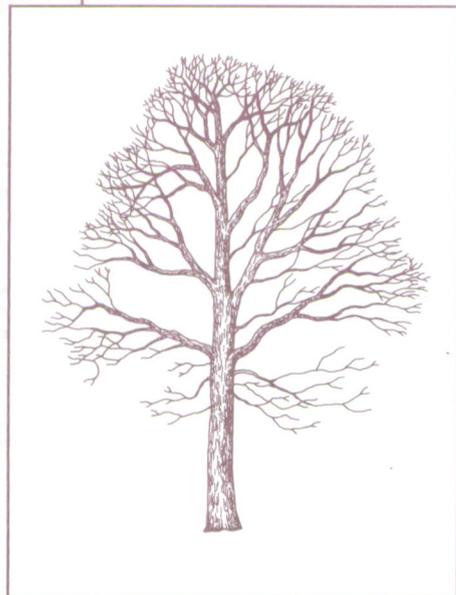


Forestry Principles for Small Communities in Illinois



White Oak
Quercus alba



Illinois Department of Natural Resources

<http://dnr.state.il.us>

524 South Second Street, Springfield, Illinois 62707-1787

George H. Ryan, Governor • Brent Manning, Director

May, 2000

Dear Community Leader:

While not new, the management of community forest resources has taken on renewed importance in the last thirty years. When one looks at the condition of many of our community forests it is difficult to get beyond the need to care for existing trees and the need to fill vacant planting sites. A lack of care and a variety of insect and disease problems have played havoc with the trees that our grandparents planted and enjoyed.

As we prepare to enter the 21st Century, the problems of our urban environments demand solutions and action. One very important part of this process is to begin managing the community forest and its related resources as a total system. The trees, forests, greenspaces, and associated natural resources of our communities are the lifeblood of these natural systems. These resources connect the urban dweller with nature, protect them from the elements, purify the air, reduce temperatures, conserve energy, and lower utility bills.

Local governments working in partnership with community leaders, businesses, and volunteer groups must rise to the challenge of integrating community forest resources into community development and planning. Communities must develop a stewardship ethic that focuses on preserving, developing, and maintaining functional sustainable community forest systems. This manual, **Community Forestry Principles**, is a tool that can help community leaders begin to properly manage their community's forest resources.

I hope you find it a useful tool in the care, and promotion of forests in your community.

Sincerely,

Stewart Pequignot, Division Chief
Illinois Division of Forest Resources

Illinois Small Communities



Population

- 125 - 1499
- 1500 - 4999
- 5000 - 9999
- 10000 - 15000



SOUTHERN ILLINOIS UNIVERSITY
CARBONDALE

April 2000

Dear Community Leader:

In 1998 the Illinois Council on Forestry Development awarded Southern Illinois University's Department of Forestry a \$14,000 grant to fund the creation of a Community Forestry resource manual for municipalities with a population of 15,000 or less. This resource is intended to help educate community leaders such as yourself about the importance of a well-organized and well-managed community forestry program. The Community Forestry Principles manual addresses several of the key and basic topics of community forestry and provides a listing of additional resources that may be used in establishing a successful program.

We would like to acknowledge the contribution and assistance by Jeremy Webber, Shawn Dickerson, Dr. Reinee Hildebrandt, Suny Parks, and Dr. James Fralish. Mr. Webber is a student in the Department of Forestry at SIUC and Mr. Dickerson is a graduate student in the Department of Forestry at SIUC. Dr. Hildebrandt is the State's Urban Conservation Administrator for the Division of Forest Resources of the Illinois Department of Natural Resources. A special thanks you also goes to Stewart Pequignot, Illinois State Forester for his letter introducing the manual. We would like to express our deepest gratitude to Suny Parks, the illustrator responsible for creating the line drawings used on the cover. Last, but definitely not least, we extend our most sincere thanks to Dr. James Fralish for his constructive remarks and comments in the final editing stage. Without his editing efforts, this publication would not be what it is.

This manual is not intended to be an all-inclusive resource on community forestry, but rather, an introduction to community forestry from a proactive management perspective. It is our intent to introduce you to the basics of community forestry and provide enough information to assist you in the establishment of a community forestry program. This manual may be referenced as SIUC Department of Forestry Research Publication NS-007. For follow-up questions or additional information please call Southern Illinois University's Department of Forestry at 618-453-3341 or the Illinois Department of Natural Resources, Division of Forest Resources at 217-782-2361.

Sincerely,

A handwritten signature in cursive script that reads 'David D. Close'.

David D. Close
Community Forestry Volunteer Coordinator

A handwritten signature in cursive script that reads 'John Groninger'.

Dr. John Groninger
Assistant Professor of Silviculture

**Forestry Principles for Small
Communities in Illinois**

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Chapter 1: Introduction

by Dr. John Groninger

Most residents of cities and towns recognize the benefits that trees provide, such as shade on a hot day, a home for songbirds, and variety in the landscape. Trees also are conspicuous when they pose problems such as when branches break during ice storms, when they die and become safety hazards, and when they serve as roosts for large flocks of birds. In many cases, community residents give trees little thought, assuming that a healthy urban forest requires little more than planting trees and that these trees, if left alone, will be assets to their surroundings for many decades. In reality, urban trees are exposed to a daunting array of forces that damage tree health and ultimately result in premature death. Many problems arise from preventable human disturbances, such as excessive root disturbance, compaction, indiscriminate topping, and vandalism. Often, problems arise when trees are planted in a location where they are not suited for long-term survival or when the wrong species is planted for a particular setting. All of these commonplace problems indicate that we have a long way to go to maximize the benefits of trees in cities and towns. Further, the money saved through proper urban forest management could be used elsewhere to improve the quality of urban life.

Urban forestry is a specialized branch of forestry concerned with the cultivation and management of trees for their present and potential contribution to the psychological, sociological and economic well-being

of urban society. This field developed in response to the desire of most people to live in a partially forested environment that is both safe and attractive. Large cities, fueled by tremendous budgets and abundant workers have successfully implemented urban forestry programs. Because of their prominence and success, these programs have served as models for smaller communities. The lack of urban forestry programs in many small towns suggests that this scaled down big city approach to urban forestry is often ineffective.

The objective of this guide is to help interested parties in small communities develop urban forestry programs in harmony with the realities of small town resources. We suggest a program in community forestry which differs from big city urban forestry programs in the following ways:

BUDGET

While successful urban forestry programs in large metropolitan areas are fueled by large staffs and budgets, programs in small communities must make due with little or no funding. Small communities and neighborhoods can receive state and federal grants to support urban forestry work. Unfortunately, most of these monies are available only on a one time or short term basis, making them appropriate for specific projects, such as establishing a park or street tree planting. However, a sustainable community forestry program usually relies on the use of local tax revenues. For this reason, volunteer initiative and

participation are essential aspects of forest management in most small communities.

ROLE OF RESIDENTS

Urban forestry in small towns requires more involvement by members of the community in tree management decisions. Residents play a more direct role in the management of trees on their property and therefore, pay more of the costs directly rather than through tax levies.

Lack of funding may not be a severe handicap since residents of small towns sometimes have a stronger sense of ownership and fewer expectations of municipal services than those in larger communities.

Unlike many large cities, decisions concerning trees on private land rest with individual homeowners. While this precludes citywide planning and the strict vegetation ordinances deemed desirable by residents of large cities, retaining personal choices may, in some cases, lead to greater civic pride and acceptance of personal responsibility by homeowners. In the absence of ordinances, individual property owner choices will lead to very different standards of tree establishment and maintenance from one property to the next. Therefore, community forestry must emphasize providing the best information and tree care to interested homeowners as well as accepting that not everyone in the community may be willing to participate.

MANAGEMENT

Foresters have noticed a shift in public sentiment whereby more people see human beings as invaders in forested settings rather than as an integral part of its environment. This widespread attitude is a byproduct of a trend toward urbanization where fewer people are aware of the connection between forest products and the forests that produce them. Large city urban forestry programs take this attitude into account by making no demands on residents regarding tree care. Residents of small towns more often have some relationship with natural vegetation and better understand tree growth processes and ecological principles underlying the maintenance of a healthy urban forest. Therefore, promoting activities that emphasize the stewardship aspects of urban forest management may convince residents to better care for their community trees.

Another critical distinction between small and large communities is that small-town residents may be less likely to expect the carefully tended vegetation found in many cities. Therefore, trees and other vegetation in small towns generally require less intensive management. Given the currently neglected state of trees in many small communities, even a small effort can produce dramatic improvements. Viewing community forestry efforts in this context may be useful in preventing discouragement among volunteers working in an environment where both budgets and expectations are modest.

The direct benefits of planting trees are obvious and important. Over time, urban trees become an ever increasingly dominant part of the environment, and therefore, are of great potential value to the community. The greatest benefits often are achieved when trees approach their largest attainable size. But large trees that are most likely to be admired and appreciated by residents and visitors also have the potential to pose the most serious safety problems. It is at this time in the life of a tree that a community will either reap the reward of proper management or pay the price of neglect. Selection of appropriate species, protection of the rooting environment, and a properly executed pruning program are all critical in determining the health of a community forest.

The role played by proper tree care in the economic well-being of a community often is not fully appreciated. The first priority of tree maintenance should be the development or maintenance of safe trees. This can be justified on a financial basis alone considering that an entire tree maintenance program may be less expensive than the settlement of a single lawsuit. Also, properly maintained trees are less vulnerable to costly damage associated with snow and ice storms. Under these conditions, improperly pruned trees, such as those subjected to topping have more broken branches and higher clean up costs than those pruned using appropriate techniques. Agencies and utilities charged with maintaining unobstructed roads and powerlines will often perform a semblance of tree maintenance free of charge. Keep in mind that this work is often performed as inexpensively as

possible without regard to long-term tree health. Ultimately, individual homeowners must take the responsibility for the health of trees on their own property and in the community. Awareness of the differences between proper and improper tree care is a first step in this process.

Chapter 2: Benefits of Community Forestry

by Dr. John Groninger

With so many demands on our resources, it is critical to strongly justify virtually every expenditure of time and money. Unfortunately, trees respond to their environment more slowly and subtly than most other aspects of modern life, and, therefore are often taken for granted and vulnerable to neglect. For this reason alone, an especially strong argument is needed to move people to invest in their trees. The following is a summary of the many ways trees and proper tree management can improve the quality of town life.

SOCIAL

Tree planting and maintenance provide a sense of community identity and cooperation. Few other activities allow even those with modest talent, physical strength, and knowledge to positively impact their surroundings while working with neighbors. This well-worn theme of National Arbor Day Foundation commercials continues to hold true. Most people who have planted a tree know that the satisfaction associated with watching it grow will far exceed the convenience of calling the town arborist to do the work. Obviously, some residents can perform the manual labor needed to plant a tree, but it is a good way to energize a core group of individuals.

Most successful parks, well-established residential neighborhoods and thriving business districts feature a large and healthy population of trees. Shade trees encourage people to linger and interact. Several studies have shown that groups of people tend to congregate near trees. Small children especially are naturally attracted to trees because of the endless supply of play materials they provide. Community trees are especially important for children living in settings where there is limited yard space and high quality places to play. Similarly, community trees may be one of few natural elements available to individuals with limited mobility or opportunities to visit forested areas.

