The State of Urban and Community Forestry in California

Status in 2003
and
Trends since 1988

by

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Acknowledgements

I am grateful to the many respondents who made this study possible. Their names and address are found in Appendix 3. The data collected for this study is available upon request to the Urban Forest Ecosystems Institute, Natural Resources Management Department, Cal Poly State University, San Luis Obispo, 93407. (805) 756-2898.

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Executive Summary

- The number of municipal trees has increased from about 7 million in 1988 to an estimated 8 million in 2003.
- The ratio of plantings to removals has actually decreased from almost 7 to 1 in 1988 to about 4.5 to 1 in 2003. Overall, cities have averaged roughly a 4% net increase per year in their tree inventories since 1988.
- About 22% of the cities and counties reporting removing more trees than they planted in 2003, up from 18% in 1988 having declined to 15% in 1992 and 1998.
- The lack of growing space for street trees is increasingly the leading factor in constraining species choice. This led to the growing dominance of small-stature, short-lived species for street tree use led by Crape Myrtle followed by Chinese Pistache and pear species (mainly Bradford pear).
- The lack of desired species availability and poor quality stock are cited as the leading problems with nursery stock.
- Responsibility for maintaining trees once planted has increasingly shifted away from homeowners to municipalities.
- Urban forestry is still heavily dependent upon taxpayer support through city or county general funds. The average city tree budget per resident has declined in constant dollars from around $3 in 1988 to $2 in 2003; the median has declined from over $4 to about $3. However, small cities have actually increased spending somewhat while cities with populations over 100,000 have sharply reduced spending since 1992.
- Today, U&CF programs are predominantly housed in Public Works, whereas in 1988 they were found mainly in Parks and Recreation Departments.
- Standards for pruning trees continue to be emphasized, as opposed to the old, unacceptable practice of "topping." Over 90% of the U&CF employees are certified according to some professional standard, usually the International Society of Arboriculture.
- More programs are investing in inventories of their urban forests, helping to reduce costs through improved planning.
- Large city programs are adding full-time staff while a greater number of smaller programs have reduced staff.
- Pruning of mature trees decreased sharply since the 1998 survey and is even lower than in 1992. Topping remains a problem with still over 15% of the reporting programs indicating that it is done.
- The primary means to prevent tree hazards from occurring are to identify and abate the hazard (76% of programs), and replace lifted sidewalks (68%). Over 40% of the programs contested damage claims.
- Although those dumping greenwaste is in rapid decline, the average rate of disposal increased in 1998 and remained steady in 2003 at around 10% of the total material generated. Solidwood products utilization has increased significantly since 1992 to now over 20% of the reporting programs at a 10% average rate of use.
- Community support for municipal tree programs has improved slightly since 1988 but still over 40% do not have Tree Boards and just over one-quarter have a tree advocacy organization.
- Getting urban forestry's message out is critical to gain support; the 2003 data indicate a growing use of various media/communications outlets. There was a major increase in the use of Arbor Day celebrations.
- In 1992, 65% of the respondents had a tree ordinance with about the same number feeling they needed one. As of 2003, programs with an ordinance and those needing one increased to 80%. The ordinance provision that seems most effective is requiring tree planting as a condition for new development.
- The most frequently and consistently cited benefits of their green infrastructure are in the areas of community pride and the economic contribution to business and property values.
- As expected, the #1 need of tree programs is more funding and citizen support (#3). Planting space was ranked #2. The need for better tree care has dropped to #4 rank probably due in large part to the push for certified tree care workers, both in the public and private sector.

Introduction

The presence of trees and lesser vegetation is recognized as an essential part of our living environment as society becomes increasingly urbanized. However, growing trees in cities is difficult and expensive. Once the benefits of trees are understood, expenditures on their establishment and care may be viewed more as investments in the city's green infrastructure rather than expenses on an amenity. Here in California a growing number of communities are investing in their green infrastructure as they realize its role in achieving environmental quality standards and that it can complement the gray infrastructure, not conflict with it.

The California Department of Forestry and Fire Protection (CDF) has been a significant force behind this social movement to enhance urban ecosystems. With the California Urban Forestry Act of 1978, CDF created the Urban Forestry Program to provide monetary and technical support for municipalities to establish and maintain a sustainable urban forest. In order to assess the program's effectiveness, CDF surveys municipalities periodically (about every 5 years) seeking information on a wide range of management issues.

CDF contracted with Phytosphere, Inc. to conduct the 1988 and 1992 surveys (Bernhardt and Swiecki, 1988 and 1992). The Urban Forest Ecosystems Institute (UFEI)[1] at Cal Poly, San Luis Obispo, conducted the 1998 survey (Thompson et al. 2000). For the 2003 survey, CDF disseminated the survey instrument and compiled the data, then contracted with UFEI for analysis and reporting. A census of city and county municipalities was attempted in all 4 surveys. Since 1992, the survey instrument has been essentially identical in order to provide the greatest amount of longitudinal information (see Appendix A). The 1988 survey instrument was less detailed, limiting the trend information on most issues to the last three surveys.

Urban and community forestry (U&CF) efforts are a reflection of how communities value the quality of life from improvements in energy conservation, air quality, stormwater control, wildlife habitat, civic pride, property value enhancement, and many others. Today, there are thousands of communities that are recognized as a Tree City USA. Over 30% of California's incorporated cities have met and maintain the standards for Tree City USA.

Despite these gains, funding to support a community's tree program has generally lagged behind other city services; a conclusion born-out in all CDF-funded surveys. As a result, many communities must rely to varying degrees on volunteers and non-profit organizations for tree planting, maintenance, and to lobby for increased support for their community's urban forestry programs.

This report on the status and trends in U&CF is organized into three main sections: 1) Trees of the Urban Forest showing trees in species composition and factors affecting species selection, 2) Managing the Urban Forest addressing funding, staffing, and management practices, and 3) Community Involvement addressing community support, education, ordinances, and advocacy. Although each survey question was analyzed, this report presents results for only those deemed to provide meaningful trend information. The raw data is available upon request.

Finally, it is important for the reader to remember that ***nearly all survey questions relate only to the public lands and programs of cities and counties, a small minority of the incorporated area's green infrastructure (some estimate at around 20% on average).***

Quotation (sidebar boxes) appear throughout the report. They are intended to provide insightful comments from respondents on key programmatic issues. These remarks were offered voluntarily.

[1] UFEI website: www.ufei.org

Survey Response

The 2003 survey of urban and community forestry in California was conducted by CDF staff in 2004. The survey retained the same questions as in the 1998 and 1992 surveys plus a few others. Using the same questions as in the 1992 survey was critical to provide the maximum amount of trend information. This trend information conveys an entirely different dimension of information that can only be detected through changes over time.

The same population of 468 incorporated cities and 58 counties were surveyed as in 2004, attempting to create a census of this population. Mailed surveys with several follow-up attempts produced responses from 137 cities and 15 counties. Figure 1 displays the response numbers by city size category and whether the responding city has a tree program. In contrast, the 1998 survey provided 256 responses from cities and 14 from counties, a 29% and 26% response rate, respectively. This compares to 51% city and 29% county response in 1998 and 74% and 81%, respectively, in 1992.

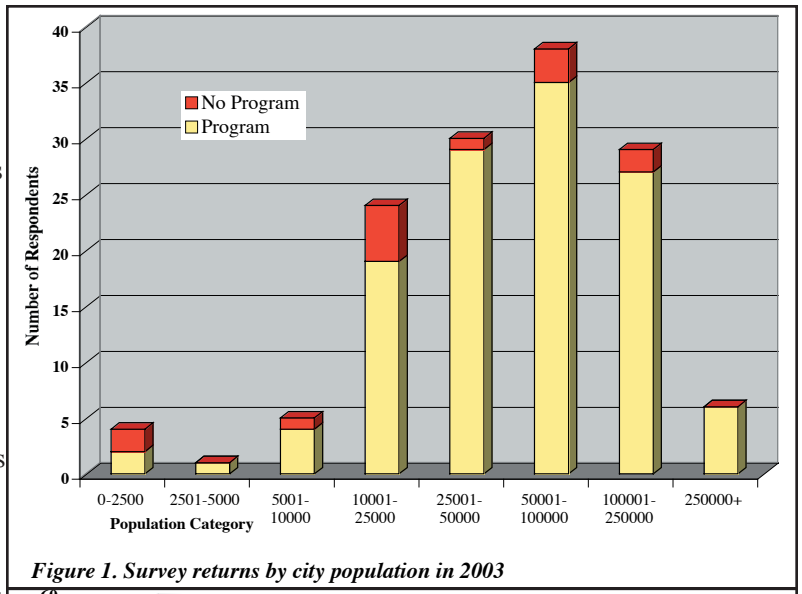


Figure 1. Survey returns by city population in 2003

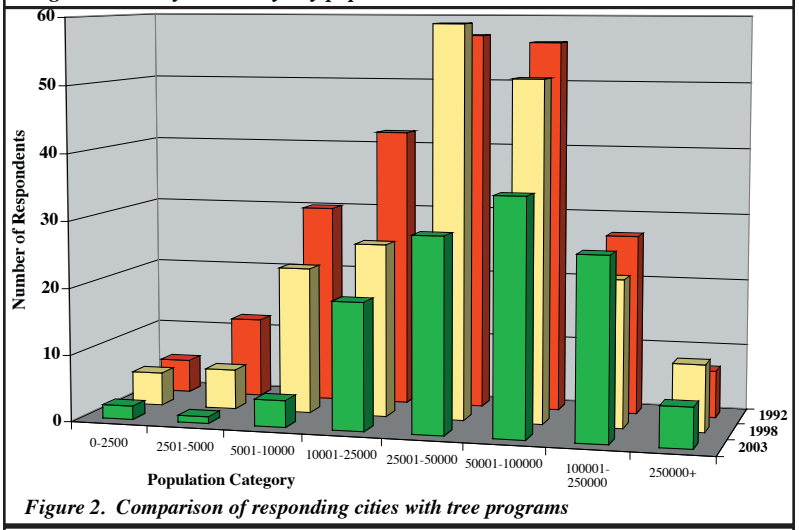


Figure 2. Comparison of responding cities with tree programs

Figure 1 shows a fairly normal distribution across city size. With only 45 cities with a population over 100,000, it appears this category is well represented (League of California Cities 2006). The response from the 82 cities with populations between 50,000 and 100,000 was not quite half. Cities with populations over 25,000 are clearly more likely to possess tree (U&CF) programs (defined by the criteria designed to receive public funds for tree planting and care). Although the 2003 response was lower, it follows a similar distribution pattern with those in 1998 and 1992 (see Figure 2). It is important to trend analysis that similar response distributions resulted by city size.

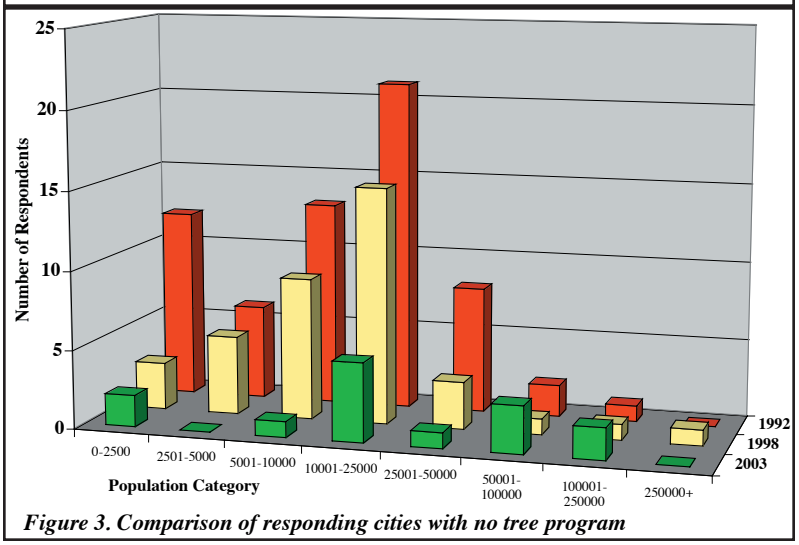


Figure 3. Comparison of responding cities with no tree program

Response from cities lacking a tree program are clearly declining over time (see Figure 3). Cities without a tree program would naturally find this survey to be irrelevant and not bother responding. Poor response also results from not correctly identifying the correct contact and failing to forward the survey, as requested in the instructions. However, the decline in response could also be a result of less aggressive follow-up attempts. Nevertheless, the 2003 results should be highly representative of urban and community forestry efforts in cities and counties with such programs.

Survey Response (continued)

Using the same geographic regions as created in the 1992 survey and retained in the 1998 survey, it appears that the 2003, 1998, and 1992 surveys obtained a similar geographic distribution of respondents, as illustrated in Figure 4. If there is any noticeable shift in response in seems to be favoring the South Coast region and away from the northeast.

As mentioned earlier, the data in this survey was collected by CDF staff during 2004 and the early part of 2005. As a result, the data relate to an earlier point in time that varied by the respondent. The majority of responses related to Fiscal Year (FY) 2002-03 which generally starts on July 1, 2002. Some responses covered FY 2003-04. Therefore, the 12 month period that best describes the data, and which will be used in this report, would be ***calendar year 2003***.

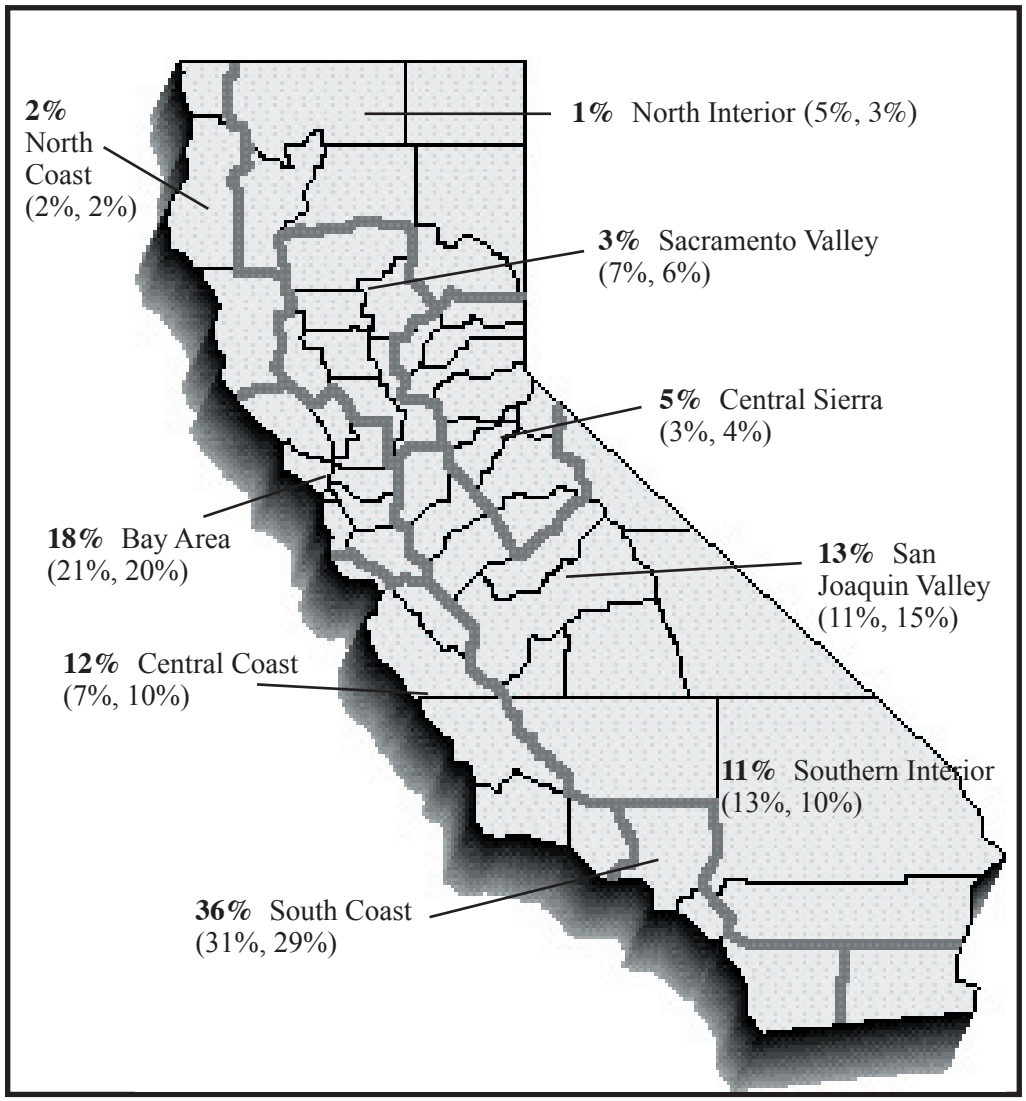


Figure 4. 2003 Survey Response by California Region (1998 and 1992 responses in parentheses, respectively)

Trees of the Urban Forest

Tree Inventories

Bernhardt and Swiecki estimated that there were about 5.9 million street trees in 1988**,** a ratio of about 4 residents per street tree. City and country park trees added about 1.2 million trees (about 5 stree street per park and open space trees), for a total inventory of about ***7 million municipal trees in 1988.*** The 2003 survey showed that ratio of residents per street tree and decreased to about 3.5 to 1, and the ratio of street trees to park and openspace had increased to about 9 to 1. Extrapolating these ratios to a comparable inventory estimate to that in 1988 is problematic since the declining response rates came primarily from cities lacking an urban forestry program. So the 2003 ratios are probably higher than the for the average city. For cities that reported in all 4 surveys (probably the most committed to urban forestry), the net increase in tree inventories since 1988 occurred early on (Figure 5). Therefore, it seems reasonable to conclude that the municipal tree inventory has increased, mainly in street trees, by no more than around 10% to 15%, giving an estimated inventory of about ***8 million municipal trees in 2003***.

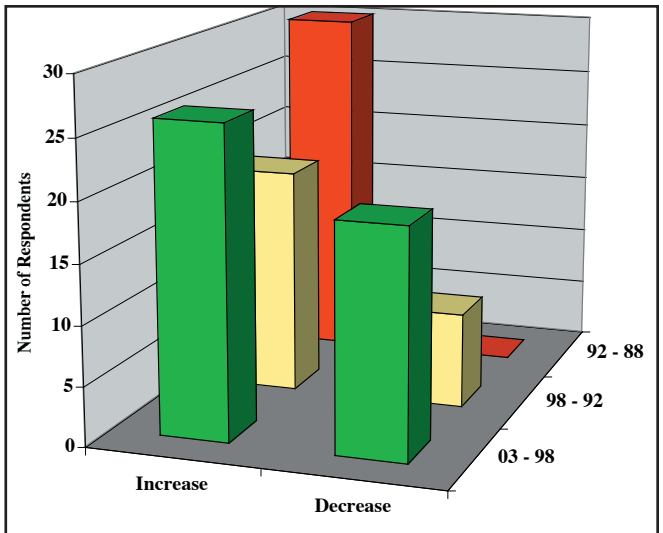


Figure 5. Changes in inventory for municipalities that responded to all 4 surveys

Figure 5 indicates that the large increase in new plantings between 1988 and 1992 occurred primarily in smaller cities. The firgure also shows that planting rates are inversely proportional to city size. This should not be too surprising given that it does not take a large number of plantings to represent a large proportionate effect on small standing inventories as compared to larger cities inventories. Nevertheless, the greater rate for smaller cities is promising since their small populations create diseconomies in city service funding. Federal and state programs have been directed toward helping smaller communities overcome these limitations -- *America the Beautiful* program in 1990 (goal was to plant a billion city trees by 2000), California *Proposition 70* in 1988, *Proposition 12* in 2000, and more recently *Proposition 40* in 2002.

Figure 6 futher shows that large cities made the greatest gain in new planting rates in 2003 than smaller cities. In fact, medium-sized cities show a slight decline in planting rates from 1998 while small cities recovered from a noticeable drop in 1998.

Note: Small cities, < 25,000; Medium 25,000 - 50,000; Large >50,000

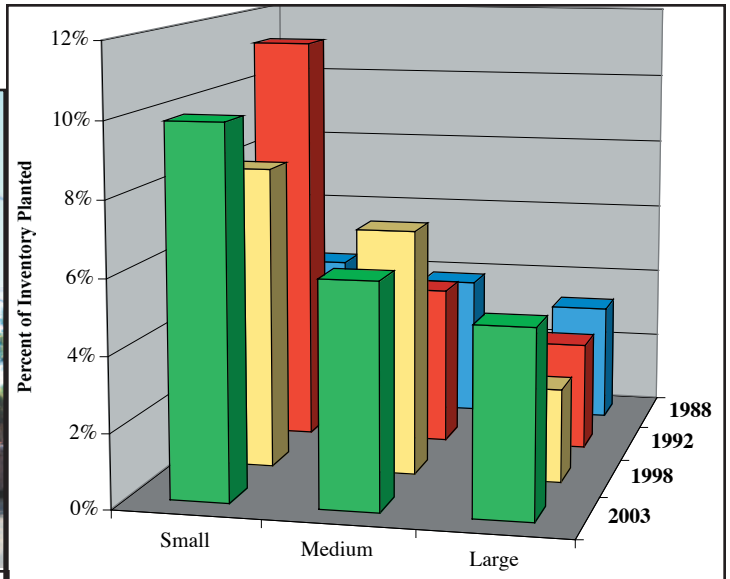


Figure 6. Percent of inventory planted by city population category

Inventory Changes - *Plantings vs. Removals*

The information displayed in Figure 7 shows that although the rate of new plantings has increased dramatically, the ***ratio of plantings to removals has actually decreased from almost 7 to 1 in 1988 to about 4.5 to 1 in 2003***. Overall, cities have averaged roughly a ***4% net increase per year*** in their tree inventories since 1988. One should not forget that most of these gains occurred in smaller cities. Interestingly, 22% of the cities and counties reporting removing more trees than they planted in 2003, up from 18% in 1988 having declined to 15% in 1992 and 1998.

