3.2. City-owned oak woodlands

Introduction

The City of Rocklin owns lands with substantial stands of native woodlands in at least 11 locations throughout the City. Many of these woodland areas are adjacent to traditional multi-use City parks and are used recreationally to varying degrees. These woodland areas provide City residents a nearby connection to the natural environment and Rocklin's natural history. In addition, these areas provide wildlife habitat, protect slopes and watercourses from erosion, moderate stormwater runoff, provide shade and evaporative cooling, and contribute to Rocklin's aesthetics and community identity. The woodlands are also important as a source of locally-adapted native tree genetic stock.

Overview

Findings

- Oak woodlands in Rocklin include both riparian oak woodlands along streams and upland woodlands.
- Most oak woodland open space areas are in fair to good condition.
- Threats to long-term survival of riparian oak woodlands include invasion by non-native species.
- Threats to long-term survival of upland woodlands include lack of regeneration.
- Non-local oaks have been used in horticultural plantings adjacent to native oak woodlands, and have the potential to adversely impact locally native oak populations.

Management issues and recommendations

- To encourage natural regeneration and promote root health, adequate levels of organic matter should be maintained on the soil surface beneath oak canopy, especially in more heavily-used areas such as Johnson-Springview Park.
- In some sites, oak regeneration can also be favored by protecting existing native seedlings and saplings from mowing, herbicide application, or other potentially damaging maintenance practices.
- To minimize future impacts and costs of managing invasive species, small localized infestations of invasive species should be eliminated before they spread further.
- To protect the genetic integrity of local oak populations, only locally-collected native oak species should be used in landscape plantings that adjoin native stands.
- Woodland areas should be monitored at least every 3-5 years to assess status and identify management needs.
- Landowners adjacent to City-owned oak woodlands need to be informed about appropriate management of urban/woodland interface areas.
- Urban/woodland interface areas should be monitored and, if necessary, inappropriate encroachment by adjacent landowners should be abated.

Current status

Existing Regulations and Plans

The City of Rocklin currently has some City regulations and plans that specifically address management of oak woodlands on publicly-owned parcels. In addition to oak woodlands, the City has non-forested open space areas that have been designated as wetland preserves and/or protected vernal pools by the US Army Corps of Engineers.

The City of Rocklin has developed plans for fighting fires on open space lands, which include access points and fire access roads. City guidelines on fire protection in and around open space lands specify that 4 to 6 inches of vegetative cover be maintained on slopes and hillsides to minimize fire hazards while providing some erosion protection during the wet season. The City also recommends that residents adjacent to open space maintain their properties in a way that minimizes the possibility that a wildland fire would affect their homes. Recommended fire safety practices include using fire-resistant plants in landscaping, maintaining adequate clearances between structures and open space areas, trimming low or overhanging tree branches that might serve as fuel ladders, and maintaining yards free of debris or materials that would be easily ignited.

Current management practices

Most City-owned open space areas are managed by Public Works. These areas are not actively managed at present, but Public Works responds to any problems that arise. Dead or failed trees are removed as needed to maintain safety.

Open space areas that are adjacent to City parks and used as extensions of the parks are managed by the Parks Division of the Department of Community Services and Facilities. Some of these areas are mowed at certain times of the year. Oak woodlands adjacent to developed parks may also receive summer irrigation runoff.

The Parks Division and Public Works have cooperated on coordinating oak restoration projects with citizen volunteers. As part of the City's volunteer program, approximately 100 native trees have been planted and maintained in an area set aside for that purpose in one of the parks. This program has been very successful, and plans are underway to add another park to this program. Additional native oak and riparian tree plantings using locally-propagated stock were completed in fall of 2004 by Public Works. Public Works has also initiated an "Oak Tree Propagation Project" by collecting acorns from local native oaks, and planting the acorns in tall (TP-4) seedling containers to produce oak seedlings for outplanting in projects involving community voluneteers. Planning is also underway to develop and implement an oak tree restoration program to revitalize the oak trees at Johnson-Springview Community Park.

City-owned oak woodlands in Rocklin receive varying amounts of recreational use, depending on their accessibility and proximity to developed parks and housing. Johnson-Springview Park probably has the most heavily-used woodlands. Within this park, most of the upland blue oak woodland receives regular use by a wide variety of users. Portions of the riparian woodlands are also used heavily. However, the presence of dense understory vegetation, which often includes Himalayan blackberry and poison oak, tends to restrict recreational use of many riparian woodlands to trails and clearings.