Another byproduct of community strengthening brought about by forestry activities is a heightened sense of resident ownership and territoriality. This results in greater vigilance toward potential criminal activity and ultimately leads to lower crime rates.

Residents of public housing units with trees were found to like their neighbors more than those where trees were absent, supporting the notion that pleasant community meeting places incorporating healthy and safe trees are more likely to foster good interpersonal relations. In addition to feeling better about their neighbors, individuals feel better about themselves. Hospitals discovered that patients able to view trees from their beds requested less pain medication than patients able to see only a brick wall.

PHYSICAL

Although the usefulness of urban trees has long been recognized in providing pleasant shaded settings for human interactions, more subtle benefits to the physical environment are now being described. Local climate modifications brought about by urban trees include lowering summer temperatures, slowing wind speeds, and removing airborne pollutants.

Windspeed and Temperature Modification

Windbreak establishment for both protection and fuelwood production was a very commonplace activity among farmers on the Prairies and Great Plains. Relatively inexpensive energy costs over much of the past several decades have permitted the degradation and removal of many of these windbreaks. Today, these same principles that helped protect farmsteads can be effective in slowing heat loss from homes, businesses, and municipal buildings in communities. Windbreaks slow the weathering of building materials and can lower building maintenance costs. Also, windbreaks can make otherwise open recreation areas hospitable under windy conditions. Proper placement of windbreaks is crucial in maximizing these benefits. In towns where space is limited, windbreaks may only be suitable for larger lots in order to be compatible with other land uses.

Shade trees are clearly effective in lowering temperatures during hot

weather. People actively avoid sunny areas in favor of shade when walking. Also, air conditioning bills obviously are lower in shaded houses. Trees should be arranged in such a way as to maximize their protective properties during both summer and winter weather. Establishing evergreen trees to the North offers protection from the coldest prevailing winds of winter. In contrast, deciduous trees are planted to the South and Southwest to provide shade in the summer and sunlight during the leafless winter period. Regional variation in prevailing wind direction should be taken into account before establishing windbreaks.

Rising atmospheric carbon dioxide concentrations have been receiving attention among scientists and in the news because of a potential to change in global climate. Environmental groups and some politicians are offering proposals to encourage the planting of trees to take up and hold (sequester) this carbon dioxide. The potential of urban forests to directly offset increasing carbon dioxide levels through carbon sequestration is relatively small. However, urban trees can significantly reduce human carbon dioxide outputs because reduced heating and cooling costs result primarily from lower consumption of carbon dioxide-generating fuels. The easiest way to achieve this benefit is through the placement of trees and shrubs to provide shade to air conditioners and heat pumps. Energy efficiency increases of 10 percent, as well as reduced wear, can be expected when the manufacturer's recommendations are followed for protecting cooling equipment.

Hydrology

Anyone who has spent time in a forest during the beginning of a rainstorm recognizes how the canopy delays rainfall from reaching the forest floor. Not only are the people protected for the short term, but the total amount of precipitation reaching the ground is reduced since a considerable amount of water is evaporated directly from the leaf surface or directed down the branches and stem.

More significant is the amount of water absorbed by roots, transported upward through the tree and released into the atmosphere by leaves. This function serves communities by lowering the water table through uptake and by decreasing temperature through evaporative cooling. Trees are so effective in moving water out of the urban environment that some communities have planted trees to reduce storm water runoff. Fast-growing evergreen species are especially effective in improving urban hydrology throughout most of the year.

Wildlife

Trees can enrich a town's landscape by attracting wildlife. Ideally, municipal trees complement vegetation in yards and other private lands in the creation of habitat for a desirable variety of wildlife species. Again, correct tree placement and species selection are essential to ensure that appropriate wildlife species are favored and that pest problems do not develop. Most urban wildlife problems result when

trees with large or messy fruits are planted in areas where automobiles are parked or where large bird populations congregate.

Air Quality

No one disputes the fact that urban trees improve air quality in both large and small communities. Interestingly, this process is very different in large and small communities. In cities, plants remove large quantities of gaseous pollutants from the air. These include sulfur dioxide, halogens, and nitrous oxides originating from transportation and industrial processes. In smaller communities, these pollutants usually are not present in significant concentrations. Rather, air in small towns is more likely to carry dust originating from unpaved roads and parking lots or nearby agricultural operations. Trees, shrubs and other vegetation can play a large role in acting as natural dust catchers. Particularly well-suited are those species with dense canopies, abundant leaf surface area and hairy leaves. One study shows that a mature tree can intercept 50 pounds of dust per year. Again, correct placement of plant material is crucial.

Noise

Similarly, urban trees can reduce noise pollution levels. Although trees are most effective when combined with man-made noise barriers, trees by themselves also produce a measurable reduction, particularly when foliage is dense. Many large cities have capitalized on this phenomenon,

establishing dense tree plantings between freeways and residential and business areas. In smaller communities, similar reductions are possible, particularly adjacent to areas with frequent heavy equipment traffic. Tree barriers in these settings will provide screening between residential areas and potentially unpleasant sites, thereby providing a low cost way to increase property values.

Economic

Trees provide financial gains to communities through measurable energy savings. However, financial rewards are far more achievable when an attractive urban forest is one component of a community development plan. Towns seeking to attract tourists or shoppers to their historic or business districts consistently have found that improving the urban forest is a relatively small, but worthwhile investment. Healthy trees in commercial and residential areas provide an air of prosperity attractive to potential businesses and homeowners.

Realtors have long recognized that trees can increase property values. Street trees alone increased property values 15 percent over houses on streets with no trees. Of course, realizing these benefits requires a maintenance program. Otherwise, trees will become a safety liability, making municipalities and homeowners vulnerable to accident-related lawsuits.

Conclusion

The full extent to which a well-planned and managed urban forest can improve town life and economic health is not yet fully appreciated. Many day-to-day benefits provided by trees are taken for granted and therefore urban trees remain subject to neglect. One critical point that cannot be overemphasized is that poorly cared for urban trees can be a tremendous liability. Reaping even some of the benefits of an urban forest requires at least some planning as well as continued maintenance. Larger and wealthier communities through high tax rates and commercial revenues are able to employ personnel responsible for perpetuating a healthy forest for residents. In small communities, enthusiasm of volunteers and homeowner pride must play a large role if a town's forest resource is to be managed successfully.

Chapter 3: Planning for Community Forestry Resources

*by Shawn Dickerson
& Dr. John Groninger*

STARTING FROM SCRATCH

Before embarking on a community forestry program, community leaders must have; a) an objective, b) interested people, and c) the material resources to make the objective a reality. The sequence of events occurring early in the development of a community forestry program varies from town to town. While it may be most satisfying to begin the development of a plan with an unencumbered vision of the future, a more practical approach is to first make an honest assessment of what is possible under current conditions. Community forestry managers seldom start with a clean slate. Generally they inherit land with varying capacity to sustain tree growth and trees that vary considerably in health, vigor and potential usefulness. Before a feasible plan can be established, an inventory of the forest resource must be conducted. Other resources important in determining the appropriate scale for a community forest program include an inventory of available funding, equipment, manpower, and community support.

Determine What Exists

A tree inventory is much like a detailed census of the human population of a community. Every tree is visited and its location recorded. Inventories vary considerably in the detail of the data collected. Minimum information that should be contained in an inventory are:

- ✓ Location
- ✓ Species
- ✓ Size
- ✓ Condition Class
- ✓ Hazard Class
- ✓ Proximity of Electrical Line Interference

Additional information often is collected, especially where time and money resources allow. However, when resources are limited, the following should be taken into consideration:

- Collect only information that will actually be used. There is no prescribed level of detail.
- Stay within the abilities and knowledge of those collecting data. If volunteers are being used, train them thoroughly so that information collected is accurate and consistent among all participants.

- Remember that it is better to have a complete and reliable inventory with less data per tree than an incomplete inventory where a lot of information is collected on some trees and not on others.

Once an inventory is completed, interpretation of the information will permit the planning of further management activities, including the following:

- ✓ How many trees require immediate maintenance or removal?
- ✓ What will be the cost of this work over the next few years?
- ✓ What is the overall condition of the tree resource?
- ✓ Will large scale replacement be necessary in the next few years?
- ✓ What tree species are doing especially well or poorly?
- ✓ Is the diversity and distribution of tree species adequate to withstand the loss of a single species to disease?

Based on this information, informed decisions can be made regarding funding and equipment needs, and where short and long term priorities lie. At this point, the planning process may begin in earnest.

Community Goals And The Tree Board

The long term goals of the community should be determined by the wishes of the residents. Typically the highest priority is creating an urban forest that is safe. If the community desires a successful urban forestry program then reasonable goals and priorities must be established. For example, planning to replace dead trees may be a feasible goal, but planning to plant a tree at every appropriate available location over the next year may not. Similarly, reducing liability by removing hazardous trees or doing corrective pruning as needed may be a more appropriate goal than planning to prune every tree in the community. While a realistic approach is crucial, more ambitious long-term goals such as an annual park tree planting program or the development of an arboretum should also be included to further express the vision of the community.

The formation of a Tree Board is a critical step in developing goals. The Tree Board is a group of people within a community charged with overseeing the development and implementation of the urban forest management plan. Starting a tree board may take several steps. The community may want to begin by assembling a tree committee, which could develop over time into a tree board. The committee should consist of a group of diverse community members to ensure fairness, and feasibility of decision making. This committee may have the responsibility of obtaining knowledge of the resources, analyzing the inventory, determining the community's needs and desires, and

finally, drawing up the management plan. Once the committee has accomplished these tasks, they may then elect to become the tree board. The board should be established through an ordinance, which could be created by the tree committee.

Rather than putting all decisions in the hands of one individual, a tree board will help the community better meet the needs and desires of the entire community. The roles of a tree board usually include policy formulation, advising, administration, management, representation, and advocacy related to trees in the community. Representation on and advocacy for tree boards is essential to successfully gain public acceptance for urban forestry activities (Grey 1993). Board members could include city officials, community organization representatives, and residents. A well-balanced group of individuals with a good understanding of community will ensure that the actions of the tree board reflect the wishes of the community. An overzealous tree board that alienates the community at large en route to satisfying their own vision of a community forest is ultimately ineffective.

Tree Board Authority

The authority, rights and responsibilities of the tree board should be defined in the city ordinances. These include the following:

- ✓ Formulate policies to establish and maintain the urban forest.
- ✓ Advise the city council regarding the needs of the urban forestry program.
- ✓ Develop and enforce a city tree ordinance.
- ✓ Designate a person to physically manage urban trees and determine that person's authority and responsibilities.

Enforcement provisions of the tree board also should be included in city ordinances. The tree board may be responsible for issuing permits, dealing with non-compliance, and regulating specific activities including the cutting and destruction of trees, unauthorized plantings, construction activities around trees, and root severing. Additionally, provisions are made in some communities for setting age class and species diversity standards, and for listing allowable species to be planted. Permits to be issued should be for cutting, trimming, and planting. Non-compliance may be addressed using a system of fines.

