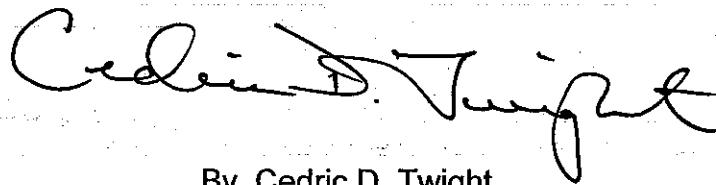


Oak Woodland Evaluation for the Clover Valley Large and Small Lot Tentative
Subdivision Maps

A handwritten signature in black ink, reading "Cedric D. Twight". The signature is written in a cursive style with a large, sweeping initial "C".

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Registered Professional Forester #2469
June 2, 2006

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Clover Valley Partners, Inc. has retained my services as a Registered Professional Forester to perform a peer review of the proposed, Clover Valley Large and Small Lot Tentative Subdivision Maps (LSLTSM), impacts on the Oak Woodlands associated with this proposed subdivision. The Project area contains 622.3 acres and is located between the Town of Loomis and the Whitney Oaks residential subdivision. The project site is situated between a ridge to the east and west of Clover Creek, which runs south through the center of the project site. The Tentative Subdivision Map would subdivide 622.3 undeveloped acres. The Environmental Impact Report for this project states, "The proposed project would include construction of 558 residential small lots, one 5.3-acre park site, one 5.0-acre neighborhood commercial site, as well as major streets and open space areas. A total of 366 acres would remain in open space and landscape lot areas. A 1.0-acre future fire station site would be dedicated by the applicant to City and would be constructed by the City at a later date. Based on a floor-area-ratio (FAR) of 0.25, the project commercial acreage represents approximately 54,450 square feet of commercial space."

RPF Role in Evaluation of the CEQA Project

The Professional Foresters Licensing Law (PRC)§ 750 states that the "practice of forestry applies only to those activities undertaken on forested landscapes." A forested landscape is defined as "those tree dominated landscapes and their associated vegetation types on which there is growing a significant stand of tree species, or which are naturally capable of growing a significant stand of native trees in perpetuity, and is not otherwise devoted to non-forestry commercial, urban, or farming uses. The Clover Valley Project contains oak woodland forests, therefore as a Registered Professional Forester the following evaluation of the inventory, impacts on individual stands, stand level impacts including edge effects and connectivity, determination of significant impacts, and development of feasible mitigation measures has been compiled.

This review of the Clover Valley Project will be limited to the forested areas (oak woodlands) within the Clover Valley Project boundaries. The individual trees associated with the offsite improvements that are outside of the project boundary were not evaluated since these improvements are in areas that have already undergone a high degree of development. The woodland that once occupied these areas is highly compromised and therefore does not constitute a woodland stand. Developments in these areas include a water treatment ponds, water tanks, paved roadways and high density residential developments. The oak woodlands associated with this project are found within the principal residential area for the Clover Valley Project. The goal of this review is to determine, with regards to oak woodlands, whether or not the Clover Valley SSLTSM project achieves the projects objective to "minimize impacts on other significant on-site natural resources through appropriate project design."

The Regulatory Framework Relating to Oak Woodlands.

The State Board of Forestry, which is the regulatory and policy making entity responsible for the state's forests and rangelands, has over the past 20-years promoted the use of the Integrated Hardwood Range Management Program (IHRMP) as the mechanism to promote the responsible management of the state's oak woodlands. This non regulatory program uses education and research to help promote a better understanding of the importance of oak woodlands and its conservation.

Since 1986, the IHRMP has improved the management of California's oak woodlands by identifying problems related to the management of California's hardwood forests; developed new information that addresses these problems and instituted new policies and outreach programs that have improved on the management practices for California's oak woodlands (Standiford and Bartolome 1997).

This effort helped in the adoption of both city and county ordinances that addressed the conservation of oak trees and/or oak woodlands by varying degrees. These ordinances are not uniform and the successful mitigation of problems relating to the conversion of oak woodlands persisted at varying degrees at the county level. As a means of addressing this public concern, the State Senate passed Senate Bill 1334, authored by Senator Sheila Kuehl. This legislation, codified in Public Resources Code Section 21083.4, outlines oak woodland mitigation options for counties under California Environmental Quality Act (CEQA) processes. Local jurisdictions are guided by local ordinances and CEQA.

Public Resources Code 21083.4(c) also directs local governments to address the conservation of oak woodlands through the adoption of guidelines or ordinances that meet that end through the adoption of oak conservation element for a general plan, an oak protection ordinance, or an oak woodlands management plan.

The 1991 City of Rocklin General Plan provides policies adopted by the City Council in order to help guide the direction of the City. The policies related to oak woodlands are as follows: Policy 4; To encourage the protection of oak trees, including heritage oaks, and other significant vegetation from destruction.

The City of Rocklin enacted the Rocklin Oak Tree Preservation Ordinance 17.77 to satisfy Policy 4 of the General Plan. The intent and purpose of the Rocklin Oak Tree Preservation Ordinance is as follows:

“The goal of this chapter is to address the decline of oak woodlands due to urbanization through a considered attempt to balance against the social benefits of private property ownership and development. To reach

this goal, this chapter offers incentives for oak tree preservation, and provides feasible alternatives and options to removal where practicable.

Project Area Habitats

The vegetation description of project area habitats done by original research by Dr. Robert F. Holland, DAVIS² Consulting Earth Scientists, and Acorn Environmental Consulting describe the vegetation present within the Clover Valley Project area.

Robert Holland identified four vegetation types including two forest types. The forest types are the Oak woodland and Riparian Wetland types. The Botanical Survey provided by Acorn Environmental Consulting identified five vegetation communities, four of which are described as forest types including: foothill woodland community, oak savannah, oak woodland, and riparian corridor. The following excerpts from the draft EIR summarize the original research by Dr. Robert F. Holland, DAVIS² Consulting Earth Scientists, and Acorn Environmental Consulting. Considering the differences in soil type, oak species composition, and canopy cover, I made a distinction between the blue oak woodland type, referred to below as oak woodland, and the blue oak savannah type referred to in the Acorn Environmental botanical survey. These two distinctly different woodlands are discussed separately. I also include a brief description of the valley oak woodland type found at Clover Valley.