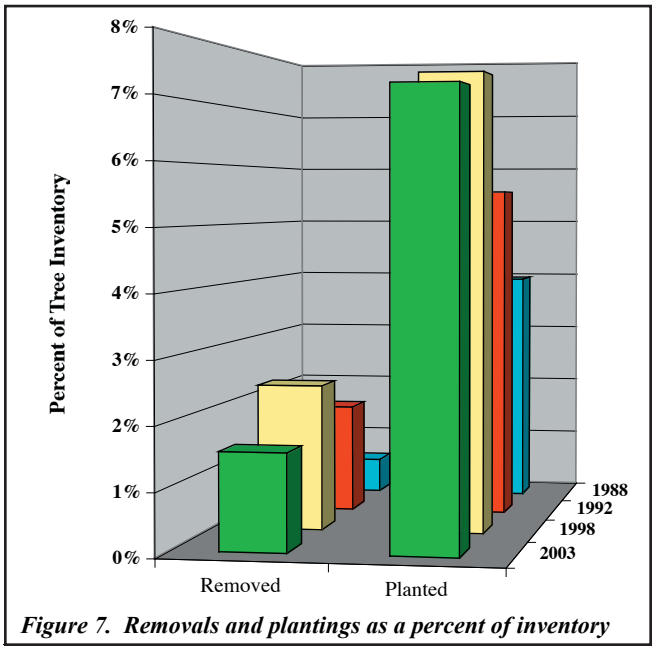


Figure 7. Removals and plantings as a percent of inventory

Comparing those cities and counties that responded to all 4 surveys shows that the rate of planting increased rapidly in the late 1980s and early 1990s (see Figure 8). However, those gains have continually eroded since 1992 to the point to now more cities indicate they have planted fewer trees since 1998 that those that have increased. Again, it is important to recall that these cities are probably more committed to their urban forestry program.

The increase in fire and flood damage in many cities may account for increases in removals (see "Flood, Drought & Fire Effects"). However, it may be that the aging of the urban forest is the underlying cause. The beautiful, large shade trees planted in the early days of city building are now reaching "old age" and are more vulnerable to damage. These structurally weakened, older trees represent hazards to the utility infrastructure forcing public works departments to remove them.

The next question is, *what species are being planting to replace the removal of older and probably large shade trees?*

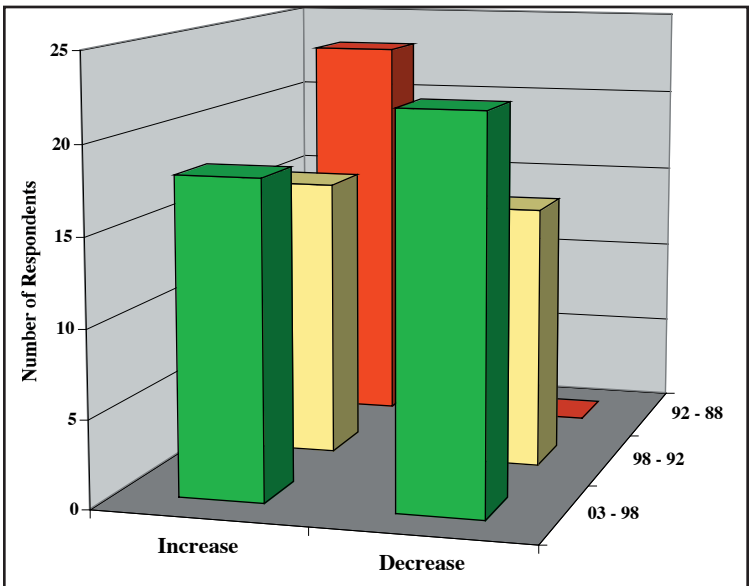


Figure 8. Changes in new plantings for municipalities that responded to all 4 surveys

Species Selection

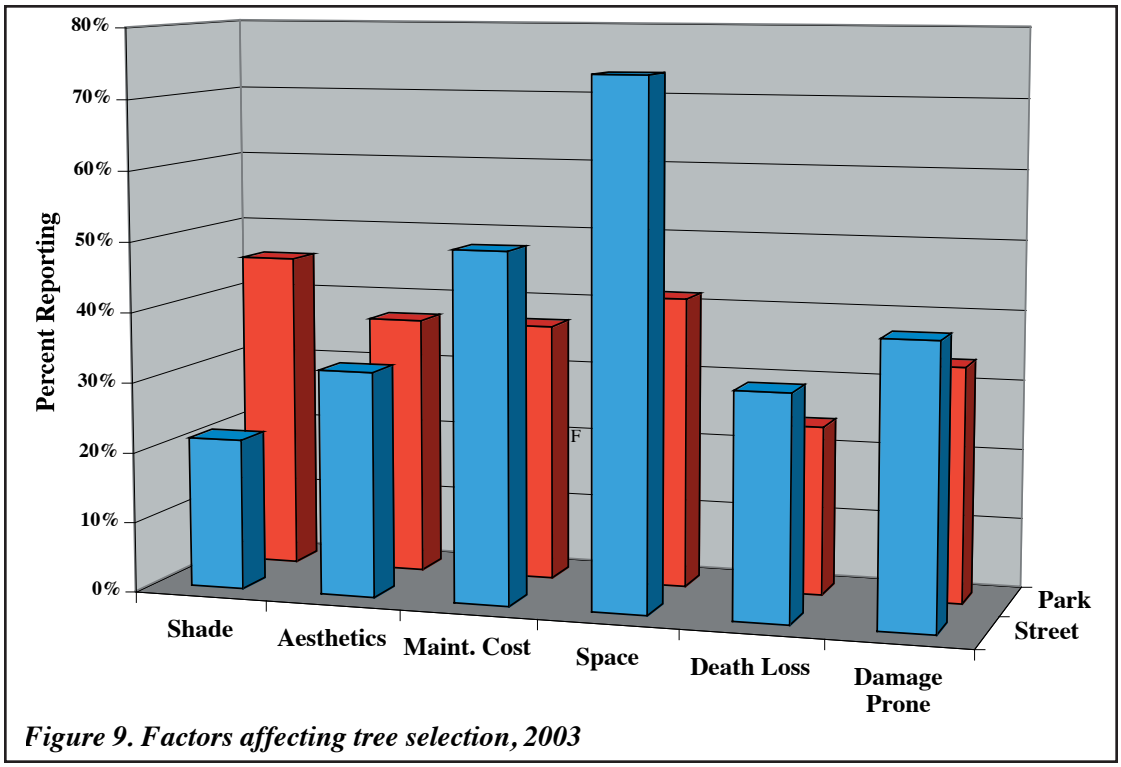


Figure 9. Factors affecting tree selection, 2003

As Figure 9 illustrates, street tree selection criteria are most influenced by space limitations with projected maintenance costs the next more important consideration. Unfortunately, the factor that has the least influence on species selection is the tree's shade potential once mature. ***Now over 70%, in 1992 60% of those reporting cited growing space as the greatest limiting factor***. As one might expect, the relative importance of these influences seems more evenly distributed for park tree species selection. It appears that concern over planting space for street trees gave way to shade preference for park trees. The relative importance of these park tree selection factors have remaining fairly over time.

Species Selection, continued

Given the importance of limited growing space in species selection, it should not be surprising that the ***most frequently used species in recent street tree plantings is Crape Myrtle (*Lagerstromia*) followed by other small-stature species -- Chinese Pistachio (*Pistacia chinensis*) and pear species (mainly Bradford pear)***, see Figure 10. It is interesting to note that the most frequently planted street tree is not a tree but a shrub.

The fact that between 40 and 50% of municipalities report reliance upon small-stature species in the species menus does not portend well for the future structure of our urban forests. An additional characteristic favoring the top 3 species is their fall colors and flowers. The next most comnonly planted species are larger shade trees -- oaks, sycamores (primarily London Plane cultivar), maples and ash. All top 10 species were broad-leafed and mostly deciduous.

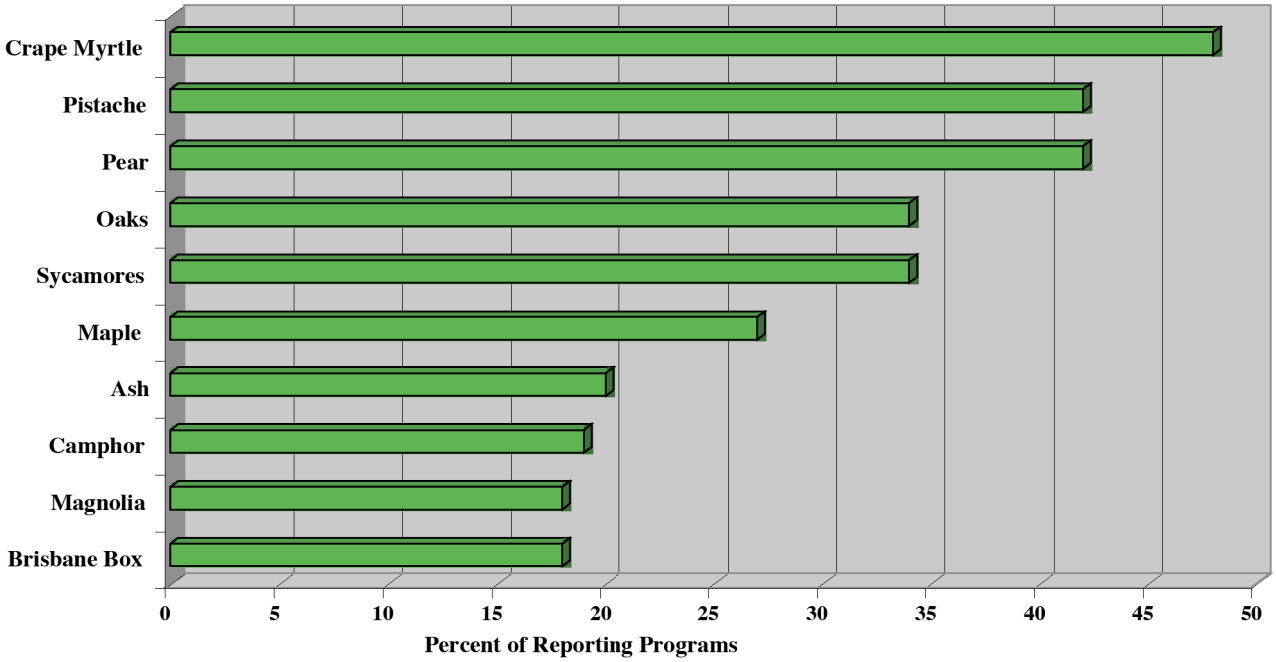


Figure 10. Ten most commonly planted street trees in 2003 *

* **Key of Common and Scientific names, including cultivars**
Crape (Crepe) Myrtle, Genus *Lagerstroemia*
Pistache (Chinese) *Pistacia chinensis*
Pear, Genus *Pyrus*, Spp: *Bradford cultivar*
Oak, Genus *Quercus*, Spp*: agrifolia, douglasii, ilex, kelloggii, lobata, rubra, virginiana*
Sycamore, Genus Platanus, Spp: *acerifolia, racemosa,* London plane cultivar
Maple, Genus *Acer,* Spp: *rubra, japonica*
Ash, Genus *Fraxinus*, Spp: *velutina, oxycarpa*
Camphor, *Cinnamomum camphora*
Magnolia, *Magnolia grandiflora*
Brisbane Box, *Tristania conferta*

Trends in Species Selection

Figures 11 and 12 illustrate the trends in species selection over the last 15 years. Figure 11 depicts this trend by using the top 10 species planted in 2003 and tracking their frequency of use back in the three previous surveys. One notices that the ***dominance of small, short-lived species in a program's planting list has grown since 1988 (e.g., Bradford pear, Crape Myrtle, Chinese pistache, and Liquidambar)***. Another perspective on these trends is provided in Figure 12 by starting with the 10 most frequently occurring urban forest species in 1988 and calculating their reported frequency of planting in 1992, 1998 and 2003. From this perspective, the trend is even more obvious since larger, longer-lived species dominated the list in 1988. The sharp decline in elms and ashes bears this out.

Comparing trends for a given species (e.g., Liquidambar) is complicated because the distribution of the 10 species by percentage is altered with different species weighting between 1988 and 2003 base periods. Eucalyptus and ash species have essentially disappeared from the top 10 list. In the case of eucalyptus, alder and mulberry, there may be sound ecological or economic reasons for reducing their use (e.g., allelopathic effects, residues, structural strength). We have already seen that the trend toward smaller species is driven by cost concerns rather than their potential benefits (e.g., shade, energy conservation, air quality improvement, flood control).

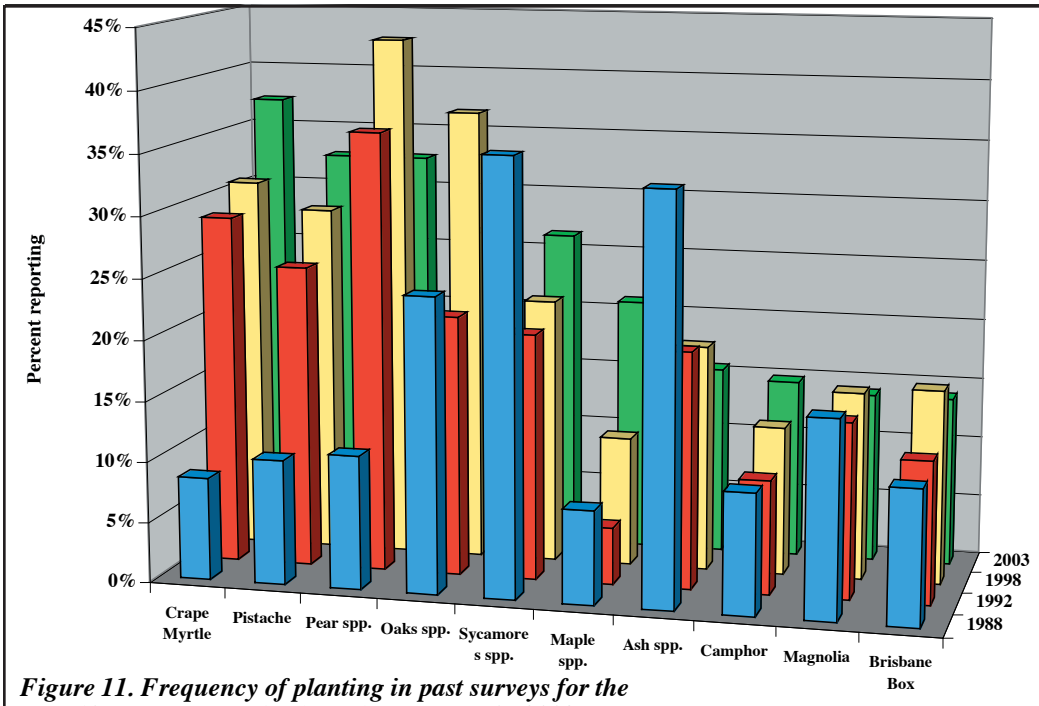


Figure 11. Frequency of planting in past surveys for the 10 most commonly planted street trees in 2003

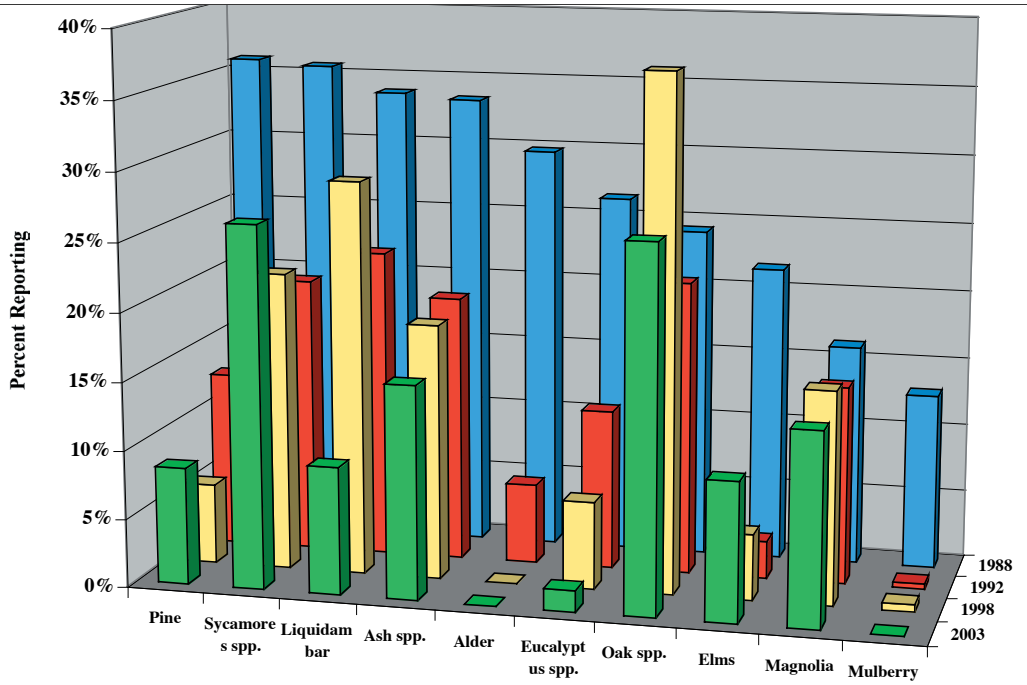


Figure 12. Frequency of planting in later surveys for the 10 most commonly occurring trees in 1988

Note: 1988 data were based on the most common species in inventory, not planted.

Trends in Species Selection (continued)

Decisions to plant smaller trees are further supported by the information shown in Figure 13 which summarizes respondent's predictions of mature sizes of planting choices. Clearly, respondents recognize the implication of their decisions by predicting significantly smaller tree heights for street trees since 1988. There appears to be a slight increase since 1992 in street trees with mature heights over 60 feet. Little change in park trees is anticipated from planting decisions which is consistent with the information on planting considerations for park trees illustrated in Figure 9.

Species selection for street trees involves a compromise between desirable shade trees and conflicts with the pre-existing gray infrastructure. However, municipal foresters need to make use of opportunities when communities renovate downtown areas. There are a number of designs and techniques for mitigating utility interference while using desirable tree species, ones that provide the benefits that respondents cited in the section on "Benefits & Needs" and from a large volume of research (recent literture listed in Benefits & Needs section). The decisions we make today will affect many generations to come.

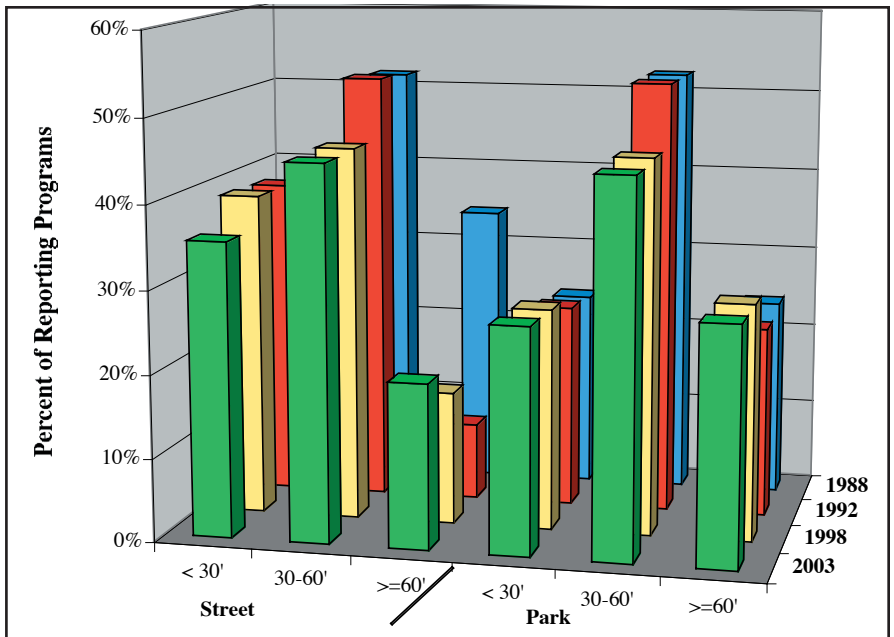


Figure 13. Predicted tree height at maturity of new plantings

"Implemented revised street tree plan which requires specific tree species for site conditions, i.e., well-size, overhead wires, sewer line location, etc." ***Oakland, 1998***

"I have had some trouble getting "low" maintenance trees added to our approved tree list due to them not providing shade and/or oxygen." ***Cypress, 1998***

Beneficial Size

Size Restricting Effect

Nursery Stock

Establishment and improvement of the urban forest begins with quality nursery stock. The two primary issues in purchasing nursery stock are the appropriate container size and tree quality. As for preferred stock size, figures 14a and 14b indicate that the 15 gallon container size is the most popular in both street and park settings. Small container sizes are more prone to, or even invite, damage, while 24 inch box are often too expensive or too large when using volunteers. Nevertheless, there seems to be a slight upturn in the use of 5 gallon container stock for street trees and even in parks. The 24 gallon sizes have also increased about the same in both settings. Still, the 15 gallon container size is preferred almost 3 to 1 to any other size.

The other nursery stock issues involve, availability of preferred species and size, cost and, as already mentioned, quality. As Figure 15 illustrates that the primary problem is increasingly the ***lack of availability in preferred species***. ***Poor quality of nursery stock*** follows closely behind availability but this problem seems to have leveled-off since 1998.

