoring and reporting requirements.

An Oak Resources Conservation Ordinance, which implements the standards set forth in the ORMP, was adopted at the same time as the ORMP and is codified in Chapter 130.39 of the Zoning Ordinance. This chapter was last amended by Ordinance No. 5235 on July 22, 2025.

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.

This ORMP serves multiple purposes. It defines the County's conservation strategy for oak resources and provides a framework for mitigating impacts to oak resources. It also complies with Implementation Measure CO-P and constitutes the oak portion of the County's Biological Resources Mitigation Program (General Plan Policy 7.4. 2.8). Finally, it establishes 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.

1.2 Goals and Objectives of Plan

The ORMP 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, Oak Woodland, and Tree Resources*: Protect and conserve forest, oak woodland, and tree 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 set forth by the General Plan are met in this ORMP:

- Identify standards for determining oak woodland and native oak tree impacts, outline impact mitigation requirements and options, identify technical report submittal requirements, and outline impact mitigation monitoring and reporting requirements;
- Define Heritage Trees and identify impact mitigation requirements;
- Provide mitigation alternatives for impacts to oak resources consistent with state-level requirements;

- Provide a flexible framework for oak resources mitigation via on-site and off-site mechanisms, including an in-lieu fee payment program;
- Develop an oak woodland in-lieu fee and an individual native oak tree-based in-lieu fee;
- Identify Priority Conservation Areas (PCAs) within large expanses of contiguous oak woodland habitat where land or conservation easements may be acquired from willing sellers to offset the effects of increased habitat loss and fragmentation elsewhere;
- Identify minimum standards under which oak woodland conservation may occur outside of identified PCAs;
- 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).

1.3 Oak Resources in El Dorado County

1.3.1 Oak Woodlands

The term "oak woodland" is defined in the Oak Woodlands Conservation Act (Article 3.5 (commencing with Section 1360) of Chapter 4 of Division 2 of the Fish and Game Code) as "an oak stand with a greater than ten percent canopy cover or that may have historically supported greater than ten percent canopy cover." For the purposes of this ORMP, the conservation focus is on existing oak woodlands. This ORMP addresses the same study area (below 4,000 feet elevation) and same categories of oak woodlands (California Department of Forestry and Fire Protection (CAL FIRE) California Fire and Resource Assessment Program (FRAP) data) as were addressed in the 2008 Oak Woodland Management Plan. These categories of oak woodland were also addressed in the 2004 General Plan using FRAP data from 2002. More recent oak woodland distribution data for El Dorado County available via FRAP (CAL FIRE 2015) identifies six oak woodland types, which are listed in Table 1 below, along with the acreage of each category found within the ORMP study area. Less than 3,500 acres of valley oak woodland is mapped for El Dorado County, which is designated as a "sensitive habitat" in the General Plan EIR. Finally, while coastal oak woodland is identified in the 2015 FRAP vegetation data set for the ORMP planning area, its presence is unlikely given the range of its dominant tree species (coast live oak (*Quercus agrifolia*)). This classification may be the result of an image processing error during creation of the 2015 FRAP data set and the area is likely another oak woodland type.

Table 1
Acreage of Oak Woodland Types in the ORMP Planning Area (2015 FRAP Data)

Oak Woodland Type	CWHR Code	Acreage	Percent
Blue oak woodland	BOW	46,521	18.9%
Blue oak-foothill pine	BOP	64,740	26.2%
Coastal oak woodland	COW	2	<0.1%
Montane hardwood	MHW	98,930	40.1%
Montane hardwood-conifer	MHC	32,643	13.2%
Valley oak woodland	VOW	3,970	1.6%
	Total:	**246,806**	**100%**

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

1.3.2 Oak Trees

There are six primary native oak tree species in El Dorado County, including blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), interior live oak (*Quercus wislizeni*), canyon live oak (*Quercus chrysolepis*), and Oregon oak (*Quercus garryana*). Additionally, one native hybrid between California black oak and interior live oak exists, known as oracle oak (*Quercus x morehus*). These oak species comprise the County's oak woodlands and also occur outside of oak woodlands as isolated individuals or small groups.

1.4 Economic Activity, Land, and Ecosystem Values of Oak Resources

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

Studies have also concluded that the presence of oak resources enhances property value by providing shade, wind breaks, sound absorption, land use buffers, erosion control, and aesthetic beauty. Oak resources also contribute to healthy lands and watersheds. They do this by providing habitat for animals, maintaining water quality, and improving soil characteristics. Oak resources have also been identified as a valuable component in greenhouse gas reduction, trapping and storing atmospheric carbon dioxide.

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

1.5 State-level Regulations

California Public Resources Code (PRC) Section 21083.4 requires a county to determine (as part of its project review required under the California Environmental Quality Act) whether a project

may result in conversion of oak woodlands that will have a significant effect on the environment. 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 ORMP incorporates a range of mitigation alternatives that conform to these requirements.

No state-level regulations exist that require mitigation for impacts to individual oak trees that occur outside of oak woodlands; however, this ORMP identifies mitigation requirements for individual native oaks trees and Heritage Trees to meet the goals and objectives of the General Plan.

2.0 Oak Resources Impact Mitigation Requirements

The following sections outline mitigation requirements for impacts to oak resources. These mitigation requirements meet the goals and objectives of the General Plan and fulfill the requirements of General Plan Policy 7.4.4.4.

2.1 Applicability, Exemptions and Mitigation Reductions

Projects directly undertaken by the County are exempt from the permit requirements of this ORMP. However, where mitigation to oak woodlands is required, pursuant to California Environmental Quality Act, Public Resources Code [PRC] Section 21083.4, the mitigation requirements of this ORMP may be applied to those projects. Oak resources impact mitigation is required for any non-exempt action requiring discretionary development entitlements or approvals from El Dorado County or ministerial actions requiring a building permit or grading permit issued by El Dorado County. All impacts to Heritage Trees, individual valley oak trees, and valley oak woodlands are subject to the mitigation requirements contained herein, regardless of location within or outside of an oak woodland and whether or not the action requires a development permit (except for dead, dying, and diseased trees, as discussed in Section 2.1.6, Dead, Dying, or Diseased Trees Exemption, trees that have fallen or sustained damage due to natural disasters/incidents or trees considered Hazardous Vegetation pursuant to Section 8.09 of the County Ordinance Code [Hazardous Vegetation and Defensible Space]).

2.1.1 Fire Safe Activities Exemption

Actions taken pursuant to an approved WUI Fire Safe Plan to protect existing structures, a Community Wildlife Protection Plan, or in accordance with maintenance of Defensible Space as identified in California Public Resources Code (PRC) Section 4291 or Chapter 8.09 of the El Dorado County code are exempted from the permit and mitigation requirements included in this ORMP. Oak resources impacts for initial defensible space establishment for new development are not exempt from the mitigation and permit requirements included in this ORMP.

In addition, fuel modification activities outside of Defensible Space, as defined in the ORMP Section 6.0 (Definitions), are exempted from the permit and mitigation requirements included in this ORMP.

2.1.2 Utility Line Maintenance Exemption

Actions associated with location and construction of new electrical energy facilities as specified in Subsection 130.10.040.B (Exemptions from Zone Ordinance Requirements) in Article 1 (Zoning Ordinance Applicability) of Title 130, or actions taken to maintain safe operation of existing utility facilities in compliance with state regulations (PRC 4292-4293 and California Public Utilities Commission (CPUC) General Order 95) are exempted from the mitigation and permit requirements included in this ORMP.

2.1.3 Agricultural Activities Exemption

With the exception of uses/activities that require issuance of a Conditional Use Permit, and when such uses/activities are otherwise consistent with Title 130 of the County Ordinance Code (Zoning Ordinance), the following activities are exempt from the mitigation and permit requirements included in this ORMP:

- Agricultural activities conducted for the purposes of producing or processing plant and animal products or the preparation of land for this purpose;
- Agricultural cultivation/operations, whether for personal or commercial purposes (excluding commercial firewood operations and Ranch Marketing); and
- Activities occurring on lands in Williamson Act Contracts or under Farmland Security Zone Programs.

2.1.4 Emergency Operations Exemption

Actions taken during emergency firefighting operations or responses to natural disasters (e.g., floods, landslides, avalanches, etc.) and associated post-fire or post-disaster remediation activities are exempted from the mitigation and permit requirements included in this ORMP.

2.1.5 Timber Harvest Plan Exemption

Tree removal permitted under a Timber Harvest Plan approved by CAL FIRE is exempted from the mitigation and permit requirements included in this ORMP.

2.1.6 Dead, Dying, or Diseased Trees Exemption

Individual native oak tree removal (including Heritage Trees, individual valley oak trees and valley oak trees within valley oak woodlands) is exempted from the mitigation requirements included in this ORMP when appropriate documentation is submitted to the County as follows:

- Affected tree(s) are dead, dying, or diseased, as certified in writing by a Certified Arborist or Registered Professional Forester; and/or
- Affected tree(s) exhibit high failure potential with the potential to injure persons or damage property, as documented in writing by a Certified Arborist or Registered Professional Forester.

  If multiple trees are proposed for removal as part of a proposed project and fifty (50%) or more of the trees are deemed dead, dying, diseased or as having a high failure potential, a second certification from another Certified Arborist or Registered Professional Forester on the status of the health of the trees will also be required from applicant. If the two certifications disagree, the report most protective of Oak Resources shall apply.

2.1.7 Minor Trimming

Minor Trimming, as defined within Section 6 of this ORMP, and conforming to the most current standards of the American National Standards Institute (ANSI) is exempt from mitigation requirements included in this ORMP.

2.1.8 Exemption from Mitigation for Personal Use

Removal of a native oak tree, other than a Heritage Tree or individual valley oak trees and valley oak woodlands, when it is cut down on the owner's property for the owner's personal use, is exempted from the mitigation requirements included in this ORMP provided that no more than 8 trees are removed from a single parcel per parcel per year and provided that the total diameter inches at breast height (dbh) of trees removed from a single parcel per year does not exceed 140 inches. Personal use shall include only trees removed for firewood, woodworking, or fabrication of oak wood products (sale or barter of oak wood products may be subject to other State regulatory approvals). The act of preparing land for subsequent development constitutes an impact that is not covered under this exemption.

2.1.9 Insurance-required Oak Removal

To qualify for an exemption from mitigation for the removal of healthy oak trees for the purpose of complying with insurance company criterion to protect persons, structures or property, a parcel-specific assessment of tree(s) required to be removed must be submitted to the El Dorado County Planning and Building Department from one of the following officials:

1. A qualified professional as defined in Section 130.39.030 (Definitions) above in this section; or
2. Written documentation from the property owner's insurance company identifying specific healthy oak tree(s) required to be removed to protect life or property in the event of a wildfire.

The assessment under either scenario shall highlight specific healthy trees required to be removed.

2.1.10 Mitigation Reductions for Affordable Housing

This ORMP also provides for reductions to oak woodland mitigation for affordable housing projects that are not exempted as defined above. Specifically, development projects that propose a minimum of ten (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 woodland that is required to be mitigated, as set forth in Table 2. The reduction is to be applied to the mitigation ratio presented in Table 3 and shall only be applied to the residential portion(s) of the proposed project. This reduction for affordable housing projects does not apply to removal of Heritage Trees or individual valley oak trees. This reduction for affordable housing projects also does not apply to impacts to valley oak woodlands. This reduction for affordable housing projects applies to impacts to other oak woodland habitat and removal of other individual oak trees. In no case shall the mitigation requirement be less than zero.

Table 2
Affordable Housing Mitigation Reduction

Affordable Housing Type (Household Income Level)	Percent Oak Woodland Mitigation Reduction (for portion of project that is income restricted)
Very Low	200%
Lower	100%
Moderate	50%

Example: A project proposes 25% of the units to be affordable in the Lower income category. The oak woodland mitigation ratio may be reduced by 25%. A Moderate income project that provides all units at that income level may reduce the oak woodland mitigation ratio by 50%. A project with 20% Very Low income units would receive a 40% reduction in oak woodland mitigation ratio.

2.2 Oak Woodland Permits and Mitigation

The policy of the County is to preserve oak woodlands when feasible, through the review of all proposed development activities where woodlands are present on either public or private property, while at the same time recognizing individual rights to develop private property in a reasonable manner. As such, the County shall require mitigation for impacts to oak woodlands. The following sections outline oak woodland permit and mitigation requirements and Figure 1 outlines the permit and mitigation process.

2.2.1 Oak Woodland Removal Permits

An Oak Woodland Removal Permit shall be required for all non-exempt activities with confirmed impacts to oak woodland. Where two (2) acres or more of oak woodlands will be impacted, an Oak Woodland Removal Permit is required. Otherwise, an Oak Tree Removal Permit is required. An oak resources technical report shall accompany any oak woodland removal permit application submitted to the County. The County may impose such reasonable conditions of approval as are necessary to protect the health of existing oak woodlands, the public, and the surrounding property. Oak Woodland Removal Permit review will be integrated into the environmental review process for discretionary projects or may be processed as an administrative permit for ministerial projects. In addition to findings of consistency with the requirements and standards of this ORMP, the County shall make the following findings before approving an oak woodland removal permit application:

- The proposed action is consistent with the General Plan; and
- The proposed action is specifically allowed by this ORMP and implementing ordinance.

Commercial firewood cutting operations in oak woodlands shall be considered discretionary and subject to a Minor Use Permit pursuant to Section 130.52.020 (Minor Use Permit) in Article 5 (Planning Permit Processing) of the County Zoning Ordinance. In reviewing an oak woodland removal permit application for firewood cutting operations, the County shall consider the following:

- Whether the removal of the tree(s) would have a significant negative environmental impact;

- Whether the proposed removal would not result in clear-cutting, but would 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 remaining oak woodland coverage would be after firewood cutting.

Fines shall be issued to any person, firm, or corporation that is not exempt from the standards included in this ORMP who impacts an oak woodland without first obtaining an oak woodland removal permit. Fines may be as high as three times the current oak woodland in-lieu fee amount. If an oak woodland is impacted without an oak woodland removal permit, in addition to issuing fines and penalties, any and all applications for development of that property shall be deemed incomplete unless and until the property owner enters into a settlement agreement with the County or all code enforcement and/or criminal proceedings are complete and all penalties, fines and sentences are paid or fulfilled. All monies received as fines for illegal oak tree and woodland removal shall be deposited in the County's Oak Woodland Conservation Fund.

Under penalty of perjury, a code compliance certificate shall be required to affirm no oak woodlands have been impacted (i.e., cut down) on the property that is the subject of an oak woodland removal permit application within two (2) years prior to the submission date of the application. If oak woodlands have been impacted, then copies of all permits for such actions must be attached to the certification. If the certification is not included with the application, then the application is incomplete. If oak woodlands have been impacted within the two (2) year period without the proper permits then the application is deemed incomplete until the applicant either: 1) enters into a remediation/settlement agreement with County (such remediation/settlement agreement shall be in full force and effect regardless of whether or not the County approves or denies the application); or, 2) all code enforcement proceedings are completed and all applicable penalties and fines are paid and/or all criminal proceedings are completed and all applicable penalties, fines and sentences are paid or fulfilled.

2.2.2 Oak Woodland Mitigation

In order to incentivize on-site retention of oak woodlands, mitigation for impacts to oak woodlands shall be based on the ratios presented in Table 3.

Table 3
Oak Woodland Mitigation Ratios

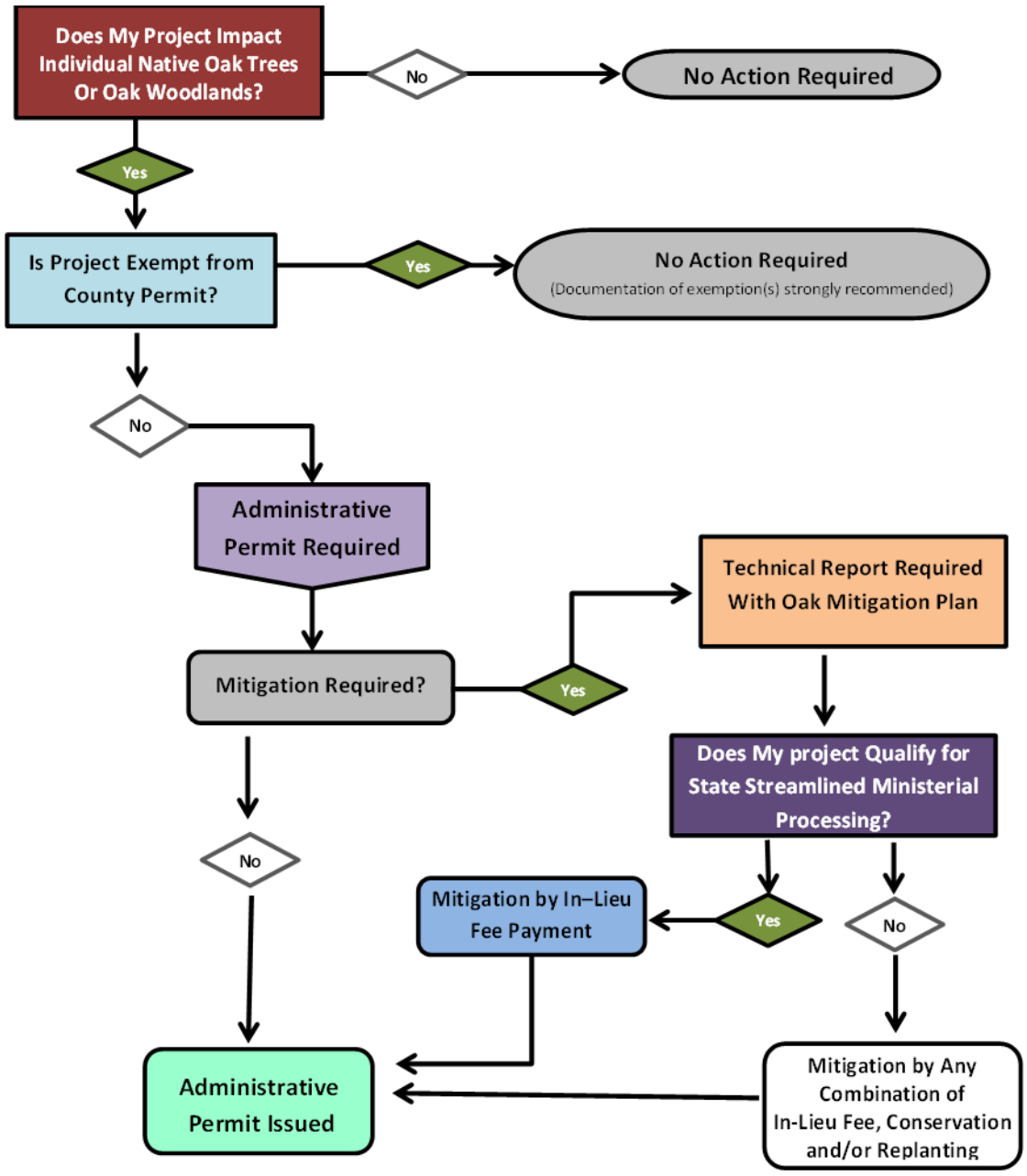
Percent of Oak Woodland Impact	Oak Woodland Mitigation Ratio
0-50%	1:1
50.1-75%	1.5:1
75.1-100%	2:1

Oak woodland impacts and mitigation shall be addressed in an oak resources technical report. As presented in Table 3, all of a project's oak woodland impacts shall be mitigated at a 1:1 ratio where 50 percent or less of on-site oak woodlands are impacted, all of a project's oak woodland impacts shall be mitigated at a 1.5:1 ratio where 50.1 to 75 percent of on-site oak woodlands are impacted, and all of a project's oak woodland impacts shall be mitigated at a 2:1 ratio where greater than 75 percent of on-site oak woodlands are impacted. A deed restriction or conservation easement shall be placed over retained on-site woodlands and those woodlands retained on site shall not be counted towards the impacted amount or towards the required mitigation. Mitigation for the impacted oak woodlands shall occur at the ratio required under Table 3 using one or more of the following options:

1. Off-site deed restriction or conservation easement acquisition and/or acquisition in fee title by a land conservation organization for purposes of off-site oak woodland conservation consistent with Chapter 4.0 (Priority Conservation Area) of this ORMP;
2. In-lieu fee payment based on the percent of on-site Oak Woodland impacted by the development as shown in Table 5 (Oak Woodland In-Lieu Fee) of this ORMP to be used by the County to fund the acquisition of land and/or Oak Woodlands Conservation Easements from willing sellers, native oak tree planting projects, and ongoing conservation area monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting;
3. Replacement planting within an area on-site for up to 50 percent of the total Oak Woodland mitigation requirement consistent with Section 2.4 (Replacement Planting Guidelines) of this ORMP. This area shall be subject to a Deed Restriction or Conservation Easement;
4. Replacement planting within an area off-site for up to 50 percent of the total Oak Woodland mitigation requirement. Off-site replacement planting areas shall be consistent with Section 2.4 (Replacement Planting Guidelines) and Chapter 4.0 (Priority Conservation Areas) of this ORMP. This area shall be subject to a Deed Restriction or Conservation Easement; or
5. A combination of numbers 1 through 4 above.

Consistent with California PRC 21083.4, replacement planting shall not account for more than 50 percent of the oak woodland mitigation requirement.

Figure 1. Oak Resources Permitting and Mitigation Process



2.3 Individual Native Oak Tree and Heritage Tree Permits and Mitigation

The policy of the County is to preserve native oak trees when 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. As such, the County shall require mitigation for impacts to individual native oak trees and Heritage Trees.

2.3.1 Oak Tree Removal Permits

A tree removal permit shall be required for all non-exempt activities with confirmed impacts to any individual native oak tree not located within an oak woodland. A tree removal permit shall be required for removal of any Heritage Tree, regardless of location within or outside of an oak woodland. An oak resources technical report shall accompany any tree removal permit application submitted to the County. 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. Oak tree removal permit review will be integrated into the environmental review process for discretionary projects or may be processed as an administrative permit for ministerial projects. In addition to findings of consistency with the requirements and standards of this ORMP, the County shall make the following findings before approving an oak tree removal permit application:

- The proposed action is consistent with the General Plan; and
- The proposed action is specifically allowed by this ORMP and implementing ordinance.

All oak tree removal permits shall be processed according to Section 130.52.010 (Administrative Permit, Relief, or Waiver) of the County Zoning Ordinance.

Commercial firewood cutting operations with impacts to individual native oak trees or Heritage Trees shall be considered discretionary and subject to a Minor Use Permit pursuant to Section 130.52.020 (Minor Use Permit) in Article 5 (Planning Permit Processing) of the County Zoning Code. In reviewing a tree removal permit application for commercial firewood cutting operations, the County shall consider the following:

- Whether the removal of the tree(s) would have a significant negative environmental impact;
- Whether the tree proposed for removal is a Heritage Tree;
- Whether replanting would be necessary to ensure adequate regeneration;
- Whether the removal would create the potential for soil erosion; and
- Whether any other limitations or conditions should be imposed in accordance with sound tree management practices.
- The resulting distribution and type of remaining oak resources including Individual Native Oak Trees, Oak Woodland, Heritage Trees, Valley Oak Trees and Valley Oak Woodland, as applicable.

Fines shall be issued to any person, firm, or corporation that is not exempt from the standards included in this ORMP who removes an oak tree without first obtaining an oak tree removal permit. Fines shall be as high as three (3) times the current market value of replacement trees, as well as the cost of replacement, and/or the cost of replacement of up to three (3) times the number of required replacement trees. In the case of unpermitted Heritage Tree removal, fines may be as high as nine (9) times the current market value of replacement trees, as well as the cost of replacement, and/or the cost of replacement of up to nine (9) times the number of required replacement trees. If individual native oak trees or Heritage Trees are impacted without an oak tree removal permit, in addition to issuing fines and penalties, any and all applications for development of that property shall be deemed incomplete unless and until the property owner enters into a settlement agreement with the County or all code enforcement and/or criminal proceedings are complete and all penalties, fines and sentences are paid or fulfilled. All monies received as fines for illegal oak tree and woodland removal shall be deposited in the County's Oak Woodland Conservation Fund.

Under penalty of perjury, a code compliance certificate shall be required to affirm no oak trees have been impacted (i.e., cut down) on the property that is the subject of an oak tree removal permit application within two (2) years prior to the submission date of the application. If oak trees have been impacted, then copies of all permits for such actions must be attached to the certification. If the certification is not included with the application, then the application is incomplete. If oak trees have been impacted within the two (2) year period without the proper permits then the application is deemed incomplete until the applicant either: 1) enters into a remediation/settlement agreement with County (such remediation/settlement agreement shall be in full force and effect regardless of whether or not the County approves or denies the application); or, 2) all code enforcement proceedings are completed and all applicable penalties and fines are paid and/or all criminal proceedings are completed and all applicable penalties, fines and sentences are paid or fulfilled.