Oak Woodland (Blue Oak Woodland)

Oak woodlands grow in shallow to moderately deep, well-drained soils of Inks and Caperton series on relatively steep canyon side slopes, in excess of 20 percent. These soils support a low, dense, closed-canopy woodland of blue oak (*Quercus douglasii*), interior live oak (*Q. wislizenii*), California buckeye (*Aesculus californicus*) and poison oak (*Toxicodendron diversilobum*). Small openings in the woodland canopy support ripgut brome and dogtail grass (*Cynosurus echinatus*). The floor of the oak woodland support a species mixture of annual non-natives similar to the dry grassland. The oak woodland covers approximately 185 acres (29 percent) of the project area.

Blue Oak Savannah

The Blue oak savannah type is restricted to the ridge tops that border Clover Valley. It is on these upland areas where a relatively thin soil has developed on the top of the volcanic flows that define Clover Valley. These thin soils do not retain water late into the summer and plants that grow in these areas must be very drought tolerant, a defining characteristic of blue oaks. The understory beneath the blue oak savannah is dominated by annual grasses.

Riparian Wetlands (Valley Foothill Riparian)

Along the banks of the Clover Valley Creek in alluvial deposits (Xerofluvents) a riparian area flourishes that supports Valley oak (*Q. lobata*), willows (*Salix*

goodingii, *S. hindsiana*, *S. laevigata*, and *S. lasiolepis*), white alder (*Alnus rhombifolia*), cottonwood (*Populus fremontii*), walnut (*Juglans nigra*), wild grape (*Vitis californica*) and blackberry. Virtually all of this riparian habitat is jurisdictional wetland subject to provisions of Section 404 of the Clean Water Act. The riparian wetlands cover approximately 20.4 acres (3 percent) of the project area.

Valley Oak Woodland

The valley oak woodlands are found along the valley floor where the soils are deeper and the valley oaks tap root can find water late into the summer. The largest stands of valley oaks are adjacent to and contiguous with the Valley Foothill Riparian stands that border Clover Creek.

Oak Tree Inventory Review

As part of this evaluation Stantec Inc. supplied a current aerial photograph of the project area that showed the outline of the project area, road locations, lot locations, and wetland delineation. The scale of the photograph is 1" = 200'. In addition Stantec Inc. provided electronically the project area boundary, roads, lots locations, bike/walking trail locations, and the tree inventory data. All of this electronic data was integrated into the Atlas GIS system that I currently use to analyze data and map projects.

The first step in the evaluation of these oak woodlands involved developing criteria for establishing the stand boundaries. The sometimes patchy or open condition found in oak woodlands presents some difficulty in determining the boundary of one stand type from another. Depending on the methodology used the area of each individual stand could vary greatly. The goal of this woodland analysis is to choose a methodology that accurately defines the extent of the oak woodland vegetation type versus the extent of the grassland type.

The methodology I used to define the boundary between one stand type and another and the boundary between an oak woodland habitat and grassland habitat is as follows:

- a. A group of trees is considered a stand if three or more trees are growing within two mean canopy widths of one another. The minimum mapping size of a stand of trees is .22 acres. This is slightly larger than the minimum lot size for the Clover Valley Project and therefore impacts at the lot size level will be evident.
- b. An individual tree was included in a stand if it is within two mean canopy widths of two or more trees in the adjoining stand.
- c. The stand boundary between vegetation types is defined as one mean canopy width from the edge of the drip line of the trees within the subject stand. Where two forest types

join one another the edge was defined by the edge of the canopy of the denser forest stand type.

This means of defining an oak woodland stand is a variation on the methodology used in *An Ecosystem-Based Approach to Valley Oak Mitigation*, by M.S. Rawlings and D.A. Airola, for defining stands as part of the Contra Costa Water Districts Los Vaqueros Reservoir Project. The Rawlings/Airola methodology differs from the parameters in the Clover Valley assessment in that the distance for including three or more trees in a stand of trees was four mean canopy diameters instead of two mean canopy diameters. The decision to reduce the distance between trees for inclusion/exclusion within a stand to two canopy mean widths instead of four canopy widths was done to provide a degree of segregation between stands that reflects both the continuity and variability within the forest stands in the Clover Valley Project. I was concerned that using four mean canopy widths, as the criteria for inclusion into a stand, would have homogenized the stand structure and not provided the detail at the scale of an individual lot size level. The stand level view provided using two canopy widths will show the effects of the project on individual trees within the project area and the impacts to various stands of trees found in the Clover Valley project.

Quantification of Oak woodlands- GIS Analysis of the Oak Woodland Stands

The criteria stated above were used to map the woodland stands within the Clover Valley Project. The trees within these stands will continue to be characterized as fair, fair/poor, and poor for the sake of consistency. As part of this analysis 56 oak woodland stands were identified (see Clover Valley Woodlands Map). These woodland stands can be grouped into four separate vegetation types including: Blue Oak Woodland, Blue Oak Savannah, Valley Foothill Riparian, and Valley Oak Woodland.

The Blue oak woodland type is the dominant woodland type in Clover Valley. There are 23 stands of Blue Oak ranging in size from 0.2 acres to 70.0 acres with an average stand size of 10.2 acres and a total area of 235.7 acres. Tree species present in the Blue oak woodland type include; Blue oak, Interior Live oak, Valley oak, and some scattered Grey pine. The species composition within these stands varies greatly. Most of these stands contain both Blue oak and Interior Live oak at a frequency that exceeds 10% or more of the trees present. Stand 4 and 6 are the only Blue oak woodland stands that contain Valley oak. The trees in the Blue Oak Woodland stands are generally classified as having a fair condition. The next most frequent tree condition classification for trees in the Blue Oak Savannah is poor. The areas covered by the Blue Oak Woodland type have a canopy closure that is generally greater than 50%. The *Guidelines for Managing California's Hardwood Rangelands* reported that for Blue oak woodland stands having similar canopy closures as those found at Clover Valley, the CWHR model predicts that 10-19 amphibian species, 23-28 reptile species, 77- 128 bird species, and 28-64 mammal species may be present (Tinnin, 1996).

