Oak Woodland Impact Decision Matrix

A Guide for Planner's to Determine Significant Impacts to Oaks
as Required by SB 1334.
(Public Resources Code 21083.4)

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Introduction

In 2004 the California Environmental Quality Act (CEQA) was amended with the passage of SB 1334, (Chapter 732, and Statutes of 2004). As amended, CEQA now requires a county to determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. According to the law (PRC 21083.4) if a county determines that a project will result in a significant effect to oak woodlands, the county shall require one or more oak woodland mitigation alternatives to mitigate for the significant effect associated with the conversion of oak woodlands.

In response to numerous inquiries from county planners, developers and concerned citizens on how to implement this new provision of CEQA, the University of California (UC) Integrated Hardwood Range Management Program (IHRMP) convened a working group comprised of the California Department of Fish and Game, the California Department of Forestry and Fire Protection and the Wildlife Conservation Board (WCB). The purpose of the working group was to develop information to assist county planners with the process of determining project significance including, what types of projects fall under the purview of the law, what constitutes a "significant impact," compliance standards, effective strategies to conserve oak woodlands and how to determine suitable, appropriate mitigation.

In addition to this report, tools such as a web-based decision key, PowerPoint presentations and visual comparison standards for assessing oak woodland impacts will be made available through the IHRMP web site. This represents an ongoing effort to assist county planners on how to protect and conserve critical oak woodland resources and comply with new regulations.

What Science Tells Us About County Conservation Planning

Given the variety of regional situations that face county planners, it is important to first consider broad, conceptual conservation goals and then develop applicable tools that allow the concepts to be visualized "on the ground." Forman and Collinge (1997) maintain that in order to conserve biological diversity conservation planning should be done before more than 40 percent of the natural vegetation is altered or removed from the landscape. Conservation planning grounded in science-based information allows for the development of sensitive planning scenarios that if initiated in the early stages of the development process can prevent environmental crises.

The Ecological Society of America (ESA) provides a basis for the conceptual approach to planning that should be included in conservation planning. In their Land Use Committee Guidelines for Land Use Planning and Management (Dale and others 2000) the ESA recommends;

1) Examine the impacts of local decisions in a regional context;
2) Plan for long-term change and unexpected events;
3) Preserve rare landscape elements and associated species;
4) Avoid land uses that deplete natural resources over a broad area;

5) Retain large contiguous or connected areas that contain critical habitats;
6) Minimize the introduction and spread of non-native species;
7) Avoid or compensate for effects of development on ecological processes; and
8) Implement land use and land management practices that are compatible with the natural potential of the area.

Furthermore, it is broadly recognized that a gap exists between conceptual planning designs and pragmatic implementation in the politically charged reality of county planning. Given this reality, it is important that scientifically valid approaches be included in the planning process. Also, well articulated decision-making tools need to be developed that specifically address the idiosyncrasies of oak woodlands. These tools must strive to incorporate the current conventional wisdom pervasive throughout the literature that identifies those elements or characteristics most important for maintaining the integrity of oak woodlands, i.e., old trees/forests, maintaining rare and representative habitats, riparian corridors, water quality and quantity, ecosystem functions and natural connectivity. Additionally, any planning tools should strive to assist planners in promoting compatible land uses to avoid or minimize habitat loss and fragmentation whenever possible.

All current projects should be viewed in context of past events.

In order to address the issue of "*significance*" there needs to be recognition that each project site has a peculiar history and situation. This history of site-specific land use practices may result in sites whose qualities span from relatively undisturbed sites to properties whose oak woodlands have been entirely altered.

We propose a decision matrix, described herein, that uses a process beginning with establishing a baseline site condition from which to initiate decision making process. It relies on the judgment of the resource professional and their ability to objectively determine is likely to have a significant impact.

What is a Woodland?

There are two very different approaches to address what appears to be a relatively straight-forward question.

- The first is to answer this question with a definition of oak woodland;
- The second is to use a *description* of oak woodland.

