

CALIFORNIA WILDLIFE FOUNDATION

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Honorable Board of Supervisors  
Butte County  
California

August 30, 2018

Honorable Members of the Board:

California Wildlife Foundation/California Oaks (CWF/CO) has been participating in Butte County's process to conserve its important oak tree resources now and for years to come. Future generations will either benefit or suffer, depending on how you consistently protect Butte's Green Capital.

Enclosed are comments that we have shared with your planners and citizen groups. Please take these comments seriously for the sake of your region being able to meet its climate stability responsibilities and its sustainable wildlife habitat. The natural beauty of your area is also at stake.

Oak trees, often taken for granted, provide considerable services to your county and its residents. These services – clean, cool, filtered air, healthy watersheds to ensure plentiful water for a growing population -- are not easily or economically replaced. Therefore, your decision on this issue is being watched by Californians throughout the state.

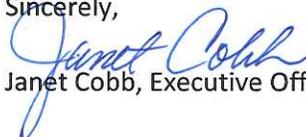
The question is whether you will lead the way in meeting the laws of our state to benefit all of your constituents, or circumvent the law for quick monetary payoffs for the few. It is my hope that you will step back and view this proposal with the seriousness it deserves. As forwarded to you by your staff, it cannot be considered an Oak Ordinance. As it stands, it is an Oak Destruction Plan.

We are ready to help you in any way you deem appropriate. In addition to the attachments, our web sites, [www.californiaoaks.org](http://www.californiaoaks.org) and [www.californiawildlifefoundation.org](http://www.californiawildlifefoundation.org) have information which may be valuable to you. Your County has oak documents that you've approved in the past that should be revisited before proceeding with a vote on this flawed proposal.

CWF/CO has invested time and treasure in working with your land trust to place easements on Butte County's ranches; we have invested in your conservation organization and volunteers to fund planting oaks in your beautiful and important Bidwell Park. As agricultural areas and open spaces are diminished by population pressures, these oak woodlands and oak-forested areas, will become more important and considerably more valuable than they are today. Their fate is in your hands.

Please conserve what you have inherited so that you may pass on a Butte County to future generations that all will be proud to call home. Thank you for your consideration.

Sincerely,

  
Janet Cobb, Executive Officer



August 28, 2018

To: Pete Calarco, Assistant Director, Development Services, Butte County

From: Janet Cobb and Angela Moskow, California Wildlife Foundation/California Oaks

RE: Draft Butte County Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual

Thank you for your communications with California Wildlife Foundation/California Oaks, as well as local stakeholders, during the development of the Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual. This memo provides feedback on the draft ordinance that will be considered at the meeting on August 29.

**XX-8 Exemptions. C. Conversion of oak woodlands on agricultural lands:** We refer you to our memos of August 9 and July 26 stating that the ordinance should apply to agricultural lands because California Environmental Quality Act (CEQA) requires the analysis and mitigation of greenhouse gas emissions associated with proposed oak woodland or oak forest conversions.

The inclusion of language that references the grading permit [Butte County Code Chapter 13-14 (c)] is an improvement to the ordinance.

**XX-11 Oak Canopy Impacts:** The new language that states the following is an improvement to the ordinance: *Subsequent discretionary projects filed within a project approved under this ordinance are subject to these thresholds and shall not be used as a means to cumulatively exceed the thresholds.*

We refer you to our memo of August 9 on this section, formerly XX-10.

**XX-13 Oak Canopy Replacement Ratio:** California Oaks concurs with local representatives who suggest that oak replanting requires much higher replacement ratios. We also agree that conservation of an oak woodland of like size of the woodland that is impacted still results in degradation of the county's oak resources such that impacts remain significant. Thus a more rigorous metric is needed for this calculation as well. That said, we recognize that the revisions to the draft ordinance are reflective of input gathered from the community in that the replacement ratio for 10.1-50% removal is now 2:1 rather than 1:1 and 50.1-70% is now 3:1 rather than 2:1. However, we object to the provision that the calculations are less ten percent of the impact.

We appreciate your consideration and review of our comments.



August 9, 2018

To: Pete Calarco, Assistant Director, Development Services, Butte County

From: Janet Cobb and Angela Moskow, California Wildlife Foundation/California Oaks

RE: Draft Butte County Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual

Thank you so much for reaching out to California Wildlife Foundation/California Oaks, as well as local stakeholders, during the development of the Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual. We very much appreciate the opportunity to provide input. The attached drafts of these materials display our feedback in track change mode. Additionally, this memo provides background on some of the suggested changes to the ordinance.

#### ORDINANCE

**Applicability of the ordinance to agricultural lands:** As mentioned in our memo from July, we understand that the ordinance is being drafted as a means for Butte County to develop procedures for discretionary projects, so that the impact review and mitigation of projects with oak impacts does not require case-by-case environmental review. We also understand that the ordinance is shaped by the provisions of California Public Resources Code 21083.4. Nonetheless, the ordinance should apply to agricultural lands because California Environmental Quality Act (CEQA) requires the analysis and mitigation of greenhouse gas emissions associated with proposed oak woodland or oak forest conversions.

CEQA § 15364.5 states that “Greenhouse gas” or “greenhouse gases” includes but is not limited to: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

California’s Senate Bill 1383 (2016) designated methane, black carbon and hydrofluorocarbon as short-lived climate pollutants. Neither the 2009 CEQA GHG amendments nor the enabling legislation, Senate Bill 97, mention the term “carbon sequestration.” CEQA’s sole focus is “the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions.”

Upon the disposal of impacted vegetation, the decomposition of biomass does, in all cases, result in CO<sub>2</sub> and CH<sub>4</sub> emissions, and the combustion of biomass does in all cases result in CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and black carbon. CEQA does not differentiate between anthropogenic and biogenic GHG emissions. The following 2009 Natural Resources Agency response to the California Wastewater Climate Change Group proves the point:

Response 95-1: “Regarding the comment that the Guidelines should distinguish between anthropogenic and biogenic carbon dioxide emissions, the Natural Resources Agency notes that SB 97 did not distinguish between the sources of greenhouse gas emissions. Thus, it would not be appropriate for the Natural Resources Agency to treat

the different categories of emissions differently absent a legislative intent that the Guidelines do so. Neither AB 32 nor the Air Resources Board's Scoping Plan distinguishes between biogenic and anthropogenic sources of greenhouse gas emissions. On the contrary, the Scoping Plan identifies methane from, among other sources, organic wastes decomposing in landfills as a source of emissions that should be controlled. (Scoping Plan, pp. 62-63)."

Further, the expansion of the ordinance to agricultural lands would help Butte County to achieve its climate change and hazard management goals.

Senate Bill 379 (Jackson), chaptered in 2015, mandates counties to *include a set of adaptation and resilience goals, policies, and objectives* in hazard mitigation and climate adaptation plans. Section (4) (VII) (C) of the legislation states that guidelines shall include: (i) *Feasible methods to avoid or minimize climate change impacts associated with new uses of land*. Later in this section the legislation states: (v) *Where feasible, the plan shall use existing natural features and ecosystem processes...to increase resiliency to climate change, manage environmental hazards, or both*. The legislation is reflective of a growing understanding of the importance of natural landscapes in maintaining climate stability.

**Section XX9 Oak Woodland Evaluation Plan.** Please see the notations in the text about County of San Luis Obispo maintenance of a listing of qualified individuals to prepare Oak Management Plans as part of the Oak Ordinance, which was enacted in 2017. These notations were provided in response to Woody Elliot's suggestion that standards should be in place to assess the qualifications of those who prepare the plans.

**Section XX10 Impacts.** The draft ordinance states: *Replacement of oak woodlands shall not be required for projects that meet the following standards provided that no oak trees that are 24 inches or greater in DBH are removed*. The ordinance does not later define the protections for trees that are of this size. Does it mean there are to be no removals? Twenty-four-inches is not a sufficiently protective metric for blue oaks since the trees grow so slowly. We recommend that protections of all valley and blue oaks at the 5-inch DBH size, as defined by CEQA is a more suitable figure. The focus on heritage trees can result in trees that are lovely, yet not regenerating.

**B and C. Discussion of removal of up to 70 percent of canopy:** Butte County's Oak Woodland Assessment Report calls for maintaining a 30 percent canopy: *When harvesting oaks for fuel or range improvement, encourage land owners to maintain an average leaf canopy of at least 30 percent* (Standiford and Tinnin 1996). UC Cooperative Extension made this recommendation before climactic trends were understood as they are today. The language of the ordinance, which in the current draft allows no more than *70 percent removal*, is not acceptable. We recommend an uppermost figure of 10 percent removal and also recommend that the ordinance place restrictions on removals in subsequent years, using the 10 percent figure as the uppermost limit.

Regarding the importance of canopy, numerous studies point to the importance of proximity in maintaining oak diversity and regeneration. In the chapter on Genetic Diversity in Oaks authored by Deborah Rogers, Ph.D. in Costello et al. *Oaks in the Urban Landscape: Selection, Care, and Preservation* University of California Agriculture and Natural Resources Publication 3518

...In a comparison of the pollination patterns of California valley oak (*Q. lobata*) in 1944 and 1999 (after considerable thinning), it was determined that the oak pollen did not travel as far as one might expect for a wind-pollinated species (average distance of 65 meters), and that the (1999) lower-density stand had fewer trees acting as pollen parents, making the resulting seeds and progeny less diverse (Sork et al. 2002). This study suggested a number of implications for this species. First, pollen flow seems to be fairly local for this species, so geographically distinct populations may be quite genetically different from one another. Second, if the remaining oak populations are isolated by intervening developments, they might experience increased inbreeding, which could result in loss of genetic diversity and potentially cause lower viability of natural regeneration.

A study of blue oak (*Q. douglasii*) provided some information on the impacts of fragmentation and thinning on this species... Acorn production was measured over several years in relation to distance among pollen-producing trees and other factors. A relationship was revealed between the number of neighboring pollen producers and the amount of acorn production... These results suggest that thinning in blue oak stands or increasing the distance among small stands (e.g., by habitat conversion to other land uses) could negatively impact natural reproduction in the residual stands (Knapp et al. 2001).

**XX-12 Replacement Ratio:** California Oaks concurs with local representatives who suggest that oak replanting requires much higher replacement ratios. We also agree that conservation of an oak woodland of like size of the woodland that is impacted still results in degradation of the county's oak resources such that impacts remain significant. Thus a more rigorous metric is needed for this calculation as well.

**Other Considerations:** Is Butte County interested in including language in the ordinance to maintain the natural resource values on slopes of a certain percentage where oaks grow to prevent erosion and to protect waterways? Perhaps there are zoning regulations that address this.

We appreciate your consideration and review of our comments.



