

Appendix B

WIEMEYER ECOLOGICAL SCIENCES

BIOLOGICAL ASSESSMENT

HERITAGE PARK
8685 OLD REDWOOD HIGHWAY, WINDSOR, CA

TOWN FILE NO. 17-19

Prepared For:

**Town of Windsor
P.O Box 100
Windsor, CA**

Prepared By:

**Darren Wiemeyer
Wiemeyer Ecological Sciences
4000 Montgomery Drive, Suite L-5
Santa Rosa, CA 95405**

November 8, 2018

WIEMEYER ECOLOGICAL SCIENCES
4000 MONTGOMERY DRIVE, SUITE L-5, SANTA ROSA, CA 95405

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HERITAGE PARK SITE PLAN

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1 SUMMARY

The Heritage Park project site is located at 8685 Old Redwood Highway in Windsor, CA (APN 164-100-023) (referred to as the “site”) (Figure 1). Habitat types at the site consist of annual grassland, seasonal wetland, and ruderal (disturbed) habitat and landscaped areas around the residence and barn (Figure 4). There are several trees at the site, but would not constitute a separate habitat type.

A wetland delineation was performed at the site on April 4, 2008. 0.05-acres of seasonal wetlands were delineated at the site. Philip Shannin with the United States Army Corps of Engineers (USACE) has confirmed the final acreage and jurisdictional determination of the seasonal wetlands at the site but has not issued a confirmation letter. The seasonal wetlands will be subject to Section 404 of the Clean Water Act, pending USACE determination. The seasonal wetlands will also be subject to Section 401 of the Clean Water Act and regulated by the North Coast Regional Water Quality Control Board (NCRWQCB).

Special-status plant species surveys were performed at the site during the 2008, 2009 and 2018 blooming season. The surveys were performed on March 27, April 4, April 26 and May 20, 2008, March 10, April 26 and May 12, 2009, and March 26, April 16 and May 12, 2018. Special-status plant species surveys were performed in accordance with state and federal plant survey protocols (CDFG 2000; USFWS 1996a; USFWS 1996b). No special-status plant species were observed. A list of all plant species observed at the site is included in Appendix C. The site is not listed as an occurrence site in the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) (CNDDDB, 2018) or the Seasonal Wetland Baseline Report for the Santa Rosa Plain, Sonoma County (Patterson, et. al., 1994).

Habitat assessments for special-status animal species, raptor nest searches, a bat habitat assessment and a wildlife inventory was performed at the site during special-status plant species surveys and previously on February 8 and June 26, 2008. Trees were searched for raptor nests and the barn was inspected for evidence of owls or bats. No special-status animal species were observed. The larger trees at the site could provide suitable nesting habitat for several special-status raptor species and several special-status bat species and the site could provide suitable nesting habitat for native nesting birds.

The site is not within the potential range of the California tiger salamander (*Ambystoma californiense*) (CTS) as mapped by the United States Fish and Wildlife Service (USFWS) according to the Santa Rosa Plain Conservation Strategy (SRPCS) (SRPCST, 2005). The site is categorized as “Presence for CTS is not likely but Mitigation for listed plants may be required” according to Figure 3 of the SRPCS (SRPCST, 2005). The SRPCS states that “neither surveys nor mitigation would be required for projects on these properties”.

In addition, the site is categorized as “May affect listed plants, but would not likely affect CTS” according to Enclosure 1 of the Programmatic Biological Opinion for U.S. Army Corps of Engineers Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California, dated November 9, 2007

(USFWS, 2007). According to these two documents, mitigation for potential impacts to California tiger salamander habitat will not be required and a CTS site assessment will not need to be conducted.

The proposed project will result in the loss of 0.05-acres of seasonal wetlands (Figure 4). The fill 0.05-acres of seasonal wetlands will require permit authorization from the USACE (Section 404 Nationwide Permit #39) and NCRWQCB (Section 401 Water Quality Certification).

A total of 36 trees are proposed to be removed as a result of development impacts and due to poor species characteristics or poor condition. A Tree Preservation and Mitigation Report has been prepared for the site and is enclosed in Appendix D. Tree removal and construction activities have the potential to impact special-status bat species, raptors and native nesting birds.

All recommended avoidance, minimization and mitigation measures are proposed in Section 8 of this report to reduce impacts to seasonal wetlands, suitable endangered vernal pool plant species, nesting birds and roosting bats to a less than significant level. These avoidance, minimization and mitigation measures will reduce identified potential impacts to biological resources to less than significant levels.

2 PURPOSE OF STUDY

The purpose of this Biological Assessment is to determine whether the site provides habitat for any special-status plant species, special-status animal species, or special-status habitats, including seasonal wetlands and waterways. In the event these resources exist on site, the significance of potential direct and indirect impacts to biological resources would be assessed pursuant to provisions of the California Environmental Quality Act (CEQA).

This Biological Assessment will also be in compliance with the requirements of the Santa Rosa Plain Conservation Strategy as well as the Town of Windsor CEQA requirements per the Memo from Peter Chamberlin dated May 29, 2008 entitled "Contents of Biological Assessments". In addition, this biological assessment will discuss compliance with the Programmatic Biological Opinion for U.S. Army Corps of Engineers Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California, dated November 9, 2007 (USFWS, 2007).

This Biological Assessment will identify appropriate mitigation measures to off-set potential direct and indirect impacts to biological resources on the subject site as a result of site development.

3 SITE DESCRIPTION

The site is located at 8685 Old Redwood Highway, Windsor (APN 164-100-023) (Figure 1). The site is 1.66-acres. The site consists of a single rural residence and a small barn with limited landscaping and ornamental plants on the western portion of the site and an open pasture on the eastern portion of the site. Photos of the site are included as Photo Plate A in the Figures section.

3.1 HABITATS

Habitat types at the site consist of annual grassland, seasonal wetland, and ruderal (disturbed) habitat and landscaped areas around the residence and barn (Figure 4). There are several valley oak and coast live oak trees along all boundaries of the site and a large valley oak tree south of the residence. There are also eucalyptus trees, walnut trees, acacia trees and a spruce tree on the site.

3.2 SURROUNDING LANDS

To the west of the site is pastureland, to the north of the site are rural residences and to the east and south of the site are apartment complexes.

3.3 TOPOGRAPHY

The site is mostly flat and elevations range from 115-120 feet above sea level (Figure 2).

3.4 HYDROLOGY

The site is mostly flat with a very slight slope back toward the southwest corner of the site. It appears that most all of the runoff or water collection that occurs on the site would be from direct rainfall. Subtle undulations in the topography allow water to pool in shallow depressions during the wet season after the ground has become saturated. No storm drains were observed at the site.

Surface water, either through surface flow or through a storm drain system along Old Redwood Highway, flows into East Windsor Creek, which is located to the west of the site, near Highway 101. East Windsor Creek flows under Highway 101 and connects with Windsor Creek on the west side of Highway 101. Windsor Creek flows into Mark West Creek which flows into the Russian River. The Russian River continues west and is the ultimate drainage prior to its terminus at the Pacific Ocean.

3.5 SOIL TYPES

The site is mapped as having a single soil type, Huichica loam, 0 to 2 percent slopes (Miller, 1972) (Figure 3).

3.5.1 Geologic Context

The project site occurs in a geological feature known as the Cotati Valley on USGS maps, but is commonly known as the Santa Rosa Plain. The valley is a broad, structural trough brought about by the uplift and tilting of large, regional-scale structures (Higgins, 1952). The low hills of the Merced formation on the west side of the valley and the volcanic Sonoma Mountains to the east have uplifted as the valley floor has sunk. The down-faulting of the Santa Rosa Valley, which began approximately one million years ago during the Pleistocene epoch, has helped cause the low gradient of the Laguna de Santa Rosa and its tributaries.

The predominant geologic units in the Cotati Valley are the early and later Pleistocene alluviums. These older deposits occur as remnants of dissected alluvial terraces laid down by streams eroding the volcanic Sonoma Mountains to the east of the Santa Rosa Valley. These deposits underlie the mildly undulating expanse of the Santa Rosa Plain, which supported vast expanses of oak savanna and vernal pools prior to colonization by European Americans. The swales draining these deposits drain into the Laguna de Santa Rosa.

North of Santa Rosa Creek, the alluvium is early Pleistocene alluvium (70,000-1.8 million years old) and corresponds with the Huichica loam soil series. South of the creek the alluvium is late Pleistocene (10,000-70,000 years old) in origin and corresponds with the Wright loams. Basins in the valley that have collected fine sediments and high organic matter content develop into the Clear Lake clays, of recent origin (< 10,000 old).

3.5.2 Huichia Loam

The Huichica series consists of moderately well-drained and somewhat poorly drained loams that have a clay subsoil. At a depth of 25 to 40 inches that soils are underlain by strongly cemented old valley alluvium from mixed sedimentary, volcanic ash, and basic rock sources. These soils are on hummocky plains and terraces. They are on the plains west and northwest of Santa Rosa and in the vicinity of the town of Sonoma.

Taxonomic Class: Order: Alfisols; Subgroup: Abruptic, Haplic, Durixeralfs; Family: Fine, montmorillonitic, thermic.

4 PROJECT DESCRIPTION

The proposed development is a 33 unit housing project located within the Town of Windsor. It appears from the Heritage Park Site Plan, that the entire site is being developed. All structures will be demolished and a total of 36 trees are proposed to be removed. The project involves the installation of underground sewer lines and storm drains, construction of sidewalks along Old Redwood Highway and Second Street, construction of an entrance driveway to access 54 parking spaces and landscaping. On the west end of the development, a small garden and play area is proposed as well as a bio-retention area for storm water run-off treatment and infiltration. A Site Plan is included in the Figures section.

5 REGULATORY CONTEXT

5.1 UNITED STATES FISH AND WILDLIFE SERVICE

The United States Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (ESA). Listed threatened and endangered species are protected from take, defined as direct or indirect harm, unless a Section 10 permit is granted to an entity other than a federal agency or a Biological Opinion with incidental take provisions is rendered to a federal lead agency via ESA Section 7 consultation. Pursuant to the requirements of ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the study area and determine whether the proposed federal action will jeopardize the continued existence of the species.

Under ESA, habitat loss is considered to be an adverse effect to a species. In addition, the action agency is required to determine whether its action is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or to result in the destruction or adverse modification of critical habitat proposed to be designated for such species. The USFWS also administers the federal Migratory Bird Treaty Act of 1918. Under this legislation, it is unlawful to destroy active nests, eggs, and young.

5.2 UNITED STATES ARMY CORPS OF ENGINEERS

The United States Army Corps of Engineers (USACE) administers the federal Clean Water Act (CWA). Section 404 of the CWA requires approval prior to discharging dredged or fill material into the waters of the United States. Waters of the United States includes essentially all surface waters such as all navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. "Wetlands" are areas characterized by growth of wetland vegetation where the soil is saturated during a portion of the growing season or the surface is flooded during some part of most years. Wetlands generally include seasonally inundated wetlands, swamps, marshes, bogs and similar areas.

5.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The California Department of Fish and Wildlife (CDFW) administers the California Endangered Species Act (CESA). It is state policy to conserve, protect, restore and enhance any endangered or threatened species and its habitat. The CDFW has jurisdiction over species that are formally listed as threatened or endangered under the CESA. The CESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered in the state. In addition to CESA, the California Native Plant Protection Act (NPPA) provides protection to endangered and rare plant species. The CDFW also maintains a list of species of special concern to be considered during CEQA review.

Pursuant to the requirements of CESA, a state or local agency reviewing a proposed project within its jurisdiction must determine whether any state-listed species may be present in the project area and determine whether the proposed project will have a potentially significant impact upon such species. If significant impacts to state listed species are identified, the state lead agency must adopt reasonable and prudent alternatives as specified by CDFW to prevent or

mitigate for impacts. CDFW can authorize take of a state-listed species if an incidental take permit is issued by the Secretary of the Interior or Commerce in compliance with the federal ESA, or if the director of CDFW issues a permit under Section 2080 in those cases where it is demonstrated that the impacts are minimized and mitigated.

CDFW also administers the California Fish and Game Code. California Fish and Game Code Section 3503.5 makes it unlawful to take, possess or destroy birds in the Falconiformes (birds of prey, vultures, eagles, falcons) and Strigiformes (owls) families, which can include nest disturbance from construction and other activities.

5.4 STATE WATER RESOURCES CONTROL BOARD

The State Water Resources Control Board (SWRCB) administers the state CWA. Under Section 401 of the CWA, projects that apply for a USACE permit for discharge of dredge or fill material, and projects that qualify for a Nationwide Permit, must obtain water quality certification from the RWQCB that the project will uphold state water quality standards. The SWRCB also administers the National Pollutant Discharge Elimination System (NPDES) which includes the General Permit for Storm Water Discharges from Construction Activities.

5.5 CALIFORNIA NATIVE PLANT SOCIETY

The California Native Plant Society (CNPS) is a non-profit group dedicated to preserving the state's native flora. It has developed lists of plants of special concern in California (Skinner and Pavlik 1994). In the spring of 2011, CNPS officially changed the name "CNPS List" to "California Rare Plant Rank" (CRPR). The definitions of the ranks and the ranking system have not changed, and the ranks are still used to categorize the same degrees of concern, which are described as follows:

CRPR 1A: The plants with a California Rare Plant Rank of 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. This rank includes plants that are both presumed extinct as well as those plants which are presumed extirpated in California. A plant is extinct if it no longer occurs anywhere. A plant that is extirpated from California has been eliminated from California, but may still occur elsewhere in its range. All of the plants constituting California Rare Plant Rank 1A meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. Should these taxa be rediscovered, it is mandatory that they be fully considered during preparation of environmental documents relating to the California Environmental Quality Act (CEQA).

CRPR 1B: Plants with a California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. California Rare Plant Rank 1B plants constitute the majority of taxa in the CNPS *Inventory*, with more than 1,000 plants assigned to this category of rarity. All of the plants constituting California Rare Plant Rank 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR 2: Except for being common beyond the boundaries of California, plants with a California Rare Plant Rank of 2 would have been ranked 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act in 1979, plants were considered for protection without regard to their distribution outside the state. With California Rare Plant Rank 2, we recognize the importance of protecting the geographic range of widespread species. In this way we protect the diversity of our own state's flora and help maintain evolutionary processes and genetic diversity within species. All of the plants constituting California Rare Plant Rank 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR 3: The plants that comprise California Rare Plant Rank 3 are united by one common theme - we lack the necessary information to assign them to one of the other ranks or to reject them. Nearly all of the plants constituting California Rare Plant Rank 3 are taxonomically problematic. For each California Rare Plant Rank 3 plant we have provided the known information and indicated in the "Notes" section of the CNPS *Inventory* record where assistance is needed. Data regarding distribution, endangerment, ecology, and taxonomic validity are welcomed and can be submitted by emailing the Rare Plant Botanist at asims_cnps.org or (916) 324-3816. Some of the plants constituting California Rare Plant Rank 3 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. We strongly recommend that California Rare Plant Rank 3 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.

CRPR 4: The plants in this category are of limited distribution or infrequent throughout a broader area in California. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a California Rare Plant Rank 4 plant change, we will transfer it to a more appropriate rank. Very few of the plants constituting California Rare Plant Rank 4 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Nevertheless, many of them are significant locally, and we strongly recommend that California Rare Plant Rank 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.

5.6 LITERATURE REVIEW

Information on the biology, distribution, taxonomy, legal status, and other aspects of the special-status species was obtained from documents on file in the library of Wiemeyer Ecological Sciences. Standard references used for the biology and taxonomy of plants included Hickman, ed., 1993 and Best et al, 1996. Existing literature was reviewed for information regarding sensitive resources that have the potential to occur in the project area and surrounding Santa Rosa Plain (Waaland, 1989; Patterson et al, 1994; CH2M Hill et al, 1995).

The CDFG California Natural Diversity Data Base (CNDDDB) was queried for a list of all plant and animal species reported from the *Healdsburg, Santa Rosa, Mark West Springs, Geyserville, Sebastopol, Jintown, Kenwood, Mt. St. Helena, and Guerneville* USGS 7.5-minute quadrangles (nine quad search) (CNDDDB, 2018). The Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS, 20018) was queried for a list of all plant species reported from the *Healdsburg, Santa Rosa, Mark West Springs, Geyserville, Sebastopol, Jintown, Kenwood, Mt. St. Helena, and Guerneville* USGS 7.5-minute quadrangles.

The following table (Table 1) is a list of special-status plant species that have the potential to occur at the site based on habitat types that exist at the site. A full list of special-status plant species is provided in Appendix A.

Table 1. Special-Status Plant Species with the Potential to Occur in the Study Area.

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Blooming Window</u> | <u>Habitat</u> |
|--|--------------------------------|------------------------|-------------------|---------------------|------------------------|--|
| <i>Amsinckia lunaris</i> | bent-flowered fiddleneck | 1B.2 | None | None | Mar-Jun | Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland |
| <i>Astragalus breweri</i> | Brewer's milk-vetch | 4.2 | None | None | Apr-Jun | Chaparral, Cismontane woodland, Meadows and seeps, Valley and foothill grassland (open, often gravelly) |
| <i>Astragalus claranus</i> | Clara Hunt's milk-vetch | 1B.1 | CT | FE | Mar-May | Chaparral (openings), Cismontane woodland, Valley and foothill grassland |
| <i>Astragalus rattanii</i> var. <i>jepsonianus</i> | Jepson's milk-vetch | 1B.2 | None | None | Mar-Jun | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Balsamorhiza macrolepis</i> | big-scale balsamroot | 1B.2 | None | None | Mar-Jun | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Blennosperma bakeri</i> | Sonoma sunshine | 1B.1 | CE | FE | Mar-May | Valley and foothill grassland (mesic), Vernal pools |
| <i>Brodiaea leptandra</i> | narrow-anthered brodiaea | 1B.2 | None | None | May-Jul | Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland |
| <i>Calystegia collina</i> ssp. <i>oxyphylla</i> | Mt. Saint Helena morning-glory | 4.2 | None | None | Apr-Jun | Chaparral, Lower montane coniferous forest, Valley and foothill grassland |
| <i>Carex comosa</i> | bristly sedge | 2B.1 | None | None | May-Sep | Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland |
| <i>Castilleja ambigua</i> var. <i>ambigua</i> | johnny-nip | 4.2 | None | None | Mar-Aug | Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins |
| <i>Centromadia parryi</i> ssp. <i>parryi</i> | pappose tarplant | 1B.2 | None | None | May-Nov | Chaparral, Coastal prairie, Meadows and seeps, Marshes and swamps (coastal salt), Valley and foothill grassland (vernally mesic) |
| <i>Clarkia imbricata</i> | Vine Hill clarkia | 1B.1 | CE | FE | Jun-Aug | Chaparral, Valley and foothill grassland |
| <i>Delphinium bakeri</i> | Baker's larkspur | 1B.1 | CE | FE | Mar-May | Broadleafed upland forest, Coastal scrub, Valley and foothill grassland |
| <i>Delphinium uliginosum</i> | swamp larkspur | 4.2 | None | None | May-Jun | Chaparral, Valley and foothill grassland |
| <i>Downingia pusilla</i> | dwarf downingia | 2B.2 | None | None | Mar-May | Valley and foothill grassland (mesic), Vernal pools |

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| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Blooming Window</u> | <u>Habitat</u> |
|---|------------------------------------|------------------------|-------------------|---------------------|------------------------|---|
| <i>Erythronium helenae</i> | St. Helena fawn lily | 4.2 | None | None | Mar-May | Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland |
| <i>Fritillaria liliacea</i> | fragrant fritillary | 1B.2 | None | None | Feb-Apr | Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland |
| <i>Gilia capitata ssp. tomentosa</i> | woolly-headed gilia | 1B.1 | None | None | May-Jul | Coastal bluff scrub, Valley and foothill grassland |
| <i>Hemizonia congesta ssp. congesta</i> | congested-headed hayfield tarplant | 1B.2 | None | None | Apr-Nov | Valley and foothill grassland |
| <i>Hesperexax caulescens</i> | hogwallow starfish | 4.2 | None | None | Mar-Jun | Valley and foothill grassland (mesic, clay), Vernal pools (shallow) |
| <i>Horkelia tenuiloba</i> | thin-lobed horkelia | 1B.2 | None | None | May-Jul(Aug) | Broadleafed upland forest, Chaparral, Valley and foothill grassland |
| <i>Hosackia gracilis</i> | harlequin lotus | 4.2 | None | None | Mar-Jul | Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland |
| <i>Layia septentrionalis</i> | Colusa layia | 1B.2 | None | None | Apr-May | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Leptosiphon jepsonii</i> | Jepson's leptosiphon | 1B.2 | None | None | Mar-May | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Lessingia arachnoidea</i> | Crystal Springs lessingia | 1B.2 | None | None | Jul-Oct | Cismontane woodland, Coastal scrub, Valley and foothill grassland |
| <i>Lessingia hololeuca</i> | woolly-headed lessingia | 3 | None | None | Jun-Oct | Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland |
| <i>Limnanthes vincularis</i> | Sebastopol meadowfoam | 1B.1 | CE | FE | Apr-May | Meadows and seeps, Valley and foothill grassland, Vernal pools |
| <i>Micropus amphibolus</i> | Mt. Diablo cottonweed | 3.2 | None | None | Mar-May | Broadleafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Microseris paludosa</i> | marsh microseris | 1B.2 | None | None | Apr-Jun(Jul) | Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland |
| <i>Navarretia cotulifolia</i> | cotula navarretia | 4.2 | None | None | May-Jun | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Navarretia leucocephala ssp. bakeri</i> | Baker's navarretia | 1B.1 | None | None | Apr-Jul | Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Valley and foothill grassland, Vernal pools |
| <i>Perideridia gairdneri ssp. gairdneri</i> | Gairdner's yampah | 4.2 | None | None | Jun-Oct | Broadleafed upland forest, Chaparral, Coastal prairie, Valley and foothill grassland, Vernal pools |
| <i>Ranunculus lobbii</i> | Lobb's aquatic buttercup | 4.2 | None | None | Feb-May | Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools |
| <i>Trifolium amoenum</i> | two-fork clover | 1B.1 | None | FE | Apr-Jun | Coastal bluff scrub, Valley and foothill grassland (sometimes serpentinite) |
| <i>Trifolium hydrophilum</i> | saline clover | 1B.2 | None | None | Apr-Jun | Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools |

BIOLOGICAL ASSESSMENT: 8685 OLD REDWOOD HIGHWAY WINDSOR, CA

The following table (Table 2) is a list of special-status animal species that have the potential to occur at the site based on habitat types that exist at the site. A full list of special-status animal species is provided in Appendix B.

Table 2. Special-Status Animal Species with the Potential to Occur in the Study Area.

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|--------------------------------|--------------------------|---------------------|-------------------|-------------------------------------|---|
| <i>Antrozous pallidus</i> | pallid bat | None | None | Species of Special Concern | Chaparral Coastal scrub Desert wash Great Basin grassland Great Basin scrub Mojavean desert scrub Riparian woodland Sonoran desert scrub Upper montane coniferous forest Valley & foothill grassland |
| <i>Athene cunicularia</i> | burrowing owl | None | None | Species of Special Concern | Coastal prairie Coastal scrub Great Basin grassland Great Basin scrub Mojavean desert scrub Sonoran desert scrub Valley & foothill grassland |
| <i>Corynorhinus townsendii</i> | Townsend's big-eared bat | None | None | Species of Special Concern | Broadleaved upland forest Chaparral Chenopod scrub Great Basin grassland Great Basin scrub Joshua tree woodland Lower montane coniferous forest Meadow & seep Mojavean desert scrub Riparian forest Riparian woodland Sonoran desert scrub Sonoran thorn woodland Upper montane coniferous forest Valley & foothill grassland |
| <i>Elanus leucurus</i> | white-tailed kite | None | None | Fully Protected | Cismontane woodland Marsh & swamp Riparian woodland Valley & foothill grassland Wetland |
| <i>Lasiurus blossevillei</i> | western red bat | None | None | Species of Special Concern | Cismontane woodland Lower montane coniferous forest Riparian forest Riparian woodland |
| <i>Lasiurus cinereus</i> | hoary bat | None | None | None | Broadleaved upland forest Cismontane woodland Lower montane coniferous forest North coast coniferous forest |
| <i>Myotis thysanodes</i> | fringed myotis | None | None | None | * Habitat types not included by CNDDB |
| <i>Taxidea taxus</i> | American badger | None | None | Species of Special Concern | Many habitat types listed in CNDDB – only including region habitat types. Broadleaved upland forest Chaparral Cismontane woodland Closed-cone coniferous forest Freshwater marsh Lower montane coniferous forest Marsh & swamp Meadow & seep North coast coniferous forest Riparian forest Riparian scrub Riparian woodland Ultramafic Upper montane coniferous forest Valley & foothill grassland |

6 STUDY METHODS

6.1 SPECIAL-STATUS PLANT SPECIES

Special-status plant species surveys were performed at the site during the 2008, 2009 and 2018 blooming season. The surveys were performed on March 27, April 4, April 26 and May 20, 2008, March 10, April 26 and May 12, 2009, and March 26, April 16 and May 12, 2018.