2.3.2 Oak Tree Mitigation

Mitigation for removal of individual native oak trees shall be based on an inch-for-inch replacement standard (defined in Section 2.4) and shall be quantified and outlined in an oak resources technical report (Section 2.5). Mitigation for removal of Heritage Trees shall be based on an inch-for-inch replacement standard at a 3:1 ratio and shall also be quantified and outlined in an oak resources technical report. Multifamily and mixed-use housing projects that qualify for streamlined ministerial processing under state law shall mitigate for loss of individual tree(s) via in-lieu fee payment as outlined in Table 3 of this ORMP. For all other development projects, impacts shall be mitigated by the applicant's selection of one (1) or more of the following options:

Options for individual native oak tree and Heritage Tree impact mitigation requirements include:

1. Replacement planting on-site consistent with Section 2.4 within an area subject to a Deed Restriction or Conservation Easement and utilizing the replacement tree sizes and quantities shown in Table 4 (Oak Tree Replacement Quantities). On-site replacement planting shall be consistent with Section 2.4 (Replacement Planting Guidelines);
2. Replacement planting off-site within an area subject to a conservation easement or acquisition in fee title by a land conservation organization utilizing the replanting sizes and quantities specified in Table 4. Off-site replacement planting shall be consistent with Section 2.4;

3. In-lieu fee payment for individual oak tree removal to be either used by the County to plant oak trees or to be given by the County to a land conservation organization to plant oak trees as shown in Table 6 (Individual Oak Tree In-Lieu Fee); or
4. A combination of numbers 1 through 3 above.

Mitigation for individual native oak tree and/or Heritage Tree impacts shall be addressed in an oak resources technical report.

2.4 Replacement Planting Guidelines

This section provides guidelines for projects that elect to mitigate via replacement planting. Replacement plantings may be accepted if the replanting area can support oak resources (e.g., proper soil type and general environment). The intent is not to remove existing natural habitats for replacement plantings or to create a continuous canopy that would reduce wildlife value or contribute to increased fire hazard. Replacement plantings are subject to County approval and shall be completed as follows:

- Oak Woodland Impacts: For impacts to oak woodlands, planting density shall be based on recommendations made by a Qualified Professional and presented in an oak resources technical report. Planting density shall be documented in the oak resources technical report and shall be based on the density of impacted oak woodlands. Replacement trees shall be regularly monitored and maintained and shall survive for a period of seven (7) years, calculated from the day of planting. Acorns may be used instead of container trees. If acorns are used, they shall be planted at a 3:1 ratio as determined by the tree replacement formula. The replacement is as follows:

  Replacement planting with container trees (one-gallon or TreePot 4-sized container trees, that are locally sourced, shall follow this formula for ratios:

  (Impacted Oak Woodland Area in acres) x (Impacted Oak Woodland Density in trees/acre) = the total number of replacement trees to be replanted

  Replacement replanting by acorn shall be from locally sourced acorns (acorns gathered locally). The replacement ratio by acorn replanting shall be obtained by the following formula

  (Impacted Oak Woodland Area in acres) x (Impacted Oak Woodland Density in trees/acre) x (3 acorns per tree) = the total number of acorns to be replanted

  This ORMP does not preclude over-planting so that the identified woodland density may be accomplished at the end of the 7-year maintenance, monitoring and reporting period. Replacement planting may use a combination of replacement tree sizes (one gallon, TreePot 4, acorns) if consistency with these ratios is maintained and documented in an Oak Resources Technical Report. Replacement plantings shall be inspected, maintained and documented consistent with requirements for Mitigation Maintenance, Monitoring and Reporting.
- Individual Native Oak Tree and Heritage Tree Impacts: For impacts to individual native oak trees that are not otherwise mitigated, replacement planting shall be calculated based upon an inch-for-inch replacement of removed individual native oak trees. The total of

replacement trees shall have a combined diameter of the tree(s) removed. Replacement tree species shall be the same proportion as those removed. Replacement trees shall be planted on-site and monitored and maintained for a period of seven (7) years, calculated from the day of planting, Replacement plantings shall be inspected, maintained and documented consistent with requirements for Mitigation Maintenance, Monitoring and Reporting.

Replacement tree sizes may vary and may include acorn plantings, based on documentation of inch-for-inch replacement consistency included in an oak resources technical report. Table 4 identifies replacement tree size options and associated quantity of trees, by size, required to meet the inch-for-inch replacement standard.

Table 4
Oak Tree Replacement Quantities

Replacement Tree Size	Number of Trees Required Per Inch of Trunk Diameter Removed
Acorn	3
1-gallon/TreePot 4	2
5-gallon	1.5*
15-gallon	1

**Quantity of replacement trees to be rounded up to the nearest whole number*

If acorns are used, they shall be planted at a 3:1 ratio (3 acorns for every 1-inch of trunk diameter removed) under the direction of a Qualified Professional. Acorn planting shall not exceed 25-percent of any project's tree planting total. If 1-gallon/TreePot 4-sized containers are used, they shall be planted at a 2:1 ratio (2 container trees for every 1-inch of trunk diameter removed). If 5-gallon-sized containers are used, they shall be planted at a 1.5:1 ratio (1.5 container trees for every 1-inch of trunk diameter removed). Finally, if 15-gallon-sized containers are used, they shall be planted at a 1:1 ratio (1 container tree for every 1-inch of trunk diameter removed).

The replacement planting area shall be suitable for tree planting, shall not conflict with current or planned land uses, and shall be large enough to accommodate replacement plantings up to a maximum density of 200 trees per acre. This ORMP does not preclude over-planting so that the minimum survival rate may be accomplished at the end of the 7-year maintenance and monitoring period. Replacement plantings shall be inspected, maintained and documented consistent with the requirements for Mitigation Maintenance, Monitoring and Reporting. For impacts to Heritage Trees, replacement planting shall adhere to the standards identified for individual native oak trees; however, replacement totals shall be calculated based upon an inch-for-inch replacement at a 3:1 ratio.

- On-Site Replacement Planting: On-site replacement trees are to be planted in compliance with the approved Oak Resources Technical Report or permit. The replacement planting area shall be suitable for tree planting, shall not conflict with current or planned land uses, and shall be large enough to accommodate replacement plantings at a density equal to the density of oak woodlands impacted, up to a maximum density of 200 trees per acre. A deed restriction or conservation easement to the satisfaction of County Counsel and the Director shall be required to ensure the long-term conservation of any on-site replacement trees

planted. The Conservation Easement shall be in favor of the County or a County-approved conservation organization. Replacement plantings shall be inspected, maintained, and documented consistent with the requirements for Mitigation Maintenance, Monitoring and Reporting.

- Off-Site Replacement Planting: The applicant may be permitted to procure an off-site planting area for replacement planting, preferably in proximity and/or in connection with oak woodlands contiguous to the project site or within or adjacent to a PCA or an Important Biological Corridor as designated in the General Plan or important ecological area as identified in the Initial Inventory and Mapping (June 2010). The replacement planting area shall be suitable for tree planting, shall not conflict with current or planned land uses, and shall be large enough to accommodate replacement plantings up to a maximum density of 200 trees per acre. A conservation easement to the satisfaction of County Counsel and the Development Services Director shall be required to ensure the long-term maintenance and preservation of any on-site replacement trees planted. The Conservation Easement shall be in favor of the County or a County approved conservation organization Replacement plantings shall be inspected, maintained and documented consistent with requirements for Mitigation Maintenance, Monitoring and Reporting.
- Replacement Planting Plans: Oak resources replacement planting plans shall be prepared for all replacement planting efforts (on- and off-site) by a Qualified Professional and may be prepared in conjunction with oak resources technical report. Replacement planting plans shall address the following:
    - Consistency with the accepted native oak tree planting standards, including those outlined in Regenerating Rangeland Oaks in California (McCreary 2009), How to Grow California Oaks (McCreary 1995), How to Collect, Store and Plant Acorns (McCreary undated), and other publications and protocols that may be established by the University of California, Division of Agriculture and Natural Resources.
    - The suitability of the site shall be demonstrated with soil information, aerial photography, or other resources.
    - The density of replanting shall be determined by the Qualified Professional, based on accepted practice and current research, up to a maximum density of 200 trees per acre.
    - The intent of the replacement planting 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.
    - Acorns or container trees for replanting shall be from local sources, when available, to maintain local genetic strains.
    - Replacement planting shall not be located within the 100-foot 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 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, tree protection, pest management, and/or fertilization.
- The replacement planting plan shall identify the frequency and methods of maintenance and monitoring, as well as contingencies or alternatives if the success criteria are not met annually or at the end of the monitoring term along with a means to ensure compliance with the replacement planting plan. The monitoring term shall be 7 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.

2.5 Oak Resources Technical Reports

This section provides guidelines for projects that require preparation of an oak resources technical report. An oak resources technical report is a stand-alone report prepared by a Qualified Professional that includes the following:

- Identification, location, and quantification of all oak resources on the property:
  - Oak woodlands shall be mapped and assessed in accordance with the CDFG 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* and subsequent updates, and the *List of Vegetation Alliances and Associations* (CDFG2025) and subsequent updates;
  - Data collected for individual native oak trees and Heritage Trees shall include: location, species, trunk diameter (dbh), height, canopy radius, and general health and structural condition;
- Identification and quantification of project-related impacts to oak resources;
- Measures identifying how specific trees and woodlands (or retained portions thereof) shall be protected during development and related work;
- Proposed actions to mitigate impacts to oak resources, consistent with the requirements included in this ORMP:
  - For replacement planting, the report shall provide detail regarding the quantity, location, planting density, replacement tree size(s), and acorn/seedling source consistent with the definition of Replacement Planting included in this ORMP;
  - For conservation easement placement/acquisition and/or land acquisition in fee title, the report shall provide documentation of easement placement on-site and/or documentation of easement or land acquisition off-site to the satisfaction of the County;
  - For in-lieu fee payment, the report shall document the quantity of impacts (acreage of oak woodlands and/or total diameter inches of individual native oak trees/Heritage Trees) and the total in-lieu fee payment necessary (presented

separately for oak woodlands, individual native oak trees, and Heritage Trees, where applicable);

- Identification of responsible parties;
- Identification of maintenance, monitoring, and reporting requirements;
- Analysis of non-PCA conservation easement areas, where applicable;
- A site map(s) depicting the location of all oak woodlands, individual native oak trees, and Heritage Trees and the location of all proposed project-related improvements (including, but not limited to, the limits of grading, fuel modification/defensible space areas, and above- and below-ground infrastructure). The site map(s) shall also clearly identify impacted oak resources.

2.6 Mitigation Program Flexibility

This ORMP provides for flexibility in meeting oak resources mitigation requirements. An applicant for a development project may comply with the provisions of this ORMP by combining mitigation options, except as specified for replacement planting to mitigate oak woodland impacts. Off-site mitigation may be accomplished through private agreements between the applicant and another private party consistent with the standards included in this ORMP and subject to approval by the County. When dedication of off-site conservation easements outside of PCAs is proposed by a developer, the proposed site shall be prioritized based on the standards set forth in this ORMP (Section 4.0, Priority Conservation Areas). A developer that dedicates a County-approved conservation easement is not subject to the acquisition component of the in-lieu fee but is subject to the Initial and Long-Term Management and Monitoring and Administration components of the fee.

3.0 In-Lieu Fee

The methodology for determining the in-lieu fee for impacts to individual native oak trees and oak woodlands is provided in detail in Appendix B. In general, the in-lieu fee for oak woodlands is based on the costs of acquisition of land and conservation easements, along with management, monitoring, and administrative costs. For individual native oak trees, the in-lieu fee is based on an inch-for-inch replacement approach that accounts for costs associated with purchasing and planting 1-inch of trunk diameter.

3.1 Oak Woodlands

As noted, the in-lieu fee for impacts to oak woodlands is based on the costs of acquisition of land and conservation easements, along with management, monitoring, and administrative costs. A breakdown of costs per acre is provided in Table 5.

Table 5
Oak Woodland In-Lieu Fee

Activity	Cost per Acre
Acquisition	$4,400
Initial Management and Monitoring	$2,600
Long-Term Management and Monitoring	$890
Administration	$395
Total Cost per Acre	**$8,285**

Source: New Economics & Advisory Oak Resource In-Lieu Fee Nexus Study (June 2016)

The in-lieu fee payment option for impacts to oak woodlands shall be made at the ratio outlined in Table 3, which provides for a variable mitigation ratio depending on the percentage of oak woodland impacted on a project site. The County shall deposit all oak woodland in-lieu fees into its Oak Woodland Conservation Fund, which shall be used to fund the acquisition of land and/or conservation easements from willing sellers as described in Section 4.0 (Priority Conservation Areas). 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. It is anticipated that conservation easements and mitigation lands would be held by a land conservation organization; therefore, ongoing monitoring and management activities would be conducted by such organizations. Funding to support the negotiation of the purchase price and oversight of the land transaction is included in the management component of the oak woodland in-lieu fee.

If a project applicant independently negotiates purchase of a conservation easement with a willing seller to mitigate oak woodland impacts, the applicant shall be responsible for paying the Initial and Long-Term Management and Monitoring and Administration components of the Oak Woodland In-Lieu Fee to the County, unless the applicant also independently negotiates acceptance of the conservation easement management and monitoring with a land conservation organization approved by the County.

As costs 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 a report to be submitted to the Planning Commission and Board of Supervisors every other March, as described in Appendix A. The first fee adjustment study would occur at least 12 months after adoption of this ORMP.

3.2 Oak Trees

For individual native oak trees, the in-lieu fee is based on an inch-for-inch replacement approach that accounts for costs associated with purchasing and planting 1-inch of trunk diameter and maintaining those trees for a period of seven years.

The assumptions that factor into the in-lieu fee are:

1. Two 1-gallon/TreePot 4-sized container trees are assumed to represent one inch of trunk diameter. The acquisition and planting component of the per-inch mitigation fee is then based on the costs to purchase and plant two 1-gallon/TreePot 4-sized container trees.
2. To determine the per-inch fee, the median price of 1-gallon/TreePot 4-sized container trees was calculated from a survey of nurseries in El Dorado County and the surrounding region.
3. This price was then doubled for each tree to account for costs associated with planting. Doubling the per-tree cost to account for purchasing and planting a tree (inclusive of labor and materials) is a standard approach in the landscape/habitat restoration industry.
4. The management and monitoring component of the per-inch mitigation fee is based on annual costs associated with maintaining planted trees for a period of seven years. Data for this fee was derived from cost estimates provided by a habitat restoration contracting firm, Habitat Restoration Sciences, Inc.

Based on this analysis, the individual native oak tree mitigation fee was calculated to be $153.00 per-inch. In the case of Heritage Trees, the mitigation fee shall be $459.00 per-inch (3:1 ratio). Table 6 summarizes the cost breakdown associated with the in-lieu fee for individual native oak trees.

Table 6
Individual Oak Tree In-Lieu Fee

Activity	Cost per Inch
Acquisition and Planting	$31.90
Initial Management & Monitoring (Years 1-7)	$113.40
Administration (5%)	$7.27
Total Cost per Inch (non-Heritage Trees) (rounded to nearest whole dollar)	**$153**
Total Cost Per Inch (Heritage Trees – 3:1 Ratio)	**$459**

Source: New Economics & Advisory Oak Resource In-Lieu Fee Nexus Study (June 2016)

As described in this ORMP, this per-inch mitigation fee may be paid as mitigation for impacts to individual native oak trees or Heritage Trees. The per-inch fee shall be multiplied by the total number of trunk diameter inches removed (dbh). The County shall deposit all oak tree in-lieu fees into its Oak Woodland Conservation Fund and shall use collected per-inch mitigation fees for native oak tree planting projects or may use such funds to acquire oak woodland conservation

easements, with documentation that the number of diameter inches being acquired meets those for which mitigation fees have been paid.

3.3 Fee Adjustments, Reporting, and Findings

Appendix B details the annual inflation fee adjustment approach; however, as costs change over time, there will be a need to review and adjust the in-lieu fees to closely match future cost increases or decreases. Additionally, there are certain county and state reporting and finding requirements that the county will have to comply with after the in-lieu fee is adopted.

- Annual Inflation Adjustment: An annual adjustment for cost escalations influenced by changes in land values affecting acquisition, conservation easement values, as well as property tax obligations and organizational overhead costs (e.g. rent, wages, benefits, equipment, etc.) shall be applied to the Oak Woodland In-Lieu Fees. The Individual Oak Tree In-Lieu Fees shall be subject to an annual inflation fee that accounts for changes in acquisition/planting and management/monitoring costs.

- Five-Year Monitoring and Reporting of Oak Tree/Oak Woodland Removal Permits and Enforcement Actions (Ordinance Code Section 130.39.100.A): The County shall monitor all Oak Tree and Oak Woodland Removal Permits and any enforcement actions and provide the results of this monitoring in a report to the Board of Supervisors every five years. The report shall include the quantity of permits issued and estimated inches/acres approved for removal during the reporting period.

- Five-Year Oak Woodland Conservation FeeReporting (Ordinance Code Section 130.39.100.B): The County shall monitor all In-lieu Fees deposited into the Oak Woodland Conservation Fund and provide a report documenting fees collected and recommended fee adjustment(s), as appropriate, to the Board of Supervisors every five years, as specified in Appendix A of this ORMP.

- Mitigation Fee Act annual reporting requirement (Government Code Section 66006)

- Mitigation Fee Act 5-year findings (Government Code Section 66001)

4.0 Priority Conservation Areas

4.1 Identification of Priority Conservation Areas

Figure 2 identifies the areas in which acquisition of land or conservation easements from willing sellers shall be prioritized using the Oak Woodland Conservation Fund generated by the payment of the in-lieu fees described above. These areas were identified using the FRAP classification of oak woodland habitat 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 7. A more detailed description of the mapping process and data used to identify PCAs is provided in Appendix A. Figure 2 also shows existing public lands with oak woodlands contiguous to the PCAs.

Table 7
PCA Parcel Statistics

Parcel size (Acres)	Number of Parcels	Acres
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
Total	***529***	***66,052.8***
	Avg. Size	**124.9**
	Median Size	**84.3**

Acquisition of land or conservation easement must be configured in such a manner as to preserve the integrity of the oak woodland ecosystem. Priority should be given to conserving oak woodland habitat within PCAs, particularly areas that are adjacent to existing woodlands lying west of the National Forest within the Important Biological Corridor overlay, under a conservation easement, on public lands, in open space lands, in riparian corridors, or ecological preserves.

Oak woodlands within the PCAs will be conserved to mitigate for losses of oak woodlands. Prioritization within the PCAs will be given to areas that provide a diversity of oak woodland types. The acreage of oak woodlands conserved will include areas conserved by developers under private conservation agreements and those conserved by the County using Oak Woodland Conservation Funds.

Figure 2. Priority Conservation Areas, Oak Woodlands, and Public Lands in El Dorado County

This ORMP establishes a strategy for conserving oak woodland habitat to offset the effects of increased habitat loss and fragmentation elsewhere in the county. Identification of PCAs and standards for prioritizing conservation of oak woodlands outside of PCAs (Section 4.3, Conservation Outside of PCAs) fulfills the oak woodlands portion of the conservation requirements outlined in General Plan Policy 7.4.2.8.

4.2 Management of PCAs

Existing oak woodlands within the PCAs identified as mitigation for project impacts, whether on or off a 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 or by acquisition in fee title by a land conservation group or acquisition in fee title by the County. Management activities would be conducted by land conservation organizations and may include, but are not limited to, one or more of the following activities, as determined appropriate and/or necessary 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. Agricultural use (i.e., grazing) shall be allowed in conserved oak woodlands as long as the activity occurred at the time the conservation easement is established, the spatial extent of the agricultural use is not expanded on conserved lands, and the agricultural use does not involve active tree harvest or removal (e.g., fuelwood operations, land clearing for crop planting, etc.).

4.3 Conservation Outside of PCAs

The PCAs have been delineated to prioritize the acquisition of land or oak woodland conservation easements either by the County (using the funds collected in the County's Oak Woodland Conservation Fund) or privately by developers. However, acquisition of land or oak woodland conservation easements outside of the PCAs may also occur on minimum contiguous habitat blocks of 5 acres, as described below. The following criteria shall be used for selecting potential oak woodlands conservation lands or easements outside of PCAs, consistent with General Plan Policy 7.4.2.8 (D):

- Location within IBCs;
- Location within other important ecological areas as identified in the Initial Inventory and Mapping (June 2010);
- Woodlands with diverse age structure;
- Woodlands with large trees and dense canopies;
- Opportunities for active land management to be used to enhance or restore natural ecosystem processes;
- Potential to support special status species;
- Connectivity with adjacent protected lands;
- Parcels that achieve multiple agency and community benefits;
- Parcels that are located generally to the west of the Eldorado National Forest; and

- Parcels that would preserve natural wildlife movement corridors such as crossings under major roadways (e.g., U.S. Highway 50 and across canyons).

Land or conservation easement acquisition that occur outside of PCAs shall occur on minimum contiguous habitat blocks of 5 acres (the acquired land or conservation easement shall be contiguous to or shall create a contiguous area of no less than 5 acres of oak woodland in conserved or open space status (e.g., parks, national forest, other conserved oak woodlands on private property)). For transactions where land is acquired or a conservation easement outside of the PCAs is negotiated between a developer and a private seller, an analysis of the proposed oak woodland conservation area shall be performed by a Qualified Professional. The Qualified Professional shall demonstrate that the proposed conservation area is of equal or greater biological value as the oak woodland proposed to be removed. The analysis of conservation areas shall be included as a component of an oak resources technical report.

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

4.4 Conservation Easements

Where the mitigation requirements of this ORMP are met through conservation easements for oak woodlands, whether within or outside of PCAs, the conservation easement shall be granted in perpetuity to the County or a land conservation group approved by the County. The easement shall be provided on a form approved by the County and shall be accepted by the Board prior to issuance of a grading or building permit, filing of a parcel or final map, or otherwise commencing with the project.

4.5 Deed Restrictions

Where the mitigation requirements of this ORMP are met through deed restrictions for oak woodlands, whether within or outside of PCAs, the deed restriction shall commit the property to oak woodland conservation use in perpetuity. The deed restriction shall be recorded with the County Clerk/Recorder prior to issuance of a grading or building permit, filing of a parcel or final map, or otherwise commencing with the project.

5.0 Application of ORMP to Development Review Process

Applicability of the ORMP to a development project shall be made as follows:

1. Oak resources are mapped, quantified, and categorized (oak woodland, individual native oak tree, and/or Heritage Tree) by a Qualified Professional hired by the applicant and documented in an oak resources technical report.
2. Oak resources impacts are quantified in the oak resources technical report. Oak resources impacts are calculated by identifying all disturbed areas as proposed, including:
    a. Roads, driveways, and access drives;
    b. Graded areas for building pads, parking lots, staging areas, and other improvements; and
    c. Other disturbed areas resulting in oak resources impacts including septic system leach fields, above- and below-ground utilities, and defensible space vegetation removal for new construction.
3. The proposed oak woodland impact area is compared with the total on-site oak woodland area to determine the appropriate mitigation ratio.
4. Impacts to individual native oak trees and/or Heritage Trees are determined and the sum of impacted trunk diameter (dbh) calculated.
5. If applicable, the applicant proposes mitigation for impacts to oak woodlands in an oak resources technical report by one of the following mechanisms:
    a. Off-site Deed Restriction or Conservation Easement acquisition for purposes of off-site oak woodland conservation consistent with Chapter 4.0 (Priority Conservation Areas) of this ORMP;
    b. In-lieu fee payment determined by percentage of on-site Oak Woodland impacted by the development as shown in Table 5 (Oak Woodland In-Lieu Fee) in this ORMP to be used by the County to fund the acquisition of land and/or Oak Woodlands Conservation Easements from willing sellers, native oak tree planting projects, and ongoing conservation area monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting;
    c. Replacement planting within an area on-site for up to 50 percent of the total Oak Woodland mitigation requirement consistent with Section 2.4 (Replacement Planting Guidelines) of this ORMP. This area shall be subject to a Deed Restriction or Conservation Easement;
    d. Replacement planting within an area off-site for up to 50 percent of the total Oak Woodland mitigation requirement. Off-site replacement planting areas shall be consistent with Section 2.4 (Replacement Planting Guidelines) and Chapter 4.0 (Priority Conservation Areas) of this ORMP. This area shall be subject to a Conservation Easement or Deed Restriction; or
    e. A combination of options (a) through (d) above..

In no case shall replacement planting exceed 50 percent of oak woodland mitigation requirement.

6. If applicable, the applicant proposes mitigation for impacts to individual native oak trees and/or Heritage Trees in an oak resources technical report by one of the following mechanisms:
    a. Replacement planting on-site consistent with Section 2.4 (Replacement Planting Guidelines) of this ORMP within an area subject to a Deed Restriction or Conservation Easement and utilizing the replacement tree sizes and quantities shown in Table 4 (Oak Tree Replacement Quantities) in this ORMP. On-site replacement planting shall be consistent with Section 2.4 (Replacement Planting Guidelines) of this ORMP;
    b. Replacement planting off-site within an area subject to a Conservation Easement or acquisition in fee title by a land conservation organization utilizing the replanting sizes and quantities specified in Table 4 (Oak Tree Replacement Quantities) in this ORMP. Off-site replacement planting shall be consistent with Section 2.4 (Replacement Planting Guidelines) of the ORMP;
    c. In-lieu fee payment for individual oak tree removal to be either used by the County to plant oak trees or to be given by the County to a land conservation organization to plant oak trees as shown in Table 6 (Individual Oak Tree In-Lieu Fee) in this ORMP; or
    d. A combination of options (a) through (c) above.
7. Payment of applicable in-lieu fees and establishment of any required deed restrictions and/or granting of any required conservation easements and/or land acquisition in fee title shall be required as a condition of approval of all discretionary or ministerial 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 in-lieu fees may be phased to reflect the timing of the oak resources removal/impact. For phasing, permits issued for oak resources removal shall only be for the area covered by the fee payment.
8. Payment of in-lieu fees and establishment of any required deed restrictions and/or granting of any required conservation easements and/or land acquisition in fee title, if necessary, shall be completed prior to issuance of a building or grading permit for ministerial projects.

6.0 Definitions

For the purposes of this ORMP, the following terms and phrases shall have the meanings respectively ascribed to them by this section:

Agricultural Conversion: As defined by General Plan Policy 7.1.2.7.

