

**Native Tree Impact
Erickson Residence Permit Exception, P13-00348
3211 State Highway 29
APN: 022-070-046
Napa County**



KJELDSSEN BIOLOGICAL CONSULTING
923 St. Helena Ave.
Santa Rosa, CA 95404

January 7, 2014

EXECUTIVE SUMMARY

This review was conducted at the request of the property owner and Napa County. The project proposes a temporary access road for the construction of a tennis court. The property is located at 3211 State Highway 29, St Helena, CA. It is within the USGS St Helena Quadrangle, Napa County. The property is north of the city of St Helena on the west side of Napa Valley. The parcel is a +/- 20-acre parcel on east facing slopes.

Napa County has requested information on the loss of trees native to the region and mitigation measures that adequately addresses the tree loss as part of the project. The findings presented are the result of field study conducted on December 16, 2013, by Kjeldsen Biological Consulting. The findings are the following:

- The property consists of a house and guest house with infrastructure, landscape plantings, fruit orchard, and open space woodlands and chaparral;
- The temporary construction road extends through an olive plantation within oak woodlands. The temporary road will consist of cut and fill that will be removed after completion of the tennis court and the existing grades restored;
- The tennis court area consists of a mix of Oak Woodlands and shrubs on a ridge below the residence;
- No sensitive habitat or biotic communities of limited distribution are present on the project site;
- Mapping provided of the proposed road alignment and tennis court shows that 36 native trees will be either removed or impacted (within cut and fill) by the proposed project.

Native trees (>6in DBH) impacted by the proposed project.

| Tree Species | | | |
|---------------------------------|--------------------|-------------|---------------------|
| <u>Scientific Name</u> | <u>Common Name</u> | Road | Tennis Court |
| <i>Quercus agrifolia</i> | Live Oak | 5 | 3 |
| <i>Quercus kelloggii</i> | Black Oak | 1 | 5 |
| <i>Arbutus menziesii</i> | Madrone | 2 | 5 |
| <i>Umbellularia californica</i> | Bay | 5 | 5 |
| <i>Pseudotsuga menziesii</i> | Doug Fir | 0 | 5 |
| | Total | 13 | 23 |

As per survey of project footprint 10/10/13 by Delta Consulting

- Trees along the edge of the project may require pruning and or may have their roots impacted by the cut and fill of the road grading;
- The flora and fauna observed on and near the site are included as an Appendix.

Proposed Mitigation Measures.

It is proposed that native trees be replanted around the grade of the tennis court and on other parts of the parcel be implemented to mitigate for the loss of native species at a two to one ratio.

The following measures should be considered in the implementation of the project to protect local biological resources:

1. All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures, retaining ground cover litter, monitoring for invasive species, providing mulch for bare ground must be implemented to protect off-site movement of sediment and dust during and post construction;
2. Construction fencing and signage must be installed around trees out side of the project site to protect there root zones, and to ensure that no construction equipment, fill, staging or storage occur adjacent to the creek;
3. Any roots, over two inches, encountered during excavation of trees not proposed for removal shall be exposed by hand and roots shall be cut cleanly with a saw (if necessary) to minimize impacts to the longevity of the tree;
4. If road or grading cuts exposing roots of near by trees they should be inspected by an Arbororist or biologist for potential long-term impacts. It is recommended that this evaluation be made at the time of construction.
5. Following construction when the road is removed and the restoration of existing grades the area should be inspected by an Arbororist or biologist to determine if any additional trees have been impacted. Root damage could compromise the longevity of the tree and if it is determined that there is a risk to the tree survival additional replacement plantings will be necessary.
6. Plant trees according to attached recommended planting plan (Appendix B).

Native Tree Impact

Erickson Residence Permit Exception, P13-00348

INTRODUCTION

This study was conducted at the request of the property owner and Napa County. The project proposes a temporary construction road for the construction of a tennis court below the residence. The road will extend off of an existing paved driveway (see Photo # 1) through a developed landscape with residual native trees to the proposed site of the tennis court. Upon completion of the tennis court the road grade will be removed and the existing topography restored. The temporary construction road will be 10 foot wide on slopes greater than 30% and extend for 420 feet around and below the residence. The proposed alignment will require the removal of native trees.

The property is located at 3211 State Highway 29, north of the City of St Helena. It is within the USGS St Helena Quadrangle, Napa County. The property is north on the west side of Napa Valley. The parcel is a +/- 20-acre parcel on east facing slopes. The findings presented below are the results of fieldwork conducted by Kjeldsen Biological Consulting.