Special-status plant species surveys were conducted in a manner to locate any rare or endangered species that may be present (CDFG, 2000; USFWS, 1996). The survey was conducted at the time of year when rare or endangered species are both "evident" and identifiable, i.e. they were scheduled (1) to coincide with known flowering periods, and/or (2) during periods of phenological development that are necessary to identify special-status plant species. The surveys were floristic in nature and not based on the occurrence of habitat or other physical features. The surveys were conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.

A meandering pattern was walked through each habitat to ensure that all areas were viewed. Every species noted in the field was identified to the extent necessary to determine whether it was rare or endangered. All plants at the site were identified to the level necessary to ascertain whether they were "special-status species." A full list of potentially occurring special-status plant species is included in Appendix A.

Federally listed plant species reference site surveys were performed at several locations in the Santa Rosa Plain in 2008, 2009 and 2018.

6.2 SPECIAL-STATUS ANIMAL SPECIES

Existing literature was reviewed for information regarding sensitive wildlife resources that have the potential to occur in the project area (CH2M Hill et al, 1995). A CNDDDB printout for the Healdsburg quad and its eight surrounding quads were utilized to prepare a list of all animal species that could potentially occur in the project study area (Table 2). Only those species that are known to inhabit or forage within annual grassland and seasonal wetlands or nest or roost in large oak trees, eucalyptus trees or barns have the potential to occur at the site.

Habitat assessments for special-status animal species, raptor and raptor nest searches were performed at the site on February 8, March 27, April 4, April 26 and May 20, 2008, March 10, April 26 and May 12, 2009, and March 26, April 16 and May 12, 2018. Trees were searched for raptor nests during each site visit. The barn, located at the southwest corner of the site, was inspected on to determine if barn owls or bat species utilized the barn as nesting or roosting habitat.

6.3 WILDLIFE

Due to the importance of habitat and its subsequent effect upon which wildlife species are present, a general picture of wildlife that is present can be made based upon habitat assessments gathered during site surveys. The term “wildlife” is being used to define all animal species (mammals, birds, fish, amphibians, reptiles, invertebrates). A wildlife inventory was conducted at the site during all site visits, but a comprehensive list of all wildlife species has not been prepared. Daylight site visits greatly limits the amount and variety of wildlife species that could potentially utilize habitats at the site at any given time.

7 RESULTS OF SURVEYS

7.1 HABITATS

Habitat types at the site consist of annual grassland, seasonal wetland, and ruderal (disturbed) habitat and landscaped areas around the residence and barn (Figure 4). There are several valley oak and coast live oak trees along all boundaries of the site and a large valley oak tree south of the residence. There are also eucalyptus trees, walnut trees, acacia trees and a spruce tree on the site.

7.1.1 Annual Grassland

Annual grassland was the dominant plant community observed at the site (Figure 4). Although non-native grasses dominant the plant community, there are several native grasses within this grassland plant community. Dominant plant species consist of perennial ryegrass (*Festuca perenne*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus mollis*), prickly-leafed lettuce (*Lactuca serriola*), California oatgrass (*Danthonia californica*), meadow barley (*Hordeum brachyantherum*), spring vetch (*Vicia sativa*), chicory (*Chichorium intybus*) and three weeks fescue (*Vulpia bromoides*). Additional species include annual bluegrass (*Poa annua*), red-stem filaree (*Erodium cicutarium*), field bindweed (*Convolvulus arvensis*), cut leaf geranium (*Geranium dissectum*) and several clover species (*Trifolium* spp.).

Tree species, including valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), silver wattle (*Acacia dealbata*), blue gum (*Eucalyptus globulus*), English walnut (*Junglans regia*) and an ornamental spruce (*Picea* spp.) occur around the margins of this habitat type.

7.1.2 Seasonal Wetland

0.05-acres of seasonal wetlands occur at the site (Figure 4). The seasonal wetland occurs near the center of the site. Dominant plant species consist meadow barley (*Hordeum brachyantherum*), three weeks fescue (*Vulpia bromoides*), prickly-leafed lettuce (*Lactuca serriola*), California oatgrass (*Danthonia californica*), soft chess (*Bromus mollis*), field rush (*Juncus tenius*) and curly dock (*Rumex crispus*).

The seasonal wetlands are shallow and only ponded water to a maximum depth of 4 inches, as observed on February 9, 2008, approximately seven days after several storm events. Seasonal wetland is a sensitive natural community and considered Waters of the United States and Waters of the State.

7.2 SPECIAL STATUS PLANT SPECIES

No special-status plant species were observed during the special-status plant species surveys at the site. The seasonal wetlands provide suitable habitat for Burke's goldfields (*Lasthenia burkei*), Sonoma sunshine (*Blennosperma bakeri*) and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*), and to a lesser extent Sebastopol meadowfoam (*Limnanthes vinculans*). This site is not listed as a historic or known site for these species according to the Seasonal Wetland Baseline Report for the Santa Rosa Plain, Sonoma County (Patterson, *et. al.*, 1994).

A list of all plant species observed at the site is included in Appendix C. Federally listed plant species reference site surveys were performed at several locations in the Santa Rosa Plain in 2008, 2009 and 2018.

7.3 SPECIAL STATUS ANIMAL SPECIES

7.3.1 Birds

7.3.1.1 Burrowing Owl

Conservation Status: CDFW - Species of Special Concern

Burrowing owl (*Athene cunicularia*) occurs in open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Burrowing owl is a subterranean nester which is dependent upon burrowing mammals, most notably, the California ground squirrel. The site provides very limited, but suitable habitat for this species. No medium or large burrows were observed at the site, which significantly limits the suitability of the site for nesting. Surrounding developments greatly limits the suitability of the site for nesting and foraging habitat. This species was not observed at the site.

There is one CNDDDB occurrence of this species approximately 2 miles to the south of the site (Figure 5). The proposed project will impact potentially suitable habitat, but the lack of medium to large burrows at the site and surrounding developments greatly limits the likelihood that burrowing owls will initiate nesting at the site prior to site development. Based on this evaluation, it has been determined that there will be no significant impact to this species as a result of the proposed project.

7.3.1.2 *White-tailed Kite*

Conservation Status: CDFW - Fully Protected

White-tailed kite (*Elanus leucurus*) is generally found in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodlands. They typically nest in oak trees with dense tops. The annual grassland provides suitable foraging habitat for this species and the larger trees at the site provides potentially suitable nesting habitat. No large nests were observed at the site and this species was not observed at the site.

There is one CNDDDB occurrence of this species approximately 5 miles to the west of the site (Figure 5). It is unlikely that species utilizes habitats at the site for foraging and nesting. Tree removal and construction activities may disturb this species if it initiates nesting at the site. Therefore, it has been determined that there may be a significant impact to this species as a result of the proposed project without appropriate avoidance and mitigation measures.

7.3.2 Mammals

7.3.2.1 *American Badger*

Conservation Status: CDFW - Species of Special Concern

American badger (*Taxidea taxus*) generally occur in open pasture and grassland habitats and are most abundant in drier open stages of most shrub, forest and herbaceous habitats with friable soils on uncultivated ground. They dig their own burrows and prey primarily on burrowing rodents. The annual grassland at the site provides very limited, but potentially suitable habitat for this species. However, there were no large burrows observed at the site which would greatly limit the likelihood that this species occurs at the site. This species was not observed at the site.

There are no CNDDDB occurrences of this species within 5-miles of the site (Figure 5). The proposed project will impact potentially suitable habitat, but the lack of large burrows at the site and surrounding developments greatly limits the likelihood that American badger utilize the site prior to site development. Based on this evaluation, it has been determined that there will be no significant impact to this species as a result of the proposed project.

7.3.2.2 *Special-Status Bat Species*

All special-status bat species, including several bat species which do not have special status, but have potential to occur in habitats at the site, have been included in this evaluation of habitat suitability and discussion of potential impacts. All bat species have state protection during nesting and roosting seasons. The following bat species are included in this habitat assessment:

Pallid Bat (*Antrozous pallidus*) - Conservation Status: CDFW – Species of Special Concern
Day roost habitat requirements include caves, crevices, mines, tree/snag cavities, buildings and bridges.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*) - Conservation Status: State - Candidate Threatened; CDFW - Species of Special Concern

Day roost habitat requirements include caves, mines, tunnels, buildings, rock crevices and large tree/snag cavities.

Big brown bat (*Eptesicus fuscus*) - Conservation Status: None

Day roost habitat requirements include buildings, bridges, caves, mines, rock crevices and large tree/snag cavities.

Western mastiff bat (*Eumops perotis*) - Conservation Status: CDFW – Species of Special Concern

Day roost habitat requirements include cliffs, rocky outcrops, rock crevices.

Western red bat (*Lasiurus blossevillii*) – Conservation Status: CDFW – Species of Special Concern

Day roost habitat requirements include foliage of trees and large shrubs, commonly in riparian corridors.

Hoary Bat (*Lasiurus cinereus*) – Conservation Status: None

Day roost habitat requirements include foliage of trees and tree/snag cavities.

Silver-haired bat (*Lasionycteris noctivagans*) - Conservation Status: None

Day roost habitat requirements include tree/snag cavities, buildings, rock crevices, caves, exfoliating bark of large diameter trees.

California myotis (*Myotis californicus*) - Conservation Status: None

Day roost habitat requirements include crevices of buildings, caves, mines, and exfoliating bark.

Western small-footed myotis (*Myotis ciliolabrum*) - Conservation Status: None

Day roost habitat requirements include crevices of buildings, caves, mines, and exfoliating bark.

Long-eared myotis (*Myotis evotis*) - Conservation Status: None

Day roost habitat requirements include exfoliating bark, tree/snag cavities, caves, mines, cliffs, and rocky outcrops.

Little brown bat (*Myotis lucifugus*) - Conservation Status: None

Day roost habitat requirements include buildings, trees/snag cavities, caves and rock crevices.

Fringed Myotis (*Myotis thysanodes*) – Conservation Status: None

Day roost habitat requirements include crevices in buildings, caves, mines, cliffs, rocks, bridges, exfoliating bark, and tree/snag cavities.

Long-legged myotis (*Myotis volans*) – Conservation Status: None

Day roost habitat requirements include rock crevices, buildings, caves, exfoliating bark, tree/snag cavities, mines and caves.

Yuma myotis (*Myotis yumanensis*) – Conservation Status: None

Day roost habitat requirements include rock crevices in buildings, caves, mines, cliffs, rocks, bridges, and tree/snag cavities.

Western canyon bat (*Parastrellus hesperus*) - Conservation Status: None

Day roost habitat requirements include rock crevices, rocky outcrops, cliffs, mines and caves.

Mexican free-tailed bat (*Tadarida brasiliensis*) - Conservation Status: None

Day roost habitat requirements include crevices in buildings, caves, mines and bridges.

Bats are known to utilize a vast variety of habitat types for foraging and several types of structures for nesting and roosting including trees and snags, cliffs, rock outcrops, foliage, buildings, bridges, caves and mines. The larger trees at the site and to a lesser extent, the barn, provides suitable roosting habitat for bats as some of the trees exhibit cavities, fissures or exfoliating bark, foliage and/or snag cavities suitable to bat species. Those species which have more likelihood of occurring at the site include those species which utilize these microhabitats commonly associated with woodland habitat.

The bat species most likely to roost at the site include most of those listed above. However, the spotted bat, Western mastiff bat, Western canyon bat and Mexican free-tailed bat tend to be more associated with rocky outcrops, buildings, caves, mines, cliffs, and/or bridges and are therefore less likely to roost in the larger trees at the site. No bat species were observed at the site and there was no evidence that bat species were roosting in the barn.

There are two CNDDDB occurrences of bat species within 5 miles of the site (Figure 5). Townsend's big eared bat and fringed myotis are known to occur within 5 miles of the site (Figure 5). The proposed project will result in the loss of several trees at the site that provides suitable roosting habitat for bat species. Therefore, it has been determined that there may be a significant impact to special-status bat species as a result of the proposed project without appropriate avoidance and mitigation measures.

7.4 WILDLIFE

The annual grassland and seasonal wetland habitat along with the variety of trees which occur along the boundaries of the site provides adequate habitat value for wildlife. Very few burrows were observed, but small mammals, small birds and some raptors potentially utilize these habitats at the site. The larger valley oak trees could provide nesting habitat for cavity nesting birds, but none were observed. No raptor nests were observed in any of the trees at the site. There was no sign of barn owls or any bat species utilizing the barn as nesting or roosting habitat. The site may provide limited use as a wildlife corridor, but because of existing developments around the site, it would not be considered a significant wildlife corridor.

The proposed project will result in the loss of several trees at the site that provides suitable nesting habitat for raptors and native birds. Therefore, it has been determined that there may be a significant impact to raptors and native birds as a result of the proposed project without appropriate avoidance and mitigation measures.

8 IMPACTS TO BIOLOGICAL RESOURCES

The Heritage Park project will have significant impacts to biological resources without appropriate mitigation measures decrease the loss to a less than significant level. The following is a list of impacts to biological resources as part of the Heritage Park project.

- The project will result in the loss of 0.05-acres of seasonal wetlands
- The project will result in the loss of 0.05-acres of suitable seasonal wetland habitat for federally listed plant species.
- The project will result in the removal of several trees which provide suitable habitat for roosting bats.
- The project will result in the removal of several trees which provide suitable habitat for native nesting birds.

9 TOWN OF WINDSOR CEQA INITIAL STUDY QUESTIONNAIRE

1. *Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Yes. The Heritage Park project would have a substantial adverse effect, either directly or through habitat modifications, or any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

The project will require the filling of 0.05-acres of seasonal wetlands. Seasonal wetlands located in the Santa Rosa Plain provide suitable habitat for federally endangered plant species. Construction activities and tree removal has the potential to impact raptors and native nesting birds. Tree removal has the potential to impact special-status bat species and other native roosting bats.

2. *Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Yes. The Heritage Park project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

The project will require the filling of 0.05-acres of seasonal wetlands, which is a sensitive natural community.

3. *Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, wetlands, etc.) through direct removal, filling hydrological interruption, or other means?*

Yes. The Heritage Park project would have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling hydrological interruption, or other means. The project will require the filling of 0.05-acres of seasonal wetlands.

4. *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

No. The Heritage Park project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The site would not be considered a migratory wildlife corridor because of substantial developments surrounding the site and the lack of significant undeveloped areas to the north, east and south of the site. No nursery sites (heron or egret rookery, etc.) were observed at the site.

5. *If the answers to questions 1-4 above identify potentially significant effects on biological resources, identify mitigation measures and monitoring actions to ensure compliance with CEQA and state and federal regulations. If the mitigation measures identified are typically required conditions of state and federal permits, then evidence of permit issuance by that agency may be identified as a measure of compliance. In the professional judgment of the biologist, will these mitigation measures reduce these identified impacts to less than significant levels?*

Mitigation measures and monitoring actions should consist of the following and would result in reducing identified impacts to biological resources to less than significant levels.

MITIGATION MEASURE 1:

Obtain permit authorization from the USACE and the NCRWQCB for fill of the 0.05-acres of seasonal wetlands. The permit applications that would need to be submitted include a USACE Section 404 Nationwide Permit #39 and a NCRWQCB Section 401 Water Quality Certification.

Mitigate for the loss of 0.05-acres of seasonal wetlands through the purchase of 0.05-acres of constructed seasonal wetlands at an agency approved wetland mitigation bank in the Santa Rosa Plain.

MITIGATION MEASURE 2:

During the permitting process with the USACE, request the USACE to obtain formal consultation with USFWS to append the Heritage Park project to the Programmatic Biological Opinion (USFWS, 2007).

Under specified conditions under the Programmatic Biological Opinion (USFWS, 2007), mitigate for the loss of 0.05-acres of suitable habitat for listed plants through the purchase of 0.05-acres (1:1 mitigation ratio) of Burke's goldfields or Sonoma sunshine occupied or established habitat (any combination) with success criteria met prior to groundbreaking at the project site AND 0.025-acres (0.5:1 mitigation ratio) of Burke's goldfields or Sonoma sunshine establishment habitat with success criteria met prior to groundbreaking at the project site.

MITIGATION MEASURE 3:

Tree protection fencing shall be installed around any tree that is proposed to be preserved to avoid disturbance or impacts to these trees during construction activities. In addition, the project will need to comply with the Town of Windsor's Tree Preservation and Protection Ordinance.

MITIGATION MEASURE 4:

In the event that construction activities are initiated (including land clearing, demolition, and/or tree removal) within the avian nesting season (February 1 – August 31), a preconstruction survey shall be performed by a qualified biologist on the site to locate any active nests on or immediately adjacent to the site. The preconstruction survey shall be performed within 15 days before initiation of site activities. If active nests are identified, protective measures shall be implemented. An appropriate non-disturbance buffer zone shall be established – typically up to 300 feet for raptors and 50 feet for passerines, or as otherwise recommended by the biologist. These protection measures shall remain in effect until the young have left the nest and are foraging independently or the nest is no longer active, as determined by the biologist. If land-clearing activities (including all vegetation removal) can be performed outside of the nesting season (August 31 - January 31), no preconstruction surveys for nesting birds are warranted.

MITIGATION MEASURE 5:

To ensure that actively roosting bats are not disturbed as a result of tree trimming and tree removal, it is recommended that specific mitigation measures be implemented to avoid impacts to bat species.

1. The pruning or removal of living trees or snags must not occur during the maternity season between April 1 and September 1 to minimize the disturbance of young that may be present and unable to fly.
2. The pruning or removal of living trees or snags must occur between the hours of 12 pm and sunset on days after nights when low temperatures were 50° or warmer to minimize impacting bats that may be present in deep torpor. Sunset times shall be obtained from http://aa.usno.navy.mil/data/docs/RS_OneDay.php and temperatures for prior-work nights shall be obtained from <http://www.wunderground.com/history/>
3. When it is necessary to perform crown reduction on trees over 12 inches in diameter breast height or remove entire trees or branches over six inches in diameter there shall be preliminary pruning of small branches less than 2 inches in diameter performed the day before. The purpose of this is to minimize the probability that bats would choose to roost in those trees the night before the work is performed.

If it is not possible to implement Measures 2 and/or 3, then a qualified bat biologist will be required in order to conduct tree cavity surveys and humanely evict roosting bats within 24 hours of vegetation management activities. Measure 1 (avoidance of maternity season) is critical as young bats that are not able to fly cannot be humanely evicted.

MITIGATION MEASURE 6:

It is recommended that mitigation measures be incorporated during construction activities to avoid sedimentation and other potential pollutants from entering storm drains. Appropriate mitigation measures should include an adequate erosion control plan and best management practices to minimize the amount of sediment and other pollutants leaving the site during construction activities. Because the project will disturb approximately 1.66 acres, a General Permit for Discharges of Storm Water Associated with Construction Activity must be obtained from the State Water Resources Control Board and a Construction Storm Water Pollution Prevention Plan must be prepared and implemented.

6. *Demonstrate how analysis and recommended mitigation measures comply with the requirements of the Santa Rosa Plain Conservation Strategy, and any subsequent Programmatic Opinion issued by the US Fish and Wildlife Service?*

The analysis and recommended mitigation measures comply with the requirements of the Santa Rosa Plain Conservation Strategy and the Programmatic Biological Opinion issued by the USFWS dated November 19, 2007 (USFWS, 2007).

The Heritage Park project does comply with the requirements of the Santa Rosa Plain Conservation Strategy. The site is not within the potential range of the California tiger salamander (*Ambystoma californiense*) (CTS) as mapped by the United States Fish and Wildlife Service (USFWS) according to the Santa Rosa Plain Conservation Strategy (SRPCS) (SRPCST, 2005). The site is categorized as “Presence for CTS is not likely but Mitigation for listed plants may be required” according to Figure 3 of the SRPCS (SRPCST, 2005).

In addition, the site is categorized as “May affect listed plants, but would not likely affect CTS” according to Enclosure 1 of the Programmatic Biological Opinion for U.S. Army Corps of Engineers Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California, dated November 9, 2007 (USFWS, 2007).

According to these two documents, mitigation for potential impacts to California tiger salamander habitat will not be required but mitigation for impacts to suitable seasonal wetland habitat for federally listed plant species will be required. The site is not listed as an occurrence site in the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) (CNDDDB, 2008) or the Seasonal Wetland Baseline Report for the Santa Rosa Plain, Sonoma County (Patterson, *et. al.*, 1994).

Compliance with MITIGATION MEASURE 2 will comply with the requirements of the Santa Rosa Plain Conservation Strategy and the Programmatic Biological Opinion issued by the USFWS (USFWS, 2007).

7. *Is it recommended by the professional biologist that the property owner apply for permits from the following regulatory agencies (specify permit type and description) in order to comply with State and Federal law:*

- *California Department of Fish and Game (CDFG)*
- *California Water Quality Control Board: North Coast Region (NCRWQCB)*
- *U.S. Army Corps of Engineers (USACE)*
- *U.S. Fish and Wildlife Service (USFWS)*

Yes. It is recommended that the Heritage Park project applicants apply and obtain permit authorization through the USACE and the NCRWQCB.

Permit authorization under Section 404 of the Clean Water Act through the USACE under Nationwide Permit #39 and Section 401 of the Clean Water Act through the NCRWQCB Water Quality Certification will need to be obtained.

Formal consultation between the USACE and the USFWS under Section 7 of the Endangered Species Act in order to append the project to the Programmatic Biological Opinion will also be required to comply with the federal Endangered Species Act.

In addition, a General Permit for Discharges of Storm Water Associated with Construction Activity must be obtained from the State Water Resources Control Board

and a Construction Storm Water Pollution Prevention Plan must be prepared and implemented.

