3.3. Trees in parks

Introduction

The City of Rocklin maintains 24 improved parks with 148 acres of developed parkland (as of September 2003) that includes both planted trees and conserved native trees. Developed areas of parks are cared for by the Parks Division of the Community Services and Facilities Department. These parks are a key contributor to the quality of life in Rocklin. The trees in these parks increase the desirability and usability of the parks by providing critical shading and visual interest. They also provide habitat for wildlife species and enhance opportunities for wildlife viewing within the City. Trees in parks also provide a variety of other benefits, such as controlling soil erosion, intercepting particulate and gaseous air pollution, and reducing urban noise, which are noted in Section 1. Trees are a long-term asset of City parks that need to be managed in a way that maintains their utility and safety for as long as possible. Heavy human use of park lands and maintenance of turf and other park assets can also impact tree health.

Overview

Findings

- Tree density in most parks ranged from about 15 to 30 trees per acre.
- The majority of the park trees were in the intermediate age class, although some individual parks had a preponderance of trees in the youngest or oldest age classes.
- Although the selection of tree species in the parks was moderately diverse, flowering pear varieties were planted more commonly than is considered optimal for a given species.
- Almost all parks had some declining trees, but 91% of all surveyed trees were in fair to good condition.
- Many mature oaks that were retained in developed park areas are in decline due to altered conditions (due to grading, soil compaction, and irrigation) in the trees' rootzones, which have adversely impacted root health.
- Pruning to improve tree structure and safety is the most common maintenance need identified in park trees.
- Personnel from the Parks Division of the Department of Community Services and Facilities have the ability to prune trees from the ground, whereas other tree care work requires the use of private contractors who have specialized equipment for tree removal, high tree work, and pest control.
- The City has very few regulations or guidelines that are related to tree planting in parks.

Management issues and recommendations

- Rocklin parks contain many young trees which need to be inspected and pruned to develop good structure. Timely pruning of young trees reduces later maintenance needs.

- Many older trees are developing problems associated with poor structure or decline that will require more expensive pruning of large branches to mitigate hazardous conditions.
- Most of the problems seen in park trees are related to the design and execution of the landscape installation at the time the park was constructed.
- To guide tree selection, placement, and soil preparation as replacement plantings become necessary, long-term management plans should be developed for each park.
- Site assessments should be conducted before replanting empty planting spaces so that corrective actions can be taken if necessary to improve the planting site and/or species selection.
- Species composition of new plantings should be reviewed to ensure that common species are not overused to the exclusion of other suitable species.
- If native oaks are planted in parks adjacent to natural oak stands, seed sources of planted material should be from the Rocklin area.

Current status

Existing Regulations and Plans

The City of Rocklin has few City regulations or guidelines related to tree planting in public parks. Like many other cities, Rocklin City Code includes sections dealing specifically with City street trees, but does not include regulations unique to City park trees.

The General Plan states that the City will continue its long term revitalization program to beautify and upgrade all City parks (policy # 12), but trees are not specifically mentioned in this planning document.

The Northwest Rocklin General Development Plan does include a specific mention of park landscaping. Section G.8 of this plan states that "plant materials used within the parks adjacent to open space shall be carefully chosen to make the parks appear as extensions of the native corridor. Designs shall be by a licensed landscape architect and approved by the City. Native trees, shrubs and groundcover materials shall be emphasized."

Current management practices

Trees in developed portions of Rocklin parks are maintained by the City of Rocklin Parks Division of the Community Services and Facilities Department. Trees in open space parcels are the responsibility of the Rocklin Public Works Department, except that natural areas within developed parks are maintained by the Parks Division.

City of Rocklin Parks Division staff provided information about their park tree maintenance practices in the spring of 2004. This information on current management practices is summarized below. A chronological description of past and current tree care practices prepared by City of Rocklin Parks Division staff is included in Appendix 7.2.

The current status of park tree resources largely reflects past construction and maintenance practices, dating back 10 to 20 or more years. Especially for large mature trees such as conserved oaks, impacts of these practices will influence tree management options for the remaining life of the trees. Current management and maintenance practices will similarly affect the future status of park trees by influencing tree growth and health.

City of Rocklin Parks Division staff conducts most of the tree care in City parks as part its regular parks maintenance program. Parks Division staff estimated that they prune 500 to

600 trees per year. The lower limbs of all City park trees are inspected and pruned once a year and on an as needed basis during the year. Work on large park trees, mostly native oaks, is done on an as-needed basis by contractors. Last year, 11 park trees were removed. The number of removals varies from year to year, depending on weather, disease, vandalism, and other factors.

About 90% of the tree work in parks is done as part of the regular inspection cycle. Parks Division staff conduct tree care activities in City parks on an as needed basis as time permits as part of the daily workload. At every visit, Parks Division staff visually inspect parks for items in need of repair and safety-related issues. All parks are visited at least once a week and a thorough inspection of each park is conducted once a month. The monthly inspection includes an in-depth inspection of all areas of the park and documentation of the results. Parks Division staff also inspects all parks following major storms.

About 10% of the park tree maintenance is done in response to complaints and problems that fall outside of the regular inspection cycle. Residents occasionally call the City to report problems with City park trees. Parks Division staff follow up on such calls by inspecting the tree(s) in question and taking the appropriate action. Most of these calls relate to tree damage caused by vandalism.