1. The first is a prescriptive, arbitrary standard or definition that is used to define a woodland, i.e., 10% canopy closure; trees of a certain diameter size class; number of trees per acre, etc.
2. The second option uses other qualitative standards such as soil type, or plant classifications that describe where different types of woodlands are expected to occur, i.e., valley oak woodland soil types. This approach can also be used to describe where woodlands are capable of occurring based on site attributes.

Both options have merit. A jurisdiction has the freedom to decide which option better suits its particular needs.

There are eight major oak species that are generally recognized to occur across California;

- **Blue oak**, **valley oak**, **Oregon white oak** and **Engelmann oak** are all deciduous and members of the white oak group.

- **Coast live oak**, **interior live oak**, and **canyon live oak** are three important evergreen oaks in the red oak group. **California black oak** is a deciduous oak in the red oak group.

Oaks can be found in a wide range of canopy densities depending on site characteristics and landscape characteristics (e.g. aspect, soil type, vegetation community type) as well as historical land use practices (e.g. burning, clearing). Small isolated stands (less than 1 acre) with lower than 10 percent cover are often not considered to be part of a woodland but rather represent remnant trees which can have ecological value but may not be part of a functioning woodland.

It is not unusual for woodlands to have both multiple oak species and other non-oak associates growing in close approximation including madrones, alders, maples, sycamores, and Douglas-fir.

For information on how to identify California's tree oaks, their biology, and the associated plants that are commonly found with them, please see http://danr.ucop.edu/ihrmp/oaks.html.

Step I: Getting Started—Establishing Site Condition

To use this matrix a planner must first establish the condition of the site (*for a review of the CEQA guidelines on establishing site condition see §15125 and §15126*). Site condition should evaluate either the oaks as individual trees, or the condition of the oaks as a component of a larger forest. Significance at both scales can then be determined based on the alterations being proposed and how these alterations might affect the ability of the site to continue providing the ecological goods and services currently in place.

By assessing past, present and future impacts on oak woodlands this matrix is designed to help address potential *Cumulative Impacts* as part of the assessment of significance. Significance criteria for cumulative impacts to biological resources may include:

- The cumulative contribution of other approved and proposed projects that lead to fragmentation of oak woodlands in the project vicinity.

- The net loss of sensitive habitats and species.

- Increased fragmentation of woodlands and loss of habitat connectivity.

- Contribution of the project to urban expansion into natural areas.

- The potential for the proposed project to increase run-off, nutrients and other pollutants into adjacent waterways.

- Isolation of open space within the proposed project by future projects in the vicinity.

To evaluate the quality and ecological condition of a site, we propose that a planner should ascertain if the site represents an oak woodland whose ecological functions are still relatively "intact," "moderately degraded," or "severely degraded." This relative comparison is intended to classify the current state of the site to what would be considered undisturbed oak woodland.

Intact?

The site is currently in a "wild state" being managed for grazing, open space, recreation, etc., where all of the ecological functions are still being provided, i.e., shade, ground water filtration, wildlife/fish habitat, nutrient cycling, wind/noise/dust abatement, carbon sequestration, etc. 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.

Some latitude is necessary to allow a site to be classified as ***Intact***. There are very few private lands in California that are entirely free from land use and ecological impacts. Virtually all oak woodland-grass communities are dominated by exotic grasses and forbs in the understory. Also, fire exclusion has affected the density and species composition of oak woodlands in many locations. The designation ***Intact*** refers mainly to being free from destructive land use practices that inhibit or limit the oak woodland to naturally sustain itself and its associated flora and fauna.

If a site is classified as ***Intact***, any proposed project that would substantially change its conditions may be determined to have significant impacts. That determination should be based on the findings of an impact assessment process; an example is described in the next section of this matrix.

Moderately Degraded?

In this case, the site has obviously been altered from a "wild" condition but is currently in a state where oak trees are present; natural regeneration is capable of occurring; limited ecological services are still being provided and the site still provides for utilization by wildlife. Roads and stream crossings are present but limited or clustered. Developed areas are centralized and concentrated over a small percentage of the site. The site is recognized as being ***Moderately Degraded***. Examples of ***Moderately Degraded*** oak woodlands may include some golf courses, large ranches that have been subdivided into

large parcels, oak woodland subdivisions that share "common grounds" of woodland acres.