Agricultural Cultivation/Operations: As defined by General Plan Policy 8.2.2.1.

Agricultural Lands: As defined by General Plan Policies 2.2.1.2 and 8.1.1.8, and further, Policy 8.2.2.1.

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

CAL FIRE: California Department of Forestry and Fire Protection.

Commercial Firewood Cutting: Fuel wood production where a party cuts firewood for sale or profit.

Conservation Easement: An easement granting a right or interest in real property that is appropriate to retaining land or water areas predominately in their natural, scenic, open, or wooded condition; retaining such areas as suitable habitat for fish, plants, or wildlife; or maintaining existing land uses.

For conservation easement dedication (on-site) or acquisition (off-site) as mitigation for oak woodland impacts, a conservation easement to the satisfaction of County Counsel and the Development Services Director shall be required to ensure the long-term maintenance and preservation of oak woodlands. The conservation easement shall provide for the preservation of the designated area in perpetuity and shall include such terms, conditions, and financial endowments for monitoring and management deemed necessary by the County to ensure the long-term preservation of the oak woodland within the easement area. The conservation easement shall be in favor of the County or a County-approved conservation organization.

Construction/Disturbance Area: Any area in which movement of earth, alteration in topography, soil compaction, disruption of vegetation, change in soil chemistry, and any other change in the natural character of the land occurs as a result of site preparation, grading, building construction or any other construction activity.

Deed Restriction: Private agreements that restrict the use of the real estate and are listed in the deed. Restrictions travel with the deed and cannot generally be removed by new owners.

Defensible Space: The buffer that Responsible Person(s) is(are) required to create on their property between a “Structure” and the plants, brush, trees or other items surrounding the “Structure” that could ignite in the event of a fire, as defined in Chapter 8.09 of the County Ordinance Code (Hazardous Vegetation and Defensible Space).

Diameter at Breast Height (dbh): The measurement of the diameter of a tree in inches, specifically four (4) feet six (6) inches above natural grade on the uphill side of the tree. In the case of trees with multiple trunks, the diameter of the three largest stems (trunks) at breast height shall be combined to calculate the diameter at breast height of the tree.

Fire Safe Plan: Defined in the El Dorado County General Plan (Policy 6.2.2.2) as a plan prepared by a Registered Professional Forester (RPF) and approved by the local Fire Protection District and/or California Department of Forestry and Fire Protection. The plan is prepared to demonstrate that development can be adequately protected from wildland fire hazard in areas of high and very high wildland fire hazard or in areas identified as "urban wildland interface communities within the vicinity of Federal lands that are a high risk for wildfire," as listed in the Federal Register of August 17, 2001.

Fire Hazard: As defined in Chapter 8.09 of the El Dorado County Ordinance Code, means any condition, arrangement, act, or omission which:

1. Increases, or may cause an increase of hazard or menace of fire to a greater degree than that customarily recognized as normal by persons in the public service regularly engaged in preventing, suppressing, or extinguishing fire; or
2. May obstruct, delay, hinder, or interfere with the operations of a fire department or the egress of occupants in the event of fire.

Hazardous Vegetation: As defined in Chapter 8.09 of the El Dorado County Ordinance Code, means any vegetation that is combustible and endangers the public safety by creating a Fire Hazard. Hazardous Vegetation includes material that in its natural state will readily ignite, burn, and transmit fire from native or landscape plants to any Structure or other vegetation. Hazardous Vegetation includes, but is not limited to, dry grass and leaves, brush, weeds, green waste, dead or dying trees, low-hanging branches, litter, or other flammable vegetation that create a Fire Hazard. Hazardous Vegetation shall not include a commercial agricultural crop that is being actively grown and managed by a Responsible Person.

Habitat: The physical location or type of environment in which an organism or biological population lives or can be found.

Heritage Trees: Any live native oak tree of the genus *Quercus* (including blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), interior live oak (*Quercus wislizeni*), canyon live oak (*Quercus chrysolepis*), Oregon oak (*Quercus garryana*), oracle oak (*Quercus x morehus*), or hybrids thereof) with a single main trunk measuring 36 inches dbh or greater, or a multiple trunked tree with an aggregate diameter of the three largest trunks measuring 36 inches dbh or greater.

Impact: For individual native oak trees, the physical destruction, displacement or removal of a tree or portions of a tree caused by poisoning, cutting, burning, relocation for transplanting, bulldozing or other mechanical, chemical, or physical means. Impact includes regulated activities within the Tree Protection Zone. For oak woodlands, tree and land clearing associated with land development, including, but not limited to, grading, clearing, or otherwise modifying land for

roads, driveways, building pads, landscaping, utility easements, fire-safe clearance and other development activities.

In-lieu Fee: Cash payments that may be paid into the County's Oak Woodland Conservation Fund by an owner or developer as a substitute for deed restriction or conservation easement or replacement planting. In-lieu fee amounts for individual native oak trees, Heritage Trees, and oak woodlands are presented in this ORMP and may be adjusted by the County over time to reflect changes in land values, labor costs, and nursery stock costs.

Individual Native Oak Trees: Any live native oak tree of the genus *Quercus* (including blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), interior live oak (*Quercus wislizeni*), canyon live oak (*Quercus chrysolepis*), Oregon oak (*Quercus garryana*), oracle oak (*Quercus x morehus*), or hybrids thereof) with a single main trunk measuring six (6) inches dbh, or greater but less than 36 inches dbh, or with a multiple trunk with an aggregate trunk diameter measuring greater than ten (10) inches dbh and is not a Heritage Tree.

Minor Trimming: The cutting of dead or diseased limbs or twigs, parts which may result in damage to an existing dwelling, parts which must be removed for safety or public utilities or pruning to promote the health or growth of the tree. Safety includes but is not limited to minor trimming to comply with defensible space requirements outlined in Chapter 8.09 of El Dorado County Ordinance Code. Trimming which substantially reduces the overall size, density, or alters the natural shape of the tree is not considered minor trimming.

Mitigation Maintenance, Monitoring and Reporting: Required care, inspection and documentation of Replacement Trees, including acorns, when planted as mitigation for loss of oak woodlands, loss of individual native oak tree(s) or Heritage Tree(s) as defined in the ORMP. Mitigation maintenance, monitoring and reporting shall contain the following elements:

1) Annual monitoring and maintenance of Replacement Trees during the 7-year period after planting in which any trees that do not survive during this period are replaced as needed by the responsible party listed on the Oak Tree or Oak Woodland Removal Permit for a period of 7 years from the date of planting,

2) Monitoring reports documenting the success of Replacement Tree planting submitted to the County at the following intervals:

- Oak Woodland Mitigation: Annually and at the conclusion of the 7-year period after planting (see definition of "Monitoring Report" in this section).

- Individual Native Oak Tree and Heritage Tree Mitigation: At the conclusion of the 7-year period after planting (see definition of "Monitoring Report" in this section).

Monitoring Report: A report prepared by a Qualified Professional documenting site observations and replacement planting survival totals for oak resources mitigation efforts. A Final Monitoring Report is one prepared at the end of the 7-year maintenance and monitoring period that summarizes replacement planting survival totals. All Final Monitoring Reports shall contain contingencies or alternatives if the success criteria for replanting, as determined by a Qualified Professional, have

not been met at the end of the monitoring term, along with a means to ensure compliance with the replacement planting plan. A copy of the Final Monitoring Report shall be submitted to the County.

Oak Resources: Collectively, oak woodlands, individual native oak trees, and Heritage Trees.

Oak Resources Impacts: For individual native oak trees and Heritage Trees, removal or actions that cause the death of the tree shall constitute an impact. For oak woodlands, the oak woodland acreage that occurs within project-related disturbance areas shall be considered impacted.

Oak Tree Removal Permit: A permit issued by the County allowing removal of individual native oak trees not located within an oak woodland or where less than two (2) acres of oak woodland will be impacted by a project. An oak resources technical report shall accompany any tree removal permit application submitted to the County. Conditions of approval may be imposed on the permit.

Oak Woodland Conservation Fund: A fund set up by the County to receive in-lieu fees (Oak Woodland In-Lieu Fee and Individual Tree In-Lieu Fee) which shall be used to fund the acquisition of land and/or oak woodland conservation easements from willing sellers, native oak tree planting projects, and ongoing conservation area monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting.

Oak Woodlands: An oak stand with a greater than 10 percent canopy cover or that may have historically supported greater than 10 percent canopy cover (California Fish and Game Code Section 1361).

Oak Woodland Removal Permit: A permit issued by the County allowing removal of oak trees that are a component of an oak woodland. Where two (2) acres or more of oak woodlands will be impacted, an Oak Woodland Removal Permit is required. Otherwise, an Oak Tree Removal Permit is required. An oak resources technical report shall accompany any oak woodland removal permit application submitted to the County. Conditions of approval may be imposed on the permit.

Qualified Professional: An arborist certified by the International Society of Arboriculture (ISA), a qualified wildlife biologist, or a registered professional forester (RPF).

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

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

Responsible Person: An owner, tenant, occupant, lessor, manager, licensee, political subdivision, local government agency, municipality, or other person having control over a structure or parcel of land or, to the fullest extent allowed by law, the parent or legal guardian of any person under 18 years who have done any act for which a penalty may be imposed under this Chapter, or any other person required to comply with the provisions of the Code and, any other lien holder, secured party, or other person who has properly recorded a security interest or other appropriate document evidencing an interest in the property, which has been recorded in the official records of the County, as defined in Chapter 8.09 of the El Dorado County Ordinance Code.

Replacement Tree: A tree planted as mitigation for oak resources impacts. For oak woodland impact mitigation, replacement trees include container tree stock (1-gallon/TreePot 4 size) and acorns. If acorns are used, the planting ratio shall be 3:1 as compared with container tree stock. For individual native oak tree (including Heritage Tree) impact mitigation, replacement tree sizes may vary and may include the following: 1-gallon/TreePot 4, 5-gallon, or 15-gallon. Documentation of inch-for-inch replacement consistency shall be included in an oak resources technical report and shall be based on the following ratios: 1-gallon/TreePot 4 (2:1), 5-gallon (1.5:1), and 15-gallon (1:1). Acorns and container stock shall be locally sourced (from within El Dorado County).

Sensitive Habitat: In El Dorado County, this includes the following habitat types: montane riparian, valley-foothill riparian, aspen, valley oak woodland, wet meadow, and vernal pools, as defined in the 2004 El Dorado County General Plan EIR.

Structure: Buildings which qualify for occupancy classification and use designation per the County building code, such as residential dwellings (which includes trailers and mobile homes, whether situated in a park or installed on private property), commercial buildings, industrial buildings, agricultural buildings, barns, storage buildings, government buildings, and any accessory buildings thereto deemed appropriate for a site address by the County Surveyor, as defined in Chapter 8.09 of the El Dorado County Ordinance Code.

Exception: Any freestanding outbuilding 120 square feet or less in floor area.

Tree Protection Zone (TPZ): The area surrounding a tree where the majority of the tree's roots take place. The TPZ shall be the greater of the following: (1) one foot diameter for every inch of trunk diameter, or (2) the area of ground beneath the tree's canopy.

Wildland-Urban Interface (WUI) Fire Safe Plan: A plan prepared by a qualified professional as approved by the El Dorado County Fire Prevention Officers Association and approved by the local Fire Protection District and/or the California Department of Forestry and Fire Protection (CAL FIRE), as defined in the El Dorado County General Plan (Policy 6.2.2.2). The plan is prepared to demonstrate that development can be adequately protected from wildland fire hazard in areas of high and very high wildland fire hazard or in areas identified as "[WUI] communities within the vicinity of Federal lands that are a high risk for wildfire", as listed in the Federal Register Executive Order No. 13728, dated May 18, 2016.

Woodland Habitats: Biological communities that range in structure from open savannah to dense forest. In El Dorado County, major woodland habitats include blue oak-foothill pine, blue oak woodland, montane hardwood, montane hardwood-conifer, and valley oak woodland.

Appendix A

Oak Resources Management Plan
Background and Support Information

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El Dorado County

Oak Resources Management Plan Background and Support Information

September 2017
Updated 2025

El Dorado County Planning and Building Department
Planning Division – Long Range Planning Unit

2850 Fairlane Court
Placerville, CA 95667

In association with

Dudek

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Auburn, CA 95603

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Oak Resources Management Plan Background and Support Information
Appendix A

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

1.0 Oak Resources in El Dorado County

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

1.1 Oak Woodland Habitats

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

Table 1-1
Acreage of Oak Woodland Types in the ORMP Area
(2015 FRAP Data)

Oak Woodland Type	CWHR Code	Acreage	Percent
Blue oak woodland	BOW	46,521	18.9%
Blue oak-foothill pine	BOP	64,740	26.2%
Coastal oak woodland	COW	2	<0.1%
Montane hardwood	MHW	98,930	40.1%
Montane hardwood-conifer	MHC	32,643	13.2%
Valley oak woodland	VOW	3,970	1.6%
	Total:	**246,806**	**100%**

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

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

1.1.1 Oak Woodland Types

1.1.1.1 Blue Oak Woodland (BOW)

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

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

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

The CWHR description for BOW can be found here.

1.1.1.2 Blue Oak-Foothill Pine (BOP)

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

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

The CWHR description for BOP can be found here.

1.1.1.3 Montane Hardwood (MHW)

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

The CWHR description for MHW can be found here.

1.1.1.4 Montane Hardwood-Conifer (MHC)

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

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

The CWHR description for MHC can be found here.

1.1.1.5 Valley Oak Woodland (VOW)

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

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

The CWHR description for VOW can be found here.

1.1.2 Current Distribution of Oak Woodland Types

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

1.1.3 Historic Distribution

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

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

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

1.1.4 Existing Threats

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

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

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

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

1.1.5 Natural Regeneration

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

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

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

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

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

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

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

1.2 Individual Tree Species

1.2.1 Oak Species

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

Table 1-2
Native Oak Tree Species within the ORMP Area

Species	Common Name
Quercus chrysolepis	Canyon live oak
Quercus douglasii	Blue oak
Quercus garryana	Oregon white oak
Quercus kelloggii	California black oak
Quercus lobata	Valley oak
Quercus wislizeni	Interior live oak
Quercus x morehus	Oracle oak (hybrid of California black and interior live oaks)

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

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

1.2.1.1 Canyon Live Oak

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

1.2.1.2 Blue Oak

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

1.2.1.3 Oregon White Oak

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

1.2.1.4 California Black Oak

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

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

1.2.1.5 Valley Oak

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

1.2.1.6 Interior Live Oak

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

1.2.1.7 Oracle Oak

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

1.2.2 Non-Oak Species

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

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

2.0 Natural Resource Values of Oak Resources

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

2.1 Wildlife

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

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

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

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

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

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

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

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

2.2 Special-Status Species

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

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

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

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

Status:
Federal
FE Federally listed as "Endangered"
FT Federally listed as "Threatened"
State
CE State listed as "Endangered"
CT State listed as "Threatened"
CR State "Rare"
Other
CNPS: Rare Plant Rank
1B.1 Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
1B.2 Plants rare, threatened, or endangered in California and elsewhere, fairly threatened in California
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Sources: CDFW 2015, CNPS 2016

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

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

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

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

Status:
Federal
FE Federally listed as "Endangered"
FT Federally listed as "Threatened"
FCT Candidate for federal listing as "Threatened)
State
CE State listed as "Endangered"
CT State listed as "Threatened"
CCT Candidate for State listing as "Threatened"
CFP State designated "Fully Protected" or "Protected"
CSC State designated "Species of Special Concern"

Source: CDFW 2015

2.3 Recreation and Open Space

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

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

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

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

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

2.4 Health and Function of Local Watersheds

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

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

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

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

2.5 Soil and Water Retention

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

2.6 Reduction of Fuel Loads

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

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

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

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

2.7 Effects from Loss of Oak Woodlands

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

2.7.1 Wildlife Habitat

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

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

2.7.2 Fragmentation

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

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

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

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

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

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

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

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

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

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

2.7.3 Retention of Soil and Water

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

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

3.0 Economic Value of Oak Resources

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

3.1 Support of Important Economic Activities

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

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

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

3.2 Contribution to Land Value

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

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

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

3.3 Contribution to Ecosystem Function

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

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

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

4.0 Priority Conservation Areas

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

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

1. Using the best geographic information on oak woodlands that is currently available for the entire ORMP area;

2. Considering oak woodland habitat evaluation criteria based on the adopted 2004 General Plan policies; and

3. Completing a mapping process that is objective, replicable, and supportable for the intended purpose of identifying oak woodlands that will receive priority for the mitigation and conservation purposes of this ORMP.

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

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

4.1 Priority Conservation Area Mapping

Priority Conservation Area mapping was conducted in two phases:

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

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

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

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

4.1.1 Mapping Data Sets

4.1.1.1 Oak Woodland Data

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

4.1.1.2 Other Relevant Data

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

4.1.2 Large Expanses of Oak Woodland

Initial Mapping of Large Expanses of Oak Woodland was created by dissolving the Oak Woodlands layer that removed boundaries between contiguous polygons. An acreage calculation was applied to the new aggregate polygons and a selection of all polygons >= 500 acres was made. This selection was then exported to a "Large Expanse of Oak Woodland" layer. 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. The total acreage of the Large Expanses of Oak Woodlands was 219,494.

4.1.3 Initial Mapping of Priority Conservation Areas

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

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

Table 4-1: Parcel Size

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

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

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

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

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

4.1.4 Finalization of Priority Conservation Areas

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

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

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

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

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

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

4.2 Current Oak Woodland Acreage in Priority Conservation Areas

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

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

4.3 Criteria for Conservation Outside of Priority Conservation Areas

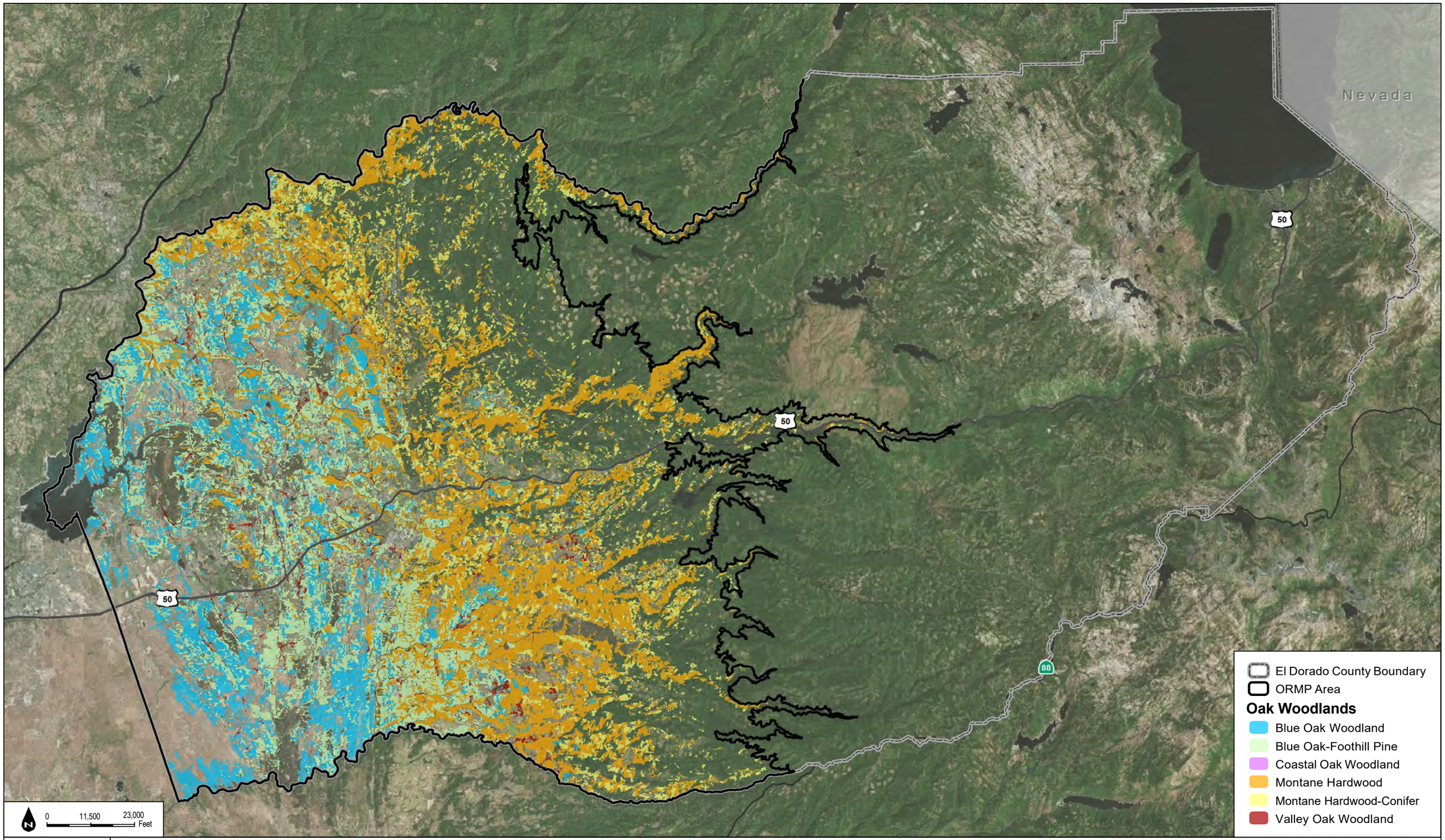
The PCAs have been delineated to prioritize the acquisition of land or oak woodland conservation easements either by the County (using the funds collected in the County's Oak Woodland Conservation Fund) or privately by developers. However, acquisition of land or oak woodland conservation easements outside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

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

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

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

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



DUDEK

SOURCE: Bing Maps 2016; FRAP 2015

FIGURE A-1

Oak Woodland Distribution in ORMP Area

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5.0 Thresholds of Significance for the Loss of Oak Resources

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

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

6.0 Mitigation for the Loss of Oak Resources

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

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

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

7.0 Resources

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

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

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

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

> The County shall preclude development in areas of high and very high wildland fire hazard or in areas identified as "urban wildland interface communities within the vicinity of Federal lands that are a high risk for wildfire," as listed in the Federal Register of August 17, 2001, unless such development can be adequately protected from wildland fire hazard, as demonstrated in a Fire Safe Plan prepared by a Registered Professional Forester (RPF) and approved by the local Fire Protection District and/or California Department of Forestry and Fire Protection.
> Fire Safe Plans address emergency access, signing and building numbering, emergency water standards, and fuel modification standards. These plans are equivalent to Fire Protection Plans, defined in Chapter 47 of the California Fire Code as:
>
> "A document prepared for a specific project or development proposed for a Wildland Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure."

As noted, Fire Safe Plans in El Dorado County are documents written by a Registered Professional Forester (RPF) that address basic wildland fire protection standards of the California Board of Forestry and Fire Protection in relation to a proposed project or parcel split. The authority for these regulations is found within PRC §4290 and Title 14 CCR 1270-1276. These regulations have been adopted with amendments by El Dorado County. Fire Safe Plans are reviewed and approved by the local fire district where the project is being planned as well as by CAL FIRE. Fire Safe Plans incorporate the defensible space requirements of PRC §4291 and may make recommendations for fuel (vegetation) modification outside of the 100 foot defensible space zone. Such fuel modification recommendations outside that required under PRC §4291 are

designed to modify fire behavior such that the safety of emergency firefighting personnel is heightened, and the evacuation of civilians during a wildland fire is expedited. Fuel modification or defensible space zones provide a point of attack or defense for firefighters during a wildland fire.

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

- CAL FIRE's Defensible Space information: https://readyforwildfire.org/prepare-for-wildfire/defensible-space/
- El Dorado Fire Safe Council: http://www.edcfiresafe.org

8.0 Monitoring and Reporting

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

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

8.1 Replacement Tree Plantings

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

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

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

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

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

8.2 Status Reports to the Board of Supervisors

The County shall deposit all oak woodland in-lieu fees into its Oak Woodland Conservation Fund, which shall be used to fund the acquisition of land and/or conservation easements from willing sellers. A portion of the fund shall also be used for ongoing monitoring and management activities, including but not limited to fuels treatment, weed control, periodic surveys, and reporting. Reporting shall be to the Board of Supervisors every five years and shall address the status of conserved oak woodlands in the County and whether adjustments to the oak resources in-lieu fee are necessary to reflect current acquisition and operating costs.

8.3 Adaptive Management

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

9.0 Administration of the Oak Woodland Conservation Program

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

1) A County maintained database for the separate accounting of oak woodland conservation grants and in-lieu fees, and the separate tracking of acreages of oak woodland impacts and conservation/preservation and restoration for periodic review and reporting on a 5-year basis by the County. This database will be used to track the monitoring and reporting information described in Section 8; and

2) One or more entities approved by the Board of Supervisors to assist in the management, maintenance, monitoring or restoration of oak woodlands acquired for any purpose authorized under this ORMP. In this context, oak woodlands are considered "acquired" if the lands are acquired in fee, or subject to oak tree conservation easements for the purpose of oak woodland conservation.

10.0 Education and Outreach

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

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

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

11.0 Partnering to Achieve Goals of the ORMP

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

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

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

The WCB's criteria are as follows:

> "To qualify for funding consideration for a restoration, enhancement, purchase of an oak conservation easement or long-term agreement, projects must meet one or more of the following criteria, must contain an appropriate management plan to assure project goals are maintained and the oak stand must have greater than 10 percent canopy:
>
> - The project is of sufficient size to provide superior wildlife values.
> - The project area contains a diverse size-class structure of oak woodlands and/or a diversity of oak species that will promote the sustainability and perpetuation of oak woodlands.
> - The property is adjacent to other protected areas or will promote the sustainability and perpetuation of oak woodlands.