The tree board generally is not expected to perform the day to day management activities involving community trees. Preferably, a qualified urban forester is hired by the tree board on either a full time or part time basis. Many small communities opt to retain a consulting forester on an as needed basis if permanent employment is not feasible. The community forester should have a thorough understanding of the biological functions of trees as well as a practical grasp of appropriate management techniques. In addition,

good public relation skills are essential since the forester, as a representative of the community government, will be in continuous contact with community members. While a hired forester may be able to help with the development of the plan guiding the management of the urban forest resource, merely employing such an individual should in no way act as a substitute for the plan.

Tree care workers are needed periodically to perform maintenance, planting, and other work on the trees under the supervision of the forester. In small communities, these individuals typically are employed to perform a wide range of tasks but generally have little or no training in proper tree care techniques. Every effort should be made to train and retain skilled and conscientious workers to perform tree care. Even the best plan will fail if implementation of tree work is not carried out in a competent manner. Of course, tree workers must be outfitted with the appropriate tools and safety equipment.

PRESERVATION ORDINANCES

The Starting Point

One way to enforce natural resource protection during development is to establish a preservation ordinance. This type of ordinance usually is designed by a technical subcommittee formed by a city

tree board. The subcommittee should include, but not be limited to, a city tree manager, local construction contractors and developers, a street department representative, and a city attorney. Depending on the site and condition of trees, groups of trees or individuals may be selected for preservation. Priority should be given to healthy and attractive individuals of desirable species with the potential for several years of continued growth. Care must be taken to preserve only those trees that will not interfere with the function of the newly developed area.

Minimum tree density standards can ensure that the aesthetic quality and overall tree health is maintained. This can be done by establishing a minimum percent canopy cover, basal area, or stem per acre count. If few trees are found on site, or will be left on site after development, it may be desirable to require developers to plant trees to meet a minimum required density. It also may be desired to set a minimum species and age class diversity standard. Preserving age class diversity can be done by requiring at least two age classes of trees on site. Species diversity can be preserved by setting a minimum number of species required on site. Species selection requirements also should be enforced, and should be determined by site characteristics.

Spelling it out for the Developer

During land use planning, the city tree manager should participate to

ensure natural features are considered in the development plans. During construction, the site should be evaluated to ensure that soil surrounding designated trees is protected. Once development is completed, trees should be monitored to make sure they remain in good health if a bond is imposed by the community (Moll 1989). Some considerations when making a development plan are trees of importance to the land owner, vigor and health of these trees, and knowledge of the age and sizes of existing trees. Making sure that trees to be protected are healthy, and vary in size will help keep the natural landscape protected. A difference in age and size of trees will ensure that not all trees will die at the same time due to age, disease, insects, or some other natural disaster. Having a diversity of age and species will also make the site more attractive (National Arbor Day Foundation 1992). Keep in mind that trees are not the only part of natural resources in an area. The trees are only a visual part of the environment, which consists of organisms in the soils, wildlife, and other plants in the area. When making plans for development it may be wise to consider an ecosystem approach, which will take into account soils, hydrology, and vegetation other than trees (Clark 1995). This is particularly critical in settings where construction damage may alter water drainage patterns, effectively making a site too wet or too dry for the species present.

TREES AND CONSTRUCTION

Preventing Damage

Despite their large size and potentially great longevity, trees are extremely vulnerable to root system damage during construction. Bulldozing, digging, grading and compaction of the soils around trees can be responsible for damage to trees that often is not visible for one or more years. Suggestions to prevent tree health degradation during construction includes performing construction that fits in with the natural landscape, and keeping clear of trees when possible (Moll 1989). If disturbance must occur near trees, efforts should be made to protect roots, prevent soil compaction, and avoid adding or removing soil within the root zone.

1. What measures can be taken to reduce damage to existing trees?
 - a) Avoid soil compaction. Compaction due to the activity of construction machinery is commonplace with development. Compaction of soil can occur rapidly, especially when the soil is wet and has a high clay content. Compacted soil severely threatens tree health by restricting root growth, preventing water movement through the soil, as well as infiltration into it. Compaction may cause soil to remain saturated with water for long periods of times. Barriers around trees prevent traffic over the tree rooting zone.

Barriers should be placed no closer to the tree than the drip line at the edge of the crown. Other ways to reduce soil compaction during construction are to position temporary mats or wood chips in areas that will receive heavy traffic, avoid driving on soil during wet periods, and when possible, scheduling appropriate construction activities when the ground is frozen in the winter (Hall 1995).

- b) Avoid chemical contamination of soil. Use of heavy equipment can also cause on-site pollution. It is not uncommon for heavy equipment with leaky engines, transmissions, and hydraulic lines and cylinders to drip fluids onto soil. Developers should inspect and prevent leaks on equipment to prevent soil contamination, as well as keep equipment safe and functional. However, accidents can occur, such as ruptured hydraulic lines. Requiring developers to train their crews for emergency clean-ups can be helpful in the prevention of damage if a spill should occur.

- c) Avoid changing soil depth. A large portion of the tree root system is relatively near the soil surface, usually within the top several inches. Removal of soil can cut or expose roots while adding soil can smother roots by decreasing oxygen availability. The base of the trunk is particularly vulnerable

to changes in grade. If soil must be moved, noncompacted topsoil should be returned to the original depth over tree roots.

- d) Contractors often are unaware of the long range impacts of their activities on trees because the effects of development on tree health usually are not visible until after the project has been completed. Following the completion of construction activities, tree health decline. Therefore, the landowner should take the initiative to insure the health of trees to be kept on site. Careful watering, fertilizing, and trimming of trees may help sustain trees following development (National Arbor Day Foundation 1992). Where possible, placing a bond on construction site trees redeemable only when two years have elapsed following cessation of construction activity may encourage contractors to take greater care around the rooting zone.

Road and sidewalk construction or widening presents additional challenges to the maintenance of tree health. Maintaining a permeable and undisturbed soil surface for trees adjacent to roads will improve the odds of maintaining tree health. Planting tree species that have a small space requirement is useful especially when soil disturbance is unavoidable. Also, using tree species that tend to root deeply will prevent lifting of sidewalks. Root barriers also may be a useful tool to avoid tree-sidewalk incompatibilities.

Similarly the installation and maintenance of underground utilities such as water, sewer, electric, cable, phone and gas lines should minimize disturbance and severing of tree roots. Tunneling rather than trenching is the preferred, but considerably more expensive, method of access from the perspective of preserving tree health. Hydraulic soil excavation also can prevent root severing. This method of soil excavation uses water to wash away soil around roots. Once the work is complete, soil can then be placed back into the excavation area (Gross 1995).

Working with developers (designers, engineers, architects)

Tree protection often is neglected by developers because of the added time and expense. Sometimes, the benefits of retaining trees on site is simply not fully understood. It is possible to add three to seven percent to sale prices when natural resources are protected, and developers who practice natural resource protection are commonly chosen over those who do not (National Arbor Day Foundation 1992). In some instances, contractors can be fined or sued for negligent practices when trees die after development, providing them an incentive for protecting trees during construction. As awareness of this issue grows, many contractors likely will be interested in following voluntary tree protection guidelines for developing land in order to prevent the institution of restrictive legislation that would likely be brought about by anti-sprawl groups and elected officials.

1. Bring everyone to the table at the beginning.

In many cases, development projects lack provisions to protect natural resources due to the unavailability of information during decision making (Dwyer 1995). Good communication should always be practiced to ensure that the city tree manger, engineer, owner, and all the contractors understand the plans and, where possible, make changes to those plans to accommodate the natural resources. City tree managers also should be trained to read and understand construction documents. This skill will help them make knowledgeable suggestions to the developer. Particular attention should be given to soils reports, grading, landscaping, and architectural plans within construction documents (Leach 1994).

2. Conflict resolution: Being able to compromise.

Conflicts between contractors and the city frequently arise and can become a major problem. The best way to avoid conflicts is to set standards for contractors in a city tree preservation ordinance. However, conflicts may arise even when a good preservation ordinance is established. Where there is conflict between the contractor and the city tree manager, steps should be taken to find a compromise. Involvement of the city tree board may help formulate a resolution. An appropriate sequence of actions include identifying the problem, discussing alternatives to resolving the problem, choosing an alternative that would work well for all sides, and

implementation of the alternative.

Educating homeowner associations

Some subdivisions and neighborhoods have homeowner associations that elect a board of directors with enforcement authority over management and development activities (Grey 1996). These boards are appropriate in situations when a neighborhood wishes to establish standards that go beyond those of the town. Organizations such as these where stakeholders have a common aesthetic vision are particularly well-suited for the development of successful community forestry programs. Activities likely to be of particular importance to these groups include :

- ▶ avoiding unnecessary tree topping
- ▶ proper trimming of trees under utility lines
- ▶ avoidance of root severing during street and sidewalk repairs
- ▶ relation between species and planting sites
- ▶ avoidance of tree damage during construction.

Arguments justifying proper community forestry management based on improvements in real estate value associated with well-cared for trees are particularly compelling in these situations.

Chapter 4: Arboriculture

by David D. Close

Arboriculture deals primarily with the planting and care of trees, but may also include woody shrubs and vines. Issues addressed within this chapter include soil assessment, species selection, site preparation, planting stock selection, planting techniques, and post-planting care. While the most important decision initially may be selecting the appropriate species for the planting site, post-planting care and maintenance are critical in increasing the longevity of planted trees.

TREE PLANTING PROCESS

Site Evaluation

Site evaluation and assessment is a crucial step in tree planting, whether for a single tree or a group of trees. Before a decision can be made about species selection, many aspects of the physical conditions of the site must be considered. The soil type or series should be determined. Unless the soil is highly disturbed, a county soil survey map should provide the physical characteristics of the soil pertinent to tree growth. Local extension offices, county soil and water conservation district offices, or the district forestry office should have county soils maps that can provide a general idea

about soil series on the planting site and how tree planting might be impacted. Soil series may not be important, however, if the site is highly disturbed or modified from relatively natural conditions. Such sites would include an abandoned railroad berm, along a street, or a former building site. If the soil is extremely disturbed (highly compacted, presence of impervious surface, non-topsoil fill, presence of old asphalt, concrete, construction waste), it may be necessary to reconstruct the soil or at the very least amend the soil with organic matter such as mulch, peat, compost, or manure. In the most extreme case, it may be necessary to establish a new topsoil with quality fill. In conjunction with determining soil type, it is important to consider whether the soil is unusually wet or dry over the course of the year. Also, how could the soil drainage potentially be affected by construction activity? Table 4.1 provides a short list of species that are tolerant of extreme soil conditions.

The last consideration to be made regarding site evaluation is available rooting space. Is the tree to be planted in a highway berm, between a sidewalk and street, in a parking lot, or in an open area at a municipal park? The amount of available rooting space may influence your choice of species. Table 4.2 lists common species and their respective minimum aboveground space requirements with respect to tree height.

Gaining an understanding of soil conditions will assist with the decision for selecting the appropriate species. A few things to look for might include the soil texture (is it a silt loam or a heavy clay), drainage, or the presence of clay pan or hard pan. County extension

agents, district forestry offices, or university staff should be able to provide appropriate soil information.

Table 4.1 List of species suitable for wet and for dry sites.