July 26, 2018

To: Pete Calarco, Assistant Director, Development Services, Butte County

From: Angela Moskow, California Wildlife Foundation/California Oaks

RE: Draft Butte County Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual

Thank you so much for reaching out to California Wildlife Foundation/California Oaks, as well as local stakeholders, during the development of the Oak Woodland Mitigation Ordinance and Oak Woodlands Technical Manual. We very much appreciate the opportunity to provide the input contained in this memo and attachment.

#### ORDINANCE

**Applicability of the ordinance to agricultural lands:** We understand that the ordinance is being drafted as a means for Butte County to develop procedures for discretionary projects, so that the impact review and mitigation of projects with oak impacts does not require case-by-case environmental review. We also understand that the ordinance is shaped by the provisions of California Public Resources Code 21083.4. Nonetheless, we suggest that the provisions of the ordinance apply to agricultural lands for the reasons articulated below:

Although California Public Resources Code 21083.4 states that agricultural conversion of oak woodlands are exempt from California Environmental Quality Act (CEQA), these lands are not exempt from CEQA's required analysis of the Greenhouse Gas (GHG) impacts of the conversion to agricultural acreage. Net present value of greenhouse gas emissions forms the foundation of the state's greenhouse reduction objectives, as well as the California Forest Protocol preservation standards. Every ton of carbon dioxide (CO<sub>2</sub>) released into the atmosphere by oak woodland or forest conversion—alongside the loss of the woodland's or forest's role in carbon sequestration—represents a measurable potential adverse environmental effect, which is covered by CEQA. Thus California requires the analysis and mitigation of greenhouse gas emissions associated with proposed oak woodland or forest conversions.

We offer that current climatic trends, including net emissions from California's natural areas, make it imperative that the ordinance is protective of ongoing carbon sequestration in Butte County's working landscapes. Standing trees and associated soils sequester carbon while providing habitat, watershed, and other important ecosystem benefits. Oak woodlands have a productive understory of grasses that support approximately 60% of California's rangelands. Further, acorns are a highly nutritious food source for livestock. It is vital that these oaks remain standing and regenerate.

Further, we suggest that the next iteration of Butte County’s Climate Action Plan include discussion about the importance of keeping trees standing in agricultural settings. In *Soil Carbon Pools in California’s Annual Grassland Ecosystems*, the authors note:

...Sites that contained woody plants at the time of sampling consistently had high soil C (carbon) pools, even when controlling for temperature and precipitation. Oak woodlands and wooded savanna make up a significant proportion of the rangelands in California (Griffen 1977). These ecosystems are characterized by tree islands in a grassland matrix. Oak understories tend to have higher soil C and nutrient pools and lower bulk densities than the surrounding grasslands (Dahlgren et al. 1997). Oaks have greater rooting depth than grasses, providing an important contribution to deep soil C. These ecosystems may also be better at retaining C over time due to more complete use of seasonally available water (Ma et al. 2007).<sup>1</sup>

In the research paper, “Soil Organic Carbon Stability Across Mediterranean Oak Agroecosystem,” which was delivered at the Seventh Symposium on Oak Woodlands: Managing Oak Woodlands in a Dynamic World, Leslie M. Roche et al. found total soil organic carbon to be positively correlated with woody plant cover. The authors also found the carbon stores can be quickly degraded and lost upon removal of woody cover: “Although there is considerable potential for carbon sequestration with woodland conservation and restoration, these carbon stores are not more resilient to disturbances than grassland carbon pools and can be quickly degraded and lost upon oak removal.”<sup>2</sup>

In the chapter on Watershed Management in Oak Woodlands of *A Planner’s Guide for Oak Woodlands* the authors speak about oak trees creating “islands of enhanced soil fertility... The result is deposition of two or three times more organic matter under an oak canopy and 35 to 40 percent more organic carbon and nitrogen in soils under an oak canopy than in grassland soils.”<sup>3</sup>

**Section XX9 Oak Woodland Evaluation Plan.** The County of San Luis Obispo maintains a listing of qualified individuals to prepare Oak Management Plans as part of the Oak Ordinance, which was enacted in 2017. Contact information is in the first attachment.

**Section XX10 Impacts.** Consideration should be given to the question of whether 24-inches is a sufficiently protective metric for blue oaks since the trees grow so slowly. Perhaps a lower figure could be used for blue oaks.

**B and C. Discussion of removal of up to 70% of canopy:** Butte County's Oak Woodland Assessment Report calls for maintaining a 30% canopy. We commend the county for reflecting similar language in the ordinance. We recommend that the language of the ordinance, which in the current draft allows no more than *70% removal*, be modified to reflect goal of the

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<sup>1</sup> Whendee L. Silver, Rebecca Ryals, and Valerie Eviner, *Rangeland Ecology and Management* 63:128–136. January 2010. DOI: 10.2111/REM-D-09-00106.1, Page 113.

<sup>2</sup> Roche, L.M., Chang, J.F., Six, J. O’Geen, A.T., Tate, K.W. An abbreviated version of this paper was presented at the Seventh California Oak Symposium: Managing Oak Woodlands in a Dynamic World, US Forest Service, Pacific Southwest Research Station, held in Visalia, CA. November 2014. Page 227.

<sup>3</sup> Edited by Giusti, G.A., McCreary, D. D., and Standiford, R.B. Chapter authors: Larsen, R., Lewis, D., and Valachovic, Y. *A Planner’s Guide for Oak Woodlands*, Second Edition, University of California Agriculture and Natural Resources Publication 3491. 1993, rev. 2005. Page 35.

maintenance of a 30% canopy (otherwise, removals will potentially result in much lower canopies, especially for lands in which oak removals occur over a number of years). We also encourage the Butte County to consider greater protections than the 30% threshold, which was recommended by UC Cooperative Extension before warming climactic trends were fully understood.

**XX-12 Replacement Ratio:** Please find attached a document that summarizes some of the provisions of Santa Barbara County's tree removal ordinance, along with contact information for the county. Note the very high replacement ratios required.

**Other Considerations:** Is Butte County interested in including language in the ordinance to maintain the natural resource values on slopes of a certain percentage where oaks grow to prevent erosion and to protect waterways? Perhaps there are zoning regulations that address this.

### TECHNICAL MANUAL

A second document, which may be of interest, is a publication developed through the Willamette Oak Accord process. It is too large for us to attach, but it may be downloaded at: <http://willamettepartnership.org/oak-habitat-metric-user-guide-calculator/>. We recommend it because it provides a means of linking oak conservation with habitat quality.

We appreciate your of review of our comments.

**DRAFT (July 2018)**

Butte County Oak Woodland Mitigation Ordinance

Contents

- XX-1 Title
  - XX-2 Findings
  - XX-3 Purpose
  - XX-4 Relationship to Other Laws, Regulations and Ordinances
  - XX-5 Applicability
  - XX-6 Definitions
  - XX-7 Exemptions
  - XX-8 Approval Required Prior to Removal
  - XX-9 Oak Woodland Evaluation Plan
  - XX-10 Impacts
  - XX-11 Oak Woodland Replacement
  - XX-12 Replacement Ratio
  - XX-13 Equivalent Canopy Area Replacement Standards
  - XX-14 Temporary Impacts
  - XX-15 Monitoring of Approved Projects
  - XX-16 Premature Removal
  - XX-17 Alternate Project Design and Review
- [Notes are denoted by brackets.]

XX-1 Title. Butte County Oak Woodland Mitigation Ordinance.

XX-2 Findings. In Butte County, oak woodland biological community types include valley oak woodland, blue oak woodland and blue oak-foothill pine, which contains a variety of species. Oak woodlands are scattered throughout the county, but are concentrated in the transition area between the lower valley and higher mountainous areas of the county, between the elevations of 200 feet and 3,000 feet. Oak woodlands support a rich wildlife community by providing food, shelter, nesting and resting areas for mammals, birds, reptiles, amphibians, and insects. Oak woodlands facilitate nutrient cycling, moderate temperature extremes, reduce soil erosion, sustain water quality and increase the ecological and monetary value of property. The California Oaks Program of California Wildlife Foundation (formerly the California Oaks Foundation) estimated that trees of the genus *Quercus* within oak woodlands and oak forests in Butte County, account for approximately 6.9 million metric tons of sequestered carbon. Oak woodlands contribute to the overall health and well-being of Butte County through the sequestration of atmospheric carbon. Oak

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woodlands are one of the defining physical features of the Butte County area. They provide scenic beauty, shade, and recreational areas to residents and parkland visitors. Oak woodlands are common locally and regionally; however, native oak trees and woodland habitats are declining statewide because of development, disease, fire, and land management practices.

XX-3 Purpose. The purpose of this chapter is to provide protection for native oak woodlands through the establishment of a threshold of significance and mitigation standards for oak canopy and oak tree removal on discretionary projects. It is the intent of this chapter to implement goals, policies and actions of the Butte County General Plan Conservation and Open Space Element pertaining to oak woodland habitat by setting forth standards for oak canopy retention and establishing an in-lieu payment methodology for oak woodland canopy removal for discretionary projects. It is further the intent to satisfy the provisions of California Public Resources Code §21083.4, as well as climate change and hazard reduction regulations, including other mitigation measures developed by the County. This chapter provides for the protection of trees on private property where discretionary applications have been filed by controlling tree removal while allowing for reasonable enjoyment of private property rights and property development for the following reasons:

- A. The County finds it necessary to preserve oak woodlands on private property in the interest of public health, safety and welfare.
- B. Oak woodlands provide habitat for over 300 vertebrate species and more than 5,000 species of insects.
- C. Oak woodlands stabilize the soil, improve drainage conditions, provide aesthetic beauty and screening for privacy.
- D. Provides a clear, defensible, feasible, and reasonable approach to managing impacts to oak trees and oak woodlands.

XX-4 Relationship to Other laws, Regulations and Ordinances. This ordinance only applies to the effects on oaks and oak woodlands. Discretionary projects that are consistent with this ordinance are considered to have less than significant impacts with respect to impacts to oaks and oak woodlands pursuant to the California Environmental Quality Act (CEQA).

XX-5 Applicability. The provisions of this ordinance shall apply to discretionary projects that result in the removal of oak trees or oak woodlands, including disturbance to the Critical Root Zone (CRZ). The provisions of this ordinance shall not apply to ministerial actions, including but not limited to the following:

- A. Hazardous Tree Removal – The removal of trees with structural defects that indicate pending failure as determined by a qualified professional.
- B. Operations subject to the State Forest Practice Act or State Forest Practice Rules including tree removal resulting from a Timber Harvest Plan or Timber Harvest Plan Exemption approved by CAL FIRE.
- C. Vegetation removal required to comply with defensible space requirements set forth in Public Resources Code Section 4290 (Fire Safety Regulations).
- D. Removal of oak canopy through the utilization of State and local fuel reduction programs such as those managed by local Fire Safe Councils and similar organizations;
- E. Requirements under Butte County Code Chapter 38A (Fire Prevention and Protection).