In some areas, homeowners whose parcels abut City lands have undertaken management activities on City lands. For example, Phytosphere observed plantings of non-native, landscaping plants installed and maintained by adjacent landowners in some City-owned areas.

Adjacent property owners have also cleared fuel breaks on some City-owned areas by mowing and raking organic debris off the soil surface. Although management of fuel and vegetation in these wildland-urban interface areas may be needed, uncoordinated and sometimes inappropriate management activities by private homeowners have the potential to increase soil erosion and adversely impact public oak woodland resources.

Field assessment of oak woodlands

Based on discussions with City staff, Phytosphere identified 11 areas with natural oak woodlands for sampling. All selected areas were either owned by the City of Rocklin, or in the case of the Greenbrae Road site, were to be transferred to the City as a condition of project approval (Table 3.2-1, Figure 3.2-1). The sites included both open space areas with upland woodlands and creekside corridors with riparian woodlands. At the China Garden Rd. site, Phytosphere surveyed only the south portion of the parcel, beyond the area being considered for development.

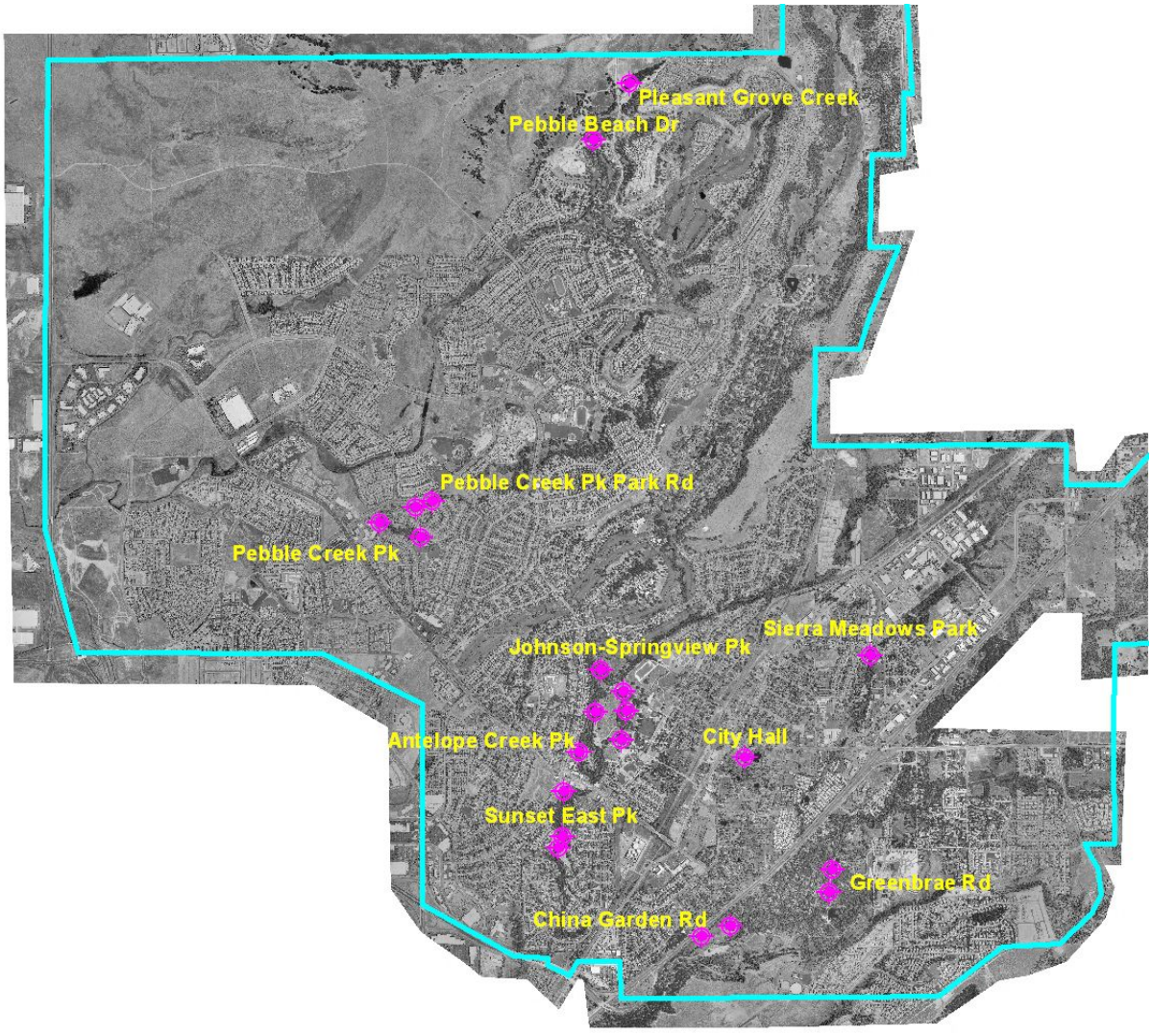

Figure 3.2-1. Locations of oak woodland survey plots (markers) and location names. Date of photograph: August 2003.