PURPOSE

This biological review was conducted to provide requested information for the Use Permit Exception request application for County Review (Letter of November 8, 2013 from Planning, Building and Environmental Services). This report addresses information requested regarding potential loss of trees native to the valley and mitigation measures that will adequately address the tree loss from the project.

METHODS

Our fieldwork and photographs were conducted on December 16, 2013. Our site study was conducted by walking the proposed project footprint. A survey of project footprint 10/10/13 by Delta Consulting was provided which shows the trees within the footprint of the project. All trees within the soil disturbance area were counted. Trees that split or have several trunks at Diameter Breast Height (DBH 4.5-feet) are counted as individual trees.

Plants Our field survey was conducted recording and identifying all species on the project site and in the vicinity. The open nature of the site, landscape plantings and relatively small size of the proposed development footprint facilitated our field studies.

FINDINGS

The site is located within the North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993), which is strongly influenced by the Pacific Ocean. The region is in a climate Zone "Ocean influenced Northern and Central California" characterized as an area with ocean or cold air influence. The climate of the region is characterized by hot, dry

summers and cool, wet winters, with precipitation that varies regionally from less than 30 to more than 60 inches per year. This climate regime is referred to as a “Mediterranean Climate.” The average annual temperature ranges from 45 to 90 degrees Fahrenheit. In the region there are abiotic variations, including geology, which result in a high level of biological diversity per unit area often within short distances.

Habitat

It is generally convenient to refer to the vegetation associates on a site as a plant community. There have been numerous plant community classification schemes proposed by different authors. There is also evidence that the vegetation in nature is part of a continuum without well-defined boundaries. For practical purposes and site descriptions plant communities/associations or habitat types are used.

The plant community or alliance on the project site would be considered to be landscape plantings, olive orchard with residual native trees (mixed oak woodland).

Sawyer, J. O., T. Keeler-Wolf and Julie M. Evans 2009. A Manual of California Vegetation Second Edition classifies the native vegetation on the site as Mixed Oak Woodland. This classification is the presently preferred system that over time will replace existing classification systems. The photographs below illustrate the project site.



Photo 1. View of the proposed construction access road alignment. The alignment will proceed from the driveway in the foreground.



Photo 2. The proposed construction road will extend through the landscaping and extend to the right at the center of the photograph to the proposed tennis court.



Photo 3. Ridge which is the site of the proposed tennis court.

Sensitive Communities

The Napa County Baseline Data Report defines Biotic communities as the characteristic assemblages of plants and animals that are found in a given range of soil, climate, and topographic conditions across a region. Sensitive biotic communities in the County were identified using a two-step process for the Napa County Baseline Data Report. The two steps were:

1. An existing list of sensitive biotic communities prepared by the California Department of Fish and Wildlife (DFW) (2003a) was first reviewed by senior Jones & Stokes biologists, and those communities that may occur in the County were identified. Because the community names in the DFW list (2003a) did not correspond directly with the names used in the Land Cover Layer, a determination was made as to which land cover types on the Land Cover Layer correspond to the communities on the DFW list.

2. The aerial extent of each land cover types mapped in the County was generated from the land cover layer. Those biotic communities with an areal extent of less than 500 acres in the County (approximately 0.1% of the County) were identified. These communities were discussed with local experts and their conservation importance established. Those that were not already on the original DFW list and that were determined to be worthy of conservation were added to the list.

The Napa County Baseline Data Report as well as the California Department of Fish and Wildlife Natural Diversity Data Base (DFW CNDDDB) lists recognized Sensitive Biotic Communities. The Napa County Baseline Data Report lists twenty-three communities which are considered sensitive by DFW due to their rarity, high biological diversity, and/or susceptibility to disturbance or destruction. The CNDDDB communities in Napa County are the following:

Serpentine bunchgrass grassland, Wildflower field (located within native grassland), Creeping ryegrass grassland, Purple Needlegrass grassland, One-sided bluegrass grassland, Mixed serpentine chaparral, McNab cypress woodland, Oregon white oak woodland, California bay forests and woodlands, Fremont cottonwood riparian forests, Arroyo willow riparian forests, Black willow riparian forests, Pacific willow riparian forests, Red willow riparian forests, Narrow willow riparian forests, Mixed willow riparian forests, Sargent cypress woodland, Douglas-fir-ponderosa pine forest (old-growth), Redwood forest, Coastal and valley freshwater marsh, Coastal brackish marsh, Northern coastal salt marsh, and Northern vernal pool.