A ***Moderately Degraded*** 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 or it may be a situation where "ranchettes" dot the landscape.

Severely Degraded?

Here a 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. This site should be considered ***Severely Degraded***.

> Some isolated rare oak trees, even though found in a severely degraded site, such as valley oak or Englemann oak may warrant special consideration based on their overall distribution within a county. These types of trees or small stands should be evaluated on the basis of regional occurrence and site potential for restoration. Additionally, some jurisdictions may have local statutes that provide additional protection to heritage trees.

Although a site in a severely degraded state may perform limited or no ecological or socially important functions, it may have potential for restoration or enhancement as part of a proposed development. That said, it should not simply be dismissed without considering possibilities for mitigating past damage. Restoring or improving the woodland on the site could provide benefits such as improving connectivity or patch size for locally important wildlife habitat.

Step II: Assessing Thresholds of Significance

The Guide to CEQA, 11th edition states: "In the absence of an impact necessarily deemed significant, the lead agency has discretion to adopt standards for determining whether an impact is significant. In recent years interest has focused on encouraging agencies to develop standardized "thresholds of significance", rather than to continue making ad hoc determinations in the context of particular projects…" See CEQA Guidelines § 15064.7 for more on establishing thresholds.

As with the determination of existing conditions, the evaluation of potential impacts of a project should be considered at three scales: (1) landscape, (2) site and (3) individual trees or groves. A project may have significant impacts at one scale but not at another. Or, in some cases, it may have significant impacts at all scales. For example, a project in an oak woodland deemed ***Intact*** that results in the removal of some trees but retention of other woodland qualities such as species composition and canopy cover may only have

significant impacts at the tree scale. Another project that creates a barrier, such as a road that interrupts wildlife migrations, may have significant impacts at the landscape scale even if few trees are removed.

The determination of significance in an impact assessment is by no means simple. Any assessment should consider and address more than simply the impacts to the trees; the planner should consider the potential impacts to the other tangible aspects of the woodland.

Many jurisdictions have arbitrarily established thresholds of significance to aid in the determination process. The vast majority of examples to date have focused on the tree scale. [Only a few examples exist of counties developing spatial thresholds, i.e., Lake County's grading ordinance specifies one quarter acre of native vegetation as a threshold.] These include: individual tree diameter limits established in tree ordinances; soil disturbance limits often contained in grading ordinances; heritage tree designations initiating a discretionary permit review process prior to removal.

Here we propose another means of determining thresholds through a process of pre-determining those oak woodlands whose site qualities qualify them to be recognized according to there existing condition. By using spatially derived images (aerial photos, GIS data, etc) a planner can determine contiguous acreages of oak woodlands that may qualify as ***Intact*** woodlands; using other available planning tools areas could be identified as ***Moderately Degraded*** and the same could be done for ***Severely Degraded*** areas. Conceptually, this approach mimics other planning designations identified through zoning.

Developing a System Using Impact Prediction as a Means of Determining Significance

An important consideration dealing with *significance* in wildlands is the assessment and prediction of both the nature and extent of the potential impacts. Predictions can be based on simplified conceptual models of how natural processes function. Models range in complexity from those that are very intuitive to those based on explicit assumptions about environmental processes. We propose a combination of intuition and strict quantitative assessment to help make a determination. Criteria that can be used to describe the nature and duration of an impact may include:

Determination of Impact Magnitude

Spatial Extent

1) At the site scale:

What proportion of the woodland will be removed or changed to the extent that ecological functions or goods and services will be impaired? Metrics that can be evaluated include:

1. Road density pre and post development.
2. Percent canopy cover pre and post development.
3. Oak species present pre and post development.

4. Vegetation composition pre and post development.

2) At the landscape scale:

Would changes at the site cause fragmentation, loss of connectivity or interruption of processes such as wildlife migration, water flow, or increased fire risk over a larger geographic area? Metrics that can be evaluated include:

1. Road density within 1 km of the site,
2. Results in reduced distance between woodlands and urban development.
3. Changes in size and configuration of woodland habitat patches and increased edge habitat.
4. Severe wildlife corridors or habitat linkages thereby impacting animal and plant movement.