<u>Wet Sites</u>	<u>Dry Sites</u>
Bald Cypress	Black Oak
Bur Oak	Chestnut Oak
Cherrybark Oak	Chinkapin Oak
Swamp White Oak	White Oak
Overcup Oak	Pignut Hickory
Green Ash	Shagbark Hickory
Deciduous Holly	Serviceberry
Larch	Ironwood
Yellow-bud Hickory	Black Gum
Water Oak	Hedge Maple
River Birch	Sugarberry
Sugarberry	Hackberry
Blue-Beech/Musclewood	Eastern Redbud
Sweetgum	Douglas Fir
Willow Oak	Kentucky Coffeetree
Downy Serviceberry	Goldenrain Tree
Fringe Tree	Sawtooth Oak
Thornless Honeylocust	Shingle Oak
Sweetbay Magnolia	Eastern Redcedar
Dawn Redwood	Carolina Buckthorn

Table 4.2 Species with their respective minimum space requirements.

<u>Small (< 30 ft)</u>	<u>Medium (30-60 ft)</u>	<u>Large (> 60 ft)</u>
American Holly	Ironwood	Bald Cypress
Blue Beech	Blackgum	Bur Oak
Fringetree	Carolina Silverbell	Cherrybark Oak
Hawthorn	Chinkapin Oak	Tulip Poplar
Flowering Dogwood	River Birch	Kentucky Coffeetree
Eastern Redbud	Red Buckeye	Northern Red Oak
Serviceberry	Ohio Buckeye	Swamp White Oak
Witchhazel	Pawpaw	White Oak
Deciduous Holly	Persimmon	Shumard Oak
Flowering Crabs	Sassafras	White Fir
Trident Maple	American Yellowwood	Sugar Maple
Red Buckeye	Ginkgo	Yellow Buckeye
Winterberry	Thornless	Pignut Hickory
Goldenraintree	Honeylocust	Shagbark Hickory
Star Magnolia	Southern Magnolia	Hackberry
Mugo Pine	White Spruce	American Beech
Carolina Buckthorn	Blue Spruce	White Ash
Rusty Blackhaw	Overcup Oak	Norway Spruce
	Nuttall Oak	

Species Selection

Selecting the right tree for a planting site may be one of the most crucial decisions in the planting process. This decision, based on information from the site evaluation, will assist in determining tree health and longevity. The ecological attributes of the tree should be known or understood. Is the tree sufficiently hardy to grow in the local vegetation zone (Figure 4.1)? Does the tree survive

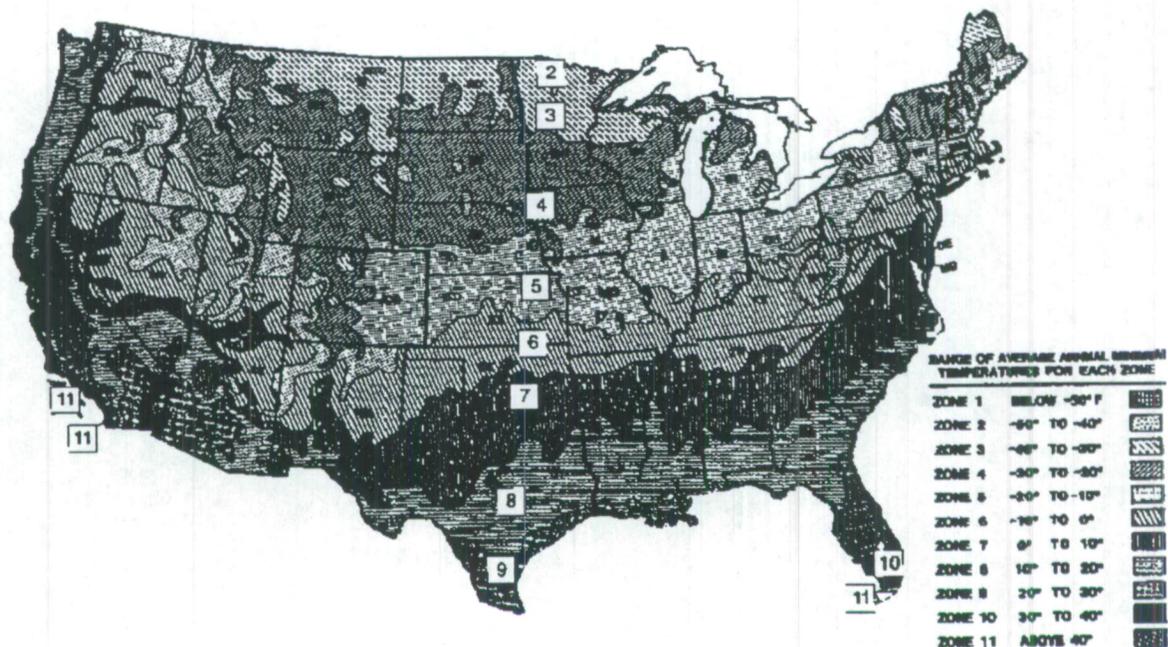


Figure 4.1 USDA Plant Hardiness Zone Map for the United States.

and grow well in acid or alkaline, wet or dry, well-drained or poorly drained soil?

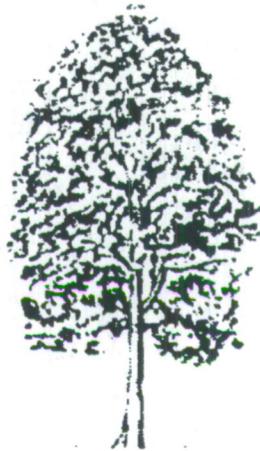
Other attributes to be considered when selecting a suitable species is resistance to environmental stresses. Species that are highly susceptible to specific pathogens or vulnerable to structural failure should be avoided. Forest geneticists and tree breeders have developed some cultivars that are less susceptible to pathogens such as Dutch Elm Disease and the American Chestnut Blight. Resistance may refer to more than disease or pathogen resistance. In heavily urbanized settings, resistance to pollution, both airborne and water

transported, may need to be considered. For instance, some trees are more hardy than others where air quality is extremely poor (Table 4.3). Tolerance to deicing chemicals may be an important consideration for communities in northern Illinois. Tree resistance may also include reduced susceptibility to insect infestation and structural failure. For instance, species to avoid due to a high potential for structural failure include Bradford Pear, Silver Maple, and Boxelder. Table 4.4 lists several common trees that should be avoided due to their susceptibility to certain pathogens or structural failure. A list of problem or pest trees may be included in your city ordinance under tree planting or replacement guidelines.

Achieving optimal aesthetic impact as well as minimizing tree maintenance costs requires planning for potential maximum tree size and shape. Choosing the desired shape or form is mostly an aesthetic consideration. However, if the planting site is along a parkway or median, shape and form decisions may influence public safety as well. For example a pyramidal or weeping shaped species with large lower branches may pose a safety problem for drivers. If space is limited for a developed canopy, a tree with a columnar or vase-shaped crown may be more appropriate than a spreading or full-crowned species. Figure 4.2 illustrates some of the most common tree shapes and crown forms.



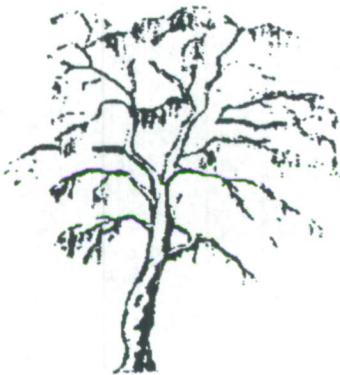
pyramidal



full-crowned



fountain



weeping



columnar



spreading



vase-shaped



multistemmed

Figure 4.2 Illustration of various tree crown shapes and forms. (Watson and Himelick 1997)

Failure to recognize the mature size of trees often results in planted individuals becoming a nuisance. Mature tree size may not be an issue if the planting site is in a city park or large green space, but in parkway and street plantings, size selection becomes a crucial issue. Therefore, the potential mature size of the species should be an important consideration.

Table 4.3 List of species resistant to at least one air pollutant.

<u>Tree Species</u>	<u>Tolerant to:</u>
Norway Maple	SO ₂
Red Maple	SO ₂ , O ₃
Sugar Maple	SO ₂ , O ₃ , PAN
Flowering Dogwood	SO ₂ , O ₃
Ginkgo	SO ₂
Black Walnut	O ₃
Juniper	SO ₂
Black Gum	SO ₂
Northern Red Oak	SO ₂ , O ₃
Red Pine	O ₃
Arborvitae	SO ₂ , O ₃
Norway Spruce	O ₃
White Spruce	SO ₂ , O ₃ , PAN

Table 4.4 List of trees to avoid planting.

<u>Tree Species</u>	<u>Reason to Avoid</u>
Bradford Pear	weak branches and wood
Silver Maple	weak branches and wood overplanted
Red Maple	overplanted
Sugar Maple	overplanted
Boxelder	weak branches and wood
American Elm	Dutch Elm Disease (DED)
Siberian Elm	brittle wood
Paper, European, Grey Birch	borer insects
Butternut	canker disease
Black Cherry	borers, black knot disease
Mountainash	borers, fire blight disease
Princess Tree (Paulownia)	aggressive exotic
Cottonwood	brittle wood, cottony seed
White Poplar	suckers
Lombardy Poplar	canker disease
Russian & Autumn Olive	aggressive exotic, offensive odor
Tree of Heaven	aggressive exotic
Buckthorn	borers, hard to eliminate (suckers)
Privet	aggressive exotic
Amur Honeysuckle	aggressive exotic
Black Locust	borers, hard to eliminate (suckers)
American Chestnut	American Chestnut Blight
Paper Mulberry	extremely aggressive exotic

Large mature trees require a large amount of adequate rooting space. The branch spread may eventually interfere with utility lines. Will the available space accommodate a mature trunk and crown? Maximum trunk size is an especially important consideration when trees are planted along side walks or in planting grates. Planning

ahead for tree development and maturity may reduce the number of problems fifteen to twenty years down the road.

From the manager's perspective the most important attribute to consider will be potential maintenance demands of a given tree. Because of their growth habits, some trees require more attention than others. For instance, pin oak produces a large number of branches along the length of the trunk. These branches may need to be pruned to avoid the production of potentially hazardous branches. Multi-stemmed species such as river birch, deciduous holly, and hawthorne may require frequent branch and crown thinnings to extend the lifespan and improve the health of the tree. If personnel, equipment, and capital are in short supply, this problem may become a critical issue.

Selecting Quality Planting Stock

Planting stock survival is highest when it comes from a seed source within a 150 mile radius of the planting site. Typically, latitude is more of an issue than longitude. For example, white pine from a southern Appalachian seed source does better in southern Illinois than would material from northern Illinois or Wisconsin. In most cases, it is wise to use locally produced planting stock. However, a reliable out of state nursery may also be appropriate if they can assure their plant material is compatible with the climate in your

area. Otherwise, consult the USDA plant hardiness zone map (Figure 4.1) to determine if specific planting material is appropriate for the region. This map shows isobars of the average minimum temperature across the nation. Illinois falls within Zones 5 and 6.

