

## 6.5 TREE RESOURCES

### 6.5.1 INTRODUCTION

This section describes the tree resources that exist at the project site and identifies potential impacts to tree resources that may result from development of the Proposed Project or project alternatives. An assessment of the tree resources at the project site was conducted by AES biologists on November 28, 2001. The assessments identified the location, species, and diameter of trees occurring within the vicinity of the project sites.

### 6.5.2 SETTING

The Proposed Project and alternative sites are located within the current Sacramento Zoo boundaries in the southwest corner of William Land Park. The project vicinity contains extensive vegetation characteristic of an urban park. Numerous landscape trees exist throughout William Land Park, providing shade and aesthetic features for park visitors.

Landscaping trees in William Land Park adjacent to the Zoo include American elm (*Ulmus americana*), ash (*Fraxinus sp.*), European white birch (*Betula verrucosa*), canyon live oak (*Quercus chrysolepis*), Chinese elm (*Ulmus parvifolia*), coast live oak (*Quercus agrifolia*), coast redwood (*Sequoia sempervirens*), cork oak (*Quercus suber*), deodar cedar (*Cedrus deodora*), bluegum eucalyptus (*Eucalyptus globulus*), Chinese pistachio (*Pistacia chinensis*), London plane tree (*Platanus acerfolia*), camphor tree (*Cinnamomum camphora*), cherry plum (*Prunus cerasifera*), and valley oak (*Quercus lobata*). Street trees along Park Land Drive and Sutterville Road consist of bluegum eucalyptus and ornamental pear (*Pyrus calleryana*).

## PROJECT SITE

The project site consists of the current Sacramento Zoo grounds located in the southwest corner of William Land Park. There are extensive tree resources within the Zoo grounds. The majority of trees are ornamentals planted since the park and the Zoo grounds were developed.

Some of the large oaks located within William Land Park may be remnants of native vegetation. Notably, the three large valley oaks located in the northern portion of the Zoo grounds are estimated to be over 200 years old (*Zoo-2002* EIR). Within the Zoo, there are currently 15 valley oaks of 22-inch or greater diameter. The vast majority of the vegetation within the Zoo grounds is not native to the area but are ornamental species selected for the site. Development of William Land Park began with an initial planting of approximately 4,000 trees and 6,000 shrubs (*Zoo – 2002*). Tree species that were found on the project site by an AES arborist survey are listed in **Table 6.5-1**.

### **PHASE 1 SITES**

Phase 1 will include development at three different locations within the zoo grounds: (1) Medical/Service

Complex, (2) Kampala Center, and (3) North Lawn. Existing tree resources for each of these areas are as follows:

**TABLE 6.5-1**  
PROJECT SITE TREE SPECIES

<b>Botanical Name</b>	<b>Common Name</b>
<i>Acer campestre</i>	English field maple
<i>Albizia julibrissin</i>	silk tree
<i>Calocedrus decurrens</i>	California incense cedar
<i>Camellia japonica</i>	common camellia
<i>Casuarina cunninghamiana</i>	river she-oak
<i>Catalpa speciosa</i>	northern catalpa
<i>Cedrus deodora</i>	deodar cedar
<i>Celtis australis</i>	Mediterranean hackberry
<i>Cinnamomum camphora</i>	camphor tree
<i>Citrus sp.</i>	citrus
<i>Crataegus oxycantha</i>	English hawthorn
<i>Eucalyptus globulus</i>	bluegum eucalyptus
<i>Eucalyptus spp.</i>	eucalyptus
<i>Fraxinus sp.</i>	ash
<i>Juglans hindsii</i>	California black walnut
<i>Lagerstroemia indica</i>	crapemyrtle
<i>Ligustrum lucidum</i>	privet
<i>Liquidambar formosana</i>	Chinese sweetgum
<i>Liquidambar styraciflua</i>	American sweetgum
<i>Liriodendron tulipifera</i>	tulip tree
<i>Magnolia grandiflora</i>	southern magnolia
<i>Magnolia spp.</i>	magnolia
<i>Metasequoia glyptostroboides</i>	dawn redwood
<i>Myrica sp.</i>	wax myrtle
<i>Parkinsonia aculeata</i>	Jerusalem-thorn
<i>Phoenix canariensis</i>	Canary Island date palm
<i>Phyllostachys sp.</i>	bamboo
<i>Picea sp.</i>	spruce
<i>Pinus halepensis</i>	Aleppo pine
<i>Platanus acerifolia</i>	London planetree
<i>Platanus sp.</i>	sycamore
<i>Prunus cerasifera</i>	cherry plum
<i>Quercus agrifolia</i>	coast live oak
<i>Quercus crysolepis</i>	canyon live oak
<i>Quercus hypoleucoides</i>	silverleaf oak
<i>Quercus lobata</i>	valley oak
<i>Quercus suber</i>	cork oak
<i>Salix babylonica</i>	weeping willow
<i>Sequoia sempervirens</i>	coast redwood
<i>Ulmus americana</i>	American elm
<i>Ulmus parvifolia</i>	Chinese elm
<i>Ulmus pumila</i>	Siberian elm
<i>Washingtonia filifera</i>	California fan palm
<i>Washingtonia robusta</i>	Mexican fan palm