The Blue Oak savannah type is the next most frequent woodland type in Clover Valley. There are 16 stands of Blue oak savannah ranging in size from 0.2 acres to 32.3 acres with an average stand size of 7.7 acres and a total area of 123.3 acres. Tree species present in the Blue oak woodland type include; Blue oak, Interior Live oak, Valley oak, and some scattered Grey pine. The species composition within these stands varies greatly. Most of these stands contain only Blue oak. Interior Live oak is present in 56% of the stands but generally makes up less than 15% of the trees present. The trees in the Blue Oak Savannah stands are generally classified as having a fair condition. The next most frequent tree condition classification for trees in the Blue Oak Savannah is poor. The areas covered by the Blue oak savannah type have a canopy closure that is generally less than 30%. The mature Blue oak savannah type supports the breeding needs of 10 species of mammals, 29 species of amphibians and reptiles, and 57 species of birds according to Verner and Boss (1980).

The Valley Foothill Riparian type is the third most dominant woodland type in Clover Valley. There are 11 stands of Valley Foothill Riparian ranging in size from 0.3 acres to 6.8 acres with an average stand size of 2.6 acres and a total area of 29.1 acres. Tree species present in the Valley Foothill Riparian type include; Valley oak, Fremonts Cottonwood, White alder, Walnut, Interior Live oak, Blue oak, and several species of willow. The species composition within these stands varies greatly. The tree inventory only collected information on oak trees and did not measure other tree species present in the riparian corridor. When considering only the oaks within these stands Valley oak is the most dominant species. Most of these stands contain both Blue oak and Interior Live oak however Blue oak. Where Blue oak is present it is generally found at a frequency of less than 10%, while Interior Live oak can be found at frequencies generally between 20-50%. The trees in the Valley Foothill Riparian type stands are mostly classified as having a fair condition. The areas covered by the Valley Foothill Riparian type have a canopy closure that is generally 20%-40% when only considering the oak component of the stand. Considering the presence of the other tree species growing in this area this value under estimates the true overstory canopy closure for these stands. These riparian areas generally have deep alluvial soils that can support a complex mix of vegetation. This complexity of riparian forests combined with the close proximity to water allows these stands to support more species of wildlife than any other forest type (Williams and Kilburn 1984)

The fourth stand type present at Clover Valley is the valley oak woodland type. The valley oak savannah type is the next most frequent woodland type in Clover Valley. There are 5 stands of valley oak woodland that range in size from 0.4 acres to 1.2 acres with an average stand size of 1.3 acres and a total area of 6.6 acres. Tree species present in the valley oak woodland type include; valley oak, Interior Live oak, and occasionally a single blue oak tree. The species composition within these stands is dominated by valley oaks. Most of these

stands are composed of between 75-100% valley oak. The majority of these stands contain between 19-42% percent Interior Live oak. The trees in the valley oak stands are generally classified as having a fair condition, the majority of which have multi stems. The next most frequent tree condition classification for trees in the valley oak stands is poor. The *Guidelines for Managing California's Hardwood Rangelands* reported that for valley oak woodland stands having similar canopy closures as those found at Clover Valley, the CWHR model predicts that 8-19 amphibian species, 25-30 reptile species, 93-128 bird species, and 29-71 mammal species may be present (Tinnin, 1996).

In terms of wildlife diversity the presence of water, cavity trees, snags, brush piles, and large woody debris all contribute to increasing wildlife opportunities and therefore increasing levels of species diversity. Conversely the lack of these habitat elements reduces wildlife opportunities and therefore decreases the species diversity in the woodland stand (Tinnin, 1996).

Project Planning Considerations

The Clover Valley project has previously been approved for entitlements that included 974 residential units. This zoning effort was the result of this area being annexed by the city of Rocklin. The original Clover Valley project called for approximately 70 acres of open space. Following additional input by the public that expressed concern over the impacts to the character of the Valley including the availability of open space and impact to native oak trees the original development proposal was modified to reduce the number of units to 558 and increase the amount of open space to 366 acres. The re-organization of housing units has resulted in the current configuration of lots and infrastructure. The direct impact to the oak woodland stands from this proposal is discussed below.

Phase Impacts

The Clover Valley development's "foot print" on the above referenced stands were analyzed for each phase of the development. There are ten phases; 4A, 4B, 4C, 4D, 4E, 4F, 4G, 4H, 4I, & 4J, proposed for the latest development alternative. Each of these phases was analyzed for their removal of individual oaks, the canopy area, and the total stand area affected by the phase. The affected areas included; lots areas, roadways, bike paths and other infrastructure right of ways.

The woodland stands affected by phase 4A include; 18, 28, 46, 47, and 56. The total stand area affected by this phase is 26.7 acres. The total canopy removed is 7 acres. This phase of the project will remove 748 trees. These trees total 9,274 caliper inches.. This phase will remove most of stands 28 and 47 all of stand 56. These stands are Blue oak savannah stands.

The woodland stands affected by phase 4B include; 18, 37, 40, 45, 46, 54, and 55. The total stand area affected by this phase is 5 acres. The total canopy removed is 1.4 acres. This phase of the project will remove 129 trees. These trees total 2,162 caliper inches. This phase will remove a small part of stand 40 and 46, both of which are Blue oak woodland stands. Phase 4B will remove most of stand 54 and a small portion of stand 37, both Blue oak savannah stands. In addition phase 4B will remove a very small part of stand 45. Phase 4B does include both a trail along the western edge of the Valley Foothill Riparian stand 45 and a portion of the road infrastructure that crosses Clover Valley. The trail segment affects the largest a portion of the canopy in the Foothill Riparian habitat. The road alignment associated with phase 4B across Clover Creek appears to minimize the impact to individual trees in the riparian corridor; however it will create a disruption in the continuity of this Valley Foothill Riparian habitat.

The woodland stands affected by phase 4C include; 31, 32, 33, 36, 37, 40, 41, 42, 48, 49, 51, 52, and 53. The total stand area affected by this phase is 19.8 acres. The total canopy removed is 7.5 acres. This phase of the project will remove 682 trees. These trees total 9,718 caliper inches. Phase 4C will remove a small piece of stand 53, a large piece of stand 37 and four small Blue oak savannah stands: 41, 49, 51, and 52. Phase 4C will remove a small piece of stand 32, 36, and 40 and three small Blue oak woodland stands 31, 42 and 48.