After determining the quality of the planting material, the type of planting stock must be considered. There are three primary categories of planting stock:

- ▶ bare root seedlings
- ▶ containerized
- ▶ balled and burlap

Bare root seedlings can be obtained in a variety of ages and sizes, but rarely exceed two inches in diameter at the base of the stem. Containerized plants also are sold in a wide range of sizes. Typically, containerized trees are categorized based on the gallon capacity of the container. One, two, five, ten, and fifteen gallon containers are the most common sizes. Balled and burlap stock is typically the largest size material that can be planted without the aid of a mechanical tree spade. Balled and burlap comes in a range of diameters ranging from one to three or four inches. Depending on the species, these may be anywhere from five to ten feet in height and may weigh as much as two or three hundred pounds.

Bare root stock is ideal for planting projects where a large number

of trees are planted at one time. With this stock, it is important to keep the roots moist at all times prior to planting. Careful root pruning at the time of planting also may increase survival of late transplants. If the root system is too small, top clipping may also be appropriate to prevent drought damage in some species.

Trees that are large enough to provide an immediate visual impact with the community are containerized or balled and burlap stock. Ball and burlap stock typically have a more narrow transplant window than other forms of planting material. All stock should be carefully inspected prior to purchase. When selecting container grown stock, avoid those with girdling roots; i.e. roots encircling the top of the root collar. Some species such as sugar maple and sweetgum are prone to this phenomena regardless of how they are grown. These specimens may look okay superficially, but later they will have problems when diameter growth causes roots to constrict the stem.

The main stem, as well as the roots, should be inspected. It is important that the stem has a single dominant leader (Figure 4.3). Trees with codominant or double leaders can lead to future problems of structure and safety. Often, trees with double leaders will have a v-shaped crotch which will have "included bark" (Figure 4.3). As trees with included bark grow, pressure increases at the junction of the two leaders and the tree will be vulnerable to splitting.

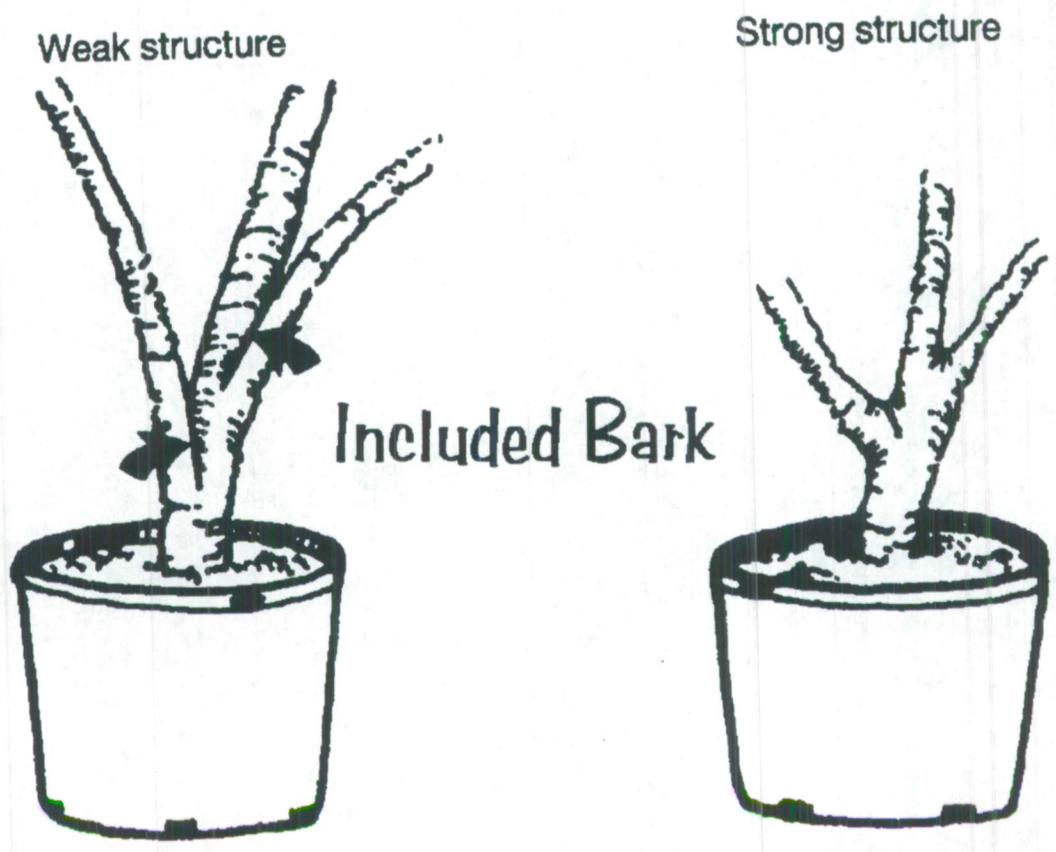


Figure 4.3 The left illustration shows included bark and weak unions. It also illustrates multiple leaders. The right illustration shows strong unions without included bark.

Planting Site Preparation

Once the species has been selected, the planting site must be prepared. Preparing the site involves more than just digging a hole, setting the tree, and backfilling. Depth, width, and shape of the hole are also important considerations when digging. Hole depth may influence the tree survival. Whether working with bare root seedlings, potted trees, or balled and burlap trees, it is important to

avoid planting too deep or too shallow. It is important to plant the tree to the same depth it was grown at the nursery. Do not bury the root collar.

Planting the tree too deeply may lead to suffocation of the roots, especially if the soil is saturated or highly compacted. Planting a tree too shallowly may lead to excessive drying of the roots and an inadequate amount of rooting space. Sometimes the roots will grow along the surface of the ground, particularly if the tree is planted in a berm. Special consideration should be given when planting where a high watertable is present. High watertables often result in poorly aerated soils due to insufficient oxygen which prevents proper root growth and development. It may be beneficial to construct a berm and plant the trees in a raised area in order to speed drainage and avoid saturated soil.

The hole width should be at least twice the diameter of the root ball or container. If the hole is smaller, it is likely that the roots will not grow radially from the tree. It is more likely that girdling roots will develop and the tree will not be adequately anchored in the soil. By creating a larger hole, new roots have a larger area to grow and develop properly.

It has been shown that the shape of the hole also influences root development. Holes with sloping sides as opposed to vertical sides seem more conducive to root development (Figure 4.4). Some studies

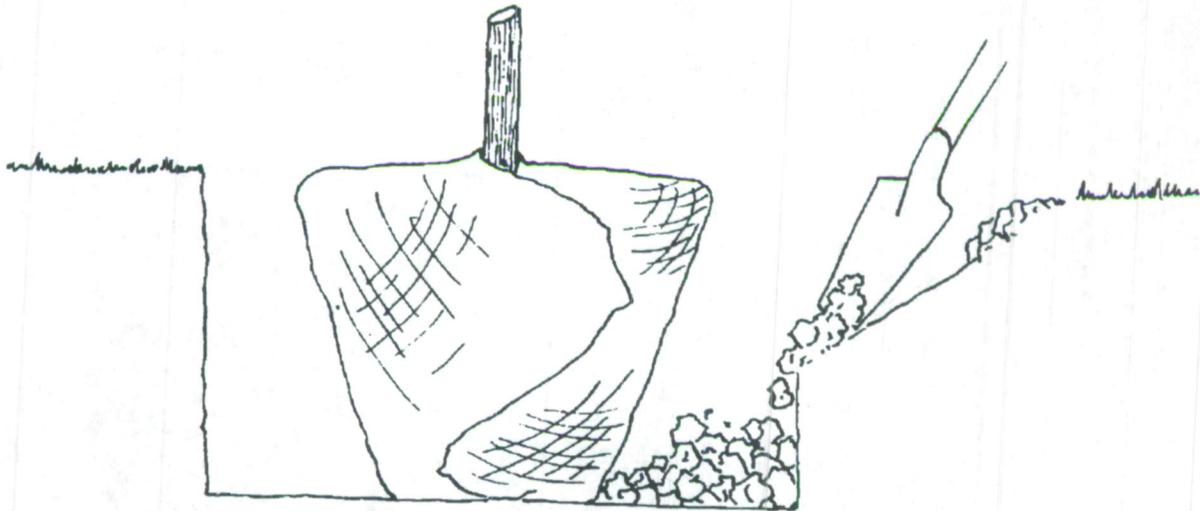


Figure 4.4 If the hole does have vertical sides, this can be amended by sloping the sides with a tree spade or shovel. The slope should begin no higher than half the height of the root ball and end level with the top of the root ball or at the base of the trunk flare.

have shown that the wall of a hole initially may serve as a physical barrier to root extension. This is referred to as glazing. The differences in loose structure of backfill soil and the surrounding, undisturbed more compacted soil is sufficient to prevent proper root growth. Figure 4.4 illustrates one way to amend the soil to promote better root growth.

When to Plant

Like many aspects of tree care, the most appropriate time to plant varies with the species. It is best to plant deciduous species when leaves are absent during the dormant season either in late fall or

early spring. By doing so, immediate exposure to many pests and pathogens is avoided and the tree is less likely to become stressed by drought. Evergreen species may be more flexible. Evergreens may be planted earlier in the fall or later in the spring than most hardwoods. Fall planting should allow time for root growth before the soil freezes. The key to ensuring survival following transplanting is maintenance of adequate moisture. After buds break and leaves flush in the spring, the demand for water increases tremendously. If planting is late, there must be a watering regime for the trees to prevent drought stress. If paid personnel are not available, community volunteers may provide the labor to water trees. Following the first growing season, watering should no longer be necessary. The importance of regular watering is generally proportional to planting stock size.

Environmental conditions such as humidity, air temperature, soil temperature, and soil moisture can influence ideal planting periods. The best time would be an extended period of warm air and soil temperatures with adequate soil moisture. In the spring, it is important to plant after the ground has thawed. Stress levels also are reduced when the air is calm, humidity is high, and temperatures are moderate.

Reminders and Tips

- Tip 1: Don't forget to dig the hole to the right depth. Be sure to cover the root flare, but not bury the cambium just above the root flare.
- Tip 2: If balled and burlap stock is being planted, be sure to remove any wire or twine that is holding the burlap around the root.
- Tip 3: Prune dead or damaged branches from the tree.
- Tip 4: **DO NOT** remove more than 20 - 30% of the leaf area if you do prune the tree after planting.
- Tip 5: Mulch newly planted trees. Mulching provides several benefits. Mulching trees will help retain moisture in the soil around the root ball. Mulch also reduces the amount of weeds and grass immediately adjacent to the tree. Lastly, mulch serves as a protective barrier around the base of the tree by keeping lawn care equipment away from young bark.
- Tip 6: If wildlife poses a potential threat, consider using tree shelters. Tree shelters can provide protection from herbivory and mechanical damage.

Post Planting Tree Care

Watering trees after planting is an important maintenance task, particularly if for balled and burlap stock. Assisting the newly planted tree through its first growing season definitely increases its chance of survival. The frequency and degree of watering should be determined based on local precipitation, soil type, and available workforce.

Fertilization requirements must be determined on a tree by tree basis. If nursery stock is of good quality, there is no need to fertilize trees during the first year of growth. Decisions to fertilize should be supported by a soil fertility test to determine the presence of any nutrient deficiencies or excesses. Using a standard premix of 10-10-10 or 20-20-20 usually is sufficient. It is advisable to consult a professional concerning soil fertility.

Mulching is a must. Mulch offers many benefits to the tree and should be refreshed at least every other year. Mulch helps trap moisture in the soil helping to prevent drought damage. Mulch also protects the tree from the mechanical damage of lawnmowers and weedeaters.