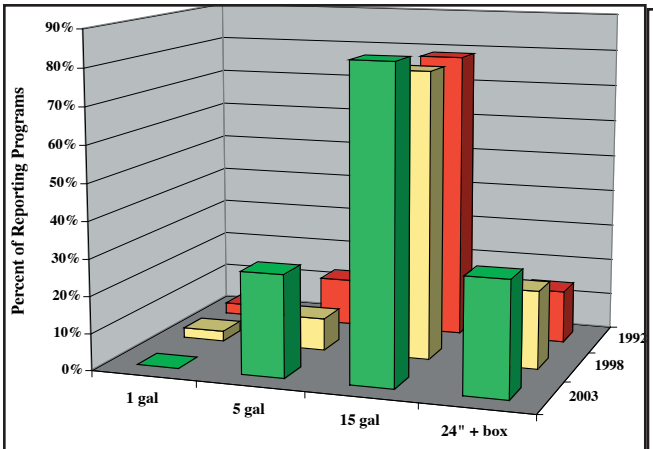


Figure 14a. Most common street tree nursery stock size

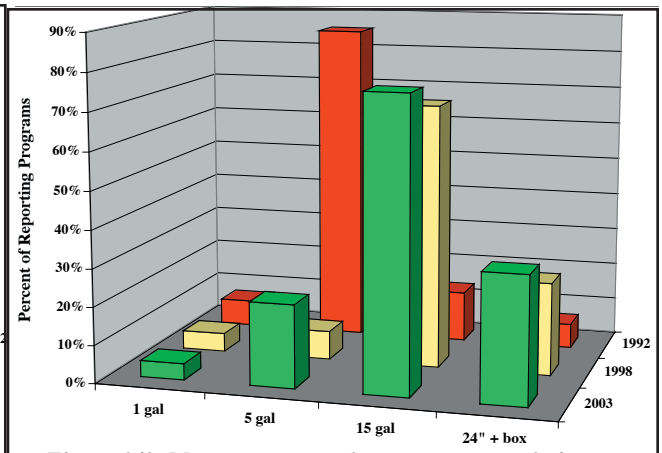


Figure 14b. Most common park tree nursery stock size

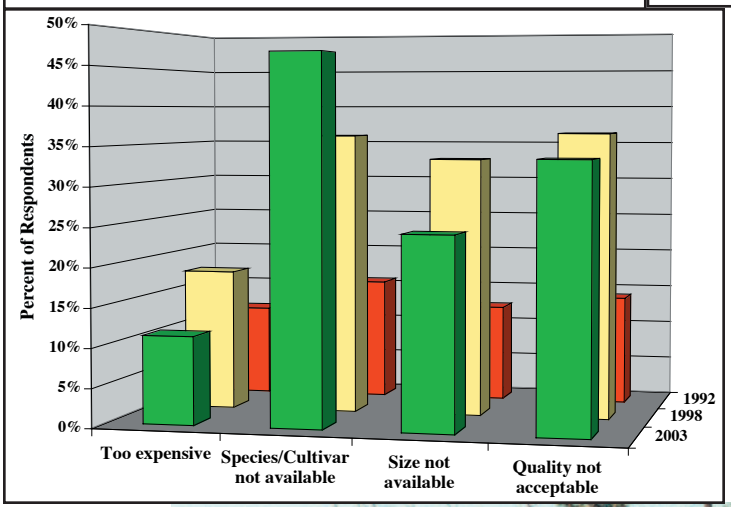


Figure 15. Nursery stock factors affecting tree programs

"Nurseries need to rethink their methods of raising trees destined for municipalities. Lower growth should be left on trees, pruning methods should be improved and stakes should be used only when absolutely necessary." ***Fontana, 1998***

Managing the Urban Forest

Management

One of the first issues in managing the urban forest is to determine whether the developer, city, or homeowner pays for establishment and upkeep. As Figure 16 shows, cities still appear to assign nearly all establishment responsibilities to developers, generally as a requirement in development permits. This trend has been increasing from about 75% in 1988 to around 90% in 2003. But the evidence presented in Figure 16 also suggests that government is still paying about half of the bill for maintaining the trees bought and planted by developers. ***Back in 1988, cities and homeowners shared almost equally in maintenance responsibilities. Now homeowners account for half of what cities do to maintain trees in residential developments.***

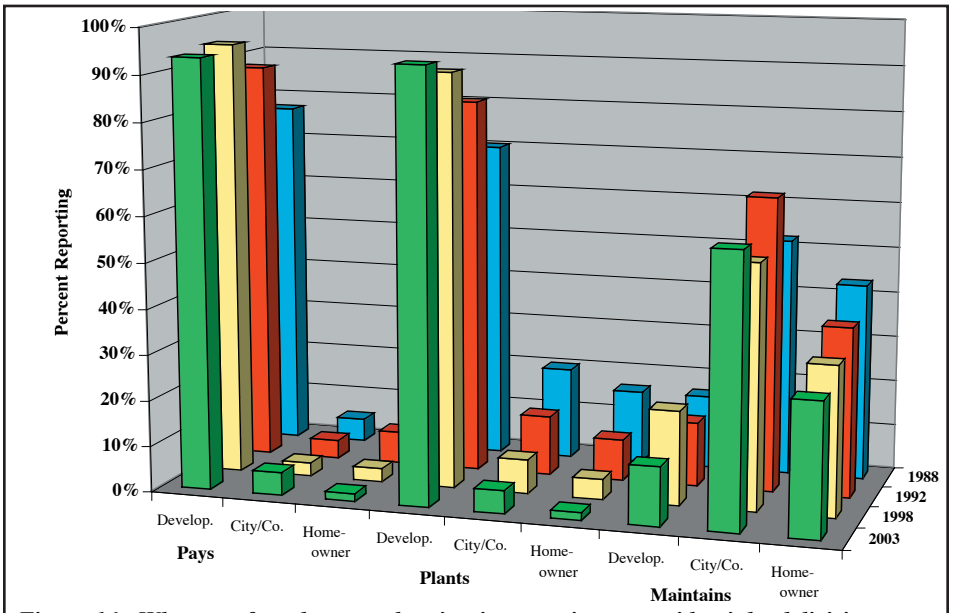


Figure 16. Who pays for, plants, and maintains trees in new residential subdivisions

The maintenance role of U&CF programs is increasing in nearly all city land use categories, as illustrated in Figure 17. U&CF programs are now responsible for trees on about one-third of private property, and nearly 50% of the "open space" in cities and counties. City responsibilities for residential trees has increased now to being almost as high as "open space."

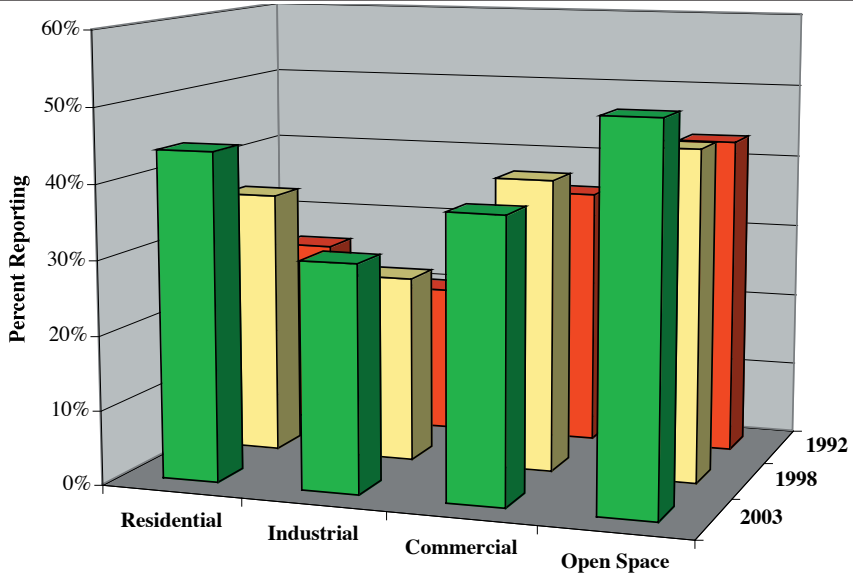


Figure 17. Percent of areas for which U&CF program is responsible

"Pleasanton has funding but little support for a residential tree maintenance program."
Pleasanton, 1998

"We shifted subdivision tree planting to the developer. Trees must be planted to get an occupancy notice. This way trees are designed into the landscape . . . and have better survival."
Merced, 2003.

Funding Sources

Funding is a persistent problem for urban and community forestry (tree) programs. Figure 18 illustrates the trend in the average percentage of funds from various sources. The most obvious result is that the city (or county) general fund remains the primary funding source. It appeared that tree programs dependence on the general fund was declining, down to just over 60% of the programs on average, but the average increased in 2003 to around 70%. There appears to be a slight growth in alternative funding sources, such as assessment districts and a little from recent earmarks in California gas taxes. Nevertheless, ***urban forestry is still heavily dependent upon taxpayer support through city or county general funds***.

The heavy reliance on city general funds is to be expected for any city program; however, under tight budget conditions, city officials are forced to cut services starting with those viewed as non-essential. If urban forestry is to be sustainable then the benefits that an urban forest provides must be "translated" into essential benefits. In essence of urban foresters ask communities to invest major capital into building the green infrastructure, but the returns seem intangible or indirect. Efforts to assess private sector fees of all sorts are part of the solution in tapping these returns.

Grants have not played a large role in funding due to limited sources and funds and that many grants are directed toward non-profits and tree planting. This has led to the ***pervasive problem of street and park trees being added to the public inventory but no funding for maintenance for which the city is then responsible*** (refer back to Figure 16).

Generating funds through fines is generally not desirable given the social-political image impact. The only remaining sources of funds are fees from development and building. Such fees have the potential for generating large revenues but other regulatory pressures have raised construction fees to politically unacceptable levels.

The urban forest itself has the potential to generate revenues from the marketing of wood resources derived from tree removals. New laws like California's AB 939 in 1999 have forced communities to seriously reduce dumping these useful materials in landfills. In turn, this has helped to spur the emergence of a new wood products industry that uses wood recycled from our urban forests (see the section, "Utilization of Greenwaste Resources," pages 24 and 25).

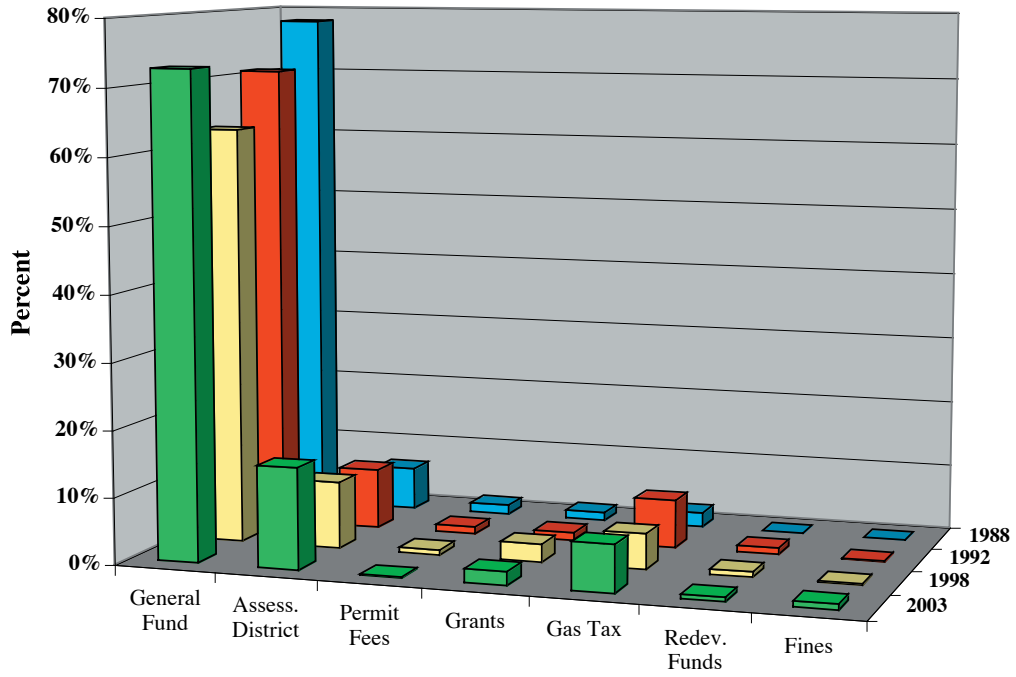


Figure 18. Change in U&CF funding sources - average percentages

"California ranked 47th in per capita funding from the Federal Grant for Urban and Community Forestry in 2005. The national average in 2005 was $0.12 per person. California's funding in 2006 was decreased to $841,500, around $0.02 per person." ***CDF Urban Forestry Program Administrator***

Budgets

Since funding is still primarily driven by taxpayer support, it is appropriate to evaluate U&CF budgets on a dollar per capita basis. Figure 19 shows that the average (mean) city budget per resident, in constant dollars, dropped significantly after 1992. California experienced a major recession around 1992 but has recovered since then but apparently not equally so in the support for city tree programs. In the late 1980s and early 90s, the average budget was over $4 per resident, dropping by around $1/resident in the late 90s and up to the present. When the ***median*** is used to express the most likely budget/resident, the estimate drops more gradually but continuously after 1988 - from about ***$3 in 1988 to less than $2.50/resident in 2003***. This indicates that large cities with their large budgets have lost more funding support since 1988 than smaller communities.

Figure 20 complements these findings by showing the trends from cities that responded to all 4 surveys. For every city whose budget decreased from 1988 to 1992, two city's budgets increased. That trend has totally reversed to now ***more cities have decreasing budgets than increasing by a 3:1 ratio over the last two survey intervals.***

Recall that one of the criteria for a city to receive "Tree City USA" status from the National Arbor Day Foundation is for the community to spend at least $2/resident. This requirement has not changed since its beginning in 1976. Failure to adjust the $2 standard for inflation results in an effectively lower standard to maintain this status.

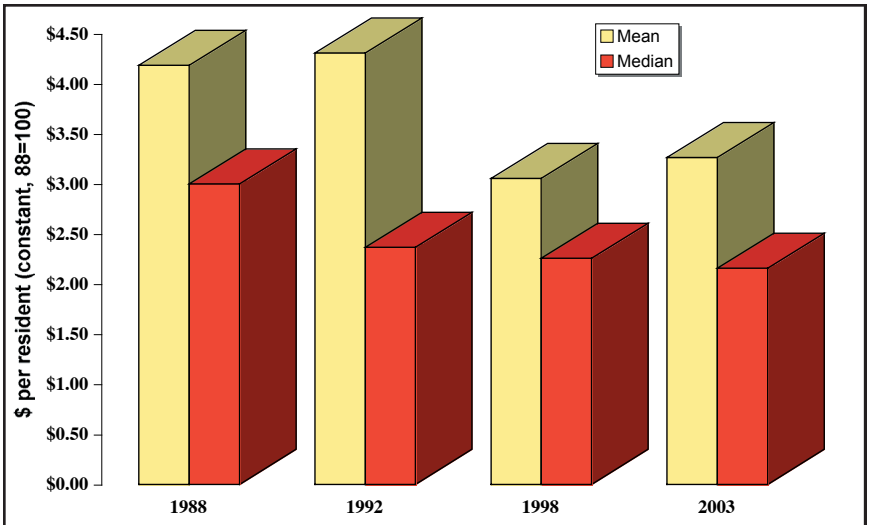


Figure 19. Per capita U&CF budgets adjusted for inflation, 1988 - 2003 *

* Note: All dollar amounts were adjusted for inflation using the GDP Deflator, base year 1988. US Dept. of Commerce, Bureau of Labor Statistics.

"CDF's support of urban forest is improving public awareness. City leaders have provided funding for accelerated tree pruning." ***Stockton, 2003***

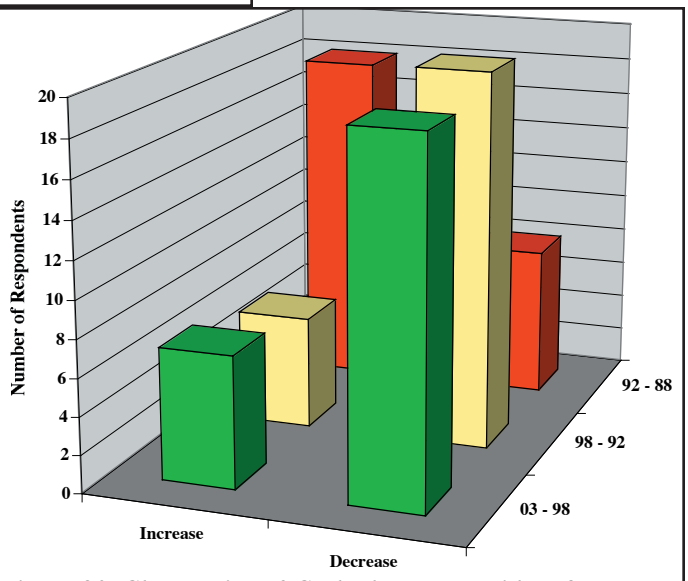


Figure 20. Changes in U&CF budgets per resident for municipalities that responded to all 4 surveys

Budgets (continued)

Analysis of the information in Figures 19 and 20 led to the finding that tree program funding in large cities declined more rapidly than in smaller communities. Figure 21 supports this conclusion showing how per capita tree budgets vary by city size over the last 4 surveys. In 1988, per capita spending was fairly consistent across city size with an expected drop only in the largest metropolitan areas given their economies of size. After adjusting for inflation, ***small cities have actually increased spending somewhat while cities with populations over 100,000 have sharply reduced spending since 1992***.

Another perspective on the community's commitment to its tree programs is the total expenditures per tree in the public inventory. This should not be confused with the cost of nursery stock or even the cost of an established tree. ***Without adjusting for inflation, the average expenditure/tree is up slightly to around $19 in 1998 and 2003 from around $18 in 1992 and 1988***. Clearly, expenditures in constant dollars are down from 1988, regardless whether one calculates the average on a per resident or a tree basis.

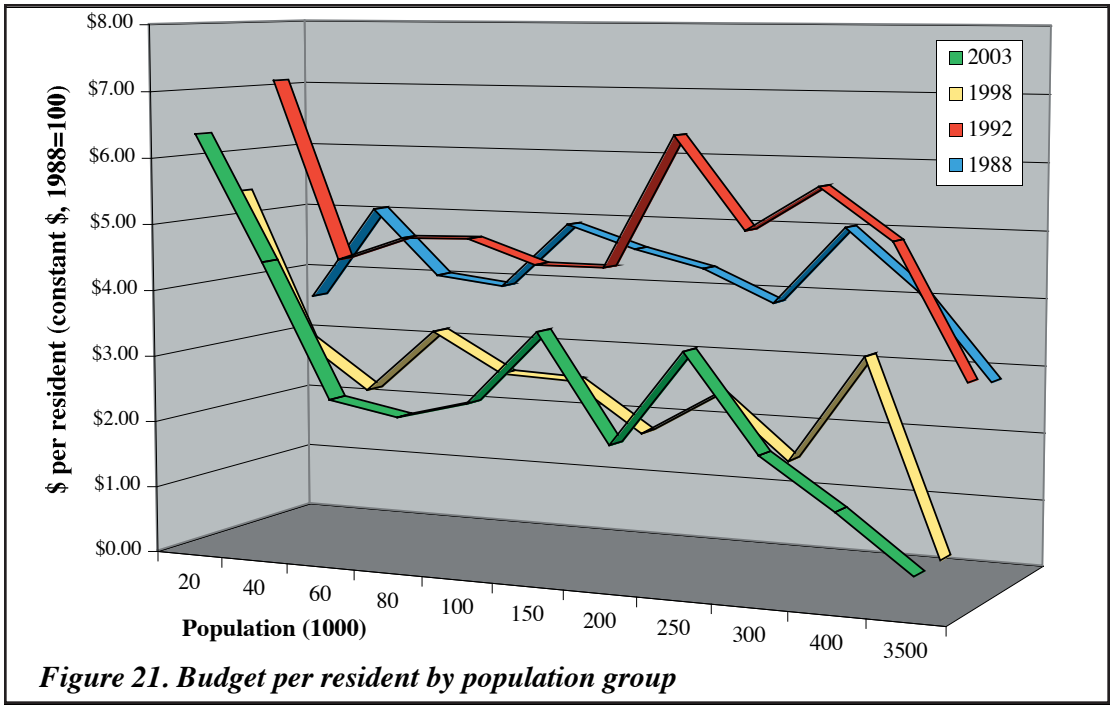


Figure 21. Budget per resident by population group

Exemplary Smaller Cities

Lompoc

- Population: 41,167
- Cindy McCall, Parks & Urban Forestry Manager
- Tree Program Budget (100% General Fund):
  - $900,000 (***$21.36 per capita***)
  - 11 Full-Time Staff, 3 FTE Part-Time
- Municipal Tree Inventory: 31,000 (***$29 per tree***)
  - 17,000 Street Trees
  - 9,000 Park Trees
  - 5,000 Open Space
- Plantings in 2003: 1,817 (***3%*** of current inventory)
  - Stone Pine, Sycamore, Magnolia, Palm, Liquidambar
- Removals in 2003: 693 (***2%*** of inventory)
  - most chipped for mulch, some solidwood utilization
- Top Benefits: reduced hazards, civic pride, and energy conservation
- Top Needs: Better nursery stock, improved tree maintenance, more citizen support
- Tree Ordinance in-place and effective, detailed tree replacement policy/program for utility right-of-ways, residents can request one 30'-40' tree planted in street frontage
- Awards: Tree City USA since 1988, Sterling Growth Award for quality urban forestry practices, "Best Urban Forestry Program" in 2000 from California Urban Forest Council

Claremont

- Population: 34,964
- Mark Hodnick, Community Services Department
- Tree Program Budget (100% Community Services Assessment District):
  - $640,000 (***$18.30 per capita)***
  - 2 Full-Time staff, 0.5 FTE Part-time
- Municipal Tree Inventory: 23,500 (***$27.83 per tree***)
  - 20,000 Street Trees
  - 3,500 Park Trees
  - 1,608 acres of public parkland of which 1,480 is wilderness
- Planted 150 trees in 2003 but removed only 100; 100% wood recycled for solidwood products
- Top Benefits: business development, civic pride, increased real estate values
- Top Needs: Better nursery stock, technical information, planting space
- Very high support from city government, tree board and citizen advocates
- Tree City USA since 1986.

Monterey

- Population: 29,960
- Robert Reid, Urban Forester
- Tree Program Budget (80% General Fund, 10% grants, 10% assessments and redevelopment funds):
  - $900,000 (***$30 per capita***)
  - 8 Full-Time staff, 0.5 FTE Part-time
- Municipal Tree Inventory: 35,000 (***$25.71 per tree***)
  - 15,000 Street Trees
  - 20,000 Park & Open Space Trees
  - Significant responsibilty for native Monterey Pine grove heavily impacted by pitch canker disease
- Planted 250 trees in 2003 but removed only 178; 100% wood utilized for mulch or firewood
- Top Benefits: reduced hazards, civic pride, and energy conservation
- Top Needs: Citizen support, technical information, planting space
- Very high support from city government and tree board
- Tree City USA since 1983, "Best Urban Forestry Program" in 2002 from California Urban Forest Council

Program Organization

One of the most critical issues in promoting the city tree program is the organizational "position" in the government. It is difficult for new government programs, like U&CF, to break into the highest echelons of city government in order to have its needs recognized in policy and funding decisions. Only political pressures and high-profile issues can surmount the barriers to obtaining departmental status. The principle of "span of authority" for city managers limits the number of subordinate department heads he/she can handle (theoretically around 8 to 10 subordinates). Therefore, it is important to position the U&CF program in the department that is most likely to represent its needs.

From Figure 22, the departments "housing" a city's urban tree program gone back and forth between Parks & Recreation or Public Works. In 1992, Bernhardt and Swiecki found that there was a shift away from Parks & Rec departments to Public Works. The 1998 survey showed that trend was reversed in 2003. ***Today, U&CF programs are predominantly housed in Public Works, whereas in 1988 they were found mainly in Parks and Recreation Departments***. The only other government department one might find the tree program is in Planning.

There are, of course, pros and cons to this trend depending upon the philosophies, traditions, and personalities within each city or county department. After public safety, Public Works receives the lions share of the remaining general fund. It would seem that being aligned with Public Works would therefore offer the greatest opportunity for expanding budgets, but traditionally, heads of these departments are engineers who have perceived trees as hazards rather than assets. Research from the Western Center for Urban Forestry Research and Education has shown that trees can reduce life cycle costs for streets and parking lots (McPherson 2005). *This information is finding its way into the design and planning in Public Works departments and possibly creating a valued role for urban foresters to make the connection between the gray and green infrastructures*.