The woodland stands affected by phase 4D include; 33, 34, 35, 36, 37, 38, 39, and 40. The total stand area affected by this phase is 6.1 acres. The total canopy removed is 2.6 acres. This phase of the project will remove 261 trees. These trees total 5,438 caliper inches. Phase 4D will remove a small segment of four blue oak woodland stands: 34, 36, 38, 39, and 40. Phase 4D will remove a small piece of stands 33 and 37 which are both Blue oak savannah stands.

The woodland stands affected by phase 4E include stand 18 and 30. The total stand area affected by this phase is 0.4 acres. The total canopy removed is 0.1 acre. This phase of the project will remove 16 trees. These trees total 287 caliper inches. This phase will remove a small segment of stand 18 a Blue oak woodland stand.

The woodland stands affected by phase 4F include; 18 and 28. The total stand area affected by this phase is 11.9 acres. The total canopy removed is 4.4 acres. This phase of the project will remove 481 trees. These trees total 6,414 caliper inches. This phase will remove most of the remainder of stand 28, a Blue oak savannah stand, following the implementation of phase 4A. This phase will remove a small portion the Blue oak woodland stand 18.

Phase 4G impacts stand 18. The total stand area affected by this phase is 2.0 acres. The total canopy removed is 1.0 acre. This phase of the project will

remove 131 trees. These trees total 2,381 caliper inches. This phase will remove a small segment of stand 18 a Blue oak woodland stand.

The woodland stands affected by phase 4H include; 18 and 21. The total stand area affected by this phase is 2.6 acres. The total canopy removed is 0.9 acre. This phase of the project will remove 95 trees. These trees total 1,757 caliper inches. This phase will remove a small segment of stand 18 a Blue oak woodland stand. This phase will remove a small portion the Blue oak woodland stand 18.

The woodland stands affected by phase 4I include; 6, 12, 13, 14, and 23. The total stand area affected by this phase is 5.2 acres. The total canopy removed is 2.6 acres. This phase of the project will remove 305 trees. These trees total 5,119 caliper inches. This phase will remove most of stands 14 and 23 both of which are Blue oak woodland stands and also most of two Valley oak woodland stands 12 and 13. This phase will remove a small portion the Blue oak woodland stand 6.

The woodland stands affected by phase 4J include; 4, 5, 6, 7, 8, 9, and 10. The total stand area affected by this phase is 9.2 acres. The total canopy removed is 2.9 acres. This phase of the project will remove 277 trees. These trees total 3,831 caliper inches. This phase will remove most of the Blue oak savannah stands 4, 5, and 9. Phase 4J will remove a small portion of the Blue oak savannah stand 8. It will also remove a small portion of the Blue oak woodland stands 6 and 7.

The infrastructure related to this project that will impact oak woodlands are confined to the perimeter of the project boundaries. There are offsite projects that will be implemented as part of this project; however these impacts will be to individual oak trees and not to a woodland stand. The woodland that once occupied these areas are highly compromised and therefore do not constitute a woodland stand. Because the offsite improvements are not in oak woodlands these areas are not forested and therefore are not considered in this woodland review. Those trees to be removed as part of these offsite impacts were included in the Tree Summary Report and the caliper inches removed has been accounted for in that report. The discussion regarding impacts to oak woodlands that result from infrastructure improvements will be restricted to those improvements that occur within the project boundary.

For clarity the impacts related to infrastructure improvements for this project will be reported as exempt infrastructure or non-exempt infrastructure so that the discussion coincides with the 1998 Development Agreement. The 1998 Development Agreement determined that oak trees removed within certain proposed roadways would not be counted towards reaching the mitigation threshold of 25% of the total trees impacted while oak trees in other non-exempt roadways would be counted towards the mitigation threshold.

The infrastructure that is not exempted from oak mitigation as part of the 1998 Development Agreement and is within the principal project boundary are generally within the stand boundaries discussed previously. The impact on the individual stands includes approximately 20.7 acres of total stand area and 7.4 acres of total canopy. This infrastructure and roads will remove 848 trees. These trees total 11,462 caliper inches.

The roadways that are exempted from requiring trees removed to count towards the 25% oak mitigation threshold are shown on the Oak Woodlands Stands map. The majority of the roadways exempted from mitigation avoid most of the oak woodland stands since they are aligned along the edge of the grassland type that separates the Foothill Valley Riparian woodlands from the Blue oak woodlands. The connector road between Sierra College Boulevard and Park Drive, which bisects the northern 1/3 of the project, impacts the greatest number of oak trees. The impact on the individual stands for all of these mitigation exempt roadways includes approximately 12.9 acres of total stand area and 6.8 acres of total canopy. This infrastructure and roads will remove 1009 trees. These trees total 14,788 caliper inches.

The walking trail/bike paths are generally outside of the proposed phases and will affect approximately 2.2 acres of total stand area and approximately 0.7 acre of total canopy. The walking trail/bike paths will affect approximately 51 trees that total 750 caliper inches.

Project Level Stand Impacts on Edge and Stand Connectivity

The stands of oak woodland identified in the project area encompass approximately 396 acres. The total canopy area within these stands totals to approximately 215 acres. The various phases and infrastructure will remove approximately 125 acres from oak woodland stands in the project area or 31.6% of the total stand area. The project will remove approximately 46.0 acres of canopy or 21.4% of the total canopy area. The 27,410 trees in the principal project area were evaluated spatially using GIS. This differs slightly from the oak tree inventory of 28,246 that included all of the trees related to the off site improvements. Using this 27,410 tree inventory the project, including the "exempt roadways" will remove approximately 5,012 trees or 18.3% of the total. The total Caliper inches of the trees inventoried is 410,505. The project, including the "exempt roadways" will remove approximately 73,047 caliper inches or 17.8% of the total.