To describe current conditions in these stands, Phytosphere established permanent survey plots at each site and collected baseline data on the trees in the plots, including species present, tree size class, and tree condition. Phytosphere also assessed the status of oak regeneration. Methods used are described in detail in Section 7.1.2. The permanent survey plots can be reassessed in the future to determine how these stands are changing over time in response to management actions.

Woodland characteristics

Woodlands in Rocklin can be placed in two broad categories. Riparian woodlands (Figure 3.2-2) are found along perennial and some seasonal creeks. Upland woodlands (Figures 3.2-3, 3.2-4) are found both on slopes and on relatively level areas away from creeks. Within each category, several different woodland types or associations (e.g., blue oak woodland) can be identified based on the most dominant tree species present. Although the species present in riparian and upland woodlands overlap (Table 3.2-1), these woodlands differ in several ways and are considered separately in this report. Most smaller City-owned parcels include only one woodland type, but some of the larger parcels include two or more woodland types. To be effective, management objectives and methods need to be geared toward the type of woodland and the species present.

Species composition of riparian areas vs. upland woodlands

Riparian woodlands are characterized by the presence of species that are adapted to relatively high levels of soil moisture and periodic flooding. Willows, cottonwood, alder, Oregon ash, and buttonbush are normally very closely associated with creeks or ponds. Due to their relative lack of drought tolerance, these species do not typically extend into the drier uplands. Valley oak, interior live oak, California buckeye, and elderberry are also commonly found along riparian areas but also occur in some uplands (Table 3.2-1).

Valley oak is the most common oak and often the dominant tree in Rocklin's riparian woodlands. Valley oak is found away from creeks only if its roots can tap into shallow water tables or deep soils that store high amounts of water. Interior live oak is more drought tolerant than valley oak, and is common in both riparian and upland woodlands. It occurred in all survey locations (Table 3.2-1). Blue oak is only occasionally found close to riparian areas, partly because it is intolerant of wet soils and partly because it is quickly overtopped and shaded out by faster-growing riparian species in moist sites.

Figure 3.2-2. Riparian valley oak woodland in Sierra Meadows Park.

Figure 3.2-3. Upland blue oak woodland along Pebble Creek Drive. Buttonbush (light green plants) growing along a creek are visible in the lower center of the photo.

Table 3.2-1. Tree species present in surveyed locations.

		Native species									Non-native species				
Location	Woodland type	Blue oak *Quercus douglasii*	Valley oak *Q. lobata*	Interior live oak *Q. wislizeni*	Calif. Buckeye *Aesculus californicus*	Foothill pine *Pinus sabiniana*	Willows *Salix* spp.	Cotton-wood *Populus fremontii*	White alder *Alnus rhombifolia*	Elder-berry *Sambucus mexicana*	Other species	Fig *Ficus carica*	Chinese tallow *Sapium sebiferum*	Privet *Ligustrum* sp.	Other species
Antelope Creek Pk	Riparian		✓	✓			✓	✓						✓	
China Garden Rd (south end)	Upland	✓	✓	✓			✓								
	Riparian		✓	✓			✓	✓	✓	✓		✓			Silk tree- *Albizzia julibrissen*
City Hall	Upland	✓	✓	✓		✓	✓	✓							
Greenbrae Rd*	Upland	✓		✓	✓	✓									
	Riparian		✓	✓	✓		✓	✓	✓						
Pebble Beach Dr (near creek and detention basin)	Upland	✓	✓	✓											
	Riparian		✓	✓			✓								
Pebble Creek Pk	Riparian		✓	✓	✓		✓	✓		✓	Oracle oak- *Q.× morehus*	✓	✓	✓	mulberry- *Morus alba*, sweetgum- *Liquidambar styraciflua*
Park Dr. near Pebble Creek Pk	Upland	✓	✓	✓						✓					
Pleasant Grove Creek	Riparian	✓	✓	✓						✓					
Sierra Meadows Park	Riparian		✓	✓			✓	✓							Plum cherry - *Prunus cerasifera*
Johnson-Springview Park	Riparian	✓	✓	✓			✓	✓				✓			
	Upland	✓		✓											
Sunset East	Upland	✓	✓	✓											
	Riparian		✓	✓			✓	✓			Oregon ash- *Fraxinus latifolia*		✓		Silk tree

* future park site not City-owned at the time of survey.