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FIGURES

FIGURE 1. SITE VICINITY MAP

FIGURE 2. USGS MAP

FIGURE 3. SOILS MAP

FIGURE 4. HABITAT MAP

FIGURE 5. CNDDDB MAP

SITE PLAN

PHOTO PLATE A

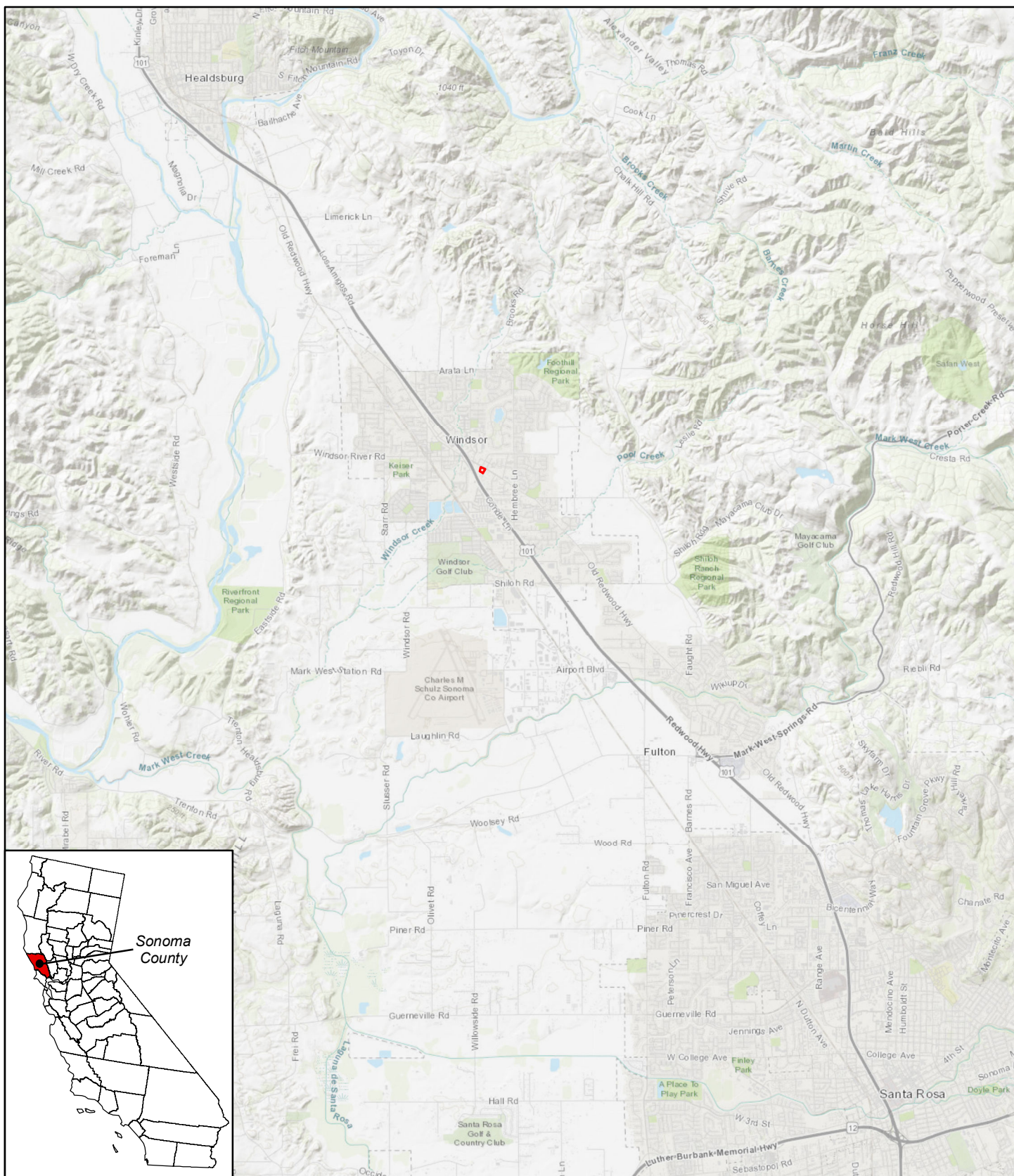


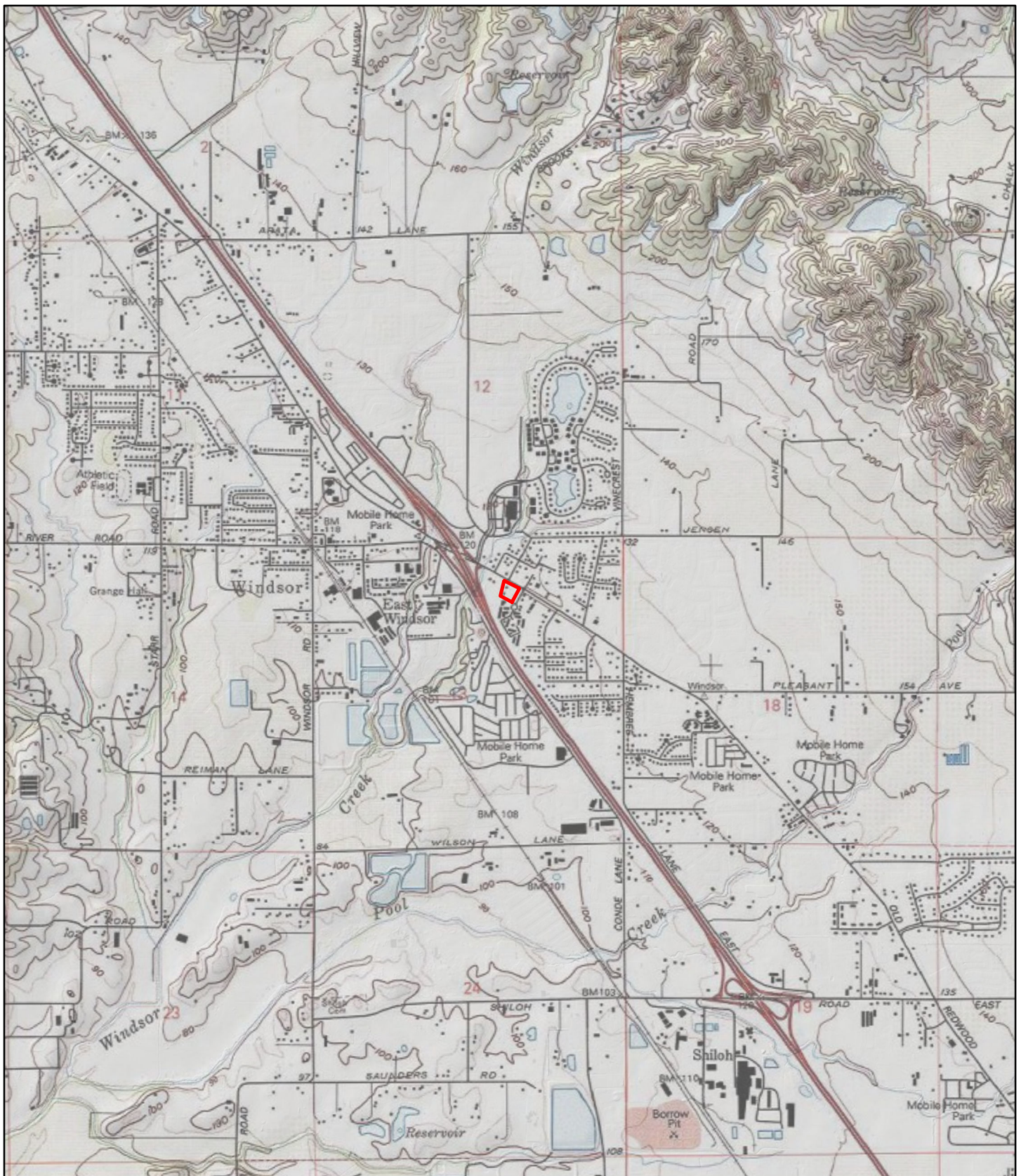
Figure 1 - Site Vicinity Map


8685 Old Redwood Hwy
Windsor, CA,
Sonoma County APN:164-100-023



Wiemeyer Ecological Sciences
4000 Montgomery Drive, Suite L-5
Santa Rosa, CA 95405

Parcel boundary
provided by
Sonoma County
Map date: 11/2018



 Site Boundary

0 0.5 1 2 Miles

Figure 2 - USGS Map

8685 Old Redwood Hwy
Windsor, CA,
Sonoma County APN:164-100-023



Wiemeyer Ecological Sciences
4000 Montgomery Drive, Suite L-5
Santa Rosa, CA 95405

Parcel boundary
provided by
Sonoma County
Map date: 11/2018



Site Boundary
 HtA - Huichica loam, 0 to 2 percent slopes

Figure 3 - Soils Map

8685 Old Redwood Hwy
 Windsor, CA,
 Sonoma County APN:164-100-023

0 50 100 200 Feet



Wiemeyer Ecological Sciences
 4000 Montgomery Drive, Suite L-5
 Santa Rosa, CA 95405

Parcel boundary provided
 by Sonoma County
 Soils provided by NRCS
 Map date: 11/2018



Site Boundary
 Seasonal Wetland
 AG - Annual Grassland

Figure 4 - Habitat Map

8685 Old Redwood Hwy
 Windsor, CA,
 Sonoma County APN:164-100-023

0 50 100 200 Feet



Wiemeyer Ecological Sciences
 4000 Montgomery Drive, Suite L-5
 Santa Rosa, CA 95405

Parcel boundary
 provided by
 Sonoma County
 Map date: 11/2018

Parcel boundary provided
by Sonoma County
5 CNDDDB provided
by CDFW (v. 9/2018)
Map date: 11/2018



J.E. ARMSTRONG
ARCHITECT, INC
LICENSE C22059
2300 KNOLL DR., STE. A
VENTURA, CA. 93003
805-644-8180



PROJECT TITLE:

HERITAGE PARK

FOR

WJ INVESTMENTS

SHEET TITLE:

PROPOSED SITE PLAN

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |
| | |

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| | |
|--------------------------|-------------------|
| DATE: 03/19/18 | FILENAME: A1.0 |
| JEA'S PROJECT #: 1724 | DRAWN BY: JL |
| CONSULTANT'S #: | REVIEWED BY: |

THE ORIGINAL SIZE OF THIS SHEET IS 30" X 42". IF THE CURRENT SIZE IS OTHER THAN 30" X 42", ADJUST THE SCALE OF THE DRAWINGS ACCORDINGLY.

A1.0

SITE SUMMARY

PROJECT ADDRESS: 8685 OLD REDWOOD HIGHWAY WINDSOR, CA. 95492

NET ACREAGE: 1.43 AC. (61,134 SF) 21.7 DU/AC

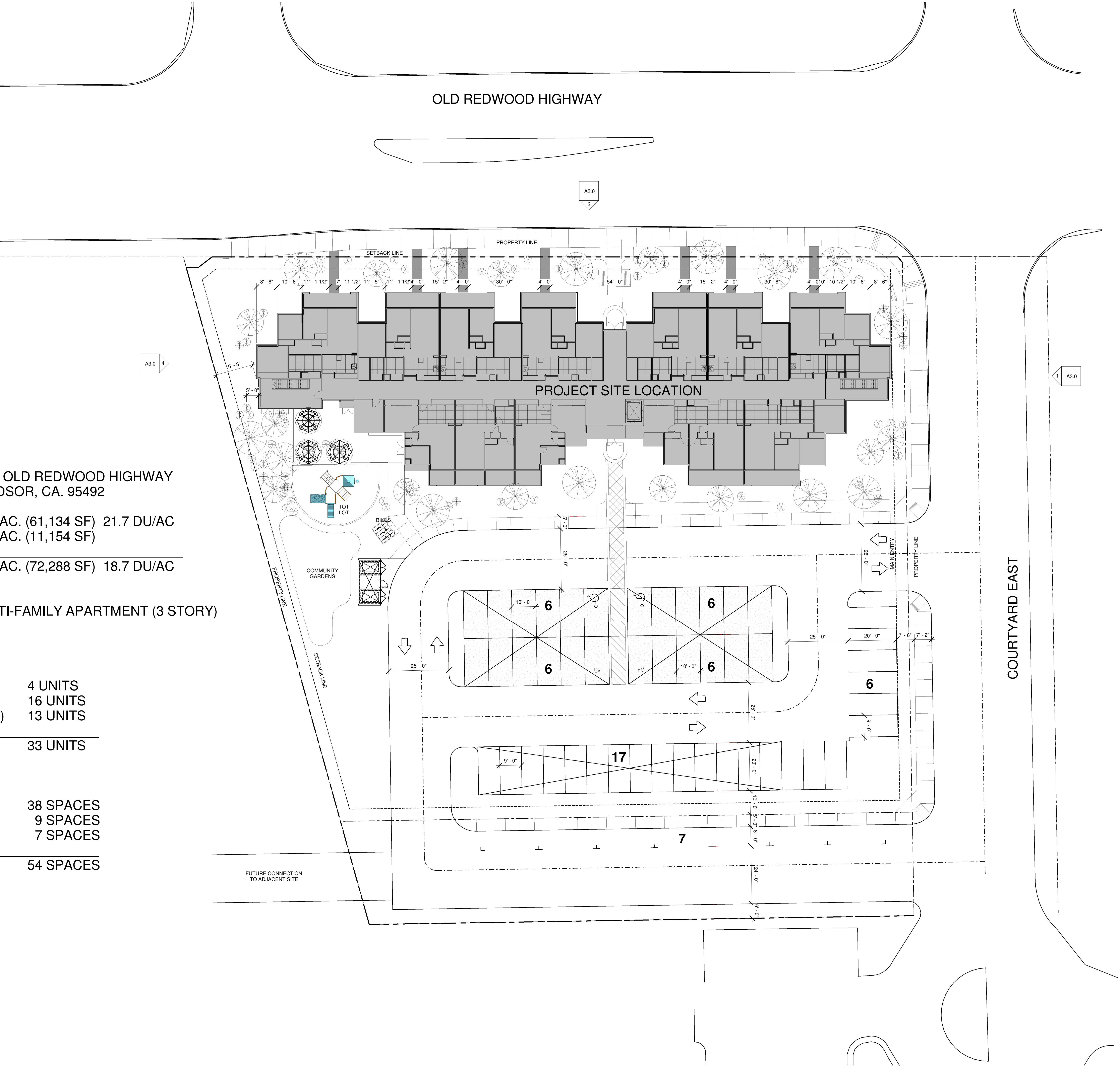
DEDICATED ACREAGE: 0.26 AC. (11,154 SF)

TOTAL AREA: 1.66 AC. (72,288 SF) 18.7 DU/AC

PROPOSED USE: MULTI-FAMILY APARTMENT (3 STORY)

| | |
|----------------------|----------|
| PROPOSED UNITS: | |
| 1 BEDROOM (720 SF) | 4 UNITS |
| 2 BEDROOM (955 SF) | 16 UNITS |
| 3 BEDROOM (1,055 SF) | 13 UNITS |
| TOTAL: | 33 UNITS |

| | |
|-----------|-----------|
| PARKING: | |
| COVERED | 38 SPACES |
| UNCOVERED | 9 SPACES |
| PARALLEL | 7 SPACES |
| TOTAL: | 54 SPACES |



1 Site
1/16" = 1'-0"



A-1: Looking west at northeast corner of site.



A-2: Looking south at northeast corner of site.



A-3: Looking west near southwest corner of site.



A-4: Looking north showing seasonal wetland habitat.



A-5: Looking southwest showing center of site and oak samplings.



A-6: View of barn and residence in background.

**8685 Old Redwood Highway
Windsor, CA**

PHOTO PLATE A

**WIEMEYER ECOLOGICAL SCIENCES
4000 MONTGOMERY DRIVE, SUITE L-5
SANTA ROSA, CA 95405
(707) 573-1770**

APPENDIX A
SPECIAL STATUS PLANT SPECIES

APPENDIX A: SPECIAL-STATUS PLANT SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|--|---------------------------------|------------------------|--------------------|-------------------|-------------------|---------------------|---|
| <i>Alopecurus aequalis</i> var. <i>sonomensis</i> | <i>Sonoma alopecurus</i> | 1B.1 | G5T1 | S1 | None | FE | Marshes and swamps (freshwater), Riparian scrub |
| <i>Amorpha californica</i> var. <i>napensis</i> | <i>Napa false indigo</i> | 1B.2 | G4T2 | S2 | None | None | Broadleafed upland forest (openings), Chaparral, Cismontane woodland |
| <i>Amsinckia lunaris</i> | <i>bent-flowered fiddleneck</i> | 1B.2 | G3 | S3 | None | None | Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland |
| <i>Anomobryum julaceum</i> | <i>slender silver moss</i> | 4.2 | G5? | S2 | None | None | Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest |
| <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i> | <i>Baker's manzanita</i> | 1B.1 | G2T1 | S1 | CR | None | Broadleafed upland forest, Chaparral |
| <i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i> | <i>The Cedars manzanita</i> | 1B.2 | G2T2 | S2 | CR | None | Closed-cone coniferous forest, Chaparral |
| <i>Arctostaphylos densiflora</i> | <i>Vine Hill manzanita</i> | 1B.1 | G1 | S1 | CE | None | Chaparral (acid marine sand) |
| <i>Arctostaphylos hispidula</i> | <i>Howell's manzanita</i> | 4.2 | G4 | S3 | None | None | Chaparral (serpentinite or sandstone) |
| <i>Arctostaphylos manzanita</i> ssp. <i>elegans</i> | <i>Konocti manzanita</i> | 1B.3 | G5T3 | S3 | None | None | Chaparral, Cismontane woodland, Lower montane coniferous forest |
| <i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> | <i>Rincon Ridge manzanita</i> | 1B.1 | G3T1 | S1 | None | None | Chaparral (rhyolitic), Cismontane woodland |
| <i>Asclepias solanoana</i> | <i>serpentine milkweed</i> | 4.2 | G3 | S3 | None | None | Chaparral, Cismontane woodland, Lower montane coniferous forest |
| <i>Astragalus breweri</i> | <i>Brewer's milk-vetch</i> | 4.2 | G3 | S3 | None | None | Chaparral, Cismontane woodland, Meadows and seeps, Valley and foothill grassland (open, often gravelly) |
| <i>Astragalus claranus</i> | <i>Clara Hunt's milk-vetch</i> | 1B.1 | G1 | S1 | CT | FE | Chaparral (openings), Cismontane woodland, Valley and foothill grassland |
| <i>Astragalus clevelandii</i> | <i>Cleveland's milk-vetch</i> | 4.3 | G4 | S4 | None | None | Chaparral, Cismontane woodland, Riparian forest |

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CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------|-------------------|---------------------|---|
| Astragalus rattanii var. jepsonianus | Jepson's milk-vetch | 1B.2 | G4T3 | S3 | None | None | Chaparral, Cismontane woodland, Valley and foothill grassland |
| Balsamorhiza macrolepis | big-scale balsamroot | 1B.2 | G2 | S2 | None | None | Chaparral, Cismontane woodland, Valley and foothill grassland |
| Blennosperma bakeri | Sonoma sunshine | 1B.1 | G1 | S1 | CE | FE | Valley and foothill grassland (mesic), Vernal pools |
| Brodiaea leptandra | narrow-anthered brodiaea | 1B.2 | G3? | S3? | None | None | Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland |
| Calamagrostis bolanderi | Bolander's reed grass | 4.2 | G4 | S4 | None | None | Bogs and fens, Broadleafed upland forest, Closed-cone coniferous forest, Coastal scrub, Meadows and seeps (mesic), Marshes and swamps (freshwater), North Coast coniferous forest |
| Calamagrostis crassiglumis | Thurber's reed grass | 2B.1 | G3Q | S2 | None | None | Coastal scrub (mesic), Marshes and swamps (freshwater) |
| Calochortus raichei | The Cedars fairy-lantern | 1B.2 | G2 | S2 | None | None | Closed-cone coniferous forest, Chaparral |
| Calochortus uniflorus | pink star-tulip | 4.2 | G4 | S4 | None | None | Coastal prairie, Coastal scrub, Meadows and seeps, North Coast coniferous forest |
| Calystegia collina ssp. oxyphylla | Mt. Saint Helena morning-glory | 4.2 | G4T3 | S3 | None | None | Chaparral, Lower montane coniferous forest, Valley and foothill grassland |
| Campanula californica | swamp harebell | 1B.2 | G3 | S3 | None | None | Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest |
| Carex comosa | bristly sedge | 2B.1 | G5 | S2 | None | None | Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland |
| Castilleja ambigua var. ambigua | johnny-nip | 4.2 | G4T5 | S4 | None | None | Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins |
| Castilleja uliginosa | Pitkin Marsh paintbrush | 1A | GXQ | SX | CE | None | Marshes and swamps (freshwater) |

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USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|-------------------------------------|----------------------------------|------------------------|--------------------|-------------------|-------------------|---------------------|--|
| Ceanothus confusus | Rincon Ridge <i>ceanothus</i> | 1B.1 | G1 | S1 | None | None | Closed-cone coniferous forest, Chaparral, Cismontane woodland |
| Ceanothus divergens | Calistoga <i>ceanothus</i> | 1B.2 | G2 | S2 | None | None | Chaparral (serpentinite or volcanic, rocky) |
| Ceanothus foliosus var. vineatus | Vine Hill <i>ceanothus</i> | 1B.1 | G3T1 | S1 | None | None | Chaparral |
| Ceanothus gloriosus var. exaltatus | glory brush | 4.3 | G4T4 | S4 | None | None | Chaparral |
| Ceanothus purpureus | holly-leaved <i>ceanothus</i> | 1B.2 | G2 | S2 | None | None | Chaparral, Cismontane woodland |
| Centromadia parryi ssp. parryi | pappose tarplant | 1B.2 | G3T2 | S2 | None | None | Chaparral, Coastal prairie, Meadows and seeps, Marshes and swamps (coastal salt), Valley and foothill grassland (vernally mesic) |
| Chorizanthe valida | Sonoma spineflower | 1B.1 | G1 | S1 | CE | FE | Coastal prairie (sandy) |
| Clarkia imbricata | Vine Hill clarkia | 1B.1 | G1 | S1 | CE | FE | Chaparral, Valley and foothill grassland |
| Cordylanthus tenuis ssp. brunneus | serpentine bird's-beak | 4.3 | G4G5T3 | S3 | None | None | Closed-cone coniferous forest, Chaparral, Cismontane woodland |
| Cordylanthus tenuis ssp. capillaris | Pennell's bird's-beak | 1B.2 | G4G5T1 | S1 | CR | FE | Closed-cone coniferous forest, Chaparral |
| Cryptantha dissita | serpentine <i>cryptantha</i> | 1B.2 | G2 | S2 | None | None | Chaparral (serpentinite) |
| Cuscuta obtusiflora var. glandulosa | Peruvian dodder | 2B.2 | G5T4T5 | SH | None | None | Marshes and swamps (freshwater) |
| Cypripedium montanum | mountain lady's-slipper | 4.2 | G4 | S4 | None | None | Broadleafed upland forest, Cismontane woodland, Lower montane coniferous forest, North Coast coniferous forest |
| Delphinium bakeri | Baker's larkspur | 1B.1 | G1 | S1 | CE | FE | Broadleafed upland forest, Coastal scrub, Valley and foothill grassland |
| Delphinium luteum | golden larkspur | 1B.1 | G1 | S1 | CR | FE | Chaparral, Coastal prairie, Coastal scrub |
| Delphinium uliginosum | swamp larkspur | 4.2 | G3 | S3 | None | None | Chaparral, Valley and foothill grassland |
| Downingia pusilla | dwarf downingia | 2B.2 | GU | S2 | None | None | Valley and foothill grassland (mesic), Vernal pools |

APPENDIX A: SPECIAL-STATUS PLANT SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|----------------------------------|---|--------------------------------|------------------------|-----------------------|-----------------------|-------------------------|--|
| Erigeron biolettii | <i>streamside daisy</i> | 3 | G3? | S3? | None | None | Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest |
| Erigeron greenei | <i>Greene's narrow-leaved daisy</i> | 1B.2 | G3 | S3 | None | None | Chaparral (serpentine or volcanic) |
| Erigeron serpentinus | <i>serpentine daisy</i> | 1B.3 | G2 | S2 | None | None | Chaparral (serpentine, seeps) |
| Eriogonum nervulosum | <i>Snow Mountain buckwheat</i> | 1B.2 | G2 | S2 | None | None | Chaparral (serpentine) |
| Eriophorum gracile | <i>slender cottongrass</i> | 4.3 | G5 | S4 | None | None | Bogs and fens, Meadows and seeps, Upper montane coniferous forest |
| Erythronium helenae | <i>St. Helena fawn lily</i> | 4.2 | G3 | S3 | None | None | Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland |
| Fritillaria liliacea | <i>fragrant fritillary</i> | 1B.2 | G2 | S2 | None | None | Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland |
| Gilia capitata ssp. tomentosa | <i>woolly-headed gilia</i> | 1B.1 | G5T1 | S1 | None | None | Coastal bluff scrub, Valley and foothill grassland |
| Gratiola heterosepala | <i>Boggs Lake hedge-hyssop</i> | 1B.2 | G2 | S2 | CE | None | Marshes and swamps (lake margins), Vernal pools |
| Harmonia nutans | <i>nodding harmonia</i> | 4.3 | G3 | S3 | None | None | Chaparral, Cismontane woodland |
| Hemizonia congesta ssp. congesta | <i>congested-headed hayfield tarplant</i> | 1B.2 | G5T2 | S2 | None | None | Valley and foothill grassland |
| Hesperervax caulescens | <i>hogwallow starfish</i> | 4.2 | G3 | S3 | None | None | Valley and foothill grassland (mesic, clay), Vernal pools (shallow) |
| Hesperolinon bicarpellatum | <i>two-carpellate western flax</i> | 1B.2 | G2 | S2 | None | None | Chaparral (serpentine) |
| Horkelia tenuiloba | <i>thin-lobed horkelia</i> | 1B.2 | G2 | S2 | None | None | Broadleafed upland forest, Chaparral, Valley and foothill grassland |