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

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

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

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

11.1 Governmental Partners

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

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

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

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

3. Natural Resources Conservation Service (NRCS)
   https://www.nrcs.usda.gov

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

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

4. California Department of Forestry and Fire Protection (CAL FIRE)
   https://www.fire.ca.gov/what-we-do/fire-resource-assessment-program

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

5. Bureau of Land Management (BLM)
   https://www.blm.gov/office/mother-lode-field office

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

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

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

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

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

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

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

The City of Placerville General Plan identifies the retention of tree canopy, which includes oaks, as important. The City currently is contemplating a comprehensive plan for Hangtown Creek, which is a major tributary of Weber Creek. Placerville and the County share land management 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
   https://www.placer.ca.gov/2845/Planning-Services

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

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

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

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

10. Amador County
    https://www.amadorgov.org/departments/planning/general-plan-update-draft-environmental-impact-report-and-draft-general-plan

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

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

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

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

Several of the largest preserves in El Dorado County exist within or adjacent to the Cameron Park Community Service District boundary. The preserves support a mixture of chaparral and woodland types. Some opportunities for oak planting or enhancement of existing stands may exist.

13. El Dorado County Agriculture Department
https://readyforwildfire.org/prepare-for-wildfire/defensible-space/

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

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

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

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

15. El Dorado County Long Range Planning Division
https://www.eldoradocounty.ca.gov/Land-Use/Planning-and-Building/Long-Range-Planning-Division

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

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

16. Sierra Nevada Conservancy*
    https://sierranevada.ca.gov/

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

11.2 Public Utility Partners

1. El Dorado Irrigation District (EID)*

   http://www.eid.org

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

2. Georgetown Divide Public Utility District

Currently no opportunities for partnerships have been identified.

3. Sacramento Municipal Utility District (SMUD)
   http://www.smud.org/

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

4. Pacific Gas and Electric (PG&E)
   http://www.pge.com/

Currently no opportunities for partnerships have been identified.

11.3 Private Partners

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

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

11.4 Non-profit Partners

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

12.0 Consistency with the General Plan and State Law

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

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

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

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

12.2 Consistency with Measure CO-P

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

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

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

12.4 Compliance with PRC 21083.4

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

12.5 Effect of Future Amendments to General Plan

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

13.0 List of Preparers

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

County staff involved in preparation of this ORMP included:

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

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Isabel Domeyko, Managing Member (New Economics & Advisory)

14.0 Acronyms

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

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

Appendix B

El Dorado County Oak Resources In-Lieu Fees Nexus Study

NEW ECONOMICS & ADVISORY®

LAND USE ANALYSIS & STRATEGIES

El Dorado County Oak Resources In-Lieu Fees Nexus Study

Prepared by New Economics & Advisory

Updated June 2016

Office: (916) 538-9857 | www.new-econ.net | 951 Reserve Drive, Suite 120, Roseville, CA 95678

1. Introduction

This Oak Resources Nexus Study (Nexus Study) has been prepared for El Dorado County (County) pursuant to the "Mitigation Fee Act" found in California Government Code 66000. The purpose of this Nexus Study is to establish the legal and policy basis to allow the County to offer two in-lieu fee options for new development within the County to mitigate impacts to these Oak Resources: Oak Woodland Areas (OWAs) and Individual Oak Trees (IOTs), (which include Heritage Oak Trees and Native Oak Trees). The In-Lieu Fees would provide one mitigation option for projects that impact Oak Resources; other mitigation options include replacement tree planting on- or off-site or conserving existing oak woodlands off-site, as described in the 2016 Oak Resources Management Plan (ORMP).

Oak Resources Conservation Strategy Background

The County's 2004 General Plan Environmental Impact Report identified substantial fragmentation and/or elimination of Oak Resources by residential and commercial development that would occur as a result of new development in El Dorado County[1]. The projected growth in the County increases the potential for significant oak woodland loss.

In 2008 the County prepared an Oak Woodland Management Plan (OWMP), which outlined the County's strategy for conservation of oak woodland areas. The in-lieu oak woodland mitigation fee was intended to be consistent with a future conservation fund to be established under the Integrated Natural Resources Management Plan (INRMP). The fee was established through an economic analysis that was presented to the Board in April 2008. However, a lawsuit challenging the County's approval of the OWMP and its implementing ordinance (Oak Tree Replacement Ordinance) ultimately resulted in the Board's rescission of the OWMP and its implementing ordinance in September 2012. At the same time, the County decided to update biological resources policies in the General Plan. As part of that update, an ORMP based on Board direction has been prepared, including a mitigation fee program for impacts to oak woodlands and individual oak trees. This 2016 Nexus Study reflects the parameters described in the ORMP prepared by Dudek in June 2016 and the Oak Resources Conservation Ordinance and has been prepared to support the in-lieu fee mitigation program component of the ORMP and its implementing ordinance.

The ORMP and its implementing ordinance also define mitigation requirements and options for impacts to Oak Resources, which include OWAs and IOTs. IOTs include individual Native Oak Trees and Heritage Trees.

[1] As cited in the Oak Resources Management Plan prepared by Dudek, June 2016, page 1.

Overview of 2008 In-Lieu Mitigation Fee

An in-lieu mitigation fee was originally developed concurrently with the 2008 OWMP. Calculation of the 2008 in-lieu fee utilized a Level of Service (LOS) methodology, as opposed to a Capital Improvement Program (CIP) methodology, as the basis for its technical approach. While a CIP approach relies on a fixed set of improvements—in this case a known number of acres that can be acquired for a known cost— the LOS approach relies on a service target or standard—in this case a mitigation ratio and mitigation cost per acre. The 2008 analysis relied on the OWMP standard of conserving existing oak canopy of equal or greater biological value as those lost at a conservation mitigation ratio of 2:1[2].

The 2008 analysis developed a per-acre cost for three broad oak woodland conservation activities: acquisition, management, and monitoring. The study estimated cost assumptions for each activity based on a variety of sources, and then applied these assumptions to a hypothetical conservation easement of approximately 125 acres in size. This parcel size was selected because it reflected the average parcel size within Priority Conservation Areas (PCAs)[3].

The OWMP in-lieu fee study established a total cost of $4,700 per acre of canopy impact to fund the acquisition, management, and ongoing monitoring of oak woodland. Based on the 2:1 mitigation ratio, the 2008 OWMP In-Lieu Fee was established at a rate of $9,400 per acre. **Figure 1.1** provides a summary of the cost and fee per acre.

[2] El Dorado County Oak Woodland Management Plan, April 2, 2008, page 9.

[3] Areas where oak woodland conservation efforts may be focused. The ORMP contains a map showing the location of PCAs.

List of Acronyms

ARC	American River Conservancy
CAL FIRE	California Department of Forestry and Fire Protection
CE	Conservation Easement
CEQA	California Environmental Quality Act
CIP	Capital Improvement Project
CPUC	California Public Utilities Commission
FRAP	Fire and Resource Assessment Program
GIS	Geographic Information Systems
HRS	Habitat Restoration Sciences, Inc.
Initial M&M	Initial Management and Monitoring
INRMP	Integrated Natural Resources Management Plan
IOT	Individual Oak Tree
LCO	Land Conservation Organization
Long-Term M&M	Long-Term Management and Monitoring
LOS	Level of Service
NACUBO	National Association of College and University Business Officers
ORMP	Oak Resources Management Plan
ORTR	Oak Resources Technical Report
OWA	Oak Woodland Area
OWMP	Oak Woodland Management Plan
PCA	Priority Conservation Area
PCCP	Placer County Conservation Plan
PLT	Placer Land Trust
PRC	California Public Resources Code
SACOG	Sacramento Area Council of Governments
SF	Sempervirens Fund
SFC	Sierra Foothill Conservancy
SRAS	State Responsibility Areas
SRL	Save the Redwoods League
STF	Sacramento Tree Foundation
SVC	Sacramento Valley Conservancy
TAZ	Transportation Area Zones

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1.1 *2008 OWMP In-Lieu Mitigation Fee Rate*

2008$

Activity	Amount Per Acre
Cost Components	
Acquisition [1]	$2,300
Management [2]	$1,200
Monitoring [3]	$1,200
Total Cost Per Acre	$4,700
Mitigation Ratio For In-Lieu Fee	2:1
Proposed Fee per Acre	$9,400

Prepared by New Economics & Advisory, June 2016.

[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.

Source: El Dorado County Oak Woodland Management Plan, April 2, 2008, Page 10, Table 4.

The 2008 analysis did not include an in-lieu fee for individual Heritage Trees or Oak Trees.

As described previously, the 2008 OWMP In-Lieu Fee was only in effect for a limited time because the OWMP itself was the subject of litigation. The County has prepared an ORMP reflecting a number of policy changes directed by the County Board of Supervisors. This Nexus Study has been prepared to update the assumptions and costs in support of the in-lieu fee mitigation component of the ORMP.

New Proposed Fee: Purpose, Approach, and Amount

Purpose of the Nexus Study and Fee

The purpose of the 2016 El Dorado County Oak Resources Nexus Study is to determine in-lieu fee rates for mitigating impacts to eligible Oak Resources, including OWAs, and IOTs.

This Nexus Study proposes a fee designed to pay the full cost of the mitigation for development impacts, including Acquisition, Initial Management & Monitoring (Initial M&M), Long-Term Management & Monitoring (Long-Term M&M), and associated Administrative functions.

Nexus Study Approach

Typically one of two methodologies is utilized to prepare a nexus study: a CIP approach and a LOS approach. The CIP approach relies on a known amount of improvements that must be funded by the fee program and a known amount of new development that will participate in the fee program. The CIP approach is appropriate when the improvements and scale of new development is known. The LOS approach relies on an established level of service or performance measure (such as a required amount of library space per resident) and is used in cases where the amount of development is not certain. For this study, the levels of service evaluated are the mitigation ratios identified in the ORMP.

This 2016 Nexus Study is an update to the 2008 in-lieu mitigation fee study and continues to utilize a LOS methodology. LOS standards for Oak Resources mitigation, developed in the ORMP, are summarized in **Figure 1.2**. This 2016 Nexus Study also notes that the LOS approach remains preferable because the amount of OWAs and IOTs ultimately conserved by one or more Oak Resources Land Conservation Organization(s) (LCOs) with funds from Oak Resources In-Lieu Fees cannot be reasonably predicted at this time, for the following reasons:

- Impacts to Individual Oak Trees could occur as a result of improvements constructed on property that is already developed, unrelated to new development proposals; the County has no projections for the potential scale at which improvements to existing developed property may occur.
- The amount of impacts to Oak Resources as a result of new development is uncertain because it is not known to what extent land-use plans would avoid and/or lessen impacts to existing Oak Resources.
- For new projects that do impact Oak Resources, the mitigation requirement will depend on the percentage of woodland impact.
- The ORMP provides three options to mitigate impacts to Oak Resources. Developers can choose one of the three options to meet their mitigation requirements. The Oak Resources In-Lieu Fees represent one of the three options. It is not known in what proportion each option will be selected; therefore it is not known how much land would be conserved under the in-lieu fees.

Certain development activities are exempted from mitigation requirements, including small parcels that cannot be further subdivided, agricultural activities, creating defensible space/undertaking fire safe measures, qualified affordable housing projects, and certain public roads and public utility projects. **Section 7** of this Nexus Study describes these exemptions in more detail.

1.2 *Standards for Oak Woodland Resources*

2016 ORMP

Standard	Oak Woodland Areas (OWAs)	Individual Oak Trees (IOTs)	
		Heritage Oak Trees	Native Oak Trees
Definition	Oak stand that contains greater than ten percent canopy cover. [1]	Native oak trees, outside of Oak Woodland Areas, with a single main trunk measuring measuring 36 dbh or greater, or with a multiple trunk with an aggregate trunk diameter measuring 36 inches or greater.	Individual oak tree, outside of Oak Woodland Areas, with a single main trunk measuring greater than 6 but less than 36 inches dbh, or with a multiple trunk with an aggregate trunk diameter measuring greater than 10 but less than 36 inches dbh.
Mitigation Ratio	00.1-50.0% of Oak Woodland Impact = 1:1 Ratio 50.1-75.0% of Oak Woodland Impact = 1.5:1 Ratio 75.1-100% of Oak Woodland Impact = 2:1 Ratio	Inch-for-inch replacement at a 3:1 ratio	Inch-for-inch replacement at a 1:1 ratio
Mitigation Obligations	Conservation, Tree Planting, Management & Monitoring	Conservation, Tree Planting, Management & Monitoring	Conservation, Tree Planting, Management & Monitoring
Duration of Conservation	Perpetuity	Seven (7) years	Seven (7) years

[1] The definition of OWAs also includes an oak stand that "may have historically contained greater than ten percent canopy cover," per Article 3.5 (commencing with Section 1360) of Chapter 4 of Division 2 of the Fish and Game Code. However, page 3 of the ORMP clarifies that ORMP conservation efforts focus on existing woodlands.

Prepared by New Economics & Advisory, June 2016.

Source: ORMP, June 2016.

For oak woodland impacts that do not fall under an exemption category, mitigation options include on- or offsite tree planting, offsite conservation, and/or in-lieu fee payment. For IOT impacts (including Heritage Oak Trees and Native Oak Trees) that are not otherwise exempt, mitigation options include on- or offsite tree planting and/or in-lieu fee payment. This Nexus Study provides the justification for the in-lieu fee rate for each Oak Resource.

As described previously, the 2008 in-lieu mitigation fee study applied a series of cost estimate assumptions to a hypothetical 125-acre parcel to develop a per-acre fee. In contrast, this 2016 Nexus Study considers actual recent and/or current acquisition and management and monitoring costs faced by LCOs actively conserving oak woodland resources or other tree-dominated habitat. **Section 3** of this Nexus Study provides a complete list of existing LCOs actively acquiring and managing land for the purpose of conserving trees that were studied for purposes of identifying a range of costs. Data was sought for three major conservation activity categories: Acquisition, Initial M&M, and Long-Term M&M. Once the cost ranges were established and reviewed, New Economics & Advisory, in consultation with County staff, determined that costs incurred by Placer Land Trust (PLT), American River Conservancy (ARC), and planning efforts

related to the Placer County Conservation Plan (PCCP) should be prioritized because these organizations/studies provided data specific to oak woodland areas *and* operate primarily within El Dorado County or Placer County; therefore, their data represent the most accurate information pertaining to acquisition as well as management and monitoring costs. Moreover, compared to other adjacent counties (Sacramento County and/or Amador County), the attributes of Placer County's Oak Resources and development patterns are more similar to those of El Dorado County.

Costs incurred by these select LCOs are then averaged. This approach differs from the 2008 in-lieu fee analysis in that this 2016 Nexus Study takes into consideration costs for a variety of locations (rural and urban), terrains (canyon, valley, foothills), and sizes (small, ranch). Based on the recent and/or current costs incurred by these select LCOs, New Economics & Advisory developed an OWA In-Lieu Fee that includes the following components:

- Acquisition (via direct acquisition or conservation easements)
- Initial M&M
- Long-Term M&M
- Fee Program Administration

This 2016 Nexus Study also includes proposed fees for IOTs. Dudek and its subsidiary company, Habitat Restoration Sciences, Inc. (HRS), developed costs for acquisition and planting, as well as seven (7) years of management and monitoring, on a per diameter inch basis. Dudek and HRS researched current purchase prices for 1-gallon oak trees, applied industry standard assumptions for planting costs, and developed a per-acre cost of seven years of management of monitoring for a one-acre re-planting project.

This Nexus Study assumes that the County will administer the Oak Resources In-Lieu Fee program and remit fee revenues to existing or new LCO(s) dedicated to conserving Oak Resources (Oak Resources LCO). The Oak Resources LCO(s) will utilize In-Lieu Fees established herein to acquire and conserve Oak Resources.

Proposed Fee Rate Amounts

Figure 1.3 summarizes the total proposed fee rates for OWAs and IOTs. **Section 3** of this Nexus Study contains the assumptions and analysis supporting each of the OWA rates, while **Section 5** contains the assumptions and analysis supporting each of the IOT rates.

1.3 *Summary of Fee Rates (2016$)*
El Dorado County Oak Woodland Nexus Study

Item	Oak Woodland Areas (OWAs)			Individual Oak Trees (IOTs)	
	0.01 - 50.0% Impact	50.01 - 75.0% Impact	75.01 - 100.0% Impact	Heritage Oak Trees	Native Oak Trees
	per acre			*per diameter inch*	
Fee Rate	$8,285	$12,428	$16,570	$459	$153

Prepared by New Economics & Advisory, June 2016.

Oak Woodland Area In Lieu Fee (per acre)

The OWA In-Lieu Fee ranges from $8,285 to $16,570 per acre, depending on the mitigation ratio level. This rate funds the cost of land acquisition, Initial M&M (years 1-5), and Long-Term M&M (years 6-perpetuity).

Individual Oak Tree In Lieu Fee (per diameter inch)

The IOT In-Lieu Fee is $459 per diameter inch for Heritage Oak Trees and $153 per diameter inch for Native Oak Trees. This amount funds the cost of tree acquisition and planting as well as Initial M&M (years 1-7). This Nexus Study presumes that Long-Term M&M costs will be nominal and can be covered by the Oak Resources LCO(s) through maintenance of OWAs.

Administration and Implementation

As stated previously, it is anticipated that the County will collect in-lieu fees and transfer them to one or more Oak Resources LCOs, which will be in charge of acquiring, managing, and monitoring conservation areas and tree planting efforts funded by the in- lieu fees. The proposed fee rates identified above also include a 5 percent administration cost component for County staff to calculate fee obligations, collect fee revenues, transfer revenues to the entity managing conservation efforts, implement annual inflation updates, and periodically update the Nexus Study.

Documents Consulted for the Preparation of This Report

This 2016 Nexus Study references and/or relies upon a number of other documents and interviews with LCOs. **Appendix C** contains a complete list of sources and persons consulted.

Overview of Methodology

The approach utilized to develop the Oak Resources In-Lieu Fees includes the following general steps:

1. Identify the potential scale of new development that may impact existing Oak Resources.
2. For each Oak Resource, define the mitigation requirements and ratio(s).
3. Review the costs associated with mitigation for each Oak Resource. Convert costs to a per-acre basis for OWAs and per diameter inch for IOTs.
4. Establish a fee rate and nexus for each Oak Resource In-Lieu Fee.
5. Review administrative and implementation process for the Oak Resources In-Lieu Fee programs.

Organization of this Nexus Study

The remainder of this Nexus Study is organized in the following manner:

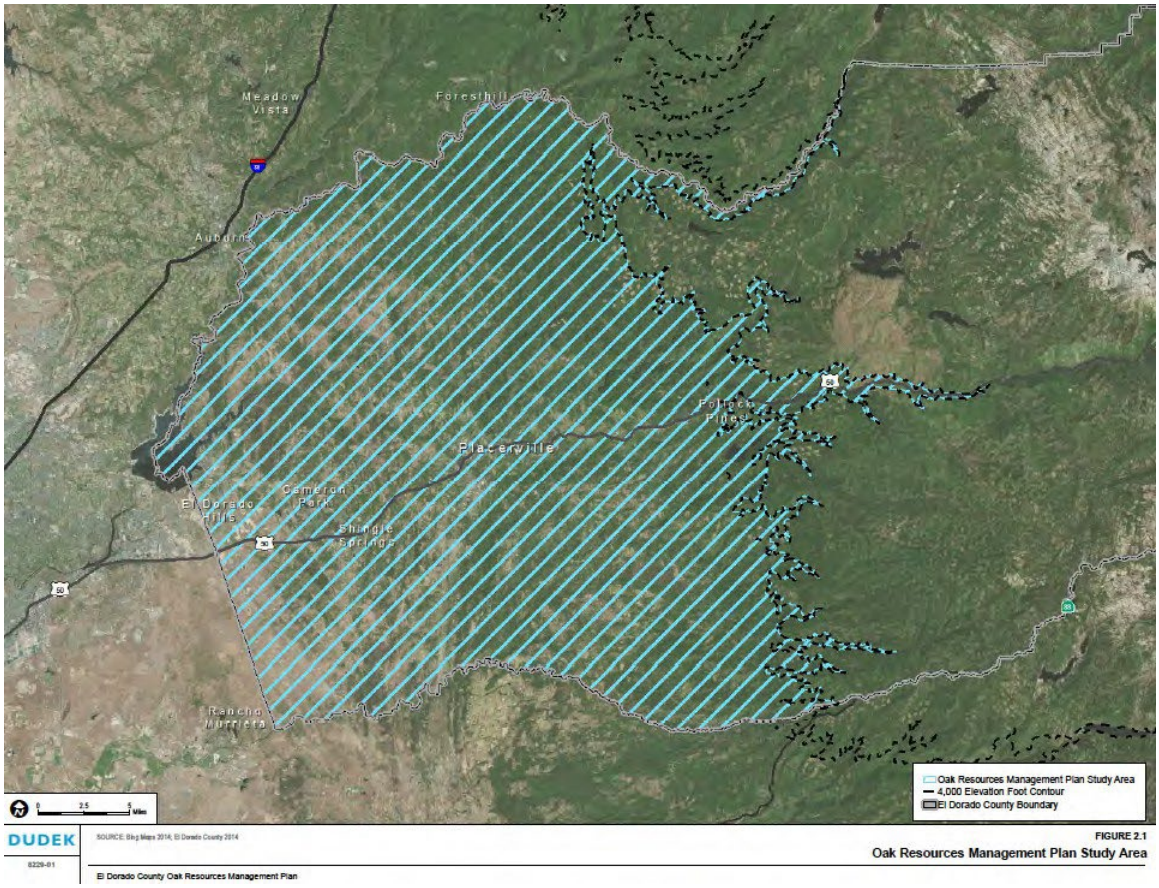
- **Section 2** provides an overview of the boundaries of the Oak Resources In-Lieu Fee program and reviews the type and potential scale of development that may elect to pay the fees.
- **Section 3** describes how oak woodland conservation costs were developed.
- **Section 4** establishes the nexus for the proposed OWA In-Lieu Fee.
- **Section 5** explains the development of individual oak tree replacement costs.
- **Section 6** establishes the nexus for the proposed IOT In-Lieu Fee.
- **Section 7** provides implementation procedures to administer the fee programs.
- **Appendix A** contains supporting calculations for OWA conservation costs.
- **Appendix B** contains supporting calculations for the endowment component of the OWA In-Lieu Fee.
- **Appendix C** contains a bibliography for this Nexus Study.

2. Fee Program Boundary, Eligibility, & Standards

This section provides an overview of the boundaries of the Oak Resources In-Lieu Fee program and reviews the type and potential scale of development that may elect to pay the fees.

Fee Program Boundaries

The boundaries for this Nexus Study are the same as those included in the ORMP, which include the 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 as shown in **Figure 2.1.** This area contains the same categories of oak woodlands as described in the California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program (FRAP) and addressed in the County's 2004 General Plan.



New Development Eligible for In-Lieu Fee Option

Mitigation requirements for impacts to OWAs will apply to any land development project requiring a discretionary entitlement from the County that is subject to review under CEQA and which will have an impact on Oak Resources within the ORMP boundaries. Mitigation requirements for IOTs will apply to any activity requiring a building permit or grading permit issued by El Dorado County and/or any action requiring discretionary development entitlements or approvals from El Dorado County within the ORMP boundaries. **Section 7** of this Nexus Study contains a description of development activities that are exempt from mitigation requirements for Oak Resources. For non-exempt activities, the ORMP provides options for mitigation:

- on- or offsite tree planting[4];
- off-site conservation;
- payment of the In-Lieu Fee; or
- a combination of the above.

The Oak Resources In-Lieu Fees will apply to any eligible, non-exempt development project that chooses to mitigate quantified impacts to Oak Resources by selecting the In-Lieu fee payment option.

Anticipated Growth Through 2035

The projected growth throughout the County is anticipated to impact oak resources. **Figure 2.2** summarizes the scale of development anticipated between 2014 and 2035 within unincorporated areas of the County's Western Slope (the area outside of the Lake Tahoe Basin[5]). This area includes a larger territory than the ORMP boundary but is the closest approximation for purposes of this Nexus Study.

Oak Resources Mitigation Standards

LOS standards for Oak Resources mitigation, developed in the ORMP, are summarized in **Figure 1.2** in **Section 1** of this Nexus Study. For OWAs, the mitigation ratio depends on the percentage of OWAs impacted. For IOTs, mitigation is based on the total tree trunk diameter inches removed.

[4] As noted in Section 2.2.2 of the ORMP, replacement planting shall not account for more than 50 percent of the oak woodland mitigation requirement, consistent with California Public Resources Code Section 21083.4..

[5] SACOG tracks data for multiple Transportation Area Zones (TAZs) that comprise the Western Slope; TAZ 13 appears to include a large area between the boundary of the ORMP and the Lake Tahoe Basin.

2.2 *El Dorado County Development Projections 2010-2035*

Category	Units/Jobs 2010	2020	2035	Growth 2010-2035
Housing Units [1]	59,668	66,102	77,077	17,409
Jobs [2]	32,597	38,539	48,675	16,078

Prepared by New Economics & Advisory, June 2016.

[1] From BAE 2035 Growth Projections Memorandum, Table 2: Projected Residential Growth Rates, 2010 to 2035. (Full report citation below). Projection based on historical average annual rate of new units (2000-2011).

[2] From BAE 2035 Growth Projections Memorandum, BAE Memorandum, Table 5: Projected New Jobs by Market Area, 2010-2035. (Full report citation below).