SOURCE: AES, 2001

**Medical/Service Complex**

Trees in this area consist primarily of large eucalyptus trees near the existing administration and service buildings in the southwest corner of the Zoo. There are also three valley oaks in the area; one is directly east of the administration building, the other two are north of the administration building near the cul-de-sac of William Land Park Drive. There are also two rows of casuarinas (which resemble pine trees), one row along the border with the Holy Spirit School, and one row between the administration building and the cul-de-sac.

**Kampala Center**

Trees in this area consist of a Canary Island date palm tree on the southeast corner of the Center, and a variety of trees to the northwest of the Center, including a sweetgum, magnolia, elm and cedar.

**North Lawn**

Numerous trees exist in the north lawn area. Three large valley oaks dominate the northern portion of the area. On the southern portion of the lawn there are several redwoods and a fan palm. On the western border of the lawn area is a medium sized crepe myrtle.

**6.5.3 REGULATORY SETTING****CITY OF SACRAMENTO TREE ORDINANCE*****CITY STREET TREES***

Street trees within the City of Sacramento are protected under Sacramento City Codes Chapter 12.56.

**Definition**

A "City street tree" is defined as any tree growing on a public street right-of-way. City street trees are maintained by the city.

**Protection of City Street Trees**

The City of Sacramento tree ordinance provides for the protection of City Street Trees as follows:

- No person shall remove, trim, prune, cut or otherwise perform any maintenance on any City street tree without first obtaining a permit from the Director of the Parks and Recreation Department.
- No person shall interfere or cause any person to interfere with any tree related work being done pursuant to this article by any employee of the City of Sacramento or any person or firm doing work for the City.
- No person shall injure or destroy any City street tree by any means, including but not limited to the following:

- Constructing a concrete, asphalt, brick, or gravel sidewalk, or otherwise filling up the ground area around any tree so as to shut off air, light, or water from its roots, unless ordered or authorized to do so by the City.
  - Piling building material, equipment, or other substance around any tree so as to injure the tree.
  - Pouring any deleterious matter on or around any tree or on the surrounding ground, lawn, or sidewalk.
  - Posting any sign, poster, notice, or similar device on any tree, tree stake or guard, or by fastening any guy wire, cable, rope nails, screws, or other device to any tree, tree stake or guard for any purpose other than supporting the tree.
  - Causing any fire or burning near or around any tree.
  - Cutting roots with a diameter of two inches (2”) or greater for sidewalk repair or any other purpose; provided, however, that roots with a diameter of two inches or greater may be cut if authorized in advance by the Director of the Parks and Recreation Department.
- The Director of Public Works and the Planning Director shall notify the Director of Parks and Recreation Department of any applications for new subdivisions, curb, gutter, sidewalk, street light or driveway installation, or other proposed improvements which might require the removal of or cause injury to, any City street tree, or interfere with the fulfillment of the maintenance easement private street tree plantings.

## ***HERITAGE TREES***

### **Intent and Purpose**

The intent and purpose of the heritage tree ordinance is to provide for the protection of “significant specimen trees” within the City. The protection of heritage trees will “promote scenic beauty, enhance property values, reduce soil erosion, improve air quality, abate noise and provide shade to reduce energy consumption” (Sacramento City Code Section 12.64.010).

### **Definition**

Significant specimen trees are protected under Sacramento City Codes Chapter 12.64 as “Heritage Trees.” Heritage Trees are defined by the code as:

- Any tree of any species with a trunk circumference of 100 inches or more, which is of good quality in terms of health, vigor of growth, and conformity to generally accepted horticultural standards of shape and location for its species.