Insects & Disease should be monitored annually, preferably during late spring. If a problem is detected, collect a sample and have it analyzed by an expert. This may be someone from a local

university or college, an extension agent, or a pathologist. The important thing is to minimize damage by acting quickly. The impact of pathogens ranges from negligible in the case of most leaf galls to severe where Asian longhorn beetles are present. If you don't recognize the problem, find someone who will. The Illinois Natural History Survey may be a valuable contact.

Pruning can influence the longevity and quality of a tree.

PROPER TREE PRUNING TECHNIQUES

Given all the other activities required in an urban forestry program, what priority should be given to pruning? The answer lies in three separate areas:

- 1)Public Safety
- 2)Tree Health
- 3)Aesthetics

Pruning for the sake of public safety should be the foremost concern. Trees associated with targets should receive immediate attention. A "target" is any object or area that receives high use by individuals and potentially may receive damage from a failing tree or tree part. Targets may include picnic shelters, picnic tables, playground equipment, water spigots, parking lots, heavily used

walking paths, or busy roadways. If pruning hazardous trees is not possible, consider moving the target. Moving mobile targets (picnic tables or some playground equipment) is one way to manage hazardous trees if pruning or removal cannot be performed immediately. Hazard tree pruning involves the removal of dead or dying limbs from a tree. Of course, the cost of pruning should be weighed against the benefit of maintaining the tree. If maintenance is deemed too expensive, removal might be the most viable option. Whatever the decision, the primary concern is to eliminate the immediate risk.

Secondly, trees should be pruned to maintain health and vigor. Simply reducing the weight of some branches can prevent breakage of the trunk. Removing diseased wood, criss-crossing branches, and crown thinning to increase air flow all potentially contribute to tree longevity. Pruning for this objective should begin within a few years of being transplanted, keeping in mind to never remove more than one-third of the foliage in any one year. It is also important to avoid removing any branches that are greater than one-half the diameter of the supporting stem or trunk. Wounds this large will not properly close, increasing the likelihood of insect or disease damage in wounded areas. Major pruning on mature trees should be avoided if possible and may never be necessary if routine pruning occurs early in the tree's lifespan.

Lastly, pruning for aesthetics alone may not be an immediate public

safety or tree health issue, but it does merit some attention. Having an understanding of the typical growth form of the tree may help in determining the steps for aesthetic pruning. Further, an appropriately pruned tree will ultimately be healthier and safer as well as more attractive.

If young trees are placed on a pruning cycle, fewer problems are likely to develop. Hazardous branches should be pruned immediately. Otherwise, delay pruning until winter to minimize tree damage due to the possibility of insects and disease infestations. Branches that rub or grind each other or buildings should be removed. Thinning the crown early may reduce the amount of rubbing in the future. Pruning should be done in the winter unless hanging branches present a safety hazard. When pruning, it is crucial to make a proper cut. Figure 4.5 shows how to properly prune a tree to minimize wound size.

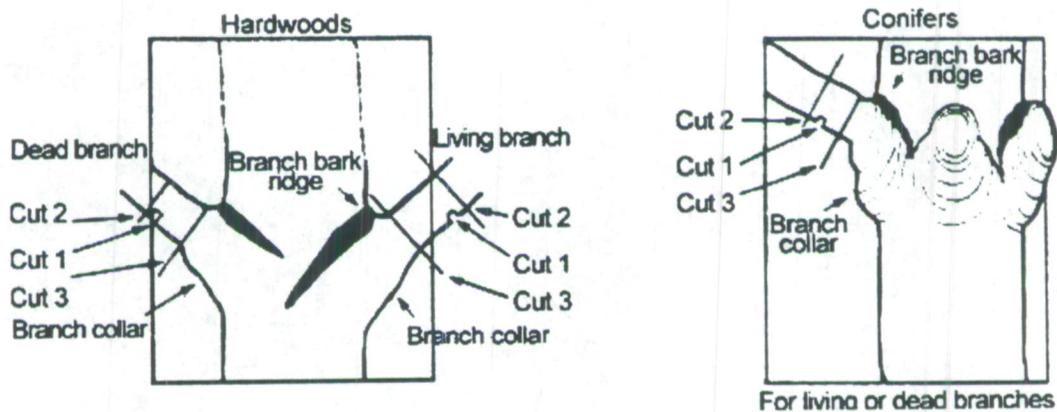


Figure 4.5 Proper pruning methods for both hardwoods and conifers. (Delaware Cooperative Extension HYG-71)

When to Prune

Overall, the dormant season is the best time to prune trees. Conifers are a little more forgiving regarding the timing of pruning operations. Summer pruning will not damage conifers, but higher sap flow can create a larger mess at that time. Pruning time should occur when there is a decreased chance of transmitting any disease.

When pruning during the dormant season, it is easier to visualize the structure of the tree, making it easier to determine whether or not a branch should be removed. Even during the dormant season, tissues of the tree can produce a callous that will begin to enclose the wound before the growing season begins. Many diseases, including oak wilt, can be transmitted by contaminated equipment. Prevent transferring diseases by keeping pruning equipment clean with a dilute solution of bleach or alcohol.

For showy flowering trees and shrubs, ideally pruning should immediately follow flowering, but occur before the leaves flush. An important exception are flowering ornamentals that are also susceptible to a bacterial disease called fire blight. This disease can be avoided by pruning trees and shrubs of the rose family during the dormant season.

Which Tool to Use

The size of the limb being pruned determines the most appropriate tool for the job (Figure 4.6). If the branch is too large for any handheld equipment (approximately 4 inches or more), then a chainsaw may be most appropriate.

Review of General Pruning Procedures*

1. Start pruning while plants are young to maintain the natural form and avoid the need for corrective pruning later.
2. Know the specific objective of pruning before you start.
3. Time your pruning properly for aesthetic and functional reasons.
4. Remove any dead, broken, injured, diseased, or insect infested branches. When removing diseased wood, clean your tools after each cut by immersing cutting blades in rubbing alcohol or household bleach solution.
5. Prune out undesirable branches such as criss-crosses, suckers, sprouts, or those branches which are too long or too low.

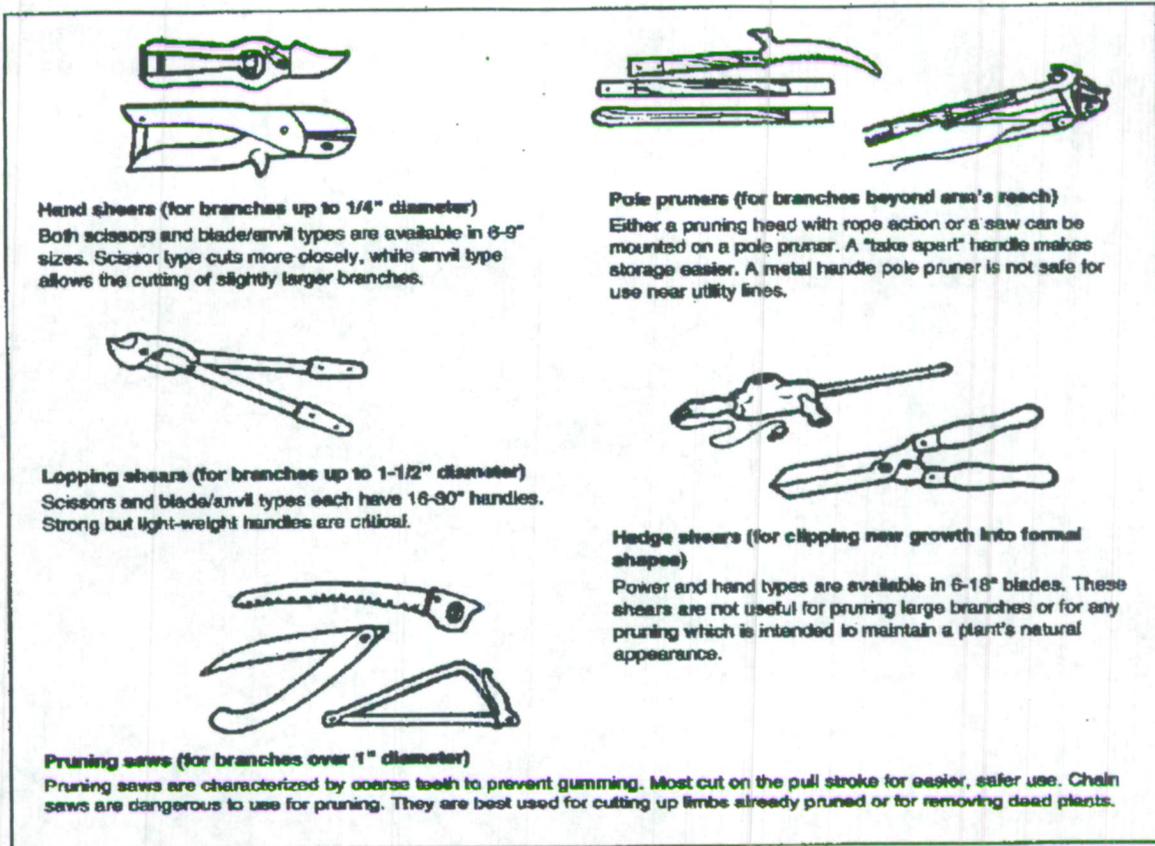
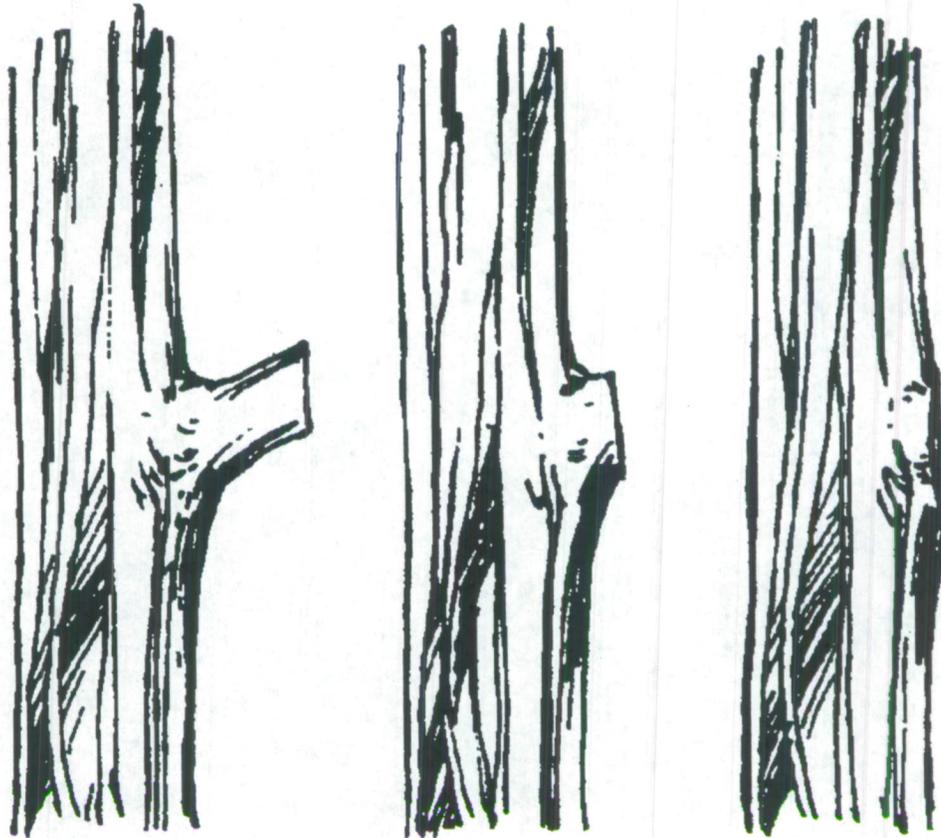


Figure 4.6 Examples of Common Pruning Equipment (Purdue University Cooperative Extension Service, Landscape Horticulture HO-4).