Source: BAE Urban Economics, 2035 Growth Projections Memorandum, March 14, 2013.

3. Costs to Conserve OWAs

New development that impacts existing OWAs will have three options to mitigate impacts: plant replacement trees on- or offsite, conserve oak woodlands off-site, and/or pay an In-Lieu Fee. This section of the Nexus Study describes the costs associated with mitigation through an In-Lieu OWA Fee.

Oak Woodland Areas Overview

Figure 3.1 provides a summary of the different types of Oak Woodland and the number of acres that currently exist in the ORMP Study Area (including within the PCAs).

3.1 ***Oak Woodland Types***
El Dorado County, 2016

Oak Woodland Type	ORMP Boundary Total (acres)	Percent
Blue Oak Woodland	46,521	18.9%
Blue Oak-Foothill Pine	64,740	26.2%
Coastal Oak Woodland	2	<0.1%
Montane Hardwood	98,930	40.1%
Montane Hardwood-Conifer	32,643	13.2%
Valley Oak Woodland	3,970	1.6%
Total	246,806	100%

Source: California Department of Forestry and Fire Protection (CAL FIRE) California Fire and Resource Assessment Program (FRAP) 2015.

Impacts to OWAs

As discussed in **Section 5** of the ORMP, the number of OWA acres impacted by a project, if any, will be identified in an Oak Resources Technical Report (ORTP) prepared by a qualified professional hired by the project applicant. Should it be determined that OWAs will be impacted, the development project will be subject to the mitigation ratios shown in **Figure 1.2** in **Section 1** of this Nexus Study.

Approach to Estimating Costs

As explained in **Section 1**, this Nexus Study considers actual recent and/or current acquisition and M&M costs faced by LCOs actively conserving oak woodland resources or other tree-dominated habitat. **Figure 3.2** lists these organizations and provides an

indication of the geographic territory they serve, their structure, the type of habitat conserved, and their primary conservation role(s).

These organizations were selected because of their focus on conserving woodland habitat or other tree-dominated habitat. **Figure 3.3** provides an overview of the scale of habitat protected by these LCOs, how this habitat has been protected (via direct acquisition or conservation easement), and the scale of habitat actively managed by each organization. Because some organizations protect a variety of habitat land, (e.g. vernal pools, riparian corridors), acreage shown in this figure includes *all* land protected by the organization, not merely land protected for purposes of conserving woodland habitat.

For each of these LCOs, New Economics & Advisory collected data regarding recent land acquisitions, (including the cost and method), as well as annual management and monitoring costs. These costs were then translated into a "per-acre" basis. Data was gathered from each LCO's website, publicly available financial statements, and/or consultation with LCO staff. **Appendix A** contains the detailed technical research supporting financial calculations for each of the LCOs.

Conservation Activities Overview

This 2016 Nexus Study identifies three stages of conservation:

1. **Acquisition.** This first stage includes due diligence, planning for management and monitoring, and the actual land acquisition transaction.
2. **Initial M&M.** According to interviews with LCO staff, this second stage of conservation typically lasts up to 5 years and includes baseline documentation, fuel management, clearing of debris, establishment of fencing, active monitoring to ensure that OWAs or IOTs are maintained, etc.
3. **Long-Term M&M.** This third stage of conservation is the least onerous and involves periodic fuels management, invasive species management, and repairs on an as-needed basis.

Figure 3.4 provides examples of conservation activities during each of these stages.

3.4 ***Typical Conservation Activities-- OWAs***
Acquisition, Management, and Monitoring

Acquisition	Initial M&M [1]	Long-Term M&M
Conservation Easement Acquisition	Biological Surveys/Baseline Documentation	License/Contract Agreement Mgmt.
Direct Property Acquisition	Fuel Load Mgmt.	Fuel Load Mgmt.
Legal Document Prep. & Review	Equipment & Materials Mgmt.	Volunteer Training/Coordination
Site Inspection	Database Mgmt./Reporting	Office Equipment/Computers Maint./Upgrades
Aerial Photos	Photo-Documentation	Endowment Mgmt.
Appraisals	Manage/Transition Cattle/Grazing Leases	Aerial Photos
Due Diligence Surveys/Analyses	Monitoring & Adaptive Management:	Administration/Overhead
Mitigation/CE Negotiations	Reforesting	Infrastructure/Property Maintenance:
	Exotic Species/Plant Removal	Debris/Trash Mgmt.
	Building Removal/Maint.	Weed Control
	Invasive Vegetation/Thatch Mgmt.	Cattle Grazing Monitoring & Mgmt.
	Invasive Species Mgmt.	Water Systems Maint.
		Fence Building & Repairs
		Trail Building & Maintenance
		Erosion/Road Repair & Improvements
		Recreation Use Enhancements

Prepared by New Economics & Advisory, June 2016.
[1] Some Initial M&M tasks are carried over to long-term management and monitoring with less intensity.
Sources: California Council of Land Trust website accessed May 2015; Land Trust Alliance website, accessed May 2015; New Economics internet research, interviews; and land conservation organization feedback, April-June 2015.

Acquisition (Year 0)

Acquisition of OWAs are expected to take one of two forms:

- **Direct Acquisition**. This Nexus Study presumes that the Oak Resources LCO(s) will hold fee title to property conserved through direct acquisition (instead of passing it along to another public agency or non-profit entity). This Nexus Study also assumes that properties conserved via direct acquisition will also be actively managed by the LCO. This assumption is consistent with current practices for many of the LCOs tracked in this analysis.
- **Acquisition of Conservation Easements (CEs)**. Properties protected through the purchase of CE's are expected to remain under the ownership of private landowners holding fee title to such properties. LCO interviews indicated that land protected through CEs is, in some cases, managed by the landowners but nearly always monitored (for compliance purposes) by the LCO. In other cases, the landowner and LCO enter into an M&M contract that specifies the range and cost of M&M services to be provided by the LCO. This 2016 Nexus Study presumes that OWAs protected through CE's will be subject to an active M&M contract between the land owner and Oak Resources LCO and that the LCO will provide the same level of M&M as land owned by the Oak Resources LCO.

In addition to the purchase price for acquisition of property or CE's, other costs included in this category include legal services, appraisals, due diligence, title insurance and escrow fees, and organizational staff time associated with acquisition efforts.

Direct Acquisition Costs

Figure 3.5 contains a summary of direct property acquisition cost trends for LCOs on a per-acre basis. These per-acre figures reflect acquisitions expressly made for purposes of conservation, predominantly within the last five years, and reflect nominal dollars.[6] **Appendix A** contains supporting acquisition information for each LCO, including the purchase price, other acquisition-related costs, and the size of the property. In some cases, LCO staff was able to articulate trends as well as specific transaction details. Recent conservation land costs among LCOs range from $1,000 to nearly $17,000 per acre, but most fall within a range of $2,800 to $12,000 per acre.

New Economics & Advisory then further reviewed per-acre costs incurred within El Dorado County and Placer County, given that these areas provide the most proximate approximations of cost likely to be incurred by one or more Oak Resources LCOs conserving OWAs with funds from Oak Resources In-Lieu Fees.[7] **Figure 3.5** lists data points from the following entities:

- **El Dorado County Assessor's Office.** The Assessor's Office provided a list of land transactions over the last five years for properties that contain OWAs. Of the information provided (see **Appendix A Table A1**), one transaction stood out as a viable comparable because a significant portion of the property contained OWA. This transaction, which dates back to 2012, is included in **Figure 3.5**. The other transactions contained relatively little OWA and their prices per acre reflect their "development" value, as opposed to their potential OWA value.
- **ARC.** ARC provided three direct acquisition transactions as well as a per-acre estimate that staff utilizes for planning purposes. These transactions varied in size from 1,000 to 10,000 acres. Because ARC is about to complete an unusually large land purchase, New Economics & Advisory applied a direct average approach when deriving a per-acre cost for this organization (shown- in **Appendix A Table A2.1**).
- **PLT.** PLT provided two direct acquisition transactions for land containing OWAs; these transactions varied in size from 80 acres to nearly 1,800 acres and costs include purchase price, legal fees, appraisal, title insurance and escrow fees, and staff and administrative time. **Appendix A Table A3.1** contains the detailed documentation of these transactions. Staff also provided their input on current per-acre market prices for oak woodland in different terrains within Placer County.

[6] Real estate transactions are not converted to a single year (i.e. 2016$) owing to varying market conditions over time and by market area. As a result, all transactions are shown in nominal dollars—or the cost incurred in the year they were incurred—and are not inflated to 2016$.

[7] For example, Save the Redwoods League (SRL) makes the bulk of its acquisitions along the California Coast for properties that contain redwood groves; coastal values tend to be significantly high compared to Central Valley values.

Data points developed from these three sources provides a narrower range of $2,000 - $12,000, with most points falling between $3,000 and $6,000. New Economics & Advisory selected a direct acquisition price of $5,000 per acre for purposes of this 2016 Nexus Study; this amount falls within the range of prices experienced and/or anticipated by the organizations actively conserving OWAs within closest proximity to El Dorado County and is aligned with the expertise of organizational staff. The selected price is also higher than the mid-point of the range to allow for purchase of non-OWA land included in a parcel that contains the desired amount of OWA acreage.

Conservation Easement Acquisition Costs

CE's tend to provide a more cost effective means of conserving land. **Figure 3.6** provides a summary of recent acquisitions via CE's by LCOs. These per-acre figures reflect CEs entered into expressly for purposes of conservation, predominantly within the last five years. **Appendix A** contains supporting CE information for each LCO, including the purchase price, other acquisition-related costs, and the size of the property. Because CEs are used less often than direct acquisition, there were fewer CE data points; nonetheless, individual easement transactions varied from 26 acres (PLT) to 22,986 (Save the Redwoods League) acres in size. These data points provide a range of $700 - $3,500 per acre.

Interviews with LCO staff revealed the following important caveats regarding valuation of CEs:

- CE's are sometimes chosen over direct acquisition because the subject property has a development restriction already and cannot be developed. For example, a subject property within a larger master planned community may have a vernal pool on it. Other examples of development restrictions can include poor road access, lack of utility connections, steep slope, etc. In these cases, because the property is already prevented or hindered from being developed, the starting appraised value may well be lower than a nearby "comparable" property that can be developed.
- The value for a CE should, theoretically, reflect the value of "development potential," excluding other income potential for the property, primarily associated with grazing and/or timber. LCO staff experienced in appraisals have observed that CE values are often lower than expected by the landowner, which can act as a disincentive to landowners interested in placing a CE on their property. In practice, only properties located in urban areas or areas facing significant development pressures tend to generate enough value for a CE to make financial sense to most landowners.

3.6 *Conservation Easement Value Assumption*
LCO Case Studies (Nominal Dollars)

Organization	Recent Conservation Easement Purchases: Acres [1]	Recent Conservation Easement Purchases: Cost per Acre
All LCOs		
American River Conservancy (ARC)	1,178	$1,585
Placer Land Trust (PLT)	858	$1,600
Sierra Foothill Conservancy (SFC)	6,948	$700
Sempervirens Fund (SF)	151	$3,477
Save the Redwoods League (SRL)	23,364	$771
Placer County Conservation Plan (PCCP)	N/A	N/A
Sacramento Tree Foundation (STF)	N/A	N/A
Sacramento Valley Conservancy (SVC)	N/A	N/A
LCO Data Applied in this Analysis		
American River Conservancy (ARC)	1,178	$1,585
Placer Land Trust (PLT)	858	$1,600
CE Acquisition Price Applied for this Analysis [2]		$1,600

Prepared by New Economics & Advisory, June 2016.
[1] Reflects select recent CE's, based on information provided directly by organizations or taken from their published financial documents.
[2] Figure rounded to nearest hundred dollars. Also, while the data sources reflect figures expressed in nominal dollars over a period of multiple year, this analysis expresses the final figure as a 2016 dollar amount for purposes of calculating a fee rate.
Source: See Technical Appendix A for supporting calculations.

New Economics & Advisory further reviewed per-acre CE costs incurred within El Dorado County and Placer County, given that these areas provide the most proximate approximations of cost likely to be incurred by an Oak Resources LCO conserving OWAs with funds from Oak Resources In-Lieu Fees. **Figure 3.6** lists data points from the following entities:

- **ARC.** ARC provided one recent CE for a 1,200-acre easement. Costs included the purchase price as well as a contribution to an Endowment Fund; the endowment contribution was included in the cost because the purchase price could have been increased without this contribution.
- **PLT.** PLT provided five recent CEs transactions; these transactions varied in size from 26 to 350 acres and costs include purchase price, legal fees, mitigation

contracts, and contributions to a Stewardship Fund. The Stewardship Fund contribution was included in the cost because the purchase price could have been increased without this contribution. **Appendix A Table A3.1** contains the detailed documentation of these transactions. Staff also provided their input on current per-acre market prices for oak woodland in different terrains within Placer County.

Data points developed from these two sources provides an estimate of $1,600 per acre for CE costs. New Economics & Advisory selected this cost for purposes of this 2016 Nexus Study; this amount falls within the range of prices experienced and/or anticipated by the organizations actively conserving OWAs within closest proximity to El Dorado County.

Calculation of Overall Acquisition Cost Per Acre Assumption

The Acquisition Component of the OWA In-Lieu Fee should account for both direct acquisitions and acquisitions via CEs. **Figure 3.7** indicates a range of 7% to 65% of total land acquired through CEs (as opposed to direct acquisition), with a weighted average of 18%. When considering only ARC and PLT, the range is slightly smaller—7% to 52%-- but the weighted average remains 18%. This 2016 Nexus Study applies this same proportionality of direct acquisition versus acquisition via CE's. **Figure 3.7** calculates an Acquisition cost per acre for OWAs based on this proportionality.

3.7 *Weighted Average Acquisition Cost Per Acre*

2016$

Organization	Total Acres Protected	CE's as a % of Total [1]
All LCOs		
American River Conservancy (ARC)	24,984	7%
Placer Land Trust (PLT)	7,766	52%
Placer County Conservation Plan (PCCP)	48,250	N/A
Sierra Foothill Conservancy (SFC)	25,743	65%
Save the Redwoods League (SRL)	200,000	11%
Weighted Average of Land Acquired via CE	[2]	18%
LCO Data Applied in this Analysis		
American River Conservancy (ARC)	24,984	7%
Placer Land Trust (PLT)	7,766	52%
Weighted Average of Land Acquired via CE		18%
Calculation of Average Acquisition Cost Per Acre		
Average Direct Acquisition Cost Per Acre	$5,000	82%
Average CE Cost Per Acre	$1,600	18%
Weighted Average Acquisition Cost Per Acre [3]	$4,400	

Prepared by New Economics & Advisory, June 2016.

[1] Based on total protected land shown in Figure 1.3.

[2] Excludes STF (which does not own or acquire property), SVC (for lack of information), and PCCP (for lack of information).

[3] Figure rounded to nearest hundred dollars.

Source: See Technical Appendix for supporting calculations.

Management & Monitoring (M&M)

The ORMP requires that OWAs be actively managed and maintained in perpetuity. An Initial M&M stage consists of one-time activities (certain one-time tasks that must be performed), as well as specific M&M efforts conducted over the first few years to ensure that the OWAs are brought up to a manageable condition. The Long-Term M&M stage begins when Initial M&M activities come to an end and less intensive M&M activities are needed. **Figure 3.4** provides examples of these activities.

Figure 3.8 summarizes estimated M&M on a per-acre basis for LCOs; costs range from $19 (from planning efforts associated with the Placer County Conservation Plan [PCCP]) to $11,211 (Sacramento Tree Foundation [STF])[8] per managed acre, but tended to fall mostly within a range of $40 to $51 per managed acre.

3.8 ***Annual M&M Costs -- Case Study LCOs***
2016$

Organization	Managed Acres	Annual M&M Costs per Acre
All LCOs		
Placer County Conservation Plan (PCCP)	N/A	$18.82
Sempervirens Fund (SF)	10,713	$41.19
Sacramento Valley Conservancy (SVC)	4,062	$39.97
American River Conservancy (ARC)	15,401	$40.00
Placer Land Trust (PLT)	4,825	$51.08
Sierra Foothill Conservancy (SFC)	6,481	$116.06
Save the Redwoods League (SRL)	14,454	$314.96
Sacramento Tree Foundation (STF)	30	$11,211.09
LCO Data Applied in this Analysis		
American River Conservancy (ARC)	15,401	$40.00
Placer Land Trust (PLT)	4,825	$51.08
Weighted Avg M&M Costs		$42.64
Monitoring & Management Applied in Nexus Study [1]		$43.00

Prepared by New Economics & Advisory, June 2016.
[1] Figures rounded to the nearest whole dollar.
Source: See Technical Appendix for supporting calculations.

New Economics & Advisory derived these estimates based on recent publicly available financial statements, consultation with organizational staff, and information gleaned from the organization's web site and/or annual reports. M&M costs generally include conservation activities for active M&M as well as a proportionate share of overhead and administrative costs. **Appendix A** contains detailed financial calculations supporting M&M costs for each LCO.

[8] STF's primary mission is to plant trees as opposed to maintaining existing woodland.

New Economics & Advisory further reviewed per-acre CE costs incurred by organizations actively managing OWAs in El Dorado County and/or Placer County, given that these areas provide the most proximate approximations of cost likely to be incurred by an Oak Resources LCO conserving OWAs with funds from Oak Resources In-Lieu Fees. **Figure 3.8** lists data points from the following entities:

- **ARC.** ARC staff provided a verbal estimate of $35-40 per acre to manage oak woodland areas located on ranch-size properties (1,000 acres+); this amount includes 15-20% overhead. Staff also pointed out that annual M&M costs can be more expensive for smaller properties, properties located in urban areas, or properties that provide recreational access. New Economics & Advisory applied the high end of the range for purposes of this 2016 Nexus Study to provide buffer for properties that cost more to manage and monitor.
- **PLT.** PLT provided M&M costs for four conservation properties recent CEs transactions; these costs include active M&M, 15% overhead, and maintenance of field equipment. PLT also cited the need for periodic surveys and aerial photos, but has not yet performed any of these on oak woodland properties.

Appendix A contains the detailed documentation supporting these cost estimates.[9]

Initial M&M

Initial M&M includes one-time costs spread over the first few years of managing and monitoring a conservation property as well as five years of typical M&M annual costs. One-time costs typically include baseline documentation, fuel load management, clearing of debris, establishment of fencing, active monitoring to ensure that OWAs are maintained, etc. LCO staff confirmed that Initial M&M costs are higher than Long-Term M&M costs; also, the Initial M&M stage lasts 2-5 years, to allow the LCOs to spread one-time costs over a number of years.

However, existing LCOs were unable to parse out the cost of Initial M&M activities. In some cases, Initial M&M costs are factored into the Acquisition price (in the form of M&M contracts, as well as a portion of contributions to a Stewardship Fund and/or Endowment Fund). Also, Initial M&M costs can vary significantly depending on the nature and needs of the property; for example, to the extent that a property is located in an urban area and/or has public access, Initial M&M costs tend to be higher because of the need to address recreation access, trespassing, dumping, fencing, etc.

[9] Estimated M&M costs for the PCCP were excluded from the final M&M cost per acre calculation because, at the time of preparing this Nexus Study, Placer County staff knowledgeable about oak woodland management were unavailable to provide clarifications regarding why this planning effort appeared to have a much lower cost per acre compared to other organizations actively engaged in M&M efforts.

PCCP planning efforts have considered Initial M&M activities for oak woodlands and other habitat; these planning efforts have identified a specific need for field facilities, (which would include equipment storage, manager's office, shared office, locker room, and restrooms), and an initial fuels treatment. Based on the financial planning worksheets developed by the PCCP, **Figure 3.9** provides an indication of one-time costs that can be incurred during the Initial M&M period.

3.9 *M&M Costs - Potential One-Time Costs*
2016$

Expenditure	Amount	Metric	Cost Per Acre
One-Time Activities (Year 0) [1]			
Field Facilities [2]	$500,000	Projected 48,250 acres within 50-yr permit period.	$10.36
Initial Management [3]	$1,800	Initial One-Time Cost per acre.	$1,800.00
Subtotal One-Time Activities			$1,810.36
Inflated to 2016$			$2,423.61
One-Time Costs Applied in this Analysis [4]			**$2,424.00**

Prepared by New Economics & Advisory, June 2016.

Source: Woodland Restoration Potential: Placer County Conservation Plan, Richard R. Harris, Ph.D., February 2013; and PCCP Cost Model 2013 Working 9/23/2013.

[1] Reflects cost of one-time activities conducted shortly after undertaking management and monitoring responsibilities.

[2] This estimated cost is currently incurred by Placer County as estimated for purposes of developing the Placer County Conservation Plan (PCCP). Field facilities could include equipment storage, offices for personnel, locker rooms and restrooms, etc. To ensure full funding for this nexus study, New Economics has integrated this cost into Initial M&M.

[3] Could include fuels management, fencing, clearing of debris, active monitoring, and other related efforts. This analysis applies the estimated cost of intial fuels management for woodland areas, based on an estimate created for the PCCP. A portion of gross Initial Management efforts may be integrated into acquisition costs, so the total cost for Initial Management could vary with each individual property acquisition.

[4] Figure rounded to nearest dollar.

In addition to these one-time costs, this analysis assumes that the Oak Resources LCO(s) will incur typical annual M&M costs shown in **Figure 3.8**. As a result, the Initial M&M period will include both one-time costs and annual M&M costs. This 2016 Nexus Study includes an Initial M&M period of five (5) years based on recommendation of LCOs and standard practices.

Figure 3.10 provides the total cost per acre for Initial M&M.

3.10 ***M&M Costs -- OWAs***
2016$

Item	Cost per Acre
Initial M&M (Yrs. 1-5)	
One-Time Costs	$2,424
M&M Costs (Yrs. 1-5) [1]	$215
Total Initial M&M Costs	$2,639
Initial M&M Costs Applied in this Analysis [2]	$2,600

Prepared by New Economics & Advisory, June 2016.
[1] Reflects annual cost of $43 over five years.
[2] Figure rounded to nearest one hundred dollars.

Long-Term M&M

The ORMP requires M&M in perpetuity for OWAs. As a result, the OWA In-Lieu Fee is designed to fund annual M&M in perpetuity to ensure that conservation land can be adequately maintained over time. **Figure 3.8** establishes an annual M&M cost of $43 per acre; this figure forms the basis for Long- Term M&M costs on a per-acre basis.

Endowment Calculations

To ensure that Long-Term M&M can be provided in perpetuity, it is expected that Oak Resources LCOs will create an Endowment Fund whose annual interest accrual can be utilized to fund annual M&M. This 2016 Nexus Study establishes a Long-Term M&M Fee Component that reflects a contribution to an Endowment Fund.

New Economics & Advisory reviewed endowment rates utilized to establish other habitat-related fee programs, ten-year averages tracked by the National Association of College and University Business Officers (NACUBO), and goals established by select LCOs. These sources indicate that long-term interest rates range from 3 to 6 percent annually. **Technical Appendix B** contains documentation of this research.

Based on this range, New Economics & Advisory calculated an Endowment component for the OWA In-Lieu Fee that generates sufficient interest beginning in Year 8 to cover Long-Term Annual M&M costs. **Figure 3.11** calculates the lump-sum per-acre contribution needed to achieve 4% annual interest earnings that can fully fund annual M&M in perpetuity. **Figure 3.12** summarizes the resulting lump-sum contribution needed, on a per-acre basis, to create sufficient interest earnings to fully fund Long- Term M&M costs, at three different interest-earning rates, beginning in Year 8. **Technical Appendix B** provides the back-up technical documentation supporting the 3% and 6% interest rate. For purposes of establishing an Endowment component for this

fee study, the OWA In-Lieu Fee assumes the middle interest rate (4%) earnings assumption.

3.12 ***Endowment Fee Component-- OWAs***
2016$

Item	Cost per Acre
Endowment Fee	
Assuming 6.0% annual interest	$550
Assuming 4.0% annual interest	$890
Assuming 3.0% annual interest	$1,250
Endowment Fee Applied in this Analysis	$890

Prepared by New Economics & Advisory, June 2016.
Source: See Technical Appendix for supporting calculations.

Administration

As described in more detail in **Section 7** of this Nexus Study, the County will be responsible for administration of the Oak Resources Fees. Administrative duties will include the calculation and collection of the fees, tracking of deposits, preparation of required reports, performance of annual inflation adjustments, and periodic updates to the Oak Resources In-Lieu Fees Nexus Study. The County also intends to track the location of OWAs purchased with In-Lieu Fee revenues; this effort is expected to require mapping services using Geographic Information Systems (GIS) or similar software. As such, the OWA In-Lieu Fee will include a 5% administrative cost for these administrative functions.

Total Costs

Figure 3.13 provides a summary of the total cost per acre to conserve OWAs through the In-Lieu fee program. This rate includes Acquisition, Initial M&M, Long-Term M&M, and Administration.

3.13 *OWA Conservation Cost Components*

Per Acre (2016$)

Item	Amount Per Acre
Cost Components	
Acquisition (Direct or CE)	$4,400
Initial M&M (Years 1-5)	$2,600
Endowment (for Long Term M&M) [1]	$890
Subtotal Cost per Acre	$7,890
Administration (5%)	$395
Total Cost Per Acre	$8,285

Prepared by New Economics & Advisory, June 2016.

Source: See Technical Appendix for supporting calculations.

[1] Assumes that the Endowment Fund will generate interest earnings of 4%, enough to cover the cost of providing annual M&M monitoring in perpetuity.