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CNPS - November 2018

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|---|----------------------------------|--------------------------------|------------------------|-----------------------|-----------------------|-------------------------|---|
| <i>Hosackia gracilis</i> | <i>harlequin lotus</i> | 4.2 | G3G4 | S3 | None | None | Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland |
| <i>Iris longipetala</i> | <i>coast iris</i> | 4.2 | G3 | S3 | None | None | Coastal prairie, Lower montane coniferous forest, Meadows and seeps |
| <i>Kopsiopsis hookeri</i> | <i>small groundcone</i> | 2B.3 | G4? | S1S2 | None | None | North Coast coniferous forest |
| <i>Lasthenia burkei</i> | <i>Burke's goldfields</i> | 1B.1 | G1 | S1 | CE | FE | Meadows and seeps (mesic), Vernal pools |
| <i>Lasthenia californica</i> ssp. <i>bakeri</i> | <i>Baker's goldfields</i> | 1B.2 | G3T1 | S1 | None | None | Closed-cone coniferous forest (openings), Coastal scrub, Meadows and seeps, Marshes and swamps |
| <i>Layia septentrionalis</i> | <i>Colusa layia</i> | 1B.2 | G2 | S2 | None | None | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Legenere limosa</i> | <i>legenere</i> | 1B.1 | G2 | S2 | None | None | Vernal pools |
| <i>Leptosiphon jepsonii</i> | <i>Jepson's leptosiphon</i> | 1B.2 | G3 | S3 | None | None | Chaparral, Cismontane woodland, Valley and foothill grassland |
| <i>Lessingia arachnoidea</i> | <i>Crystal Springs lessingia</i> | 1B.2 | G2 | S2 | None | None | Cismontane woodland, Coastal scrub, Valley and foothill grassland |
| <i>Lessingia hololeuca</i> | <i>woolly-headed lessingia</i> | 3 | G3? | S3? | None | None | Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland |
| <i>Lilium pardalinum</i> ssp. <i>pitkinense</i> | <i>Pitkin Marsh lily</i> | 1B.1 | G5T1 | S1 | CE | FE | Cismontane woodland, Meadows and seeps, Marshes and swamps (freshwater) |
| <i>Lilium rubescens</i> | <i>redwood lily</i> | 4.2 | G3 | S3 | None | None | Broadleafed upland forest, Chaparral, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest |
| <i>Limnanthes vinculans</i> | <i>Sebastopol meadowfoam</i> | 1B.1 | G1 | S1 | CE | FE | Meadows and seeps, Valley and foothill grassland, Vernal pools |
| <i>Lomatium repostum</i> | <i>Napa lomatium</i> | 4.3 | G3 | S3 | None | None | Chaparral, Cismontane woodland |
| <i>Lupinus sericatus</i> | <i>Cobb Mountain lupine</i> | 1B.2 | G2? | S2? | None | None | Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest |

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CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|---------------------------------------|------------------------------------|------------------------|--------------------|-------------------|-------------------|---------------------|--|
| Micropus amphibolus | <i>Mt. Diablo cottonweed</i> | 3.2 | G3G4 | S3S4 | None | None | Broadleafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland |
| Microseris paludosa | <i>marsh microseris</i> | 1B.2 | G2 | S2 | None | None | Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland |
| Monardella viridis | <i>green monardella</i> | 4.3 | G3 | S3 | None | None | Broadleafed upland forest, Chaparral, Cismontane woodland |
| Navarretia cotulifolia | <i>cotula navarretia</i> | 4.2 | G4 | S4 | None | None | Chaparral, Cismontane woodland, Valley and foothill grassland |
| Navarretia leucocephala ssp. bakeri | <i>Baker's navarretia</i> | 1B.1 | G4T2 | S2 | None | None | Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Valley and foothill grassland, Vernal pools |
| Navarretia leucocephala ssp. pliantha | <i>many-flowered navarretia</i> | 1B.2 | G4T1 | S1 | CE | FE | Vernal pools (volcanic ash flow) |
| Orobanche valida ssp. howellii | <i>Howell's broomrape</i> | 4.3 | G4T3 | S3 | None | None | Chaparral (serpentinite or volcanic) |
| Penstemon newberryi var. sonomensis | <i>Sonoma beardtongue</i> | 1B.3 | G4T2 | S2 | None | None | Chaparral (rocky) |
| Perideridia gairdneri ssp. gairdneri | <i>Gairdner's yampah</i> | 4.2 | G5T3T4 | S3S4 | None | None | Broadleafed upland forest, Chaparral, Coastal prairie, Valley and foothill grassland, Vernal pools |
| Pleuropogon hooverianus | <i>North Coast semaphore grass</i> | 1B.1 | G2 | S2 | CT | None | Broadleafed upland forest, Meadows and seeps, North Coast coniferous forest |
| Ranunculus lobbii | <i>Lobb's aquatic buttercup</i> | 4.2 | G4 | S3 | None | None | Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools |
| Rhynchospora alba | <i>white beaked-rush</i> | 2B.2 | G5 | S2 | None | None | Bogs and fens, Meadows and seeps, Marshes and swamps (freshwater) |
| Rhynchospora californica | <i>California beaked-rush</i> | 1B.1 | G1 | S1 | None | None | Bogs and fens, Lower montane coniferous forest, Meadows and seeps (seeps), Marshes and swamps (freshwater) |

APPENDIX A: SPECIAL-STATUS PLANT SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNPS - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Rare Plant Rank</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>State List</u> | <u>Federal List</u> | <u>Habitat</u> |
|---|-----------------------------------|------------------------|--------------------|-------------------|-------------------|---------------------|---|
| Rhynchospora capitellata | <i>brownish beaked-rush</i> | 2B.2 | G5 | S1 | None | None | Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Upper montane coniferous forest |
| Rhynchospora globularis | <i>round-headed beaked-rush</i> | 2B.1 | G4 | S1 | None | None | Marshes and swamps (freshwater) |
| Sidalcea oregana ssp. valida | <i>Kenwood Marsh checkerbloom</i> | 1B.1 | G5T1 | S1 | CE | FE | Marshes and swamps (freshwater) |
| Streptanthus brachiatus ssp. hoffmanii | <i>Freed's jewelflower</i> | 1B.2 | G2T2 | S2 | None | None | Chaparral, Cismontane woodland |
| Streptanthus hesperidis | <i>green jewelflower</i> | 1B.2 | G2 | S2 | None | None | Chaparral (openings), Cismontane woodland |
| Streptanthus morrisonii ssp. elatus | <i>Three Peaks jewelflower</i> | 1B.2 | G2T1 | S1 | None | None | Chaparral (serpentine) |
| Streptanthus morrisonii ssp. kruckebergii | <i>Kruckeberg's jewelflower</i> | 1B.2 | G2T1 | S1 | None | None | Cismontane woodland (serpentine) |
| Stuckenia filiformis ssp. alpina | <i>slender-leaved pondweed</i> | 2B.2 | G5T5 | S3 | None | None | Marshes and swamps (assorted shallow freshwater) |
| Trifolium amoenum | <i>two-fork clover</i> | 1B.1 | G1 | S1 | None | FE | Coastal bluff scrub, Valley and foothill grassland (sometimes serpentine) |
| Trifolium buckwestiorum | <i>Santa Cruz clover</i> | 1B.1 | G2 | S2 | None | None | Broadleafed upland forest, Cismontane woodland, Coastal prairie |
| Trifolium hydrophilum | <i>saline clover</i> | 1B.2 | G2 | S2 | None | None | Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools |
| Triquetrella californica | <i>coastal triquetrella</i> | 1B.2 | G2 | S2 | None | None | Coastal bluff scrub, Coastal scrub |
| Usnea longissima | <i>Methuselah's beard lichen</i> | 4.2 | G4 | S4 | None | None | Broadleafed upland forest, North Coast coniferous forest |
| Viburnum ellipticum | <i>oval-leaved viburnum</i> | 2B.3 | G4G5 | S3? | None | None | Chaparral, Cismontane woodland, Lower montane coniferous forest |

APPENDIX B
SPECIAL STATUS ANIMAL SPECIES

APPENDIX B: SPECIAL-STATUS ANIMAL SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNDDDB - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|--------------------------------|---------------------------------------|---------------------|----------------------|--------------------|-------------------|-------------------------------------|--|
| <i>Agelaius tricolor</i> | tricolored blackbird | None | Candidate Endangered | G2G3 | S1S2 | Species of Special Concern | Freshwater marsh Marsh & swamp Swamp Wetland |
| <i>Ambystoma californiense</i> | California tiger salamander | Threatened | Threatened | G2G3 | S2S3 | Watch List | Cismontane woodland Meadow & seep Riparian woodland Valley & foothill grassland Vernal pool Wetland |
| <i>Andrena blennospermatis</i> | Blennosperma vernal pool andrenid bee | None | None | G2 | S2 | None | Vernal pool |
| <i>Antrozous pallidus</i> | pallid bat | None | None | G5 | S3 | Species of Special Concern | Chaparral Coastal scrub Desert wash Great Basin grassland Great Basin scrub Mojavean desert scrub Riparian woodland Sonoran desert scrub Upper montane coniferous forest Valley & foothill grassland |
| <i>Arborimus pomo</i> | Sonoma tree vole | None | None | G3 | S3 | Species of Special Concern | North coast coniferous forest Oldgrowth Redwood |
| <i>Ardea herodias</i> | great blue heron | None | None | G5 | S4 | None | Brackish marsh Estuary Freshwater marsh Marsh & swamp Riparian forest Wetland |
| <i>Athene cunicularia</i> | burrowing owl | None | None | G4 | S3 | Species of Special Concern | Coastal prairie Coastal scrub Great Basin grassland Great Basin scrub Mojavean desert scrub Sonoran desert scrub Valley & foothill grassland |
| <i>Bombus caliginosus</i> | obscure bumble bee | None | None | G4? | S1S2 | None | * Habitat types not included by CNDDDB |
| <i>Bombus occidentalis</i> | western bumble bee | None | None | G2G3 | S1 | None | * Habitat types not included by CNDDDB |

APPENDIX B: SPECIAL-STATUS ANIMAL SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNDDDB - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|-----------------------------------|--------------------------------------|---------------------|-------------------|--------------------|-------------------|-------------------------------------|---|
| <i>Corynorhinus townsendii</i> | Townsend's big-eared bat | None | None | G3G4 | S2 | Species of Special Concern | Broadleaved upland forest Chaparral Chenopod scrub Great Basin grassland Great Basin scrub Joshua tree woodland Lower montane coniferous forest Meadow & seep Mojavean desert scrub Riparian forest Riparian woodland Sonoran desert scrub Sonoran thorn woodland Upper montane coniferous forest Valley & foothill grassland |
| <i>Coturnicops noveboracensis</i> | yellow rail | None | None | G4 | S1S2 | Species of Special Concern | Freshwater marsh Meadow & seep |
| <i>Dicamptodon ensatus</i> | California giant salamander | None | None | G3 | S2S3 | Species of Special Concern | Aquatic Meadow & seep North coast coniferous forest Riparian forest |
| <i>Dubiraphia giulianii</i> | Giuliani's dubiraphian riffle beetle | None | None | G1G3 | S1S3 | | Aquatic |
| <i>Elanus leucurus</i> | white-tailed kite | None | None | G5 | S3S4 | Fully Protected | Cismontane woodland Marsh & swamp Riparian woodland Valley & foothill grassland Wetland |
| <i>Emys marmorata</i> | western pond turtle | None | None | G3G4 | S3 | Species of Special Concern | Aquatic Artificial flowing waters Klamath/North coast flowing waters Klamath/North coast standing waters Marsh & swamp Sacramento/San Joaquin flowing waters Sacramento/San Joaquin standing waters South coast flowing waters South coast standing waters Wetland |
| <i>Erethizon dorsatum</i> | North American porcupine | None | None | G5 | S3 | None | Broadleaved upland forest Cismontane woodland Closed-cone coniferous forest Lower montane coniferous forest North coast coniferous forest Upper montane coniferous forest |

APPENDIX B: SPECIAL-STATUS ANIMAL SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNDDDB - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|---|--|---------------------|-------------------|--------------------|-------------------|-------------------------------------|---|
| <i>Hysteroecarpus traski pomu</i> | Russian River tulle perch | None | None | G5T4 | S4 | Species of Special Concern | Aquatic Klamath/North coast flowing waters |
| <i>Lasiurus blossevillei</i> | western red bat | None | None | G5 | S3 | Species of Special Concern | Cismontane woodland Lower montane coniferous forest Riparian forest Riparian woodland |
| <i>Lasiurus cinereus</i> | hoary bat | None | None | G5 | S4 | None | Broadleaved upland forest Cismontane woodland Lower montane coniferous forest North coast coniferous forest |
| <i>Lavinia symmetricus navarroensis</i> | Navarro roach | None | None | G4T1T2 | S2S3 | Species of Special Concern | Aquatic Sacramento/San Joaquin flowing waters |
| <i>Linderiella occidentalis</i> | California linderiella | None | None | G2G3 | S2S3 | None | Vernal pool |
| <i>Mylopharodon conocephalus</i> | hardhead | None | None | G3 | S3 | Species of Special Concern | Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters |
| <i>Myotis thysanodes</i> | fringed myotis | None | None | G4 | S3 | None | * Habitat types not included by CNDDDB |
| <i>Oncorhynchus kisutch pop. 4</i> | coho salmon - central California coast ESU | Endangered | Endangered | G4 | S2? | None | Aquatic |
| <i>Oncorhynchus mykiss irideus pop. 8</i> | steelhead - central California coast DPS | Threatened | None | G5T2T3 Q | S2S3 | None | Aquatic Sacramento/San Joaquin flowing waters |

APPENDIX B: SPECIAL-STATUS ANIMAL SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNDDDB - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|-----------------------------|------------------------------|---------------------|----------------------|--------------------|-------------------|-------------------------------------|--|
| <i>Pandion haliaetus</i> | osprey | None | None | G5 | S4 | Watch List | Riparian forest |
| <i>Pekania pennanti</i> | fisher - West Coast DPS | None | Threatened | G5T2T3 Q | S2S3 | Species of Special Concern | North coast coniferous forest Oldgrowth Riparian forest |
| <i>Rana boylei</i> | foothill yellow-legged frog | None | Candidate Threatened | G3 | S3 | Species of Special Concern | Aquatic Chaparral Cismontane woodland Coastal scrub Klamath/North coast flowing waters Lower montane coniferous forest Meadow & seep Riparian forest Riparian woodland Sacramento/San Joaquin flowing waters |
| <i>Rana draytonii</i> | California red-legged frog | Threatened | None | G2G3 | S2S3 | Species of Special Concern | Aquatic Artificial flowing waters Artificial standing waters Freshwater marsh Marsh & swamp Riparian forest Riparian scrub Riparian woodland Sacramento/San Joaquin flowing waters Sacramento/San Joaquin standing waters South coast flowing waters South coast standing waters Wetland |
| <i>Stygobromus cherylae</i> | Barr's amphipod | None | None | G1 | S1 | None | Aquatic |
| <i>Syncaris pacifica</i> | California freshwater shrimp | Endangered | Endangered | G2 | S2 | None | Aquatic Sacramento/San Joaquin flowing waters |
| <i>Taricha rivularis</i> | red-bellied newt | None | None | G4 | S2 | Species of Special Concern | Broadleaved upland forest North coast coniferous forest Redwood Riparian forest Riparian woodland |

APPENDIX B: SPECIAL-STATUS ANIMAL SPECIES LIST

USGS 9-QUADRANGLE MAPS- Healdsburg, Geyserville, Jintown, Mount St. Helena, Guerneville, Mark West Springs, Camp Meeker, Sebastopol, Santa Rosa

CNDDDB - November 2018

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Federal List</u> | <u>State List</u> | <u>Global Rank</u> | <u>State Rank</u> | <u>Dept. Fish and Wildlife Rank</u> | <u>Habitat</u> |
|----------------------------|---------------------------------------|---------------------|-------------------|--------------------|-------------------|-------------------------------------|--|
| <i>Taxidea taxus</i> | American badger | None | None | G5 | S3 | Species of Special Concern | Many habitat types listed in CNDDDB – only including region habitat types. Broadleaved upland forest Chaparral Cismontane woodland Closed-cone coniferous forest Freshwater marsh Lower montane coniferous forest Marsh & swamp Meadow & seep North coast coniferous forest Riparian forest Riparian scrub Riparian woodland Ultramafic Upper montane coniferous forest Valley & foothill grassland |
| <i>Trachykele hartmani</i> | serpentine cypress wood-boring beetle | None | None | G1 | S1 | None | * Habitat types not included by CNDDDB |

APPENDIX C
PLANT INVENTORY LIST

Appendix C: Plant Inventory List

8685 Old Redwood Highway, Windsor

| FAMILY | SPECIES NAME | COMMON NAME | NATIVE=N INTRODUCED=I |
|-----------------|---------------------------------|-------------------|--------------------------|
| Apiaceae | | | |
| | Daucus carota | wild carrot | I |
| | Foeniculum vulgare | fennel | I |
| Apocynaceae | | | |
| | Vinca major | periwinckle | I |
| Araliaceae | | | |
| | Hedera helix | English ivy | I |
| Asteraceae | | | |
| | Anthemis cotula | dog fennel | I |
| | Centaurea solstitialis | star thistle | I |
| | Chicorium intybus | chicory | I |
| | Hemizonia congesta spp congesta | hayfield tarweed | N |
| | Hypochoeris glabra | smooth cat's ear | I |
| | Lactuca serriola | prickly lettuce | I |
| | Picris echioides | bristly ox tongue | I |
| | Senecio vulgaris | common groundsel | I |
| | Taraxacum officinale | dandelion | I |
| | Tragopogon porrifolius | salsify | I |
| Caryophyllaceae | | | |
| | Stellaria media | chickweed | I |
| Convolvulaceae | | | |
| | Convolvulus arvensis | bindweed | I |
| Cruciferae | | | |
| | Brassica nigra | wild mustard | I |
| | Raphanus sativus | wild radish | I |

| FAMILY | SPECIES NAME | COMMON NAME | NATIVE=N INTRODUCED=I |
|----------------------|--------------------------|-----------------------|----------------------------------|
| Cyperaceae | | | |
| | Cyperus eragrostis | nut-sedge | I |
| | Eleocharis macrostachya | creeping spiked sedge | N |
| Euphorbiaceae | | | |
| | Eremocarpus setigerus | turkey mullen | N |
| Fabaceae | | | |
| | Lotus purshianus | trefoil | N |
| | Lupinus bicolor | miniature lupine | N |
| | Medicago polymorpha | bur-clover | I |
| | Trifolium subterraneum | subterranean clover | I |
| | Trifolium variegatum | white-tip clover | N |
| | Vicia sativa | spring vetch | I |
| Fagaceae | | | |
| | Quercus agrifolia | coast live oak | N |
| | Quercus kelloggii | black oak | N |
| | Quercus lobata | valley oak | N |
| Geraniaceae | | | |
| | Erodium cicutarium | redstem filaree | I |
| Iridaceae | | | |
| | Sisyrinchium bellum | blue-eyed grss | N |
| Juglandaceae | | | |
| | Juglans regia | English walnut | I |
| Juncaceae | | | |
| | Juncus bufonius | toadrush | N |
| | Juncus tenuis | slender rush | N |
| Lamiaceae | | | |
| | Mentha pelugium | pennyroyal | I |
| Liliaceae | | | |
| | Chlorogalum pomeridianum | soap plant | N |
| Lythraceae | | | |
| | Lythrum hyssopifolia | hyssop loosestrife | I |
| Myrtaceae | | | |
| | Eucalyptus globulus | blue gum | I |

| FAMILY | SPECIES NAME | COMMON NAME | NATIVE=N INTRODUCED=I |
|----------------|---|-----------------------|----------------------------------|
| Onagraceae | | | |
| | Epilobium ciliatum | Willow Herb | N |
| Papaveraceae | | | |
| | Eschscholzia californica | California poppy | N |
| Plantaginaceae | | | |
| | Plantago lanceolata | English plantain | I |
| Poaceae | | | |
| | Avena fatua | wild oat | I |
| | Briza minor | small quaking grass | I |
| | Bromus diandrus | rip-gut brome | I |
| | Bromus mollis | soft chess | I |
| | Cynodon dactylon | bermuda grass | I |
| | Danthonia californica | California oatgrass | N |
| | Lolium perenne | perennial rye grass | I |
| | Phalaris aquatica (Phalaris tuberosa var. stenoptera) | Harding grass | I |
| | Poa annua | annual bluegrass | I |
| | Vulpia bromoides | six-weeks brome grass | I |
| Polygonaceae | | | |
| | Polygonum aviculare | common knotweed | I |
| | Rumex acetosella | sheep sorrel | I |
| | Rumex crispus | curly dock | I |
| | Rumex pulcher | fiddle dock | I |
| Primulaceae | | | |
| | Anagallis arvensis | scarlet pimpernel | I |
| Ranunculaceae | | | |
| | Ranunculus californicus | California buttercup | N |
| | Ranunculus muricatus | spiny buttercup | I |
| Rosaceae | | | |
| | Prunus sp. | plum | I |
| | Rubus discolor (procerus) | Himalaya berry | I |
| Rubiaceae | | | |
| | Galium aparine | cleavers | I |
| | Galium californicum | California Bedstraw | N |

| FAMILY | SPECIES NAME | COMMON NAME | NATIVE=N INTRODUCED=I |
|-------------------------|-------------------------|--------------------|----------------------------------|
| Scrophulariaceae | | | |
| | Orthocarpus densiflorus | owl's clover | N |
| | Parentucellia viscosa | parentucella | I |
| Verbenaceae | | | |
| | Phyla nodiflora | fog fruit | I |

APPENDIX D
HERITAGE PARK ARBORIST REPORT

HORTICULTURAL

Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Heritage Park Apartments
Windsor, CA

Prepared for:
Town of Windsor
Planning Department
P.O. Box 100
Windsor, CA 95492

Prepared by:
John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A

July 11, 2018

July 11, 2018

Kim Voge
Planning Department
Town of Windsor
P.O. Box 100
Windsor, CA 95492

Re: Completed *Tree Preservation and Mitigation Report*, Heritage Park Apartments, Windsor, California

Kim,

Attached you will find our completed *Tree Preservation and Mitigation Report* for the above noted site in Windsor. A total of 58 trees were evaluated and this includes all native and non-native trees that are present over 6 inches in trunk diameter.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report was evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* also includes information about expected impacts of the proposed development plan and recommendations for action based on the plan reviewed. The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees. We have also provided *Tree Preservation Guidelines* and *Tree Pruning Standards* for your reference.

This report is intended to be a basic inventory of trees present at this site, which includes a general review of tree health and structural condition. No in-depth evaluation has occurred on any tree, and assessment has included only external visual examination without probing, drilling, coring, root collar examination, root excavation, or dissecting any tree part. Failures, deficiencies, and problems may occur in these trees in the future, and this inventory in no way guarantees or provides a warranty for their condition.

EXISTING SITE CONDITION SUMMARY

The project site consists of an empty lot, outbuildings, and an abandoned residence.

EXISTING TREE SUMMARY

Native tree species found on the site include Valley Oak, Black Oak, and Coast Live Oak.

Non-native species on the site include English Walnut, Zelcova, Glossy Privet, Green Wattle, Blue Gum, Deodar Cedar, and Mexican Fan Palm.

CONSTRUCTION IMPACT SUMMARY

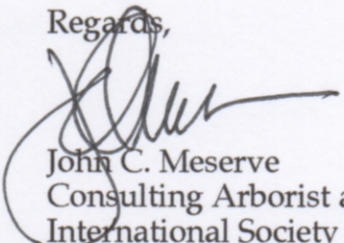
A summary of tree impacts follows:

- (22) Appear to be preservable
- (33) Require removal due to significant development impacts
- (3) Should be removed due to poor species characteristics or poor condition

These recommendations are based on the assumption that most trees along Old Redwood Highway have been allowed adequate room for preservation and that the existing sidewalk will remain in its current location. They are also based on the assumption that trees along Courtyard East cannot be preserved due to the construction of a sidewalk and nearby improvements. If these assumptions are incorrect further discussion may be required.

Please feel free to contact me if you have questions regarding this report, or if further discussion would be helpful.