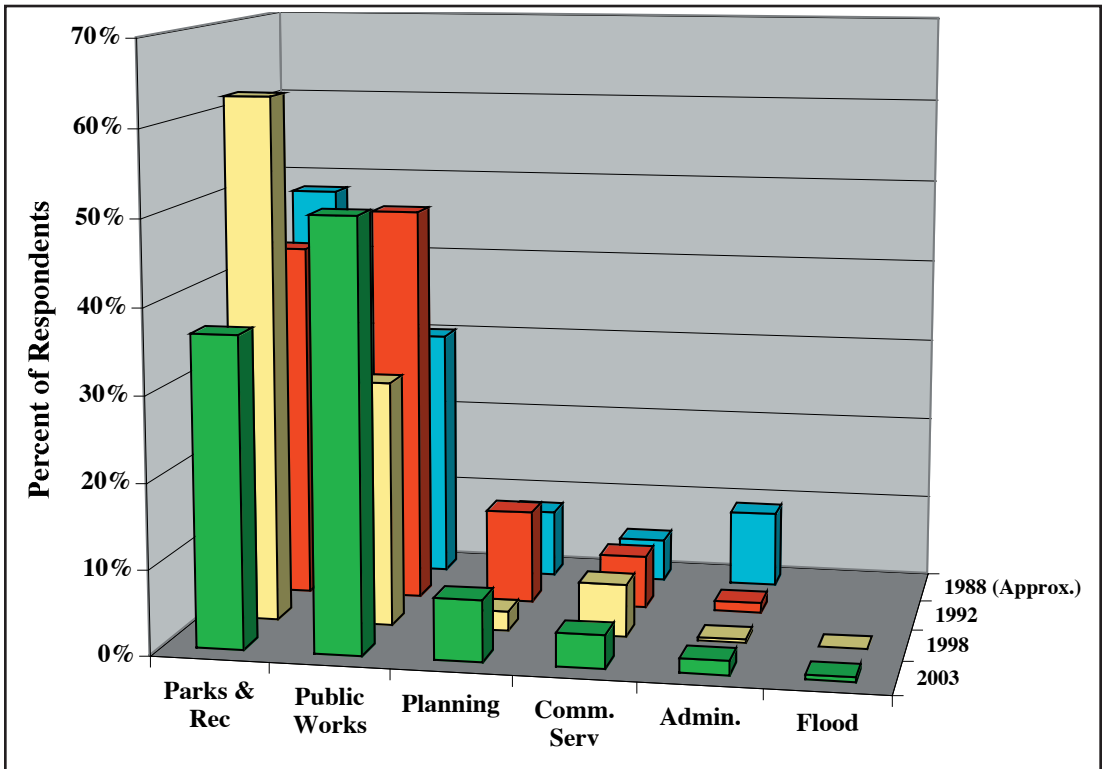


Figure 22. Location of U&CF programs within municpal government

Staffing

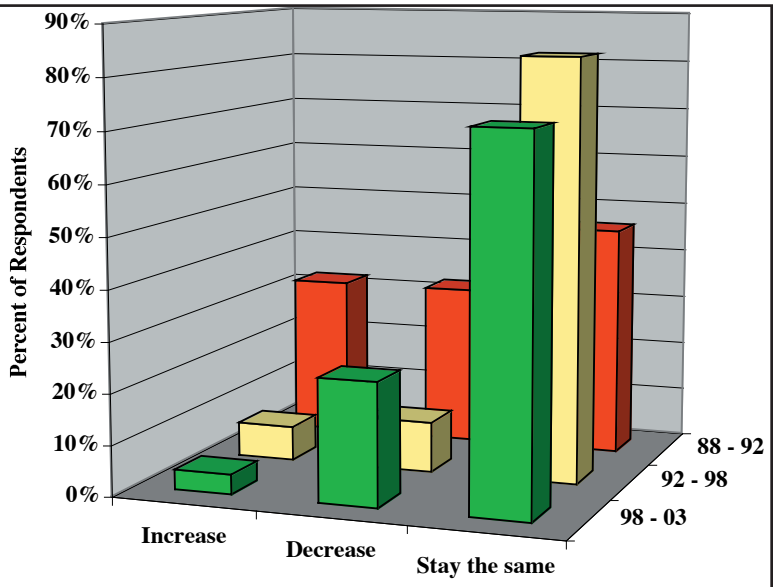


Figure 23. Changes in U&CF staffing levels

Table 1. Percent of Tree Budget Spent on Contractors by City Size Category

City Size	1992	1998	2003
Small	55%	70%	64%
Medium	42%	55%	65%
Large	22%	44%	51%

Note: City size is the same as used in Figure 6.

Staffing levels in municipal urban forestry programs are subject to the same fiscal forces as in all city government. Outsourcing of city services to contractors has been the trend for many years. ***The average proportion of the city's tree programs spent on contractors has steadily increased from 34% in 1992 to 55% in 2003***. This trend combined with reduced budgets has produced smaller staff levels in urban and community forestry programs than in 1988, as illustrated in Figure 23. There appears to have been a sharp decrease in staffing since the 1998 survey.

Tree program full-time staffing remains steady with a slight increase of nearly 1.5 FTEs since 1998 to an average of 7 FTEs (see Figure 24). Table 1 explains why more programs show declining staff levels while the average full-time increased -- ***large city programs are adding full-time staff while a greater number of smaller programs have reduced staff***. Figure 25 confirms this conclusion - those programs with more than 10 FTE employees increased from 18% in 1998 to 21% in 2003 drawing mainly from the mid-size category of 5 to 9 FTEs.

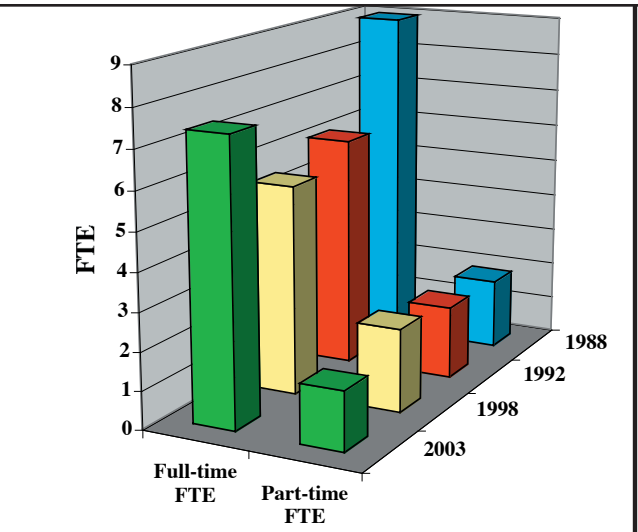


Figure 24. Changes in U&CF full-time & part-time employment

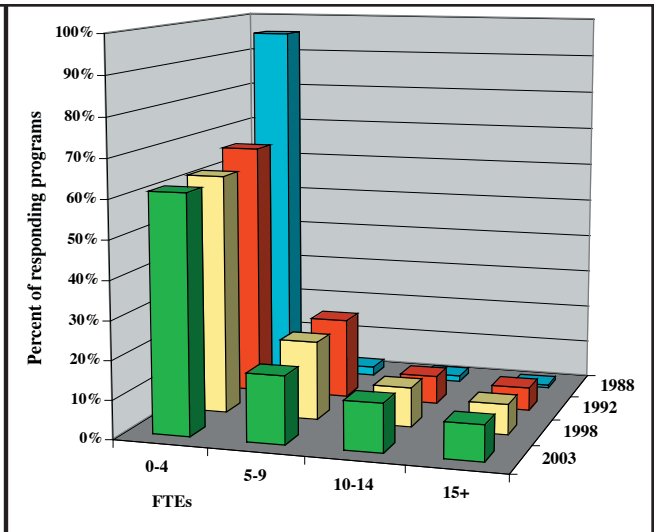


Figure 25. Distribution of full-time U&CF staff

Contract and Volunteer Services

As discussed under the Staffing section, small to mid-size city tree programs are increasing their reliance upon private sector to the point where more than half of their budget is spent on contract services. Table 1 indicated that larger cities are actually adding full-time staff, while smaller cities naturally need to rely more upon the private sector. The quality work by city staff and private sector organizations is critical to the success of any tree program.

Large cities have a greater number of volunteer and youth organizations to accomplish much of the needed work, especially tree planting. The 2003 survey showed a sharp drop in programs reporting the use of all three types of organization in planting and caring for urban trees - more like what was reported in the 1992 survey (see Figure 26).

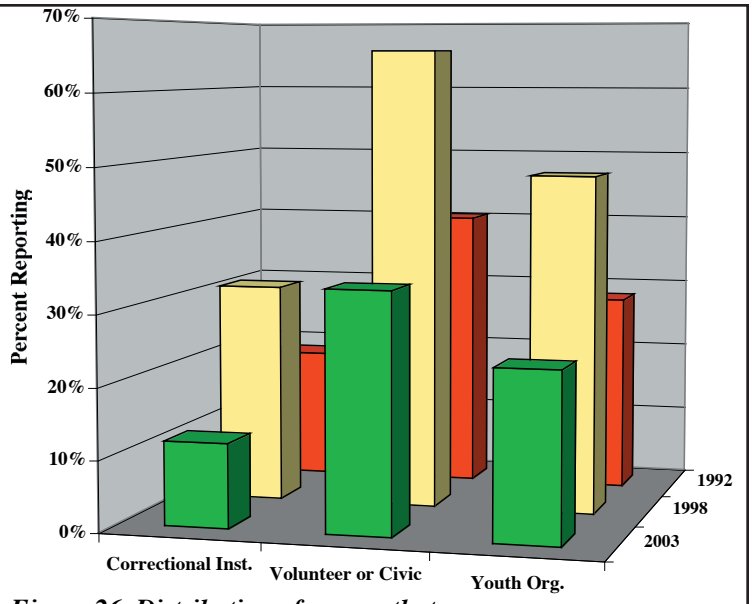


Figure 26. Distribution of groups that plant or care for urban trees

"City program staff by ISA Certified Arborists 100%. Contractors crew leader is an ISA Certified Arborist. Proper schedules with adequate funding eliminate potential problems."
Irvine, 1998

Tree Care

Pruning, trimming, pollarding, and topping are all terms used and misused to describe that part of arboriculture involving the removal of parts of the tree (above and below ground) to achieve some objective. Whether that objective is explicitly stated or even justified is probably at the core of the controversy over this critical step in caring for urban trees.

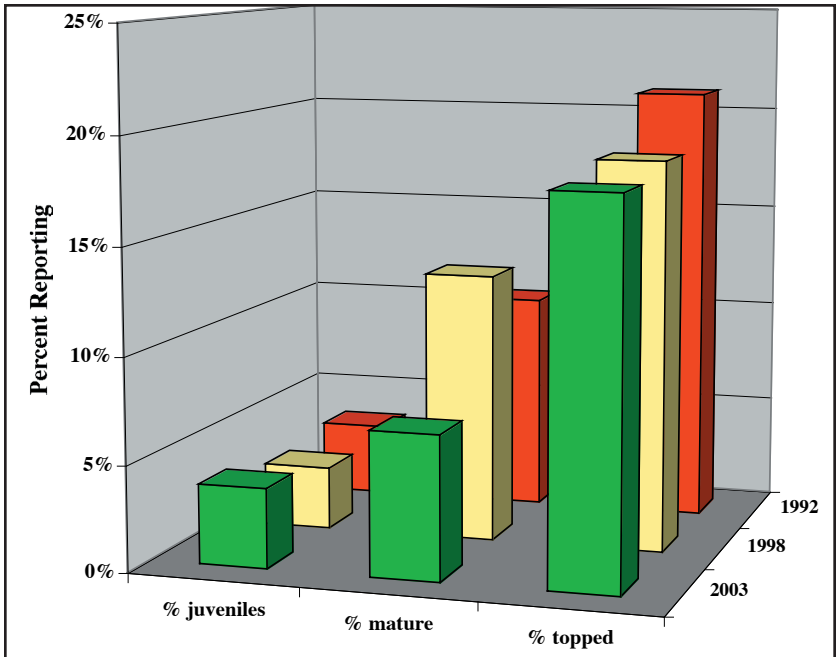


Figure 27. Average percent of street & park tree inventory pruned by tree size and percent topped

Pruning is defined as "the removal of parts of a plant for size control, health, or appearance" (Rice and Rice 2000). It is a well-established principle of arboriculture that pruning jueveniles correctly will yield tremendous savings in maintenacnce costs as the tree matures ("Pruning Young Trees," International Society of Arboriculture 2006). Figure 27 illustrates that ***pruning of mature trees decreased sharply since the 1998 survey and is even lower than in 1992***. However, only a slight increase in pruning jueveniles occurred indicating that reduced budgets may the cause.

Topping (a.k.a., "heading," "tipping," "hat-racking," and "rounding over") involves shortening of the central leader of a tree to make the head fuller and keep the tree short (Rice and Rice 2000). Topping is considered a bad practice since it is not designed to improve the health or appearance of a tree. If the wrong species for a street site is planted, frequent structural pruning will be necessary if topping is to be avoided. Since frequent treatments are expensive and funds are scarce, street trees often go untreated forcing programs or utilities to top to mitigate hazardous conditions. But healthy trees that are not interfering with utilities or paving are still topped due to lack of proper training or failure to put in practice what is known. Figure 27 indicates that ***topping remains a problem with still over 15% of the reporting programs indicating that it is done.***

"The urban forest is being destroyed due to utility companies 'pruning' [quotes added] techniques. Directional pruning looks bad to the entire public; they have no one to answer to, except the shareholders. Help put a stop to directional pruning, better known as 'dollar-based' pruning." ***Novato, 1998***

"Educating the public is probably the most important thing we can do. Most residents think topping or pollarding is the right way to trim trees because they see others trimming that way. The public needs to be aware that this is more detrimental to trees and just because a tree is 60 feet or taller doesn't mean that it's dangerous." ***Brea, 1998***

Tree Care (continued)

The 2003 survey indicates that the strong growth in certifying city staff in the late 1990s has slowed to be on-pace with contract services, see Figure 28. Though the question asked whether pruning standards were required, it may be that this requirement is becoming less of an issue as more contractors become ISA, NAA or ANSI [1] certified. This is supported by the reduced number of trees topped (a practice shunned by professional organizations), as presented earlier in Figure 27.

A final tree care practice involves the extent to which drip irrigation systems are used to irrigate relatively new plantings as opposed to manual methods. ***In all surveys since 1992, barely over 50% of the reporting programs indicated that more than half of their municipal trees are irrigated***. Irrigation certainly involves higher initial costs and provides more reliable irrigation. Shrinking budgets and more attention to planting more xeric species may explain why this practice has not grown in use.

[1] ISA: International Society of Arboriculture, NAA: National Arborists Association, ANSI: American National Standards Institute

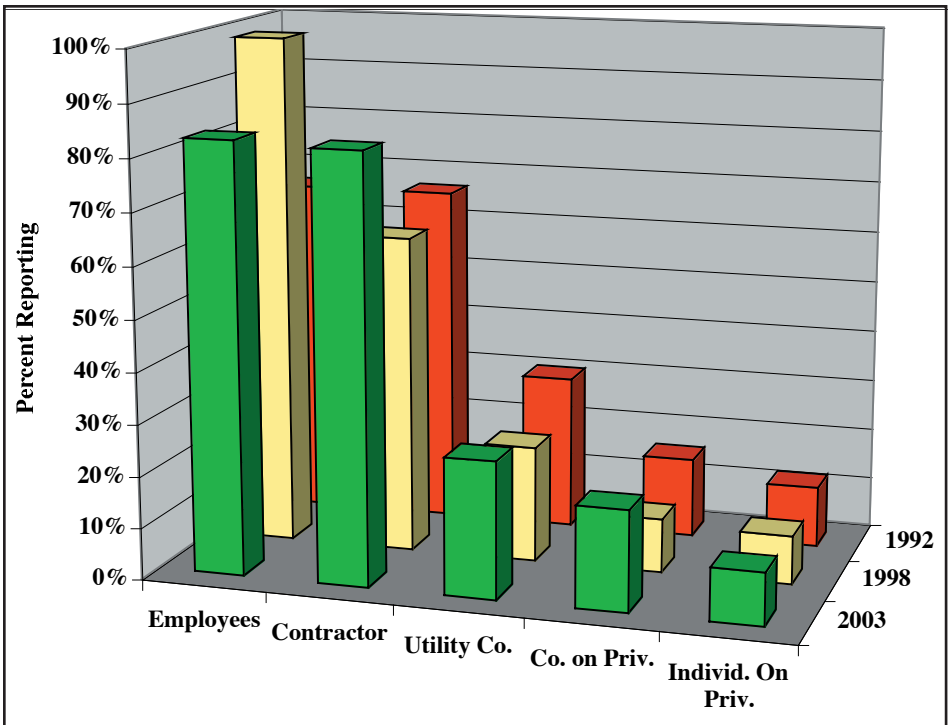


Figure 28. Groups required to follow pruning standards

"Too many people still perform incorrect pruning. Those tree left standing are monuments of bad examples left to be duplicated because people see them and believe it is proper work. We have just initiated a volunteer tree pruning program where volunteers are trained . . ."
Redwood City, 2003

Planning & Inventories

As was just discussed, scheduled maintenance and pruning of juvenile trees is essential to avoid (1) the high costs managing the size of mature trees, (2) hazard tree liabilities, and (3) the need for topping. The results shown in Figure 29 indicate that ***managers of urban tree programs are shifting to systematic maintenance*** wherein trees are evaluated on regular cycles regarding maintenance needs. The 2003 and past surveys reveal that around 70% of the programs use a 5 year planning cycle with most others on a 10 year cycle. Only 38% of the programs believe cost efficiency improvements would result from shortening the planning cycle, up slightly from 1998.

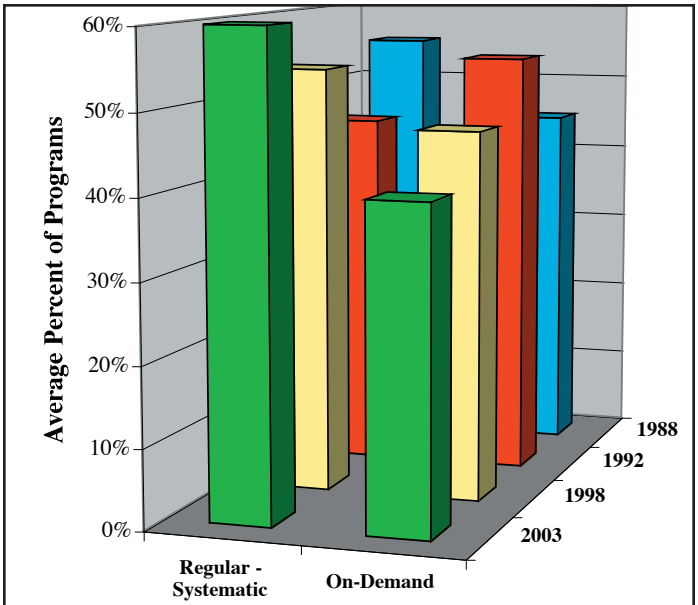


Figure 29. Scheduling of tree maintenance

In order to make the transition from reactive work to planned work (e.g., tree planting, maintenance, and removal), it is necessary to have, and maintain, a detailed inventory of the urban forest. Figure 30 shows that ***there has been a recent surge in the use of inventories in municipalities with tree programs - over 80% now have computerized inventories***. Nearly half of the reporting programs indicated frequent to somewhat frequent use of their inventories; with about the same percentage of use indicating rarely to frequently used.

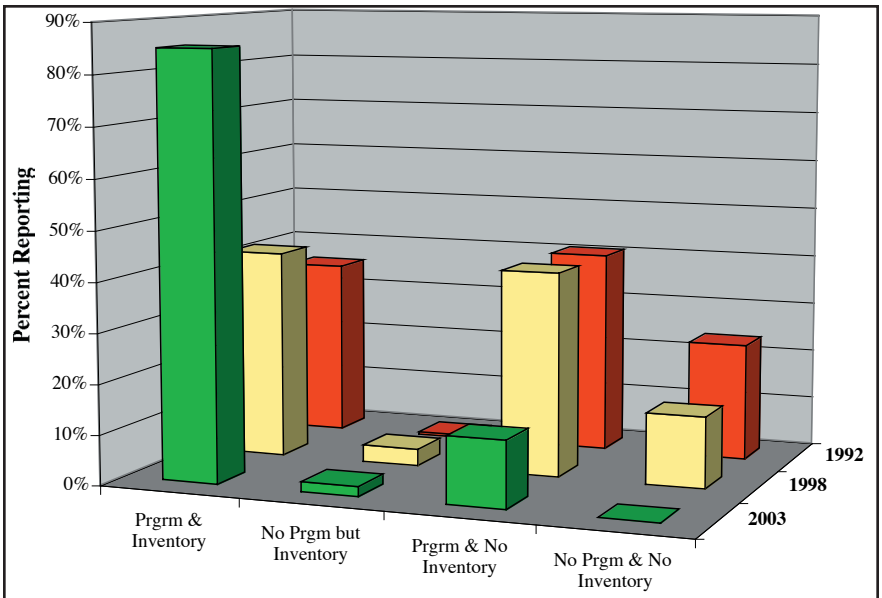


Figure 30. Use of inventories by U&CF programs

"This City's budget is extremely limited in personnel, equipment and therefore, we are forced to practice arbor care on demand." ***San Carlos, 1998***

"Just beginning a UFMP [urban forest management plan] integrating public trees with private guidelines." ***Del Mar, 1998***

Hazard Mitigation and Liability

Today, a major consideration in urban tree management is the potential liabilities arising from decisions ranging from tree selection and planting to care and removal. Municipal U&CF programs use a variety of methods to prevent, mitigate and limit the hazards that urban trees can create. Lawsuits arising from any negligence can involve millions of dollars in damages.

As already discussed, having a quality forest inventory is probably the most effective tool for identifying potential hazards, planning mitigations and communicating liability assessments. Figure 31 illustrates the extent to which various methods are used to limit or address liabilities resulting from tree hazards. Transferring liability to owners is still used when appropriate and legal. However, the ***primary means to prevent the hazard from occurring are to (1) identify and abate the hazard (76% of reporting programs), and (2) replace lifted sidewalks (68%)***. Interestingly, the 2003 survey indicates that ***over 40% of the programs contested damage claims***, double the number in the 1998 survey but on par with the 1992 survey.