Edge Effects

The diversity of stands in Clover Valley is a reflection of the variations in soil productivity and water availability. The continuity of the Blue oak woodland stands (6, 7, 18, 36, 40, & 46) that run the length of the slopes leading from the

valley floor to the flat ridges that border Clover Valley reflect a uniform soil condition that easily supports this stand type. The Blue oak stands 18 and 46 are quite uniform and the edge habitat in these stands is generally restricted to the outside perimeter of the stand. The Blue oak woodland stands 6, 7, 32, 34, 36, 38, 39 are much less continuous. These Blue oak woodland stands have much more edge than the more continuous stands of Blue oak woodland. The openness of the Blue oak woodland stands on the eastern half of the project compared to the western edge of the project is probably due to past firewood harvesting activities that focused on the eastern half of the valley because this half of the valley had better vehicle access than the western half and is not the result of a dramatic difference in soil conditions.

The Blue oak savannah stand type is more open than the Blue oak woodland type. The Blue oak savannah stand type found on the western ridge line of the project is however generally covered by a single continuous stand (28 & 47). The Blue oak savannah type on the eastern ridge of the project is less continuous and is broken up into at least ten smaller stands. This is probably the result of a less continuous soil condition that can support tree growth. In looking at the aerial photograph of that area it shows that the eastern ridge moves more quickly to a grassland type than the western ridge. All of these Blue oak savannah stands have a great deal of edge both at their perimeter and within each stand.

The Foothill Valley Riparian stands are restricted to the edges of Clover Creek. This long thin configuration creates a great deal of edge habitat. The Foothill Valley Riparian stands are fairly continuous in the northern half of the project area and become more fragmented in the southern half of the project area. This may be the result of the fact that Clover Creek historically ran dry in the summer months. I would hypothesize that the areas where the Foothill Valley Riparian stands are the thinnest or least continuous are the areas where seasonal drying occurred the earliest. Clover creek today runs water year round due to a diversion dam upstream of the project area that captures excess water during the winter and meters it out through the summer. The Foothill Valley Riparian stands are generally bordered by grassland. In seven instances another woodland stand type borders a portion of a Valley Riparian stand.

The Valley oak woodland type occurs in only a few areas in Clover Valley. The Valley oak woodland stands are generally quite small. Three of the five stands are found adjacent to the Foothill Valley Riparian stands. I would have anticipated additional Valley oaks along the valley bottom between the Foothill Valley Riparian stands and the Blue oak woodlands stand since these deep alluvial soils will support the growth of Valley oaks. The lack of additional Valley oaks could be due to historical harvesting of these trees to "improve" the capacity of the grasslands along the valley floor to support cattle. Raising cattle did occur in the recent and historical past.

The natural edge between woodland types and between the woodland types and grassland type is generally well maintained with the proposed project alignment (see Oak Woodlands Stands Map). There are portions of the Blue oak savannah (stand 47, 28, 37, 33, 9) that will continue to border the proximate Blue oak woodland stands (46, 18, 40, 36, 38, 32, 7, and 6). In all but one case, the edge between the Foothill Valley Riparian stands and other adjacent woodland stand types will be maintained following the implementation of the proposed project. Overall however there is a reduction of natural stand edge and an increase in induced edge as a result of this project. This reduction in natural edge is the result of the positioning of the residential lots along the edges of the woodland stands and placing the lots along the ridges in the Blue oak savannah stand type. The Blue oak savannah type has a high degree of edge habitat. The negative effect of the increase in induced edge includes an increase in human activities, an increased likelihood that domestic pets will escape to the wild and become feral, an increase in the potential for the introduction of invasive non-native plants, and an increase in animal species that prey on bird nest and are well adapted to living in close proximity to humans (Tietje, Purcell, Drill).

Stand Connectivity

The continuity of each stand type within the project is fairly well maintained. The *Planner's Guide to Oak Woodlands* suggests that one large stand of trees is better than many small patches.

On the West half of the project there are six contiguous stands (18, 19, 20, 28, 46, & 47) that encompass 95.3 acres of woodland. This forest area creates a nearly continuous woodland that connects woodlands to the north of the project with those situated in the western half of the project. These Blue oak woodland stands stretch from the southwestern corner of the project to the northwestern edge of the project and provides a degree of connectivity to the oak woodland stands on the adjacent property at either end of the project. These stands also connect to the Valley Foothill Riparian Habitat at two locations. This forest area is fragmented by the proposed connector road between Sierra College Boulevard and Park Drive and one secondary road that provides circulation within the project for phase 4F. The connector road splits this forest area into two continuous woodlands that are approximately 32.0 acres and 63.2 acres. The 32.0 acre area has three trail or utility easements bisecting it. The 63.2 acre stand has two trail or utility easements bisecting it and one secondary roadway that provides circulation for phase 4F. These stands will provide wildlife habitat for oak woodland species and a migration corridor to other oak woodland stands. These corridors will work better for birds than for terrestrial wildlife since the connector road between Sierra College Boulevard to Park Drive and to a lesser degree the secondary road and trail or utility easements will impede overland travel by terrestrial wildlife by varying degrees depending on the size and habits of the animal in question.

There are four contiguous stands (40, 36, 38, & 39) that encompasses 85.3 acres of woodland in the northeastern portion of the project. This forest area creates a nearly continuous woodland that connects oak woodlands to the north of the project with those situated in the northeast corner of the project. These stands also connect to the Valley Foothill Riparian Habitat at one location. This forest area is fragmented by the proposed connector road between Sierra College Boulevard and Park Drive and two secondary roads that provide circulation within the project for phase 4B and 4C. The connector road splits this forest area into two continuous woodlands that are approximately 32.7 acres and 41.4 acres. The 32.7 acre stand is not fragmented. The 41.4 acre stand is bisected by one utility easement. These stands will provide wildlife habitat for oak woodland species and a migration corridor to other oak woodland stands. These stands will work better as migration corridors for birds than for terrestrial wildlife since the proposed connector road between Sierra College Boulevard to Park Drive and to a lesser degree the secondary road and trail or utility easements will impede overland travel by terrestrial wildlife by varying degrees depending on the size and habits of the animal in question.