Various non-native tree species, including fig, mulberry, silk tree, privet, Chinese tallow tree, and plum cherry are found in some of the riparian woodlands (Table 3.2-1). The California Invasive Plant Council (Cal-IPC, http://www.cal-ipc.org/) maintains an inventory of exotic plants that are invasive in natural areas. Appendix 7.6 at the end of this report contains a list of trees from the inventory that may be invasive in the Rocklin area. Invasive plant species, such as Chinese tallow tree and fig can proliferate in riparian areas, displacing native vegetation and disrupting native ecosystems. Although only 3% of the trees in the riparian woodland survey plots were non-natives, exotic species such as these have the potential to spread in riparian zones and may displace more desirable native species over time.

Non-native vegetation dominates the understory in many of Rocklin's riparian woodlands. One of the most common understory plants is Himalayan blackberry (*Rubus discolor=R. armeniacus*), a thorny bramble that produces edible blackberries. This is a highly invasive exotic that displaces native understory species and may interfere with regeneration of native tree species.

Rocklin's upland woodlands are dominated by oaks, most commonly blue oak. Blue oak is Rocklin's most drought-tolerant native oak and occurs in nearly pure stands in the driest sites. Mixtures of blue oak, interior live oak, and valley oak are found in most other upland woodlands (Table 3.2-1, Figure 3.2-4). Foothill pine and California buckeye were present in only a few of the upland woodlands included in the survey. Even willows are sometimes found in upland woodlands if relatively shallow groundwater is present. Upland woodlands are not commonly invaded by non-native trees, mainly because few exotic trees can withstand the levels of drought stress present in these areas. However, non-native annual plant species, including yellow star thistle and a variety of exotic grasses, are common in the understory of upland woodlands. This dense annual vegetation can interfere with oak regeneration by competing with oak seedlings for scarce soil water and by favoring high populations of rodents such as voles, which damage or kill oak seedlings.

Density and canopy cover

Tree density (trees per acre) and canopy cover (the percent of the land area covered by tree canopy) are important descriptors of woodlands that help describe both condition and changes in the woodland that occur over time. Habitat values and various benefits provided by woodlands generally increase with increasing canopy cover. Tree canopy cover also tends to increase with increasing tree density up to a point. However, complete canopy cover can be attained with varying levels of tree density. Overly high tree densities, typically the result of past management actions, may lead to excessive levels of competition between trees and can adversely affect tree health.

Rocklin's riparian woodlands are generally much denser than its upland woodlands, a pattern that is typical throughout most of the Sierra Nevada foothills. Survey plots in riparian woodlands had an average density of 171 native trees per acre, including all trees at least 4 inches in diameter. In comparison, survey plots in upland woodlands averaged 34 native trees at least 4 inches in diameter per acre. Higher tree densities can typically be sustained in riparian areas because more water is available for tree growth in these areas. However, some of the densest riparian stands may be subject to natural thinning because of excessive tree density.

Figure 3.2-4. Mixed oak woodland dominated by interior live oak at Greenbrae Rd. The California buckeye at center bottom is undergoing normal summer drought-induced leaf drying. Tall dying tree at left and dead tree at right are foothill pines.

The high tree density in riparian plots is due to the presence of numerous small-diameter trees. As shown in Figure 3.2-5, riparian plots had very high densities of trees between 4 and 12 inches in diameter, and even higher densities of saplings/young trees in the 1 to 4 inch diameter size class. This high density of small diameter trees is generally the result of abundant seedling and sapling growth following earlier episodes of clearing in these areas. The growth of many of these trees has subsequently been slowed by competition due to overcrowding. In the densest stands, a high proportion of the smaller trees in the understory are in decline due to excessive competition and can be expected to die out over time.

Tree densities in most upland woodlands were generally close to sustainable levels with a few exceptions. Several plots at the Greenbrae Road site had high densities of interior live oak, and as discussed below, these high tree densities may contribute to the poor condition of many of the interior live oaks at this site.