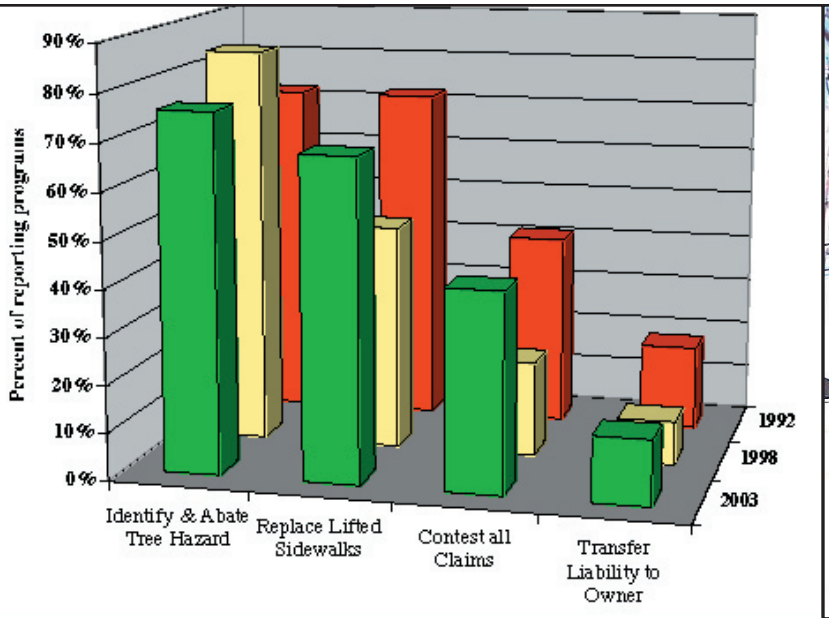


Figure 31. Methods used by municipalities to limit tree-related liability

"Our biggest success is our Concrete Maintenance Program. The purpose of the CMP is not only to have safe sidewalks and effective curbs & gutters but to protect mature street trees in the process of concrete reconstruction." ***Sunnyvale, 2003***

"The City of Los Angeles ' Sidewalk Repair and Tree Retention Program is very successful. See article in WCISA and SMA journals. ***Los Angeles, 2003***

Hazard Mitigation and Liability (continued)

As the saying goes - *an ounce of prevention is worth a pound of cure*. Prevention strategies are shown in Figure 32 where proper species selection is seen as the most effective mitigation measure. ***The measures that are gaining popularity the fastest are physical root barriers and re-engineering sidewalks.*** Another, practice the gained use since the 1998 survey is to eliminate lawns around trees, since irrigated lawns and trees don't co-exist well. Still, sidewalk realignment remains popular.

A fairly popular mitigation method is root pruning of planting stock, a practice consistently used over the year by around one-third of the program. This must be used selectively since many species are damaged as a result or may die years later, as illustrated in Figure 33. There appears to be a particular problem with liquidambars, pines, and ashes 5 years after planting.

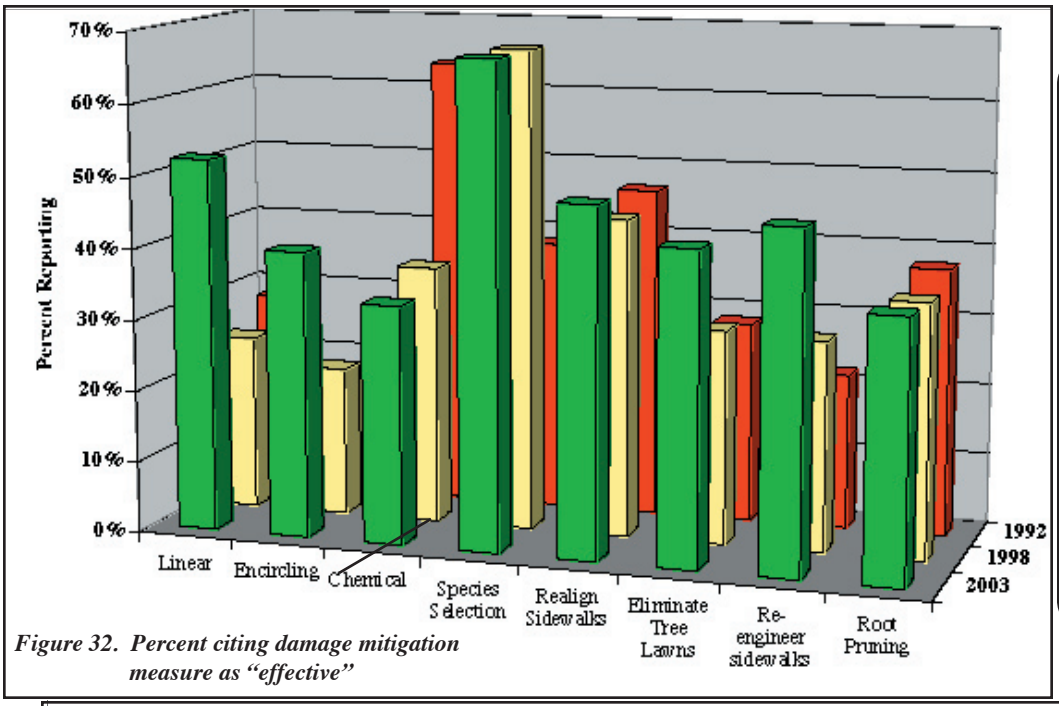


Figure 32. Percent citing damage mitigation measure as "effective"

"We have begun to install root barriers. Encircling root barriers are killing many trees, we don't use them anymore. Residents demand tree removal because of roots in sewers, broken concrete and mess. . . . Lots of median trees are damaged by cars, rare to recover money. Root pruning increases tree life only ten years before sidewalk lifts again." ***Santee, 1998***

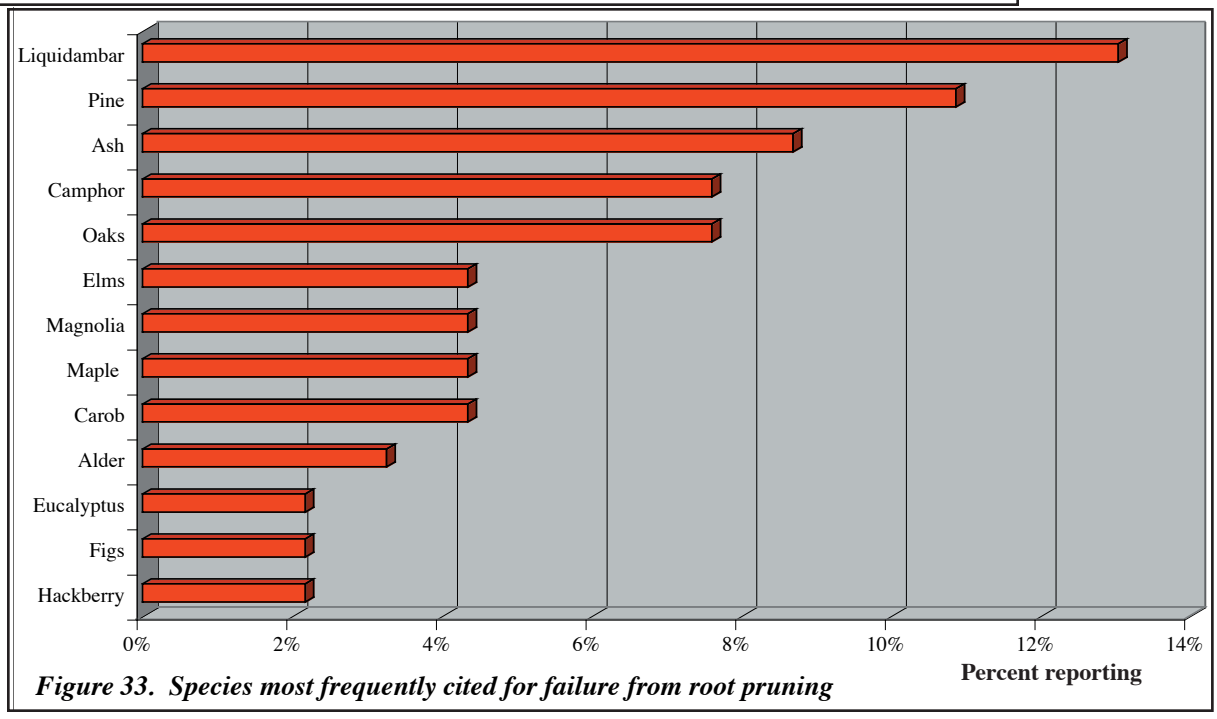


Figure 33. Species most frequently cited for failure from root pruning

Utilization of Wood Material

As described earlier in the report, tree removals appear to be a fairly steady proportion of the standing inventory -- somewhere between 1% and 2%. Since the municipal tree inventory has increased to an estimated 8 million trees, removals will be increasing as well.

The question is, what to do with the wood material be generated? State law per the Integrated Waste Management Act (AB 939) mandated a 50% reduction in disposal of greenwastes by 2000. The Tellus Institute (1991) estimated that about 5% of California's 50 million tons of solid waste produced in 1990 was woody waste. This translates to over 2 million tons per year; essentially all of it disposed in landfills at that time. Prohibiting disposal of half of the woody material in landfills has created a serious problem for cities but also a growing perception of these materials as a potentially valuable resource.

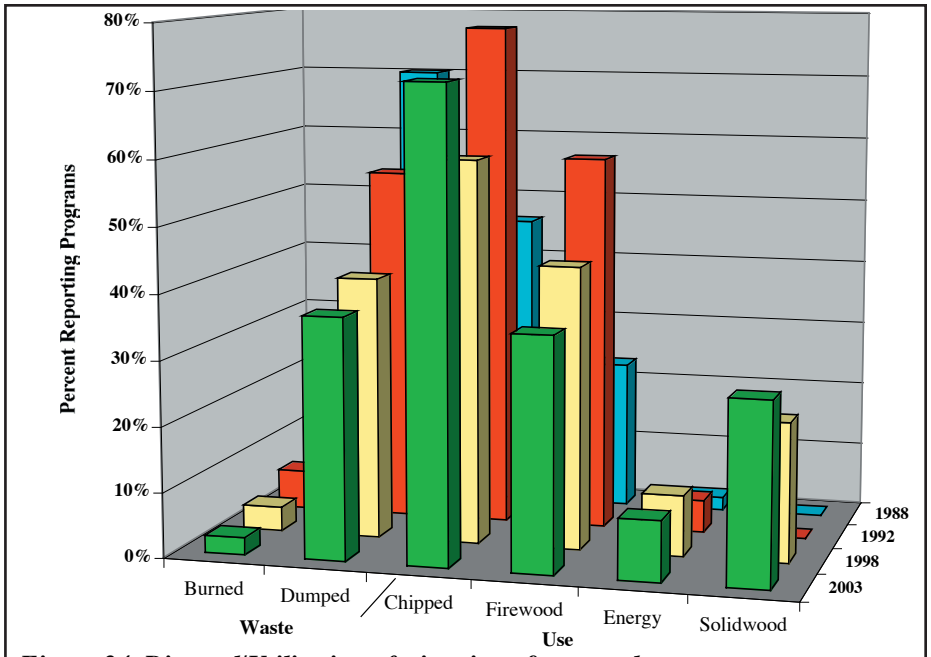


Figure 34. Disposal/Utilization of trimmings & removals

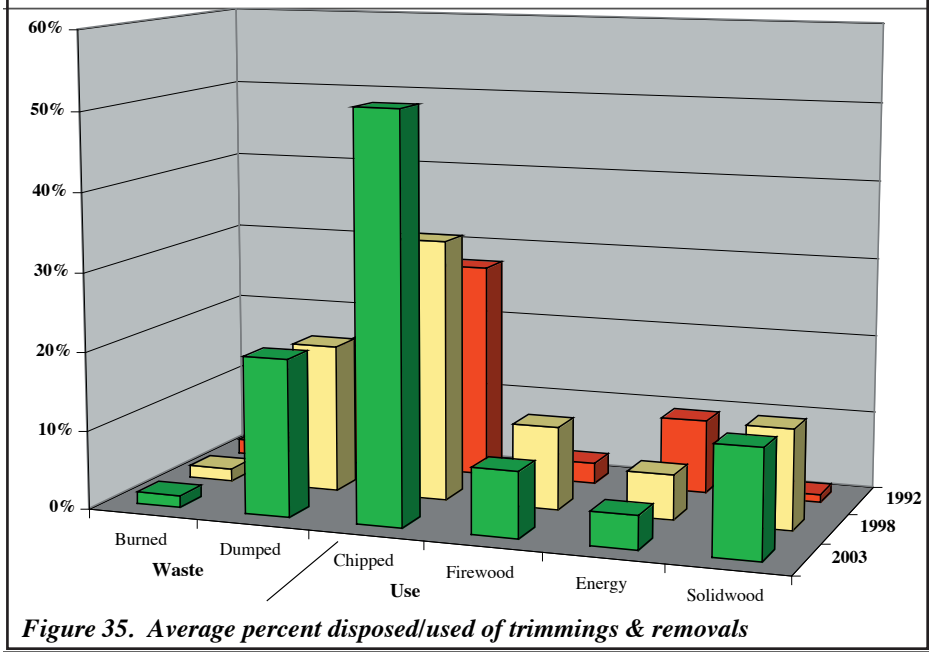


Figure 35. Average percent disposed/used of trimmings & removals

Figures 34 shows the percent of respondents using various methods of "greenwaste" utilization/disposal. Figure 35 displays the same information as the average percent of use of each utilization/disposal method. ***The number of programs dumping greenwaste is in rapid decline, but the average rate of disposal increased in 1998 and remained steady in 2003 at around 10% of the total material generated*** (Figure 35). Evidently there fewer programs disposing but more frequently. Due to air quality laws, burning has not been significant since the earliest surveys.

Utilization of Wood Material (continued)

Chipping for mulch grew rapidly since 1988. Efficiency and material characteristics are compelling reasons for it to remain the dominant utilization method. Utilization for firewood also grew sharply between 1988 and 1992 but has declined since then. ***Solidwood products utilization has increased significantly since 1992 to now over 20% of the reporting programs at a 10% average rate of use***. However, little information is available on the proportion of this huge volume that is log-size which yields high-value commodity and speciality solidwood products (Plumb et al. 1999) In 1994, the NEOS Corp. (1994) estimated that commercial tree care companies, representing nearly half of the urban "greenwaste" volume, produced about 1.5 million yd^3 of log-sized material (defined herein as unchipped wood greater than 12" small-end diameter with lengths at least 4 feet). Extrapolating this to all producers would result in about 200 million bd. ft. of wood volume, about the consumption of several industrial scale sawmills.

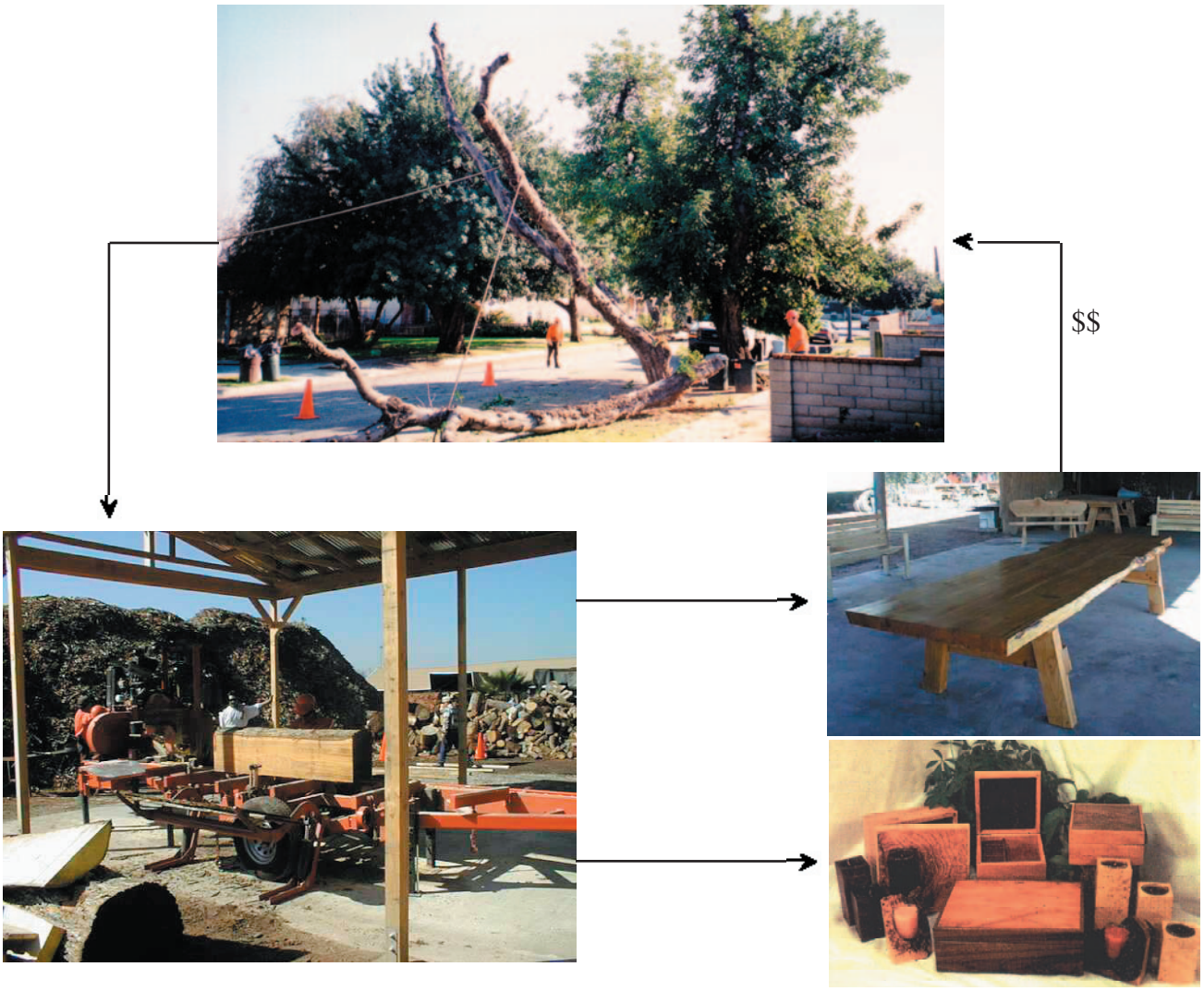
The Urban Forest Ecosystem Institute created a web-based resource, called UrbanWood, to provide the following information and resources in support of solidwood utilization of urban wood waste:

- technical and milling information,
- manufacturers directory (firms that buy and sell wood products at various stages in production,
- wood properties and grades.
- related Internet links.

This web resource is found under the UFEI home page.

The direct address is www.ufei.org/urbanwood/index.html.

From Trash to Treasure



Flood, Drought and Fire Effects

The Mediterranean climate of California and its geographic location means the effects of fire, flood and drought cycles will have to be incorporated in urban forestry decision-making. The 1992 survey was the first to seek specific information on this subject. Figure 36 shows that few significant changes in drought effects have occurred between then and the 2003 survey. ***Planting drought resistant species is the dominant and most logical strategy for coping with droughts.*** The only other strategies that appear to have changed since 1992 are that reduced watering is not as common as well as timing tree planting to take advantage of seasonal climates.

Flooding caused by El Nino cycles also has the potential to affect tree selection and maintenance decisions. Figure 37 shows the obvious effect that reduced watering occurs, but, generally, flooding has no effect on such decisions.

Municipal tree program managers were also asked if fire risk influenced their decisions (*question D4, Appendix 2*). Figure 38 shows that ***over 25% of the responding programs said fire concerns were affecting their program, double what was reported in 1998 and 1992***.

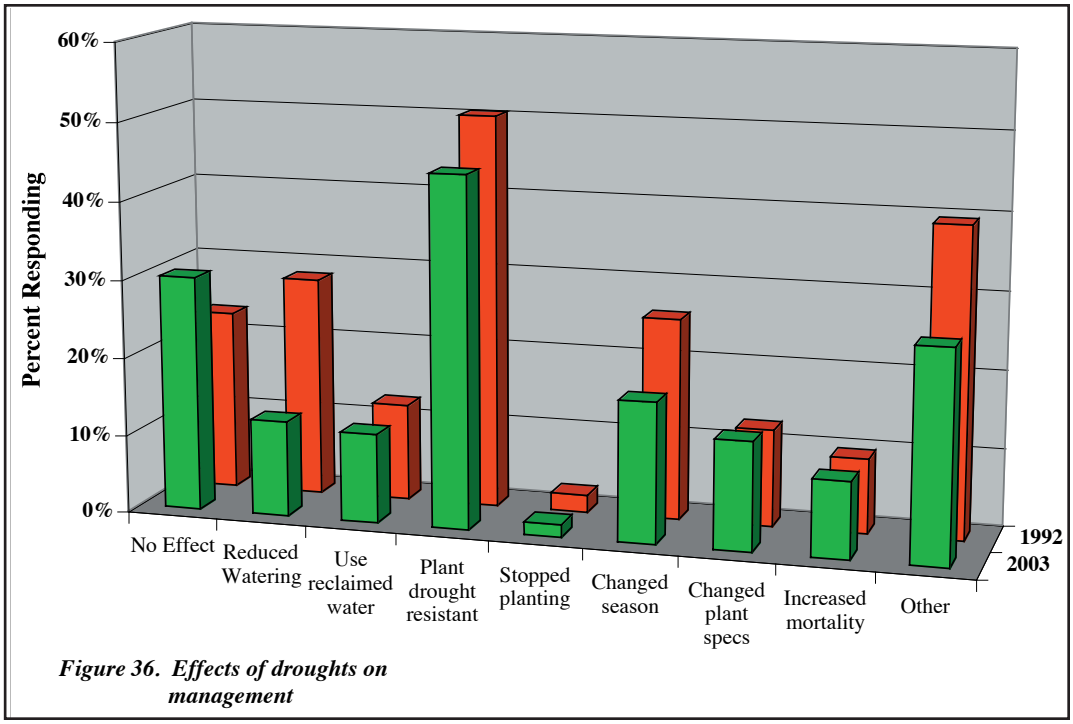


Figure 36. Effects of droughts on management

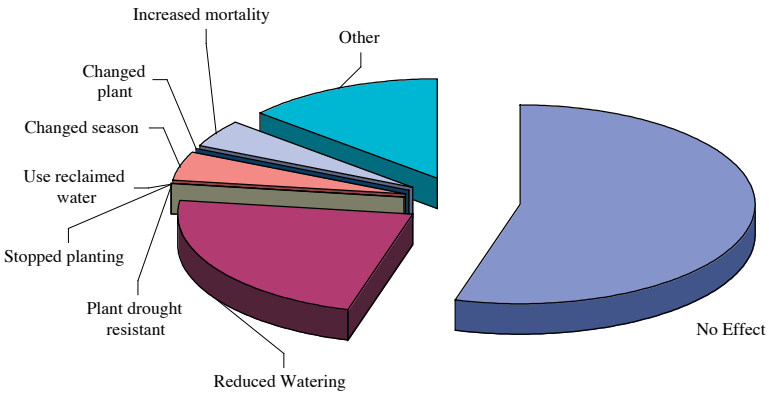


Figure 37. Effect of Flooding on Decisions

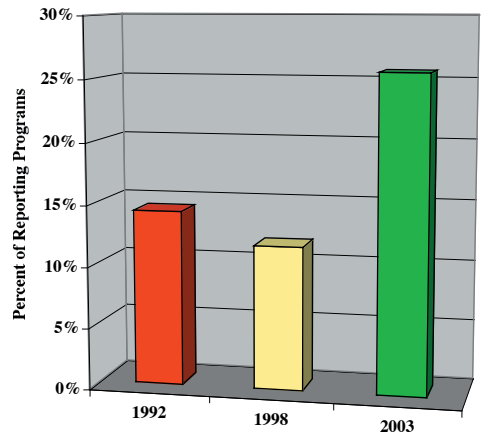


Figure 38. Fire concerns affecting tree progam

Exemplary Medium-sized and Large Cities

Modesto

- Population: 206,872
- Bill Dufresne, Community Forestry Superindent
- Community Forestry Budget (100% General Fund):
  - $2,438,690 (***$11.79 per capita***)
  - 30 Full-Time Staff, 2 FTE Part-Time
- Municipal Tree Inventory: 115,000 (***$21 per tree***)
  - 90,000 Street Trees
  - 20,000 Park Trees
  - 5,000 Open Space
- Plantings in 2003: 3610 (***3% of inventory***), 95% Modesto Ash
- Removals in 2003: 1339 (***1% of inventory***), nearly all chipped for mulch
- Top Benefits: energy conservation, decreased air pollution, civic pride
- Top Needs: increased funding, planting space, citizen support
- Tree Ordinance in-place, effective and enforced
- Awards: Tree City USA since 1987, Accredited Forestry Department by the Society of Municipal Arborists since 1990, Pearl Street Pistache was patented in 1991, patented Modesto Ash is recognized by the American Forestry Association National Register of Big Trees.