Temporal Extent

Does the proposal result in long-term impacts to the structure and ecological services being provided? Metrics that can be evaluated include:

5. What is the duration of the proposed impacts?
6. Are the impacts reversible?
7. Does the project protect oaks and other oak woodland components from future potential impacts to the site?
8. Are exotic and weedy species likely to increase at the site?

Impact Prediction Checklist—Intact Woodlands

If a project is being proposed for ***Intact*** woodland, the following criteria could be considered to determine significance.

- ✓ Net loss of oak woodland acreage.
- ✓ Increase habitat fragmentation.
- ✓ Loss of vertical and horizontal structural complexity.
- ✓ Loss of understory species diversity.
- ✓ Loss of food sources.
- ✓ Loss of nesting, denning, burrowing, hibernating, and roosting structures.
- ✓ Loss of habitats and refugia for sedentary species and those with special habitat requirements, i.e., mosses, lichens, rocks, native grasses and fungi.
- ✓ Net loss of oak woodland acreage.
- ✓ Road construction, grading, trenching, activities affecting changes in grade, other road-related impacts.
- ✓ Stream crossings, culverts, and road associated erosion and sediment inputs.

Although mitigation measures may help to diminish some of the negative aspects of a project, they can not ensure that the cumulative effects would not result in long-term changes affecting the ecological processes associated with an ***Intact*** woodland. Therefore, cumulative impacts may have to be considered when predicting the affect of a project proposed for designated ***Intact*** woodland.

Impact Prediction Checklist—Moderately Degraded Woodlands

Moderately Degraded woodlands may be the most frequently encountered oak woodland condition found in California. When a site is determined to be moderately degraded, the baseline conditions may be such that further perturbations will have a significant impact. Conversely, a proposed development may present opportunities for improving or enhancing site conditions.

If a project is being proposed for woodland you determine to be Moderately Degraded, the following criteria could be considered to determine significance:

- ✓ Net loss of oak woodland acreage.
- ✓ Increase habitat fragmentation.
- ✓ Loss of vertical and horizontal structural complexity.
- ✓ Loss of understory species diversity.
- ✓ Loss of food sources.
- ✓ Loss of nesting, denning, burrowing, hibernating, and roosting structures.
- ✓ Loss of habitats and refugia for sedentary species and those with special habitat requirements i.e. mosses, lichens, rocks, native grasses and fungi.
- ✓ Net loss of oak woodland acreage.
- ✓ Road construction, grading, trenching, activities affecting changes in grade, other road-related impacts.
- ✓ Stream crossings, culverts, and road associated erosion and sediment inputs.
- ✓ Road building activities that aggravate existing conditions.
- ✓ Changes in environmental conditions that prevent existing residual trees the ability to naturally regenerate.
- ✓ Proposed project designs that result in the construction of obstacles that pose as barriers to wildlife or fish passage.
- ✓ Proposed project designs that result in the probable introduction of invasive plants and animals.

Impact Prediction Checklist—Severely Degraded Woodlands

If the project is being proposed for a ***Severely Degraded*** woodland, consideration of the following impacts should be recognized to determine potential significance. In order for a site to be initially classified as ***Severely Degraded*** it should be highly altered, fragmented or in such a state as to make it virtually unrecognizable as ever having been an oak woodland. These sites may be urban, suburban or agricultural sites whose only link to its past natural heritage is found in the name of the community. In these sites, the oaks

remain only as a relic of the past and the reality of oak regeneration is highly unlikely and constrained.

Take note that these sites may have significance if the relic trees represent a resource protected by local ordinance or statute. Additionally, the site may have significance if the relic trees are considered in a spatial context of what may have been found throughout the county prior to development, and though mitigation may never fully recover the lost biological attributes of a forest, it may serve as a strong source of civic pride that should be considered as part of the determination of significance.

The conversion of these resources may not lead directly to the loss or reduction of sensitive habitat or species but in a cumulative sense may be significant. Thus, impacts to ***Severely Degraded*** *sites may be less than significant* when dealing with individual trees on a small scale, but some projects, depending on specific attributes, may in fact be significant.