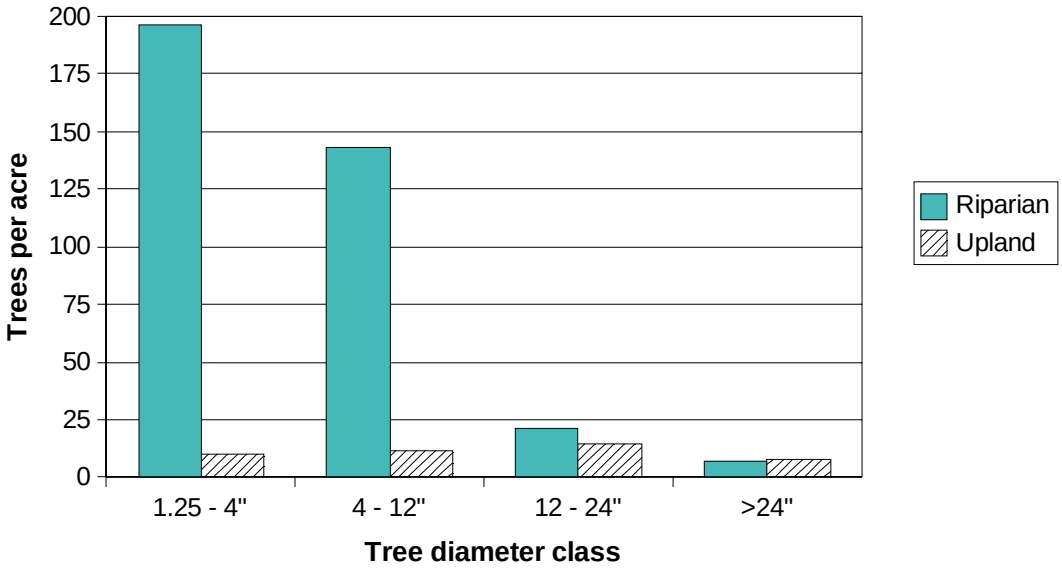

Figure 3.2-5. Average tree density in riparian and upland woodland survey plots by diameter class.

Most of the riparian woodlands consist of relatively narrow bands of trees along creeks, mostly about 110 to 160 feet wide. The riparian woodlands along Antelope Creek in Johnson-Springview Park are the broadest, ranging from about 200 to 300 feet wide. Between 80 and 100% of the land area within these riparian corridors is covered by tree canopy. The main exception to this pattern is the north end of Sunset East Park, southwest of Sunset Boulevard. Due to previous clearing, much of this section has less than 50% tree canopy cover, well below its potential. Most riparian woodlands in Rocklin would be expected to have complete (100%) or nearly complete canopy cover at maturity.

Upland woodlands in the surveyed areas are more variable and patchy than the riparian woodlands. They include patches with complete or nearly complete canopy cover and clearings of varying size with no tree cover. For the surveyed sites, tree canopy cover ranges from about 25% (China Garden Road site) to 70% (blue oak woodland portion of Johnson-Springview Park). Most of the surveyed upland woodland areas are probably capable of supporting 70% to 90% native tree canopy cover.

Tree condition

The health and condition of trees within stands are important indicators of the health and sustainability of the stand as a whole. Many of Rocklin's native trees are long-lived species that tend to decline slowly in response to stressful conditions and diseases. Evaluating tree condition provides clues to unfavorable stand conditions, such as competition due to overcrowding, as noted above. Tree condition ratings can also help identify trends that will change the stand in the future. For example, if older canopy trees are in decline, tree death and canopy cover loss are likely over the short term, increasing the importance of natural regeneration to refill gaps created in the canopy.

As discussed in section 3.1, Rocklin's current oak woodlands have been greatly altered by past human activities. Virtually all of these oak woodlands were at least partially logged at various times over the past 150 years. Most of the existing trees in these stands are

second- or third-growth trees, that is, trees that arose after the first or second round of tree cutting, respectively.

Because the locally native oak species all have potential lifespans in excess of 300 years, most of the second and third-growth oaks in these areas are still in their prime. This accounts for the generally good condition of most mature trees in relatively undisturbed stands: 87% of the native riparian trees and 90% of the native upland trees in the survey plots were in at least fair condition.

Despite the generally good condition of most woodland trees, tree health problems were evident in several situations. Small-diameter trees in the understory of dense valley oak riparian woodlands often showed high amounts of canopy dieback (dead twigs and branches). Overall, about 10% of the valley oaks in riparian woodland survey plots were in decline and 3.5% were dead. All of these declining and dead valley oaks had stems less than 12 inches in diameter and most were in the understory. This tree decline and death represents natural thinning of an excessively dense stand, and therefore does not imply that regeneration is needed to replace the lost trees.