- F. Public Road and Public Utility Projects – Oak canopy removal necessary to complete County capital improvement projects when the new alignment is dependent on the existing alignment. This exemption applies to road widening and realignments which are necessary to increase capacity, to protect the public’s health, and to improve the safe movement of people and goods in existing public road rights-of-way, as well as acquired rights-of-way necessary to complete the project. This exemption shall also apply to removal of oak canopy necessary to comply with the safety regulations of the Public Utilities Commission and necessary to maintain a safe operation of utility facilities. The following are excluded from this exemption:
  1. Lands owned by public utilities and used for administrative purposes or uses unrelated to the public service provided by the utility are not exempted under this provision.
  2. This exemption shall not apply to new roads or utility installation, or to internal circulation roads within new development.

XX-6 Definitions.

- A. Canopy Cover: The area directly under the live branches of oak trees.
- B. Critical Root Zone (CRZ): A circle on the ground around a tree that generally corresponds to the drip line of the tree. An equation is used to determine the CRZ of a tree. The CRZ is especially sensitive to construction impacts such as compaction. Disturbance within the CRZ has potential to severely damage or kill oak trees and woodlands.
- C. Decision-Making Authority: The public hearing authority to make a decision on a discretionary project. This includes the Zoning Administrator, Planning Commission or Board of Supervisors
- D. Diameter at Breast Height (DBH): The diameter of the perimeter tree trunk at 54 inches (4.5 feet) above natural grade level.
- E. Discretionary Project: A project ~~which hat~~ requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity.
- F. Hazardous Tree: A tree that possesses a structural defect which poses imminent risk if the tree or part of the tree that would fall on someone or something of value. Structural defect means any structural weakness or deformity of a tree or its parts.
- G. Oak tree: means a native tree species in the genus *Quercus*, not designated as Group A or Group B commercial species pursuant to regulations adopted by the State Board of Forestry and Fire Protection pursuant to Section 4526, and that is 5 inches or more in diameter at breast height.
- H. Oak Woodland: For the purposes of this ordinance, an oak woodland is considered to be any group of trees that contain any oak tree or trees.
- I. Oak Woodland Corridors: Strips of habitat that connect large patches of oak woodland and have a high ecological value. For the purposes of this ordinance, the term “connections” is used interchangeably with “corridors”.
- J. Oak Woodland Condition. A description of the condition of oak woodland prepared by a qualified professional based on a variety of factors. Methodology to determine this includes but is not limited to the University of California Oak Woodland Impact Decision Matrix. Oak Woodland Condition is further defined as follows:

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1. Oak Woodland Condition, Intact: In this condition roads and buildings are rare across the site. Trees, both dead and alive, dominate the landscape and the site is capable of natural regeneration of oaks and other plant species. The site allows for movement of wildlife and the existing development is localized and limited to a small number of residences with service buildings or barns. The site is relatively undisturbed and is recognized as Intact. Examples of an Intact woodland may include large to moderately (even relatively small parcels may qualify) sized private ranches; expansive oak woodlands zoned for agriculture, open space, scenic corridors, etc.
  2. Oak Woodland Condition, Moderately Degraded: The site has been changed in one or more ways that has reduced its potential for providing ecological and socially important services. For example, it may have been partially developed resulting in the net loss of trees; the canopy or understory may have been reduced or eliminated over all or part of the site; past grazing or soil disturbance may have impaired regeneration in some areas.
  3. Oak Woodland Condition, Severely Degraded: Site has been dramatically altered and is currently in a condition that has no trees or very few remain; it is being managed in such a way that natural regeneration is not possible or practical; the soil is compacted or contaminated; and/or has been used for residential, commercial or industrial purposes. Roads and stream crossings are commonplace and fencing and other obstructions limit wildlife access and movement.
- K. Oak Woodland Technical Manual: The Oak Woodland Technical Manual is a companion document to the Butte County Oak Woodland Ordinance that outlines the process of managing construction projects on oak woodlands in detail and implementing other portions of the Ordinance.
- L. Project Site: A parcel or parcels of land on which a land development project is proposed.
- M. Qualified Professional: A qualified professional [\[Please note that some arborists do not have expertise in the care of oaks. Consider maintaining a list of qualified professionals as San Luis Obispo County does. Contact Megan Martin, 805-781-4163 or mamartin@co.slo.ca.us for more information.\]](#) is either:
1. Certified Arborist is a person certified by the International Society of Arboriculture (ISA), American Society of Consulting Arborists (ASCA), or other recognized professional organization of arborists that provides professional advice and licenses professionals to do physical work on trees.
  2. Registered Professional Forester (RPF) is a person licensed by the State of California to perform professional services that require the application of forestry principles and techniques to the management of forested landscapes. RPFs have an understanding of forest growth, development, and regeneration; forest health; wildfire; soils, geology, and hydrology; wildlife and fisheries biology, and other forest resources.

XX-7 Exemptions. The following types of actions, when they include a discretionary action, are exempt from this ordinance:

- A. Projects undertaken pursuant to an approved Natural Community Conservation Plan or approved subarea plan within an approved Natural Community Conservation Plan that includes oaks as a covered species or that conserves oak habitat through natural community conservation preserve designation and implementation and mitigation measures that are consistent with Public Resource Code, Section 21083.4.

- ~~B.~~ Affordable housing projects for lower income households, as defined pursuant to Section 50079.5 of the Health and Safety Code, that are located within an urbanized area, or within a sphere of influence as defined pursuant to Section 56076 of the Government Code
- ~~C.B.~~ Conversion of oak woodlands on agricultural land, with a zoning designation of Agriculture (AG) or Agriculture Services (AS), that includes land that is used to produce or process plant and animal products for commercial purposes.
- ~~D.C.~~ Projects undertaken pursuant to Section 21080.5 of the Public Resources Code as a State Secretary of Resources Agency certified regulatory program.

XX-8 Approval Required Prior to Removal. On applicable discretionary projects, unless exempted or

not applicable under this ordinance, no oak tree, oak woodland or portion thereof shall be removed until all of the following has occurred:

- A. The project is approved by the decision-making authority
- B. Compliance with the applicable requirements of this chapter is established and as otherwise required in the conditions of approval, and
- C. The Department of Development Services has issued a letter to proceed.

XX-9 Oak Woodland Evaluation Plan.

- A. An Oak Woodlands Evaluation Plan shall be required in conjunction with an application for the required discretionary entitlements for a development project to document the proposed extent of impact. The Oak Woodlands Evaluation Plan shall include but not be limited to the following:
  1. Site location and site plan
  2. Description of oak woodland including an evaluation of its overall condition including intact, moderately degraded and severely degraded
  3. Measurement of total oak canopy area; location and area of proposed oak canopy removal and calculation of percentage removal.
  4. Oak woodlands to remain. The project shall be designed such that the oak woodlands that are to remain are of intact condition; along waterways and/or wildlife corridors including deer migration corridors; are connected with oak woodlands on adjacent lands including public lands; and, is in compliance with [list those other factors?]; other factors determined by the Department of Development Services]. [California Oaks suggests that the ordinance include a discussion of the timeframe under which alterations to oak woodlands are made. Otherwise a landowner could impact oak woodlands sequentially.] [If a parcel only has one oak woodland are the requirements under the ordinance different?]
  5. The location of required tree protection fencing and signage
  6. Proposed replacement consistent with the requirements of this ordinance.
- B. The Oak Woodlands Evaluation Plan shall be prepared by a qualified professional. Exceptions to this may be considered by the Director based on limited scale of the project or other factors.
- C. The Zoning Administrator shall review the Oak Woodland Evaluation Plan in order to determine its completeness and distribute it together with the project environmental document.
- D. The decision-making authority shall include the Oak Woodland Evaluation Plan in its action on the project.

XX-10 Impacts. Based up on the information in the Oak Woodland Evaluation Plan, the following thresholds are applicable.

A. Less than Significant impact, no replacement required. Replacement of oak woodlands shall not be required for projects that meet the following standards provided that no oak trees that are 24 inches or greater in DBH are removed, unless the trees are blue oaks or valley oaks in which case the threshold is 5-inches. In the case of multiple-stemmed trunks, the DBH is calculated based on the combined diameters of the stems.

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1. ~~Ten~~ Five percent or less of the oak woodland canopy as identified in the Oak Woodland Evaluation Plan is removed.

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2. Impacts greater than ~~ten~~ five percent. If the Evaluation Plan demonstrates that the oak woodland is of a degraded condition, then up to 10 oak trees may be removed without a replacement requirement. A qualified professional is to determine whether a woodland is degraded. [Might this provision be an incentive for landowners to degrade their oak woodlands if the ordinance does not address the condition of woodlands over time? A landowner could remove trees on an annual basis to ensure the woodland does not reach a more healthy condition. Also, these lands could potentially be used for offsite replanting.]

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B. Less than significant impact, replacement required. Replacement of Oak Woodlands shall be required for removal of over ~~five~~ ten percent and up to ~~nine~~ 70 percent total oak canopy cover, excepting as provided in XX-10(A)(2).

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C. Significant impact, additional analysis required. The total removal of oak canopy shall not exceed ~~70~~ 10 percent of the oak canopy on the project site, nor shall it result in canopy cover of less than [the county should determine a figure that is a threshold] percent, excepting as provided in Section XX-10(A)(2). (See section XX-17 Alternative Project and Design).

~~XX-11~~ XX-II Oak Woodland Replacement. The replacement of oak woodlands shall take place within Butte

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County. Replacement trees shall be of a similar species mix, density, and viability as would be found in a naturally occurring and healthy oak woodland. Priority replacement shall be of the type found on the project site. The project shall include one or a combination of the following measures for the equivalent oak canopy area removed at the replacement ratio specified in XX-12 to the satisfaction of the Zoning Administrator:

~~A.~~ a. Conservation Easement: Proof of executing a conservation easement for the equivalent canopy area removed.

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~~B.~~ b. Payment to mitigation bank: Proof of payment for replacement of equivalent canopy area within a mitigation bank.

~~C.~~ c. Payment to accredited Land Trust: Proof of payment for replacement of equivalent canopy area to an accredited land trust

~~D.~~ d. Payment to the State Oak Woodlands Conservation Fund. A payment may be made to the State Oak Woodlands Conservation Fund in-lieu of replacement through one or a combination of the following subsections. Funds from this program are to be spent on oak woodland conservation within Butte County. The calculation of the fee is subject to review and acceptance by the Department of Development Services. Proof of payment shall be provided within six months of the Department acceptance of the payment amount calculation.

1.i. For the removal of up to 100 trees. The calculation of the payment shall be submitted to the Department of Development Services by an International Society of Arboriculture (ISA) certified Arborist with experience in valuing oak trees. Valuation shall be consistent with the ISA standards for valuing trees of different sizes. [What are the provisions for the removal of a greater number of trees?]