4. Nexus, Fee Calculation, & Fee Act Findings – OWA In-Lieu Fee

This section documents the nexus for the study, calculates the proposed rates for the OWA In-Lieu Fee, and documents the findings of this Nexus Study consistent with the Mitigation Fee Act.

Nexus Requirements

In order to impose habitat conservation impact fees, this Nexus Study demonstrates that a reasonable relationship or "nexus" exists between new development that occurs within the County and the need to conserve OWA as a result of new development. More specifically, this Nexus Study presents the necessary findings in order to meet the procedural requirements of the Mitigation Fee Act, also known as AB 1600. The requirements are as follows:

1. Identify the purpose of the fee;
2. Identify the use to which the fee is to be put;
3. Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed;
4. Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed;
5. Determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

Step 1: Purpose of the Fee

The OWA In-Lieu Fee proposed by this Nexus Study is designed to fund mitigation of impacts to OWAs in the County through acquisition and conservation of similar types of OWAs elsewhere in the County.

The OWA In-Lieu Fee is intended to pay the full cost of acquiring, managing, and monitoring OWAs.

Step 2: Use of the Fee

The OWA In-Lieu Fee will be used to acquire OWA through direct property acquisition or acquisition of conservation easements; to conduct Initial M&M activities and Long-Term M&M activities designed to ensure conservation in perpetuity.

Step 3: Reasonable Relationship Between Fee Use & Development

The conservation of OWAs promotes the health, safety, and general welfare of El Dorado County by protecting significant historical heritage values, enhancing the beauty and complementing and strengthening zoning, subdivision and land use standards and

regulations, while at the same time recognizing individual rights to develop private property.

The General Plan identifies the following overarching objectives (County of El Dorado 2004) that relate to the relationship between the proposed fee and new development:

- To foster a rural quality of life;
- To sustain a quality environment;
- To conserve, protect, and manage the County's abundant natural resources for economic benefits now and for the future; and,
- To accomplish the retention of permanent open space/natural areas on a project-by-project bases through clustering.

The Conservation and Open Space Element further identifies the following Goals for biological resources (County of El Dorado 2004):

- Goal 7.4: Identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value.

The conservation of OWAs enhances the County's natural scenic beauty, sustains the long-term potential increase in property values which encourages quality development, maintains the area's original ecology, retains the original tempering effect of extreme temperatures, increases the attractiveness of the County to visitors, helps to reduce soil erosion, and increases the oxygen output of the area which is needed to combat air pollution.

The development of new residential and non-residential land uses in the County may impact existing OWAs. The proposed OWA In-Lieu Fee, charged according to the impact on OWA, provides a means for development to occur while also achieving the environmental goals and objectives stated in the County General Plan . The proposed fee will be used to acquire and conserve other OWAs in perpetuity, thereby furthering the County's overarching objectives and biological resources goal stated above.

A reasonable relationship exists between the need for the OWA In-Lieu Fee and new development that would pay the fee.

Step 4: Reasonable Relationship Between Conservation Need & Development

Each new development project that impacts OWAs triggers a need for conservation measures in order to implement the overarching objectives and biological goals of the County General Plan. Mitigation of impacts to OWAs can occur through replacement tree planting on- or off-site, offsite conservation, and/or payment of an OWA In-Lieu Fee. The proposed OWA In-Lieu Fee is designed to mitigate the impacts of removing OWA. The costs associated with the Acquisition, Initial M&M, and Long-Term M&M of OWAs are accounted for in the OWA In-Lieu Fee.

Step 5: Reasonable Relationship[10] Between Fee Amount & Mitigation Cost

The amount of the OWA In-Lieu Fee is proportional to the cost of mitigating impacts to OWAs by new development; the in-lieu fee paid by new development is calculated based on the the mitigation ratios set forth in the ORMP and the cost per acre to provide for OWA conservation, determined through an analysis of costs currently incurred by existing LCOs. Should new development choose the in-lieu fee option, the fee amount will be based on the scale of impacts and the mitigation ratio for that scale of impacts, as defined in the ORMP and the Oak Resources Conservation Ordinance.

Fee Calculation

This Nexus Study provides the basis upon which a new OWA In-Lieu Fee is calculated. **Figure 4.1** summarizes the detailed cost components, shown on a per-acre basis, associated with acquisition, Initial M&M, and Long-Term M&M of OWAs actively managed by the LCO. To this total cost, an administrative component of 5% is added to cover the cost of administering and updating the fee program, calculating total fee obligations for each development opting to pay the OWA In-Lieu Fee, collecting fee revenues, and transferring these revenues to one or more Oak Resources LCO(s).

4.1 ***Detailed OWA Cost Composition per Acre (2016$)***

Item	Amount per Acre
OWA Cost Components	
Acquisition	$4,400
Initial M&M (Years 1-5)	$2,600
Endowment (for Long Term M&M)	$890
Subtotal Cost	$7,890
Administration (5%)	$395
Total Cost	$8,285

Prepared by New Economics & Advisory, June 2016.

Figure 4.2 shows the resulting fee, according to the level of OWA Impacts, made by new development. These rates would be set uniformly within the ORMP boundary

[10] California State Code does not define "reasonable relationship" but it is certainly broader than the "proportionate benefit" requirement for assessments (California Government Code 36620-36630). Over time the phrase "reasonable relationship" has been interpreted by preparers of fee studies to mean that there is a logical connection between the purpose of the fee and the rate assigned to those paying the fee.

(delineated in **Figure 2.1** in **Section 2**), and would be charged per OWA acre impacted. As described previously, impacted OWAs will be identified in an ORTR prepared by a qualified professional retained by the Project Applicant during the development review process.

4.2 ***Oak Woodland Area In-Lieu Fee Rates***
2016$

Item	Oak Woodland Areas: 0.01 - 50.0% Impact	50.01 - 75.0% Impact	75.01 - 100.0% Impact
	per acre		
Cost Per Acre	$8,285	$8,285	$8,285
Mitigation Ratio [1]	1.0 : 1	1.5 : 1	2.0 : 1
Total Fee Per Acre	**$8,285**	**$12,428**	**$16,570**

[1] Mitigation ratios established in the ORMP (Section 2.2.2).
Prepared by New Economics & Advisory, June 2016.

Fee Calculation Example

For example, if a developer wanted to remove 60% of a 10-acre OWA by paying the OWA In-Lieu Fee, the fee would be calculated as follows:

1. Acres Impacted: 10 acres times 60% = 6 acres
2. Cost Per Acre = $8,285 per acre
3. Mitigation Ratio = 1.5 : 1.0
4. Mitigation Fee Per Acre (1.5 times $8,285) = $12,428
5. Fee = 6 acres times $12,428 per acre = $74,568 OWA In-Lieu Fee.

5. Costs to Replace IOTs

New development that impacts IOTs will have two options to mitigate impacts: plant replacement trees on- or offsite and/or pay an In-Lieu Fee.[11]. This section of the Nexus Study describes the costs associated with mitigation through an IOT In-Lieu Fee.

Conservation Overview

For individual IOTs, the in-lieu fee is based on a diameter inch-for-inch replacement approach. This approach accounts for costs associated with acquisition and planting, expressed on a "per 1 inch of trunk diameter" basis.

It is expected that the Oak Resources LCO(s) will incur one cost to acquire and plant replacement trees, and another cost to conduct management and monitoring during an Initial M&M period of seven (7) years. This time period is a requirement of the ORMP, consistent with state regulations (California Public Resources Code Section 20183.4). **Figure 5.1** provides examples of conservation activities during each of these stages.

[11] On- or off-site mitigation would require a conservation easement to ensure conservation in perpetuity.

5.1 *Typical Conservation Activities-- IOTs*
Acquisition, Management, and Monitoring

Acquisition/Planting	Initial M&M
Planting	Irrigation
Tree Acquisition	Weed Control
Due Diligence Surveys/Analyses	Staking
Aerial Photos	Mulching
	Minor Canopy Pruning
	Monitoring
	Removal of Irrigation or Protection Materials at the end of the Maintenance Period
	Installation of Above/Below Ground Protection Devices (cages, tubes, etc.)
	Pest and Disease Control (application of herbicide, fungicide, etc.)

Prepared by New Economics & Advisory, June 2016.
Sources: California Council of Land Trust website accessed May 2015; Land Trust Alliance website, accessed May 2015; New Economics internet research, interviews; and land conservation organization feedback, April-June 2015.

This Nexus Study assumes that IOT In-Lieu Fees will be used to plant replacement trees on properties owned and managed by the Oak Resources LCO(s); this assumption was developed in consultation with LCOs, whose staff confirmed that they only plant new trees on property they own, and not on property for which they only hold a CE.

As such, Long Term M&M costs for these replacement trees will be absorbed into the costs of managing and monitoring land acquired primarily for purposes of conserving OWAs. Therefore, no incremental Long-Term M&M cost component is included in the IOT In-Lieu Fee.

Acquisition and Planting (Year 0)

Dudek developed costs for purchasing and planting IOTs. The estimated cost for the equivalent of one inch of trunk diameter is a 1-gallon size native oak tree; the median price of 1-gallon oak trees was calculated from a survey of eight nurseries in El Dorado County and the surrounding region. Consistent with standard landscape/habitat restoration industry practices, this median price ($60) was then doubled to account for costs associated with planting (inclusive of labor and materials), as described in the

ORMP. The resulting per-inch individual native oak tree mitigation fee is $120.00, as shown in **Figure 5.2**

5.2 *IOT Tree Acquisition Price*
Local Nurseries (2016$)

Nursery	Location	Price
Nursery Purchase Prices [1]		
Intermountain Nursery	Prather	$9.95
Lu Restoration Nursery	Sheridan	$4.70
Urban Tree Farm	Fulton	$6.00
Cornflower Farms	Elk Grove	$10.87
Median Purchase Price per 1-gallon Tree (1/2 diameter inch)		$7.98
Estimated Acquisition Price per Diameter Inch		
Estimated Purchase Price per Diameter Inch [2]		$15.95
Estimated Cost for Installation [3]		$15.95
Estimated Acquisition Cost per Diameter Inch		$31.90

Prepared by New Economics & Advisory, June 2016.
Source: Dudek, June 2016.
[1] 1-gallon oak tree at local nurseries.
[2] This analysis assumes that a 1-gallon tree represent the equivalent of 1/2 diameter inch of tree trunk, so the median cost per tree is doubled to derive the cost per diameter inch of trunk.
[2] Doubling the tree acquisition price is a standard industry approach utilized to estimate total planting costs per diameter inch.

Initial M&M (Years 1-7)

Figure 5.3 shows the cost of conducting Initial M&M for IOTs on a per diameter-inch basis. Habitat Restoration Sciences, Inc. (HRS), a subsidiary of Dudek that provides native habitat restoration services in California, prepared a cost estimate for Initial M&M for IOTs based on a hypothetical planting scenario. The hypothetical scenario assumes a planting of 1,000 1-gallon oak trees (each tree representing one diameter inch of trunk), each with a planting radius of approximately 5 feet; this scale of planting requires approximately 1.80 acres. HRS applied its technical experience conducting tree establishment and maintenance to the planting scenario to estimate annual M&M costs during the first seven years. Because this analysis relies on a 1-gallon tree, which represents ½ diameter inch of trunk, the cost is doubled to reflect the cost of maintaining two trees instead of one for each diameter inch of trunk. The estimated

amount includes costs associated with ensuring that the replacement tree grows properly, irrigation, fencing/caging, pruning and pest/disease control (as listed in **Figure 4.1**) are some of the active management efforts undertaken during this stage.

5.3 ***IOT Initial M&M Cost Assumption***
2016$

Item	Per Acre Cost [1],[2]	Avg. Annual M&M [3]
IOT Initial M&M		
Year 1	$6,000	$10,800
Year 2	$5,500	$9,900
Year 3	$5,000	$9,000
Year 4	$4,500	$8,100
Year 5	$4,000	$7,200
Year 6	$3,500	$6,300
Year 7	$3,000	$5,400
Subtotal Costs (Yr 1-7)		$56,700
Cost Per Tree/Diameter Inch (Yr 1-7)		$56.70
Estimated IOT Initial M&M Cost Assumption		
Cost Per Diameter Inch Assuming 1-Gallon Tree (Yr 1-7) [4]		$113.40

Prepared by New Economics & Advisory, June 2016.

Source: Habitat Restoration Sciences, Inc., June 2015 and April 2016.

[1] Assumes a hypothetical planting of 1,000 oak trees (each tree representing one diameter inch). Assumes a radius of 5 feet around each planting location. Therefore the total site area is 1.80 acres; this calculation was made by HRS.

[2] If total area is less than one acre, unit cost may need to increase to account for overhead costs.

[3] Unit price per acre per year typically will not drop below $2,500 per acre.

[4] Each 1-gallon tree represents a one-half inch diameter of trunk, so two trees must be maintained for every diameter inch of trunk. Therefore, the maintenance cost per diameter inch is doubled to reflect the cost of maintaining two trees instead of one for each diameter inch of trunk.

Administration

As described in more detail in **Section 7** of this Nexus Study, the County will be responsible for administration of the Oak Resources Fees. Administrative duties will include the calculation and collection of the fees, tracking of deposits, preparation of required reports, performance of annual inflation adjustments, and periodic updates to the Oak Resources In-Lieu Fees Nexus Study. The County may also desire to track the

location of IOTs planted with In-Lieu Fee revenues; this effort is expected to require mapping services using Geographic Information Systems (GIS) or similar software. As such, the IOT In-Lieu Fee will include a 5% administrative cost for these administrative functions.

Total Costs

Figure 5.4 provides a summary of the total cost per acre to replace IOTs through an In-Lieu fee program. This rate includes Acquisition, Initial M&M, and Administration.

5.4 ***IOT Conservation Cost Components***
Per Diameter Inch (2016$)

Item	Amount per Diameter Inch
IOT Cost Components	
Acquisition	$31.90
Initial M&M (Years 1-7)	$113.40
Endowment (for Long Term M&M) [1]	N/A
Subtotal Cost	$145.30
Administration (5%)	$7.27
Cost per Diameter Inch	$152.57
Total Cost Per Diameter Inch (Rounded) [2]	$153.00

Prepared by New Economics & Advisory, June 2016.

Source: See Technical Appendix for supporting calculations.

[1] Replacement trees will be planted on land owned and managed by the land conservation organization also overseeing Oak Woodland Areas; Long-Term M&M costs are expected to be nominal and will be absorbed into the Oak Resource LCO's overall M&M costs.

[2] Total rounded to nearest whole dollar.

6. Nexus, Fee Calculation, and Fee Act Findings – In-Lieu Individual Oak Tree Fee

This section documents the nexus for the study, calculates the proposed rates for the IOT In-Lieu Fee, and documents the findings of this Nexus Study consistent with the Mitigation Fee Act.

Nexus Requirements

In order to impose habitat conservation impact fees, this Nexus Study demonstrates that a reasonable relationship or "nexus" exists between new development that occurs within the County and the need to conserve and replace IOTs as a result of new development. More specifically, this Nexus Study presents the necessary findings in order to meet the procedural requirements of the Mitigation Fee Act, also known as AB 1600. The requirements are as follows:

1. Identify the purpose of the fee;
2. Identify the use to which the fee is to be put;
3. Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed;
4. Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed;
5. Determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

Step 1: Purpose of the Fee

The IOT In-Lieu Fee proposed by this Nexus Study is designed to fund mitigation of impacts to IOTs in the ORMP boundaries through replacement planting elsewhere in the County.

The IOT In-Lieu Fee is intended to pay the full cost of tree acquisition, planting, and maintenance for a 7-year period.

Step 2: Use of the Fee

The IOT In-Lieu Fee will be used to acquire and plant individual replacement trees and perform M&M activities for a period of 7 years.

Step 3: Reasonable Relationship Between Fee Use & Development

The replacement of IOTs promotes the health, safety, and general welfare of El Dorado County by protecting significant historical heritage values, enhancing the beauty and

complementing and strengthening zoning, subdivision and land use standards and regulations, while at the same time recognizing individual rights to develop private property.

The replacement of IOTs enhances the County's natural scenic beauty, sustains the long-term potential increase in property values which encourages quality development, maintains the area's original ecology, retains the original tempering effect of extreme temperatures, increases the attractiveness of the County to visitors, helps to reduce soil erosion, and increases the oxygen output of the area which is needed to combat air pollution.

The General Plan identifies the following overarching objectives (County of El Dorado 2004) that relate to the relationship between the proposed fee and new development:

- To foster a rural quality of life;
- To sustain a quality environment;
- To conserve, protect, and manage the County's abundant natural resources for economic benefits now and for the future;
- To accomplish the retention of permanent open space/natural areas on a project-by-project bases through clustering;

The Conservation and Open Space Element further identifies the following Goal for biological resources (County of El Dorado 2004):

- Goal 7.4: Identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value.

The development of new residential and non-residential land uses in the County may result in a loss of existing IOTs. The proposed IOT In-Lieu Fee, charged according to the impact on IOTs, provides a means for development to occur while also achieving the environmental goals and objectives stated in the County General Plan. The proposed fee will be used to acquire and plant replacement trees and maintain them for a period of 7 years, thereby furthering the County's overararching objectives and biological resources goal stated above.

A reasonable relationship exists between the need for the IOT In-Lieu Fee and new development that would pay the fee.

Step 4: Reasonable Relationship Between Conservation Need & Development

Each new development project that impacts IOTs triggers a need for conservation measures in order to implement the overarching objectives and biological goals of the County General Plan. As established in the ORMP and Oak Resources Conservation Ordinance, mitigation of impacts to IOTs can occur through replacement tree planting on- or off-site and/or payment of an IOT In-Lieu Fee. The fee is designed to mitigate the impacts of removing Heritage Oak Trees or Native Oak Trees outside of OWAs. The costs associated with the acquisition and planting and maintenance for a period of 7 years is accounted for in the respective In-Lieu Fee program.

Step 5: Reasonable Relationship[12] Between Fee Amount & Mitigation Cost

The amount of the IOT In-Lieu Fee for impacts to IOTs is proportional to the cost of mitigating impacts to IOTs for non-exempt development activities; the in-lieu fee amount is calculated based on the the mitigation ratios set forth in the ORMP and Oak Resources Conservation Ordinance and the cost to meet said requirements. Should a project proponent for non-exempt activities choose the in-lieu fee option, the fee amount will be based on the scale of impacts and the mitigation ratio that scale of impacts.

The total fee for non-exempt activities is proportional to the scale of the impact based on the size (based on diameter inches) of the impacted tree(s). As explained previously, the fee is based on hypothetical scenario assuming a planting of 1,000 1-gallon oak trees, each with a planting radius of approximately 5 feet. HRS applied its technical experience conducting tree establishment and maintenance to the planting scenario to estimate annual M&M costs during the first seven years on a per-acre basis.

For example, a removed Native Oak Tree with a 10-inch trunk diameter would require mitigation for 10 diameter inches, based on the inch-for-inch replacement requirement in the ORMP. The IOT In-Lieu Fee assumes that a 1-gallon size replacement tree equals 1 inch in trunk diameter; therefore, mitigation for removal of a 10-inch native oak tree requires planting and maintenance of 10 1-gallon trees.

Fee Calculation

This Nexus Study provides the basis upon which a new IOT In-Lieu Fee is calculated. **Figure 6.1** summarizes the detailed cost components, shown on a per-diameter inch basis, associated with acquisition/planting and maintenance for 7 years undertaken by the Oak Resources LCO(s). To this total cost, an administrative component of 5% is added to cover the cost of administering and updating the fee program, calculating total fee obligations for each development opting to pay the IOT In-Lieu Fee, collecting fee revenues, and transferring these fee revenues to the Oak Resources LCO(s).

[12] California State Code does not define "reasonable relationship" but it is certainly broader than the "proportionate benefit" requirement for assessments (California Government Code 36620-36630). Over time "reasonable relationship" has been interpreted by preparers of fee studies to mean that there is a logical connection between the purpose of the fee and the rate assigned to those paying the fee.

6.1 Detailed IOT Cost Composition
2015$

Item	Amount per Diameter Inch
Cost Components	
Acquisition	$31.90
Initial M&M (Years 1-7)	$113.40
Endowment (for Long Term M&M) [1]	N/A
Subtotal Cost	$145.30
Administration (5%)	$7.27
Cost per Diameter Inch	$152.57
Total Cost (Rounded) [2]	$153.00

Prepared by New Economics & Advisory, June 2016.

[1] Replacement trees will be planted on land owned and managed by the land conservation organization also overseeing Oak Woodland Areas; Long-Term M&M costs are expected to be nominal and will be absorbed into the Oak Resource LCO's overall M&M costs.

[2] Total rounded to nearest whole dollar.

Figure 6.2 shows the resulting fee, according to the cost and mitigation ratio, made by new development, for Heritage Oak Trees compared to Native Oak Trees. These rates would be set Countywide within the ORMP boundary, and would be charged on a per IOT tree diameter inch impacted.

6.2 IOT In-Lieu Fee Rates
2015$

Item	Heritage Oak Trees	Native Oak Trees
	per diameter inch	
Cost Per Acre	$153	$153
Mitigation Ratio[1]	3 : 1	1 : 1
Total Fee Per Acre	**$459**	**$153**

[1] Mitigation ratios are established in the ORMP (Section 2.3.2 Oak Tree Mitigation Standards).

Prepared by New Economics & Advisory, June 2016.

Fee Calculation Example

For example, if a developer wanted to remove one 50-inch diameter Heritage Oak Tree and one 10-inch Native Oak Tree, the IOT In-Lieu Fee would be calculated as follows:

Heritage Oak Tree In-Lieu Fee Calculation

1. Diameter Inches Impacted: 1 tree at 50 diameter inches = 50 diameter inches
2. Cost Per Diameter Inch = $153 per diameter inch
3. Mitigation Ratio: 3.0 to 1.0 diameter inch impacted
4. Fee = 50 diameter inches times $153 per acre times 3.0 per diameter inch ratio = $22,950 Heritage Oak Tree In-Lieu Fee

Native Oak Tree In-Lieu Fee Calculation

1. Diameter Inches Impacted: 1 tree at 10 diameter inches = 10 diameter inches
2. Cost Per Diameter Inch = $153 per diameter inch
3. Mitigation Ratio: 1.0 to 1.0 diameter inch impacted
4. Fee = 10 diameter inches times $153 per acre times 1.0 per diameter inch ratio = $1,530 Native Oak Tree In-Lieu Fee

Total IOT In-Lieu Fee: $22,950 Heritage Oak Tree In-Lieu Fee + $1,530 Native Oak Tree In-Lieu Fee = $24,480 Total IOT In-Lieu Fee.

7. Implementation & Administration

This concluding section of this Oak Resources Nexus Study provides an overview of implementation and administrative procedures. This section applies collectively to all Oak Resources In-Lieu Fees analyzed in this Nexus Study.

Adoption and Authorization

After review and consideration and having conducted a public hearing, the El Dorado County Board of Supervisors will consider adopting this Oak Resources In-Lieu Fee Nexus Study and the Oak Resources Conservation Ordinance establishing the Oak Resources In-Lieu Fees and authorizing collection of said fees. The fee will be effective 30 days following the El Dorado County Board of Supervisors final action of the adoption of the Nexus Study, and all ordinances and/or resolutions establishing or authorizing the fee(s).

Establishment of Fees

With respect to OWAs, this program applies to any land development project requiring a discretionary entitlement from the County that is subject to review under CEQA and which will have an impact on Oak Resources. With respect to IOTs, this program applies to any activity requiring a building permit or grading permit issued by El Dorado County and/or any action requiring discretionary development entitlements or approvals from El Dorado County, other than those activities identified in the Exemptions section. The Oak Resources In-Lieu Fees shall be charged on non-exempt development activities that impact Oak Resources; these impacts will be documented in an ORTR. Impacts occurring on either public or private property are subject to this program.

The Oak Resources Fees shall be calculated during the development review process or prior to grading permit issuance for projects not subject to development review. The fees shall be calculated based on impacts identified in an ORTR and will be consistent with the mitigation ratios described in **Section 1** of this Nexus Study.

Timing of Collection of Fees

Oak Resources In-Lieu Fees shall be collected prior to issuance of a grading or building permit, filing of a parcel or final map, or otherwise commencing with the development project.

The Oak Resources Fees shall be collected by the County's Planning and Building Department, Building Division. The County shall maintain the account.

Exemptions

Removal of OWAs and IOTs are exempt from mitigation requirements, including participation in the Oak Resources In-Lieu Fees, for certain activities. These activities, documented in detail in Section 2 of the ORMP, include:

- Projects or actions occurring on lots of 1 acre or less allowing a single-family residence by right, and that cannot be further subdivided without a General Plan Amendment or Zone change;
- Actions taken pursuant to an approved Fire Safe Plan for existing structures or in accordance with defensible space maintenance requirements for existing structures in state responsibility areas (SRA) as identified in California Public Resources Code (PRC) Section 4291 (actions associated with Fire Safe Plans or defensible space areas for new or proposed development are not exempt);
- Actions taken to maintain safe operation of existing utility facilities in compliance with state regulations (PRC 4292-4293 and California Public Utilities Commission (CPUC) General Order 95) (actions associated with development of new utility facilities, including transmission or utility lines, are not exempt);
- Road widening and realignment projects necessary to increase capacity, protect public health, and improve safe movement of people and goods in existing public rights-of-way (as well as acquired rights-of-way necessary to complete the project) where the new alignment is dependent on an existing alignment (new proposed roads within the County Circulation Element and internal circulation roads within new or proposed development are *not* exempt);
- Affordable housing projects for lower income households, as defined pursuant to Section 50079.5 of the California Health and Safety Code, that are located within an urbanized area, or within a sphere of influence as defined pursuant to California Government Code §56076;
- Agricultural activities conducted for the purposes of producing or processing plant and animal products or the preparation of land for this purpose;
- Agricultural cultivation/operations, whether for personal or commercial purposes (excluding commercial firewood operations);
- Activities occurring on lands in Williamson Act Contracts or under Farmland Security Zone Programs;
- Actions taken during emergency firefighting operations or natural disasters (e.g., floods, landslides, avalanches) and associated post-fire or post-disaster remediation activities;
- Tree removal permitted under a Timber Harvest Plan approved by CAL FIRE;
- Native oak tree removal when the tree is dead, dying, or diseased, as documented in writing by a Certified Arborist or Registered Professional Forester;

- Native oak tree removal when a tree exhibits high failure potential with the potential to injure persons or damage property, as documented in writing by a Certified Arborist or Registered Professional Forester; or
- When a native oak tree, other than a Heritage Tree, is cut down on the owner's property for the owner's personal use.