Scenarios where the loss of trees may be considered significant in a ***Severely Degraded*** oak woodland:

- ✓ Loss of individual heritage tress that are recognized and/or protected by ordinance or statute.
- ✓ Loss of appropriate recruitment sites for recognized and/or protected heritage tree species.
- ✓ Loss of individual trees in a county where the natural range and occurrence of the species has been dramatically reduced and/or altered thereby affecting the recruitment/restoration potential for the species.
- ✓ The removal of even a few individual trees, taken in spatial context of the county and species being considered, may represent a significant portion of the existing population of that species.

Scenarios that may be **less than** significant under this classification may include:

- ✓ Removal of a small number of immature trees for a road-widening project.
- ✓ Removal of a single tree(s) from a residential property associated with a remodeling project.
- ✓ Actions associated with tree care, maintenance and health, i.e., pruning, shaping, etc..
- ✓ Removal and replacement of street trees.
- ✓ Removal and replacement of landscape trees associated with existing developments.
- ✓ Removal of hazard trees where the threat of a tree failure could injure people or property.

Designing an Oak Woodland Decision Matrix

As has been previously stated, the matrix being proposed here relies on the planner making an assessment of the proposed project based on:

1. the site condition of the oak woodlands at the project site; and
2. the degree to which the initial site condition will be changed as a result of the project.

When developing your matrix start by using a set of broadly defined criteria as a means to identify rudimentary thresholds of significance in simple terms. These criteria apply subjective reasoning to determine the level of impact being proposed (Table 1).

Conceptually, your matrix should compare the site condition (Step I) to the relative impacts being proposed (Step II) thus, the matrix will provide both the planner and the applicant a relatively straight-forward and economically cost effective assessment of environmental impacts and their potential significance.

Table 1. Conceptual sample of how the decision matrix is intended to demonstrate the determination of ***significance*** by comparing the initial condition of the site with the proposed impacts of the project.

	Site Condition		
Degree of Impact	Undisturbed (Intact)	Moderately Degraded	Severely Degraded
Low	Moderately Significant	Least likely significant	Least likely significant
Moderate	Highly likely significant	Moderately likely significant	Less likely significant
High	Significant	Highly likely Significant	Most likely significant

If a county has pre-determined designated lands that are assigned a condition rating of ***Intact***, ***Moderately Degraded*** or ***Severely Degraded***, it will facilitate the process.

Table 2 provides example criteria that can be considered when trying to qualify impacts at a project level (Table 3). Supporting documents to consider should include maps, aerial photos, landsat imagery or areas/trees with special designation (rare, threatened or endangered habitats, heritage trees, zoning overlays, etc.)

Table 2. Criteria for consideration when rating of impact magnitude and significance. (Adapted from Rossouw 2003).

Impact Magnitude and Significance Rating	Examples
HIGH Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time consuming or some combination of these. Site scale—Typically on a small scale (less than 3 acres) a high impact would result in the removal of a majority of the existing trees. Landscape scale—Does the loss of trees result in habitat fragmentation because the site is located within a larger continuous patch of woodland. Existing threshold limits delineating significant impacts currently in use in California range from ¼ acre to 3 acres.	Examples include alterations/conversion of oak woodlands resulting in: ✓ Loss of vertical and horizontal structural complexity. ✓ Loss of understory species diversity. ✓ Loss of food sources. ✓ Loss of nesting, denning, burrowing, hibernating, and roosting structures. ✓ Loss of habitats and refugia for sedentary species and those with special habitat requirements, i.e., mosses, lichens, rocks, native grasses and fungi. ✓ Net loss of oak woodland acreage. ✓ Road construction, culverts, grading and other road-related impacts. ✓ Stream crossings, culverts, and road associated erosion and sediment inputs.
MODERATE A second order or tier impact. In the case of adverse impacts, mitigation or minimization of impacts is sometimes possible to offset overall alterations. Site scale—Both tree and non-tree components of the oak woodland are being considered for removal or alteration. Removal of trees will result in the creation of more edge impacts. Landscape scale—Increased edge habitat but less than 1 kilometer. Complete loss of habitat resulting in a disturbance envelops less than 3 acres. Existing threshold limits delineating significant impacts currently in use in California range from ¼ acre to 3 acres.	Examples of moderate impacts at a site scale may include: ✓ Understory removal. ✓ Thinning of existing trees. ✓ Removal of snags and other wildlife elements. Examples of moderate impacts at a landscape scale may include: ✓ Right of way clearing. ✓ Road alignments. ✓ Road expansion.
LOW A third tier or order of proposed impacts. In the case of adverse impacts, minimal disturbance is anticipated or can easily be avoided, minimized or mitigated.	Examples of low impacts at a site scale – Less than 10 trees: Large scale—No change to the stand structure and immeasurable impacts on canopy cover.