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2.ii. Calculate the value of the land of the area where the trees are proposed for removal. Use a qualified property appraiser who has met the educational requirements for General Certification pursuant to the Appraisal Qualifications Board of the Appraisal Foundation and who holds a designation from a recognized professional appraisal organization. The appraiser should be familiar with oak woodland land valuation and should follow best practice guidelines.

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e. On-site replanting does not count toward replacement. Replanting within a conservation easement, mitigation bank or land trust does qualify for replacement.

E. [Santa Barbara County on-site replacement is given priority, yet their ordinance includes agricultural land, so on-site replacement may be more viable in that context. (See language in the attachment sent by CWF/California Oaks on July 26.) For more information contact; Alex Tuttle, Supervising Planner Development Review, 805-568-2000, [atuttle@countyofsb.org](mailto:atuttle@countyofsb.org); Alex has worked on the oak tree ordinance.]

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**XX-12** XX-12 Replacement Ratio

A.f. A 1:1 [California Oaks suggests that local representatives can best suggest replacement ratios] replacement ratio shall apply to the removal of more than 10% and up to 50% of the total oak canopy.

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B.g. A 2:1 replacement ratio shall apply to removal that exceeds 50% and up to 70% of the total oak canopy. The 2:1 replacement ratio shall only apply to the portion of the removal that exceeds 50%.

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C.h. Under XX-10(C), removal of ~~greater than~~ 71% of oak canopy is required to be addressed under XX-17 Alternative Project and Design.

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(Concept for graphic showing the percentage of removal and triggers in ordinance)

	10%	20%	30%	40%	50%	60%	8% 9% 70%	80%	90%	100%	
Replacement	None	<u>1:1</u> Replacement Ratio				2:1 Replacement Ratio		See Section XX-17			
Percent Range	0-10%	1.0-1% to 50%				50.1% to 70%		70.1% to 100%			

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**XX-13** XX-13 Equivalent Canopy Area Replacement Standards. Canopy replacement refers to planting activities as part of mitigations for project impacts on oak woodlands. For replacement planting offsite, the calculation of replacement area for oak woodlands canopy removed is one or a

combination of the following: California Oaks suggests that local representatives can best suggest appropriate sapling, tree, and acorn metrics.

~~A.~~ Replacement Trees. 200 trees (saplings one-gallon or greater) per acre of woodland canopy removed.

~~B.~~ Replacement Acorns. 600 acorns per acre of oak woodland canopy removed.

~~XX-14~~ XX-14 Temporary Impacts. Construction or similar temporary activities can result in temporary impacts to oak woodlands. The Department of Development Services shall prepare and maintain a manual, referred to as the "Oak Woodlands Technical Manual", which shall contain the standard practices for temporary impacts on oak woodlands.

~~XX-15~~ XX-15 Monitoring of Approved Projects. Staff time for monitoring of the compliance with this ordinance shall be the hourly rate under the Board of Supervisors adopted fee schedule for the Planning Division.

~~XX-16~~ XX-16 Premature Removal: If the decision making authority has evidence and concludes that trees were removed prior to development application approvals, then the requirements of this ordinance shall be applied for those trees that were removed prior to approval of the development application. The decision-making authority may also require a penalty of replacement trees of up to 10 to 1 in addition to the ratios outlined in section XX-12. The removal of oak trees up to five years prior to filing the development application is considered premature. In determining the amount of the penalty, the decision-making authority shall consider the following factors:

- ~~A.~~ The seriousness and scope of the premature removal of oak trees;
- ~~B.~~A. The relationship to project site design;
- ~~C.~~B. The impact of the premature removal of oak trees on the community;
- ~~D.~~C. Whether the property owner or applicant has previously been found responsible for premature removal of oak trees; and
- ~~E.~~D. Any other factors.

~~XX-17~~ XX-17 Alternate Project Design and Review. Projects that do not meet the requirements of this ordinance, except Section XX-16 Premature Removal, may seek propose an alternate approach. Any alternate project proposal shall include standard methods of evaluation, impact identification and mitigation strategies. The applicant shall provide a plan for review that proposes equivalent or better mitigation than this ordinance would otherwise provide. The decision-making authority may consider the proposed alternate methods in its environmental determination and in its decision to approve, deny or modify the project.

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**Butte County**  
**Oak Woodlands Technical Manual**  
**Draft**



**July 2018**

**Department of Development Services**

# **Oak Woodlands Technical Manual**

-This manual is organized as follows-

**Introduction**

**Before Your Project**

**After Project Approval**

**Site Construction**

# Contents

## 1. Introduction

- 1.1. Goals
- 1.2. Definitions
- 1.3. Applicability
- 1.4. Exemptions
- 1.5. Flow Chart

## 2. Before Your Project

- 2.1. Premature Removal of Trees
- 2.2. Contacting an Expert
- 2.3. Oak Woodlands Evaluation Plan
  - 2.3.1. Site plan
  - 2.3.2. Description
  - 2.3.3. Canopy cover
  - 2.3.4. Oak woodland to remain
  - 2.3.5. Fencing plan
  - 2.3.6. Proposed replacement
- 2.4. Critical Root Zone
- 2.5. Compaction
- 2.6. Erosion Control
- 2.7. Verification of Tree Protections
- 2.8. Pre-Construction Meeting

## 3. After Project Approval

- 3.1. Approved Conditions
  - 3.1.1. Conservation easement
  - 3.1.2. Payments to mitigation banks
  - 3.1.3. Payment to land trust
  - 3.1.4. Payment to State Oak Woodlands Conservation Fund
  - 3.1.5. On-site replanting
- 3.2. Follow-Up Management

## 4. Site Construction

- 4.1. Tunneling and Drilling
  - 4.1.1. Root cutting
- 4.2. Grading
- 4.3. Irrigation
- 4.4. Dust control

# Section 1

## Introduction

### 1.1 Goals

Butte County has prepared this Oak Woodlands Technical Manual as a companion document to the Oak Woodlands Mitigation Ordinance. The intent of this guide is to give clear instruction to applicants, property owners, builders, arborists and foresters who are managing discretionary projects in oak woodland habitat areas.

The Oak Woodlands Technical Manual is a separate document maintained by Butte County Department of Development Services which is intended to establish specific technical regulations, standards and specifications necessary to implement the Ordinance.

#### Goals of this Manual

- Outline and implement the requirements of the Butte County Oak Woodlands Mitigation Ordinance.
  
- Specifically detail construction and environmental mitigation requirements related to discretionary projects impacting oak woodlands.

### 1.2 Definitions

**Caliper:** An instrument for measuring the distance between two opposite sides of an object. Calipers are commonly used to measure tree diameters.

**Canopy Cover:** The area directly under the live branches of oak trees.

**Conservation Easement:** a legal agreement a property owner makes to restrict the type and amount of development that may take place on his or her property.

**Critical Root Zone (CRZ):** A circle on the ground around a tree that generally corresponds to the drip line of the tree. An equation is used to determine the CRZ of a tree. The CRZ is especially sensitive to construction impacts such as compaction. Disturbance within the CRZ has potential to severely damage or kill oak trees and woodlands.

**Crown:** The totality of a plants above ground parts, including stems. Leaves, and reproductive parts.

**Decision-Making Authority:** The public hearing authority to make a decision on a discretionary project. This includes the Zoning Administrator, Planning Commission or Board of Supervisors.

**Defensible Space:** The buffer, generally 100 feet, around an existing structure, or to the property line, whichever is closer or as otherwise provided by CAL FIRE or other fire agency. Defensible space is intended to reduce the danger of fires.

**Diameter at Breast Height (DBH):** The diameter of the perimeter tree trunk at 54 inches (4.5feet) above natural grade level.

**Diameter Tape:** Measuring tape used to estimate the diameter of a tree or other cylindrical object.

**Discretionary Project:** A project which requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity.

**Drilling:** A method of tunneling under the sensitive roots of trees through the use of specialized drilling equipment.

**Disturbance:** All of the various activities from construction or development that damage trees.

**Drip Line:** The area directly below the branches of a tree, typically represented as a circle on the ground. It represents the location of water dripping off the end of the tree's foliage.

**Foliage:** The aggregate of leaves of one or more plants.

**Hazardous Tree:** a tree that possesses a structural defect which poses an imminent risk if the tree or part of the tree that would fall on someone or something of value. Structural defect means any structural weakness or deformity of a tree or its parts.

**International Society of Arboriculture:** Arborist collective and professional certification organization.

**Land Trust:** A private, nonprofit organization that, as all or part of its mission, actively works to conserve land by undertaking or assisting in land or conservation easement acquisitions, or by its stewardship of such land easement.

**Mitigation Banking:** The restoration, creation, enhancement, or preservation of a wetland, stream, or other habitat area undertaken expressly for the purpose of compensating for unavoidable resource losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial.

**Natural Community Conservation Plan:** A plan that is required by the Natural Community Conservation Plan act. It identifies and provides for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity.

**Oak Tree:** means a native tree species in the genus Quercus, not designated as Group A or Group B commercial species pursuant to regulations adopted by the State Board of Forestry and Fire Protection pursuant to Section 4526, and that is 5 inches or more in diameter at breast height..

**Oak Woodland:** For the purposes of this technical manual and the corresponding ordinance, an oak woodland is considered to be any area or group of trees that contain any oak tree or trees.

**Oak Woodland Corridors:** Strips of habitat that connect larger patches of oak woodland and have a high ecological value. For the purposes of this manual, the term “connections” is used interchangeably with “corridors”.

**□ Oak Woodland Condition.** A description of the condition of oak woodland prepared by a qualified professional based on a variety of factors. Methodology to determine this includes but is not limited to the University of California Oak Woodland Impact Decision Matrix. [{The attached tool, Oak Habitat Metric Calculator, developed in Oregon may be helpful.}](#)

Oak Woodland Condition is further defined as follows:

1. **Oak Woodland Condition, Intact:** In this condition roads and buildings are rare across the site. Trees, both dead and alive, dominate the landscape and the site is capable of natural regeneration of oaks and other plant species. The site allows for movement of wildlife and the existing development is localized and limited to a small number of residences with service buildings or barns. The site is relatively undisturbed and is recognized as Intact. Examples of an Intact woodland may include large to moderately (even relatively small parcels may qualify) sized private ranches; expansive oak woodlands zoned for agriculture, open space, scenic corridors, etc.
2. **Oak Woodland Condition, Moderately Degraded:** The site has been changed in one or more ways that has reduced its potential for providing ecological and socially important services. For example, it may have been partially developed resulting in the net loss of trees; the canopy or understory may have been reduced or eliminated over all or part of the site; past grazing or soil disturbance may have impaired regeneration in some areas.
3. **Oak Woodland Condition, Severely Degraded:** Site has been dramatically altered and is currently in a condition that has no trees or very few remain; it is being managed in such a way that natural regeneration is not possible or practical; the soil is compacted or contaminated; and/or has been used for residential, commercial or industrial purposes. Roads and stream crossings are commonplace and fencing and other obstructions limit wildlife access and movement.