Fee Rate Reductions for Affordable Housing Projects

The ORMP also provides for reductions to OWA mitigation for affordable housing projects that are not exempted as defined above. Specifically, 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 woodland that is required to be mitigated, as set forth below in **Figure 7.1**. This reduction for affordable housing project applies only to OWA impacts and does not apply to IOT impacts.

7.1 ***Affordable Housing Mitigation Reduction***
ORMP

Affordable Housing Type (Household Income Level)	Percent Oak Woodland Mitigation Reduction (for portion of project that is income restricted)
Very Low	200%
Lower	100%
Moderate	50%

Source: Oak Resource Management Plan, June 2016.

For example, a proposed project that contains 1,000 units will include 200 (or 20%) *moderate-income* units. The project's ORTR indicates an impact on 70% of existing OWAs. The developer chooses to pay the OWA In-Lieu Fee to meet the mitigation obligation. The rate reduction for affordable housing would be calculated as follows:

- **Step 1: Establish the Original Mitigation Ratio.** The Original Mitigation Ratio would be 1.50 to 1 for a 70% impact on OWAs.
- **Step 2: Identify the Portion of the Affordable Units.** Affordable housing constitutes 20% of the residential units.
- **Step 3: Identify the Affordable Housing Reduction Rate.** Moderate-income units qualify for a 50% reduction.
- **Step 4: Calculate the Mitigation Reduction Amount.** The Mitigation Reduction is calculated by multiplying the 50% moderate-income reduction times the 20% affordable housing share. 50% times 20% = 10% Mitigation Reduction Amount.
- **Step 5: Calculate the Adjusted Mitigation Rate**. The Adjusted Mitigation Obligation is: 1.50 minus 10% (0.15) = 1.35 Adjusted Mitigation Ratio.

Administration and Administrative Fee

The County Planning and Building Department shall be responsible for administration of the Oak Resources Fees, including the calculation and collection of the fees, tracking of deposits, preparation of required reports, annual inflation adjustments, and periodic updates to the Oak Resources In-Lieu Fees Nexus Study. The County also intends to track the location of OWAs purchased with In-Lieu Fee revenues; this effort is expected to require mapping services using Geographic Information Systems (GIS) or similar software. As such, the County will retain the 5% administrative cost portion of the Fee described in this Nexus Study for these purposes.

It is the County's intent to work with one or more Oak Resources LCOs to acquire as well as manage and monitor OWAs, and acquire/plant as well as manage and monitor replacement Heritage Oak Trees, and Native Oak Trees. The County will transfer fee revenues (excluding the 5% administrative cost) to said LCO on a quarterly basis subject to County approval of acquisition, maintenance and monitoring actions.

Annual Inflation Adjustment

An annual adjustment for cost escalations influenced by changes in land values affecting acquisition, conservation easement values, as well as property tax obligations and organizational overhead costs (e.g. rent, wages, benefits, equipment, etc.) shall be applied to the Oak Resources Fees. The Oak Resources Fees shall be subject to an annual inflation fee that accounts for changes in acquisition/planting, Initial M&M, and Long-Term M&M costs.

OWA Fee Adjustment

OWA Acquisition Cost Component

The Acquisition Cost Component of the OWA fee is driven largely by land values within El Dorado County. Over time, land purchased for the express purpose of mitigation may develop a value that is different from land purchased for its development potential. This trend should be monitored over time. This Nexus Study initially recommends that the Acquisition Component of the OWA Fee be consistent with increases in assessed value for the County overall; future updates to the Nexus Study should revisit this measure to determine whether mitigation land purchases are changing at a different rate than assessed value countywide.

Consistent with the 2008 OWMP Fee Study, this Nexus Study recommends that the Acquisition Portion of the OWA In-Lieu Fee be adjusted annually by a three-year average change in assessed valuation countywide for all land uses or for vacant land containing OWAs. The County Assessor's Office can calculate this value each year.

OWA Initial M&M Cost Component

Initial M&M is influenced most heavily by salaries/wages, including staff and consultant costs. Because these costs are driven primarily by staff time, this fee component should

be adjusted based on labor costs. Consistent with the 2008 OWMP Fee Study, this Nexus Study recommends that the Initial M&M Portion of the OWA In-Lieu Fee be adjusted annually based on changes in wages for Forest and Conservation workers (occupation code 45-4011) in California. These wage rates currently track the pay period including the 12th day of May or November, and are published in May of each year (containing data from the previous year). The data can be found here: http://www.bls.gov/oes/tables.htm.

OWA Endowment Cost Component (OWA Long-Term M&M)

Long-Term M&M is influenced by two variables: the annual cost of M&M and the interest earnings rate on the Endowment Fund. Both of these variables should be tracked and updated. On an annual basis, the Endowment Component should be adjusted based on any changes in annual M&M costs. Because these costs are driven primarily by staff time, this fee should be adjusted based on labor costs, similar to Initial M&M.

However, changes in annual M&M do not have a 1:1 impact on the Endowment; if, for example, annual M&M costs increase by 10%, the Endowment Fee would need to increase about 12% in order for the Endowment to remain self-sustaining.

As a result, this Nexus Study recommends that the Endowment Cost component be increased annually based on labor wage changes and include an additional 2 percent adjustment for every 10 percent change in wages. **Figure 7.2** provides an example of how this adjustment calculation would work.

7.2 ***Endowment Component Fee Adjustment***
OWA In-Lieu Fee

Item	Formula	Oak Woodland Areas 0.01 - 50.0% Impact	75.0% Impact	100.0% Impact
Existing Endowment Fee Component	A	$890	$890	$890
Change In Labor Costs (example)	B	4.0%	4.0%	4.0%
Additional Adjustment per 10%	C = 2% * (B/10%)	0.8%	0.8%	0.8%
Total Adjustment (%)	D = B + C	4.8%	4.8%	4.8%
Total Adjustment (amount)	E = A* D	$43	$43	$43
Total Adjustment Cost Per Acre [1]	F = A + E	$933	$933	$933

Prepared by New Economics & Advisory, June 2016.
[1] Total rounded to nearest whole dollar.

OWA Inflation Adjustment Summary

The OWA In-Lieu Fee would be adjusted annually as follows:

1. Adjust Acquisition Cost Component
2. Adjust Initial M&M Cost Component
3. Adjust Long-Term M&M Cost Component

4. Recalculate Total Cost per Acre (including 5% Administrative Fee component)
5. Recalculate Fees based on Mitigation Ratios

IOT Fee Adjustment

IOT Acquisition/Planting Cost Component

This component of the fee was developed by doubling the identified cost of purchasing a new 1-gallon oak tree; as described in the ORMP, this approach reflects a standard industry approach to account for labor costs associated with tree planting. Because acquisition is the primary driver, County staff could check on the price from existing nurseries and recalculate the average cost each year.

IOT Initial M&M Cost Component

This component of the IOT In-Lieu Fee appears to be largely driven by labor costs. This Nexus Study recommends that the Initial M&M Portion of the IOT In-Lieu Fee be adjusted annually based on changes in wages for Forest and Conservation workers (occupation code 45-4011) in California. These wage rates currently track the pay period including the 12th day of May or November, and are published in May of each year (containing data from the previous year). The data can be found here: http://www.bls.gov/oes/tables.htm.

IOT Inflation Adjustment Summary

The IOT In-Lieu Fee would be adjusted annually as follows:

1. Adjust Acquisition/Planting Cost Component based on changes in the cost for one 1-gallon oak tree at local nurseries.
2. Adjust Initial M&M Cost Component based on changes in labor wages.
3. Recalculate Total Cost per Acre (including 5% Administrative Fee component)
4. Recalculate Fees based on Mitigation Ratios

Annual Findings/Accounting

Every five years, the Planning and Building Department shall prepare, for the Board of Supervisors, a report of any portion of Oak Woodland Resources Fees remaining unexpended or uncommitted five or more years after deposit of the Fees, identifying the purpose to which the Fees are to be put, and demonstrating a reasonable relationship between the Fees and the purpose for which they were charged.

Refund of Unexpended Revenues

Except as provided by County Code, the County shall refund to the then current record owner or owners of each unit of development on a prorated basis the unexpended or uncommitted portion of the Oak Resources Fees, and any interest accrued thereon, for which need cannot be demonstrated.

Such refund of unexpended or uncommitted revenues may be made by direct payment from the applicable trust fund, by providing a temporary suspension of fees, or by any other means consistent with the intent of Government Code Section 66001.

Reallocation of Remaining Revenues

If the administrative costs of refunding unexpended or uncommitted revenues exceed the amount to be refunded, the County, after a public hearing, notice of which has been published under Government Code Section 6061 and posted in three prominent places within the area of the development project, may determine that the revenues shall be allocated for some other purpose for which fees are collected subject to Section 66000 of the Government Code.

Other Periodic Reviews and 5-Year Updates

As El Dorado County's Oak Resources In-Lieu Fees are implemented, the County will be able to track actual costs related to direct acquisition, conservation easements, overhead, wages, and management and monitoring costs. As such, this Nexus Study should be considered a living document that will need to be updated as new information becomes available and key assumptions can be appropriately refined. Periodically, the real estate market and broader economy undergoes more dramatic changes in land, and/or construction labor costs. The County may conduct additional periodic review at any time to determine if costs and/or fees require further adjustments. These periodic and/or 5-year update reviews could include changes to the following assumptions:

- Land acquisition values for mitigation land
- Conservation Easement values for mitigation land
- The proportion of Conservation Easements versus direct acquisition of conservation land
- Initial Annual M&M costs
- Long-Term Annual M&M costs
- Endowment interest earnings rate
- Annual adjustment procedures and assumptions
- IOT acquisition and planting costs

Beginning with the fifth fiscal year following the first deposit into the fee account or fund, and every five years thereafter, El Dorado County is required to make certain findings pertaining to unexpended balances. The required findings include:

1. Identifying the purpose for which the fee is to be used.
2. Demonstrating a reasonable relationship between the fee and its purported purpose.
3. All sources and amounts of funding anticipated to complete financing in incomplete plan area improvements.
4. Recalculate/recalculate annual adjustment factor.

5. For any unexpended or uncommitted revenues El Dorado County cannot demonstrate a need based on the four findings described above, El Dorado County must refund such revenues, unless the administrative costs exceed the amount of the refund.

Appendix A: Supporting Calculations for OWA Conservation

A1 *Individual Vacant Land Comparables*

El Dorado County, 2004-2014 (Nominal Dollars)

APN		Subdivision/Tract	Oak Woodland ID [1]	Zoning	Total Acres [1]	Oak Woodland Areas OWA Acres	Oak Woodland Areas % of Total Acres	Sale Date	Sales Price	Sales Price Per Acre
RE-10 Zoning										
046-720-06-100	[2]	River Pines Est. #4	7	RE-10	22.24	0.223720	1.01%	8/18/04	$249,950	$11,239
046-720-11-100		**River Pines Est. #4**	**7**	**RE-10**	**70.85**	**60.022561**	**84.72%**	**6/29/12**	**$145,000**	**$2,047**
046-720-06-100	[2]	River Pines Est. #4	7	RE-10	22.24	0.223720	1.01%	1/8/14	$165,000	$7,419
104-481-07-100		Pilot Hill Crossing	19	RE-10	12.55	0.000012	0.00%	7/12/12	$50,000	$3,984
046-710-19-100		River Pines Est. #3	6	RE-10	13.59	0.000115	0.00%	5/21/13	$125,000	$9,198
046-720-04-100		River Pines Est. #4	6	RE-10	32.96	0.000148	0.00%	8/14/07	$385,000	$11,681
Weighted Average										**$6,421**
RE-2 Zoning										
092-301-06-100	[2]	Golden West Par #5	9	R2A	2.88	0.000001	0.00%	4/30/04	$185,000	$64,256
092-301-06-100	[2]	Golden West Par #5	9	R2A	2.88	0.000001	0.00%	5/25/05	$265,000	$92,042
092-301-06-100	[2]	Golden West Par #5	9	R2A	2.88	0.000001	0.00%	2/6/08	$226,200	$78,565
092-293-11-100		Golden West Par #5	9	R2A	2.51	0.000024	0.00%	7/23/14	$90,000	$35,796
Weighted Average										**$68,708**

Prepared by New Economics & Advisory, June 2016.

[1] Oak Woodland ID identifies woodland areas that cross a parcel to identify all parcels within the same cluster area.

[1] Acres are calculated from GIS basemap polygons or property data collected from recorded maps or other means.

[2] Parcel has been bought and sold multiple times.

Source: El Dorado County staff, March 2015.

A2.1 *American River Conservancy Recent Direct Land Acquisitions 2013-2015 (Nominal Dollars)*

	El Dorado Ranch		El Dorado Ranch		Pending (Sierra Crest) Property		Cronan Ranch		Current Estimate: Sierra Hills Area
Item	Amount	Per Acre	Amount	Per Acre	Amount	Per Acre	Amount	Per Acre	Per Acre
Acres	1,059		1,080		10,000		**NA**		
Land Acquisitions	**2013$**		**2014$**		**2015$**			**2001$**	
Purchase Price	$4,800,000		$4,995,000		$10,230,000		**NA**		
Other Costs	N/A		$205,000	[1]					
Subtotal Land Acquisitions	**$4,800,000**	**$4,533**	**$5,200,000**	**$4,815**	**$10,230,000**	**$1,023**	**NA**	**$6,107**	**$5,000**
Average Applied in This Analysis [2]									**$5,400**

Prepared by New Economics & Advisory, June 2016.

Source: ARC Staff, June 2015.

[1] Amount represents a donation made by the seller.

[2] A weighted average calculation would not be appropriate for ARC because a large recent purchase was made that would skew the result. Therefore, New Economics applied a straight average calculation to derive an average for this organization. Figure rounded to nearest hundred dollars.

A2.2 *American River Conservancy Recent Conservation Easements*
2001$

Item	Garibaldi Ranch Amount	Garibaldi Ranch Per Acre	Current Estimate of CE as a % of Acq. Price
Acres	1,178		
Conservation Easements	**2001$**		
Purchase Price	$1,767,123		
Other Costs (Cont. to Endowment)	$100,000	*CE*	
Subtotal Conservation Easements	**$1,867,123**	**$1,585**	50% [1]
Value Used in This Analysis			

Prepared by New Economics & Advisory, June 2016.

Source: ARC staff, June 2015.

[1] ARC staff reports that CEs typically cost about half as much as direct acquisition. The CE value should be associated with the value of grazing and/or tree harvesting, which is much lower than 50% and would result in a CE that is around 75-80% of gross land value. However, many CE parcels are less desirable to begin with or have development restrictions already, thus lowering the overall value.

A2.3 *ARC M&M Costs*
2016$

Expenditure	Cost per Acre [1]
Management & Monitoring	**$40.00**

Prepared by New Economics & Advisory, April 2016.
[1] Range of $35-40 per acre provided by ARC staff. Reflects average cost for undeveloped oak woodland of a ranch size (1,000 acres+) and includes 15-20% overhead costs. Actual M&M costs vary and can be more expensive for smaller properties and/or properties that are in urban areas and/or have recreational access. Cost range expressed in 2015$; because the incremental increase to reflect 2016$ is not enough to increase the amount remains the same.
Source: ARC staff, June 2015.

A3.1 *Placer Land Trust Recent Property Acquisitions*
2010-2012 (Nominal Dollars)

	Outman Big Hill		Bruin Ranch/Harvego	
Expenditure	Amount	Per Acre	Amount	Per Acre
Recent Land Acquisitions	**2012$**		**2010$**	
Acres	80		1,773	1,853
Purchase Price	$475,000	$5,938	$9,500,000	$5,358
Legal Fees	$1,100	$14	N/A	N/A
Appraisal	$5,303	$66	N/A	N/A
Title Insurance & Escrow Fees	$684	$9	$1,482	$1
Staff & Admin	$10,363	$130	$250,482	$141
Subtotal Recent Land Acquisitions	$492,450	$6,156	$9,751,964	$5,500
Rounded Weighted Average Recent Land Acquisitions				**$5,500**
Stewardship Fund Contribution			**2010$**	
Acres			1,773	
Stewardship Contribution			$500,000	
Subtotal Stewardship			**$500,000**	**$282**
Endowment Contribution			**2010$**	
Acres			1,773	
Endowment Contribution			$25,000	
Legal Funds			N/A	
Subtotal Endowment			**$25,000**	**$14**

Prepared by New Economics & Advisory, June 2016.
Source: Placer Land Trust staff, April-May 2015.

A3.2 *Placer Land Trust Recent Conservation Easements & Contributions*

2008-2015 (Nominal Dollars)

Expenditure	Miner's Ravine Preserve Amount	Miner's Ravine Preserve Per Acre	Oest Ranch Lake Clementine Preserve Amount	Oest Ranch Lake Clementine Preserve Per Acre	Oest Ranch Cold Springs Preserve Amount	Oest Ranch Cold Springs Preserve Per Acre	Big Gun Preserve [1] Amount	Big Gun Preserve [1] Per Acre	Wakamatsu Tea & Silk Colony Amount	Wakamatsu Tea & Silk Colony Per Acre	Rounded Weighted Avg
Acres	26		350		158		52		272		
Conservation Easements											
Purchase Price	$0 [2]		$894,542		$405,458		$0 [2]		$0 [2]		
Other Costs	$0		N/A		N/A		$30,000 [3]		$15,000	$55	
Subtotal Conservation Easements	$0	$0	$894,542	$2,556	$405,458	$2,566	$30,000	$577	$15,000	$55	**$1,600** [4]
Stewardship Fund Contribution [5]											
Stewardship Contribution	$200,000		$194,542		$105,458		$5,000 [6]				
Subtotal Stewardship	$200,000	$7,692	$194,542	$556	$105,458	$667	$5,000	$96			
Rounded Weighted Average								$4,200			
Total Cost	**$200,000**	**$7,692**	**$1,089,084**	**$3,112**	**$510,916**	**$3,234**	**$663,308**	**$12,756**	**$15,000**	**$55**	
Endowment Contribution											
Endowment Contribution							$598,308 [7]				
Legal Funds							$30,000 [8]				
Subtotal Endowment							**$628,308**	**$12,083**			
Average Conservation Easement as a % of Average Acquisition										**29%**	

Prepared by New Economics & Advisory, June 2016.

Source: Placer Land Trust staff, April-May 2015.

[1] Westervelt Ecological Services (WES) is the land owner of this preserve and PLT is the conservation easement holder and fiscal agent.

[2] Donated.

[3] Includes $15,000 for legal expenses and $15,000 for mitigation contract.

[4] Weighted average includes donated properties.

[5] The Stewardship fund is utilized similarly as an Endowment Fund (to fund long-term M&M) but is not technically restricted in the same manner as an Endowment Fund. However, this price is included in the total "cost" of acquisition because the purchase price was, in most cases, reduced to allow for the contribution to the Stewardship Fund.

[6] PLT receives $5,000 per year until the endowment is fully funded. Total expected amount is unknown at this time.

[7] PLT will receive this endowment when fully funded once credits are sold. This is expected to take several years because this contribution is a factor of income associated with the sale of credits. It is excluded from the total acquisition cost figure.

[8] PLT received $15,000 for legal defense and $15,000 to enter into mitigation contract with WES.

A3.3 *Placer Land Trust Estimated M&M costs*
2016$

Expenditure	Total Cost	Metric	Acres	Cost Per Acre
Annual Management & Monitoring Examples (2013$)				
Outman Preserve	$2,375	For entire property.	80	$29.69
Harvego Reserve/Bruin Ranch	$60,000	Annual M&M estimate.	1,773	$33.84
Wakamatsu Tea & Silk Colony	$10,000	Annual M&M estimate.	272	$36.76
Big Gun Preserve	$2,500	$2,000 -$3,000 annually.	52	$48.08
Weighted Average Cost				**$34.39**
Other Annual Costs (2013$)				
Overhead	15%	Typically applied to M&M contract costs. Applied to M&M Weighted Average Cost.		$5.16
Field Equipment	$5,000	Per year for Harvego Reserve.	1,773	$2.82
Periodic Surveys, Aerial Photos	N/A	Not specifically performed yet on Oak Woodland properties.		N/A
Subtotal Other Annual Costs				**$7.98**
Subtotal Annual Management & Monitoring (2013$)				**$42.37**
Inflated to 2016$				**$51.08**

Prepared by New Economics & Advisory, June 2016.

Source: PLT Staff, April - June 2015.

A4 *Placer County Conservation Plan (PCCP) Projected Costs*
2016$

Expenditure	Amount	Metric	Cost Per Acre
One-Time Activities (Year 0) (2013$) [1]			
County Field Facilities Contribution [2]	$500,000	Spread over 48,250 acres at end of 50-years.	$10.36
Oak Woodland Fuel Management	$1,800	Initial One-Time Cost per acre.	$1,800.00
Maintaining New Plantings [3]	$20,000	per 100-acre project over a 3-yr. period	$200.00
Subtotal One-Time Activities			**$2,010.36**
Inflated to 2016$			**$2,423.61**
Annual Management & Monitoring (2013$)			
Mgmt. Equip. & Materials	$3,000	Cost per 1,000 acres.	$3.00
On-going Site Maintenance	$10,000	Cost per 1,000 acres.	$10.00
Wildlife Management	$1,000	Cost per 1,000 acres.	$1.00
Oak Woodland Fuel Management	$1,000	Interval treatment every 5 years ($1,000 every 5 years per 1,000 acres).	$0.20
Field Facilities Maint. & Utilities	$10,000	Annual cost spread over 48,250 acres.	$0.21
Staffing Cost	$50,000	(1/3-1/2 time position)	$1.04
Reserve Mgmt. Plan Updates	$40,000	Every 5 years (2 total plans)	$0.17
Subtotal Annual Management & Monitoring			**$15.61**
Inflated to 2016$			**$18.82**
Other Data Points			
Case Study Restoration Costs [3]	$43,000	per 100-acre project	$430.00
Total Estimated Cost over 50-yr permit period		Cost estimate ranges from $3,000 to $30,000 per acre	$13,500

Prepared by New Economics & Advisory, June 2016.

Source: Woodland Restoration Potential: Placer County Conservation Plan, Richard R. Harris, Ph.D., February 2013.

[1] Reflects cost of one-time activities conducted shortly after undertaking management and monitoring responsibilities.

[2] This estimated cost is currently anticipated by Placer County for purposes of developing the Placer County Conservation Plan (PCCP). New Economics has integrated this cost into Initial M&M.

[3] From Attachment A of PPCP Woodland Restoration Report. Estimated Oak Woodland Restoration Notes by Riley Swift.

A5.1 *Sempervirens Fund Recent Acquisitions*
2012-2014 (Nominal Dollars)

Expenditure	Amount	Acres	Cost per Acre
Recent Land Acquisitions	2012		
Gallaway	$378,000	89	$4,247
	2013		
Butano & Waterman Creek	$870,000	80	$10,875
Lachnbrauch	$500,000	76	$6,579
Redwood Meadows	$525,000	151	$3,477
	2014		
Van Kempen	$650,000	33	$19,697
Weighted Average Acquisitions			**$6,814**
Related Acquisition Costs [1]	$838,885	429	$2,073
Subtotal Recent Land Acquisitions			**$8,886**
Recent Conservation Easements	**2013$**		
Redwood Meadows	$525,000	151	$3,477
Average Conservation Easement as a % of Average Acquisition [2]			**56%**

Prepared by New Economics & Advisory, June 2016.

Source: Sempervirens Fund Audited Financial Statements, June 30, 2014, and staff.

[1] Reflects 70% of General and Administration Costs from Financial Statement spread across 398 acres acquired in the same year to determine per-acre amount.

[2] Reflects 2013$ land acquisitions and conservation easements.

A5.2 *Sempervirens Fund M&M Trends*
2016$

Expenditure	Financial Statement Ending 06/30/2014 Stewardship	Total General & Admin	General & Admin Portion [1]	Total Cost	Metric	Cost per Acre [2]
Annual Management & Monitoring (2014$)						
Salaries	$99,223	$219,309	$65,793	$165,016	Lump Sum	$15.40
Payroll Taxes & Benefits	$20,552	$43,097	$12,929	$33,481	Lump Sum	$3.13
Other Outside Services	$86,039	$21,957	$6,587	$92,626	Lump Sum	$8.65
IT Services	$4,509	$11,070	$3,321	$7,830	Lump Sum	$0.73
Office Expenses	$5,622	$16,823	$5,047	$10,669	Lump Sum	$1.00
Occupancy Expenses	$16,037	$35,763	$10,729	$26,766	Lump Sum	$2.50
Printing, Postage & Direct Mail	$2,323	$12,418	$3,725	$6,048	Lump Sum	$0.56
Legal and Accounting	$1,273	$36,121	$10,836	$12,109	Lump Sum	$1.13
Insurance	$808	$26,381	$7,914	$8,722	Lump Sum	$0.81
Travel, Training, Meetings & Ent.	$5,788	$16,771	$5,031	$10,819	Lump Sum	$1.01
Government Fees	$183	$549	$165	$348	Lump Sum	$0.03
Subtotal Annual Management & Monitoring						**$34.95**
Inflated to 2016$						**$41.19**

Prepared by New Economics & Advisory, June 2016.