Napa County biotic communities of limited distribution that are sensitive include: Native grassland; Tanbark oak alliance; Brewer willow alliance; Ponderosa pine alliance; Riverine, lacustrine, and tidal mudflats; and Wet meadow grasses super alliance.

No sensitive habitat or biotic communities of limited distribution present on the project site.

Native Tree Impacts

The proposed alignment of the road and tennis court shows that 36 native trees will be removed by the proposed project (our analysis of the proposed project footprint is presented in the table below);

Trees (>6in DBH)

| Tree Species | | | |
|---------------------------------|--------------------|-------------|---------------------|
| <u>Scientific Name</u> | <u>Common Name</u> | Road | Tennis Court |
| <i>Quercus agrifolia</i> | Live Oak | 5 | 3 |
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As per survey of project footprint 10/10/13 by Delta Consulting

Trees along the edge of the project may require pruning and or may have their roots impacted by the cut and fill of the road grading. All trees within the soil disturbance area were counted. Trees that split or have several trunks at Diameter Breast Height (DBH 4.5-feet) are counted as individual trees.

RECOMMENDED MITIGATION MEASURES FOR

It is proposed that native trees be replanted around the grade of the tennis court and on other parts of the parcel be implemented to mitigate for the loss of native species at a two to one ratio.

The following measures should be considered in the implementation of the project to protect local biological resources:

1. All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures, retaining ground cover litter, monitoring for invasive species, providing mulch for bare ground must be implemented to protect off-site movement of sediment and dust during and post construction;
2. Construction fencing and signage must be installed around trees out side of the project site to protect there root zones, and to ensure that no construction equipment, fill, staging or storage occur adjacent to the creek;
3. Any roots, over two inches, encountered during excavation of trees not proposed for removal shall be exposed by hand and roots shall be cut cleanly with a saw (if necessary) to minimize impacts to the longevity of the tree;
4. If road or grading cuts exposing roots of near by trees they should be inspected by an Arbororist or biologist for potential long-term impacts. It is recommended that this evaluation be made at the time of construction.

5. Following construction when the road is removed and the restoration of existing grades the area should be inspected by an Arbororist or biologist to determine if any additional trees have been impacted. Root damage could compromise the longevity of the tree and if it is determined that there is a risk to the tree survival additional replacement plantings will be necessary.
6. Plant trees according to attached recommended planting plan (Appendix B).

SUMMARY

The project as proposed will impact a total of 36 trees native to Napa County. Replacement plantings at a two to one ratio is proposed to mitigate for the loss by the project. Replacement plantings can be initiated on the property. Napa county General Plan Policy Con-24 Paragraph (c) states that a project should "provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio." A recommended Tree Planting Plan is presented in Appendix B of this report.

Should you have any questions, please do not hesitate to contact us at, (707) 544-3091, Fax (707) 575-8030, or by email at (Kjeldsen@sonic.net).

Kjeldsen Biological Consulting
Kjeldsen Biological Consulting

ATTACHMENTS

- Appendix A List of Plants Observed**
- Appendix B Recommended Planting Plan**

Names of and Qualifications of Field Investigators

Daniel T. Kjeldsen, B. S., Natural Resource Management, California Polytechnic State University, San Luis Obispo, California. He spent 1994 to 1996 in the Peace Corps managing natural resources in Honduras, Central America. His work for the Peace Corps in Central America focused on watershed inventory, mapping and the development and implementation of a protection plan. He has over fifteen years of experience in conducting Biological Assessments, DFW Habitat Assessments, ACOE wetland delineations, wetland rehabilitation, and development of and implementation of mitigation projects and mitigation monitoring. He has received 3.2 continuing education units MCLE 27 hours in Determining Federal Wetlands Jurisdiction from the University of California Berkeley Extension. A full resume is available upon request.