**Oak Woodlands Evaluation Plan:** A plan prepared by a qualified professional that assesses the health of Oak Woodlands on and near a project site. The Oak Woodland Evaluation Plan shall include but not be limited to the site location and plan, a description of the oak woodland, a measure of total oak canopy, an indication of any oak woodland connections, a fencing plan and any proposed mitigations.

**Oak Woodland Conservation Fund:** A fund, established by the Oak Woodland Conservation Program that holds and distributes funds paid as mitigation by development projects.

**Oak Woodlands Technical Manual:** This manual. The Oak Woodland Technical Manual is a companion document to the Butte County Oak Woodland Mitigation Ordinance that outlines the process of managing construction projects on oak woodlands in detail and implementing other portions of the Ordinance.

**Premature Removal:** The removal of oaks prior to development application for the purpose of avoiding regulation, which may be subject to penalties. The removal of trees up to five years prior to filing the development application is considered premature.

**Project Site:** A parcel or parcels of land on which a land development project is proposed.

**Prune:** The selective removal of parts of a plant such as branches, buds, or roots.

**Qualified Professional:** A qualified professional is either:

1. **Certified Arborist** is a person certified by the International Society of Arboriculture (ISA), American Society of Consulting Arborists (ASCA), or other recognized professional organization of arborists that provides professional advice and licenses professionals to do physical work on trees.
2. **Registered Professional Forester (RPF)** is a person licensed by the State of California to perform professional services that require the application of forestry principles and techniques to the management of forested landscapes. RPFs have an understanding of forest growth, development, and regeneration; forest health; wildfire; soils, geology, and hydrology; wildlife and fisheries biology, and other forest resources.

**Removal:** Complete tree removal such as cutting to the ground or the extraction of the tree, taking any action foreseeably leading to the death of a tree or permanent damage to its health or structural integrity, including but not limited to excessive pruning, cutting, girdling, poisoning, over watering, unauthorized relocation or transportation of a tree, or trenching, excavation, altering the grade or paving within the drip line of a tree.

**Soil Compaction:** The compression of soil particles that may result from the movement of heavy machinery and trucks, storage of construction materials, structures, paving, etc. Soil compaction within the Critical Root Zone can result in atrophy of roots and the potential death of the tree. Damage from root compaction can manifest years after construction activities take place.

**Specimen Tree:** Any tree that is selected for outstanding qualities, such as age, size, or beauty.

**Trenching:** Any excavation to provide irrigation, install foundations, utility lines, services, pipe, drainage, or other property improvements below grade. Trenching within the Critical Root Zone (CRZ) damages roots and tree health. Trenching within the CRZ is prohibited unless approved. Approved trenching within the CRZ must be done in compliance with the recommendations made in this manual.

## **1.3 Applicability**

Be sure to review your project for applicability before you start. You may find that the provisions of the Oak Woodland Mitigation Ordinance and Technical Manual do not apply to your project. The Ordinance

applies to discretionary projects that result in the removal of oak trees or oak woodlands including disturbance to the Critical Root Zone (CRZ). See the Ordinance for additional information on applicability.

## **1.4 Exemptions**

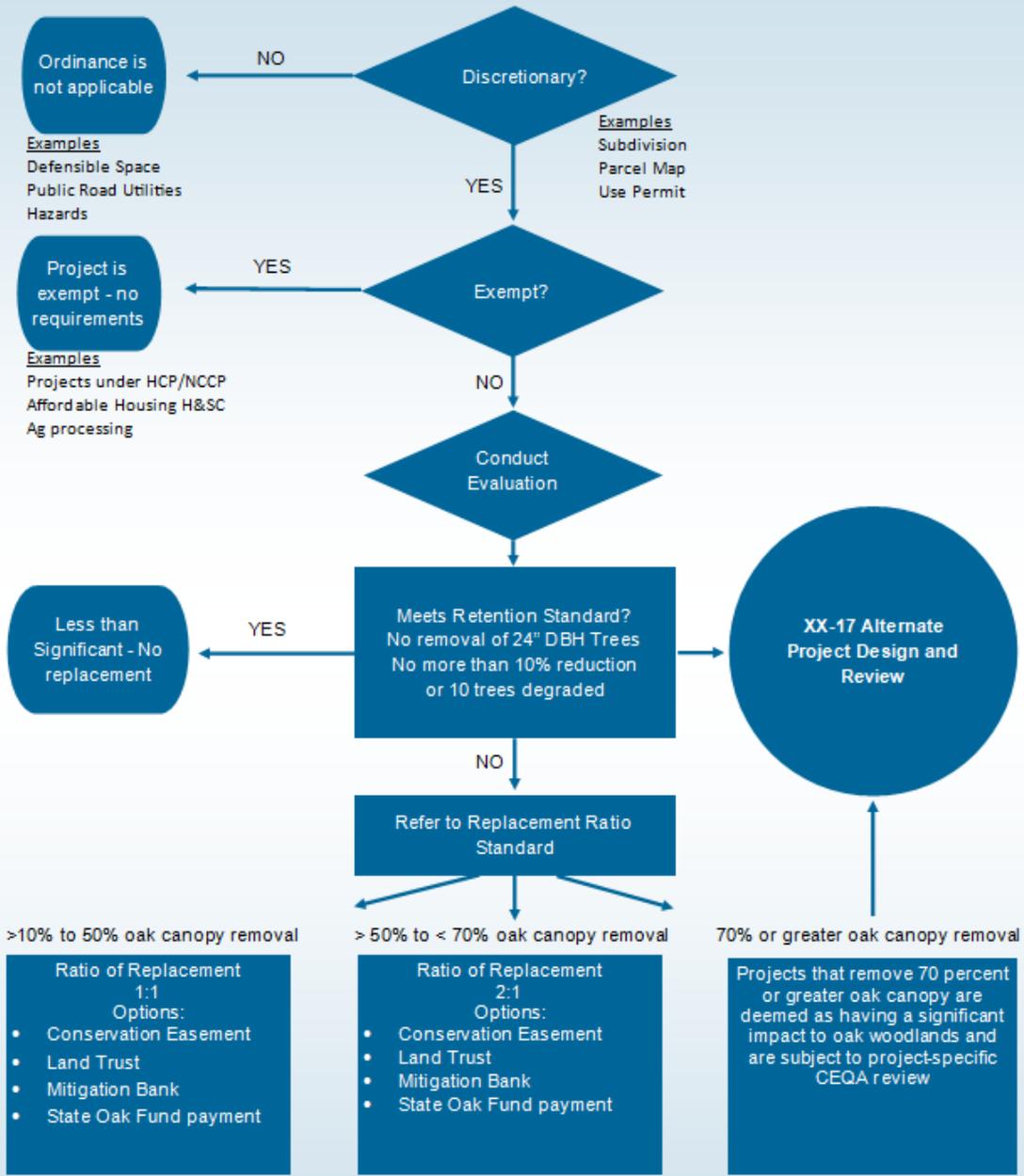
Your project may be exempt from the requirements of the Oak Woodland Ordinance and the provisions of this manual. Take a moment to review the possible exemptions. The following types of actions are exempt from this ordinance:

- ❑ Projects undertaken pursuant to an approved Natural Community Conservation Plan or approved subarea plan within an approved Natural Community Conservation Plan that includes oaks as a covered species or that conserves oak habitat through natural community conservation preserve designation and implementation and mitigation measures that are consistent with Public Resource Code, Section 21083.4.
- ❑ Affordable housing projects for lower income households, as defined pursuant to Section 50079.5 of the Health and Safety Code, that are located within an urbanized area, or within a sphere of influence as defined pursuant to Section 56076 of the Government Code.
- ❑ Conversion of oak woodlands on agricultural land, with a zoning designation of Agriculture (AG) or Agriculture Services (AS), that includes land that is used to produce or process plant and animal products for commercial purposes.
- ❑ Projects undertaken pursuant to Section 21080.5 of the Public Resources Code as a State Secretary of Resources Agency certified regulatory program.

## **1.5 Flow Chart**

Use this flow chart to help figure out where you are in the process of your oak-related discretionary project.

## Butte County Draft Oak Woodland Mitigation Ordinance Flow Chart



### On-site/off-site replanting replacement standards

Replacement Density: 200 trees (saplings or one-gallon) per acre density  
Acorn conversion: 3 acorns per 1 replacement tree = 600 acorns per acre density

## Section 2

### Before Your Project

Review the provisions in this section to plan your construction activities carefully. Thorough planning can reduce the likelihood of damaging the health of oaks and oak woodlands during construction.

#### **2.1 Premature Removal of Trees**

If sufficient evidence exists that oaks were removed prior to development application approval, a penalty may be applied to the responsible party. If a premature removal is determined to have happened, the requirements of the Butte County Oak Woodlands Mitigation Ordinance shall be applied for those trees that were removed prior to development application approval. The decision-making authority may also choose to implement a replacement tree penalty of up to 10:1 in addition to the ratios outlined in the Oak Woodland Ordinance. The removal of trees up to five years prior to filing the development application shall be considered premature. In determining the penalty, the decision-making authority shall consider the following factors:

- The seriousness and scope of the premature removal of trees
- The relationship to project site design
- The impact of the removal on the health of the oak woodland habitat
- Any other factors deemed relevant

#### **2.2 Contacting an Expert**

An arborist or registered professional forester should be called in as a consultant to the construction site before any work is started. The qualified professional will recommend the removal of trees that are unlikely to survive construction activities, regardless of the scope of work. Your qualified professional will be your expert opinion and point of contact for any tree related construction activity, such as tree pruning, tree removal, root cutting, mitigation options and any other questions related to tree health. In general, the contractor is responsible for preventing trees from damage. It is the responsibility of the contractor to ensure that any person working on the project be aware of their impact on oaks or groups of oaks on the project site. The construction and maintenance staff must make the best effort to avoid unnecessary activities within the drip line of trees. Contact the Department regarding exceptions to this requirement.