[1] Stewardship Costs account for approximately 30% of Total Annual Costs (net of Admin). This analysis applies 30% of General and Administrative costs as a preliminary estimate of proportionate administrative costs. Subject to further refinement.

[2] Costs are spread over 10,713 acres of redwood forests and forest land actively managed by Sempervirens.

Source: Sempervirens Fund Audited Financial Statements, June 30, 2014, and staff.

A6 *Sacramento Tree Foundation M&M Trends*
2016$

Expenditure	Financial Statement Ending 06/30/2013: Mitigation Amount	Total Gen. & Admin.	Adj. Gen. & Admin. [1]	Total Cost	Metric	Cost per Acre [2]
Annual Management & Monitoring (2013$)						
Trees, Materials & Land Use Fees	$6,140	$2,116	$275	$6,415	Lump Sum	$214
Salaries, Benefits & Taxes	$193,847	$141,376	$18,379	$212,226	Lump Sum	$7,074
Professional Services	$3,132	$21,427	$2,786	$5,918	Lump Sum	$197
Marketing	$220	$2,550	$332	$552	Lump Sum	$18
Rent & Utilities	$11,513	$25,602	$3,328	$14,841	Lump Sum	$495
Vehicles	$15,787	$159	$21	$15,808	Lump Sum	$527
Depreciation	$7,087	$5,169	$672	$7,759	Lump Sum	$259
Computer Services	$1,433	$2,577	$335	$1,768	Lump Sum	$59
Equipment Costs	$6,061	$5,179	$673	$6,734	Lump Sum	$224
Postage, Freight & Printing	$923	$2,408	$313	$1,236	Lump Sum	$41
Meeting & Conferences	$570	$10,970	$1,426	$1,996	Lump Sum	$67
Insurance	$856	$640	$83	$939	Lump Sum	$31
Office Supplies	$638	$930	$121	$759	Lump Sum	$25
Staff Development	$840	$3,028	$394	$1,234	Lump Sum	$41
Miscellaneous	$551	$1,920	$250	$801	Lump Sum	$27
Subtotal Annual Management & Monitoring				**$226,051**		**$9,299**
Inflated to 2016$						**$11,211**

Prepared by New Economics & Advisory, June 2016.

[1] Amount includes Mitigation Program Costs and 13% of Administrative Costs as a preliminary estimate of proportionate administrative costs. Subject to further refinement.

[2] In 2014, STF planted and cared for 4,450 trees. At about 150 trees per acre, STF estimates 30 acres of land under management.

Source: Sacramento Tree Foundation Financial Statements, June 30, 2013.

A7.1 *Sierra Foothill Conservancy Recent Direct Land Acquisitions*
2012 (Nominal Dollars)

	Martin Preserve		Miller Preserve	
Item	Amount [1]	Amount per Acre	Amount	Amount per Acre
Recent Land Acquisitions	**2012$**		**2012$**	
Acres	280		2,011	**2,291**
Purchase Price	$1,021,100	$3,647	$1,230,000	$612
Subtotal Recent Land Acquisitions		**$3,647**		**$612**
Weighted Average Recent Land Acquisitions				**$1,000**

Prepared by New Economics & Advisory, June 2016.

Sources: Consolidated Financial Statements and Additional Information for FY 2012/13 and 2011/12, and Sierra Foothill Conservancy staff.

[1] This transaction also include $280,507 in Stewardship Fund contribution; however, this amount is excluded because it is intended to fund M&M.

A7.2 SFC - Recent Easements & Contributions
2008-2014 (Nominal Dollars)

Item	2008-2014 Amount	Acres	Per Acre
Conservation Easements (CE)		*2008*	
Bohna	$1,000,000	840	$1,190
Trabucco	$300,000	524	$573
		2012	
San Joaquin River Corridor	$820,000	1,390	$590
Wild Life Conservation Board	$280,000	680	$412
		2010	
Millar Ranch	$1,850,000	2,990	$619
		2011	
Pt. Millerton Ranch	$125,000	200	$625
		2014	
Hendrick	$440,000	324	$1,358
		2012$	
Martin Preserve-- Stewardship Fund Contribution Only	$280,507	280	$1,002
Rounded Weighted Average Recent CE Cost			**$700**
Average Conservation Easement as a % of Average Acquisition [1]			**70%**

Prepared by New Economics & Advisory, June 2016.

[1] Based on 2013$ land acquisitions and rounded weighted average of conservation easements (2008-2014).

Sources: Consolidated Financial Statements and Additional Information for FY 2012/13; and Sierra Foothill Conservancy staff, May 2015.

A7.3 *Sierra Foothill Conservancy M&M Trends*

2016$

Expenditure	Financial Statement Ending 06/30/2013 Program Services	General & Admin.	Total Cost [1]	Metric	Cost per Acre [2]
Management & Maintenance (2013$)					
Management Fee	N/A	$27,635	$27,635	Lump Sum	$4.26
Outside Services	$62,699	N/A	$62,699	Lump Sum	$9.67
Repairs & Maintenance	N/A	$19,842	$19,842	Lump Sum	$3.06
Salaries & Wages	$228,654	$55,619	$284,273	Lump Sum	$43.86
Payroll Taxes	$22,177	$5,394	$27,571	Lump Sum	$4.25
Employee Benefits	$5,304	$1,290	$6,594	Lump Sum	$1.02
Advertising & Promotions	N/A	$942	$942	Lump Sum	$0.15
Auto Expenses	$12,325	$8,084	$20,409	Lump Sum	$3.15
Bank & Finance Charges	N/A	$1,936	$1,936	Lump Sum	$0.30
Conference Expenses	$422	$3,603	$4,025	Lump Sum	$0.62
Dues & Subscriptions	N/A	$6,373	$6,373	Lump Sum	$0.98
Insurance	$3,775	$24,198	$27,973	Lump Sum	$4.32
Interest	N/A	$20,179	$20,179	Lump Sum	$3.11
Loss on Disposition of Assets	N/A	$4,979	$4,979	Lump Sum	$0.77
Member Events	$1,242	N/A	$1,242	Lump Sum	$0.19
Miscellaneous	$260	$3,517	$3,777	Lump Sum	$0.58
Office Expenses	$4,004	$6,369	$10,373	Lump Sum	$1.60
Postage & Delivery	$282	$1,314	$1,596	Lump Sum	$0.25
Printing & Copying	$3,315	$863	$4,178	Lump Sum	$0.64
Professional Fees	$30,634	$8,459	$39,093	Lump Sum	$6.03
Property Taxes	$9,282	N/A	$9,282	Lump Sum	$1.43
Rent & Related	$15,226	$3,704	$18,930	Lump Sum	$2.92
Taxes & Licenses	N/A	$232	$232	Lump Sum	$0.04
Travel	$964	$2,322	$3,286	Lump Sum	$0.51
Utilities	$13,288	$3,232	$16,520	Lump Sum	$2.55
Subtotal Management & Monitoring			**$623,939**		**$96.27**
Inflated to 2016$					**$116.06**

Prepared by New Economics & Advisory, June 2016.

[1] Figures include costs associated with Program Services and General & Administration.

[2] SFC actively manages only the land owned in fee title. Costs are spread over 6,481 acres of nature preserves actively managed by SFC.

Source: Consolidated Financial Statements and Additional Information for FY 2012/13 and 2011/12, and SFC staff.

A8.1 *Save the Redwoods League Recent Acquisitions*
2012-2014 (Nominal Dollars)

Expenditure	Amount	Cost per Acre	Amount	Cost per Acre
Recent Land Acquisitions	**2013$**		**2014$**	
Acres	125		33	**158**
Purchase Price	$2,000,000	$16,000	$650,000	$19,697
Weighted Average Cost				**$16,772**
Recent Conservation Easements (CE)	**2014$**		**2012$**	
Acres	22,986		378	
Purchase Price	$16,900,000	$735	$300,000 [1]	$794
Appraisals & Environmental [2]	$364,362	$16	$310,745	$822
Legal Fees [2]	$16,435	$1	$113,511	$300
Subtotal CE Acquisition		**$752**		**$1,916**
Weighted Average Cost				**$771**
Average Conservation Easement as a % of Average Acquisition Cost				**5%**

Prepared by New Economics & Advisory, June 2016.

[1] Donation.

[2] New Economics assumed that these costs, included in both Program Services and General and Administrative Cost categories were predominantly associated with acquisition activities. Subject to further refinement pending additional feedback from SRL staff.

Sources: Save the Redwoods League Financial Statements, March 31, 2014 and 2013; Save the Redwoods League 2014 Annual Report, and Save the Redwoods League staff.

A8.2 *Save the Redwoods League M&M Trends*

2016$

Expenditure	Financial Statements 03/14/2014 Program Services	Total General & Admin	Adjusted General & Admin [1]	Total Cost [1]	Metric	Cost per Acre [2]
Management & Monitoring (2014$)						
Other Project Costs	$353,504		N/A	$353,504	Lump Sum	$24.46
Equip. Rental & Maint.	$7,094	$6,743	$4,720	$11,814	Lump Sum	$0.82
Salaries & Benefits	$1,658,517	$837,483	$586,238	$2,244,755	Lump Sum	$155.30
Payroll taxes	$103,922	$52,476	$36,733	$140,655	Lump Sum	$9.73
Printing & Publications	$121,945	$11,909	$8,336	$130,281	Lump Sum	$9.01
Services & Fees	$110,183	$299,548	$209,684	$319,867	Lump Sum	$22.13
Occupancy	$168,770	$92,539	$64,777	$233,547	Lump Sum	$16.16
Consultants	$240,281	N/A	N/A	$240,281	Lump Sum	$16.62
Conferences and Meetin	$53,657	$43,430	$30,401	$84,058	Lump Sum	$5.82
Travel	$62,009	$25,189	$17,632	$79,641	Lump Sum	$5.51
Investment Fees	N/A	$137,153	$96,007	$0	Lump Sum	$0.00
Miscellaneous Expenses	$29,746	$30,665	$21,466	$51,212	Lump Sum	$3.54
Accounting Fees	N/A	$49,715	$34,801	$34,801	Lump Sum	$2.41
Postage & Shipping	$9,616	$21,297	$14,908	$24,524	Lump Sum	$1.70
Furniture & Equipment	$18,669	$10,980	$7,686	$26,355	Lump Sum	$1.82
Insurance	$18,867	$10,345	$7,242	$26,109	Lump Sum	$1.81
Supplies	$15,822	$6,206	$4,344	$20,166	Lump Sum	$1.40
Telephone	$12,482	$7,627	$5,339	$17,821	Lump Sum	$1.23
Subtotal Management & Monitoring						**$279.47**
Inflated to 2016$						**$314.96**

Prepared by New Economics & Advisory, June 2016.

[1] Amount includes Program Services Costs and 70% of General and Administrative Costs as a preliminary estimate of proportionate administrative costs. Subject to further refinement.

[2] Cost are spread over 14,454 acres of forests and surrounding land actively managed by SRL.

Source: Save the Redwoods League Financial Statements, March 31, 2014; Save the Redwoods League 2014 Annual Report; and SRL staff.

A9.1 *Sacramento Valley Conservancy Recent Acquisitions*
Deer Creek Hills (2003$)

Expenditure	Amount	Cost per Acre
Recent Land Acquisition	**2003$**	
Acres [1]	4,062	
Acquisition Costs	$11,422,400	$2,812
Subtotal Recent Land Acquisition	**$11,422,400**	**$2,812**

Prepared by New Economics & Advisory, June 2016.

[1] Owned and managed acres per Deer Creek Hills Preserves Master Plan, July 2008.

Source: Deer Creek Hills Preserve Master Plan, 2008; SVC website; and SVC staff.

A9.2 *Sacramento Valley Conservancy M&M Trends*
Deer Creek Hills, 2016$

Expenditure	Amount	Metric	Cost per Acre [1]
Annual Management & Monitoring (2013$)			
Property Tax & Management Costs [2]	$55,844	Lump Sum	$13.75
Payroll	$50,986	Lump Sum	$12.55
Payroll Taxes	$3,890	Lump Sum	$0.96
Employee Benefits	$71	Lump Sum	$0.02
Travel & Meetings	$735	Lump Sum	$0.18
Occupancy	$1,012	Lump Sum	$0.25
Postage & Delivery	$31	Lump Sum	$0.01
Phone & Internet	$3,118	Lump Sum	$0.77
Office Expense	$195	Lump Sum	$0.05
Payroll Services	$838	Lump Sum	$0.21
Insurance	$7,552	Lump Sum	$1.86
Taxes & Licenses	$1,213	Lump Sum	$0.30
General Admin Overhead [3]	$29,435	Lump Sum	$7.25
Subtotal Administrative Expenses	**$154,922**		**$38.14**
Inflated to 2016$			**$39.97**

Prepared by New Economics & Advisory, June 2016.

[1] Costs are spread over 4,062 acres of Deer Creek Hills Preserve actively managed by SVC.

[2] Includes weed management, trash management, grazing management, property repairs, management licensing agreements, and training.

[3] General overhead and administrative cost estimated at 19% of overall budget per SVC staff.

Source: Deer Creek Hills Preserve Master Plan, 2008; and Sacramento Valley Conservancy staff, May 2015.

Appendix B: Supporting Calculations for Endowment Fee Component

B1 *Endowment Fund Annual Rate of Return Research*

Nominal Rates

Item	Year	Source	Rate of Return
National Association of College and University Business Officers (NACUBO) (Net Return) [1]			
Endowments Under $25 Million	2009		3.90%
Endowments Under $25 Million	2010		2.80%
Endowments Under $25 Million	2011		4.90%
Endowments Under $25 Million	2012		5.70%
	Average		**4.33%**
Other Habitat Fee Studies (Nominal Rates)			
Natomas Basin Conservancy	2013	EPS/ NBC	3.00%
Santa Clara Valley Habitat Plan Development Fee Nexus Study	2012	Willdan	3.25%
El Dorado Oak Woodland	2008	El Dorado County	6.00%
El Dorado County Ecological Preserve Fee Estimate	1998	EPS	6.00%
	Average		**4.56%**

Prepared by New Economics & Advisory, June 2016.

[1] NACUBO 10-year total net return for US Higher Education endowments and Affiliated Foundations, for Endowments under $25 million.

Sources: Individual Habitat Management Organizations, Fee Nexus Studies, and NACUBO Common Fund Study of Endowments 2009-2012.

B2 *Endowment Cash Flow Projections (2016$ constant dollars)*

6.0% annually

Item	Assumption	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Habitat Acres Maintained		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual Maintenance Cost	$43 per acre	$43	$43	$43	$43	$43	$43	$43	$43	$43	$43
Portion Prepaid by Initial M&M Fee Component [1]		$43	$43	$43	$43	$43	$0	$0	$0	$0	$0
Remaining Annual Maintenance Cost	$43 per acre	$0	$0	$0	$0	$0	$43	$43	$43	$43	$43
Endowment Fund											
Opening Balance		$0	$550	$583	$618	$655	$694	$693	$692	$691	$690
Interest Earnings [2]	6.0% annually	$0	$33	$35	$37	$39	$42	$42	$42	$41	$41
New Fee Revenue Available	$550 per acre	$550	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Balance		$550	$583	$618	$655	$694	$736	$735	$734	$733	$731
Amount Applied Toward O&M Cost		$0	$0	$0	$0	$0	$43	$43	$43	$43	$43
Closing Balance		$550	$583	$618	$655	$694	$693	$692	$691	$690	$689

Prepared by New Economics & Advisory, June 2016.

[1] This amount is to be provided by developers up-front to fund 5 years of maintenance.

[2] Interest earnings are applied to previous year's ending balance.

B3 *Endowment Cash Flow Projections (2016$ constant dollars)*

3.0% annually

Item	Assumption	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Habitat Acres Maintained		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual Maintenance Cost	$43 per acre	$43	$43	$43	$43	$43	$43	$43	$43	$43	$43
Portion Prepaid by Initial M&M Fee Component [1]		$43	$43	$43	$43	$43	$0	$0	$0	$0	$0
Remaining Annual Maintenance Cost	$43 per acre	$0	$0	$0	$0	$0	$43	$43	$43	$43	$43
Endowment Fund											
Opening Balance		$0	$1,250	$1,288	$1,326	$1,366	$1,407	$1,406	$1,406	$1,406	$1,405
Interest Earnings [2]	3.0% annually	$0	$38	$39	$40	$41	$42	$42	$42	$42	$42
New Fee Revenue Available	$1,250 per acre	$1,250	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Balance		$1,250	$1,288	$1,326	$1,366	$1,407	$1,449	$1,449	$1,448	$1,448	$1,447
Amount Applied Toward O&M Cost		$0	$0	$0	$0	$0	$43	$43	$43	$43	$43
Closing Balance		$1,250	$1,288	$1,326	$1,366	$1,407	$1,406	$1,406	$1,406	$1,405	$1,405

Prepared by New Economics & Advisory, June 2016.

[1] This amount is to be provided by developers up-front to fund 5 years of maintenance.

[2] Interest earnings are applied to previous year's ending balance.

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Appendix C

General Plan Goals, Objectives, Policies and Measures Applicable to the Oak Resources Management Plan

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MEASURE CO-P

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

- Mitigation standards for oak resources impacts;
- Definitions of exempt projects and actions;
- Technical report requirements;
- Oak resources mitigation options and standards;
- Heritage Tree mitigation standards; and
- Oak resources mitigation monitoring and reporting requirements.

[Policy 7.4.4.4]

Responsibility:	Planning Department
Time Frame:	Concurrent with biological resources policy update.

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,OAK WOODLAND, AND TREE RESOURCES

Protect and conserve forest, oak woodland, and tree 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 or actions that result in impacts to oak woodlands and/or individual native oak trees, including Heritage Trees, the County shall require mitigation as outlined in the El Dorado County Oak Resources Management Plan (ORMP). The ORMP functions as the oak resources component of the County's biological resources mitigation program, identified in Policy 7.4.2.8.

The ORMP identifies standards for oak woodland and native oak tree impact determination, mechanisms to mitigate oak woodland and native oak tree impacts, technical report submittal requirements, minimum qualifications for technical report preparation, mitigation monitoring and reporting requirements, and projects or actions that are exempt from this policy. The ORMP also establishes an in-lieu fee payment option for impacts to oak woodlands and native oak trees, identifies Priority Conservation Areas (PCAs) where oak woodland conservation efforts may be focused, and outlines minimum standards for identification of oak woodland conservation areas outside the

PCAs. Requirements for monitoring and maintenance of conserved oak woodland areas and identification of allowable uses within conserved oak woodland areas are also included in the ORMP.

Appendix D

Best Management Practices for Oak Resources

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Information on building around oaks and oaks in the home garden can be found in the University of California Division of Agriculture and Natural Resources' (UC ANR) 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 and Fire Protection's (CAL FIRE) Tree Notes, Protecting Trees from Construction Impacts (Sanborn 1989). Information on the Care of California's Native Oaks is also available through the California Oak Foundation[1]. Qualified professionals and interested persons should contact the local El Dorado County UCCE Advisor and the UC ANR 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.

[1] Now a project of the California Wildlife Foundation (http://www.californiawildlifefoundation.org/projects.html)

- 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.

The County also identifies tree protection measures in its Design and Improvement Standards Manual (revised 1990), which includes the following:

- Do not change the amount of irrigation provided to any oak tree from that which was provided prior to the commencement of construction activity.
- Do not trench, grade, or pave into the dripline area of an oak tree.
- Do not park or operate any motor vehicle within the dripline area of any oak tree.
- Do not place or store any equipment or construction materials within the dripline of any oak tree.
- Do not attach any signs, ropes, cables, or any other items to any oak trees.
- Do not place or allow to flow into or over the dripline area of any oak tree any oil, fuel, concrete mix, or other deleterious material.
- Where construction activity is proposed within 50 feet of an oak tree:
    - A 6-foot tall temporary fence shall be placed the protected area prior to the work beginning.
    - No grade changes shall occur within the protected area unless specifically indicated in the plans.
    - No trenching shall be allowed within the protected area. If it is necessary to install underground utilities within the temporary fence, the utility trench shall be hand dug so as not to cut any roots over 2" in diameter, or a line may be bored and drilled.
    - Only dead, weakened, diseased, or dangerous branches shall be removed, and only by a licensed arborist. Any roots 2" in diameter or larger that must be cut shall be cleanly cut with pruning (not excavation) equipment.
    - Hose off all dust from foliage of oak trees once every week during the construction of the project.

Appendix E

Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Resources

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Appendix E
Guidelines for Maintenance, Restoration, and Rehabilitation of Oak Resources

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, 2009). The documents How to Grow California Oaks and How to Collect, Store, and Plant Acorns 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.

- 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.

- 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.
- 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 in 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 that 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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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 (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
(Now a project of the California Wildlife Foundation)
1212 Broadway, Suite 810
Oakland, CA 94612
(510) 763-0282
http://www.californiaoaks.org/
http://www.californiawildlifefoundation.org/

California Oak Mortality Task Force
https://www.suddenoakdeath.org/wp-content/uploads/2025/08/August-2025-COMTF-Report.pdf

California Wildlife Conservation Board, Oak Woodlands Conservation Program
https://wcb.ca.gov/Programs/Oaks

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://ucanr.edu/sites/EDC_Master_Gardeners/

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

University of California
Division of Agriculture and Natural Resources
http://ucanr.edu/

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
https://caes.ucdavis.edu/outreach/ce
Email: wefrost@ucdavis.edu

SPECIFIC RESOURCE ARTICLES:

Blue oak seedling age influences growth and mortality
https://californiaagriculture.org/article/109289-blue-oak-seedling-age-influences-growth-and-mortality

Blue Oaks: Forage Production and Quality https://ucanr.edu/site/uc-oaks/article/blue-oaks-forage-production-and-quality

Exclosure size affects young blue oak seedling growth
https://ucanr.edu/sites/default/files/2014-01/180946.pdf
=yes

Factors affecting blue oak sapling recruitment and regeneration
http://www.phytosphere.com/publications/Factors_affecting_blue_oak_sapling_recritment_and_regeneration.pdf

How to grow California oaks
https://anrcatalog.ucanr.edu/Details.aspx?itemNo=21540E

Managed Grazing and Seedling Shelters
Enhance Oak Regeneration on Rangelands
https://ucanr.edu/sites/default/files/2014-01/180929.pdf

Modeling the Effectiveness of Tree Planting to Mitigate Habitat Loss in Blue Oak Woodlands
https://www.fs.usda.gov/psw/publications/documents/psw_gtr184/077_Standiford.pdf

Oak Seedlings Can Be Established on Grazed Rangelands
https://ucanr.edu/site/uc-oaks/article/oak-seedlings-can-be-established-grazed-rangelands

PRC §21083.4
http://codes.findlaw.com/ca/public-resources-code/prc-sect-21083-4.html

Recommendations to reduce deer grazing
https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83544&inline

Restoring Oak Woodlands in California: Theory and Practice
http://www.phytosphere.com/restoringoakwoodlands/oakrestoration.htm

Small-Parcel Landowner's Guide to Woodland Management
https://ucanr.edu/sites/default/files/2020-02/320206.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

Big Oak Nursery
10071 Grant Line Road
Elk Grove, CA 95624
(916) 686-1180
http://bigoaknursery.com/

El Dorado Nursery & Garden Inc.
3931 C Durock Road
Shingle Springs, CA 95682
(530) 676-6555
http://www.eldoradonursery.com/

Golden Gecko Garden Center
4665 Marshall Road
Garden Valley, CA 95633
(530) 333-2394
http://www.thegoldengecko.com/

High Ranch Nursery
3800 Del Mar Ave., P.O. Box 1410
Loomis, CA 95650-1410
(916) 652-9261
http://hrnursery.com/

Green Acres
205 Serpa Way
Folsom, CA 95630
(916) 358-9099
http://www.idiggreenacres.com/green-acres-folsom/

Lotus Valley Nursery & Garden
5606 Petersen Lane
Lotus, CA 95651
(530) 622-2321

Urban Tree Farm
3010 Fulton Road
Fulton, CA 95439
(707) 544-4446
http://www.urbantreefarm.com/

Native Plant Nurseries

Identified through the California Native Plant Society (CNPS) website at
https://eldoradocnps.org/gardening-resources/gardening-with-natives/nurseries/

California Native Plant Society plant sales
https://eldoradocnps.org/news-events/plant-sales/

Cornflower Farms
P.O. Box 896
Elk Grove, CA 95759
(916) 689-1015
www.cornflowerfarms.com

Floral Native Nursery
2511 Floral Avenue
Chico, CA 95973
(530) 892-2511 (phone/fax)
www.floralnativenursery.com

Intermountain Nursery
30443 N. Auberry Road
Prather, CA 93651
(559) 855-3113
http://www.intermountainnursery.com/

Oracle Oak Nursery
Hopland, CA
(415) 225-5567
http://oracleoaknursery.com/

Park Place Gardens Nursery
P.O. Box 789
Loomis, CA 95650
(916) 276-8225
www.ppgn.com

Appendix G

Literature Cited

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Appendix G
Literature Cited

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