Chris K. Kjeldsen, Ph.D., Botany, Oregon State University, Corvallis, Oregon. He has over thirty-five years of professional experience in the study of California flora. He was a member of the Sonoma County Planning Commission and Board of Zoning (1972 to 1976). He has over thirty years of experience in managing and conducting environmental projects involving impact assessment and preparation of compliance documents, Biological Assessments, DFW Habitat Assessments, DFW SB 34 Mitigation projects, ACOE Mitigation projects and State Parks and Recreation Biological Resource Studies. Experience includes conducting special-status species surveys, jurisdictional wetland delineations, general biological surveys, 404 and 1601-1603 permitting, and consulting on various projects. He has taught Plant Taxonomy at Oregon State University (three years) and numerous botanical science and aquatic botany courses (thirty-five years) at Sonoma State University including sections on wetlands and wetland delineation techniques. He has supervised numerous graduate theses, NSF, DOE and local agency grants and served as a university administrator. A full resume is available upon request. He has a valid DFW collecting permit.

Appendix A

Plants Observed

The nomenclature for the list of plants found on the project study areas and the immediate vicinity follows: Brodo, Irwin M., Sylvia Duran Sharnoff and Stephen Sharnoff, 2001, for the lichens; Arora -1985, for the fungi; S. Norris and Shevrock - 2004, for the mosses; and Baldwin, B.G., D.H. Goldman, D.J.Keil, R.Patterson, T.J.Rosati, and D.H.Wilkens, editors, 2012 - for the vascular plants.

Habitat type indicates the general associated occurrence of the taxon on the project site or in nature. **Abundance** refers to the relative number of individuals on the project site or in the region.

| MAJOR PLANT GROUP | | |
|--------------------------|---------------------|------------------|
| Family | | |
| Genus | Habitat Type | Abundance |
| Common Name | | |

NCN = No Common Name, * = Non-native, @= Voucher Specimen

FUNGI

Basidiomycota- Club Fungi

POLYPORACEAE

| | | |
|------------------------------|------------------------|--------|
| <i>Daedalea quercina</i> | Woodlands on Dead Wood | Common |
| Thick-walled Maze Polypore | | |
| <i>Lenzites betulina</i> | Woodlands on Dead Wood | Common |
| Gilled Polypore | | |
| <i>Schizophyllum commune</i> | Woodlands on Dead Wood | Common |
| Split-gill | | |
| <i>Stereum hirsutum</i> | Woodlands on Dead Wood | Common |
| False Turkey Tail | | |
| <i>Trametes versicolor</i> | Woodlands on Dead Wood | Common |
| Turkey Tail | | |

MOSESSES

MINACEAE

| | | |
|--|---|--------|
| <i>Alsia californica</i> (W.J.Hooker&Arnott) | Sullivant Coastal Forests On Trees | Common |
| NCN | | |
| <i>Dendroalsia abietina</i> (Hook.) Brit. | Woodlands | Common |
| NCN | | |
| <i>Homalothecium nuttallii</i> (Wilson) | Jaeger Epiphytic on Trees Near Coast-Inland | Common |
| NCN | | |
| <i>Orthotrichum lyellii</i> Hook & Tayl. | Woodlands, Upper Canopy | Common |
| NCN | | |
| <i>Scleropodium touretii</i> (Brid.) L Koch. | Woodlands | Common |
| NCN | | |

MAJOR PLANT GROUP**Family**

| <u>Genus</u> | <u>Habitat Type</u> | <u>Abundance</u> |
|--------------------|---------------------|------------------|
| <u>Common Name</u> | | |

NCN = No Common Name, * = Non-native, @ = Voucher Specimen

LICHENS**FOLIOSE**

| | | |
|---|---------------------------------|------------|
| @ <i>Cetraria orbata</i> (Nyl.) Fink | On Limbs Usually Conifers | Occasional |
| NCN (= <i>Tuckermannopsis orbata</i>) | | |
| <i>Flavoparmelia caperata</i> (L.) Hale | On Oaks | Common |
| NCN | | |
| <i>Flavopunctilia flaventor</i> (Stirt.) Hale | On Oaks | Common |
| NCN | | |
| @ <i>Hypogymnia apinnata</i> Goward & McCune | On Conifers, Manzanita Branches | Occasional |
| Beaded Tube Lichen | | |
| @ <i>Hypogymnia inactiva</i> (Krog) Ohlsson | On Oaks | Common |
| NCN | | |
| @ <i>Parmelia sulcata</i> Taylor | On Oaks | Common |
| NCN | | |
| <i>Pseudocyphellaria anomala</i> Brodo & Ahti | On Oaks | Common |
| NCN | | |