#### **2.3 Oak Woodland Evaluation Plan**

An Oak Woodlands Evaluation Plan is required as part of your project application. The Oak Woodlands Evaluation Plan helps to gather and present critical information about the status of an oak woodland. The Evaluation Plan should be prepared with coordination from a qualified professional. This plan is necessary to determine the extent of any impact to oak woodlands in the project area as well as to put

protections in place and plan for environmental mitigations. The plan will be reviewed and approved by the Butte County Zoning Administrator. An Oak Woodlands Evaluation Plan must include the following elements:

- 2.3.1 -- Site location and site plan
- 2.3.2 -- Description of oak woodland [{The attached tool, Oak Habitat Metric Calculator, developed in Oregon may be helpful.}](#)
- 2.3.3 -- Measure of total oak canopy area
- 2.3.4 -- Oak woodlands to remain
- 2.3.5 -- Fencing plan
- 2.3.6 -- Proposed replacement

### **2.3.1. Site location and site plan**

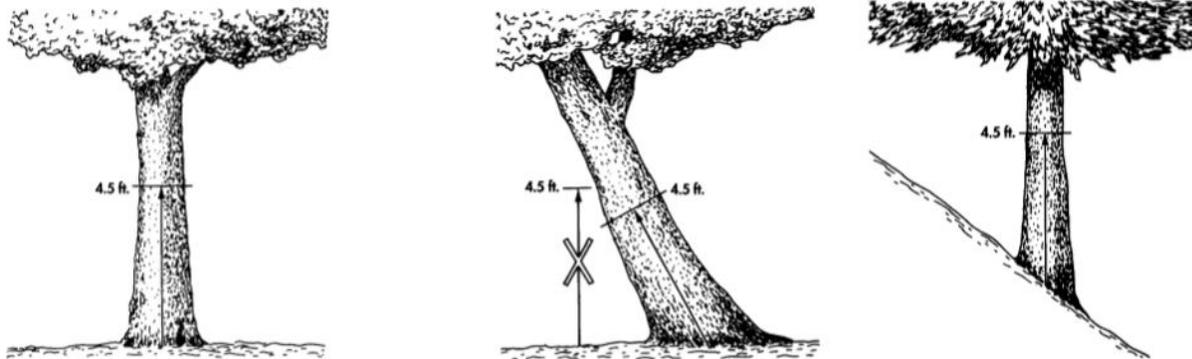
- The site location should indicate the address or parcel number of the project site, as well as total acreage.
- Site plans should show the project area and indicate where trees, vegetation and soils are going to be disturbed during the construction and operational phases of the project. This includes trees on adjacent properties that would be impacted by construction or operational activities.
- Trees or groups of trees in the disturbed area must have their locations, botanical name, Diameter at Breast Height and Critical Root Zone (see section 2.4) clearly indicated.
- Site plans should show where oak trees with a DBH of 5" or greater are going to be disturbed or removed by construction/operation of the project site.

### **2.3.2 Description of oak woodland**

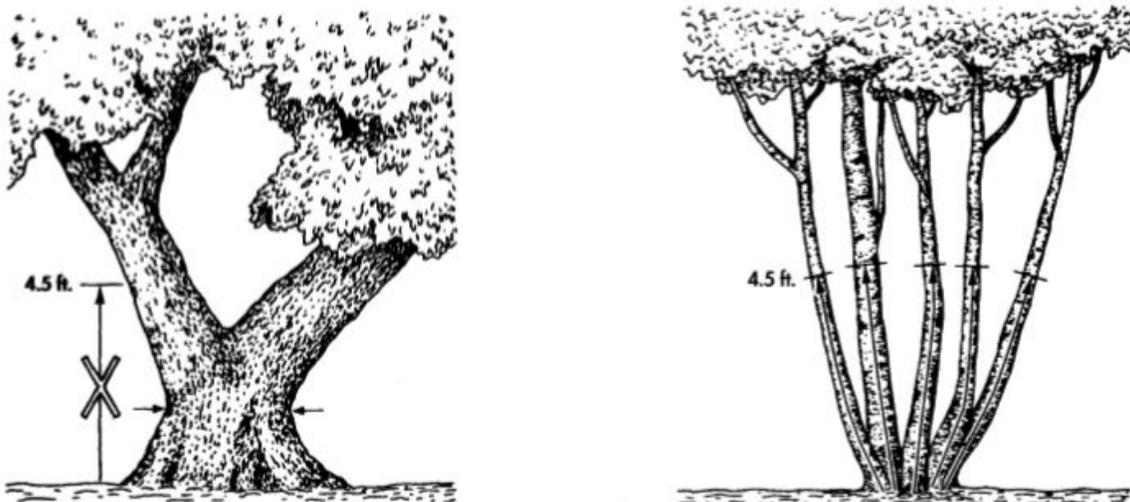
- A description of representative samples of the species and sizes of all oaks larger than 5" DBH on the project site.
- An evaluation of the health and structural stability of the woodlands on the project site and an assessment of their ability to provide long-term benefits after construction.
- Diameter at Breast Height should be recorded to the nearest inch. Trees may be measured with a caliper, cruise stick, standard tape measure or diameter tape.

### Illustration 2-1: DBH measurement areas

From: *Guide for Plant Appraisals, 9th ed.*



- ❑ **Trunk branching lower than 4 ½' from the ground:** When branching begins less than four and a half (4.5) feet from the ground, measure the smallest circumference below the lowest branch. In this example, an alternative would be to add the sum of the cross-sectional areas of the two stems measured about 12 inches above the crotch. Then average the sum of these two branch areas and the smallest cross-sectional area below the branches. This may give a better estimate of the tree size. See illustration below.
- ❑ **Multi-stemmed tree:** To determine the diameter of a multi-trunk tree, measure all the trunks; add the total diameter of the largest trunk to one-half (1/2) the diameter of each additional trunk. A multi-trunked tree is differentiated from individual trees growing from a common root stock if there is a visible connection between the trunks above ground. See illustration below.



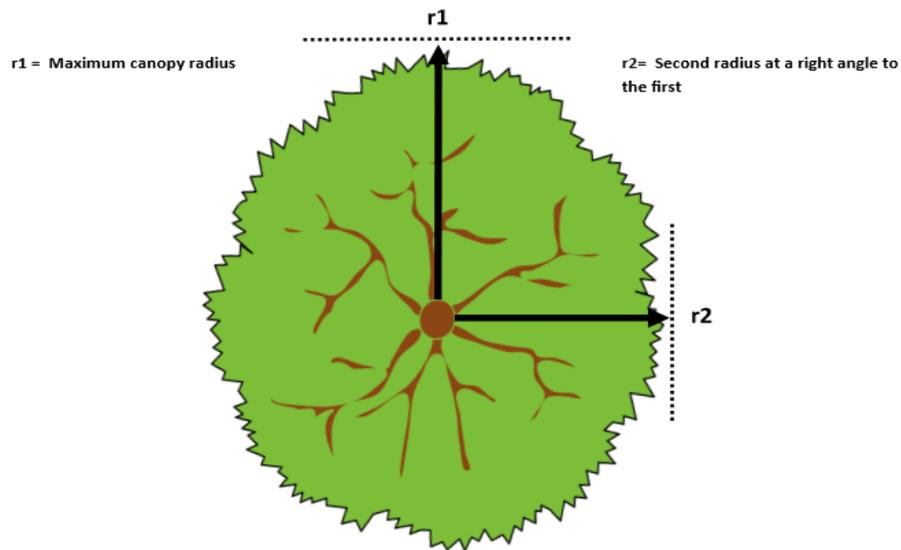
### 2.3.3 Measure of total oak canopy area

Oak canopies shall be measured using the International Society of Arboriculture recommendations. Canopy cover can be measured directly, through photogrammetry (measurement from aerial photographs or digitized aerial images), ground surveys, or a method approved by a qualified professional and accepted by the Department of Development Services. Your project's qualified expert can exercise his or her discretion when determining the appropriate method of canopy measurement.

- ❑ **Individual Tree method:** Canopy cover provided by individual trees can be estimated by measuring the maximum canopy radius and a second radius at a right angle to the first. Canopy area can then be calculated using the formula for the area of an ellipse, i.e.,

$$\text{Area} = \pi * r1 * r2$$

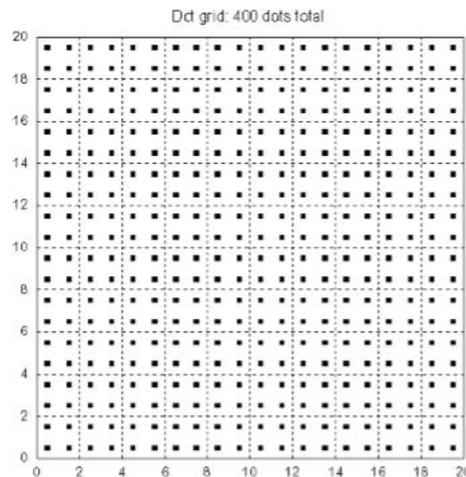
Where  $\pi=3.14159$ , and  $r1$  and  $r2$  are the two radii (i.e., half the diameters). If tree canopies are symmetrical, a single diameter can be measured and the formula for the area of a circle ( $\pi*r*r$ ) is used. The total area covered by tree canopy can be divided by the area of the site to obtain percent canopy cover. This methodology works best for areas with non-overlapping tree canopies, such as parking lots or other relatively open areas.



Calculating Individual Tree Canopy Cover		Inches to feet conversion table	
1. Measure the maximum canopy radius in feet		1"	0.0833 ft.
2. Measure a second radius at a right angle to the first in feet		2"	0.1667 ft.
3. Canopy area can then be calculated using the formula for the area of an ellipse = $\pi \times r1 \times r2$		3"	0.2500 ft.
For Example, if (r1) is 20 feet and 8 inches and (r2) is 18 feet and 4 inches, then:		4"	0.3333 ft.
3.14 $\times$ 20.6667 $\times$ 18.3333 = 1,189 square feet (remove decimal numbers but round appropriately)		5"	0.4167 ft.
Example Workspace...		6"	0.5000 ft.
1. r1 = _____ ft.		7"	0.5833 ft.
2. r2 = _____ ft.		8"	0.6667 ft.
3. 3.14 $\times$ r1 _____ $\times$ r2 _____ = _____ square feet (remove decimal numbers but round appropriately)		9"	0.7500 ft.
		10"	0.8333 ft.
		11"	0.9167 ft.