Declining or dead interior live oaks were present at most of the upland survey locations. Overall, 4% of the interior live oaks were dead and 7% were in decline. This level of interior live oak death and decline is largely related to the historical development of these stands. In some sites, many of the interior live oaks present have developed from stump sprouts and have high levels of wood decay and are structurally weak due to the presence of multiple trunks. As decay becomes more advanced, large limbs and trunks fail (i.e., break), leading to tree decline and death. In other areas, for example, portions of the Greenbrae Road site (Figure 3.2-4), competition for limited soil moisture may be contributing to the early decline of interior live oaks. Excess competition can develop when the current density of interior live oaks is artificially elevated over historical natural levels due to past clearing practices. Interior live oak readily produces vigorous sprouts from stumps. Live oak is also both faster growing and more resistant to browsing by animals than blue oak. Consequently, some sites that were originally dominated by the more drought-tolerant blue oak now have excessively dense stands of interior live oak, leading to elevated levels of drought stress in these stands.

Despite the fact that blue oak woodland was probably the dominant forest type over most of the Rocklin area prior to settlement, the amount of relatively undisturbed blue oak woodland on City of Rocklin park lands is very limited. Most of the blue oaks in the surveyed areas were still in at least fair condition. Seven percent of the blue oaks in survey plots were rated as in decline, but none were dead.

At Johnson-Springview Park, many of the upland blue oaks show early signs of stress associated with adverse impacts to their roots. Much of the understory in this area has been reduced to bare soil due to close mowing and heavy pedestrian use. Because most tree roots are relatively shallow, compaction of the soil surface can directly damage or kill fine roots. Soil compaction also reduces water infiltration and diffusion of oxygen into the soil. These changes also negatively affect root growth and health. Because the soil in this area lacks an organic mulch layer, tree roots are also subjected to greater extremes of soil temperature and moisture stress. Natural oak woodlands typically have a well-developed mulch layer that not only moderates soil conditions but provides a source of nutrients needed for roots and their associated soil microorganisms and provides a favorable seedbed for oak seedling establishment.

Regeneration

Regeneration refers to the process by which new trees are established in forests and woodlands to maintain the stand as existing trees die or are removed. Seedlings and saplings in the understory are also commonly referred to collectively as regeneration. Regeneration patterns vary between species. In addition, a given species may exhibit different regeneration patterns on different sites. For example, regeneration may be much more widespread in moist sites compared to dry sites.

In species such as willows and cottonwoods, seedlings establish best on bare mineral soil in open sites after some sort of disturbance, such as a flood. In contrast, in locally native oak species, seedlings typically become established in the natural mulch layer beneath existing tree canopy.

Although the shaded environment under the tree canopy helps oak seedlings establish, the seedlings are subsequently suppressed by the overhead trees. Consequently, understory oak seedlings persist in reserve for many years and normally do not grow into trees until a canopy opening develops through the death of an overstory tree. At that point, the established seedlings grow rapidly to fill the gap. Many of the existing second- and third-growth stands that developed after cutting followed this pattern of regeneration.

Oaks can also become established from seed in pre-existing openings in favorable sites that have adequate amounts of mulch cover and soil moisture. This is why oak seedlings often become established in openings close to existing oak canopy and in irrigated landscape beds.

To maintain a woodland over the long term, regeneration is needed to replace mature oaks that decline and die. Only a relatively small percentage of the seedlings present in the understory will survive to become trees when a gap in the canopy is created by tree death. Hence, low numbers of seedlings (less than about 10-15 healthy seedlings and saplings per overstory tree) may indicate that regeneration is inadequate to maintain the stand if mature trees die.

To assess the regeneration potential of the surveyed oak woodland sites in Rocklin, Phytosphere counted seedlings and saplings within survey plots. Oak seedlings were present in every surveyed plot. Interior live oak and valley oak seedlings and saplings were the most common and abundant overall (Figure 3.2-6). Blue oak seedling and sapling counts were especially low (Figure 3.2-6) and generally inadequate to ensure that existing canopy trees could be replaced. Only one of eight plots had as many as 10 blue oak seedlings per overstory tree. In heavily used sites such as the blue oak woodland area of Johnson-Springview Park, seedling survival is reduced due to impacts from mowing and pedestrians. High populations of ground squirrels in parts of this park may also have negative effects on seedling survival.

Seedling and sapling densities were generally more favorable for natural regeneration in riparian than in upland woodlands. However, even within riparian woodlands, seedling densities vary from spot to spot. Drier sites along seasonal creeks, sites with very heavy Himalayan blackberry cover, and highly trampled areas tend to have few oak seedlings.