Due to the way that tree care is scheduled in parks, total tree care expenditures and staff time are not broken out of the parks budget as a separate budget item. However, contracted tree care costs can be tracked separately. In the last budget year, approximately $2,000 was spent on tree removal by private contractors. As more park trees grow beyond the size that can be maintained from the ground, contracted expenditures are likely to increase. The entire budget for parks has increased over the past 5 years, primarily because the number of parks has increased.

As of mid-2004, the Parks Division had one International Society of Arboriculture (ISA) Certified Arborist on staff. Other Parks Division staff have attended professional tree care training classes. Parks Division staff are expected to prune in accordance with the ISA / ANSI pruning standards, which are the current industry standard for tree care professionals.

The Parks Division has used private contractors for various purposes, including pruning of large trees, tree removals, emergency work, pest control, and the use of specialized equipment. Overall, Parks Division staff report that they have been satisfied with the work performed by contractors. Although contractors are not explicity given pruning standards to follow, contractors employed by the City have ISA Certified Arborists on staff and are expected to follow ISA / ANSI standards when pruning trees.

Parks Division staff monitor parks for trees that die or otherwise may need to be replaced on an ongoing basis. A list of trees needing to be replaced is compiled throughout the year and replacement tree plantings are done in the fall, which is the optimum time to plant new trees in the Rocklin area. Trees are replaced in the original locations unless the tree was in an undesirable or poor location, such as areas with poor drainage. In such cases, new trees are relocated to a more favorable planting location.

Damage to hardscape or turf due to tree roots has occasionally been observed at various parks. When this situation arises, the area is inspected for safety issues and various corrective alternatives are considered. This can include rerouting the path, mulching or adding wood chips around the tree, and relocating or removing the tree. In addition, many of the mature oaks at Johnson-Springview Park are experiencing root problems that will adversely affect the health and longevity of these trees. A restoration committee is working to address and correct

these issues. Plans have been made to apply mulch beneath the trees to improve root health. Costs for these efforts will come out of the Parks Division budget.

Field assessment of park trees

Phytosphere conducted a sample survey of Rocklin City parks in September 2003 to investigate the status of trees in these representative parks. Eight City parks were selected for the survey (Table 3.3-1, Figures 3.3-1 to 3.3-6). The parks included in the survey were distributed geographically throughout the City and ranged in age from about 15 years old to just more than a year old at the time of the survey.

Phytosphere consulted with Don Jorgenson and Shawn Darling of the Parks Division of the Department of Community Services and Facilities before undertaking the survey to find out what information would be useful to Parks Division staff. Parks Division staff were particularly interested in tree condition ratings that could be used to help forecast future management needs for park trees. Details of the survey methods are presented in Section 7.1.3.

Characteristics of surveyed areas

All of the surveyed park areas support a variety of recreational uses and include general use turf areas, playground areas, picnic tables, and various other structures. Twin Oaks Park is a large community park, whereas the remaining sites are smaller neighborhood parks.

Five of the surveyed eight parks include areas with conserved native oak trees. These oaks were included in the survey if they were incorporated into the developed portions of the park, such as at Woodside Park. Oaks in woodlands along creeks (e.g., Clover Valley, Sierra Meadows) or in undeveloped portions of the parks (e.g., Monument, Pebble Creek) were not included in these surveys, but are addressed in the section on City-owned native woodlands (Section 3.2.)

Table 3.3-1. Parks included in the survey.

Park	Approximate construction date	Area surveyed (acres)	Total trees surveyed[a]	Number of species	Park includes native oak woodland
Clover Valley Park	1987	3.42	54	12	yes
Monument Park	2001	1.536	36	5	yes
Pebble Creek Park	1987	4.385	67	10	yes
Sasaki Park	2001	1.548	78	5	no
Sierra Meadows Park	1987	3.335	49	10	yes
Twin Oaks Park	1993	4.784	87	10	no
Vista Grande Park	1996	3.945	114	10	no
Woodside Park	1987	3.391	116	7	yes

[a] Excludes native trees in riparian areas and undeveloped woodland areas.