Regards,


John C. Meserve
Consulting Arborist and Horticulturist
International Society of Arboriculture
ISA Certified Arborist, WE #0478A



TREE INVENTORY CHART

TREE INVENTORY
Heritage Park Subdivision
Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|--------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 1 | <i>Quercus kelloggii</i> | Black Oak | 17 | 40 | 22 | 4 | 3 | 3 | 2 |
| 2 | <i>Quercus lobata</i> | Valley Oak | 14.5 | 45 | 24 | 2 | 3 | 3 | 2 |
| 3 | <i>Quercus lobata</i> | Valley Oak | 10 | 20 | 22 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 4 | <i>Quercus lobata</i> | Valley Oak | 9 | 25 | 22 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 5 | <i>Quercus lobata</i> | Valley Oak | 9 | 30 | 18 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 6 | <i>Quercus lobata</i> | Valley Oak | 12+6.5 | 28 | 20 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 7 | <i>Quercus agrifolia</i> | Coast Live Oak | 4.5+4.5 | 16 | 10 | 4 | 4 | 3 | 2 |
| 8 | <i>Quercus lobata</i> | Valley Oak | 13 | 35 | 26 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 9 | <i>Quercus lobata</i> | Valley Oak | 11 | 35 | 22 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |
| 10 | <i>Quercus lobata</i> | Valley Oak | 8.5 | 28 | 12 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 11 | <i>Quercus lobata</i> | Valley Oak | 7 | 28 | 18 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 12 | <i>Quercus lobata</i> | Valley Oak | 7.5+5 | 20 | 18 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 13 | <i>Quercus lobata</i> | Valley Oak | 10.5 | 30 | 18 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |

HORTICULTURAL ASSOCIATES
P.O. Box 1261, Glen Ellen, CA 95442
707.935.3911

TREE INVENTORY

Heritage Park Subdivision

Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|-----------------------|-------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 14 | <i>Quercus lobata</i> | Valley Oak | 15 | 32 | 20 | 3 | 3 | 1 | 1, 6, 7, 8, 9 |
| 15 | <i>Quercus lobata</i> | Valley Oak | 15.5 | 30 | 24 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |
| 16 | <i>Quercus lobata</i> | Valley Oak | 5 | 15 | 14 | 2 | 3 | 3 | 2 |
| 17 | <i>Quercus lobata</i> | Valley Oak | 18 | 35 | 18 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 18 | <i>Quercus lobata</i> | Valley Oak | 12.5 | 18 | 14 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 19 | <i>Quercus lobata</i> | Valley Oak | 6.5+7 | 35 | 18 | 3 | 2 | 1 | 1, 6, 7, 8, 9 |
| 20 | <i>Quercus lobata</i> | Valley Oak | 9 | 35 | 20 | 3 | 3 | 3 | 2 |
| 21 | <i>Quercus lobata</i> | Valley Oak | 6.5 | 20 | 16 | 3 | 3 | 3 | 2 |
| 22 | <i>Quercus lobata</i> | Valley Oak | 14 | 40 | 22 | 3 | 3 | 3 | 2 |
| 23 | <i>Quercus lobata</i> | Valley Oak | 12.5+4 | 30 | 18 | 3 | 3 | 3 | 2 |
| 24 | <i>Quercus lobata</i> | Valley Oak | 15 | 45 | 20 | 3 | 3 | 3 | 2 |
| 25 | <i>Quercus lobata</i> | Valley Oak | 13 | 30 | 18 | 2 | 3 | 3 | 2 |
| 26 | <i>Quercus lobata</i> | Valley Oak | 10+17 | 38 | 18 | 3 | 3 | 3 | 2 |
| 27 | <i>Quercus lobata</i> | Valley Oak | 4.5 | 25 | 10 | 2 | 3 | 3 | 2 |

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707.935.3911

TREE INVENTORY
Heritage Park Subdivision
Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|--------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 28 | <i>Quercus lobata</i> | Valley Oak | 5 | 16 | 8 | 3 | 3 | 3 | 2 |
| 29 | <i>Quercus lobata</i> | Valley Oak | 25 | 40 | 24 | 3 | 3 | 3 | 2 |
| 30 | <i>Quercus lobata</i> | Valley Oak | 6 | 20 | 12 | 3 | 3 | 3 | 2 |
| 31 | <i>Quercus lobata</i> | Valley Oak | 11.5+8.5 | 35 | 20 | 2 | 3 | 3 | 2 |
| 32 | <i>Quercus lobata</i> | Valley Oak | 6 | 25 | 12 | 4 | 3 | 3 | 2 |
| 33 | <i>Quercus lobata</i> | Valley Oak | 26.5 | 35 | 24 | 2 | 3 | 3 | 2 |
| 34 | <i>Quercus lobata</i> | Valley Oak | 43 | 60 | 32 | 4 | 2 | 3 | 2 |
| 35 | <i>Quercus lobata</i> | Valley Oak | 24+15.5+32.5 | 50 | 36 | 3 | 3 | 3 | 2 |
| 36 | <i>Quercus lobata</i> | Valley Oak | ±48 | 70 | 35 | 3 | 2 | 1 | 1, 6, 7, 8, 9 |
| 37 | <i>Quercus lobata</i> | Valley Oak | ±12 | 35 | 16 | 4 | 3 | 1 | 1, 6, 7, 8, 9 |
| 38 | <i>Quercus kelloggii</i> | Black Oak | 4.5+3+3+2.5 | 15 | 11 | 4 | 4 | 1 | 1, 6, 7, 8, 9 |
| 39 | <i>Quercus lobata</i> | Valley Oak | 13 | 45 | 20 | 3 | 3 | 1 | 1, 6, 7, 8, 9 |
| 40 | <i>Quercus lobata</i> | Valley Oak | 5.5 | 30 | 10 | 4 | 3 | 1 | 1, 6, 7, 8, 9 |
| 41 | <i>Quercus agrifolia</i> | Coast Live Oak | ±7+ multi-stem | 15 | 12 | 4 | 4 | 2 | 1, 6, 7, 8, 9 |

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TREE INVENTORY

July 11, 2018

Heritage Park Subdivision
Windsor, CA

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|----------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 42 | <i>Quercus agrifolia</i> | Coast Live Oak | 1+1+5.5+4 | 15 | 8 | 4 | 3 | 3 | 2 |
| 43 | <i>Quercus lobata</i> | Valley Oak | 4 | 20 | 4 | 3 | 3 | 3 | 2 |
| 44 | <i>Quercus Lobata</i> | Valley Oak | 6.5 | 25 | 12 | 4 | 3 | 3 | 2 |
| 45 | <i>Quercus Lobata</i> | Valley Oak | 4.5 | 15 | 10 | 4 | 4 | 3 | 2 |
| 46 | <i>Quercus Lobata</i> | Valley Oak | 5 | 18 | 11 | 3 | 3 | 3 | 2 |
| 47 | <i>Acacia decurrens</i> | Green Wattle | 12+12+18+26 | 35 | 30 | 4 | 2 | 3 | 3,5 |
| 48 | <i>Zelkova serrata</i> | Zelcova | 6 | 16 | 10 | 4 | 3 | 3 | 2 |
| 49 | <i>Zelkova serrata</i> | Zelcova | 6 | 18 | 12 | 4 | 3 | 3 | 2 |
| 50 | <i>Zelkova serrata</i> | Zelcova | 7 | 18 | 12 | 4 | 3 | 3 | 2 |
| 51 | <i>Eucalyptus globulus</i> | Blue Gum | 50 | 70 | 30 | 4 | 2 | 3 | 2, 5 |
| 52 | <i>Eucalyptus globulus</i> | Blue Gum | 52 | 60 | 30 | 2 | 2 | 2 | 3, 5 |
| 53 | <i>Juglans regia</i> | English Walnut | 18 | 18 | 12 | 2 | 2 | 3 | 2 |
| 54 | <i>Ligustrum lucidum</i> | Glossy Privet | 8+10+10+6 | 25 | 15 | 4 | 3 | 3 | 2 |
| 55 | <i>Ligustrum lucidum</i> | Glossy Privet | 6+6+6+8 | 25 | 15 | 4 | 3 | 3 | 2 |

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P.O. Box 1261, Glen Ellen, CA 95442

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TREE INVENTORY

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Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|-----------------------------|------------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 56 | <i>Cedrus deodara</i> | Deodar cedar | 30 | 60 | 16 | 4 | 3 | 2 | 1, 6, 7, 8, 9 |
| 57 | <i>Juglans regia</i> | English Walnut | 8+8+5+6+6 | 15 | 12 | 2 | 2 | 3 | 2 |
| 58 | <i>Washingtonia robusta</i> | Mexican Fan Palm | 18 | 60 | 8 | 4 | 3 | 3 | 2 |

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707.935.3911

KEY TO TREE
INVENTORY CHART

KEY TO TREE INVENTORY CHART

3600 Manor Park Place
Santa Rosa, California

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured, to the nearest one half inch, to document its diameter at 4 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

- (5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.
- (4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.
- (3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.
- (2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.
- (1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

- (4) Good structure - minor structural problems may be present which do not require corrective action.
- (3) Moderate structure - normal, typical structural issues which can be corrected with pruning.
- (2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.
- (1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

Expected Impacts

Considering the proximity of construction activities, type of activities, tree species, and tree condition - the following ratings are used to estimate the amount of impact on tree health and stability. Most trees will tolerate a (1) rating, many trees could tolerate a (2) rating with careful consideration and mitigation, but trees with a (3) rating are poor candidates for preservation due to their very close proximity to construction or because they are located within the footprint of construction and cannot be preserved.

- (3) A significant impact on long term tree integrity can be expected as a result of proposed development.
- (2) A moderate impact on long term tree integrity can be expected as a result of proposed development.
- (1) A very minor or no impact on long term tree integrity can be expected as a result of proposed development.
- (0) No impact is expected

Recommendations

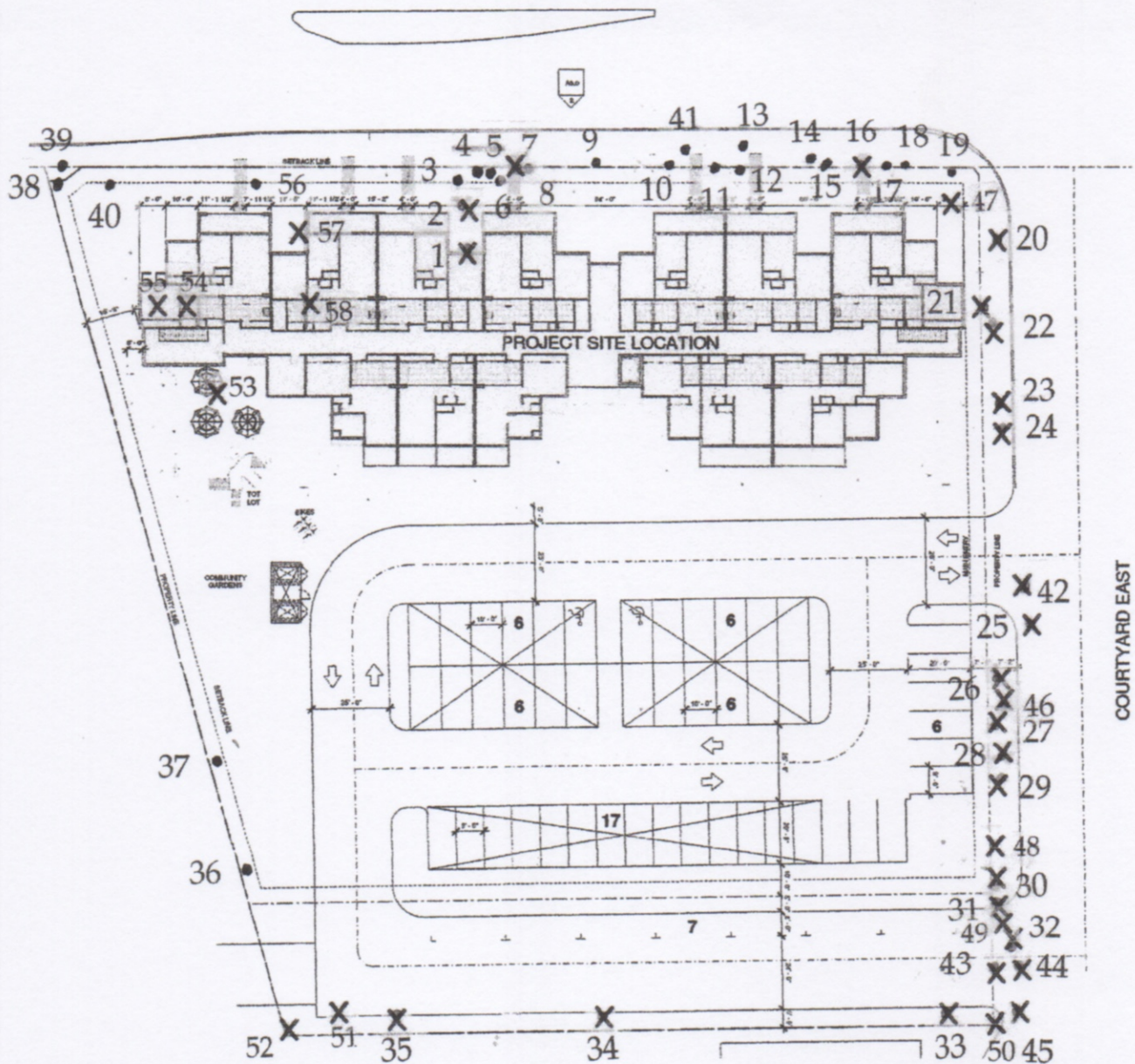
Recommendations are provided for removal or preservation. For those being preserved, protection measures and mitigation procedures to offset impacts and improve tree health are provided.

- (1) Preservation appears to be possible.
- (2) Removal is required due to significant development impacts.
- (3) Removal is recommended due to poor health or hazardous structure.

- (4) Removal is required due to significant development impacts and poor existing condition.
- (5) Removal is recommended due to poor species characteristics.
- (6) Install temporary protective fencing at the edge of the dripline, or edge of approved construction, prior to beginning grading or construction. Maintain fencing in place for duration of all construction activity in the area.
- (7) Maintain existing grade within the fenced portion of the dripline. Route drainage swales and all underground work outside the dripline.
- (8) Place a 4" layer of chipped bark mulch over the soil surface within the fenced dripline prior to installing temporary fencing. Maintain this layer of mulch throughout construction.
- (9) Prune to clean, raise, or provide necessary clearance. Prune to reduce branches that are over-loaded, over-extended, largely horizontal, arching, or have foliage concentrated near the branch ends, per International Society of Arboriculture Pruning Standards.

Pruning to occur by, or under the supervision of, an Arborist certified by the International Society of Arboriculture. Pruning Standards are attached to this report.

TREE LOCATION PLAN



TREE LOCATION & NUMBERING PLAN

Heritage Park Apartments
Windsor, California

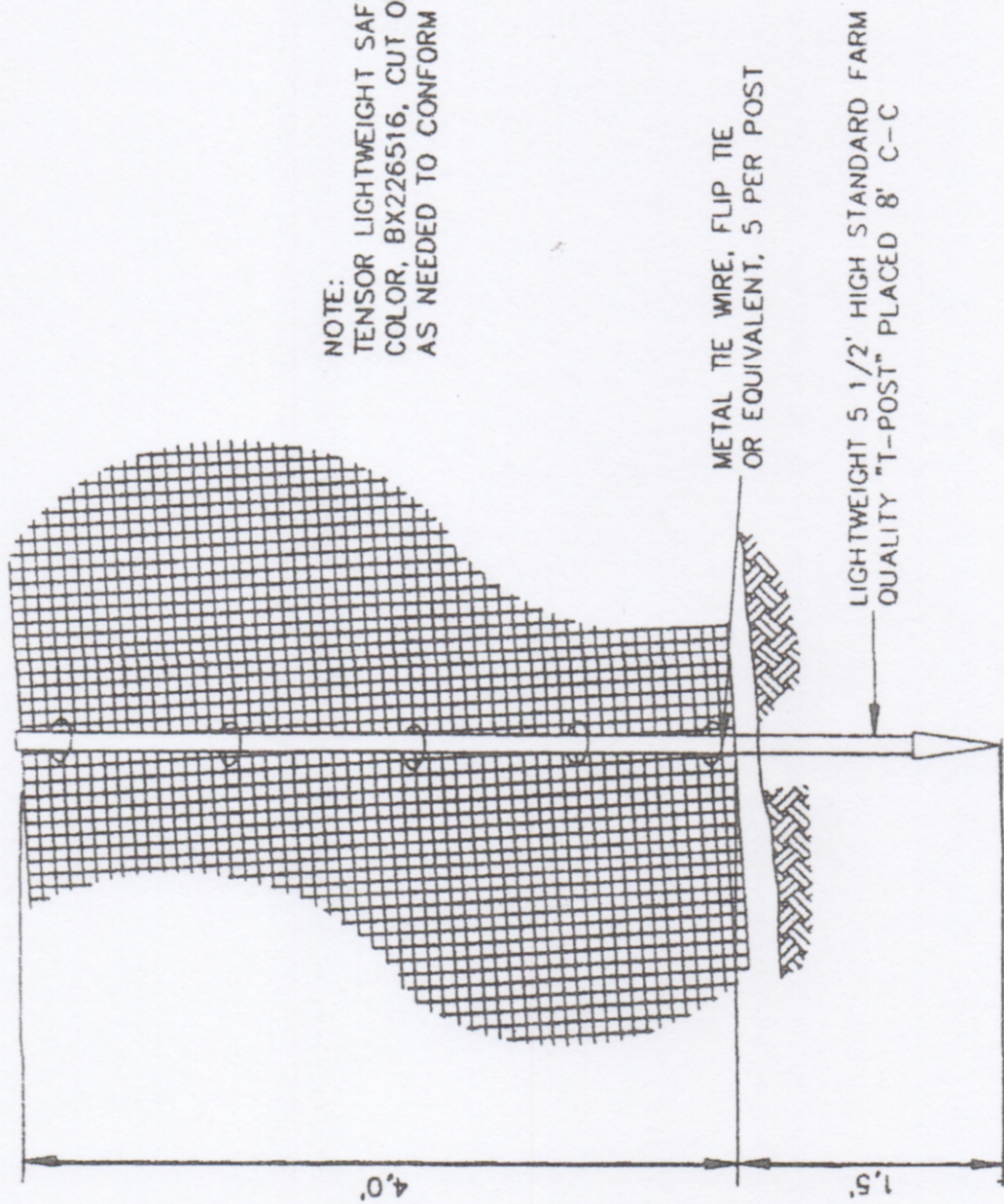
THIS PLAN TO BE USED IN CONJUNCTION WITH
TREE LOSS DETERMINATION REPORT
DATED 7/11/18

JOHN C. MESERVE

CONSULTING ARBORIST
International Society of Arboriculture
Certified Arborist WE #0478A

HORTICULTURAL ASSOCIATES
P.O. BOX 1261 / GLEN ELLEN, CA 95442
707.935.3911

TREE FENCING DETAIL



NOTE:
 TENSOR LIGHTWEIGHT SAFETY GRID, ORANGE
 COLOR, BX226516, CUT OR FOLD AT POSTS
 AS NEEDED TO CONFORM TO SLOPING TERRAIN.

METAL TIE WIRE, FLIP TIE
 OR EQUIVALENT, 5 PER POST

LIGHTWEIGHT 5 1/2' HIGH STANDARD FARM
 QUALITY "T-POST" PLACED 8' C-C

TREE PROTECTION GUIDELINES

GENERAL TREE PROTECTION GUIDELINES FOR CONSTRUCTION AROUND PRESERVED TREES

Heritage Park Apartments
Windsor, CA

INTRODUCTION

Great care must be exercised when development is proposed in the vicinity of established trees of any type. The trees present at construction sites require specialized protection techniques during all construction activities to minimize negative impact on their long-term health and vigor. The area immediately beneath and around canopy driplines is especially critical, and the requirements and procedures that follow are established to protect short and long-term tree integrity. The purpose of this protection guideline is therefore to define the procedures that must be followed during any and all phases of development in the immediate vicinity of designated and protected trees.

Established, mature trees respond in a number of different ways to the disruption of their natural conditions. Change of grade within the root system area or near the root collar, damage to the bark of the trunk, soil compaction above the root system, root system reduction or damage, or alteration of summer soil moisture levels may individually or collectively cause physiological stress leading to tree decline and death. The individual impacts of these activities may cause trees to immediately exhibit symptoms and begin to decline, but more commonly the decline process takes many years, with symptoms appearing slowly and over a period of time. Trees may not begin to show obvious signs of decline from the negative impacts of construction until many years after construction is completed. It is not appropriate to wait for symptoms to appear, as this may be too late to correct the conditions at fault and to halt decline.

It is therefore critical to the long-term health of all protected trees that a defined protection program be established before beginning any construction activity where protected trees are found. Once incorporated at the design level, it is mandatory that developers, contractors, and construction personnel understand the critical importance of these guidelines, and the potential penalties that will be levied if they are not fully incorporated at every stage of development.

The following guidelines are meant to be utilized by project managers and those supervising any construction in the vicinity of protected trees including grading contractors, underground contractors, all equipment operators, construction personnel, and landscape contractors. These protection guidelines are presented in a brief outline form to be applied to each individual activity that occurs during

Horticultural Associates
P.O. Box 1261
Glen Ellen, CA 95442
707-935-3911

development activities. It is left to project managers to implement these protection measures. Questions which arise, or interpretation of guidelines as they apply to specific site activities, must be referred to the designated project arborist as they occur.

TREE PROTECTION ZONE

1. The canopy dripline is illustrated on the Improvement Plans and represents the area around each tree, or group of trees, which must be protected at all times with tree protection fencing. No encroachment into the dripline is allowed at any time without approval from the project arborist, and unauthorized entry may be subject to civil action and penalties.
2. The dripline will be designated by the project arborist at a location determined to be adequate to ensure long term tree viability and health.

TREE PROTECTION FENCING

1. Prior to initiating any construction activity on a construction project, including demolition or grading, temporary protective fencing shall be installed at each site tree. Fencing shall be located at the dripline designated by the project arborist or illustrated on the Improvement Plans.
2. Fencing shall be minimum 4' height at all locations, and shall form a continuous barrier without entry points around all individual trees, or groups of trees. Barrier type fencing such as *Tensar* plastic fencing is recommended, but any fencing system that adequately prevents entry will be considered for approval by the project arborist. The use of post and cable fencing is not acceptable.
3. Fencing shall be installed in a professional manner with steel fence posts (standard quality farm 'T' posts work well) placed no more than 8 feet on center. Fencing shall be attached to each post at 5 locations with plastic electrical ties, metal tie wire, or flip tie. See fencing detail.
4. Fencing shall serve as a barrier to prevent encroachment of any type by construction activities, equipment, materials storage, or personnel.
5. All encroachment into the fenced dripline must be approved in writing and supervised by the project arborist. Approved dripline encroachment may require additional mitigation or protection measures that will be determined by the project arborist at the time of the request.

6. Contractors and subcontractors shall direct all equipment and personnel to remain outside the fenced area at all times until project is complete, and shall instruct personnel and sub-contractors as to the purpose and importance of fencing and preservation.
7. Fencing shall be upright and functional at all times from start to completion of project. Fencing shall remain in place and not be moved or removed until all construction activities at the site are completed.

TREE PRUNING AND TREATMENTS

1. All recommendations for pruning or other treatments must be completed prior to acceptance of the project. It is strongly recommended that pruning be completed prior to the start of grading to facilitate optimum logistics and access.
- 2.
3. All pruning shall be conducted in conformance with International Society of Arboriculture pruning standards, and all pruning must occur by, or under the direct supervision of, an arborist certified by the International Society of Arboriculture.

GRADING AND TRENCHING

1. Any construction activity that necessitates soil excavation in the vicinity of preserved trees shall be avoided where possible, or be appropriately mitigated under the guidance of the project arborist. All contractors must be aware at all times that specific protection measures are defined, and non conformance may generate stop-work orders.
2. The designated dripline is defined around all site trees to be preserved. Fences protect the designated areas. No grading or trenching is to occur within this defined area unless so designated by the Improvement Plan, and where designated shall occur under the direct supervision of the project arborist.
3. Trenching should be routed around the dripline whenever possible. Where trenching has been designated within the dripline, utilization of underground technology to bore, tunnel or excavate with high-pressure air or water will be specified. Hand digging will be generally discouraged unless site conditions restrict the use of alternate technology.
4. All roots greater than one inch in diameter shall be cleanly hand-cut as they are encountered in any trench or in any grading activity. The tearing of roots

by equipment of any type shall not be allowed. Mitigation treatment of pruned roots shall be specified by the project arborist as determined by the degree of root pruning, location of root pruning, and potential exposure to desiccation. No pruning paints or sealants shall be used on cut roots.