- Any native *Quercus* species, *Aesculus californica*, or *Platanus racemosa* having a circumference of 36 inches or greater when a single trunk, or a cumulative circumference of 36 inches or greater when a multi-trunk.
- Any tree 36 inches or greater in circumference in a riparian zone. The riparian zone is measured from the centerline of the water course to 30 feet beyond the high water mark.
- Any tree, grove of trees, or woodland trees designated by resolution of the City Council to be of special historical or environmental value, or of significant community benefit.

### Protection of Heritage Trees

The City of Sacramento tree ordinance states that none of the following activities shall be performed unless a permit is first applied for by the property owner or person authorized by the property owner and granted by the Director of the Parks and Recreation Department, subject to appeal provisions.

- The removal of any heritage tree.
- Pruning of any heritage tree segment greater than twelve inches in circumference or the placement of any chemical or other deleterious substance by spray or otherwise on any heritage tree.
- Disturbing the soil or placing any chemical or other deleterious substance or material on the soil within the drip line area of any heritage tree.

## 6.5.4 IMPACTS AND MITIGATION MEASURES

### SIGNIFICANCE CRITERIA

For the purpose of this analysis, an impact would be significant if the Proposed Project or alternatives violated specific provisions or the intent and purpose of Sacramento City Codes Chapter 12.56 or Chapter 12.64.

## MASTER PLAN IMPACTS AND MITIGATION MEASURES

### Master Plan Impact 6.5-1 Impacts to City Street Trees

PP, AA, AB A “City street tree” is defined as any tree growing on a public street right-of-way. Facility improvements and replacements that would occur as a result of the Proposed Project and project alternatives will be limited to the existing Zoo grounds. No construction activities have been identified that would result in the removal or interference with City Street Trees. Impacts could result from construction activities such as trenching, parking vehicles, storing materials, and cleaning equipment. However, construction activities must comply with Sacramento City Codes section 12.56.060 - Protection of Trees, which prohibits injury or destruction of any City Street Tree by any

means. Therefore, the impacts to City street trees from the construction of the Proposed Project and project alternatives is considered to be **less-than-significant**.

### Master Plan Mitigation 6.5-1 Impacts to City Street Trees

No mitigation is required.

### Master Plan Impact 6.5-2 Impacts to City Heritage Trees from Master Plan exhibit facility developments

PP The Proposed Project includes extensive exhibit facility developments that may either directly or indirectly impact City Heritage Trees. There are currently 15 valley oaks having a circumference greater than 36-inches within the Zoo grounds. There are also a number of other *Quercus* species present including coast live oaks and canyon live oaks that have a circumference greater than 36-inches; however, these are not considered native oaks to the Sacramento Valley. Therefore, the heritage tree ordinance would not apply to the coast live oak and canyon oaks within the Zoo. The northern portion of the Zoo also contains a walnut tree with a circumference of 100.48-inches, which exceeds the City heritage standard for other trees.

Detailed construction plans have not been developed for programmed exhibit facility developments; however, significant impacts could result from the construction and operation of these facilities. Proposed facilities that would likely impact Heritage Trees include but are not limited to: a service road along the northwest Zoo boundary, the orangutan exhibit, the chimpanzee exhibit, and the eagle/hornbill exhibit.

The construction and operation of programmed exhibit facilities could result in the removal or pruning of native oak trees, or disturbance of soil within the drip line of native oak trees. Development of programmed exhibit facilities must comply with the provisions of Sacramento City Codes Chapter 12.64. Sections 12.64.040 and 12.64.050 specifically prohibit activities that may result in damage to Heritage Trees, “unless the express written permission of the Director of the Parks and Recreation Department is first obtained.” The failure to consult with the City Arborist early on in the planning stages for future Zoo phases may result in a **significant impact** to heritage trees.

AA Under the No Project Alternative, existing conditions will be maintained in the near term. Forseeable development under the No Project Alternative includes the construction of a 5,300 square foot veterinary facility as proposed in the *Zoo – 2002* master plan. The proposed facility, as identified in *Zoo – 2002*, would be located directly southeast of the current administration building. The construction of this facility will necessitate the removal of several large eucalyptus trees. One tree with a codominant trunk of 30.5 and 27-inches in diameter measured at a height of 4.5 feet above grade, qualifies as a Heritage Tree under Sacramento City Codes Chapter 12.64. All of the eucalypts however, have been found to be in poor health or have weak structure (Pskowski, per. comm.). Those in poor health are a result of a red gum lerp psyllid infestation over the past two years. This pest has caused repeated defoliation, which has resulted in dieback, up to 70 percent of the canopy. Two of the eucalypts have weak structure. One 30.2-inch tree has codominant trucks with weak attachment. The 30.5 and 27-inch tree has cankers (dead areas) that extend along the primary and secondary scaffold limbs. This

dieback is probably a result of the December 1990 freeze that killed numerous eucalypts in the Sacramento area. These areas of dieback are so large that the tree has been unable to seal over the wound and so decay is setting in which affects the structural integrity of the limb (Pskowski, 2001).