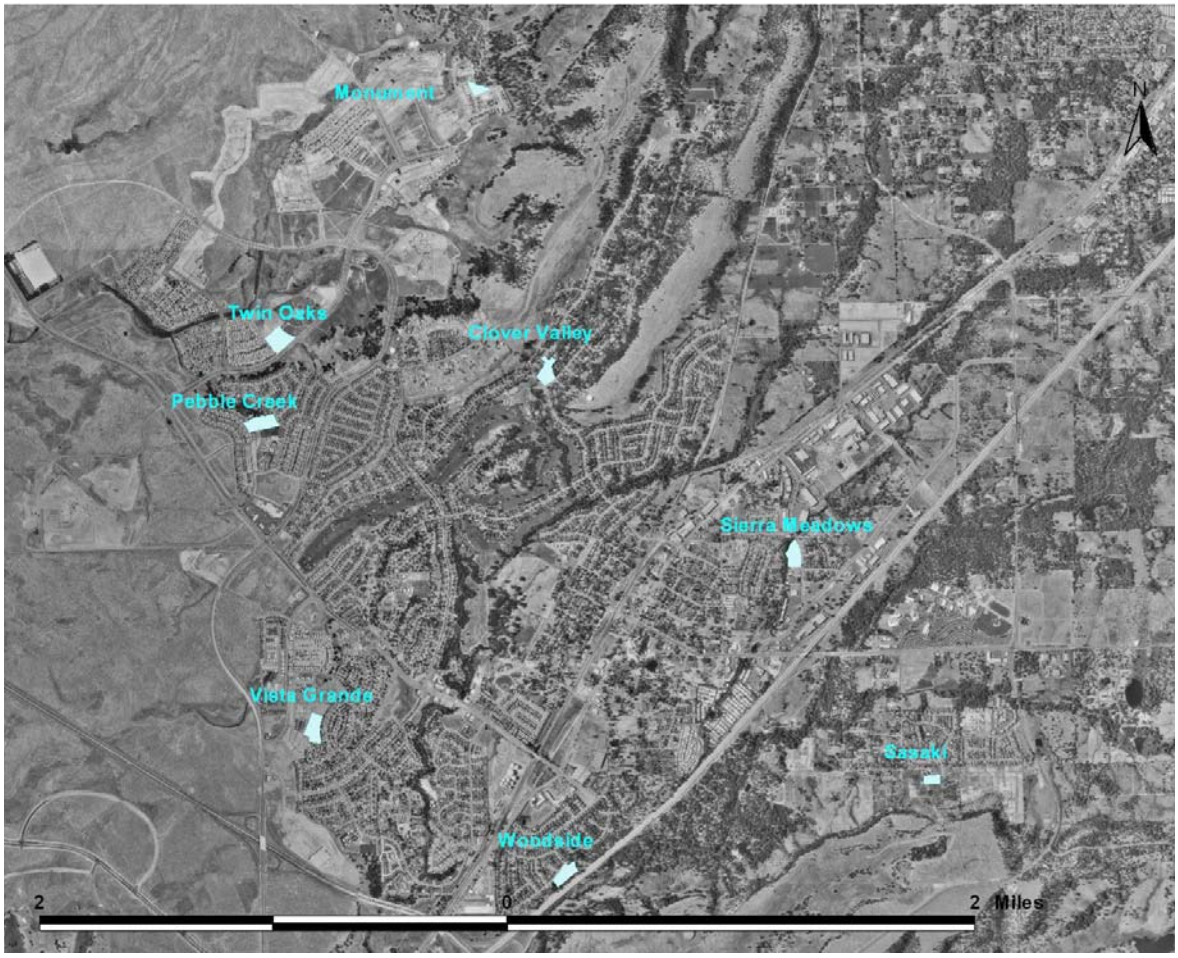

Figure 3.3-1. Locations of parks (light blue shading) included in the survey.

Figure 3.3-2. Planted trees at Monument Park, constructed in 2001, were all in the youngest age class. The woodland with mature oaks in background was not included in the survey.

Figure 3.3-3. Trees at Woodside Park, built in 1987, included many conserved mature oaks and a smaller number of planted non-native species.

Figure 3.3-4. Vista Grande Park, built in 1996, had a high density of trees in the area near the playground (top), but planting beds near the large turf area had vacant planting spaces (bottom).

Figure 3.3-5. Trees in this portion of Twin Oaks Park (built in 1993) were planted around the edges of a large turf area.

Figure 3.3-6. The developed portion of Sierra Meadows Park, built in 1987, had a few conserved oaks, including the two in this turf area, and a number of other planted trees seen in the background. The original design of this park includes irrigation and turf within the drip line of the conserved oaks, which can lead to root rot and premature death. Current design practices would exclude turf and irrigation from inside the drip line of conserved oaks.

Tree age class

Phytosphere compared current tree size to the typical size of a given tree species at maturity to estimate age classes of trees in the surveyed parks (Figure 3.3-7). About half of the trees were in the intermediate age class (25-75% of mature size), with the remainder almost evenly split between the most mature and youngest age classes. However, within most individual parks, the age distribution is much more skewed. For example, all surveyed trees in the two most recently constructed parks (Sasaki, Monument [Figure 3.3-2]) were in the youngest age class (<25% of mature size). At the opposite extreme, Woodside Park (Figure 3.3-3) had no trees in the youngest age class, and the majority of the trees, primarily conserved oaks, were in the oldest age class.

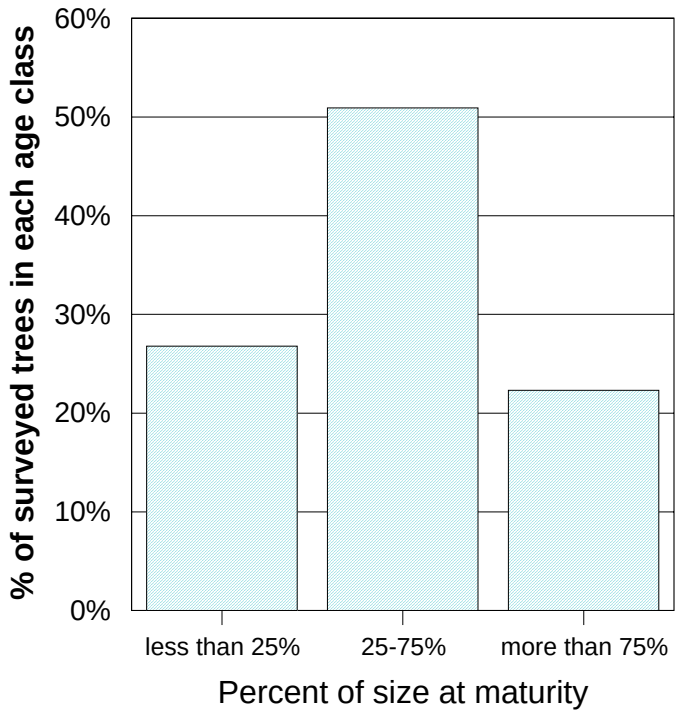

Figure 3.3-7. About half of the surveyed trees in the City parks sample were in the intermediate age class (25% to 75% of mature size).