FRUTICOSE

| | | |
|---|---------|--------|
| <i>Evernia prunastri</i> (L.) Ach. | On Oaks | Common |
| NCN | | |
| <i>Ramalina farinacea</i> (L.) Ach. | On Oaks | Common |
| NCN | | |
| <i>Usnea intermedia</i> = <i>U. arizonica</i> | On Oaks | Common |
| NCN | | |

CRUSTOSE

| | | |
|--------------------------------------|---------|--------|
| <i>Pertusaria armara</i> (Ach.) Nyl. | On Oaks | Common |
| NCN | | |

VASCULAR PLANTS FERNS**DRYOPTERIDACEAE**

| | | |
|---|---------------|--------|
| <i>Dryopteris arguta</i> (Kaulf.) Maxon | Oak Woodlands | Common |
| Coastal Wood Fern | | |

PTERIDACEAE

| | | |
|---|-----------|--------|
| <i>Pentagramma triangularis</i> (Kaulf.) G. Yatsk. subsp. <i>triangularis</i> | Woodlands | Common |
| Goldback Fern | | |

VASCULAR PLANTS DIVISION CONIFEROPHYTA--GYMNOSPERMS**PINACEAE**

| | | |
|-------------------------------|-----------------------|------------|
| * <i>Cedrus deodara</i> Loud. | Domestic Introduction | Occasional |
| Deodora Cedar | | |

MAJOR PLANT GROUP**Family**

| Genus | Habitat Type | Abundance |
|-------------|--------------|-----------|
| Common Name | | |

NCN = No Common Name, * = Non-native, @ = Voucher Specimen

| | | |
|--|-----------------------|------------|
| * <i>Pinus radiata</i> D.Don | Domestic Introduction | Occasional |
| Monterey Pine | | |
| <i>Pseudotsuga menziesii</i> (Vassey) Mayr var. <i>menziesii</i> | Woodlands | Common |
| Douglas-fir | | |
| TAXODIACEAE | | |
| <i>Sequoia sempervirens</i> (D.Don) Endl. | Coastal Forests | Common |
| Redwood | | |

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS**CLASS--DICOTYLEDONAE- TREES****MAGNOLIIDS****LAURACEAE**

| | | |
|--|-----------------------|------------|
| <i>Umbellularia californica</i> (Hook.&Arn.) Nutt. | Conifer&Oak Woodlands | Occasional |
| California Laurel, Sweet Bay, Pepperwood, California Bay | | |

EUDICOTS**ERICACEAE Heath Family**

| | | |
|--------------------------------|-----------|--------|
| <i>Arbutus menziesii</i> Pursh | Woodlands | Common |
| Madrone | | |

FAGACEAE Oak Family

| | | |
|--------------------------------|-----------|--------|
| <i>Quercus agrifolia</i> Nee | Woodlands | Common |
| Live Oak | | |
| <i>Quercus kelloggii</i> Newb. | Woodlands | Common |
| Black Oak | | |

OLEACEAE Olive Family

| | | |
|---------------------------|------------------|------------|
| * <i>Olea europaea</i> L. | Domestic Ruderal | Occasional |
| Olive | | |

SAPINDACEAE Soapberry Family

| | | |
|--------------------------------|---------------------------------|--------|
| <i>Acer macrophyllum</i> Prush | Riparian, Stream Banks, Canyons | Common |
| Big-leaf Maple | | |

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS**CLASS--DICOTYLEDONAE-SHRUBS AND WOODY VINES****EUDICOTS****ANACARDIACEAE Sumac Family**

| | | |
|--|-----------|--------|
| <i>Toxicodendron diversilobum</i> (Torry&Gray) E.Green | Woodlands | Common |
| Poison Oak | | |

CAPRIFOLIACEAE Honeysuckle Family

| | | |
|---|---------------------|------------|
| <i>Lonicera hispidula</i> Douglas var. <i>vacillans</i> | Woodlands, Riparian | Occasional |
| Honeysuckle | | |

| <u>MAJOR PLANT GROUP</u> | | |
|---------------------------------|---------------------|------------------|
| Family | | |
| Genus | Habitat Type | Abundance |
| Common Name | | |