Due to the poor health and weak structure of these trees, City Tree Services has stated that the eucalypts may be saved or removed at the Zoo's discretion. Therefore, the removal of these trees to allow for the construction of the veterinary facility is considered to be a **less-than-significant impact**.

AB

The Reduced Intensity Alternative provides for the development of an administration building and veterinary hospital located in the medical/service area near the existing administration building. As noted under the impact discussion for Alternative A, there are several large eucalyptus trees near the existing administrative building, one of which qualifies as a Heritage Tree. At least two of the eucalyptus trees would have to be removed to allow for the construction of the proposed administration building. However, as discussed above, due to the poor health and weak structure of these trees, Tree Services has stated that the eucalypts may be saved or removed at the Zoo's discretion.

The Reduced Intensity Alternative also provides for improvements to dilapidated exhibits and holding areas to assure animal health. These improvements would not be as extensive in comparison to those considered under the Proposed Project. Development of programmed facilities must comply with the provisions of Sacramento City Codes Chapter 12.64. Sections 12.64.040 and 12.64.050 specifically prohibit activities that may result in damage to Heritage Trees, "unless the express written permission of the Director of the Parks and Recreation Department is first obtained." The failure to consult with the City Arborist early on in the planning stages for future Zoo phases may result in a **significant impact** to Heritage Trees.

### **Master Plan Mitigation 6.5-2 Impacts to City Heritage Trees program exhibit facility developments**

The following mitigation is recommended to reduce the significant impact for the Proposed Project and Alternative B:

- a. Each phase of Zoo redevelopment proposed in an area containing a Heritage Tree shall be forwarded to the City Arborist for review and comment prior to commencement of construction activities. The plans shall be forwarded to the City Arborist early enough in the design process to assure that suggested changes can be incorporated into the final design. Suggested changes could include recommendations regarding permanent structures in relation to the driplines of heritage trees, pruning recommendations, treatment of soil within and around the dripline of heritage trees, etc.

### **Significance after Mitigation**

#### **Less-than-Significant**

## PHASE I IMPACTS AND MITIGATION MEASURES

### Phase I Impact 6.5-3 Impacts to City Heritage Trees from development of Medical/Service Complex Components.

PP, AB The Proposed Project, and the Reduced Intensity Alternative include the construction of a veterinary clinic, kitchen, offices and storage buildings in the southwest corner of the Zoo grounds. As discussed under Impact 6.5-2, there are several large eucalyptus trees near the current administrative building, one of which qualifies as a Heritage Tree. The construction of these facilities will necessitate the removal of several large eucalyptus trees. Due to the poor health and weak structure of these trees, the City Arborist has stated that the eucalypts may be saved or removed at the Zoo's discretion. Therefore, the removal of these trees to allow for the construction of the proposed facilities is considered to be a **less-than-significant impact**.

AA The No Project Alternative contains no Phase I components; therefore impacts resulting from the No Project Alternative are considered to be **less-than-significant**.

### Phase I Mitigation 6.5-3 Impacts to City Heritage Trees from development of Medical/Service Complex Components.

No mitigation is required.

### Phase I Impact 6.5-4 Impacts to City Heritage Trees from development of the proposed Multi-Use Pavilion (North Lawn).

PP The Proposed Project also includes the construction of a 38-foot wide by 80-foot long multi-use pavilion. The pavilion will be located on the upper lawn at the northern portion of the Zoo in an area that is currently used for hosting events. This area has three large valley oak trees that qualify as Heritage Trees.

The Zoological Society owns a 40-foot wide by 80-foot wide tent which is currently used for large dining events and traveling exhibits. The proposed pavilion will be a permanent structure to replace the temporary use of the tent within the same location. The pavilion will be located outside of the drip line of all three of the valley oak trees, but will be located immediately adjacent to two of the three tree's drip lines. The two adjacent valley oak trees are shown in **Figure 6.5-1**. The trees have a circumference of 168-inches and 175- inches at a height of 4.5 feet above grade.