Tree density

The overall density of trees in the sampled parks ranged from about 15 to 50 trees per acre (Figure 3.3-8). These densities do not include trees along riparian areas present in Clover Valley and Sierra Meadows Parks. The highest tree density overall was in Sasaki Park, a relatively small, recently constructed park. High density plantings in portions of this park (Figure 3.3-9) and the relatively small extent of the turf area help contribute to the atypically high tree density in this park. The tree density in most other parks was less than 30 trees per acre. In the absence of a complete tree survey, tree density can be used to provide an estimate of the total park tree population. If the overall average tree density in the sample (25 trees/acre) is representative of the density in the City's 148 acres of developed parkland, the citywide park tree population should be on the order of 3,700 trees.

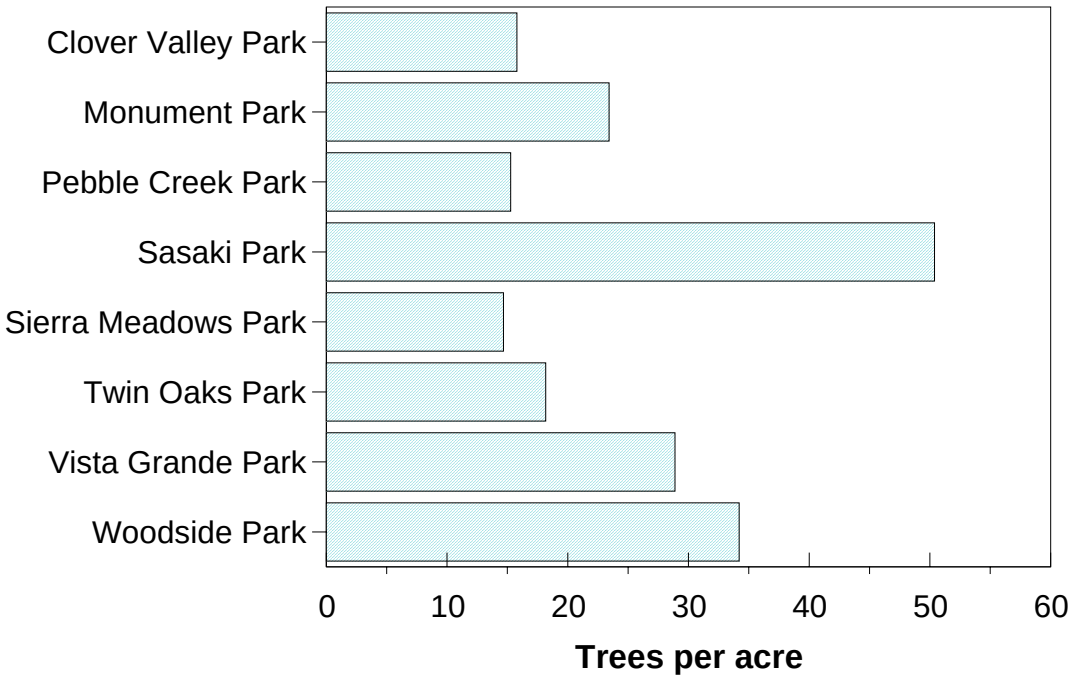

Figure 3.3-8. Tree densities (trees per acre) within the surveyed areas of the parks. Densities do not include native oaks along riparian areas.

Figure 3.3-9. The high density of trees at Sasaki Park is due to the dense planting of flowering pears and other trees to shade the playground area and the relatively small turf area of this small neighborhood park.

Species composition

The number of species present in surveyed parks ranged from five (in Sasaki and Monument Parks) to 12 in Clover Valley Park (Table 3.3-1). Overall, at least 32 species of trees were growing in the sampled parks. Most of these species are used only sparingly in the surveyed parks. Ten of the species were represented by five or fewer individuals, and 14 species were present in only one of the eight parks.

The most common species present in the surveyed parks are shown in Figure 3.3-10. Flowering pear was the most common tree in the surveyed parks, constituting almost one in every five trees. A commonly-used guideline for urban tree species diversity is that no single cultivated species should make up more than about 10% of the tree population. Hence, flowering pears represented a higher percentage of all park trees than is considered optimal, especially given that various maintenance issues are associated with this species (see "Tree condition and management concerns" below). Some of the common species on the list (e.g., Lombardy poplar) are no longer planted, but were still common at one or two parks.