5. Where significant roots are encountered mitigation measures such as supplemental irrigation and/or organic mulches may be specified by the project arborist to offset the reduction of root system capacity.
6. Retaining walls are effective at holding grade changes outside the area of the dripline and are recommended where necessary. Retaining walls shall be constructed in post and beam or drilled pier construction styles where they are necessary near or within a dripline.
7. Placement of fill soils is generally discouraged within the dripline, but in some approved locations may be approved to cover up to 30% of this area. The species and condition of the tree shall be considered, as well as site and soil conditions, and depth of fill. Retaining walls should be utilized to minimize the area of fill within the dripline. Type of fill soil and placement methods shall be specified by the project arborist.
8. Grade changes outside the dripline, or those necessary in conjunction with retaining walls, shall be designed so that drainage water of any type or source is not diverted toward or around the root crown in any manner. Grade shall drain away from root crown at a minimum of 2%. If grading toward the root collar is unavoidable, appropriate surface and/or subsurface drain facilities shall be installed so that water is effectively diverted away from root collar area.
9. Approved fill soils within the dripline may also be mitigated using aerated gravel layers and/or perforated aeration tubing systems, as specified by the project arborist.
10. Tree roots will be expected to grow into areas of soil fill, and quality of imported soil shall be considered. Ideally, fill soil should be site soil that closely matches that present within the root zone area. When import soil is utilized it must be the same or slightly coarser texture than existing site soil, should have a pH range comparable to site soils, and generally should have acceptable chemical properties for appropriate plant growth. A soil analysis is recommended prior to importation to evaluate import soil for these criteria.

11. Grade reduction within the designated dripline shall be generally discouraged, and where approved, shall be conducted only after careful consideration and coordination with the project arborist.
12. Foundations of all types within the dripline shall be constructed using design techniques that eliminate the need for trenching into natural grade. These techniques might include drilled piers, grade beams, bridges, or cantilevered structures. Building footprints should generally be outside the dripline whenever possible.

DRAINAGE

The location and density of native trees on many sites may be directly associated with the presence of naturally occurring water, especially ephemeral waterways. Project design, especially drainage components, should take into consideration that these trees may begin a slow decline if this naturally present association with water is eliminated.

TREE DAMAGE

Any form of tree damage which occurs during the demolition, grading, or construction process shall be evaluated by the project arborist. Specific mitigation measures will be developed to compensate for or correct the damage. Fines and penalties may also be levied.

Measures may include, but are not limited to, the following:

- pruning to remove damaged limbs or wood
- bark scoring to remove damaged bark and promote callous formation
- alleviation of compaction by lightly scarifying the soil surface
- installation of a specific mulching material
- supplemental irrigation during the growing season for up to 5 years
- treatment with specific amendments intended to promote health, vigor, or root growth
- vertical mulching or soil fracturing to promote root growth

- periodic post-construction monitoring at the developer's expense
- tree replacement, or payment of the established appraised value, if the damage is so severe that long term survival is not expected

FERTILIZATION

1. Native trees generally do not require supplemental fertilization unless exhibiting a deficiency symptom. Following completion of construction any tree that exhibits symptoms of a specific nutrient deficiency shall be fertilized to compensate for the deficiency. Soil or tissue analysis may be required to identify the deficiency.
2. Distressed trees, or trees damaged by construction in any way, may be detrimentally affected by supplemental fertilization. The decision to fertilize, and with what fertilizers, shall be made by the project arborist based on conditions and appearance observed at the completion of the project.

PEST CONTROL

A close visual examination for tree pests shall be conducted by the pruning contractor as he completes recommended pruning procedures. If a serious infestation is present, that was not apparent from ground observation, then pest control measures may be considered. However, the simple presence of tree pests does not warrant the use of chemical pesticides. Only a serious infestation, capable of causing tree decline, would warrant pesticide use. The use of organic sprays or pesticidal soaps is the preferred method for treating any serious pest infestation.

WEED CONTROL

No specific measures are recommended for weed control, and the presence of weeds should not be considered problematic in relation to continued tree health. However, use of contact weed killers and pre-emergent weed killers are generally not recommended due to their potential for root system damage if improperly applied.

DISEASE CONTROL

No specific measures are recommended for disease control unless noted in the Tree Protection and Preservation Plan. All disease control measures should be based on observation of actual conditions in the tree canopy.

MULCHING

Trees will generally benefit from the application of a 4-inch layer of chipped bark mulch over the soil surface within the greater root zone area. Ideal mulch material is a chipped bark containing a wide range of particle sizes. Bark mulches composed of shredded redwood, bark screened for uniformity of size, or chipped lumber will not function as beneficially. Rock and gravel mulches are generally discouraged due to their minimal benefit.

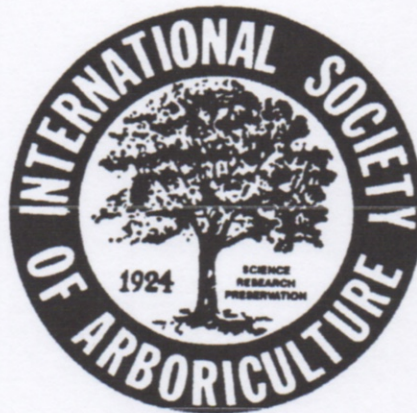
PLANTING UNDER EXISTING TREES

1. The installation of lawn beneath established native trees is strongly discouraged because it has the potential to initiate serious disease. If planting is required for aesthetic or functional purposes, the use of drought tolerant, woody species is most appropriate. Species should be selected for their ability to survive with minimal or no water through the summer months after the initial establishment period. Only drip irrigation should be utilized within the canopy dripline to minimize summer water in the root zone.
2. Many non-native trees will tolerate summer irrigation well and suitable landscape planting and irrigation may actually be beneficial.

TREE PRUNING STANDARDS

PRUNING STANDARDS

WESTERN



CHAPTER

WESTERN CHAPTER

International Society of Arboriculture

ARIZONA

CALIFORNIA

HAWAII

NEVADA

Certification Committee • P.O. Box 424 • St. Helena, California 94574

PRUNING STANDARDS

Purpose:

Trees and other woody plants respond in specific and predictable ways to pruning and other maintenance practices. Careful study of these responses has led to pruning practices which best preserve and enhance the beauty, structural integrity, and functional value of trees.

In an effort to promote practices which encourage the preservation of tree structure and health, the W.C. ISA Certification Committee has established the following Standards of Pruning for Certified Arborists. The Standards are presented as working guidelines, recognizing that trees are individually unique in form and structure, and that their pruning needs may not always fit strict rules. The Certified Arborist must take responsibility for special pruning practices that vary greatly from these Standards.

I. Pruning Techniques

- A. A thinning cut removes a branch at its point of attachment or shortens it to a lateral large enough to assume the terminal role. Thinning opens up a tree, reduces weight on heavy limbs, can reduce a tree's height, distributes ensuing invigoration throughout a tree and helps retain the tree's natural shape. Thinning cuts are therefore preferred in tree pruning.

When shortening a branch or leader, the lateral to which it is cut should be at least one-half the diameter of the cut being made. Removal of a branch or leader back to a sufficiently large lateral is often called "drop crotching."

- B. A heading cut removes a branch to a stub, a bud or a lateral branch not large enough to assume the terminal role. Heading cuts should seldom be used because vigorous, weakly attached upright sprouts are forced just below such cuts, and the tree's natural form is altered. In some situations, branch stubs die or produce only weak sprouts.

- C. When removing a live branch, pruning cuts should be made in branch tissue just outside the branch bark ridge and collar, which are trunk tissue. *(Figure 1)* If no collar is visible, the angle of the cut should approximate the angle formed by the branch bark ridge and the trunk. *(Figure 2)*
- D. When removing a dead branch, the final cut should be made outside the collar of live callus tissue. If the collar has grown out along the branch stub, only the dead stub should be removed, the live collar should remain intact, and uninjured. *(Figure 3)*
- E. When reducing the length of a branch or the height of a leader, the final cut should be made just beyond (without violating) the branch bark ridge of the branch being cut to. The cut should approximately bisect the angle formed by the branch bark ridge and an imaginary line perpendicular to the trunk or branch cut. *(Figure 4)*
- F. A goal of structural pruning is to maintain the size of lateral branches to less than three-fourths the diameter of the parent branch or trunk. If the branch is codominant or close to the size of the parent branch, thin the branch's foliage by 15% to 25%, particularly near the terminal. Thin the parent branch less, if at all. This will allow the parent branch to grow at a faster rate, will reduce the weight of the lateral branch, slow its total growth, and develop a stronger branch attachment. If this does not appear appropriate, the branch should be completely removed or shortened to a large lateral. *(Figure 5)*
- G. On large-growing trees, except whorl-branching conifers, branches that are more than one-third the diameter of the trunk should be spaced along the trunk at least 18 inches apart, on center. If this is not possible because of the present size of the tree, such branches should have their foliage thinned 15% to 25%, particularly near their terminals. *(Figure 6)*
- H. Pruning cuts should be clean and smooth with the bark at the edge of the cut firmly attached to the wood.
- I. Large or heavy branches that cannot be thrown clear, should be lowered on ropes to prevent injury to the tree or other property.
- J. Wound dressings and tree paints have not been shown to be effective in preventing or reducing decay. They are therefore not recommended for routine use when pruning.

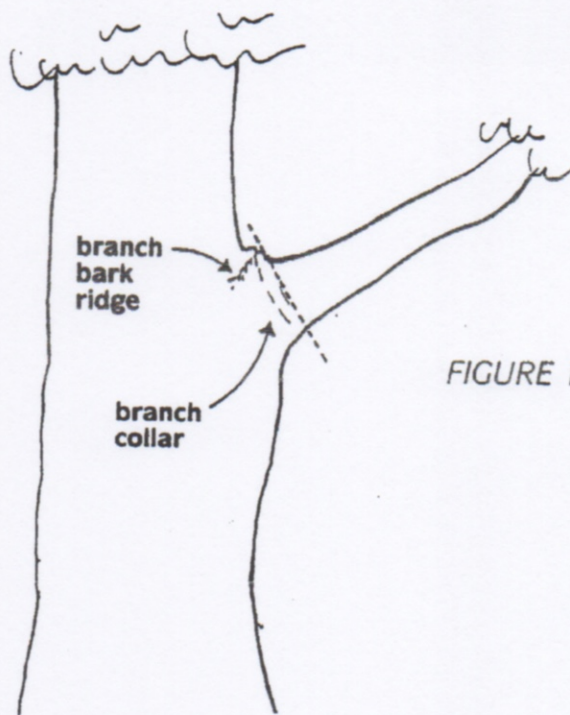


FIGURE 1. When removing a branch, the final cut should be just outside the branch bark ridge and collar.

FIGURE 2. In removing a limb without a branch collar, the angle of the final cut to the branch bark ridge should approximate the angle the branch bark ridge forms with the limb. Angle AB should equal Angle BC.

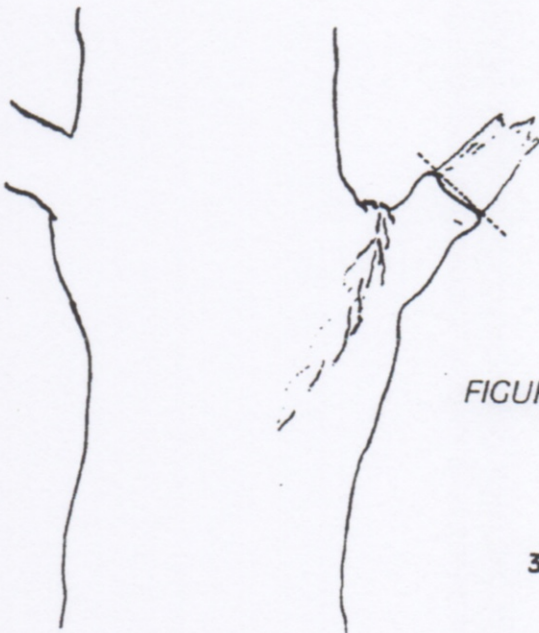
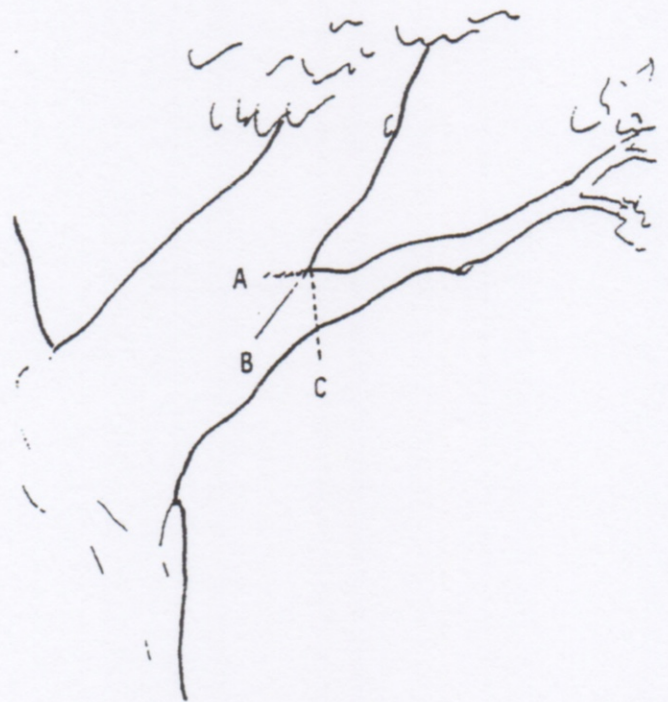


FIGURE 3. When removing a dead branch, cut outside the callus tissue that has begun to form around the branch.

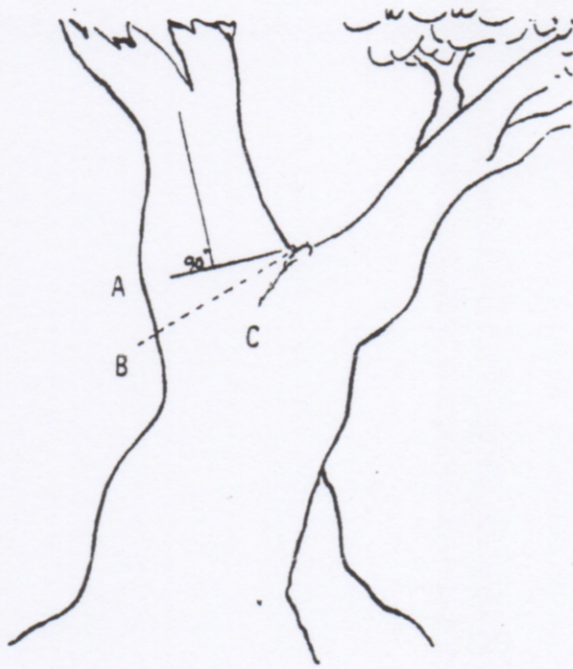


FIGURE 4. In removing the end of a limb to a large lateral branch, the final cut is made along a line that bisects the angle between the branch bark ridge and a line perpendicular to the limb being removed. Angle AB is equal to Angle BC.

FIGURE 5. A tree with limbs tending to be equal-sized, or codominant. Limbs marked B are greater than $\frac{3}{4}$ the size of the parent limb A. Thin the foliage of branch B more than branch A to slow its growth and develop a stronger branch attachment.



FIGURE 6. Major branches should be well spaced both along and around the stem.



II. Types of Pruning — Mature Trees

A. CROWN CLEANING

Crown cleaning or cleaning out is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches and watersprouts from a tree crown.

B. CROWN THINNING

Crown thinning includes crown cleaning and the selective removal of branches to increase light penetration and air movement into the crown. Increased light and air stimulates and maintains interior foliage, which in turn improves branch taper and strength. Thinning reduces the wind-sail effect of the crown and the weight of heavy limbs. Thinning the crown can emphasize the structural beauty of trunk and branches as well as improve the growth of plants beneath the tree by increasing light penetration. When thinning the crown of mature trees, seldom should more than one-third of the live foliage be removed.

At least one-half of the foliage should be on branches that arise in the lower two-thirds of the trees. Likewise, when thinning laterals from a limb, an effort should be made to retain inner lateral branches and leave the same distribution of foliage along the branch. Trees and branches so pruned will have stress more evenly distributed throughout the tree or along a branch.

An effect known as "lion's-tailing" results from pruning out the inside lateral branches. Lion's-tailing, by removing all the inner foliage, displaces the weight to the ends of the branches and may result in sunburned branches, watersprouts, weakened branch structure and limb breakage.

C. CROWN REDUCTION

Crown reduction is used to reduce the height and/or spread of a tree. Thinning cuts are most effective in maintaining the structural integrity and natural form of a tree and in delaying the time when it will need to be pruned again. The lateral to which a branch or trunk is cut should be at least one-half the diameter of the cut being made.

D. CROWN RESTORATION

Crown restoration can improve the structure and appearance of trees that have been topped or severely pruned using heading cuts. One to three sprouts on main branch stubs should be selected to reform a more natural appearing crown. Selected vigorous sprouts may need to be thinned to a lateral, or even headed, to control length growth in order to ensure adequate attachment for the size of the sprout. Restoration may require several prunings over a number of years.

II. Types of Pruning — Mature Trees (*continued*)

E. CROWN RAISING

Crown raising removes the lower branches of a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas. It is important that a tree have at least one-half of its foliage on branches that originate in the lower two-thirds of its crown to ensure a well-formed, tapered structure and to uniformly distribute stress within a tree.

When pruning for view, it is preferable to develop "windows" through the foliage of the tree, rather than to severely raise or reduce the crown.

III. Size of Pruning Cuts

Each of the Pruning Techniques (Section I) and Types of Pruning (Section II) can be done to different levels of detail or refinement. The removal of many small branches rather than a few large branches will require more time, but will produce a less-pruned appearance, will force fewer watersprouts and will help to maintain the vitality and structure of the tree. Designating the maximum size (base diameter) that any occasional undesirable branch may be left within the tree crown, such as $\frac{1}{2}$ ", 1" or 2" branch diameter, will establish the degree of pruning desired.

IV. Climbing Techniques

- A. Climbing and pruning practices should not injure the tree except for the pruning cuts.
- B. Climbing spurs or gaffs should not be used when pruning a tree, unless the branches are more than throw-line distance apart. In such cases, the spurs should be removed once the climber is tied in.
- C. Spurs may be used to reach an injured climber and when removing a tree.
- D. Rope injury to thin barked trees from loading out heavy limbs should be avoided by installing a block in the tree to carry the load. This technique may also be used to reduce injury to a crotch from the climber's line.

July 11, 2018

Pat and Shawn Devlin
220 Meadowcroft Way
Santa Rosa, CA

Re: Completed *Tree Loss Determination*, 220 Meadowcroft Way, Santa Rosa, CA

Pat and Shawn,

Attached you will find our completed *Tree Loss Determination* for your residential property in Santa Rosa. We found a total of 241 trees on the property, and many were damaged or destroyed by the October wildfires. This includes all native and ornamental trees that are present and larger than 1 inch in trunk diameter.

Our assignment was to inspect and evaluate each tree at the site to determine the extent and nature of fire damage to survivability and aesthetics. Based on the damage that was observed we agreed to determine whether the tree would reasonably survive and remain an integral aesthetic component of the site, and to provide this information in a written report. We agreed to determine a reasonable value for each tree not considered a realistic candidate for preservation, and agreed to use methodology appropriate for the trees being evaluated. This assignment is based on determining value that is accurate and reasonable. Our assignment did not include determining value for any other component of the site, or the landscape, other than trees.

We did not value trees that are located in the defined PG and E easement, although some are included in the Inventory table. PG and E has the right to remove or alter these trees at their discretion as part of their vegetation management program. Therefore, their loss is not a direct loss to you.

The attached Tree Inventory Chart includes the following information for each tree evaluated:

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the approximate location of each numbered tree.

Botanical and Common Name

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk inches at 4.5'

Each trunk has been measured to the nearest one-half inch to document its diameter at 4.5 feet above adjacent grade. This is a standard height in the arboricultural industry that is used to determine relative trunk size. Trunk size is a component of determining value. Where trunks were missing we measured at the available point and estimated what the diameter would be at 4.5'.

Multiple Trunk Adjustment to DBH

Where multiple trunks are present on the same tree a formula is utilized to determine an accurate size for a comparable single trunk. Adding up multiple trunks inflates the trunk size and is not an accurate representation of the size and age of the tree. Value is based on a single trunk.

Survival Expected

Using visual analysis, the amount of trunk and canopy that was damaged or destroyed by fire was determined. This estimate is used to determine whether we believe the tree will survive, and whether significant aesthetic damage has occurred.

PG and E ROW

Each tree was noted as being either in the PGE Right-of-Way, or not in the Right-of-Way.

Direct Replacement Value (or per insurance policy)

Various approaches to determining the value of a tree have been used in this report due to the wide variety of tree sizes that are present. Trees that can reasonably be replaced with widely available nursery container stock have been valued at their wholesale purchase price and multiplied by a 2.5 factor to cover shipping, handling, and installation. This is a standard factor used in the landscaping industry. This includes trees only up to 5 inches in trunk diameter. The following container and trunk sizes were utilized as a basis for determining the value of trees in this size range:

Trunk Diameter = 1" or less = \$60 wholesale cost

Trunk Diameter = 1.5 to 2.5" = \$180 wholesale cost

Trunk Diameter = 3" to 4" = \$450 wholesale cost

Trunk Diameter = 4.5" to 5.5" = \$900 wholesale cost

Costs were obtained from various Northern California wholesale nurseries.

Trunk Formula Method Value

Trees that are 6 inches or larger inches in trunk diameter become exponentially costlier as nursery container stock and costs become unreasonable. In place of reasonable replacement, the value of the loss has been determined by the *Trunk Formula Method* established by the International Society of Arboriculture, and supported using the 9th edition of the *Guide for*

HORTICULTURAL

Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Heritage Park Apartments
Windsor, CA

Prepared for:
Town of Windsor
Planning Department
P.O. Box 100
Windsor, CA 95492

Prepared by:
John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A

July 11, 2018

July 11, 2018

Kim Voge
Planning Department
Town of Windsor
P.O. Box 100
Windsor, CA 95492

Re: Completed *Tree Preservation and Mitigation Report*, Heritage Park Apartments, Windsor, California

Kim,

Attached you will find our completed *Tree Preservation and Mitigation Report* for the above noted site in Windsor. A total of 58 trees were evaluated and this includes all native and non-native trees that are present over 6 inches in trunk diameter.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report was evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* also includes information about expected impacts of the proposed development plan and recommendations for action based on the plan reviewed. The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees. We have also provided *Tree Preservation Guidelines* and *Tree Pruning Standards* for your reference.

This report is intended to be a basic inventory of trees present at this site, which includes a general review of tree health and structural condition. No in-depth evaluation has occurred on any tree, and assessment has included only external visual examination without probing, drilling, coring, root collar examination, root excavation, or dissecting any tree part. Failures, deficiencies, and problems may occur in these trees in the future, and this inventory in no way guarantees or provides a warranty for their condition.

EXISTING SITE CONDITION SUMMARY

The project site consists of an empty lot, outbuildings, and an abandoned residence.

EXISTING TREE SUMMARY

Native tree species found on the site include Valley Oak, Black Oak, and Coast Live Oak.

Non-native species on the site include English Walnut, Zelcova, Glossy Privet, Green Wattle, Blue Gum, Deodar Cedar, and Mexican Fan Palm.

CONSTRUCTION IMPACT SUMMARY

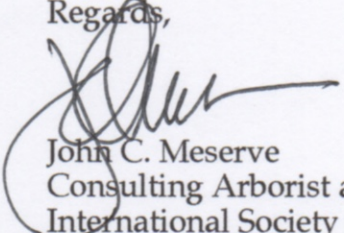
A summary of tree impacts follows:

- (22) Appear to be preservable
- (33) Require removal due to significant development impacts
- (3) Should be removed due to poor species characteristics or poor condition

These recommendations are based on the assumption that most trees along Old Redwood Highway have been allowed adequate room for preservation and that the existing sidewalk will remain in its current location. They are also based on the assumption that trees along Courtyard East cannot be preserved due to the construction of a sidewalk and nearby improvements. If these assumptions are incorrect further discussion may be required.

Please feel free to contact me if you have questions regarding this report, or if further discussion would be helpful.