"All of this has contributed to urban forestry practices and management that have placed Modesto at the forefront of California's Tree Cities and helped them develop a successful and magnificent urban forest." California Shade, CDF, Spring 2005.

There are several examples of major cities in California that are advancing urban forestry. Sacramento is widely recognized for its long history in urban forestry and one of a few large cities with significant canopy cover. San Francisco is also making significant strides in tree planting. In both cases, non-profit organizations have been a major force in advocating and volunteering -- *Sacramento Tree Foundation* and *Friends of the Urban Forest*, respectively. However, data on these cities cannot be provided since they did not respond to the 2003 survey (though both responded to the 1998 survey). Another major California city that has been in the news lately for its urban forestry initiatives is San Diego.

San Diego

- Population: 1,266,753
- Drew Potecki, Urban Forester, Street Division
- Urban Forestry Budget (60% gasoline tax, 18% General Fund, 13% Redevel. District, numerous others):
  - $3,750,000 (***$2.96 per capita***)
  - 29 Full-Time Staff
- Municipal Tree Inventory: 420,500 (***$8.75 per tree***)
  - 220,000 Street Trees (includes 30,000 palms)
  - 200,000 Park Trees
  - 500 Open Space
- Plantings in 2003: 3195 (***0.8% of inventory***)
  Chinese Flame Tree, pines, Magnolia, Brisbane Box
- Removals in 2003: 600, 50% chipped or cut for firewood, 40% disposed, nearly 10% manufactured wood products
- Top Benefits: decrease runoff from storms, energy conservation, decreased hazards
- Top Needs: increased funding, citizen support, and a revised tree ordinance
- Non-Profit Advocate: *People for Trees*
- In 2005, San Diego was one of a few large metropolitan areas analyzed for declining canopy cover to, in part, account for "heat island" effect as cities continue to grow and sprawl. According to *American Forests*, San Diego's canopy cover declined by 27% between 1985 and 2002. This information has spurred city officials, led by the Mayor, and civic organizations like *People for Trees* to promote new tree planting.

Photo from *People for Trees*

Community Relationships

Public Support

Urban forestry programs cannot be sustained unless there is adequate support from the community and local government. As government employees, urban foresters are limited in their efforts to directly "lobby" for increased funding given their dependence upon the general fund. Therefore, help from local citizens in raising the importance of the urban forest in the political process is essential.

To reveal the sense of support felt by U&CF staff for their program, respondents were asked to rate both public and government support on a 1-5 ordinal scale (1=low, 5=high). Figure 39 displays the average rating percentage for each scale value. Clearly, the appear to be a fairly normal distribution across the 5 levels, centered on a neutral (3) evaluation. ***Although little evidence of a trend exists, evaluation of support at the extremes may be improving***. On either side of neutral there may be a slight slippage in the support since 1988.

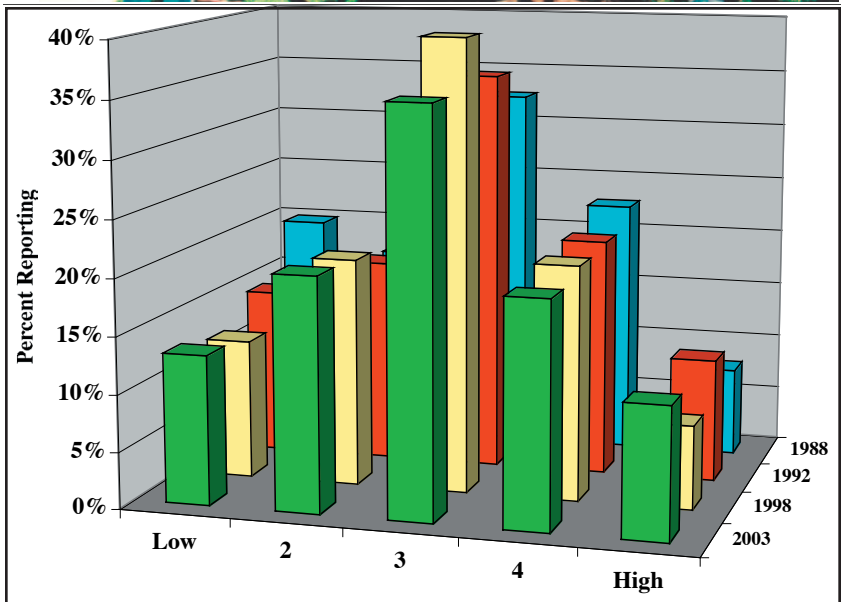


Figure 39. Evaluation of local citizen support, 1988 to 2003

Figure 40 illustrates the average rating of local government support over the 4 surveys. This distribution is clearly more skewed toward a sense of better support than in the citizens' case. ***In 1988, about 43% of the responding programs rated local government support higher than neutral; that is up to nearly 50% in 2003.*** This is an interesting result when compared to the declining budget situation that was described earlier in the report.

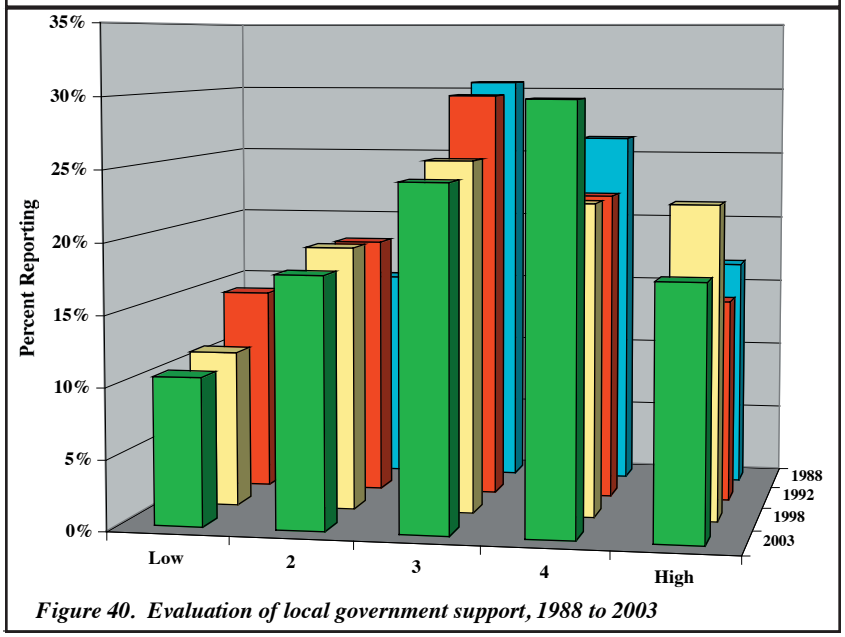


Figure 40. Evaluation of local government support, 1988 to 2003

Community Tree Boards

There are two basic types of community organizations that play a significant role in policy, education, promotion and program oversight. The first of these are tree boards or commissions which serve as advisory bodies to city government and in turn the U&CF program. The second of these are tree advocacy groups, often formed at the behest of the U&CF program directly.

Table 2. Percent of Programs with Tree Board/Commission

	1988	1992	1998	2003
Group w/ Duties	10%	11%	14%	28%
Group w/ some Duties	17%	39%	36%	30%
No Group/Commission	73%	50%	50%	42%

Table 2 indicates that only half of the respondents had a tree board or commission in 1997 or 1992, down from 73% in 1988. Those with boards having "some duties" specifically related to the tree program dropped slightly from 1992, more than doubling from 1988. These "duties" increasingly appear to be ones of public education and Arbor Day celebrations or special projects, as opposed to activities like policy setting and administration (see Figure 41). Respondents from U&CF programs seem to be satisfied that these boards are providing a beneficial role, according to Figure 42.

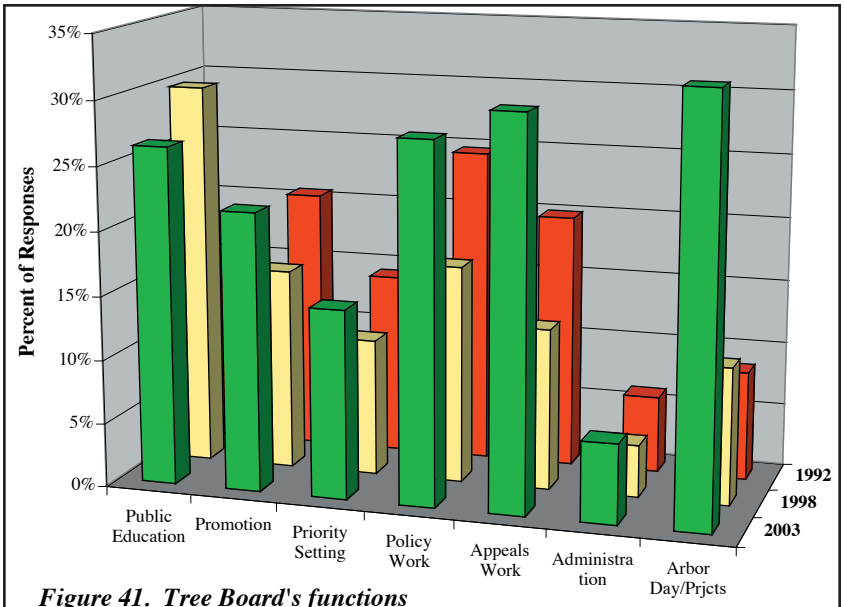


Figure 41. Tree Board's functions

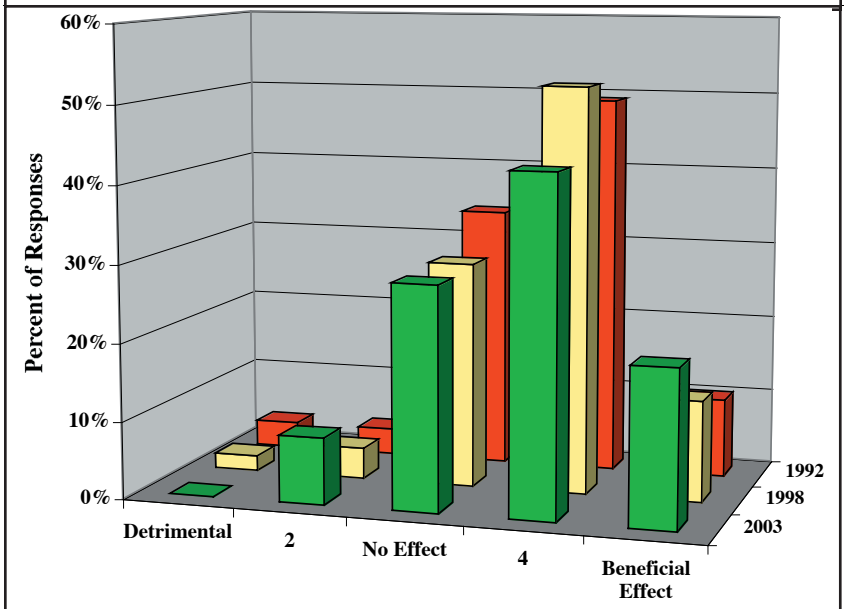


Figure 42. Evaluation of Tree Board's effect

"Arbor Day Tree Giveaway CA Natives In Liners-(2)" are given away to Lodi residents to plant in their private yards-350 with fertilizer, instructions and urban forest values handouts were provided-all were given away and more people asked for trees than we had. It got people involved in Urban Forestry and promoted drought to Grant Natives." ***Lodi, 1998***

Community Tree Boards (continued)

As shown in Figure 39, there is a clear need to improve public support. Certainly, municipal foresters should consider whether their policies and decisions align with the values of the community. But it could be simply a lack of promotion and advocacy. One of the highest priorities of every U&CF program should be to establish a "citizen tree advocacy" group.

Table 3. Percent of Respondents with a Tree Advocacy Group

	1988	1992	1998	2003
Yes	28%	25%	28%	26%
No	72%	75%	72%	74%

Table 3 indicates that ***communities with a tree advocacy group has been stable since 1988 at barely over 25% of the respondents*** -- far too few to champion their cause in their community. A significant contributing fact that may influence this flat trend is the declining response from municipalities without tree programs. All other objectives depend upon having an effective lobby in the media and government. But it is critical that the tree program and the advocacy group are in agreement. Furthermore, the diversity of the community must be recognized in both the means and the message in order for the urban forestry program to be truly sustainable (Dwyer et al. 2003, Johnston and Shimada 2004). Figure 43 indicates that the formation of such advocacy groups has a beneficial effect.

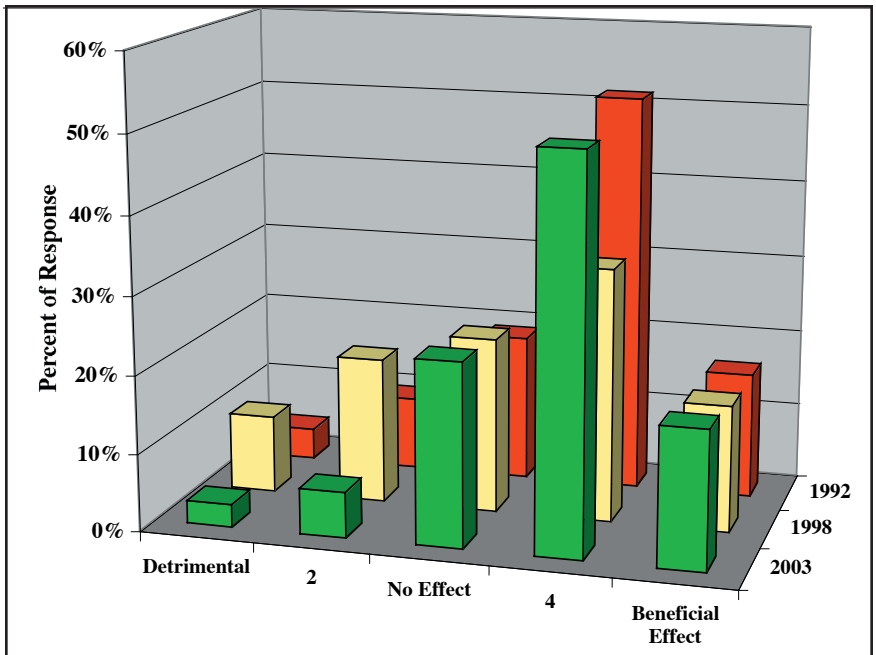


Figure 43. Evaluation of tree advocacy group's effect

"Willingness to spend time meeting with individuals and community groups is an good investment. "Influential" members of the community rallied together and held a meeting attended by about 250 people, including a few celebrities. After much discussion and some field demonstrations, they began advocating for increased support in city government." ***Los Angeles City, Parks & Recreation, 2003***

Education and Communication Methods

Survey results seem to show that much more work is needed to enlist the involvement and support of the public in both formal and informal ways. Communication is the key to building these relationships. Without them it will be very difficult to convey the message, values and issues of urban forestry. There are numerous outlets and methods for communicating information from the media to direct methods like school programs and Arbor Day celebrations. Figure 44 illustrates the trend in use of various communication methods and related media outlets.

In the first three surveys, around one-third of the respondents indicated that no education/communication means were used; fortunately this trend reversed in 2003 to about 10% (though, again, this may be a result of declining response from cities without tree programs). ***The 2003 survey also showed a significant jump in Arbor Day celebrations***, likely tied to the spike in such efforts by tree boards, as shown in Figure 44 .

These are very valuable opportunities in communicating the message of urban forestry, especially because it is usually easy to obtain media coverage. The outlet used least is TV/Radio interviews, public service announcements, etc. One obvious trend in significant decline is the use of the local paper. Coverage by local papers came in second as a means of education/communication, an increase from 1998 nearly back to earlier survey levels.

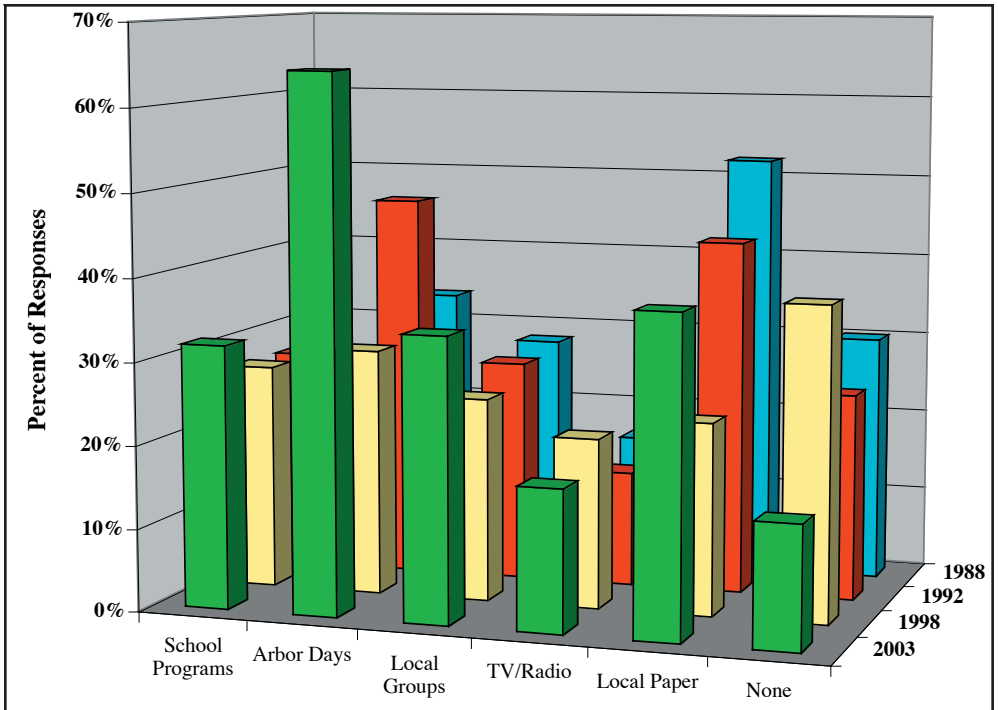


Figure 44. Public education methods

"I like to stay ahead of the game so I write a regular commentary in the OpEd section of the local newspaper." ***Lompoc, 2003***

"Working directly with public schools giving in house presentations has helped reduce vandalism and create awareness of the benefits to urban forestry." ***Manteca, 1998***

Tree Ordinances

Municipal tree ordinances are an important component of an urban forestry program, if they are properly designed and enforced. ***Starting with the 1992 survey, 65% of the respondents had a tree ordinance with about the same number feeling they needed one. As of 2003, both with an ordinance and needing one increased to 80%*** (see Figure 45). Perhaps, awareness of the merit of a proper tree ordinance accounts for both increases. Those that have ordinances increasingly think their ordinance is not in need of revision and is adequately enforced. Still, not quite half think their ordinance needs revision.

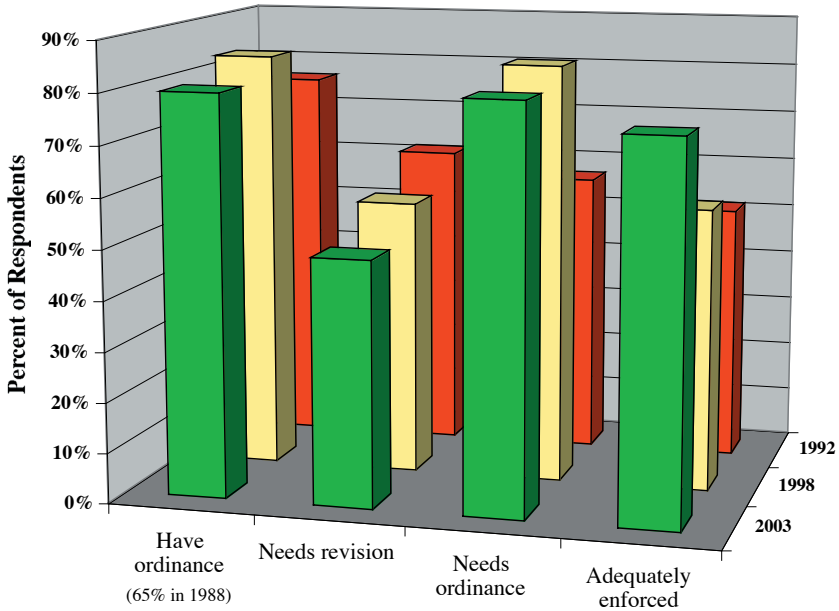


Figure 45. Status of tree ordinances

There are a variety of designs to tree ordinances with provisions ranging from preventing tree loss to requiring tree planting. The effectiveness 6 common ordinance provisions is presented in Figure 46. Generally all provisions are viewed as being relatively effective. Because it is easier to prevent a problem than to fix it, ***requiring tree planting as a condition for development is seen as the most effective provision***. Ordinance types or provisions that appear to be least effective are those aimed at abating tree hazards on private property and protecting trees during and after development. These evaluations have changed very little since 1992. Refer to Swiecki and Bernhardt (2001) for guidelines in developing tree ordinances.