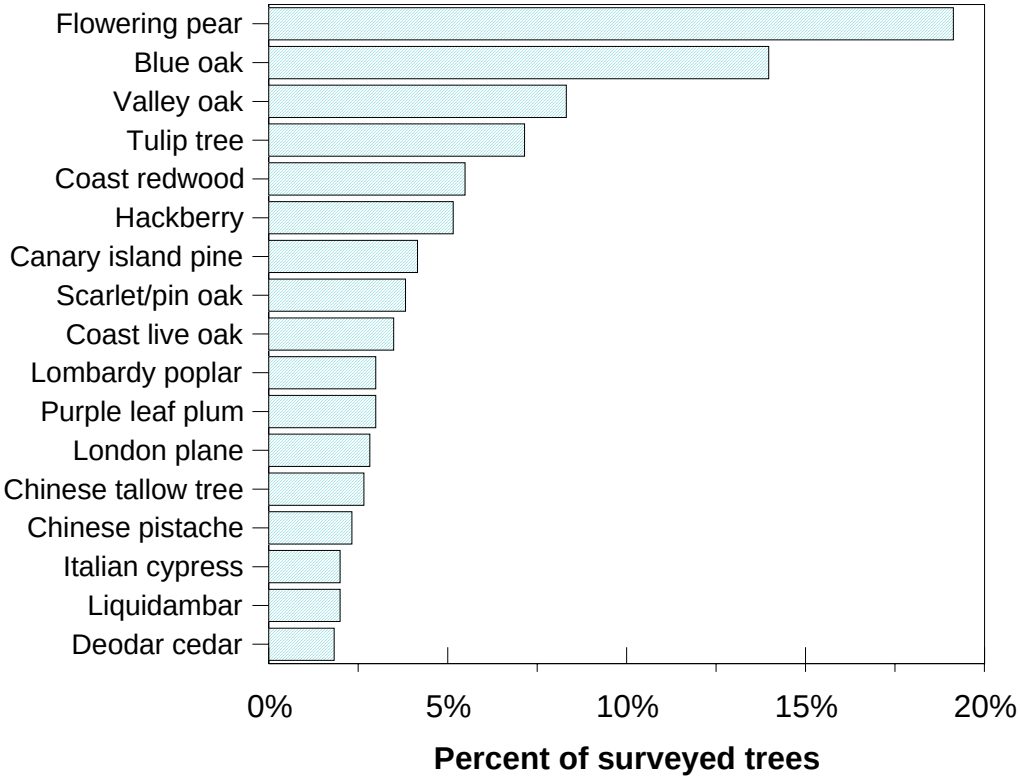

Figure 3.3-10. Most common tree species in surveyed parks. List includes all species represented by more than 10 individuals.

Two of the locally native oaks, blue oak and valley oak, were the second and third most common species, and together made up more than 20% of the trees in the sample. Most of the blue oaks in the survey (88%) were conserved mature trees in Woodside Park. For several reasons (i.e., most oaks were existing trees, native species have greater genetic diversity compared to cultivated species, and native species are well-adapted to local conditions) the

relatively high percentage of blue oaks in the overall tree species mix is not considered to be a problem.

Overall, most oaks in the surveyed parks were either mature oaks that were conserved when the parks were developed (Figures 3.3-2, 3.3-6) or small volunteer seedlings and saplings that have become established in planting beds. A few parks, including Monument Park (Figure 3.3-2) and Sasaki Park, also contain oaks that have been planted as nursery stock. Some of the nursery stock used in Monument Park was evidently of poor quality, leading to early decline and death of some of the trees. In some other parks, transplanted oaks have good form (Figure 3.3-11).

Figure 3.3-11. This native oak in Clarke Dominguez Neighborhood Park shows a favorable form for a young tree. Small branches are growing along the entire trunk. Such branches are directly responsible for providing nutrients to the trunk and increase the rate at which the trunk diameter expands. Young trees with branches along the trunk grow faster overall than trees in which the branches have been pruned off. However, as the tree grows, these temporary low branches are eventually removed. This may need to be done earlier in some situations if low branches are subject to breakage. Unfortunately, most nurseries remove lower branches along the trunk long before trees are sold.

Parks typically represent sites with sufficient space to grow trees that have large canopies at maturity. Researchers at the Forest Service Center for Urban Forest Research at UC Davis have shown that a mature large-statured tree provides an annual net benefit two to six times that of a mature small-statured tree (http://cufr.ucdavis.edu/products/cufr_419.pdf). A number of large-statured trees, including the various oak species, are common in Rocklin parks. However, the most common park tree, flowering pear, is only a medium-statured tree, and several other medium to small trees are among the most common trees listed in Figure 3.3-10.

Tree condition and management concerns

Most surveyed park trees (91%) were rated as being in fair to good condition. However, all surveyed parks except Clover Valley had some declining trees. Only four of the surveyed parks had empty planting spaces, i.e., spaces where trees had died and no apparent replacements had been planted. Overall, the number of empty planting spaces was low. Only 11 empty planting spaces (1.8% of the total tree count) were observed in the surveyed parks. Because replacement tree plantings are normally done in the fall, at least some of these sites could have been scheduled to be replanted.

The percentage of declining trees varied widely by species (Figure 3.3-12). Almost 90% of the surveyed Lombardy poplar trees were in decline. All of the Lombardy poplars were mature trees growing at Pebble Creek Park (Figure 3.3-13). The trees were declining as a result of Cytospora canker, a disease that commonly kills mature Lombardy poplars, especially those that become water-stressed. Because of their short useful life and other problems, the City no longer plants Lombardy poplars in Rocklin parks.