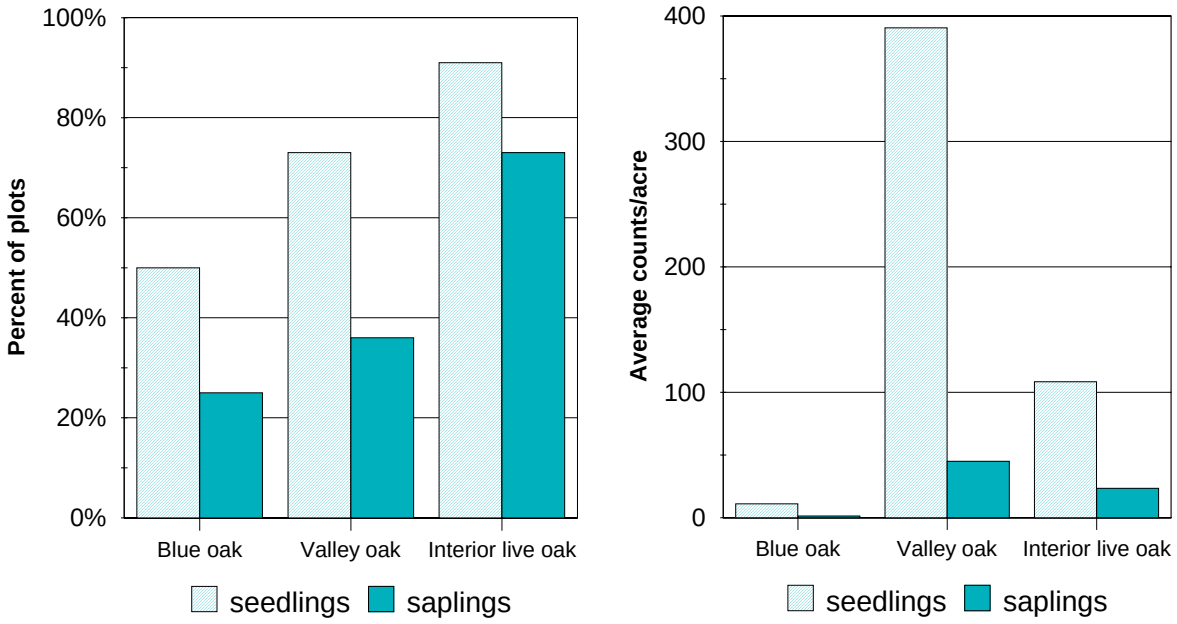

Figure 3.2-6. Regeneration within survey plots. LEFT: Percent of plots with seedlings or saplings present under tree canopy of the same species. RIGHT: Average counts of seedlings and saplings per acre in plots with tree canopy of the same species.

Management issues and recommendations

Change, either for better or worse, typically occurs slowly in oak woodlands. Although the condition of most of the surveyed oak woodland areas is still acceptable, Phytosphere identified several issues that could degrade the condition of these resources over time. Even if corrective actions are undertaken immediately, it may require many years before the impacts of these activities are obvious. Both tree growth and tree decline can proceed slowly, especially for blue oak.

Appropriate management activities vary by site and the type of woodlands present, although some recommendations apply to most locations. Most recommended changes to management will need to be ongoing in order to achieve their desired effect. Recommendations for maintaining oak woodland are summarized in Table 3.2-2 below. The list of locations for each recommendation is based on our field observations at 11 locations and so is not necessarily complete for all woodlands owned by the City. The list also includes parks Phytosphere visited for the park assessments (section 3.3) that have small areas of relatively undeveloped woodlands.

Some of the recommended practices can be implemented with little or no additional cost to the City. For instance, changing mowing height and the timing of mowing to help conserve seedlings does not increase the cost of mowing operations. Similarly, where well-placed natural oak seedlings exist, the only cost associated with tree establishment may be placing a stake next to the seedling to mark its position and prevent its destruction. Locally native oaks can be restored in many areas by directly outplanting locally-collected acorns in the fall. Community volunteers organized by staff from Public Works and the Parks Division have already accomplished projects of this type in some areas and could be involved in efforts to locate and mark existing natural seedlings as well.

Planting projects are especially important in old clearings that contain no or very few trees. Because natural oak seedlings establish most readily under or near existing oak canopy, natural recolonization of large openings by oaks may take centuries if it occurs at all. Direct planting into large openings is often the only practical way to ensure that oak woodlands become reestablished in these areas.