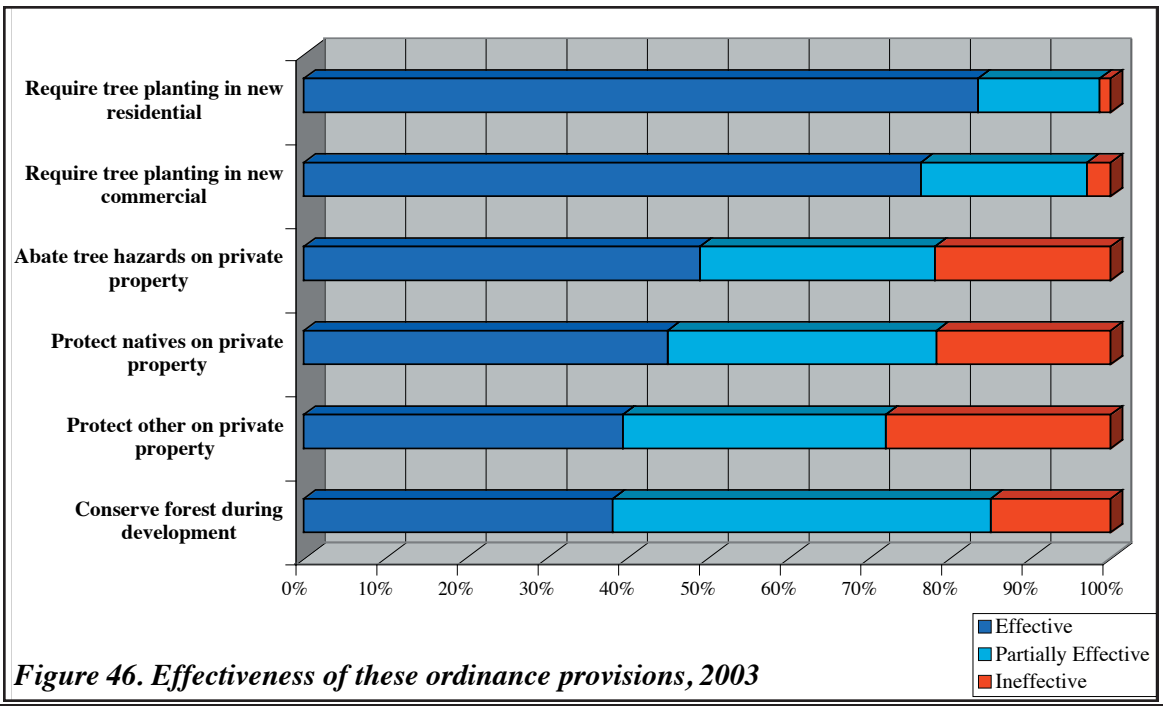


Figure 46. Effectiveness of these ordinance provisions, 2003

"Don't Mess With Our Trees" has tree ordinance 4:1 replacement with 24 foot wooden boxed trees. Two square mile town. Ordinance rigidly enforced with high community involvement." ***Hidden Hills, 1998***

"Need stronger protection of trees during construction of new homes. Need to make it part of planning process rather than after construction begins." ***Atherton, 1998***

Urban Forestry Benefits

This report has identified a number of positive as well as negative trends in the development of municipal programs to establish and enhance the community's green infrastructure. Unfortunately, this story of mixed successes will continue unless and unit communities understand the potential social, economic and ecological benefits of a sustainable urban forest. Beginning in the 1992, urban forestry managers have been asked to rank their perception of the potential benefits provided by the urban forest. These results are summarized in Figure 47.

The most frequently and consistently cited benefits of their green infrastructure are in the areas of community pride and the economic contribution to business and property values. Decreased hazards from better tree care has also been highly ranked over the years. Environmental benefits like stormwater and soil retention, and improved wildlife habitat have generally been perceived as the least important benefit of the urban forest but improvement in air quality and stormwater retention are gaining ground. Such environmental benefits clearly have significant economic and monetary benefits but these relationships are somewhat more difficult to prove and communi-

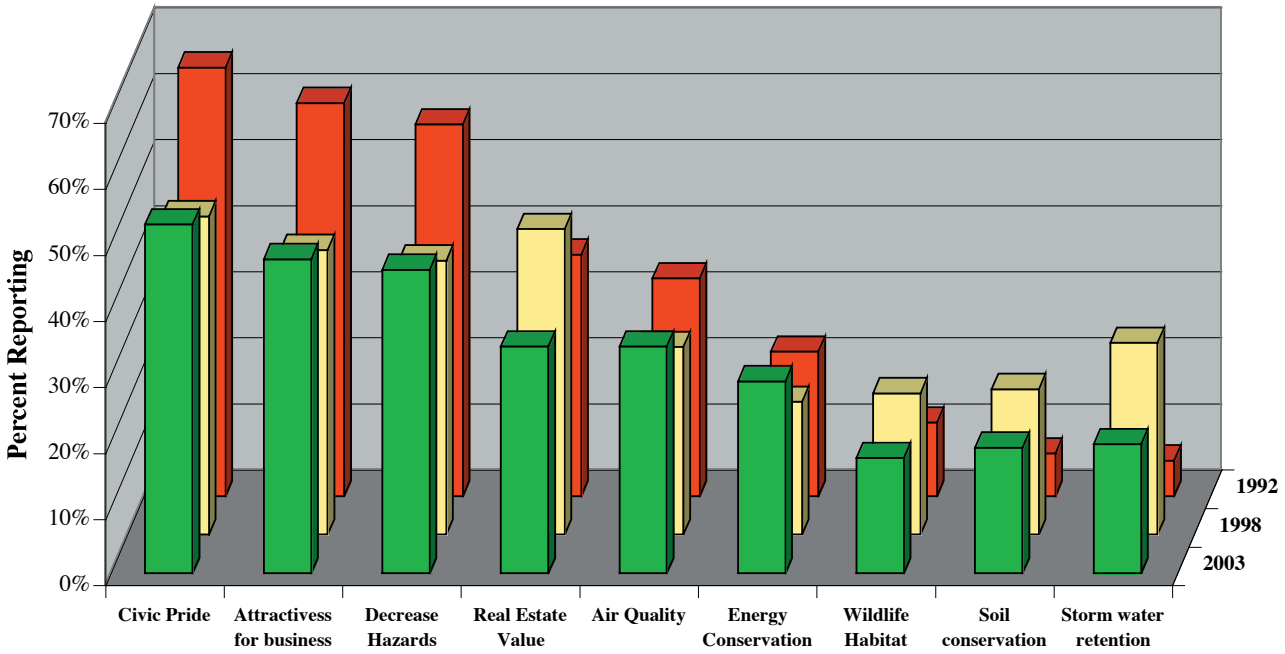


Figure 47. Trends in perceived benefits of urban forests based on 1992 rankings

Recent J. of Arboriculture publications on the benefits of urban forests

McPherson, G.E. 2005. Effects of street tree shade on asphalt concrete pavement performance. *J. of Arboriculture* 31(6): 303-310.

Lohr, V.I., Person-Mims, C.H., Tarnai, J. and D.A. Dillman. 2004. How urban residents rate and rank the benefits and problems associated with trees in cities. *J. of Arboriculture* 30(1): 28-35.

Lavern, R.J. and K. Winson-Geldeman. 2003. The influence of trees and landscaping on rental rates at office buildings. *J. of Arboriculture* 29(5): 281-290.

Westphal, L.M. 2003. Urban greening and social benefits: a study of empowerment outcomes. *J. of Arboriculture* 29(3): 137-147.

Nowak, D.J., J.C. Stevens, S.M. Sisinni, C.J. Luley. 2002. Effects of urban tree management and species selection on atmospheric carbon dioxide. *J. of Arboriculture* 28(3): 113-122.

"Older businesses in districts are becoming very aware that trees make an area much more pedestrian friendly and promote good community relations. They are also very willing to provide maintenance in almost all cases."
San Diego, 1998

Program Needs

To realize all the benefits that a healthy, sustainable urban forest can provide requires a wide range of services and knowledge. According to Figure 48, the need for funding increases, not surprisingly, remains the number one need. The results showing the decline in real budgets ensures that funding will continue to be the dominant concern of urban forestry well into the future. ***The need for better tree care has dropped to #4 rank probably due in large part to the push for certified tree care workers, both in the public and private sector.***

Though ranked only of moderate importance, two areas that show a clear increase are the need for planting space and better plant stock. The one need that is consistently ranked nearly last is the need for more technical information. This message should be heeded by those public institutions engaged in research and extension. From these results, research needs to be directed to methods and means by which urban forestry managers can obtain funds, community support and help from public works departments to provide adequate planting space for public trees.

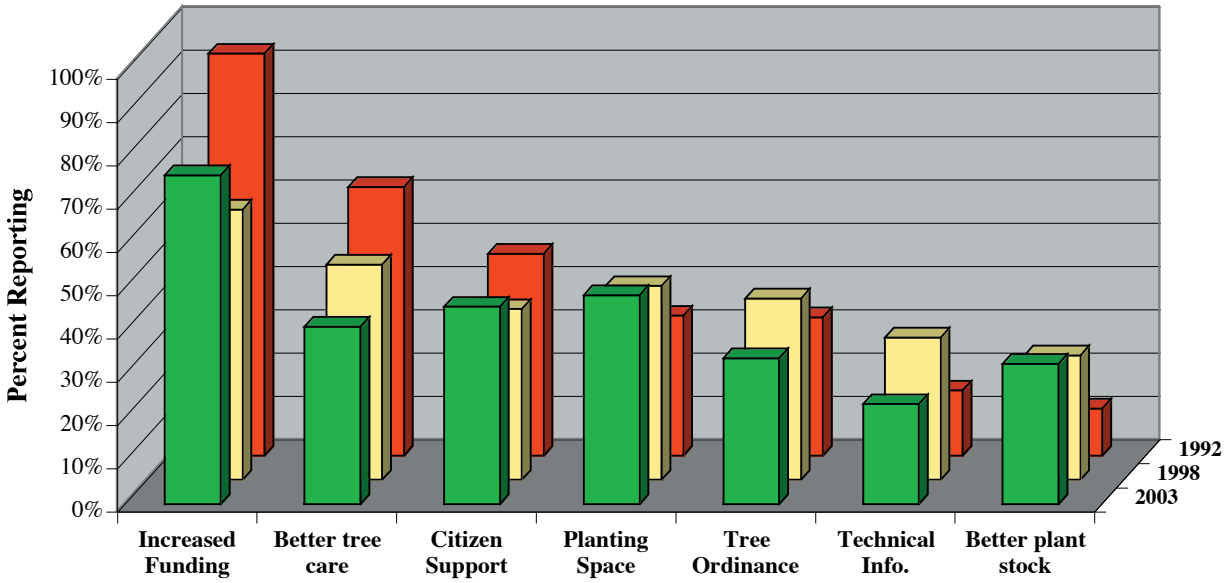


Figure 48. Trends in needs of U&CF programs based on 1992 rankings

"Street Design Manual was revised in 2003 to better accommodate street trees; it's been an outstanding success (www.sandiego.gov/planning/pdf/complete.pdf)." ***San Diego, 2003***

"We are just beginning to address urban tree needs. We are sponsoring an Arbor Day event and planting 285 trees. Within our largest park we have removed Ponderosa Pine which has paid for the cost share for a proposition 70 grant. Out tree committee has been very supportive." ***Trinity County, 1998***

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Appendix 1. References and Organizations related to Urban & Community Forestry

Federal Government

USDA Forest Service, Urban & Community Forestry
www.fs.fed.us/ucf

Western Center for Urban Forest Research and Education
www.fs.fed.us/psw/programs/cufr

California State Government

California Department of Forestry & Fire Protection, Urban Forestry Program
www.fire.ca.gov/php/rsrc-mgt_urbanforestry.php
The mission of the California Department of Forestry and Fire Protection's Urban Forestry Program is to develop a regional and statewide cooperative effort to advance the development of sustainable urban and community forests.

Urban Forest Ecosystems Institute
www.ufei.org

Non-Profit (National)

The National Arbor Day Foundation
www.arborday.org

Tree Musketeers
treemusketeers.org
TREE MUSKETEERS was the nation's first known nonprofit actually administered by kids with support of adults partners. The mission is to empower young people to lead environmental improvement in Earth's communities through innovative action and education programs that motivate others to become partners in a united youth movement. TREE MUSKETEERS is non-membership and headquartered in the Los Angeles area.

Non-Profit (California)

California ReLeaf
www.californiareleaf.org
California ReLeaf was founded in 1989 and incorporated as a 501(c)(3) nonprofit organization in 2004. Our mission is to empower grassroots efforts and build strategic partnerships that preserve, protect, and enhance California's urban and community forests.

California Urban Forest Council
www.caufc.org
The mission of CaUFC is to promote the proper planning, planting, and management of urban and community forests to maximize the quality of life for every Californian.

Professional

International Society of Arboriculture
wwwz.champion.isa-arbor.com/consumer/consumer.html

Society of Municipal Arborists
www.urban-forestry.com/mc/page.do
Founded in 1964, the SMA is an organization of municipal arborists and urban foresters affiliated with ISA. Our membership also includes consultants, commercial firms and citizens who actively practice or support some facet of municipal forestry.

General References

Urban Forestry Bibliography
web1.msue.msu.edu/imp/modb1/masterb1.html

Urban Forestry Library
www-stp.lib.umn.edu/for/bib/urban.html
1980 - present
Indexes publications relating to the history of urban forestry; urban forest legislation; the benefits of urban forests, selection and planting of trees; maintenance of the urban forest; planning and management; and urban forestry programs.

TreeLink
www.treelink.org
This site was created to provide information, research, and networking for people working in urban and community forestry.

Tree Ordinances

Guidelines for Developing and Evaluating Tree Ordinances
www.isa-arbor.com/publications/ordinance.aspx

Species Selection and Care

SelecTree
selectree.calpoly.edu
Maintained by UFEI, SelecTree is a database of 1,481 trees with up to 49 attributes and over 5,970 photos for 1,000 trees available from tree detail records.

Appendix 2. 2003 Urban & Community Forestry Survey

The California Department of Forestry and Fire Protection Urban Forestry Program first surveyed urban and community tree programs of California cities and counties in 1988. The survey results were presented in a report which helped local tree managers develop and maintain programs to care for trees. The past several years have brought many changes to our state. This follow-up survey, covering 2003, will allow us to document trends in urban forest management that have occurred since the last survey. The results of the new survey will be presented in a report that will be sent to all survey participants. The report will aid you in planning for and maintaining your community's trees.

***Please respond* with answers appropriate to your jurisdiction whether city or county.**

Read "city/county" as appropriate to your situation, either city or county.

We are a _____ City _____County(check one).

If you have any questions or comments about the survey please contact Eric Oldar (909)320-6125 or John Melvin at CDF (909) 320-6124. Phytosphere Research developed the original survey and further refined by the Urban Forest Ecosystem Institute in 1998 for the California Department of Forestry & Fire Protection - contract (Eric Oldar).

Please return this questionnaire by either Email to: eric.oldar@fire.ca.gov
or by US Mail:

Urban Forestry Program
CA Dept of Forestry & Fire Prot
2524 Mulberry Street
Riverside, CA 92501

1 Does your community currently use any public funds to carry out tree planting or tree care activities within its boundary?

_____ YES _____ NO (if NO, please skip to question l1, page 11)

2 If yes, please complete the survey, answering all of the questions which are applicable to your community. Some of the questions will ask for information from 2003. Please indicate whether your responses will be based on a fiscal year identical to the calendar year 2003 or to a fiscal year covering parts of 2002 and 2003

_____ FISCAL YEAR SAME AS CALENDAR YEAR 2003
_____ FISCAL YEAR STARTING _____, 2002

- - - - - - - - - - - - - - - - - - A. TREE PROGRAM BUDGETS -

A1 **Do you feel your tree planting and maintenance budget is adequately funded?**

_____ YES _____ NO _____ NOT SURE

A2 **Compared to 2001, did your tree budget in 2002 (choose one):**

_____ INCREASE (Please estimate percent _____% increase)
_____ DECREASE (Please estimate percent _____% decrease)
_____ REMAINED THE SAME

A3 **What was your tree program's total budget in 1998? (Please estimate if not known exactly. Write "UE" if unable to estimate.)**

$_____

A4 **What percent of your tree budget is spent on private contractors? (Please estimate if not known exactly. Write "UE" if unable to estimate.)**

_____%

A5 **What percent of the tree budget comes from the following sources? (Please estimate if not known exactly. Write "UE" if unable to estimate.)**

_____ % GENERAL FUND
_____ % ASSESSMENT DISTRICTS
_____ % PERMIT FEES
_____ % GRANTS
_____ % GAS TAX MONEY
_____ % REDEVELOPMENT FUNDS
_____ % FINES
100%

A6 **In your community, do you think that assessment fees could be used to fund most or all city tree care activities in** new **developments?**

_____ YES _____ NO _____ NOT SURE

A7 **In your community, do you think that assessment fees could be used to fund most or all city/county tree care activities in existing developments that do not now have such assessment districts?**

_____ YES _____ NO _____ NOT SURE

B. PERSONNEL

B1 **Compared to the previous year, did staffing levels for the tree program in 2002/03 (choose one):**

_____ INCREASE (Please estimate percent _____% increase)
_____ DECREASE (Please estimate percent _____% decrease)
_____ REMAIN THE SAME

B2 **How many people did your tree program employ in 2002/03?**

_____ NUMBER FULL TIME
_____ NUMBER SEASONAL/PART TIME. **For seasonal/part time please estimate the total number of full time equivalents: _____FTE**

B3 **For what purposes do you use private contractors, and how satisfied are you with the results?**

Private contractors used for: **(Please list # firms & circle all categories that apply)**

#Firms		#Certified Firms	Unsatisfied	Satisfied	Partially Satisfied	Very Satisfied
___	Arborist/tree reports	_____	0	1	2	3
___	Emergency work	_____	0	1	2	3
___	Pest control	_____	0	1	2	3
___	Planting	_____	0	1	2	3
___	Routine pruning	_____	0	1	2	3
___	Lack specialized equipment	_____	0	1	2	3

C. TREE PLANTING AND NURSERY STOCK

C1 **Please rank from 1 to 4 within each column (1=most important) the following for their importance to you in choosing trees for street and park plantings.**

	STREETS	PARKS
AMOUNT OF SHADE TREE WILL CAST	_____	_____
AESTHETICS OF TREE	_____	_____
COST OF FUTURE MAINTENANCE	_____	_____
SPACE AVAILABLE FOR GROWTH	_____	_____
DEATH LOSS	_____	_____
DISEASE/FLOOD,WIND FALL	_____	_____

C2 **How many trees did your program plant or contract for in 1998? (Please estimate if not known exactly. Write "UE" if Unable to Estimate.)**

_____ STREET TREES **(include trees along streets and in parking lots)** _____ PARK TREES **(include trees in cemeteries, golf courses, public buildings, etc., but not wildland or open space trees)**

_____ OPEN SPACE/WILDLAND TREES

C3 **How many new city/county trees were planted by people outside your program in 1998? (Include only trees that your program will care for in the future. Write "UE" if unable to estimate.)**

_____ TOTAL _____ **by contractor** _____ BY PRIVATE VOLUNTEERS

C4 **Please list the 5 tree species most commonly planted by your program along** streets **in 1998**

STREET TREE SPECIES OR COMMON NAME	% OF TOTAL PLANTED
1. _____	_____%
2. _____	_____%
3. _____	_____%
4. _____	_____%
5. _____	_____%

C5 **Please list the 5 tree species most commonly planted by your program in** parks **in 1998.**

PARK TREE SPECIES OR COMMON NAME	% OF TOTAL PLANTED
1. _____	_____%
2. _____	_____%
3. _____	_____%
4. _____	_____%
5. _____	_____%

C6 **Please estimate the percent of** street **trees your program planted in 1998 that will be:**

LESS THAN 30 FT TALL AT MATURITY	_____%
30-60 FT TALL AT MATURITY	_____%
60 FT OR TALLER AT MATURITY	_____%

C7 **Please estimate the percent of** park **trees your program planted in 1998 that will be:**

LESS THAN 30 FT TALL AT MATURITY	_____%
30-60 FT TALL AT MATURITY	_____%
60 FT OR TALLER AT MATURITY	_____%

C8 **Please rank from 1 to 4 within each column (1=most common) the sizes of tree nursery stock your program uses in street and park plantings. (Please write 0 for any size class not used.)**

	STREETS	PARKS
1 GAL OR SMALLER	_____	_____
5 GAL	_____	_____
15 GAL	_____	_____
24 INCH BOX OR LARGER	_____	_____

C9 **In the past year, which of the following nursery stock factors have affected your tree planting program? (Please check all that apply.)**

_____ **DESIRED TREES AVAILABLE BUT** TOO EXPENSIVE
_____ **DESIRED TREE** SPECIES OR CULTIVARS **NOT AVAILABLE**
_____ **DESIRED** SIZES **OF TREE NURSERY STOCK NOT AVAILABLE**
_____ **TREE NURSERY STOCK OF ACCEPTABLE** QUALITY **NOT AVAILABLE**

C10 **How often have you encountered the following quality problems in tree planting stock?**

	Never				Always
	(Please circle your answer.)				
Poor root structure (example-girdled roots)	**1**	**2**	**3**	**4**	**5**
Poor stem taper	**1**	**2**	**3**	**4**	**5**
Poor top structure (example-leader headed)	**1**	**2**	**3**	**4**	**5**
Insects or diseases	**1**	**2**	**3**	**4**	**5**

C11 **When tree planting is required in new residential subdivisions, who is** required **to: (Please circle all that apply.)**

PAY FOR TREES:	DEVELOPER	CITY/COUNTY	HOMEOWNER
PLANT TREES:	DEVELOPER	CITY/COUNTY	HOMEOWNER
MAINTAIN TREES:	DEVELOPER	CITY/COUNTY	HOMEOWNER

D. TREE CARE

D1 **Please indicate which local government departments or offices have responsibility for tree care or community tree management in your city/county?**

_____ PARKS AND RECREATION
_____ PUBLIC WORKS
_____ PLANNING
_____ COMMUNITY SERVICES
_____ ADMINISTRATION
_____ FLOOD

D2 **How has California's extended drought/floods affected your tree program?**

In Drought		In Flood
	<= (Please check all that apply) =>	
_____	NO EFFECT	_____
_____	WE'VE REDUCED WATERING OF TREES	_____
_____	INCREASED USE OF RECLAIMED (FLOOD) WASTEWATER IRRIGATION	_____
_____	WE'RE PLANTING MORE DROUGHT RESISTANT TREES	_____
_____	WE'VE STOPPED PLANTING TREES ALTOGETHER	_____
_____	WE'RE STILL PLANTING TREES, BUT WE'RE PLANTING FEWER TREES	_____
_____	WE'VE CHANGED SEASON OF PLANTING	_____
_____	WE'VE CHANGED PLANTING SPECIFICATIONS	_____
_____	WE'VE HAD INCREASED TREE MORTALITY	_____
_____	PLANTING DISEASE RESISTENT TREES	_____

D3 **What percentage of the trees your program cares for were irrigated in 1998?**

_____ **%**

D4 **Have concerns about fire prevention affected the tree program in any way?**

_____ NO _____ YES **(Please specify how)** _____

D5 **How many trees is your program responsible for?**

_____ STREET TREES **(include trees cared for along streets & in parking lots)**

_____ PARK TREES **(include trees cared for in cemeteries, golf courses, public buildings, etc., but not wildland nor open space trees)**

_____ OPEN SPACE/WILDLAND

D6 **Considering all trees in the city/county (including all of the trees in private yards, school yards, cemeteries, and so on), what percent does the program care for in each of the following areas? (Please enter NA for land uses your city/county does not have. Write UE if unable to estimate.)**

The city/county cares for approximately:

_____ **%** OF ALL TREES IN RESIDENTIAL AREAS

_____ **%** OF ALL TREES IN INDUSTRIAL AREAS

_____ **%** OF ALL TREES IN COMMERCIAL AREAS

_____ **%** OF ALL TREES IN **OPEN SPACE** AREAS

D7 **Considering all trees in the city/county, what percent does your program care for overall? (Write UE if unable to estimate.)** The program cares for approximately:

_____ **%** OF ALL TREES, CITY/COUNTY-WIDE

D8 **For the tree maintenance that your program performs, please indicate the percentage that falls into each of the following categories:**

_____ % IS PERFORMED ON A SYSTEMATIC, REGULARLY SCHEDULED CYCLE
_____ % IS PERFORMED ON DEMAND, IN RESPONSE TO UNANTICIPATED PROBLEMS

D9 **What is the longest planning interval for your tree program?**

_____ YEAR(S)

D10 **Do you think your program would be more cost-efficient if you could increase your planning interval?**

_____ YES _____ NO _____ NOT SURE

- - - - - - - - - - - - - - - - - - E. PRUNING AND REMOVAL -

E1 **How many trees does your program prune per year? (Please estimate if not known exactly. Write "UE" if unable to estimate.)**

_____ JUVENILE TREES BEING TRAINED

_____ ESTABLISHED TREES

E2 **Including all public and private trees in your community, what percent would you estimate have been topped?**

_____ %

E3 **How does your program dispose of trimmings and removals? (Please estimate the percent in each category.)**

_____ % BURNED
_____ % DUMPED
_____ % CHIPPED FOR MULCH AND USED BY THE CITY
_____ % CUT FOR FIREWOOD AND SOLD OR GIVEN AWAY
_____ % USE FOR BIOFUEL ENERGY GENERATION
_____ % USED FOR SOLID WOOD RECYCLING

Several different organizations have developed pruning standards. Please use the abbreviations shown below to answer the next two questions.