Although most native oaks were in fair to good condition, some conserved mature blue oaks were in decline. This was typically related to direct and indirect root damage that was inflicted at the time that the parks were constructed and subsequent irrigation within the rootzone (e.g., Figure 3.3-6). Several other species had some individuals showing decline symptoms that were associated with a variety of causes, including poor condition of young nursery stock planted in Monument and Sasaki Parks.

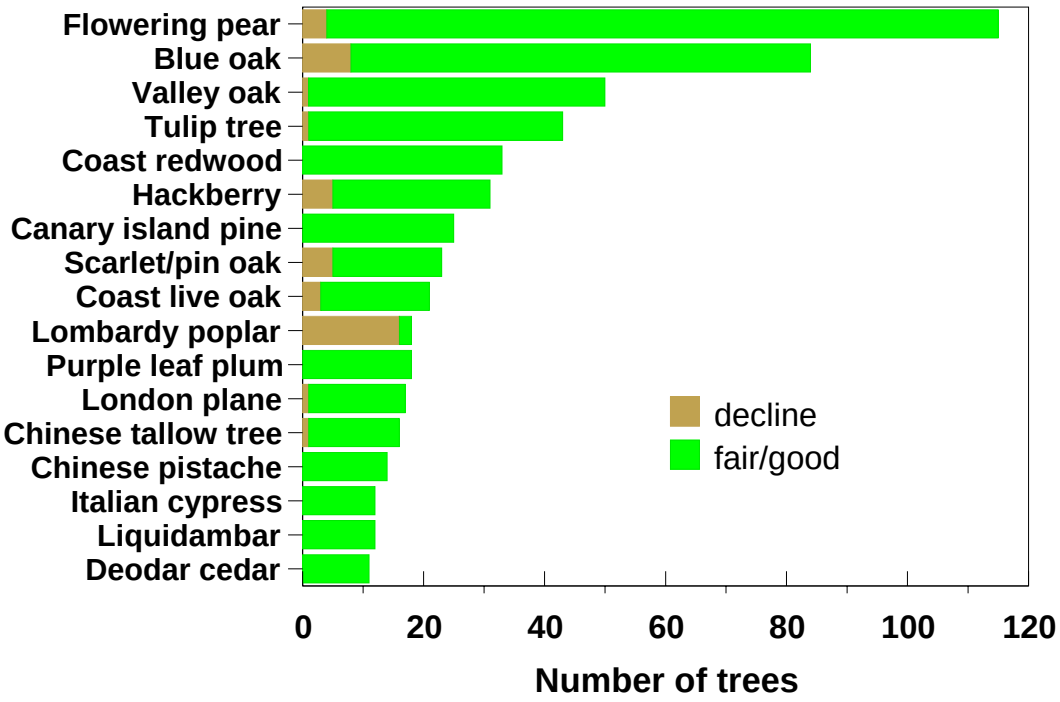

Figure 3.3-12. Condition ratings of the most common tree species present in surveyed parks. List includes all species represented by more than 10 individuals.

Figure 3.3-13. Dying Lombardy poplars at Pebble Creek Park. Although Lombardy poplars are fast growing and introduce a vertical design element into a landscape, they are no longer accepted in new landscaping in City of Rocklin parks due to their tendency to develop Cytospora canker disease and die at a relatively young age.

The management concerns identified in the field survey are described in Table 3.3-2 below. Pruning needs and related tree structural problems were the most commonly identified management concerns and occurred in a wide variety of tree species (Table 3.3-2) and parks (Figure 3.3-14). For conserved mature oak trees, such as those at Woodside Park, removal of dead wood was the most common pruning need. The need for corrective pruning was especially common in flowering pears, 71% of which had structural problems that may require some corrective pruning (Figure 3.3-15). These structural problems are almost exclusively due to the structure of the original nursery stock that was planted in the parks.

Table 3.3-2. Descriptions of management concerns identified in surveyed park trees and number of affected species.

Management concern	Description	Number of species affected
Structure / Pruning / Clearance	Tree structure is poor and/or pruning is needed to improve structure, remove dead wood, or provide adequate clearance.	16
Hazard	Tree or tree part has an elevated likelihood of failing in the future and failure could damage property or cause injury.	3
Tree placement / excessive density	Poor tree placement (e.g., under existing mature canopy) or excessive tree density	11
Diseases / pests	Typically canker rot and other decay fungi in oaks, other problems including sunburn and borer invasion in other species	6
Rootzone problems (conserved trees primarily)	Past or current fill, grading, compaction, paving, and/or irrigation of an existing tree's rootzone that has adversely affected tree health and survival	3
Excessive surface roots	Surface roots are commonly damaged by mowers and may be more subject to decay	16
Mechanical damage	Most commonly damage to lower trunk from mowers	7

Although tree structure and pruning concerns were common in parks of all construction vintages, several concerns were primarily found in the oldest surveyed parks and were associated with mature trees (Figure 3.3-14). Older parks generally have older trees, which are prone to certain problems not seen in young trees, such as the potential tree hazard issues noted in mature oaks at Sierra Meadows and Woodside Parks. In addition, some older parks have problems associated with certain design elements (e.g., inadequate rootzone protection and irrigation near conserved oaks) and plant materials that are no longer used (e.g., Lombardy poplar).