Table 3. This illustrates an example matrix and how it might be used to help determine significance.

	Initial Site Condition		
Impact Level	**Intact Woodland**	**Moderately Degraded Woodland**	**Highly Degraded Woodland**
Low Impact	Minimal disturbance to stand structure and composition and habitat features resulting in no increased edge habitat or fragmentation; road and stream crossings are not being considered; activities will not result in the introduction of exotic or invasive species. [Minimal site or spatial disturbance may still result in significant impacts to an intact or core woodland.]	Regeneration potential is being maintained across the site; expansion of developed areas are maintained and centralized; new road and stream crossings are not being considered. [In the absence of special circumstances, statutes or ordinances this may represent a non-significant impact.]	Majority of remnant trees are retained; understory removal or road widening protects existing tree health; individual tree removal on a residential, commercial or industrial site. [In the absence of special circumstances, statutes or ordinances this may represent a non-significant impact.]
Moderate Impact	Detectable change or reduction in canopy, structure or composition; loss of some habitat features, subtle impacts increasing fragmentation, edge creation or loss of connectivity (roads, fences, other introduced artificial barriers or buffers). [These impacts are considered significant.]	Regeneration potential is being marginalized; develop areas are expanding into previously undeveloped sites; new roads or stream crossing are being proposed; habitat features are being lost; activities being proposed will add to the existence of exotic and invasive species. [These impacts are considered significant.]	Loss of a majority of existing trees; activities will inhibit or harm residual tree health and vigor; barriers are constructed that increase fragmentation and connectivity; [These impacts may be significant.]
High Impact	Obvious change or reduction or loss in canopy, structure or composition loss of most of the existing habitat features and services; fragmentation and or parcelization of contiguous ownerships; introduction of roads or stream crossings; creation of edge habitats previously absent; construction of barriers (fences). [These impacts are considered significant.]	Large scale impacts including loss of habitat resulting in habitat fragmentation and increased edge. Loss of woodland structure and changes in composition occurring in large continuous patch of woodland. [These impacts are considered significant.]	Loss of remnant trees or stand increases fragmentation across the landscape through the loss of connectivity. [In the absence of special circumstances, statutes or ordinances this may represent a non-significant impact to oak woodlands.]

Step III: Identifying Potential Mitigatory or Remedial Actions

CEQA does not mandate similar mitigation for all similar projects. Nothing in CEQA requires a local legislative body to enact legislation which uniformly applies a certain level or standard of mitigation to all similar project submitted for environmental review within its jurisdiction. Guidelines § 15130.

Projects predicted to have significant impacts at the individual tree, site (or stand) and/or landscape scale should include mitigation measures designed to avoid, minimize or compensate the impacts. If that is not feasible, a project with residual significant impacts cannot be approved without a finding of overriding considerations by the approving jurisdiction. Mitigation measures may be proposed to reduce the level of impacts, restore impacted resources or enhance degraded resources. In some cases, on-site mitigation will not be practical and so provisions must be made for off-site mitigation or even compensation. Off-site compensation may include both direct measures at other suitable locations or contribution of in-lieu fees. To some extent, the existing conditions at a site, whether ***Intact, Moderately Degraded*** or ***Severely Degraded***, will determine the nature and feasibility of on-site mitigation. For example, although on-site mitigation is always preferred, a project within ***Severely Degraded*** oak woodland may have few options. Consequently, only off-site compensation may be feasible.