NAA **(National Arborist Association)** ISA **(International Society of Arboriculture)**

ANSI **(American National Standards Institute)** CDPR **(California Department of Parks and Recreation)**

E4 **Please list any pruning standards that city/county tree workers follow. (Please specify the type if other than the standards listed above. Write "NONE" if no pruning standards are followed.)**

_____

E5 **Does your city/county require any of the groups listed below to follow any pruning standards? (Please specify the type if other than the standards listed above. Write "NONE" if no pruning standards are required.)**

Pruning work done by:	Pruning standards required:
CONTRACTORS DOING WORK FOR CITY/COUNTY	_____
UTILITY COMPANIES	_____
COMPANIES DOING WORK ON PRIVATE TREES	_____
INDIVIDUALS DOING WORK ON PRIVATE TREES	_____

E6 **How many trees did your program remove in 2002/03 (last fiscal year)?**

_____ TREES

F. TREE INVENTORIES

F1 **Does your city/county have a tree inventory?**

_____ YES
_____ NO **(Please skip to question G1)**

F2 **How often is the tree inventory used as a tool for decision making? (Please circle the appropriate number.)**

RARELY				FREQUENTLY
1	2	3	4	5

F3 **Is the tree inventory computerized?**

_____ YES _____ NO

G. LIABILITY AND HARDSCAPE DAMAGE

G1 **Which of the following methods does your community use to limit tree-related liability claims? (Please check all that apply.)**

_____ PROGRAM TO IDENTIFY AND ABATE HAZARDOUS TREES AND BRANCHES
_____ PROGRAM TO IDENTIFY AND REPLACE SIDEWALKS DISPLACED BY TREE ROOTS
_____ ALL FILED CLAIMS ARE STRONGLY CONTESTED BY CITY
_____ TRANSFER RESPONSIBILITY FOR CITY TREES TO PRIVATE LANDOWNERS

G2 **Please check any of the following types of root barriers your city/county uses to reduce damage caused by tree roots to sidewalks and curbs. Also, for barriers in place at least 5 years, please rate the overall effectiveness in preventing damage.**

Methods used	Ineffective	Partially Effective	Effective	Not Sure
(Please check all uses applicable)	**(Circle your evaluation of effectiveness** for barriers in place at least 5 years)			
____ **Linear barriers**	**0**	**1**	**2**	**NS**
____ **Encircling barriers** (example-root boxes)	**0**	**1**	**2**	**NS**
____ **Chemical impregnated barriers**	**0**	**1**	**2**	**NS**

G3 **Which of the following additional methods has your city/county used to reduce damage caused by tree roots to sidewalks and curbs? Also, for methods used at least 5 years, please rate overall effectiveness in preventing damage.**

Methods used	Ineffective	Partially Effective	Effective	Not Sure
(Please check all uses applicable)	**(circle your evaluation of effectiveness for methods in use at least 5 years)**			
____ **Species selection**	**0**	**1**	**2**	**NS**
____ **Realigning sidewalks around existing trees**	**0**	**1**	**2**	**NS**
____ **Eliminating tree lawns between sidewalk and curbs**	**0**	**1**	**2**	**NS**
____ **Re-engineering sidewalks to avoid damage by roots**	**0**	**1**	**2**	**NS**
____ **Pruning roots of trees that are damaging sidewalks**	**0**	**1**	**2**	**NS**

G4 **Please list any species that in your experience become hazardous or are prone to failure after root pruning. Please list by the time frames shown below.**

SPECIES WITHIN **5** YEARS OF ROOT PRUNING: _____ _____

_____ _____ _____

SPECIES MORE THAN **5** YEARS AFTER ROOT PRUNING: _____ _____

_____ _____ _____

H. COMMUNITY INVOLVEMENT WITH THE TREE PROGRAM

H1 **Do people from any of the following groups plant or care for city/county street, park, or open space trees? (Please check all that apply.)**

_____ CORRECTIONAL INSTITUTIONS OR PROGRAMS
_____ ADULT VOLUNTEERS OR CIVIC ORGANIZATIONS **(specify _____)**
_____ YOUTH ORGANIZATIONS/PROGRAMS **(specify _____)**

H2 **What outlets or events do you use for public education? (Please check all that apply)**

_____ SCHOOL PROGRAMS
_____ ARBOR DAY CELEBRATION
_____ SPEAK TO LOCAL GROUPS
_____ LOCAL TV/RADIO
_____ LOCAL PAPER
_____ NONE

H3 **Please rate the level of support you believe your program has in each category listed below (please circle your answer).**

	Low				High
LOCAL GOVERNMENT SUPPORT	1	2	3	4	5
LOCAL CITIZEN SUPPORT	1	2	3	4	5

H4 **What type of relationship is there between the tree program and citizen boards or commissions in your city/county? (Please check one choice)**

_____ A CITIZEN TREE BOARD/TREE COMMISSION WITH DUTIES RELATED ONLY TO THE TREE PROGRAM.
_____ A CITIZEN BOARD/COMMISSION WITH SOME DUTIES RELATED TO THE TREE PROGRAM.
_____ NO CITY CITIZEN BOARDS/COMMISSIONS INTERACT WITH THE TREE PROGRAM.
(Please skip to H7, page 10)

H5 **What functions does the citizen board or commission perform related to the tree program? (Please check all that apply)**

_____ PUBLIC EDUCATION ABOUT THE TREE PROGRAM
_____ PROMOTING TREE PROGRAM TO CITY COUNCIL
_____ SETTING PRIORITIES FOR THE TREE PROGRAM
_____ ESTABLISHING POLICY RELATED TO TREES
_____ HEARING APPEALS RELATED TO THE TREE ORDINANCE
_____ ADMINISTERING THE TREE PROGRAM
_____ ARBOR DAY AND SPECIAL PLANTING PROJECTS

H6 **Please rate the effect the citizen board or commission has on the tree program. (Please circle your answer.)**

DETRIMENTAL EFFECT		NO EFFECT		BENEFICIAL EFFECT
1	2	3	4	5

H7 **Do you have a citizen "tree advocacy" group in your city/county? (Do not include city boards or commissions.)**

NO _____ _____ YES GROUP NAME_____

H8 **If yes, please rate the effect the citizen "tree advocacy" group has on the tree program. (Please circle your answer.)**

DETRIMENTAL EFFECT		NO EFFECT		BENEFICIAL EFFECT
1	2	3	4	5

H9 **In your opinion, what are the three greatest needs of your city/county's tree program? (Rank from 1 to 3, where 1=most important.)**

____ Increased funding
____ Better quality planting stock
____ Improved tree maintenance
____ Increased citizen support
____ More technical information about trees and tree care
____ Adequate space for trees
____ New or improved tree ordinance

H10 **In your opinion, what are the three most important benefits the tree program can provide to your city/county? (Rank from 1 to 3, where 1=most important.)**

____ Decrease the prevalence of hazards associated with trees.
____ Improve attractiveness of our community for business development.
____ Improve civic pride and sense of community among city residents.
____ Help the community conserve energy.
____ Provide wildlife habitat.
____ Decrease soil erosion.
____ Decrease runoff during storms.
____ Decrease local air pollution.
____ Increase real estate values & hence the tax base of our community.

H11 **Many tree managers are interested in how other communities are approaching problems in urban forest management. Do you have a "success story," an example of an innovative solution to a community forest management problem which you would be willing to share with other tree programs? If so, please describe briefly below or on the back of the survey. We would like to feature a number of these "success stories" in the report that describes the findings of this survey.**

_____
_____
_____
_____
_____
_____

I. ORDINANCES

I1 **Are you aware of the 1991 California Department of Forestry and Fire Protection publication *Guidelines for Developing and Evaluating Tree Ordinances?***

_____ YES _____ NO

I2 **Has this publication been used in your community in any of the following ways? (Please check all that apply.)**

_____ USED TO HELP WRITE NEW ORDINANCE
_____ USED TO HELP REVISE EXISTING ORDINANCE
_____ USED EVALUATION METHODS TO EVALUATE EXISTING ORDINANCE EFFECTIVENESS
_____ USED TO HELP ESTABLISH AN OVERALL COMMUNITY FOREST MANAGEMENT STRATEGY

I3 **Does your community have a tree ordinance and/or sections of municipal code pertaining to trees?**

_____ YES _____ NO

I4 **If yes, do you feel that your current tree ordinance or code needs to be revised?**

_____ YES
_____ NO

I4b **If no, do you feel that your community needs a tree ordinance?**

_____ YES **(please skip to 17, pg. 12)**
_____ NO **(please skip to 17, pg. 12)**

I5 **Please check which of the following points are included in your tree ordinance, and indicate how effective each is in accomplishing the purpose for which it was intended.**

Ordinance provisions	Ineffective	Partially Effective	Effective	Can't Evaluate
(Please check all that apply)	(Circle your evaluation of effectiveness)			
____ Provides for protection of individual native trees on private property	0	1	2	CE
____ Provides protection of other existing trees on private property	0	1	2	CE
____ Provides/ conserves integrity of forests or woodlands during development	0	1	2	CE
____ Requires tree planting in new residential dev.	0	1	2	CE
____ Requires tree planting in new commercial dev	0	1	2	CE
____ Allows city to abate tree hazards and nuisances on private property	0	1	2	CE

I6 **Overall, are tree-related ordinances adequately enforced in your city/county?**

_____ YES _____ NO _____ NOT SURE

I7 **Please indicate the following:**

YOUR NAME: _____

JOB TITLE OR POSITION: _____

DEPARTMENT: _____

MAILING ADDRESS: _____

CITY: _____ ZIP _____

PHONE NUMBER: _____

E-MAIL ADDRESS: _____

Were you the one who filled out the 1992 survey? ____Yes ____No

We would appreciate any other comments you have related to community tree programs.

Appendix 3. Survey Respondents

City Respondents (*in City Alphabetic Order)*

Richard D. Paina, Public Works Supervisor, maintenance, 1616 Fortmann Way. Alameda, Ca, 94501, (570) 747-7900,
Tom Cardoza, Park Superintendent, 111 S. First St., Alhambra, 91801, (626) 570-5048
Larry Pasco, Urban Forestry Mgr., Community Services, 1426 E. Vermont Ave, Anaheim, 92805. (714) 765-6920.
Frank Palmeri, Park Superintendent, Public Works, PO Box 5007, Antioch, Ca. 94509, (925) 779-6955
Jennifer Clarke, Park & Rec Mgr. 14955 Dale Evans Parkway, Apple Valley, CA 92307 (760) 240-7884.
David C. Thompson, Street Superintendent, Public Works, 11800 Goldring Rd., Arcadia, 91066 (626) 256-6676
Dan Hunandy, Director, Parks & Recreation Facilities, P.O. Box 643, AG, Ca, 93421, (805) 473-5474
Reg. Murray, Assoc. Planner, 1225 Lincoln Way Rm#3, Auburn, 95603 (530) 823-4211 x140
Paul Graham, Urban Forester, Recreation & Parks 1401 Truxtun Ave, Bakersfield, 93301. (661) 326-3147.
Michael Sather, Supervisor, Public Works, 8327 Garfield Ave. Bell Gardens, CA 90201
Jerry Koch, Senior Forestry Supervisor, Parks Rec & Waterfront, 1326 Allston Wax, Berkeley 94521. (510) 644-6566.
Jennifer Vasquez, Management Analyst, 600 Winston Ave., Bradbury, 91010, (626) 358-3218
Bill Bowlus, Maint.Services Sup., 1 Civic Center Circle, Brea, CA 92821 (714) 990-7694
Rudy Cisneros Public Works Sup. 6650 Beach Blvd. Buena Park, 90620 (714) 562-3703
Janice Bartolo, Deputy Dir. 275 E. Olive Ave, Burbank, 91510 (818) 238-5300
Bill Millar, Landscape District Maintenance Mgr., 26135 Mulean Rd, Calabasas, 91302, (818) 878-4242 ext.250
Ernie Villasenor, Superintendent Public Works, 601 Carmen Dr., Camarillo 93010 (805) 388-5338
Vince Huppe, Park Supervisor, Public Works, 70 N. First St., Campbell, CA 95008, (408) 866-2743
Mike Branson, City Forester, Forest Parks and Beach Dept., PO Box SS, Carmel 93921, (831) 624-3543
John Haynes, Park Supr., 2220 Magnolia St. Ceres, 95307 (209) 538-5784
Chris Boza, Urban Forester, Park, P.O. Box 3420 Chico, CA 95928. (530) 695-4944
Kurt Powell, Public Works Services Manager, 5050 Schaefer Avenue, Chino, CA, 91710, (909) 591-9883
Thomas Leuesque, City Arborist, Public Works Operations, 1800 Maxwell Rd., Chula Vista, 91911, (619) 397-6010
Mark Hodnick, Community Services, 215 Cornell Ave. Claremont, 91711, (909) 399-5431
Patty Hickel, Administrator, Public Works, PO Box 1063, Colusa, 95932, (530) 458-5622
David Brazier, Park Sup/City Arborist, Public Services, 101 B. Ave, Coronado, 92118 (619) 522-7388
Vince Mastrosimone, Public Works Director, 125 E College Street, Covina 91723-2199 (626) 858-7248
Steve W. Cooper, Street and Tree Maint. Supr., Public Works, PO Box 507, Culver City, 90232-0507, (310) 253-6440
Rob Cain, City of Arborist, Parks & Community Services. 23 Russell Blvd, Davis, 95616. (530) 757-5626 x7326
Philip Newhouse, Comm. Serv. Director, Comm Services, PO Box 939, Delano, 93216-0939, (601) 721-3335
Anthony Jordan, Parks Maintenance Supr. 21825 Copley Drive, Diamond Bar, CA 91765 (909) 839-7063
John Frenken, Park and Beach Suptd, Park & Recreation, 505 S. Vulcan Ave., Encinitas, Ca. 92024, (760) 633-2755
Debra Day, Arborist, 16489 Orange Way, Fontana 92335
Jason Dose, Associate Planner Comm. Dev., 416 North Franklin St. Fort Bragg, 95437 (707) 961-2823 x.107
Gloria Reta, Park Maintenance Supervisor, Urban Forestry, DES, 37350 Sequoia Rd., Fremont 94537 (510) 713-5727
Dan Sereno, Landscape Sup. 1580 W. Commonwealth Ave., Fullerton, 92833 (714) 738-6805
Todd Barreras, Supervisor, Community Services, 7351 Rosanna St, Gilroy, 95020. (408) 846-0281
Deborah Day, Urban Forester, Public Works, 541 E. Chevy Chase, Glendale, CA 91(204, (818) 548.3950
Richard Fitzhugl, Public Works Superintendent, 125 e. Main St., Grass Valley, 95945, (530) 477-4620
Dan Nagel, Landscape Manager, Public Works, 16 Barnes Court, Suite #3, Hayward, Ca 94544, (510) 583-8907
Rich Morgan, Director of Public Works, Hermosa Beach, Ca
Kim Stater, Economic Development Specialist, RDA, 27215 Base Line, Highland, (909) 864-8732
James Jones, Maint Operations Manager, 17371 Gothard Street, Huntington Beach 92647 (714) 536-5024
Mark Martinez, Tree Maintenance, Park & Rec, 1 Manchester Blvd., Inglewood, 90301, (310) 412-8750
Henry Canales, Landscape Sup 6427 Oak Canyon, Irvine 92618-5202 (949) 724-7621
Sal Morales, Interim Superintendent, Public Works Dept., 212 S. Vanderhurst Ave., King City, 93930, (831) 386-3281
Donald Pauley, City Manager, City Hall, 1401 Draper St., Kingsburg, 93631, (559) 897-5821
Brian Allen, Public Works Inspector, 30001 Ladyface St., Agoura Hills Ca., 91301, (818) 597-7333
George Gonzalez, Chief Forester, 600 S. Spring St 10th Floor, LA 90014, (213) 485-5675
Alex Waite, Admin. Aide, Public Works. 15515 Phoebe Ave, La Mirada, 90638, (562) 902-2382
Janet L. Cates, Recreation Supervisor, Rec & Comm Svcs, 7821 Walker St., La Palma 90623, (714) 690-3359

Steve Castellanos, Director, Public Works, 1327 Foothill Blvd., La Canada Flintridge 91011 (818) 790-8882
Jan Frainie, Parks & Landscape Supr., Pub Ser, 25201 Paseo de Alicia suite 150, Laguna Hills, 92653, (949) 707-2652
City of Lake Elsinore, 130 South Main Street, Lake Elsinore, CA 92530
Phillip Horn, Public Works Inspector, 46008 7th, West, Lancaster, CA 93534 (661) 723-6227
Lynn Breitenbucher, Deputy Director, Public Works Department 16775 Howland Rd, Lathrop, CA 95330 (209) 858-2860
D.W. Donahoo, Public Works, Grounds Supr., 3232 Main Street, Lemon Grove, CA 91945 (619) 825-3830
Ed Murdock, Landscape Maint. Suprvr., 3500 Robertson Park Rd., Livermore, CA 94550, (925) 960.8027
Steve Dutra, Parks Superintendent, Parks Division 125, North Stockton Street, Lodi, 95240 (209) 333-6742
Cindy McCall, Parks & Urban Forestry Manager, P.O. Box 8001, Lompoc 93438 (805) 737-0595
Teresa Proscewicz, Principal Forester, Rec. & Parks, 3900 West Chevy Chase Dr., City of LA 90039 (213) 485-6547
Michael O'Brien, Maint. III. Public Services, 830 6th St., Los Banos, 93635, (209) 827-7034
Ed Maze, Parks Planning Manager (City Arborist), Parks & Rec., 252 Magnolia Ln, Manteca, 95337, (209) 239-8477
Gary A. Cramblett, Public Works Superintendent, 211 Hillcrest Ave. Marina, 93933 (831) 884-1242
Dave Lusty, Park Maintenance, 525 Henrietta St, Martinez 94553 (925) 372-3583
David Lamon, City Services Dir, PO Box 150, Marysville, 95901 (530) 749-3902
Gordon Gray, Public Works Manager, Public Works, 1776 Grosan Ave. Merced, CA 95340 (209) 385-6806
Bill Dufresne, Forestry Superintendent, Public Works, PO Box 642, Modesto, 95353, (209) 342-2233
Mario Orioli, Superintendent, Public Works, PO. Box 2308 Montclair 91763 (909) 625-9466
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Greg Cain, Maint. & Op Manager-PW, P.O. BOX 88005, Moreno Valley, 92552-0805, (909)413-3160
Mori Scruve Dep. Director, Public Works, 100 Eder Ct. Morgan Hill, CA 95037. (408) 776-7773
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Miguel A Diaz, Acting Park & Red Director, Parks & Recreation, 140 East 12th St. National City, 91950. (619) 336-4290
Jeff Kemp, Street Tree Maint. Sup., 4927 Oceanside Blvd, Oceanside, CA 92056 (760)435-5208
Glean Hawks, City Engineer 408 So Squal St, Ojai, 93023 (805) 640-2560
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Lisa Hagopian, Parks Main. Sup., P.O. BOX 520, Pleasant, 94566
Ariel De La Paz, Contract Coordinator, Comm Services, 505 S. Garey Ave. Box 660, Pomona, 91769, (909) 620-3734
Milt Stowe, Chief of Operations, Parks & Rec, 291 N Main St, Porterville, 93257 (559) 782-7536
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Robert(Tony) Bowers, Street Supr, Public Works, 14467 Lk. Poway Rd P.O Box 789, Poway, 92064, (858) 668-4737
Jeff Barnes, Park & Landscape Maint. Supr, Public Works, P.O. Box 807, Rancho Cucamonga 91729. (909) 477-2735
Harry Johnson, Park Superintendent, Redondo Beach, Ca
Gordon Mann, Public Works Suptd., Public Works Services, 1400 Broadway, Redwood City, 94063. (650) 780-7493
Andrew Benelli, City Engineer, Public Works, 1733 9th St, Reedley 93654
Ted Johnston, Director, Public Works, 1210 S. Vera Ave, Ripon 95366, (209) 599-2151
Tim Doudy, Parks Sup., Public Works, 2901 High St, Riverbank 95367 (209) 869-7128
Mel Jarjoura, Director, Public Works, P.O. Box 320, Ross, 94957. (415) 543-1453 x 6
Rabi Elias, Director, Public Works, 525 San Anselmo Ave., San Anselmo 94960, (415) 258-4623
City of San Bernardino, 234 S. Mountain View Ave. San Bernardino, CA 92408
Dennis Roger Reed, Beaches and Parks Manager, 390 Avenida Pico, San Clemente Ca., 92672, (949) 361-8278
Drew Potecki, Urban Forester, Street Div., 2781 Caminite Challas, San Diego, CA 92105, (619) 527.5486
Larry Cain, City Manager, P.O Box 1420, San Juan Bautista, 95045, (831) 623-4661
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