6. Make proper cuts without leaving stubs, but do not cut into the branch collar (Figure 4.7).
7. Clean and oil metal parts of pruning tools when finished.

* From Purdue University Cooperative Extension Service, Landscape Horticulture, HO-4



too long a stub

correct cut

too close a cut

Figure 4.7 Illustration of proper and improper pruning cuts. (Purdue University Cooperative Extension Service, Landscape Horticulture, HO-4).

Things to Avoid

1. Topping & Tipping. Topping is the drastic removal or cutting back of large branches in mature trees. The tree is pruned much as a hedge is sheared and the main branches are cut to stubs. Topping is also referred to as heading, stubbing, or dehorning. Tipping

refers to lopping off a branch within the internode region (area between two nodes or buds).

2. Do NOT remove more than 1/3 of the total leaf area during a single year. Pruning too much leaf area can be detrimental to the tree.
3. Do NOT cut branches more than 1/2 the diameter of the bole or main trunk. Branches exceeding 1/2 the diameter of the trunk likely will not callus properly increasing the chances of insect infestation or infection by a pathogen.
4. Do NOT use a wound dressing. Wound dressings may create more problems than they solve. Wound dressings can trap moisture and create an ideal setting for pathogen establishment.
5. Do NOT work on trees around utility lines. If lines pass through a tree that needs pruning, contact your utility company. Only certified utility line workers should work near utility lines.

Web References

Below are a list of internet resources that will provide more information about proper tree care. Most of the websites deal with proper tree pruning. Some of the resources are available in print,

such as the USFS publication on "How to Prune Trees."

ISA: Avoiding Tree & Utility Conflicts

<http://www.ag.uiuc.edu/~isa/consumer/avoid.html>

USFS Northeastern Area: How to Prune Trees

http://www.na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm

Purdue University: Pruning Ornamental Trees & Shrubs

<http://www.hort.purdue.edu/ext/HO-4.pdf>

Missouri DOC: A Pruning Primer

http://www.conservation.state.mo.us/documents/forest/pruning_guide.pdf

Virginia Coop Extension: Tree Trunk Wraps & Paints

<http://www.ext.vt.edu/departments/envirohort/factsheets2/tree/aug94pr5.html>

Chapter 5: Volunteer Involvement

by Jeremy Webber

Developing and implementing a community forestry program can require a great deal of time and effort and is usually far too large a task for one or two employees. However, accomplishing these objectives can be made much easier by involving community volunteers. Recruiting volunteers for these purposes can increase the effectiveness of a community forestry program. Although some speak of today's volunteer support as shrinking, the pool has actually been growing (Smith 1989). People are beginning to show renewed awareness to community needs and a willingness to share both their **personal time and their financial resources**. While volunteers can be a critical resource, recruiting and managing volunteers presents a number of challenges.

RECRUITING

Recruiting supporters for a community forestry program can be difficult. However, people today like to be part of organizations that are noted for being beneficial for their community. Recruiting volunteers can be facilitated by having a catchy organization name that is or will be recognized by the community in a positive manner. For instance, Cool Communities in Miami, Forest ReLeaf of Missouri,

Openlands Project in Chicago, and Treepeople in Beverly Hills have proven effective and successful. Association and involvement with the organization may be a reward in itself for some people.

Next, how can the target audience be reached successfully? The target audience will be the type of individuals to recruit for your organization. The target audience could be a particular age range, people with specific interests in natural resources, or individuals with specific skills (marketing, horticulture, or fund raising as examples). The age of targeted volunteer personnel will have a considerable impact on developing appropriate recruiting and training strategies. Seniors are typically one of the more involved age classes in volunteer organizations. Seniors are usually available to work during the weekdays as well as weekends. However, they may or may not have the energy that is required to do the work you need, but do not underestimate their capabilities. Seniors tend to be effective, experienced planners who look at more than just one side of things and tend to apply themselves thoroughly to the task at hand. On the other hand, young people, in most cases, have abundant energy to perform physically-intense jobs, but may have difficulty sustaining interest in the program for an extended period.

Some of the best volunteers to recruit are those who are currently established in the community and plan to stay. These individuals tend to feel a sense of ownership toward their community and are more likely to stay involved with the volunteer group for a longer duration

of time than someone who is only a temporary resident. Furthermore, long-term residents can help reduce the burden of training new individuals.

Many groups or organizations reach their community through newsletters, mailings, and word of mouth (one-on-one recruiting). Using a member of the targeted group as a spokesman in recruitment efforts can help prepare a message that focuses on common interests and needs (Lynch 1990). City council members can be useful in recruitment efforts. It gives them an opportunity to refer new constituents to a community resource in addition to demonstrating to the community their involvement. Another way to recruit volunteers is through an annual appeal, sculpted around traditional fund drives (Ensmann 1984). Furthermore, the organization could broadcast an advertisement for the organization over a local radio or television station as a local public service announcement.

These recruiting methods work well but perhaps the best way to recruit is through personal contact. Although this approach is one of the most common means of recruiting, it also has a serious drawback in that participation may be limited to a narrow segment of the population. One-on-one recruiters tend to ask people whom they know, and they usually know people much like themselves (Fisher & Cole 1993). This form of recruitment tends to fall short of attracting a diverse group of volunteers to an organization, thus

increasing the chances that their efforts will fail to achieve a broad base of community support. Despite this disadvantage, personal contact remains a powerful tool. Further, new members can be encouraged to recruit additional members. Following are some thoughts to remember when talking to a perspective member (Battle 1988):

1. **Describe what the organization does and why -** Concentrate on the aspects of the organization that are most attractive to a potential new member.
2. **Respect their time -** Too often, well-meaning members try to tell a prospective member everything about an organization and either bore him or her to death or talk them out of joining after they were initially persuaded to join.
3. **Tell them why they are needed in the organization -** This should relate to an individual's experiences and interests. Help them visualize how much more effective the organization will be with his or her help.
4. **Ask them to join -** Too often, we do a great job telling the prospect about the organization, but we do not ask them to join! They can only say yes, no, or maybe. If they say yes, congratulations! If they say no or maybe, you need to ask him or her why, as their negative response merely may indicate their need for additional information. After they have given you their question,

answer only that question and then ask them to join again. They will either join, bring up another question or tell you why they really will not join. Not everyone will join your organization when asked, but few will join unless asked. There are legitimate reasons for not joining, including that the time might not be right. Respect their answer, put them into a tickler file to call in the future and do not create a negative image of your organization by reacting negatively to their answer.

TRAINING

Training can be a time consuming and costly experience. Even with the aid of volunteer trainers and donations of space, equipment, and supplies, training is a distraction from your primary goals of tree planting and maintenance. In order to maximize participation among community residents, consider the following:

- **Do the residents already have the skills they perceive to be necessary or are they offered opportunities to develop those skills by participating in the community forest project?**
 - First, recognize proficient residents in the community including nurserymen and arborists.
 - After identifying a few skilled individuals, try to create opportunities for them to serve as trainers for the community program.

- Develop subsequent training opportunities to meet the full range of needs the community will face in implementing and maintaining the community forestry project.
- **Do they believe the effort is likely to be successful in addressing the issues of concern?**
 - Furnishing evidence of past successes in similar or related programs will aid in keeping participants focused as well as ensuring them that their training will be adequate so that they too can be successful.
- **How do they perceive and think about the problem?**
 - Find out exactly what problems (planting and/or maintenance) the community must confront.
 - Address concerns residents may have about urban trees in their community and use their input to develop further community forestry projects.
- **Do they agree with the project goals?**
 - Residents will be more likely to participate if the project encompasses the recognized needs and goals of the community.
- **Do they feel a sense of duty toward their community or to participate in the organization?**

- In communities with a high turn over residency rate, such as a college community, many people may be reluctant to participate in long-term projects. Instead, focus on finding longer-term residents or committed **community activists** to help initiate involvement. However, do not overlook the help of resource-conscious college students as an excellent source of short-term help.

- **Does the program provide necessary individualized training programs to ensure the successful implementation and maintenance of each community forestry project?**
 - Identify volunteers with tree planting experience and develop a common understanding of appropriate planting techniques to maximize the likelihood of tree survival.
 - Depending on the skills and experience of local residents, training programs addressing regular maintenance and pruning and harvesting and marketing techniques may also be important. Keep in mind that volunteers may have only a narrow set of interests and abilities regarding community forestry.

Many tree organizations tend to focus on planting trees rather than maintaining them. This is partly because people tend to be more willing to join a group that will give them a sense of immediate accomplishment, such as those involved in planting trees. Many don't realize that pruning and maintaining existing trees is just as

important as planting new ones. Most groups struggle to find ways to keep volunteers interested while accomplishing their organization's goals. This may be one of the most difficult barriers to overcome. Some organizations, such as Santa Barbara County ReLEAF, recruit professional arborists who donate their time on weekends. Some even pay their crews to join them. This approach has proven effective but is also costly and unrealistic for small communities. Also, much of the work involved in tree maintenance is unsafe for most volunteers.

Once training goals for the volunteers have been determined, it is useful to put together a small information packet listing the material to be covered. Distributing the packet prior to the training event will expose the volunteers to the information and may aid in their understanding the material. This may reduce potential confusion among the trainees and shorten the training session. However, teaching new ideas requires considerable time and patience by all parties. Three points worth recognizing when training people are as follows (Battle 1988):

- There is no such thing as a dumb question, just dumb answers. People are often afraid to ask a question because they are made to feel inferior for not already knowing the answer. Welcome questions and treat even the silliest questions with respect. This will encourage people to ask questions and improve their performance.

- Do not assume that someone will know what to do in a given situation. Provide instructions if specific actions are required.
- Proper training is not a one way communication. People learn at different speeds. To conclude a successful training program, make sure the trainees have learned what they have been taught and not just heard what was presented. Ask questions or give a small quiz in a fun, non-confrontational manner.

RETAINING

Sustaining volunteer support is one of the most difficult and critical tasks of a volunteer organizer. Much as volunteers impact a community or organization, organizations influence volunteers. As people engage in volunteer activity, their horizons and interests may broaden, their attitudes may change, their skills may increase, and their loyalty to an organization may become stronger (Fisher and Cole 1993). If the volunteer's expectations are not met, their skills may not be enhanced or even appropriately used, and the appeal of the organization may not be as compelling as first they had thought. The result is one of decreasing interest rather than fulfillment. To better understand and manage this situation, conduct evaluations both at the beginning and end of each program. To determine whether the training was successful, evaluate the volunteers before and after training. This can be done by formally implementing a short multiple choice evaluation form to be administered before and

after training sessions or informally by asking for volunteer input on an individual basis. Try to avoid too many open-ended questions in order to save time. If the trainees do well, their interest likely will be higher than if they did not. Learning from your volunteers will allow increase the effectiveness of future training sessions.