In the southern 1/4 of the project there are six separate stands (1, 2, 3, 6, 7 & 11) that encompass 56.9 acres of woodland that will remain following the implementation of the project. This large forest area is fragmented by two roadways. The roads bisect this forest area into three contiguous woodlands of 13.8 acres (stands 1,2,3,6 & 11), 20.3 acres (stand 6), 22.8 acres (stand 7). These woodlands connect to adjacent parcels that border the lower 1/3 of the project. There appears to be oak woodland habitat south of stands 1 & 2. The adjacent stands that adjoin this project appear to have some connectivity within them; however there are impediments to migration similar to those in the Clover Valley project i.e. roadways, trails, and miscellaneous infrastructure.

One of the results of habitat fragmentation is the reduction of neotropical bird populations (Merenlender & Heise). The project addresses the potential affects of habitat fragmentation by clustering residential lots in a configuration that limits the fragmentation of the woodland habitats to roadways, developed trails, and infrastructure right of way areas that bisect individual stands. Another positive affect of either retaining large stands or smaller connected stands that it will encourage the use of these stand by coyotes, bobcat, and mountain lions all of which have been shown to reduce the populations of non-native predators of ground nesting birds such as house cats and red foxes(Tietje, Purcell, Drill). This project has focused the residential development in both the Blue oak savannah stands and in the grassland habitat along the Clover Valley floor. This clustering of homes in the high density Blue oak woodland stands minimizes the number of oak trees impacted and leaves large fairly contiguous stands of oak woodlands intact including the ecologically sensitive Valley Foothill Riparian stands. The negative affect of this strategy is that the majority of the Blue oak savannah stand type is impacted as a result of this development.

Thresholds of Significance

The Rocklin Oak Tree Preservation Ordinance and CEQA both have criteria for determining thresholds for the level of significance for oak woodlands. The Rocklin Oak Tree Preservation Ordinance 17.77 clearly states numeric thresholds for significant impacts. The CEQA significance thresholds for a project can be both quantitative and qualitative.

A CEQA analysis needs to identify the point at which a given environmental effect becomes significant. The thresholds identified for determining a significant effect on oak woodlands are as follows:

- 1) The impacts on oak woodlands will have a negative impact on wildlife.

The impacts to flora and fauna has already been addressed in the Recirculated Draft EIR section 4.8 Biological Resources.

- 2) The impacts on oak woodlands will have a negative impact on soil.

The removal of vegetation as part of the proposed project has already been addressed in the Recirculated Draft EIR section 4.9 Geology

- 3) The impacts on oak woodlands will have a negative impact on watersheds.

The impacts to flora and fauna has already been addressed in the Recirculated Draft EIR section 4.11 Hydrology and Water Quality.

- 4) The impacts on oak woodlands will have a significant impact on oak woodland distribution or connectivity of habitats.

Removal of oak woodlands will adversely affect the availability of oak woodland habitat locally and/or create a significant barrier to the connectivity of local stands of oak woodlands.

Determination of Significance

The project at the local level mainly impacts individual trees and stands of trees in the Blue oak savannah type. The impact to the affected stands of trees will involve the removal of oak trees in order to make room for residential homes. The project design clusters homes on the flatter topography in the Blue oak savannah and along the fringes of other Blue oak woodlands. Clustering homes in the Blue oak savannah allowed residences to be placed off of steeper side slopes and away from the riparian habitats. Positioning clusters of homes in a tightly packed configuration reduced the size of "foot print" each phase required for the same number of housing units. This design strategy will allow for the retention of large contiguous woodland areas following the implementation of the

project, preserve open space, avoid both high density stands of oak trees and sensitive habitat areas including wetlands, associated Valley Foothill Riparian woodland stands and most of the Valley oak woodland stands.

This project will protected 68.4% of the existing oak woodland stands and 78.6% of the existing oak woodland canopy. The stands of oak woodlands will be preserved mainly as large contiguous blocks of forest. There will be seven large contiguous forest areas that will be nearly devoid of impediments except for utility or trail easements. These large intact woodlands include: 20.3 acres of stand 6; 22.8 acres of stand 7; 38.0 acres of stand 18; 25.3 acres of stands 18, 19, & 20; 31.4 acres of stand 46; and 41.4 acres of stands 33, 34, 36, 37, & 40; and 32.7 acres of stand 37, 40, & 45. The retention of these large woodland areas would not have been feasible if the project was designed with the residences dispersed through the project area. The clustering of the proposed residences along with the 43% reduction in the number of proposed units from 974 to 558 allowed the opportunity for retaining the preponderance of oaks and oak woodlands within the project area. The project as proposed address the retention of oak woodlands stands in a meaningful and effective manner. The project as proposed appropriately meets the intent Rocklin Oak Tree Preservation Ordinance to "address the decline of oak woodlands due to urbanization through a considered attempt to balance against the social benefits of private property ownership and development."

The impact to the Blue Oak woodland type at the state level can be put into context by reviewing the 2003 Forest Range Assessment (FRAP). Of the 9.8 million acres of Hardwood Woodland and Hardwood Forest identified in the 2003 FRAP report the Blue Oak Woodland habitat comprises 29 percent of the hardwood coverage. The Blue oak/Foothill pine type comprises an additional 10 percent of the hardwoods of California. Looking at the Figure 21 on page 50 of the FRAP report showing the CWHR types it appears that the Blue oak savannah type was included with the Blue oak woodland type for the purpose of analyzing the statewide extent of large Blue oak habitat types. These figures reveal that there are several million acres of Blue oak woodland types present in California.

Considering the abundance of Blue oak woodland types in California, the preservation of approximately 72% of the existing oak woodlands in the project area, in a configuration that provides connectivity and large unfragmented woodlands, combined with the analysis provided in the Draft EIR including: Biological Resources, Geology, Hydrology and Water Quality the impacts to oak woodland habitat from the proposed projects would be considered ***less-than-significant*** at either the local or state level.

Mitigations

The 1998 Development Agreement (DA-97-01) between the City of Rocklin of Rocklin outlines the means with which the impacts to the oak woodlands will be mitigated. According to that agreement the developer shall:

- 1) grant to the City open space and conservation easements for an Oak Tree Preserve and an Open Space Trail System; and
- 2) construct a bicycle/pedestrian trail to the satisfaction of the City within the central portion of the site and along the southern side of the east/west connector road, from the west boundary of the project to the west side of the commercial parcel at Sierra College Boulevard.