- Dot grid method:** A dot grid is simply a set of dots, symbols, or intersecting grid lines that is superimposed over an image. Tree canopy cover is estimated by counting the number of dots that fall on tree crowns compared with the total number of dots in the area sampled. Tree canopy cover can then be calculated from the following formula:

$$\% \text{ canopy cover} = 100 \times (\text{dots falling on tree canopy} / \text{total number of dots within sampled area})$$



### 2.3.4 Oak woodlands to remain

The project shall be designed such that the oak woodlands that are to remain are of intact condition; along waterways and/or wildlife corridors including deer migration corridors; are connected with oak woodlands on adjacent lands including public lands; and, other factors determined by the Department of Development Services. A qualified professional shall determine and label the presence of any woodland corridors that connect larger oak woodlands to each other. Corridors of oak woodland are important to animals moving from woodland to woodland and for the overall health of the oak woodland habitat. The removal of Oak Woodland Corridors negatively impacts overall woodland health in Butte County and impairs the movement of many species that rely on woodland habitat. The project shall be designed such that the oak woodlands that are to remain are:

- of intact condition, as described in the UC Integrated Hardwood Range Management Programs' 2008 Oak Woodland Decision Matrix
- along waterways and/or wildlife corridors including deer migration corridors
- are connected with oak woodlands on adjacent lands including public lands
- other factors determined by the Department of Development Services

### 2.3.5 Fencing plan

A protective fence or brightly colored staked boundary will be placed 5 feet beyond the established CRZ of the tree or group of trees being protected. A warning sign shall be prominently displayed on each fence. The Sign should be a minimum of 16 x 24 inches, brightly colored and be clearly visible, even from vehicles. The sign must clearly indicate that the CRZ is a restricted area. Orange safety triangles may suffice if other signage cannot be constructed. The fencing of protected trees or groups of trees helps achieve several important goals:

- ❑ Keep foliage, branches and crown clear from contact with equipment, materials and activities.
- ❑ Preserve roots and soil conditions in an intact and non-compacted state
- ❑ Visually identify the Critical Root Zone (CRZ) in which no soil disturbance is permitted and activities are restricted, unless otherwise approved

High visibility plastic mesh fence is recommended to maximize the visibility of protected tree areas. Wire with bright-colored flags placed at equal intervals can also be a suitable barrier so long as it maintains high visibility. Tree fencing shall be erected before any demolition, grading or other construction begins and shall remain in place until the final inspection by a qualified professional.

#### **Illustration 2-2: Example of protective fencing**

*From: "conserving Wooded Areas in Developing Communities"*



### 2.3.6 Proposed Replacement

Clearly list your proposed mitigations for the project. This section should have mitigations proposed at the set county rate. If an alternative mitigation is proposed than listed in this manual, it must be done so by a qualified professional. Any alternative mitigation proposals must be likely to preserve as much or more total canopy area, within Butte County, as the mitigation strategies listed in this manual. All mitigation proposals and alternative mitigation proposals are subject to approval by the County.

**REMOVAL & REPLACEMENT RATIOS** [\[See feedback provided on the ordinance.\]](#)

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Replacement	None	1:1 Replacement Ratio				2:1 Replacement Ratio		See Section XX-17		
Percent Range	0-10%	10.1% to 50%				50.1% to 70%		70.1% to 100%		

*(Refer to Ordinance for specific requirements and limitations, for example, 24" DBH trees.)*

### 2.4 Critical Root Zone

Each tree or group of trees in an oak woodland shall have a designated Critical Root Zone (CRZ) identifying an area sufficiently large enough to protect the trees and roots from disturbance. The CRZ is a radius equal in feet to the number of inches of a tree’s trunk diameter at Breast Height (DBH), with a minimum of 8 feet. The CRZ shall be shown on all tree surveys, tree protection plans, tree replacement plans, and construction plans. Improvements or activities such as paving, utility and irrigation trenching and other activities shall occur outside the CRZ, unless authorized by a qualified professional or administrator. Unless otherwise specified, protective fencing shall be placed 5 feet beyond the CRZ. Fencing may be placed closer to a tree or group of trees at the discretion of a qualified professional.

#### Restricted Activities within the CRZ

- Grade changes within the CRZ are not permitted
- Drainage changes within the CRZ are not permitted
- The severing of roots over 2” in diameter must be done only with approval from a qualified professional
- heavy equipment use, vehicular traffic, parking of vehicles
- The use of tree trunks as winch support, anchorage, as a temporary power pole, sign post or other similar function
- Storage or dumping of construction materials, waste or tools is not permitted within the CRZ
- Cutting of tree roots by utility trenching, foundation digging, placement of curbs or trenches and other miscellaneous excavation is not permitted unless approved by a qualified professional.

- ❑ Dumping of poisonous materials such as paint, petroleum, concrete, stucco, dirty water, or any other material that can affect the health of the tree or trees.

### **Required or permitted Activities within the CRZ**

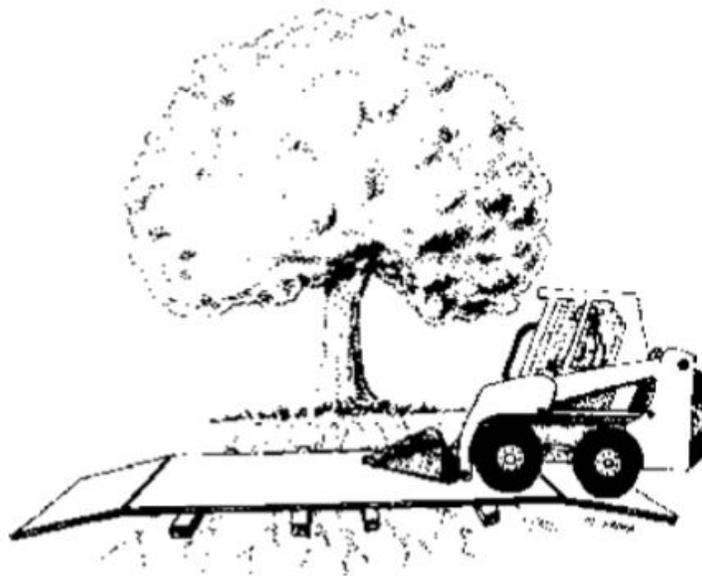
- ❑ Spread mulch, 4-6" in depth, in the CRZ, leaving the trunk clear of mulch. The application of mulch helps reduce inadvertent compaction and moisture loss from occurring. Mulch material should be 2", untreated wood chip mulch or an approved equal. Mulching should only be applied to trees or groups of trees directly adjacent to construction activities.

## **2.5 Compaction**

Compaction of soil around tree roots can impair tree development by restricting drainage and inhibiting new root growth. Damage from soil compaction can manifest years after construction activities take place. Avoid driving vehicles over the CRZ and drip line of trees. If driving over these areas is unavoidable, deflate tires slightly to redistribute the weight over a larger area. If several crossings are required, place up to 6" of mulch over the CRZ to prevent compaction. Plywood can also be used to construct a temporary crossing bridge that distributes vehicle weight over the CRZ. Consult with a qualified professional to determine the best mitigation for your project and to review your soil compaction mitigations before beginning construction.

### **Illustration 2-3: Example of plywood crossing bridge**

*From: Conserving Wooded Areas in Developing Communities*



## **2.6 Erosion Control**

If a tree or group of trees is adjacent to or in the immediate proximity to a grade slope of 8% (23 degrees) or more, then erosion control or silt barriers shall be installed outside the CRZ to prevent siltation and/or erosion within the CRZ. Erosion and sedimentation control barriers shall be installed or maintained in a manner which does not result in soil build-up within tree drip lines or CRZs.

## **2.7 Verification of Tree Protections**

The project contractor, consultant or manager will collaborate with a qualified professional to verify, in writing, that all pre-construction oak woodlands preservation conditions have been met as follows:

- Tree fencing installed on any trees or tree areas that are to be preserved
- Erosion control secured on trees or tree areas that are to be preserved
- Tree pruning completed if necessary
- Preventative measure for soil compaction have been installed
- Tree maintenance schedule established if needed

Written verification must be submitted to and approved by the Department of Development Services prior to the removal of oak trees.

## **2.8 Pre-Construction Meeting**

Contractors or employees who will be interacting with trees or operating within the CRZ must attend a pre-construction meeting with a qualified professional. The meeting is meant to ensure that all involved parties are aware of the tree protection measures and procedures that will be employed. The meeting will also review procedures, tree protections, hauling routes, staging areas and any other procedures deemed important by a qualified professional. The pre-construction meeting is an important step towards having a cohesive understanding of your impacts on oak woodlands and gives all parties an opportunity to interact with your qualified professional.

## Section 3

### After Project is Approval

#### 3.1 Approved Conditions

Butte County has several available options to mitigate for the removal or damage of oak woodlands. Your project qualified professional shall choose the mitigation option or combination of mitigation options that are most suitable for your project.

##### 3.1.1 Conservation easements

Conservation easements allow developers to set aside areas of land for preservation. Conserved lands become part of the chain of title for the property, with future buyers agreeing to uphold the easement. Proposed conservation easements may be on or off-site and should primarily conserve Intact oak woodland habitat. Conservation easements must conserve equivalent canopy area to that proposed for removal. Proposed conservation easements are subject to approval by DDS.

##### 3.1.2 Payment to mitigation bank

Mitigation banks preserve habitats and ecosystems which can offset adverse environmental impacts to similar nearby ecosystems. The intent of using a mitigation banks is to replace the exact function and value of specific habitats that would be adversely affected by a proposed activity or project. Mitigation banks sell “credits” that are representative of the ecological value associated with the conversion of certain ecosystem types. Purchasing mitigation credits from a mitigation bank can be a preferable option to some developers because it may be faster than other mitigation options.

- ❑ **Mitigation banks in Butte County with Oak Woodland Habitat**
  - ❑ **Restoration Resources Company:** Silvergate Mitigation bank, Porter Ranch Mitigation bank
    - ❑ Link: <http://www.restoration-resources.net/index.php>
    - ❑ Phone: 916-408-2990
    - ❑ Email: Email contact available on website

##### 3.1.3 Payment to an accredited land trust

A land trust is a charitable organization that acquires land or conservation easements, or that stewards land or easements, to achieve conservation purposes. Land trusts work with landowners to complete real estate transactions, purchasing property interests, or accepting the donation of property interests.

- ❑ **Land Trusts in Butte County with oak woodland habitat**
  - ❑ Northern California Regional Land Trust
    - ❑ Link: <http://landconservation.org/>
    - ❑ Phone: 530-894-7738
    - ❑ Email: [info@landconservation.org](mailto:info@landconservation.org)

### 3.1.4 Payment to State Oak Woodlands Conservation Fund

Payment to the State Oak Woodlands Conservation fund is an option in-lieu of replacement. An appraisal of the land value for the oak woodland canopy proposed for removal is required to identify the amount. Alternatively, for up to 100 trees, an in-lieu payment may be made to the State Oak Woodlands Conservation Fund. Money from this fund is used to conserve oak woodland habitat in Butte County. The calculation of payment shall be completed by a qualified professional and submitted to the Department of Development Services for acceptance. Oak woodlands valuation can also be done by consulting the International Society of Arboriculture standards for valuing trees of different sizes. Proof of payment shall be provided within six months of the Department acceptance of the payment amount calculation. Funds in the State Oak Woodlands Conservation Fund can only be used within Butte County.