NCN = No Common Name, * = Non-native, @= Voucher Specimen

| | | |
|--|-------------|------------|
| <i>Symphoricarpos mollis</i> Nuttall | Woodlands | Common |
| Creeping Snowberry, Trip Vine | | |
| ERICACEAE Heath Family | | |
| <i>Arctostaphylos manzanita</i> Parry ssp. <i>glaucens</i> | Woodlands | Common |
| Common Manzanita | | |
| FAGACEAE Oak Family | | |
| <i>Quercus berberidifolia</i> Liebm. | Chaparral | Common |
| California Scrub Oak | | |
| PHRYMACEAE Lopseed Family | | |
| <i>Mimulus aurantiacus</i> Curtis | Woodlands | Occasional |
| Bush Monkey Flower | | |
| RHAMNACEAE Buckthorn Family | | |
| <i>Ceanothus cuneatus</i> Nutt.var. <i>cuneatus</i> | Chaparral | Common |
| Buckbrush | | |
| ROSACEAE Rose Family | | |
| <i>Adenostoma fasciculatum</i> Hooker&Arn. | Shrub/Scrub | Common |
| Chamise | | |
| <i>Heteromeles arbutifolia</i> (Lind.) M. Rome. | Shrub/Scrub | Common |
| Christmas Berry, Toyon | | |

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS

CLASS--MONOCOTYLEDONAE-GRASSES

| | | |
|---|--------------------|--------|
| POACEAE Grass Family | | |
| * <i>Stipa tenuissima</i> | Landscape Planting | Common |
| Mexican Feather Grass (= <i>Nassella tenuissima</i>) | | |

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS

CLASS--MONOCOTYLEDONAE-HERBS

| | | |
|-----------------------|--------------------|------------|
| IRIDACEAE Iris Family | | |
| <i>Iris</i> ssp. | Woodlands Openings | Occasional |
| Iris | | |

Fauna Species Observed in the Vicinity of the Project Site

The nomenclature for the animals found on the project site and in the immediate vicinity follows: Mc Ginnis –1984, for the fresh water fishes; Stebbins -1985, for the reptiles and amphibians; and Udvardy and Farrand – 1998, for the birds; and Jameson and Peeters -1988 for the mammals.

AMPHIBIA AND REPTILIA

ORDER

| Common Name | Genus | Observed |
|-------------|-------|----------|
|-------------|-------|----------|

ANURA

| | | |
|-----------|---------------------|---|
| Tree Frog | <i>Hyla regilla</i> | X |
|-----------|---------------------|---|

Appendix B

Recommended Planting Plan

Project Design

Site Considerations: There is significant variance in physical and biological site factors on the property. The terrain can range from nearly level to very steep. There are areas with heavy shade, different aspect, different soil fertility, soil moisture regimes, and soil depths which must be accounted for in selecting sites for replanting.

Planting Design and Layout: Because of the site variability, it is highly recommended that the individual plant locations for the revegetation project be selected in the field by a qualified revegetation specialist. California native plant nurseries are specialized operations, so plant availability at the time of project implementation may vary. Substitutions of species and/or changes in composition should be made by a qualified specialist.

Plant Installation

Native trees and shrubs will be installed according to the species tables below. This table represents appropriate native tree and shrub species that are found in, and closely adjacent to the project area.

| Tree Species | | |
|---------------------------------|--------------------|-----------|
| <u>Scientific Name</u> | <u>Common Name</u> | |
| <i>Quercus agrifolia</i> | Live Oak | 16 |
| <i>Quercus kelloggii</i> | Black Oak | 12 |
| <i>Arbutus menziesii</i> | Madrone | 14 |
| <i>Umbellularia californica</i> | Bay | 20 |
| <i>Pseudotsuga menziesii</i> | Doug Fir | 10 |
| | Total | 72 |

Planting Stock: Planting stock should be purchased from local native plant nurseries specializing in California native plants. The container stock should be grown from locally collected seeds and vegetative materials. Available container sizes will vary, but container size is not as important as quality of the plant material and genetic origin (locally derived genetic types are adapted to the local conditions). Commonly available container sizes for revegetation include; Supercell/Liner, D-16, D-Pot, Tree band, Rose pot, Tree pot, and 1 gallon containers. Oaks are commonly planted by direct seeding of local harvested acorns by experienced restoration contractors. Direct seeding of acorns may sometimes be the only option depending on the variable cycles of acorn production by the various oak species from year to year.

Plant Protection: All tree and shrub species should receive a 3'x3' woven polypropylene weed mat. The mats will be secured to the ground with heavy gauge steel staples or pins. The weed mat

will serve as mulch for soil moisture retention and weed suppression purposes. Woven polypropylene is recommended over other weed control fabrics because of its durability and resistance to punctures. Because deer and rodents are active near the project area, all tree and shrub species should also have browse protection.