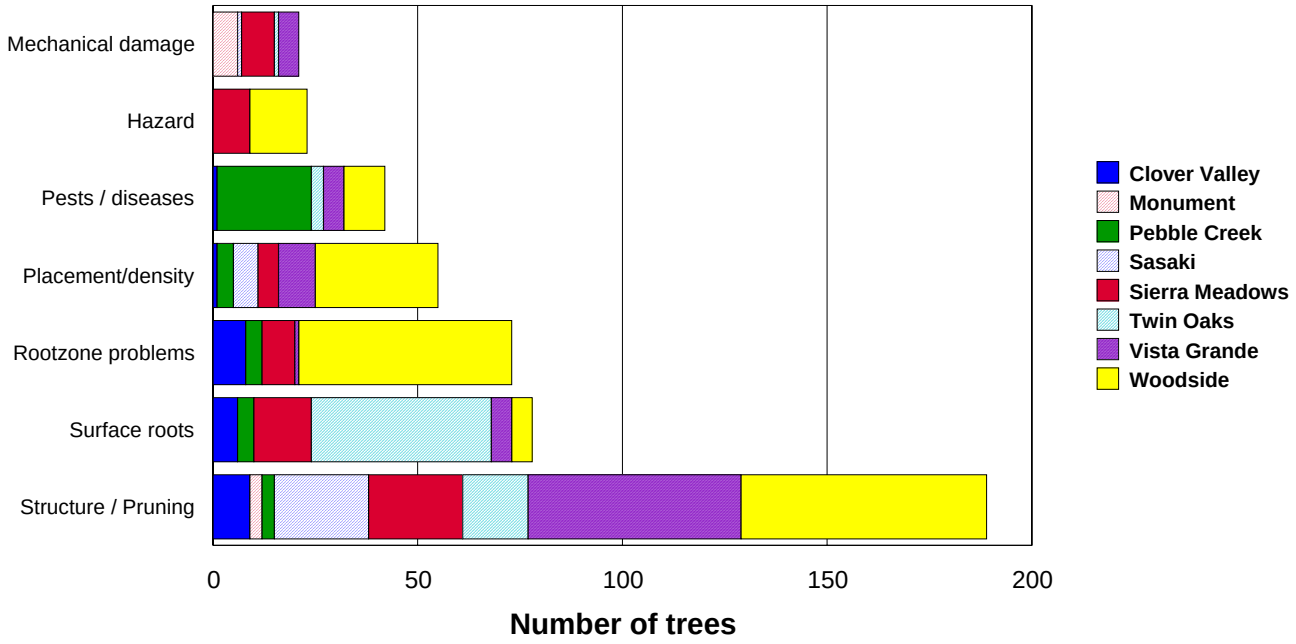

Figure 3.3-14. Frequencies of management concerns among trees at surveyed parks. In this graph, the oldest parks are shown with solid fill colors; the most recently-constructed parks are shown with the lightest striped fill.

Figure 3.3-15. Many older flowering pears (e.g., tree at Sierra Meadows Park, above) have excessive numbers of branches arising from a single point. As the tree continues to grow, these crowded branches are prone to splitting out. The problem, which is typically found in the original planted nursery stock, can best be corrected by pruning when trees are still small. The young flowering pear tree at right, (Clarke Dominguez Neighborhood Park) has a much better branch structure.

Some concerns that are more prominent at certain parks are related to local soil conditions. For instance, trees in some parks show excessive surface rooting, i.e., high numbers of shallow roots that project above the soil surface (Figure 3.3-16). Surface roots can interfere with mowing and may become tripping hazards in some situations. Roots are also subject to wounding and exposure to herbicides applied around trees, both of which can adversely affect the health of the tree. Surface roots were most common at Twin Oaks and Sierra Meadows Parks although they occurred in several other locations. Highly compacted and shallow soils contribute to excessive surface rooting.

Figure 3.3-16. Excessive surface roots on a hackberry at Sierra Meadows Park. The roots have been damaged by repeated injuries from lawn mowers. Excessive development of surface roots at certain locations may be due to excessive soil compaction at the time that the landscaping was originally installed. The tree at right, located in Vista Grande Park, has almost no surface roots.

Management issues and recommendations

Although this survey was limited to eight parks, the management issues apparent in these locations are representative of those in most Rocklin City parks. The maintenance needs of trees in the surveyed parks vary widely, in large part associated with their ages. In recently-constructed parks with uniformly young trees, the major tree maintenance issue is early structural pruning to develop good permanent branch structure. Other issues include avoiding wounding trees and replacing young trees that have died. Older parks are more likely to have trees of mature size, including both fast-growing non-native species and conserved oaks. These older and larger trees tend to have more problems related to pests and diseases and potential hazards related to poor structure and dead or declining branches.

Two distinct types of pruning are needed in various parks in Rocklin. In more recently-developed parks, many young trees need to be inspected, and pruned as needed to develop good branch structure that will reduce later maintenance needs. Such inspections typically need to occur on a two to three year cycle, and would involve about 25 to 30% of all park trees, based on our sample. Much of this pruning, especially in relatively new parks, can be done from the ground and will involve relatively small cuts. The Parks Division of the Department of Community Services and Facilities's current practice of inspecting and pruning trees on a regular basis should be sufficient to accommodate these pruning needs.

The second type of pruning involves trees in the larger size classes. In these trees, pruning is more commonly needed to reduce the potential for branch failures associated with dead or dying branches or structurally weak branches. In many cases, this type of pruning involves the removal of larger branches at greater heights in the trees. Climbing and/or aerial lift equipment may be needed in many of these cases.