The City Arborist stated that impacts to the two valley oaks may result from construction of the proposed pavilion. The 168-inch circumference tree was found to be in fair to poor health. The canopy is very thin and there is branch tip dieback throughout the entire canopy, which indicates that the tree is in decline. The decline of the tree may be the result of either soil compaction or root disease. Soil compaction can occur when, over time, foot traffic compacts soil eliminating the natural air spaces in the soil. This reduces the amount of water and oxygen in the soil necessary for root growth. Root diseases that may be affecting the tree include oak root fungus (*Armillaria mellea*) and

Insert **Figure 6.5-1**

root rot (*Phytophthora sp.*). The 175-inch circumference tree was found to be in fair health. However, the City Arborist found that the existing cable system that helps to support the tree's branches requires replacement because of a broken cable and the age of the system. The need to replace the cable system is a result of existing conditions and is not considered to be mitigation for project related impacts.

Construction of the proposed pavilion would require minor pruning for building and equipment clearance. The construction of the pavilion would also impact both oak trees' root systems.

A tree's root system consists of woody and non-woody or absorbing roots. The woody roots provide structural support for the tree, and the non-woody roots absorb nutrients and moisture. Roots grow where there is water and oxygen. Paving with concrete prevents water from soaking into the soil and impedes the exchange of gases between roots, soil, and the atmosphere. This adversely impacts tree health and causes a slow decline, which makes the tree more susceptible to insect and disease problems (Pskowski, 2001). The pavilion would have a concrete slab floor/foundation that would cover the entire 38 x 80 area.

Three exploratory holes were dug within the foundation foot print to determine the presence of oak roots. Woody and non-woody oak roots were found in the foundation foot print. Due to the presence of tree roots in the footprint and the present condition of the oaks, the construction of the pavilion is expected to result in a **significant impact**.

- AA The No Project Alternative would maintain the current use of the Zoological Society's 40 x 80 foot tent for large dining events and traveling exhibits; therefore, this alternative would not generate an increased impact beyond what currently exists. Therefore, a **less-than-significant** impact will result.
- AB The Reduced Intensity Alternative does not include the construction of the multi-use pavilion. The current use of the Zoological Society's 40 x 80 foot tent for large dining events and traveling exhibits would therefore be maintained. A **less-than-significant impact** will occur because an additional impact, resulting from construction of a permanent pavilion, would not occur.

#### **Phase I Mitigation 6.5-4 Impacts to City Heritage Trees from development of the proposed multi-use pavilion.**

The following mitigation measures are recommended to reduce the impact associated with implementing the Proposed Project.

- a. An ISA (International Society of Arboriculture) certified arborist shall perform a root collar examination on the 168-inch circumference tree to inspect for any disease or root structure problems.
- b. Prior to construction, protective fencing shall be installed around the drip line of the three valley oaks. Orange plastic environmental fence will be permitted for this project. However, if the orange plastic fence is not properly maintained, then a 6-foot chain link fence will be required. Within the fenced area there shall be no

storage of materials or equipment, no parking of vehicles, and no trenching or grade changes.

- c. All roots shall be cut clean. Any roots greater than 2-inches in diameter require an inspection by an ISA certified arborist prior to severing.
- d. Any pruning required for building or equipment clearance shall be carried out or supervised by an ISA certified arborist.
- e. The contractor shall be held liable for any damage to existing trees (e.g. trunk wounds, broken limbs, pouring of any deleterious materials or washing out concrete under the drip line of the tree). Damages will be assessed using the "Guide to Plant Appraisal" ninth edition published by the ISA. The contractor will hire an ISA certified arborist to do the appraisal and submit a report for review by the City Arborist.

Additionally, one of the following measures shall be undertaken:

- f. Install a raised foundation for the pavilion that would allow oxygen exchange between the atmosphere and the soil.

or

- g. Improve the aeration and soil conditions under the drip line of the trees. This would require the drip line to be fenced off to eliminate foot traffic and to allow the natural accumulation of oak duff (leaves and small twigs). This would enhance the population of earthworms and mycorrhizae, beneficial fungi that assist the tree in absorption of water and nutrients. Once the health of the oaks improves then the fencing could be removed and a wood chip mulch installed to a depth of 3-4 inches to prevent compaction from foot traffic.

## **Significance after Mitigation**

### **Less-than-Significant**