The proposed creation of the Oak Tree Preserve and Open Space Trail System along with improvements of the trail system were deemed acceptable "as full mitigation for oak tree removals under Rocklin Municipal Code Chapter 17.77 so long as the number of oak trees which may be removed by [the] Developer does not exceed the greater of 25-percent of the Project's total oak tree diameter at breast height (DBH) or 25-percent of the total number of trees in the Project." The project impacts 18.3% of the trees within the principal project boundary. These trees include all of the phases, the fire station, commercial lot, and all of the associated roads including the connector road between Sierra College Boulevard and Park Drive.

The project design focused the clustering of residences in a manner that preserves large contiguous woodland areas, preserves open space, avoids both high density stands of oak trees and sensitive habitat areas including wetlands, associated Valley Foothill Riparian woodland stands and most of the Valley oak woodland stands; the project has amply mitigated for the maintenance of oak woodlands in Clover Valley.

The following are a few other actions that could be included as additional mitigation. Any of these actions should be considered optional since the project design currently meets the 1998 Development Agreement (DA-97-01) and the intent of the Rocklin Oak Tree Preservation Ordinance to "address the decline of oak woodlands due to urbanization through a considered attempt to balance against the social benefits of private property ownership and development."

Trail Construction

The impact to the long term health of individual trees adjacent to the trail should be mitigated for during the construction phase of the trail system. The trees next to the bike/walking trails are desirable for retention for shade, aesthetics, and their contribution to habitat. The risk of harming the trees that are in close proximity to the trails is generally related to soil compaction due to the fact that the trails are generally upslope of the subject trees. This can be mitigated by

using the smallest equipment that can feasibly construct these trails and construct these trails when the soil moisture is lowest, i.e. in the months of August and September. In some cases damage to the root wad from excavation could occur. This can be mitigated by adding meanders to the trail, where feasible, to avoid as much of the root wad as possible.

Implement Fire Safe Strategies that Enhance Wildlife Opportunities.

The proposed plan will require the implementation of a fuels management plan. The implementation of this plan will require the removal of ground fuels and ladder fuels. This material will generally be small diameter trees, bushes, and leaf litter. The clearing effort would create a defensible space that was at least 30-50 feet from improvements. The clearing should leave some scattered brush species intermixed with a cleared understory. Cuttings from this clearing effort could be placed in small 4'x4'x5' tall piles outside of the defensible space in a well distributed arrangement that would provide habitat for woodrats, mice, and quail. The piles could be placed in openings or against existing bushes, but should not be placed in close proximity to the boles of standing trees, since this fuel would create a ladder to the crowns of the adjacent trees. This habitat enhancement should be limited to approximately 4-5 piles/acre so that the adjacent woodlands are not overburdened with flammable fuel.

Future Recruitment and Valley Oak Stands in Clover Valley and Community Outreach Program

Identify suitable areas along and adjacent to the Valley Foothill Riparian Stands that at a later date could be made available for the planting of Valley oaks. The areas identified could be made available to either a local boy scout or girl scout or elementary school class for the purposes of establishing future stands of Valley oaks adjacent to the the Valley Foothill Riparian Stands and learning about oak tree establishment, tree growth, and animals that use or eat oak trees. This planting effort could take place in cooperation with the local Natural Resources Conservation Service staff. This effort would be undertaken to increase the numbers of Valley oaks in the project area and improve the size and complexity of the stands adjacent to Clover Creek. The plantings would utilize locally collected Valley oak acorns and follow a methodology outlined in *Acorn Collection, Storage, Sorting, and Planting for the Establishment of Native Oaks Without Supplemental Irrigation*, by Ronald W. Motz. Consideration for the potential for encountering Archeological resources should be addressed when planning how and where this planting effort occurs. Irrigation of these seedlings may also be required to ensure successful establishment of these native oaks.

References:

- Clover Valley LARGE AND SMALL LOT TENTATIVE SUBDIVISION MAPS PROJECT; # SD-98-05 SCH# 93122077; Recirculated Draft Environmental Impact Report PREPARED FOR THE CITY OF ROCKLIN; Raney Planning & Management, Inc. January 2006.
- Vegetation assessment: Clover Valley Lakes EIR.; Robert F. Holland, Ph.D., July 1992.
- Clover Valley Ranch Botanic Survey; Acorn Environmental Consulting, July 1991.
- An Ecosystem-Based Approach to Valley Oak Mitigation; USDA Forest Service Gen. Tech. Rep. PSW GTR-160, Marcus S. Rawlings, Daniel A Airola, 1997.
- Wildlife Response to Different Kinds of Residential Development; Integrated Hardwood Range Management Program, Oak Fact Sheets No. 86, Adina Merenlender, Kerry Heise, 2000.
- Evaluation of Techniques and Costs for Valley Oak Riparian Forest Restoration on the Sacramento River; USDA Forest Service Gen. Tech. Rep. PSW GTR-160, Thomas Griggs, Daryl Peterson, 1997
- A Planner's Guide for Oak Woodlands; University of California Agriculture and Natural Resources Publication 3491, second edition 2005; Gregory Giusti, Doug McCreary, Richard Standiford.
- The Integrated Hardwood Range Management Program: Education and Research as a Conservation Strategy; USDA Forest Service Gen. Tech. Rep. PSW GTR-160, Richard Standiford, James Bartolome, 1997.
- Guidelines for Managing California's Hardwood Rangelands; University of California Agriculture and Natural Resources Publication 3368, 1996.
- California Wildlife and their Habitats: Western Sierra Nevada. USDA Forest Service Gen. Tech. Rep. PSW-37.; Verner, J., and A.S. Boss 1980.
- A Guide to Wildlife Habitats of California; California Department of Forestry and Fire Protection, Kenneth Mayer, William Laudenslayer, Jr., 1988.
- City of Rocklin Title 17, Zoning Ordinance; City of Rocklin Community Development Department, July 2002.
- Aerial Imagery, Stantec Inc.

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PROFILE

Registered Professional Forester #2469. Extensive background in satisfying the regulatory requirements for gaining approval of Timber Harvest Plans including: biological assessments, watercourse assessments, raptor surveys, botanical surveys, erosion site identification and mitigation, road engineering, logging engineering, silviculture, reforestation, controlled burning, and logging contract administration.