Most trees in Rocklin's Parks have not yet attained their potential mature size. As the tree population ages in these parks, pruning needs will tend to shift from the first type to the second type. This second type of pruning is currently contracted out because Parks Division lacks the specialized crews and equipment needed for large tree work. The increasing need for more specialized equipment and more highly trained tree workers may be addressed either by greater use of arboricultural contractors or by the acquisition of personnel and equipment resources to perform the work in-house.

In order to anticipate maintenance costs, the City should consider developing a program to inspect and inventory park trees for maintenance needs. Such an inventory system would be one part of the Parks Division's stated long term goal of instituting a tree management program. Software for inventorying trees and scheduling maintenance is available from a variety of sources. For example, the Mobile Community Tree Inventory (MCTI) and Street Tree Electronic Management System (STEMS) systems are free software developed by the USDA Forest Service (see http://www.umass.edu/urbantree/mcti/index.htm).

Some management issues identified in the surveyed parks result from the planning and construction methods followed in the development of the parks. Although many, if not all, of these practices have been changed in recent years, Parks Division staff still must deal with the consequences of past practices in many parks for the foreseeable future. Some of the issues identified in one or more of the surveyed parks are listed below.

- Trees are planted too densely in certain areas, in some cases near or under existing conserved trees. This can lead to excessive competition between trees and reduced tree vigor.
- Excessive encroachment (grading, soil compaction, and irrigation) within the rootzones of native oaks being retained within parks has led to reduced vigor and tree decline in some parks.
- Excessive rootzone compaction has resulted in heavy surface rooting and/or water stress associated with restricted root development in some parks. This situation can be minimized by more intensive efforts to create favorable soil conditions around tree planting sites at the time of construction;
- Some species, notably flowering pear cultivars, are planted too commonly than is desirable.
- A few species present in parks, most notably Lombardy poplar, are short-lived or likely to develop water stress and/or pest/disease problems as they mature.
- Low-quality nursery stock used in some parks has performed poorly or requires substantial reshaping of the canopy through corrective pruning.

Weaknesses in the original design and installation of park landscaping can become costly to correct, especially if the removal of mature trees becomes necessary. Designs and specifications related to the tree issues noted above should be carefully reviewed during the park design and construction process to minimize future maintenance issues. Greater input from Parks Division maintenance staff in the review of park design and construction specifications may help identify design issues that have developed into maintenance problems. Even with good designs and specifications, plant materials and installation procedures need to be adequately inspected for compliance. Enforcement procedures need to be used as necessary to ensure that specifications are followed.

Proper maintenance in the establishment period is also critical for ensuring that good tree structure is established and trees are not damaged by mowing equipment. Wounding of tree trunks with mowers and/or trimmers was seen in several parks (Figure 3.3-14) but is entirely avoidable.

Although the number of dead trees and empty planting sites is currently low, loss of additional trees from disease can be anticipated at several parks, most notably Pebble Creek and Woodside Parks. Before these sites are replanted, site analyses should be conducted to investigate factors that caused the tree to die, including soil conditions, irrigation systems, tree species, condition of original planting stock, and disease or insect pest problems. Based on

these findings and a functional evaluation of the site, a determination can be made as to whether the site should be replanted, whether remedial site preparation is needed, and what species would be most beneficial for the site.

This process of determining whether to plant replacements, where to plant them, what species to use, and how to prepare the soil, can be facilitated by developing long-term management plans for individual parks that account for problems that have developed over time. Individual tree replacements should contribute toward attaining the management objectives for each park.

Current park plantings are moderately diverse, although flowering pears make up a large percentage of the park tree population. Most flowering pears in use represent only a few clonally propagated varieties, meaning that all individuals of a given variety are genetically identical. This increases the risk that most of these trees could be adversely affected by a pest or disease problem. Populations of native oaks present at various parks are derived from seed and have higher amounts of genetic diversity within a given species. Both species diversity and genetic diversity within species should be considered in developing targets for the composition of plantings in parks.

As noted elsewhere, coast live oak has been used in some parks, with mixed levels of success. Although this species is native to California, it is not native to the Rocklin area, and may generally be less tolerant of the hotter, drier interior climate of the area than is the locally native interior live oak. Interior live oak and coast live oak are related closely enough that hybrids may develop through cross pollination. Because these hybrids may be less well adapted to the local climate than the native oak populations that have developed over time in the area, they may reduce the potential for successful oak regeneration. This is an issue in parks that are close to native oak stands, as are five of the eight sampled parks. Hence, Phytosphere recommends that coast live oak not be used in park plantings, especially where it will be adjacent to native oak stands.

For the same reason, Phytosphere recommends that nursery-grown oaks of the locally-native species valley, blue, and interior live oak that are planted in parks be derived from local seed sources. For example, the range of valley oak extends to the coast and down to southern California. Local valley oaks are more likely to tolerate conditions that are found in the Rocklin area than are trees that are derived from distant populations in cooler or wetter areas. Native oaks can be established directly from locally-collected seed either by directly planting acorns or by contracting with local native plant nurseries to produce nursery stock from local seed. Public Works has begun to purchase native oaks from a supplier that produces oak container stock from locally-collected acorns. Public Works is also producing native oak container stock in-house using locally collected acorns; this material has been used for plantings completed by community volunteers on City open space lands.