### 3.1.5 On-site replanting

On-site replanting does not count toward replacement requirements under the Ordinance. Projects pursuing an alternative Project Review and Design, as described in XX-17 of the Butte County Oak Woodland Mitigation Ordinance, may consider on-site replanting as a form of mitigation. Your qualified professional shall consider the unique attributes of the property in question to assess its viability for replanting. Factors such as woodland density, woodland health, habitat viability, soil types, potential as habitat corridor connection, proximity to riparian areas and other environmental factors may apply to the assessment of viability for onsite replanting. The project qualified professional shall construct a replanting plan that adheres to the following requirements:

- Plant the prescribed number of trees, including maintaining plantings and replacing dead or diseased trees.
- Replacement trees shall be regularly monitored and maintained and shall survive for a period of 7 years, calculated from the day of planting.
- [\[See feedback provided in the ordinance text.\]:](#) 200 1 gallon replacement trees for every 1 acre of oak canopy removed or 600 acorns for every 1 acre of canopy removed ]
- Focus on planting in areas that create connections to other, nearby, oak woodlands and wildlife corridors or that create potential wildlife corridors

Any alternative mitigation strategies or project proposals are subject to staff recommendation and approval by the decision-making authority.

## **3.2 Follow-Up Management**

Depending on the scope of your project and your chosen mitigations, you may be required to monitor tree health and survivability. Follow-up actions may be required for projects that pursue alternative mitigation strategies. Mitigation strategies that use on-site replanting will require monitoring by a qualified professional.

# **Section 4**

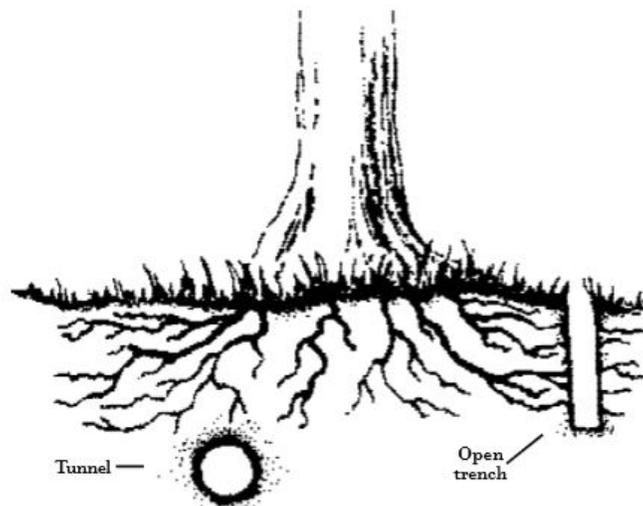
## **Site Construction**

### **4.1 Tunneling and Drilling**

Trenching, pipe or conduit installation within the CRZ must either be cut by hand, air spade, by mechanically boring a tunnel under the roots with a horizontal directional drill (hydraulic or pneumatic air excavation) or any other method approved by a qualified professional. Tunneling under a root system can greatly reduce damage to both the tree as well as minimizing the cost of replacing landscaping or other features. Tunneling may be restricted by sloped areas or rocky soils. Once piping has been installed, backfill with excavated soil and irrigate the disturbed area the same day. Consult with your qualified professional to determine an appropriate depth and distance when drilling or tunneling.

#### **Illustration 4-1: visualization of trench and tunnel**

*From: Conserving Wooded Area in Developing Communities*



### **4.1.1 Root cutting and pruning related to equipment use and excavation**

The cutting of tree roots may be necessary during construction. If root cutting is necessary, require clean cuts that are perpendicular to the direction of the root's growth. Backfill within an hour of cutting the roots. Water the tree within 24 hours of cutting the roots. A qualified professional may recommend other techniques to preserve damaged or cut roots. Damage to tree roots can have a significant impact on tree survivability. Keep the following restrictions in mind as you advance your project:

- Roots no greater than 2 inches in diameter may be cut without approval of a qualified professional or DDS representative. Your qualified expert must give approval for the cutting of larger roots.
- Excavation of any sort within the CRZ must be approved by a qualified professional.
- Excavation within the CRZ must be hand-digging, hydraulic or pneumatic.
- Heavy equipment use within the CRZ is only allowable if it is stationed outside of the CRZ or prior approval has been given by a qualified professional or the DDS.

## **4.2 Grading**

Grading can cause serious impacts to the health of individual trees and groups of trees. Keep the following restrictions in mind as you advance your project.

- Grade changes within the Critical Root Zone (CRZ) are not permitted.
- Grade changes outside of the CRZ must not significantly alter existing grade or drainage of the CRZ.
- Grade changes under specifically approved circumstances allow for no more than 4 inches of cut or fill within the CRZ and will incorporate appropriate mitigation. Mitigations may include but aren't limited to aeration systems, permeable surface for fill and retaining wall. Mitigations for grade changes may be recommended at the discretion of a qualified professional.

## **4.3 Irrigation**

During construction, irrigation is very important to the health of oak woodlands but must be carefully monitored. Irrigation should be administered to replace soil moisture lost due to site excavation. A tree should receive the amount of irrigation similar to its normal or natural allocation. Frequent light watering should be avoided. Naturally occurring oak woodlands are less likely to need changes to irrigation than "landscaped" trees. The removal of topsoil can cause moisture loss in trees. Be cautious and consult your qualified professional if topsoil is removed in or near the CRZ of trees on your project site. A qualified professional can help determine when watering is needed.

## **4.4 Dust Control**

Dust can reduce a tree's ability to photosynthesize and negatively impact its health. Spray tree trunks, limbs and foliage periodically to remove accumulated construction dust. You may need to spray for dust more or less frequently depending on the project. Consult your qualified professional to determine how frequently you should spray for dust.



## INFORMATION FROM SANTA BARBARA AND SAN LUIS OBISPO COUNTIES REGARDING OAK ORDINANCES

**Santa Barbara County:** Tree removal ordinance (Sections of possible interest are included.)

Also see: [https://qcode.us/codes/goleta/view.php?topic=15-15\\_09-appx\\_a\\_grading\\_ordinance\\_guidelines\\_for](https://qcode.us/codes/goleta/view.php?topic=15-15_09-appx_a_grading_ordinance_guidelines_for)

Where deciduous oak tree removal requires a permit under this ordinance, the following standards shall be adhered to:

1. The preparation and implementation of an Oak Tree Management Plan for the lot on which the oak tree removal will take place and any lot used for off-site replacement shall be required. The Management Plan shall be prepared or endorsed by the Oak Tree Specialist. The plan shall:

- a. Demonstrate how the mix of deciduous oak tree savannas, woodlands, and forests on the lot will be preserved, created, enhanced, restored, and maintained, so that:
  - (1) The removal of protected oak trees does not divide the remaining savanna, woodland, and forest habitats into small, isolated fragments.
  - (2) Protection, maintenance, restoration, and enhancement of large blocks of savanna, woodland, and forests are given priority over maintenance, restoration, and enhancement of smaller, more isolated habitat patches.
  - (3) Valley and blue oak trees that link on- or off-site oak tree savannas, woodlands, forests, or other existing, proximate habitats are retained to the maximum extent feasible.
  - (4) On-site replacement is given priority over off-site replacement except where no suitable on-site locations exist, or reasonable use of the lot would be precluded as determined by Planning and Development along with the Oak Tree Specialist. In such cases the replacement oak trees may be planted in an off-site location acceptable to the applicant, the landowner and the Oak Tree Specialist. For off-site replacement planting locations priority shall be given to nearby sites and to sites adjoining existing deciduous oak woodlands or providing links between deciduous oak woodlands.
  - (5) There is avoidance of removal of actively used granary trees, raptor roosting or nesting trees, and trees in riparian and other wildlife corridors.
- b. Comply with the following requirement, when applicable.
  - (1) When required by the Oak Tree Specialist on a case-by-case basis, a buffer area protecting the critical root zone shall be maintained around identified valley and blue oak trees retained on the lot.
- c. Identify valley and blue oak tree replanting, restoration, conservation and enhancement sites on a plan or aerial photograph to facilitate mitigation monitoring and tracking; and identify the species, location, and size of all oak trees that are planted or protected as mitigation or to fulfill a condition on the permit.
- d. Provide the deciduous oak tree replanting schedule and nurturing regime.

2. Protected oak trees that are removed shall be compensated at a 15:1 ratio by replacement planting, or protection of naturally occurring oak trees between six (6) inches and six (6) feet tall on the lot.
  3. Naturally occurring valley and blue oak seedlings/saplings, growing on the lot and between six (6) inches and six (6) feet in height that are protected and nurtured for five (5) years, may be counted as replacement (mitigation) trees under the Program.
  4. Any combination of acorns, planted seedlings/saplings, or naturally occurring valley and blue oaks between six (6) inches and six (6) feet tall, if established according to the requirements herein, may be used to achieve the required number of replacement trees.
  5. Replacement deciduous oak trees that are planted must come from nursery stock grown from locally-sourced acorns, or use acorns gathered locally, preferably from the same watershed in which they are planted. If planting is done using acorns, the ratio of acorns to protected oak trees removed shall be a minimum of forty-five (45) acorns for every protected valley oak tree removed. Up to three (3) acorns may be planted in the same hole.
  6. Replacement deciduous oak trees shall be established in a location suitable for their growth and survival as determined by the Oak Tree Specialist, no closer than twenty (20) feet from each other or from existing oak trees and no farther than 165-180 feet from each other or existing oak trees unless otherwise approved by the Oak Tree Specialist.
  7. Valley oaks shall replace valley oaks removed and blue oaks shall replace blue oaks removed.
  8. The replacement deciduous oak trees shall be nurtured for five (5) years, the last two without supplemental watering, using techniques consistent with the most current version of the University of California publication "How to Grow California Oaks." At the end of the five years, ten trees for every protected tree removed must be alive, in good health as determined by the Oak Tree Specialist, and capable of surviving without nurturing and protection.
  9. Each replacement deciduous oak tree must be protected against damaging ground disturbance, soil compaction, or over-irrigation within the dripline. It must be fenced to protect it from grazing or browsing by animals both below and above ground until it has reached a minimum of eight (8) feet in height.
  10. Where conditions warrant and where agreed to by the landowner and Oak Tree Specialist, tree planting designs and nurturing practices (e.g. protective structures, watering schedules) may be adjusted to improve the probability that replacement trees will be established successfully.
  11. Valley oak tree removal encompassing an area of five (5) acres or greater shall require valley oak replanting of an area of comparable size in accordance with the requirements of this section, in an area of existing or historic valley oak habitat.  
This area shall be protected in the long-term where feasible.
  12. For the purposes of this ordinance, all replacement trees are considered protected oak trees regardless of size.
- Contact:** Alex Tuttle, Supervising Planner Development Review, 805-568-2000, [atuttle@countyofsb.org](mailto:atuttle@countyofsb.org), for more information : *Alex has worked on the oak tree ordinance so any questions or concerns can be directed to him.*

**San Luis Obispo County** maintains a listing of qualified individuals to prepare Oak

Management Plans as part of the Oak Ordinance, which was enacted in 2017. See: <https://www.slocounty.ca.gov/Departments/Planning-Building/Long-Range-Planning/Services/Oak-Woodland-Ordinance.aspx> Contact Megan Martin at (805)781-4163 or [mamartin@co.slo.ca.us](mailto:mamartin@co.slo.ca.us) for more information. (She was a key staff person in developing the oak ordinance for the county.)