Negotiated extensively with the California Department of Forestry and Fire Protection, California Department of Fish and Game, Regional Water Quality Control Board, and the Department of Mines and Geology, and the USFWS during the Timber Harvest Plan approval process in order to craft a permit (THP) that both protected the environment and produced a satisfactory outcome that met the landowners forest management objectives.

Recent work has been focused on obtaining approval of Tentative Subdivision Maps, Parcel Maps and Rezone applications.

EMPLOYMENT *Sierra Pacific Industries, Lands Forester, Land Investment & Development Division* **2004-Present**

- Responsible for submitting rezone applications that provide for future management flexibility.
- Timber harvest planning and administration as part of the Conversion for Subdivision.
- Administer water availability and waste disposal investigations.
- Obtain road easements.
- Meet with stakeholders and negotiate feasible mitigation to perceived problems associated with a projects implementation.

Sierra Pacific Industries, Division Forester **1992-2004**
Weaverville Timberlands Division Forester.

Responsible for managing timberlands on the 200,000 acre Weaverville District of Sierra Pacific Industries.

- Duties included preparing and administering Timber Harvest Plans. Timber Harvest preparation included: biological assessments, watercourse assessment and the establishment of adequate protection measures, raptor surveys, marbled murrelet surveys, botanical surveys, erosion site identification and mitigation, road engineering, logging engineering, silviculture and timber marking.
- Administrative duties included: Estimating Logging, Road Construction and Reconstruction costs, supervising logging crews and their compliance with the Timber Harvest Plan and Logging Contract, supervising road construction crews and their compliance with Timber Harvest Plan and Construction Contract.
- Supervision of controlled burning projects including; fire line placement, ignition timing and pattern, personnel safety, fire suppression and monitoring.
- Supervising reforestation crews including tree planting crews, herbicide release treatments, and pre-commercial thinning crews.

Sierra Pacific Industries, Inventory Forester **1990-1992**

- As part of the field inventory crew, measured tree parameters that were utilized as part of the long term planning effort that resulted in the Sierra Pacific Industries 100 year Sustained Yield Plan.
- Surveyed for Spotted Owls on company lands, including determination of nesting status.

TRAINING

Sponsor	Class Name	Instructor	Location	Date
CLFA	Wildlife Identification for Resource Professionals	Numerous	Sacramento	Nov-90
CDF	Archeological Training for Resource Professionals	Dan Foster, Rich Jenkins, Brian Dillon	Redding	Mar-93
CA Dept. Fish and Game	Southern Torrent Salamander: Identification and Habitat	Julie Kelly	Grizzly Creek	Jun-95
CLFA	Anadromous Fisheries Workshop for Resource Professionals	Numerous	Sacramento	Mar-95
CDF	Basic Wildland Safety Training	Frank G. Rous???	Anderson	Mar-97
SPI/Timber Operators Council	Personal Communications	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Constructive Confrontation	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Improving Performance through Teamwork	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Coaching and Discipline	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Training Employees	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Harassment Discrimination and the Law	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Managing Safety	Dave Asivido	Anderson	completed 1997
SPI/Timber Operators Council	Managing People	Dave Asivido	Anderson	completed 1997
CDF	Archeological Training for Resource Professionals Refresher Course	Dan Foster, Rich Jenkins, Brian Dillon	Burney	Sep-97
CLFA	Identification and Management of Unstable areas on Forested Landscapes Workshop	Mike Heath Trinda Bedrossian, Kit Custis, Tom Spittler, Lois Kaufman	Sacramento	Oct-99
CLFA	Identification and Management of Unstable areas on Forested Landscapes Workshop Field Trip	Tom Spittler etal.	Humboldt Co.	Mar-00
SPI	Botany-CNPS plants	Ann W/Tom E.	North Trinity	May & June 2000
SPI	Botany-CNPS plants	Ann W/Tom E.	Anderson	1/25/2001
SPI	Pesticide Safety Training	Bob Taylor	Weaverville	12/3/2001
SPI	Negotiations	Cajun James	Anderson	3/5/2002
SPI	Botany-CNPS plants	Cajun James	Anderson	3/5/2002
SPI	AGIS training	Glen Rouse	Anderson	3/5/2002
SPI	LTO Annual meeting	Tom Walz	Weaverville	4/20/2002
SPI	Botany-CNPS plants	Cajun James	Rattlesnake Terrain	5/8/2002
SPI	Botany-CNPS plants	Cajun James	North Trinity	6/11/2002

CLFA/CDF	Archeological Training for Resource Professionals Refresher Course	Rich Jenkins etal	Weed	6/13/2002
Karrass Negotiations Training	Effective negotiating	Karrass trainer	Anderson	6/14/2002
Karrass Negotiations Training	Effective negotiating	Karrass trainer	Anderson	6/15/2002
SPI	Tri-max fire suppression equipment use & ATV use	Kieth Alvord	Weaverville	10/24/2002
SPI	Batch Mixer use training	Kieth Alvord	Weaverville	10/24/2002
SPI	Pesticide Safety Training	Bob Taylor	Weaverville	10/24/2002
SPI	Fire weather stations. Fire Policy.	Cajun James	Anderson	1/27/2003
SPI	Botany	Tom Engstrom	Anderson	1/27/2003
SPI	Fire Arson occurence and management	Chuck Miller	Anderson	1/27/2003
SPI	Raptor ID, policy, CEQA compliance	Julie Kelly, Steve Self, Ed Murphy	Anderson	1/28/2003
SPI	Botany-CNPS plants	Tom Engstrom, Dr. Dean Taylor	Anderson	2/4/2003
SPI	LTO Annual meeting	Tom Walz	Weaverville	2/18/2002
SPI	Raptor ID	Julie Kelly & Steve Self	Weaverville	3/3/2003
SPI	Pesticide Safety Training	Bob Taylor	Weaverville	1/8/2004
SPI	Botany-CNPS plants	Dr. Dean Taylor/Tom Engstrom	Weaverville	2/11/2004
Western Forestry Association	Rights-of-way, easements, access, tresspass	Ann Burns & Bruce Williams, Attorneys at Law	Medford, OR	2/22/2005

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY, CA

1989

B.S. Forestry

Areas of Concentration: Management, Wildlife, Harvesting