Appropriate Mitigation measures may include:

- ✓ Old trees with irreplaceable characteristics are retained.
- ✓ Snags are maintained or recruited where safe and feasible.
- ✓ Snags are well represented by size, specie, and decay class.
- ✓ Measures are initiated to minimize storm water runoff and other sources of non-point source pollution.
- ✓ Stream crossings include measures to minimize water quality degradation and facilitate fish passage.
- ✓ Hydrologically disconnect effects of impervious surfaces from waterways.
- ✓ Areas are designated to serve as seedling/sampling receptor sites or are designed to facilitate natural oak recruitment.
- ✓ Appropriate sites for long-term oak recruitment should be identified within the project impact area, e.g., roadside right-of-ways, utility easements, publicly owned open space, etc.
- ✓ Replacement of like-species of trees.
- ✓ Use of like-species of trees in off-site planting sites.
- ✓ A county-wide policy stipulating a percentage of native oaks be planted in all projects requiring landscape design approval.

- ✓ In-lieu fees, or the Wildlife Conservation Board or County department in order to provide a funding source to expand the impact of oak restorative actions across a larger spatial context on publicly maintained sites and roadways.

The matrix you develop for your particular jurisdiction should be fluid and elastic over time. As information becomes available, the decision matrix you use should be adaptable to address the challenges of your county.

Appendix I: Mitigation Considerations

The following recommended process was developed to help estimate a compensation fee listed as a mitigation option in California Public Resources Code 21083.4. This text will be incorporated into the implementation Section III of the overall decision-support document.

1. The WCB or Counties themselves are the only entities that can receive funds under option 3 of California Public Resources Code 21083.4[1].

2. Consider where in the County oak woodlands should be conserved to protect the natural communities they harbor and associated natural resource values. Ultimately, these are areas where funds will be required to protect privately-owned oak woodlands in the county. Existing regional land conservation plans developed by the county, stakeholders, or conservation organizations can be used. If no such plan exists, large continuous areas of mixed oak woodlands that are in need of protection from land conversion should be identified through a planning process (see Planners Guidelines – link to order).

3. Acquire all recent sales (1-3 years) data from woodland properties that are a priority for land conservation identified in step 2. Using this data, determine median value per acre for purchasing land in its entirety and the price range for acquiring a conservation easement from properties in these areas. If the project area falls within the area of interest for conservation then these values should also be determined based on the area impacted by the project. We encourage you to 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 conservation easement valuation and should follow best practice guidelines (web link here to SCAOSD guidelines).

4. Calculate the impact area of the project and include; the building envelope, new roads, landscaping, all areas enclosed by a fence that prohibits animal movement, and include a border surrounding the building envelope which will likely be impacted by activities associated with development such as pets and invasive weeds. Development results in human-created woodland edges where the natural habitat

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[1] (3) Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements, as specified under paragraph (1) of subdivision (d) of that section and the guidelines and criteria of the Wildlife Conservation Board. A project applicant that contributes funds under this paragraph shall not receive a grant from the Oak Woodlands Conservation Fund as part of the mitigation for the project.

ends and abuts the human-altered parts of the landscape. These edges can result in strong negative physical and biological impacts detectable as far as 1,640 feet into forested systems (Laurance 1995); therefore woodlands immediately adjacent to development will be impacted and should be considered as part of the impact area of the project.

5. Determine an appropriate mitigation ratio to determine the amount of in-kind (i.e. same type of woodland such as blue, valley or mixed) area that should be protected to compensate for the likely impacts associated with the proposed project.
    a. If you go with a 1:1 replacement this means that 50% of the woodland resources could ultimately be lost to development over the long-run.
    b. A 2:1 replacement will more fully compensate for the land impacted by the proposed development.

6. Calculate fee based on the cost of purchasing protected land in its entirety or through a conservation easement in the area identified as a priority for woodland conservation. The amount of protected land to base the fee on can be based on the number of acres impacted by the proposed (see #4) project times the mitigation ratio.

7. If the development being proposed is simply an addition to an existing structure or an outbuilding adjacent to an existing structure that will require the removal of a few trees; then compensation may best be approached through estimating the costs of replacing the trees removed. These estimates can be provided by a certified arborist or consult the International Society of Arboriculture standards for valuing trees of different sizes.