Regards,


John C. Meserve
Consulting Arborist and Horticulturist
International Society of Arboriculture
ISA Certified Arborist, WE #0478A



TREE INVENTORY CHART

TREE INVENTORY
Heritage Park Subdivision
Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|--------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 1 | <i>Quercus kelloggii</i> | Black Oak | 17 | 40 | 22 | 4 | 3 | 3 | 2 |
| 2 | <i>Quercus lobata</i> | Valley Oak | 14.5 | 45 | 24 | 2 | 3 | 3 | 2 |
| 3 | <i>Quercus lobata</i> | Valley Oak | 10 | 20 | 22 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 4 | <i>Quercus lobata</i> | Valley Oak | 9 | 25 | 22 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 5 | <i>Quercus lobata</i> | Valley Oak | 9 | 30 | 18 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 6 | <i>Quercus lobata</i> | Valley Oak | 12+6.5 | 28 | 20 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 7 | <i>Quercus agrifolia</i> | Coast Live Oak | 4.5+4.5 | 16 | 10 | 4 | 4 | 3 | 2 |
| 8 | <i>Quercus lobata</i> | Valley Oak | 13 | 35 | 26 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 9 | <i>Quercus lobata</i> | Valley Oak | 11 | 35 | 22 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |
| 10 | <i>Quercus lobata</i> | Valley Oak | 8.5 | 28 | 12 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 11 | <i>Quercus lobata</i> | Valley Oak | 7 | 28 | 18 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 12 | <i>Quercus lobata</i> | Valley Oak | 7.5+5 | 20 | 18 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 13 | <i>Quercus lobata</i> | Valley Oak | 10.5 | 30 | 18 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |

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P.O. Box 1261, Glen Ellen, CA 95442
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TREE INVENTORY

Heritage Park Subdivision

Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|-----------------------|-------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 14 | <i>Quercus lobata</i> | Valley Oak | 15 | 32 | 20 | 3 | 3 | 1 | 1, 6, 7, 8, 9 |
| 15 | <i>Quercus lobata</i> | Valley Oak | 15.5 | 30 | 24 | 2 | 3 | 1 | 1, 6, 7, 8, 9 |
| 16 | <i>Quercus lobata</i> | Valley Oak | 5 | 15 | 14 | 2 | 3 | 3 | 2 |
| 17 | <i>Quercus lobata</i> | Valley Oak | 18 | 35 | 18 | 3 | 3 | 2 | 1, 6, 7, 8, 9 |
| 18 | <i>Quercus lobata</i> | Valley Oak | 12.5 | 18 | 14 | 2 | 3 | 2 | 1, 6, 7, 8, 9 |
| 19 | <i>Quercus lobata</i> | Valley Oak | 6.5+7 | 35 | 18 | 3 | 2 | 1 | 1, 6, 7, 8, 9 |
| 20 | <i>Quercus lobata</i> | Valley Oak | 9 | 35 | 20 | 3 | 3 | 3 | 2 |
| 21 | <i>Quercus lobata</i> | Valley Oak | 6.5 | 20 | 16 | 3 | 3 | 3 | 2 |
| 22 | <i>Quercus lobata</i> | Valley Oak | 14 | 40 | 22 | 3 | 3 | 3 | 2 |
| 23 | <i>Quercus lobata</i> | Valley Oak | 12.5+4 | 30 | 18 | 3 | 3 | 3 | 2 |
| 24 | <i>Quercus lobata</i> | Valley Oak | 15 | 45 | 20 | 3 | 3 | 3 | 2 |
| 25 | <i>Quercus lobata</i> | Valley Oak | 13 | 30 | 18 | 2 | 3 | 3 | 2 |
| 26 | <i>Quercus lobata</i> | Valley Oak | 10+17 | 38 | 18 | 3 | 3 | 3 | 2 |
| 27 | <i>Quercus lobata</i> | Valley Oak | 4.5 | 25 | 10 | 2 | 3 | 3 | 2 |

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TREE INVENTORY
Heritage Park Subdivision
Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|--------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 28 | <i>Quercus lobata</i> | Valley Oak | 5 | 16 | 8 | 3 | 3 | 3 | 2 |
| 29 | <i>Quercus lobata</i> | Valley Oak | 25 | 40 | 24 | 3 | 3 | 3 | 2 |
| 30 | <i>Quercus lobata</i> | Valley Oak | 6 | 20 | 12 | 3 | 3 | 3 | 2 |
| 31 | <i>Quercus lobata</i> | Valley Oak | 11.5+8.5 | 35 | 20 | 2 | 3 | 3 | 2 |
| 32 | <i>Quercus lobata</i> | Valley Oak | 6 | 25 | 12 | 4 | 3 | 3 | 2 |
| 33 | <i>Quercus lobata</i> | Valley Oak | 26.5 | 35 | 24 | 2 | 3 | 3 | 2 |
| 34 | <i>Quercus lobata</i> | Valley Oak | 43 | 60 | 32 | 4 | 2 | 3 | 2 |
| 35 | <i>Quercus lobata</i> | Valley Oak | 24+15.5+32.5 | 50 | 36 | 3 | 3 | 3 | 2 |
| 36 | <i>Quercus lobata</i> | Valley Oak | ±48 | 70 | 35 | 3 | 2 | 1 | 1, 6, 7, 8, 9 |
| 37 | <i>Quercus lobata</i> | Valley Oak | ±12 | 35 | 16 | 4 | 3 | 1 | 1, 6, 7, 8, 9 |
| 38 | <i>Quercus kelloggii</i> | Black Oak | 4.5+3+3+2.5 | 15 | 11 | 4 | 4 | 1 | 1, 6, 7, 8, 9 |
| 39 | <i>Quercus lobata</i> | Valley Oak | 13 | 45 | 20 | 3 | 3 | 1 | 1, 6, 7, 8, 9 |
| 40 | <i>Quercus lobata</i> | Valley Oak | 5.5 | 30 | 10 | 4 | 3 | 1 | 1, 6, 7, 8, 9 |
| 41 | <i>Quercus agrifolia</i> | Coast Live Oak | ±7+ multi-stem | 15 | 12 | 4 | 4 | 2 | 1, 6, 7, 8, 9 |

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P.O. Box 1261, Glen Ellen, CA 95442
707.935.3911

TREE INVENTORY

July 11, 2018

Heritage Park Subdivision
Windsor, CA

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|----------------------------|----------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 42 | <i>Quercus agrifolia</i> | Coast Live Oak | 1+1+5.5+4 | 15 | 8 | 4 | 3 | 3 | 2 |
| 43 | <i>Quercus lobata</i> | Valley Oak | 4 | 20 | 4 | 3 | 3 | 3 | 2 |
| 44 | <i>Quercus Lobata</i> | Valley Oak | 6.5 | 25 | 12 | 4 | 3 | 3 | 2 |
| 45 | <i>Quercus Lobata</i> | Valley Oak | 4.5 | 15 | 10 | 4 | 4 | 3 | 2 |
| 46 | <i>Quercus Lobata</i> | Valley Oak | 5 | 18 | 11 | 3 | 3 | 3 | 2 |
| 47 | <i>Acacia decurrens</i> | Green Wattle | 12+12+18+26 | 35 | 30 | 4 | 2 | 3 | 3,5 |
| 48 | <i>Zelkova serrata</i> | Zelcova | 6 | 16 | 10 | 4 | 3 | 3 | 2 |
| 49 | <i>Zelkova serrata</i> | Zelcova | 6 | 18 | 12 | 4 | 3 | 3 | 2 |
| 50 | <i>Zelkova serrata</i> | Zelcova | 7 | 18 | 12 | 4 | 3 | 3 | 2 |
| 51 | <i>Eucalyptus globulus</i> | Blue Gum | 50 | 70 | 30 | 4 | 2 | 3 | 2, 5 |
| 52 | <i>Eucalyptus globulus</i> | Blue Gum | 52 | 60 | 30 | 2 | 2 | 2 | 3, 5 |
| 53 | <i>Juglans regia</i> | English Walnut | 18 | 18 | 12 | 2 | 2 | 3 | 2 |
| 54 | <i>Ligustrum lucidum</i> | Glossy Privet | 8+10+10+6 | 25 | 15 | 4 | 3 | 3 | 2 |
| 55 | <i>Ligustrum lucidum</i> | Glossy Privet | 6+6+6+8 | 25 | 15 | 4 | 3 | 3 | 2 |

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TREE INVENTORY

Heritage Park Subdivision

Windsor, CA

July 11, 2018

| Tree # | Species | Common Name | Trunk (inches at 4.5') | Height (± feet) | Radius (± feet) | Health 1 - 5 | Structure 1 - 4 | Expected Impact | Recommendations |
|--------|-----------------------------|------------------|------------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|
| 56 | <i>Cedrus deodara</i> | Deodar cedar | 30 | 60 | 16 | 4 | 3 | 2 | 1, 6, 7, 8, 9 |
| 57 | <i>Juglans regia</i> | English Walnut | 8+8+5+6+6 | 15 | 12 | 2 | 2 | 3 | 2 |
| 58 | <i>Washingtonia robusta</i> | Mexican Fan Palm | 18 | 60 | 8 | 4 | 3 | 3 | 2 |

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707.935.3911

KEY TO TREE
INVENTORY CHART

KEY TO TREE INVENTORY CHART

3600 Manor Park Place
Santa Rosa, California

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured, to the nearest one half inch, to document its diameter at 4 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

- (5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.
- (4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.
- (3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.
- (2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.
- (1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

- (4) Good structure - minor structural problems may be present which do not require corrective action.
- (3) Moderate structure - normal, typical structural issues which can be corrected with pruning.
- (2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.
- (1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

Expected Impacts

Considering the proximity of construction activities, type of activities, tree species, and tree condition - the following ratings are used to estimate the amount of impact on tree health and stability. Most trees will tolerate a (1) rating, many trees could tolerate a (2) rating with careful consideration and mitigation, but trees with a (3) rating are poor candidates for preservation due to their very close proximity to construction or because they are located within the footprint of construction and cannot be preserved.

- (3) A significant impact on long term tree integrity can be expected as a result of proposed development.
- (2) A moderate impact on long term tree integrity can be expected as a result of proposed development.
- (1) A very minor or no impact on long term tree integrity can be expected as a result of proposed development.
- (0) No impact is expected

Recommendations

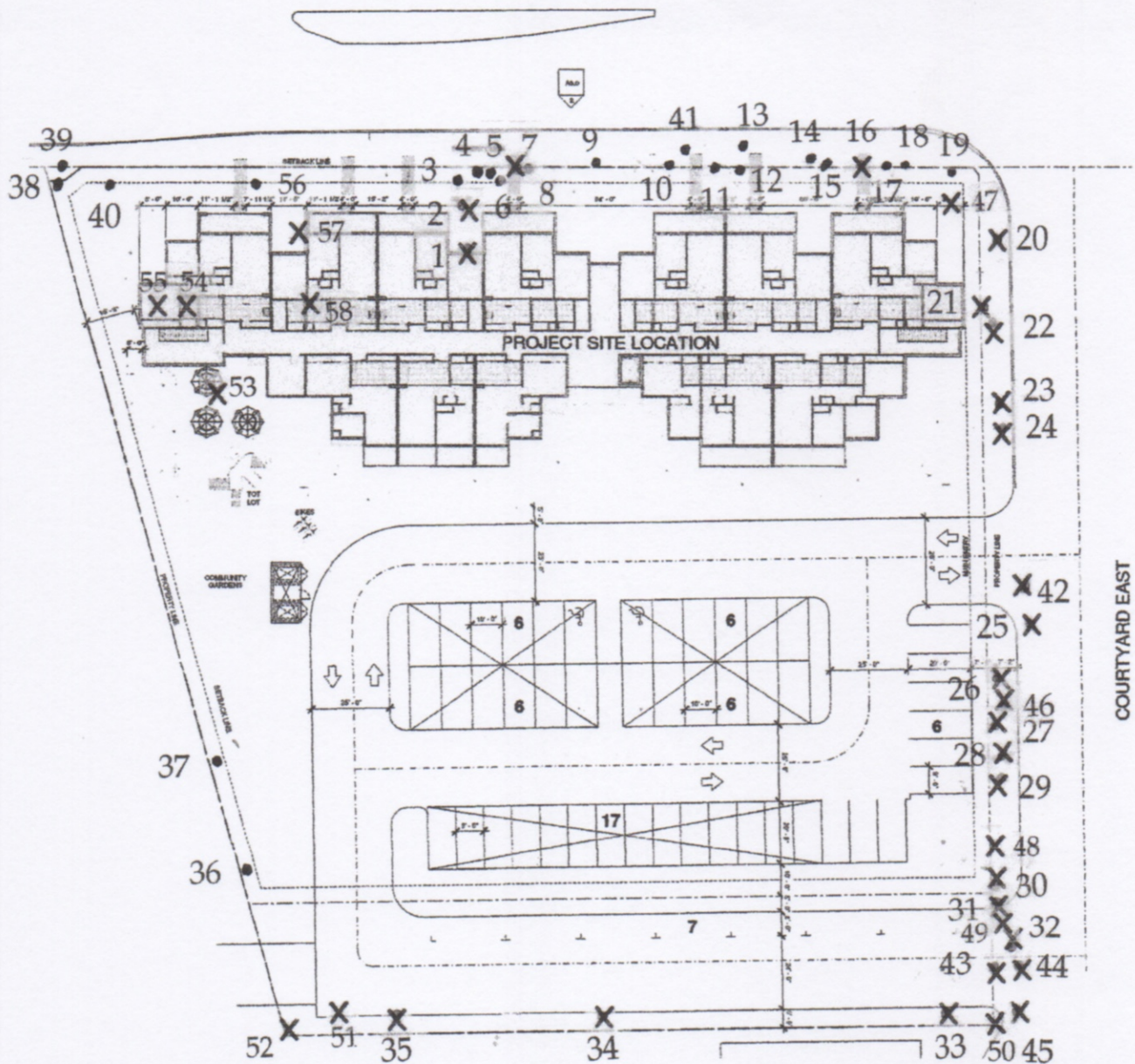
Recommendations are provided for removal or preservation. For those being preserved, protection measures and mitigation procedures to offset impacts and improve tree health are provided.

- (1) Preservation appears to be possible.
- (2) Removal is required due to significant development impacts.
- (3) Removal is recommended due to poor health or hazardous structure.

- (4) Removal is required due to significant development impacts and poor existing condition.
- (5) Removal is recommended due to poor species characteristics.
- (6) Install temporary protective fencing at the edge of the dripline, or edge of approved construction, prior to beginning grading or construction. Maintain fencing in place for duration of all construction activity in the area.
- (7) Maintain existing grade within the fenced portion of the dripline. Route drainage swales and all underground work outside the dripline.
- (8) Place a 4" layer of chipped bark mulch over the soil surface within the fenced dripline prior to installing temporary fencing. Maintain this layer of mulch throughout construction.
- (9) Prune to clean, raise, or provide necessary clearance. Prune to reduce branches that are over-loaded, over-extended, largely horizontal, arching, or have foliage concentrated near the branch ends, per International Society of Arboriculture Pruning Standards.

Pruning to occur by, or under the supervision of, an Arborist certified by the International Society of Arboriculture. Pruning Standards are attached to this report.

TREE LOCATION PLAN



TREE LOCATION & NUMBERING PLAN

Heritage Park Apartments
Windsor, California

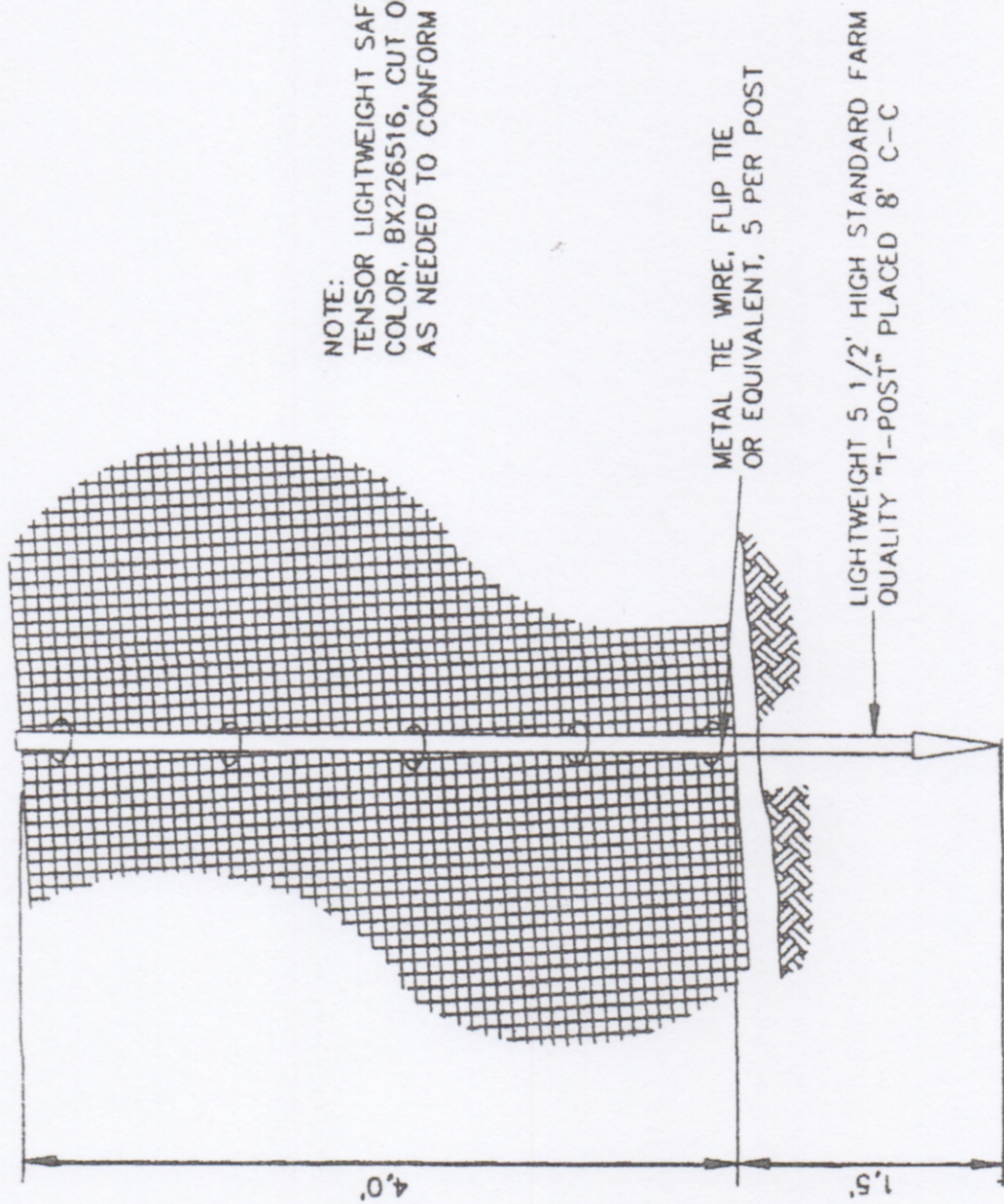
THIS PLAN TO BE USED IN CONJUNCTION WITH
TREE LOSS DETERMINATION REPORT
DATED 7/11/18

JOHN C. MESERVE

CONSULTING ARBORIST
International Society of Arboriculture
Certified Arborist WE #0478A

HORTICULTURAL ASSOCIATES
P.O. BOX 1261 / GLEN ELLEN, CA 95442
707.935.3911

TREE FENCING DETAIL



NOTE:
 TENSOR LIGHTWEIGHT SAFETY GRID, ORANGE
 COLOR, BX226516, CUT OR FOLD AT POSTS
 AS NEEDED TO CONFORM TO SLOPING TERRAIN.

METAL TIE WIRE, FLIP TIE
 OR EQUIVALENT, 5 PER POST

LIGHTWEIGHT 5 1/2' HIGH STANDARD FARM
 QUALITY "T-POST" PLACED 8' C-C

TREE PROTECTION GUIDELINES

GENERAL TREE PROTECTION GUIDELINES FOR CONSTRUCTION AROUND PRESERVED TREES

Heritage Park Apartments
Windsor, CA

INTRODUCTION

Great care must be exercised when development is proposed in the vicinity of established trees of any type. The trees present at construction sites require specialized protection techniques during all construction activities to minimize negative impact on their long-term health and vigor. The area immediately beneath and around canopy driplines is especially critical, and the requirements and procedures that follow are established to protect short and long-term tree integrity. The purpose of this protection guideline is therefore to define the procedures that must be followed during any and all phases of development in the immediate vicinity of designated and protected trees.

Established, mature trees respond in a number of different ways to the disruption of their natural conditions. Change of grade within the root system area or near the root collar, damage to the bark of the trunk, soil compaction above the root system, root system reduction or damage, or alteration of summer soil moisture levels may individually or collectively cause physiological stress leading to tree decline and death. The individual impacts of these activities may cause trees to immediately exhibit symptoms and begin to decline, but more commonly the decline process takes many years, with symptoms appearing slowly and over a period of time. Trees may not begin to show obvious signs of decline from the negative impacts of construction until many years after construction is completed. It is not appropriate to wait for symptoms to appear, as this may be too late to correct the conditions at fault and to halt decline.

It is therefore critical to the long-term health of all protected trees that a defined protection program be established before beginning any construction activity where protected trees are found. Once incorporated at the design level, it is mandatory that developers, contractors, and construction personnel understand the critical importance of these guidelines, and the potential penalties that will be levied if they are not fully incorporated at every stage of development.

The following guidelines are meant to be utilized by project managers and those supervising any construction in the vicinity of protected trees including grading contractors, underground contractors, all equipment operators, construction personnel, and landscape contractors. These protection guidelines are presented in a brief outline form to be applied to each individual activity that occurs during

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P.O. Box 1261
Glen Ellen, CA 95442
707-935-3911

development activities. It is left to project managers to implement these protection measures. Questions which arise, or interpretation of guidelines as they apply to specific site activities, must be referred to the designated project arborist as they occur.

TREE PROTECTION ZONE

1. The canopy dripline is illustrated on the Improvement Plans and represents the area around each tree, or group of trees, which must be protected at all times with tree protection fencing. No encroachment into the dripline is allowed at any time without approval from the project arborist, and unauthorized entry may be subject to civil action and penalties.
2. The dripline will be designated by the project arborist at a location determined to be adequate to ensure long term tree viability and health.

TREE PROTECTION FENCING

1. Prior to initiating any construction activity on a construction project, including demolition or grading, temporary protective fencing shall be installed at each site tree. Fencing shall be located at the dripline designated by the project arborist or illustrated on the Improvement Plans.
2. Fencing shall be minimum 4' height at all locations, and shall form a continuous barrier without entry points around all individual trees, or groups of trees. Barrier type fencing such as *Tensar* plastic fencing is recommended, but any fencing system that adequately prevents entry will be considered for approval by the project arborist. The use of post and cable fencing is not acceptable.
3. Fencing shall be installed in a professional manner with steel fence posts (standard quality farm 'T' posts work well) placed no more than 8 feet on center. Fencing shall be attached to each post at 5 locations with plastic electrical ties, metal tie wire, or flip tie. See fencing detail.
4. Fencing shall serve as a barrier to prevent encroachment of any type by construction activities, equipment, materials storage, or personnel.
5. All encroachment into the fenced dripline must be approved in writing and supervised by the project arborist. Approved dripline encroachment may require additional mitigation or protection measures that will be determined by the project arborist at the time of the request.

6. Contractors and subcontractors shall direct all equipment and personnel to remain outside the fenced area at all times until project is complete, and shall instruct personnel and sub-contractors as to the purpose and importance of fencing and preservation.
7. Fencing shall be upright and functional at all times from start to completion of project. Fencing shall remain in place and not be moved or removed until all construction activities at the site are completed.

TREE PRUNING AND TREATMENTS

1. All recommendations for pruning or other treatments must be completed prior to acceptance of the project. It is strongly recommended that pruning be completed prior to the start of grading to facilitate optimum logistics and access.
- 2.
3. All pruning shall be conducted in conformance with International Society of Arboriculture pruning standards, and all pruning must occur by, or under the direct supervision of, an arborist certified by the International Society of Arboriculture.

GRADING AND TRENCHING

1. Any construction activity that necessitates soil excavation in the vicinity of preserved trees shall be avoided where possible, or be appropriately mitigated under the guidance of the project arborist. All contractors must be aware at all times that specific protection measures are defined, and non conformance may generate stop-work orders.
2. The designated dripline is defined around all site trees to be preserved. Fences protect the designated areas. No grading or trenching is to occur within this defined area unless so designated by the Improvement Plan, and where designated shall occur under the direct supervision of the project arborist.
3. Trenching should be routed around the dripline whenever possible. Where trenching has been designated within the dripline, utilization of underground technology to bore, tunnel or excavate with high-pressure air or water will be specified. Hand digging will be generally discouraged unless site conditions restrict the use of alternate technology.
4. All roots greater than one inch in diameter shall be cleanly hand-cut as they are encountered in any trench or in any grading activity. The tearing of roots

by equipment of any type shall not be allowed. Mitigation treatment of pruned roots shall be specified by the project arborist as determined by the degree of root pruning, location of root pruning, and potential exposure to desiccation. No pruning paints or sealants shall be used on cut roots.