Tree species All tree plantings should receive 2 foot grow tubes and stakes (such as Tubex®, BluEx®, or similar product) or collar and screen protective hardware. If tubes are used, those that are specifically designed for restoration activities are recommended. *(Vineyard specific tubes have sharp edges on the upper surface that can damage the stems and branches of young trees). Protective bird netting must be installed atop of the grow tubes, if tubes are used. Collar and screen hardware may only be an option if a restoration contractor is used for the plant installation.

All plant protection hardware should be removed at the end of the project monitoring period or when plants are established, typically 3 to 5 years after installation. Failure to remove planting hardware may ultimately lead to plant mortality.

Nutrients: All plants should be given an appropriate amount of fertilizer at the time of planting to promote healthy growth in the first growing season. General purpose, slow release fertilizers, such as Ozmocote® 14-14-14 or Agriform® pellets are commonly used in revegetation installations. It is important that the fertilizer is applied directly to the root zone of the plants (sub- soil surface) to avoid encouraging weed growth.

Timing: Typically the best time of year to install plants in a native plant revegetation project is in the late fall, when the soil has become adequately wet from fall rains. Getting plants in the ground early gives the plants more time to develop roots and site familiarity before breaking dormancy in the spring. Delaying planting into the late winter and spring, can decrease planting success if an irrigation system is not online. If planting techniques such as direct seeding and vegetative propagation are used, the planting window is narrowed and controlled by the timing required by the type of seeds or cuttings used.

All exposed soil should be seeded and straw spread prior to winter rains. Recommended native seed mixes are listed below.

Pacific Coast Seed Native Erosion Control Mix
Bromus carinatus/California Brome
Hordeum brachyantherum/Meadow Barley
Vulpia microstachys/Three Weeks Fescue
Trifolium wildenovii/Tomcat Clover

Straw: If straw is used in the application of the seed mix it must be sterile or native species only. Straw should be derived from wheat, oats or barley and free of all noxious weeds. The Contractor shall furnish evidence that clearance has been obtained from County Agricultural Commissioner before straw obtained from outside the county in which it is to be used is delivered to the site of work. Straw that is rotted or has been used for stable bedding shall not be used. No invasive exotic plants or seed shall be used.

Irrigation

It will be necessary to irrigate the plants throughout the dry season for the first three years. Because there are olives within close proximity to the planting a simple above-ground drip irrigation system is recommended that can tie into the main water supply. All woody plants should be targeted with drip emitters. The irrigation system should run at regular intervals and the system should be checked on a regular basis to insure that the system is functioning properly and that the plants are getting the proper quantity of water. A typical irrigation regime for a revegetation project in this region is a once weekly watering of 1 to 3 gallons per plant. If the system is tied to a vineyard watering schedule, the plants should be monitored closely to insure that they are not being over or under watered. Irrigation should be activated in the spring when soil on the site begins to dry out from winter rains, typically mid to late April. Drought conditions may require an earlier activation date, and heavier spring rains may allow for a later activation date. Irrigation to the site would typically be shut down by mid October. Early fall rains may allow for an earlier shut down date, and a prolonged fall drought may require that irrigation occur later into the fall.

Plant Maintenance

Weed control can be just as important, if not more important than irrigation the first few years of a revegetation project. Weeds directly compete with the plantings for water, light, and nutrients. Heavy weed growth can also provide habitat for rodents, such as mice, voles, and gophers, which can girdle young trees and shrubs and damage drip irrigation lines.

Hand Weeding: Spring hand weeding of all weeds growing inside the plant protection hardware and weed mat openings will have the most profound positive effect on the young plantings. It is important to carefully perform hand weeding when weeds have not become too large and the soil is still soft and moist from winter rains. Additional hand weeding may be necessary throughout the growing season if irrigation is used. It is very important that crews performing hand weeding are familiarized with the different species selected in the revegetation planting, so that the project plants are not accidentally damaged or removed.

Performance Standard

A performance standard of 80% survival of planted stock should be proposed as a success standard measurement for this project. If this standard is not achieved, replanting will occur. Death of the planted stock will necessitate replanting.

Responsible Party For Short –Term and Long-Term Maintenance

Responsible party for coordinating plantings, short term maintenance and long-term maintenance will be the property owner.