8. Sending this fee to the WCB satisfies the CEQA mitigation requirement detailed in California Public Resources Code 21083.4. The funds will remain with the WCB for future land conservation projects within that county. This allows for a transparent public process for reallocation of these funds to protect public trust benefits.

9. If the County is going to receive the money for compensation rather than the WCB they should consider:
    a. Collecting a fee for stewardship including compliance and resource monitoring. These fees often range from 5-10% of the total.
    b. The county should develop and continually update (every 5 years at least) a land acquisition plan that is approved by the county.
    c. The county should establish an independent spending authority to provide checks and balances to protect the public interest.
    d. County legal counsel will be responsible for ensuring that the public trust interests are protected through CEQA and for every negotiated conservation easement.
    e. The county will be responsible for compliance and resource monitoring of any conservation easements that they hold.

f. The funds collected as mitigation should not be transferred to a private company or non-profit without public oversight.
g. The time lag between collecting the fee and purchasing land as compensation should be minimized, while still allowing for enough funds to be accumulated to implement a beneficial acquisition.
h. If funds are held for a period of time, interest should be accrued in order to offset expected increases in land values.

Appendix II: PRC 12220

PUBLIC RESOURCES CODE SECTION 12220

12220. Unless the context otherwise requires, the definitions in this article govern the construction of this division.

(a) "Applicant" means a landowner who is eligible for cost-sharing grants pursuant to the federal Forest Legacy Program (16 U.S.C. Sec. 2103 et seq.) or who is eligible to participate in the California Forest Legacy Program and the operation of the program, with regard to that applicant, does not rely on federal funding.

(b) "Biodiversity" is a component and measure of ecosystem health and function. It is the number and genetic richness of different individuals found within the population of a species, of populations found within a species range, of different species found within a natural community or ecosystem, and of different communities and ecosystems found within a region.

(c) "Board" means the State Board of Forestry and Fire Protection.

(d) "Conservation easement" has the same meaning as found in Chapter 4 (commencing with Section 815) of Title 2 of Part 2 of Division 2 of the Civil Code.

(e) "Conversions" is a generic term for situations in which forest lands become used for nonforest uses, particularly those uses that alter the landscape in a relatively permanent fashion.

(f) "Department" means the Department of Forestry and Fire Protection and "Director" means the Director of Forestry and Fire Prevention.

(g) "Forest land" is land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

(h) "Landowner" means an individual, partnership, private, public, or municipal corporation, Indian tribe, state agency, county, or local government entity, educational institution, or association of individuals of whatever nature that own private forest lands or woodlands.

(i) "Local government" means a city, county, district, or city and county.

(j) "Nonprofit organization" means any qualified land trust organization, as defined in Section 170(h)(3) of Title 26 of the United States Code, that is organized for one of the purposes of Section 170(b)(1)(A)(vi) or 170(h)(3) of Title 26 of the United States Code, and that has, among its purposes, the conservation of forest lands.

(k) "Program" means the California Forest Legacy Program established under this division.

(l) "Woodlands" are forest lands composed mostly of hardwood species such as oak.

References

Dale, V. H., Brown, S., Haeuber, R. A., Hobbs, N. T., Huntly, N., Naiman, R. J., Riebsame, W. E., Turner, M. G., and Valone, T. J. 2000. Ecological Principles and Guidelines for Managing the Use of Land. Ecological Applications 10 (3) 639-670.

Forman, T. T. and S. K. Collinge. 1997. Nature Conserved in Changing Landscapes With and Without Spatial Planning. Landscape and Urban Planning. 37 (1-2): 129-135.

Laurance, W. F. 1995. Rainforest mammals in a fragmented landscape. In *Landscape approaches in mammalian ecology and conservation*, ed. W. Z. Lidicker Jr., pages 46–63. Minneapolis: University of Minnesota Press

Nigel Rossouw, N. 2003. A Review of Methods and Generic Criteria for Determining Impact Significance. AJEAM-RAGEE. 6:44-61.