5. Where significant roots are encountered mitigation measures such as supplemental irrigation and/or organic mulches may be specified by the project arborist to offset the reduction of root system capacity.
6. Retaining walls are effective at holding grade changes outside the area of the dripline and are recommended where necessary. Retaining walls shall be constructed in post and beam or drilled pier construction styles where they are necessary near or within a dripline.
7. Placement of fill soils is generally discouraged within the dripline, but in some approved locations may be approved to cover up to 30% of this area. The species and condition of the tree shall be considered, as well as site and soil conditions, and depth of fill. Retaining walls should be utilized to minimize the area of fill within the dripline. Type of fill soil and placement methods shall be specified by the project arborist.
8. Grade changes outside the dripline, or those necessary in conjunction with retaining walls, shall be designed so that drainage water of any type or source is not diverted toward or around the root crown in any manner. Grade shall drain away from root crown at a minimum of 2%. If grading toward the root collar is unavoidable, appropriate surface and/or subsurface drain facilities shall be installed so that water is effectively diverted away from root collar area.
9. Approved fill soils within the dripline may also be mitigated using aerated gravel layers and/or perforated aeration tubing systems, as specified by the project arborist.
10. Tree roots will be expected to grow into areas of soil fill, and quality of imported soil shall be considered. Ideally, fill soil should be site soil that closely matches that present within the root zone area. When import soil is utilized it must be the same or slightly coarser texture than existing site soil, should have a pH range comparable to site soils, and generally should have acceptable chemical properties for appropriate plant growth. A soil analysis is recommended prior to importation to evaluate import soil for these criteria.

11. Grade reduction within the designated dripline shall be generally discouraged, and where approved, shall be conducted only after careful consideration and coordination with the project arborist.
12. Foundations of all types within the dripline shall be constructed using design techniques that eliminate the need for trenching into natural grade. These techniques might include drilled piers, grade beams, bridges, or cantilevered structures. Building footprints should generally be outside the dripline whenever possible.

DRAINAGE

The location and density of native trees on many sites may be directly associated with the presence of naturally occurring water, especially ephemeral waterways. Project design, especially drainage components, should take into consideration that these trees may begin a slow decline if this naturally present association with water is eliminated.

TREE DAMAGE

Any form of tree damage which occurs during the demolition, grading, or construction process shall be evaluated by the project arborist. Specific mitigation measures will be developed to compensate for or correct the damage. Fines and penalties may also be levied.

Measures may include, but are not limited to, the following:

- pruning to remove damaged limbs or wood
- bark scoring to remove damaged bark and promote callous formation
- alleviation of compaction by lightly scarifying the soil surface
- installation of a specific mulching material
- supplemental irrigation during the growing season for up to 5 years
- treatment with specific amendments intended to promote health, vigor, or root growth
- vertical mulching or soil fracturing to promote root growth

- periodic post-construction monitoring at the developer's expense
- tree replacement, or payment of the established appraised value, if the damage is so severe that long term survival is not expected

FERTILIZATION

1. Native trees generally do not require supplemental fertilization unless exhibiting a deficiency symptom. Following completion of construction any tree that exhibits symptoms of a specific nutrient deficiency shall be fertilized to compensate for the deficiency. Soil or tissue analysis may be required to identify the deficiency.
2. Distressed trees, or trees damaged by construction in any way, may be detrimentally affected by supplemental fertilization. The decision to fertilize, and with what fertilizers, shall be made by the project arborist based on conditions and appearance observed at the completion of the project.

PEST CONTROL

A close visual examination for tree pests shall be conducted by the pruning contractor as he completes recommended pruning procedures. If a serious infestation is present, that was not apparent from ground observation, then pest control measures may be considered. However, the simple presence of tree pests does not warrant the use of chemical pesticides. Only a serious infestation, capable of causing tree decline, would warrant pesticide use. The use of organic sprays or pesticidal soaps is the preferred method for treating any serious pest infestation.

WEED CONTROL

No specific measures are recommended for weed control, and the presence of weeds should not be considered problematic in relation to continued tree health. However, use of contact weed killers and pre-emergent weed killers are generally not recommended due to their potential for root system damage if improperly applied.

DISEASE CONTROL

No specific measures are recommended for disease control unless noted in the Tree Protection and Preservation Plan. All disease control measures should be based on observation of actual conditions in the tree canopy.

MULCHING

Trees will generally benefit from the application of a 4-inch layer of chipped bark mulch over the soil surface within the greater root zone area. Ideal mulch material is a chipped bark containing a wide range of particle sizes. Bark mulches composed of shredded redwood, bark screened for uniformity of size, or chipped lumber will not function as beneficially. Rock and gravel mulches are generally discouraged due to their minimal benefit.

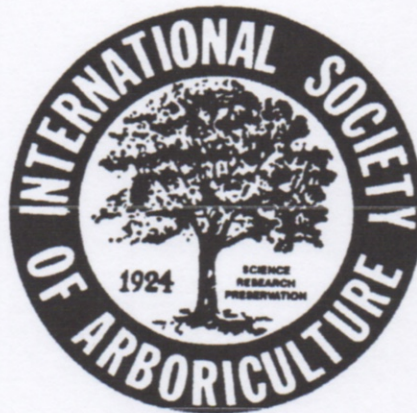
PLANTING UNDER EXISTING TREES

1. The installation of lawn beneath established native trees is strongly discouraged because it has the potential to initiate serious disease. If planting is required for aesthetic or functional purposes, the use of drought tolerant, woody species is most appropriate. Species should be selected for their ability to survive with minimal or no water through the summer months after the initial establishment period. Only drip irrigation should be utilized within the canopy dripline to minimize summer water in the root zone.
2. Many non-native trees will tolerate summer irrigation well and suitable landscape planting and irrigation may actually be beneficial.

TREE PRUNING STANDARDS

PRUNING STANDARDS

WESTERN



CHAPTER

WESTERN CHAPTER

International Society of Arboriculture

ARIZONA

CALIFORNIA

HAWAII

NEVADA

Certification Committee • P.O. Box 424 • St. Helena, California 94574

PRUNING STANDARDS

Purpose:

Trees and other woody plants respond in specific and predictable ways to pruning and other maintenance practices. Careful study of these responses has led to pruning practices which best preserve and enhance the beauty, structural integrity, and functional value of trees.

In an effort to promote practices which encourage the preservation of tree structure and health, the W.C. ISA Certification Committee has established the following Standards of Pruning for Certified Arborists. The Standards are presented as working guidelines, recognizing that trees are individually unique in form and structure, and that their pruning needs may not always fit strict rules. The Certified Arborist must take responsibility for special pruning practices that vary greatly from these Standards.

I. Pruning Techniques

- A. A thinning cut removes a branch at its point of attachment or shortens it to a lateral large enough to assume the terminal role. Thinning opens up a tree, reduces weight on heavy limbs, can reduce a tree's height, distributes ensuing invigoration throughout a tree and helps retain the tree's natural shape. Thinning cuts are therefore preferred in tree pruning.

When shortening a branch or leader, the lateral to which it is cut should be at least one-half the diameter of the cut being made. Removal of a branch or leader back to a sufficiently large lateral is often called "drop crotching."

- B. A heading cut removes a branch to a stub, a bud or a lateral branch not large enough to assume the terminal role. Heading cuts should seldom be used because vigorous, weakly attached upright sprouts are forced just below such cuts, and the tree's natural form is altered. In some situations, branch stubs die or produce only weak sprouts.

- C. When removing a live branch, pruning cuts should be made in branch tissue just outside the branch bark ridge and collar, which are trunk tissue. *(Figure 1)* If no collar is visible, the angle of the cut should approximate the angle formed by the branch bark ridge and the trunk. *(Figure 2)*
- D. When removing a dead branch, the final cut should be made outside the collar of live callus tissue. If the collar has grown out along the branch stub, only the dead stub should be removed, the live collar should remain intact, and uninjured. *(Figure 3)*
- E. When reducing the length of a branch or the height of a leader, the final cut should be made just beyond (without violating) the branch bark ridge of the branch being cut to. The cut should approximately bisect the angle formed by the branch bark ridge and an imaginary line perpendicular to the trunk or branch cut. *(Figure 4)*
- F. A goal of structural pruning is to maintain the size of lateral branches to less than three-fourths the diameter of the parent branch or trunk. If the branch is codominant or close to the size of the parent branch, thin the branch's foliage by 15% to 25%, particularly near the terminal. Thin the parent branch less, if at all. This will allow the parent branch to grow at a faster rate, will reduce the weight of the lateral branch, slow its total growth, and develop a stronger branch attachment. If this does not appear appropriate, the branch should be completely removed or shortened to a large lateral. *(Figure 5)*
- G. On large-growing trees, except whorl-branching conifers, branches that are more than one-third the diameter of the trunk should be spaced along the trunk at least 18 inches apart, on center. If this is not possible because of the present size of the tree, such branches should have their foliage thinned 15% to 25%, particularly near their terminals. *(Figure 6)*
- H. Pruning cuts should be clean and smooth with the bark at the edge of the cut firmly attached to the wood.
- I. Large or heavy branches that cannot be thrown clear, should be lowered on ropes to prevent injury to the tree or other property.
- J. Wound dressings and tree paints have not been shown to be effective in preventing or reducing decay. They are therefore not recommended for routine use when pruning.

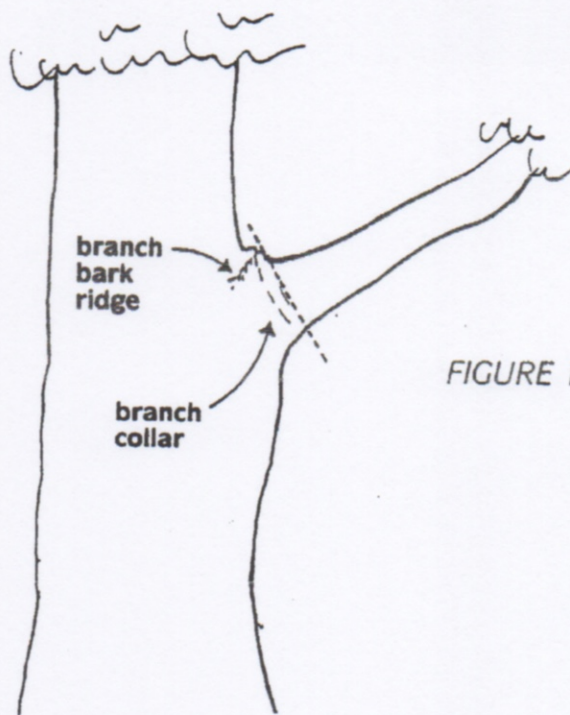


FIGURE 1. When removing a branch, the final cut should be just outside the branch bark ridge and collar.

FIGURE 2. In removing a limb without a branch collar, the angle of the final cut to the branch bark ridge should approximate the angle the branch bark ridge forms with the limb. Angle AB should equal Angle BC.

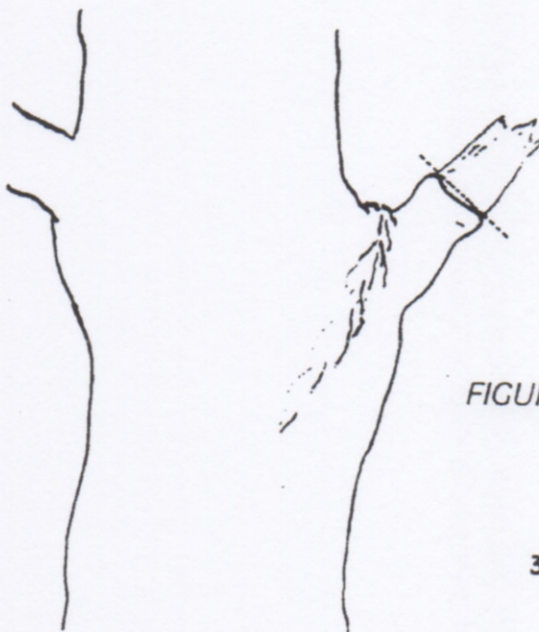
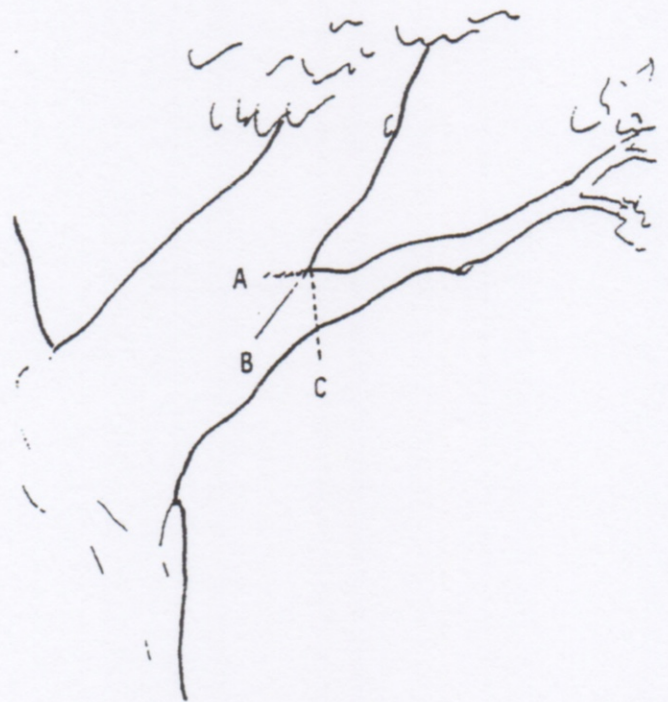


FIGURE 3. When removing a dead branch, cut outside the callus tissue that has begun to form around the branch.

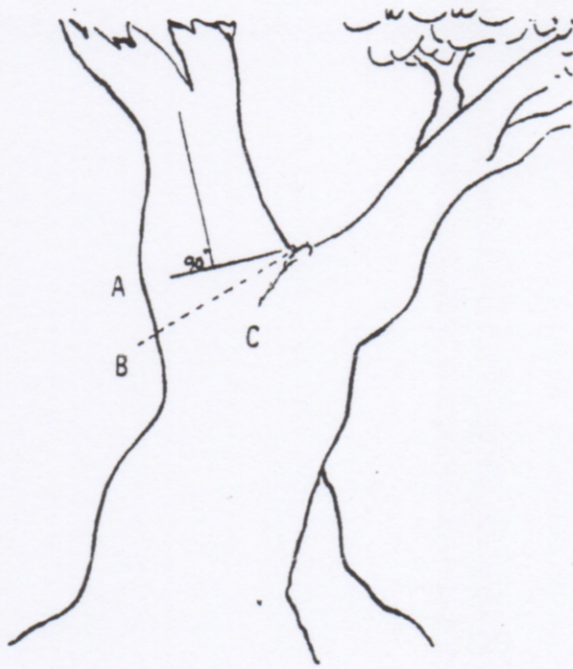


FIGURE 4. In removing the end of a limb to a large lateral branch, the final cut is made along a line that bisects the angle between the branch bark ridge and a line perpendicular to the limb being removed. Angle AB is equal to Angle BC.

FIGURE 5. A tree with limbs tending to be equal-sized, or codominant. Limbs marked B are greater than $\frac{3}{4}$ the size of the parent limb A. Thin the foliage of branch B more than branch A to slow its growth and develop a stronger branch attachment.



FIGURE 6. Major branches should be well spaced both along and around the stem.



II. Types of Pruning — Mature Trees

A. CROWN CLEANING

Crown cleaning or cleaning out is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches and watersprouts from a tree crown.

B. CROWN THINNING

Crown thinning includes crown cleaning and the selective removal of branches to increase light penetration and air movement into the crown. Increased light and air stimulates and maintains interior foliage, which in turn improves branch taper and strength. Thinning reduces the wind-sail effect of the crown and the weight of heavy limbs. Thinning the crown can emphasize the structural beauty of trunk and branches as well as improve the growth of plants beneath the tree by increasing light penetration. When thinning the crown of mature trees, seldom should more than one-third of the live foliage be removed.

At least one-half of the foliage should be on branches that arise in the lower two-thirds of the trees. Likewise, when thinning laterals from a limb, an effort should be made to retain inner lateral branches and leave the same distribution of foliage along the branch. Trees and branches so pruned will have stress more evenly distributed throughout the tree or along a branch.

An effect known as "lion's-tailing" results from pruning out the inside lateral branches. Lion's-tailing, by removing all the inner foliage, displaces the weight to the ends of the branches and may result in sunburned branches, watersprouts, weakened branch structure and limb breakage.

C. CROWN REDUCTION

Crown reduction is used to reduce the height and/or spread of a tree. Thinning cuts are most effective in maintaining the structural integrity and natural form of a tree and in delaying the time when it will need to be pruned again. The lateral to which a branch or trunk is cut should be at least one-half the diameter of the cut being made.

D. CROWN RESTORATION

Crown restoration can improve the structure and appearance of trees that have been topped or severely pruned using heading cuts. One to three sprouts on main branch stubs should be selected to reform a more natural appearing crown. Selected vigorous sprouts may need to be thinned to a lateral, or even headed, to control length growth in order to ensure adequate attachment for the size of the sprout. Restoration may require several prunings over a number of years.

II. Types of Pruning — Mature Trees (*continued*)

E. CROWN RAISING

Crown raising removes the lower branches of a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas. It is important that a tree have at least one-half of its foliage on branches that originate in the lower two-thirds of its crown to ensure a well-formed, tapered structure and to uniformly distribute stress within a tree.

When pruning for view, it is preferable to develop "windows" through the foliage of the tree, rather than to severely raise or reduce the crown.

III. Size of Pruning Cuts

Each of the Pruning Techniques (Section I) and Types of Pruning (Section II) can be done to different levels of detail or refinement. The removal of many small branches rather than a few large branches will require more time, but will produce a less-pruned appearance, will force fewer watersprouts and will help to maintain the vitality and structure of the tree. Designating the maximum size (base diameter) that any occasional undesirable branch may be left within the tree crown, such as $\frac{1}{2}$ ", 1" or 2" branch diameter, will establish the degree of pruning desired.

IV. Climbing Techniques

- A. Climbing and pruning practices should not injure the tree except for the pruning cuts.
- B. Climbing spurs or gaffs should not be used when pruning a tree, unless the branches are more than throw-line distance apart. In such cases, the spurs should be removed once the climber is tied in.
- C. Spurs may be used to reach an injured climber and when removing a tree.
- D. Rope injury to thin barked trees from loading out heavy limbs should be avoided by installing a block in the tree to carry the load. This technique may also be used to reduce injury to a crotch from the climber's line.

July 11, 2018

Pat and Shawn Devlin
220 Meadowcroft Way
Santa Rosa, CA

Re: Completed *Tree Loss Determination*, 220 Meadowcroft Way, Santa Rosa, CA

Pat and Shawn,

Attached you will find our completed *Tree Loss Determination* for your residential property in Santa Rosa. We found a total of 241 trees on the property, and many were damaged or destroyed by the October wildfires. This includes all native and ornamental trees that are present and larger than 1 inch in trunk diameter.

Our assignment was to inspect and evaluate each tree at the site to determine the extent and nature of fire damage to survivability and aesthetics. Based on the damage that was observed we agreed to determine whether the tree would reasonably survive and remain an integral aesthetic component of the site, and to provide this information in a written report. We agreed to determine a reasonable value for each tree not considered a realistic candidate for preservation, and agreed to use methodology appropriate for the trees being evaluated. This assignment is based on determining value that is accurate and reasonable. Our assignment did not include determining value for any other component of the site, or the landscape, other than trees.

We did not value trees that are located in the defined PG and E easement, although some are included in the Inventory table. PG and E has the right to remove or alter these trees at their discretion as part of their vegetation management program. Therefore, their loss is not a direct loss to you.

The attached Tree Inventory Chart includes the following information for each tree evaluated:

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the approximate location of each numbered tree.

Botanical and Common Name

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk inches at 4.5'

Each trunk has been measured to the nearest one-half inch to document its diameter at 4.5 feet above adjacent grade. This is a standard height in the arboricultural industry that is used to determine relative trunk size. Trunk size is a component of determining value. Where trunks were missing we measured at the available point and estimated what the diameter would be at 4.5'.

Multiple Trunk Adjustment to DBH

Where multiple trunks are present on the same tree a formula is utilized to determine an accurate size for a comparable single trunk. Adding up multiple trunks inflates the trunk size and is not an accurate representation of the size and age of the tree. Value is based on a single trunk.

Survival Expected

Using visual analysis, the amount of trunk and canopy that was damaged or destroyed by fire was determined. This estimate is used to determine whether we believe the tree will survive, and whether significant aesthetic damage has occurred.

PG and E ROW

Each tree was noted as being either in the PGE Right-of-Way, or not in the Right-of-Way.

Direct Replacement Value (or per insurance policy)

Various approaches to determining the value of a tree have been used in this report due to the wide variety of tree sizes that are present. Trees that can reasonably be replaced with widely available nursery container stock have been valued at their wholesale purchase price and multiplied by a 2.5 factor to cover shipping, handling, and installation. This is a standard factor used in the landscaping industry. This includes trees only up to 5 inches in trunk diameter. The following container and trunk sizes were utilized as a basis for determining the value of trees in this size range:

Trunk Diameter = 1" or less = \$60 wholesale cost

Trunk Diameter = 1.5 to 2.5" = \$180 wholesale cost

Trunk Diameter = 3" to 4" = \$450 wholesale cost

Trunk Diameter = 4.5" to 5.5" = \$900 wholesale cost

Costs were obtained from various Northern California wholesale nurseries.

Trunk Formula Method Value

Trees that are 6 inches or larger inches in trunk diameter become exponentially costlier as nursery container stock and costs become unreasonable. In place of reasonable replacement, the value of the loss has been determined by the *Trunk Formula Method* established by the International Society of Arboriculture, and supported using the 9th edition of the *Guide for*

November 28, 2018

Kim Voge
Town of Windsor Planning Department
P.O. Box 100
Windsor, CA 94552

Re: Heritage Park project; supplemental review of trees on Old Redwood Highway

Kim,

Per your request I am providing the following the following comments regarding trees along the Old Redwood Highway frontage for the proposed Heritage Park Apartments:

1. These trees are not in great health most likely due to past improvements including the immediately adjacent sidewalk that is 3 to 5 feet from many trunks. Most trees exhibit distress symptoms common on native Oaks that have had their root systems disturbed, in this case most likely roots that were cut for sidewalk construction.
2. Distress symptoms include thin canopy density, and watersprout growth on trunks and lateral limbs. Some trees are infested with Pit Scale insects as well.
3. Further disruption of root systems will lead to failure of most trees over a period of approximately 5-7 years, based on their already distressed condition. Trenching for underground utilities in the area of these trees between the back of sidewalk and the building will require their removal.
4. If root zones can be adequately protected, including no further disruption of any kind within 20 feet in any direction, it may be reasonable to preserve many these trees and mitigate their current condition. Trees in poor condition should be removed. Other trees might be selectively thinned to preserve the largest and most vital individual trees.
5. Mitigation beyond protection from grading and underground work within the specified 20-foot zone would include periodic irrigation, ground plane treatment with quality chipped bark mulch, and pesticide applications to reduce populations of pit scale to an acceptable level. This would be creating cultural conditions that are conducive to optimizing root system growth.
6. The plans we had to work with did not illustrate actual tree locations in relationship to existing conditions, and did not show required site improvements other than the basic

footprint of the adjacent proposed buildings. With more detailed information we can supply you with a more precise evaluation. If these measures were incorporated over the long term the health and vitality of many of these trees could improve.

7. It should be noted that Valley Oak becomes very large and the location of many of these trees is near the sidewalk. If they are preserved, and if the sidewalk remains in its current condition, they will cause significant problems in the future with roots damaging the sidewalk, curb, gutter, and possibly Old Redwood Highway itself. If designing this area from scratch we would never recommend trees that grow this large be placed in such close proximity to hardscape.

8. It should also be noted that as a linear grouping these trees look much better than if you look at each individually. Most individual trees are narrow and upright, somewhat lanky, and with little in the way of side branching or structure.

9. Also consider the impact of overhead power lines will have on these trees as they increase in size. They will all require topping in the coming years, and forever into the future, to prevent encroachment into the power line easement.

Feel free to contact me if you have questions regarding these comments.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