Native oaks directly seeded as acorns can often be established without irrigation and with little or no maintenance. Methods for direct planting of oaks are available online at http://phytosphere.com/oakplanting/oakplanting.htm and are also discussed in detail in UC ANR Publication 21601 (McCreary 2001). The City has begun an "Oak Tree Propagation Project" by collecting acorns from local native oaks and planting the acorns in tall (TP-4) seedling containers. These seedlings are used for plantings on City lands. Various local native plant nurseries can also propagate container stock of locally-collected oaks or other native plants for situations where such stock might be needed. The California Native Plant Society's website includes a listing of nurseries that can grow native materials on a contract basis (http://www.cnps.org/links/native_plant_nurseries.htm).

The success of an individual planting project depends on a number of factors that interact over time. Information on past planting projects can serve as the basis for refining and optimizing restoration techniques for local conditions. Useful information includes records on the methods and materials used in planting projects, including follow-up maintenance; seedling survival and growth over time; and factors that have damaged or killed seedlings. Records should be sufficient to determine what has worked, what hasn't, and why. Volunteers could be used to help collect data. City staff would be responsible for periodically compiling and analyzing the data.

Where efforts are being made to protect and enhance woodlands, interpretive signage that explains the project goals may be useful for educating the public and gaining public support for the project. By involving the public in various restoration activities, the City can help reduce overall costs of management activities. Projects involving monitoring, invasive plant removal, tree planting, tree protection, and other activities can be conducted by trained and supervised community volunteers to keep program costs low. These volunteer activities also help to educate the community about the importance of managing public woodlands and provide a greater sense of community ownership and pride in these natural areas.

References

McCreary, D. D. 2001. Regenerating rangeland oaks in California. University of California Agriculture and Natural Resources Publication 21601.

Table 3.2-2. Proposed management objectives and corresponding activities to enhance City-owned oak woodlands.

Objectives	Priority	Management activities	Woodland types	Locations
Maintain layer of organic mulch on soil surface to encourage oak seedling establishment and promote root health of existing trees	High	- Change mowing practices (mower height, timing) to conserve organic matter on soil surface (e.g., leave at least 4-6 inches of residue where possible, especially within and near tree driplines; attempt to time final mowing before annual plants are completely dry to avoid excessive loss of residue) - In critical areas (e.g., heavily used sites, rootzones of trees showing evidence of decline) apply 3-4 inches of clean wood chips as mulch within rootzone.	Upland (primarily)	Johnson-Springview Monument Park Woodside Park
Promote natural regeneration and restocking of native tree cover, especially in low-canopy areas and areas where existing trees are in decline.	High	- Selectively protect appropriately located existing native seedlings / saplings from destruction caused by mowing, herbicide application, etc.	Riparian Upland	All
Reduce cover of non-native species to promote health and regeneration of native trees and shrubs.	High	- Eliminate small localized infestations (a few individuals to about 0.25-0.5 acre) of invasive species before they spread further. - Minimize the amount of disturbance during eradication efforts.	Riparian Upland	All
	Medium	- Suppress and/or remove large infestations (0.5 acre or more) of invasive exotic trees (e.g., privet) and shrubs (e.g., Himalayan blackberry).	Riparian (primarily)	Johnson-Springview Antelope Creek Park China Garden Road Greenbrae Road Pebble Creek Park Sierra Meadows Park Sunset East
Avoid contamination and possible degradation of local tree gene pools.	High	Use only locally-collected native oak species in restoration/planting projects and in park landscape plantings that adjoin native stands.	Riparian Upland	All
Reduce chance of injury or property damage from tree failures.	High	Identify trees with high hazard potential and mitigate by minimizing target exposure (e.g., by closing off likely failure zone) or failure potential (e.g., corrective pruning, tree removal)	Upland (primarily)	Johnson-Springview Park Woodside Park
Assess woodland resources to allow for adaptive management.	Medium	Monitor woodland areas at least every 3-5 years to assess status and identify management needs.	Riparian Upland	All
Restore native tree canopy cover in previously cleared areas and areas previously occupied by exotics.	Medium	Plant native oaks and other native trees and understory species using locally-collected seed or cuttings.	Riparian Upland	China Garden Rd Sunset East (north end)

Table 3.2-2. continued

Objectives	Priority	Management activities	Woodland types	Locations
Prevent conflicts and negative impacts on woodland resources at the interface between residential and open space areas	Medium	- Educate adjacent landowners about appropriate management of interface areas. - Monitor interface areas and enforce abatement of inappropriate encroachment.	Upland (primarily)	Park Dr.