The rewards that individuals expect when first volunteering often are not the important rewards once they have become volunteers. Further, this shift in rewards of volunteering, if not anticipated and managed, can result in the rapid departure of many new volunteers (Pearce 1983). One way to maintain active volunteers is to have them implement their knowledge and skills. For example, a Chicago-area based organization known as Openlands, maintain their volunteers' interests by requiring them to contribute twenty-four hours of volunteer service after fulfilling training requirements. This is an effective way to allow people to use the skills they have acquired. This technique maintains volunteer interest through the utilization and refinement of their attained skills.

Volunteers also like to be rewarded for their time and efforts. This reward might be as easy as issuing a certificate of completion after a program. Recognition banquets that honor the volunteers and their efforts are often appropriate. Some other ideas may be to recognize the volunteers publicly at a community gathering or finding a local sponsor to donate T-shirts to those who have completed the project. All of these methods have proven themselves to be

effective means for retaining volunteer involvement.

SUMMARY

Building a community forestry program can take a considerable amount of time and effort depending upon the size of the community. In addition, the success of training can influence the volunteer's desire to continue as a volunteer. Remember there is no such thing as a dumb question, don't assume the trainees know what to do in a given situation, and make sure that they understand what they are learning. By building volunteer interest and harnessing it effectively, the community will be significantly impacted, not only by sustaining the health of the community's trees, but also by building stronger community ties.

Chapter 6: Ordinances and State Statutes

by Shawn Dickerson

& David D. Close

Municipal tree ordinances that are both thoughtfully written and fairly enforced can be a very effective means for creating or preserving a safe and attractive community forest. Ordinances range in complexity from simply designating and defining local tree authority to sanctioning or forbidding specific tree-related practices. City tree ordinances can be used to meet many objectives related to the improvement of a community's forest resource. Some common objectives of ordinances are tree protection, setting of planting standards, designating conditions for permits, and fines, and establishment of a city forester or tree board. Tree ordinances vary considerably in structure and content among municipalities, with each reflecting unique community culture and objectives. For example, some communities focus on the protection of existing historic trees while others emphasize tree planting standards. Communities that are just starting to develop a city tree ordinance may find examples from other communities useful but should tailor their ordinance to satisfy their own community's needs.

To be successful, tree ordinances must be both acceptable to local residents and enforceable by government officials. Resident acceptability is best achieved when ordinances are crafted by a committee consisting of a group of community members

encompassing a wide range of viewpoints. Such members may include, but not be limited to, an attorney, members of the tree board or park board, a city council member, a street department representative, a utility representative, a nursery representative, a tree care provider, representatives from community organizations, and residents (Wray 1997).

An effective tree ordinance should be flexible and not excessively restrictive, allowing for physical and social changes and technological innovations (Herberger 1989). The ordinance should be concise, general, and not overly regulatory. However, the provisions should be stated clearly, avoiding confusing or ambiguous wording. The use of correct terminology is imperative to avoid needless conflicts surrounding interpretation of ordinances.

Following are sample provisions that may be used in a city tree ordinance. Each provision is briefly described and an example provision is given in italics. Provisions of high importance are marked with an asterisk (*). Provisions supported by Illinois state statutes are marked with a cross (†). The state statutes pertaining to urban trees are given in Appendix H.

- Title. *

The title should consist of a general, one sentence description of the

ordinance, using precise and easily understood terminology.

This ordinance shall be known as the "Anytown Tree Ordinance" of Anytown, Illinois.

- Table of Contents. *

A table of contents should be included to better organize provisions in a lengthy ordinance. Provision titles should be as short as possible to better help the reader find pertinent information quickly.

Section I. Title.

Section II. Statement of Value.

Section III. Findings.

Section IV. Purpose and Intent.

D. Purpose.

E. Intent.

Section V. Definitions.

- Findings.

The findings provision establishes the need for a tree ordinance. This provision should list the reasons for creating a tree ordinance along with the goals of the community. A brief statement concerning the values or benefits of trees may be included. The benefits of trees may range from community beautification to increased

property values. All benefits relevant to your community should be listed.

General Findings. The city council makes the following general findings regarding the relationship between health, safety and the general welfare and protection and maintenance of street and private trees as addressed in this chapter.

- 1. They are a valuable long-term community asset, and intended to increase property values in their vicinity.*
- 2. They recycle air and water, convert carbon dioxide into oxygen, provide shade and windbreak protection, can moderate temperatures for an entire neighborhood or community, and thereby protect us from climatic extremes.*
- 3. They screen or absorb dust and pollutants, and buffer traffic and other noise.*

(Center of Excellence for Sustainable Development 1999)

- Purpose and intent. *

The purpose and intent provision lists the goals of the ordinance. Goals should be confined to a short concise list or group of brief statements.

Purpose and intent

This ordinance establishes policies, regulations, and standards necessary to ensure that the city will continue to realize the

benefits provided by its urban forest. The provisions of this ordinance are enacted to:

- Establish and maintain the maximum sustainable amount of tree cover on public and private lands in the city;*
- Maintain city trees in a healthy and non-hazardous condition through good arboricultural practices;*
- Establish and maintain appropriate diversity in tree species and age classes to provide a stable and sustainable urban forest.*

(Phytosphere Research 1999)

• **Definitions. ***

Technical terms used within the ordinance may be listed and clarified in this provision. While it is necessary to use appropriate technical language, unnecessary use of such terms should be avoided. Once the ordinance is drafted, time should be spent locating any potentially confusing terminology. Any clarification of terms should be addressed here.

Definitions

The following definitions shall apply to this chapter:

- A. "City" means the city of Carpinteria acting by and through its authorized representatives.*

- B. *"Conforming tree" means an approved tree that is included on the city adopted master street tree list, planted and grown in accordance with the street tree management plan.*
- C. *"Director" means the city manager or his designee.*
- D. *"Even-aged" means those trees of similar species, or of different species with similar life span, all of which were planted at approximately the same time and are likely to decline simultaneously.*
- E. *"Ground cover" means grass, turf or perennial plants that normally grow in a prostrate manner so as to conceal, or with the purpose of concealing, the ground surface that do not exceed eight inches in height, and will tolerate light pedestrian traffic.*
- F. *"Hedge" means any plant material, shrub or plant, when planted in a dense, continuous line or area, as to form a thicket or barrier.*
- G. *"Maintain" or "maintenance" means and includes pruning, spraying, root pruning, mulching, fertilizing, cultivating, supporting, treating for disease or injury, promoting public safety or other similar act which promotes the life, growth, health or beauty of any planting on public property.*
- H. *"Monocultures" means single species plantings, whether or not even-aged, which can intensify problems of disease susceptibility and/or insect infestation.*
- I. *"Park tree" means any tree, shrub or other plant located on, in or over any public area.*
- J. *"Parkway" means that portion of a public street which is not*

improved for actual street, curb, gutter or sidewalk use and which is available for planting and maintaining street trees.

K. *"Private tree" means any tree which is not a street tree, and which is located on private property.*

(Center of Excellence for Sustainable Development 1999)

- Determination of Definitions.

This provision establishes the authority for a person to interpret the definitions used in the ordinance. Authority should be determined by a committee or the tree board. Modifications to the Definitions provision should be made as needed by the designated authority.

In any case, the city forester shall have the right to determine whether any specific woody plant shall be considered a tree or a shrub. Such determination shall be final and not subject to appeal.

(Phytosphere Research 1999)

- Management Plan

This provision may guide city officials in the development and modification of a tree management plan. The provision may include a list of all topics to be addressed in the management plan.

Street tree management plan.

The city shall prepare and adopt a street tree management plan to include:

- A. *A master street tree list of approved trees giving their common and botanical names, and regulations and criteria relating to the location and manner of planting such trees as will protect public safety and public improvements, including consideration of the relationship of the size of a species at maturity to its designated locations.*
- B. *Management practices regarding planting, maintenance, recycling, removal and replacement of street-trees;*
- C. *Specifications regarding how a tree should be planted and staked, guying, preparation of the planting area, the use of root barriers, the proper spacing between street trees, considerations of line of sight and public safety, and the proper setback from curbs, sidewalks, fire hydrants, public utilities and street intersections;*
- D. *A comprehensive street tree inventory specifying the location, distance from the curb, species, age and life expectancy, necessary maintenance, the size and condition of existing street trees (and estimated monetary value) the characteristics of each occupied and vacant planting site, and the nature and extent of any damage to public or private improvements attributed to any tree.*

(Center of Excellence for Sustainable Development 1999)

- Policies regarding trees.

This provision provides guidelines for carrying out ordinance

provisions. Policies can contain descriptions of how the community's goals are achieved through compliance. Successful policies tend to be somewhat flexible, avoiding conflict through unnecessary restrictions.

Statement of city policy with regard to street trees.

Street tree plantings shall first be considered from the standpoint of the people using or passing along the streets, and in terms of the broader community benefit. Of secondary consideration is the benefit, embellishment or enhancement of the properties abutting the street.

(Center of Excellence for Sustainable Development 1999)

- Performance Evaluation. *

This provision calls for the ordinance to be evaluated after a designated time period. Ordinance revision may also be addressed once the evaluation process has occurred. Time intervals between evaluation periods should be defined to ensure periodic updates or revisions to reflect changing goals or practices within the community. The provision should define who will be responsible for evaluating the ordinance.

The tree program manager shall collect and maintain all records and data necessary to objectively evaluate whether progress is being made toward the stated goals of this ordinance. An annual summary and analysis of the evaluation, and recommendations for action shall

be prepared at the direction of the tree program manager and presented to the City Council. The City Council shall consider the report and recommendations and take all actions deemed necessary to accomplish the goals of this ordinance. These actions may include, but are not limited to, revision or amendment of this ordinance or the adoption of other resolutions or ordinances.

(Phytosphere Research 1999)

- Jurisdiction. † 65 ILCS 5/11-80-2

The Jurisdiction provision designates community ownership of trees on public property and rights-of-way. Extending municipal jurisdiction to private property should be avoided except in cases where public safety may be threatened.

The City of Carpinteria shall have control of all street trees, shrubs, and other plantings now or hereafter in any street, park, public right-of-way or easement, or other public place within the City limits, and shall have the power to plant, care for, maintain, remove, and replace such trees, shrubs and other plantings.

(Center of Excellence for Sustainable Development 1999)

- City tree board. *

This provision designates a city tree board and lists their duties. This provision should be flexible and encourage a diverse membership. The provision should state what the tree board is

authorized to do as well as the responsibilities of the tree board.

12.28.080 Tree advisory board.

- 1. Creation and Establishment. There is created a city tree advisory board which shall consist of five members, who shall be residents of the Carpinteria Valley area. They shall be appointed by the mayor with the advice and consent of the city council. The members shall be lay citizens, and others with established professional competence in a pertinent discipline.*
- 2. Term of Office. The term of office for members of the tree advisory board shall be two years. All terms shall expire on January 31st of odd-numbered years. In the event that a vacancy should occur during the term of any member, his or her successor shall be appointed for the un-expired portion of the term.
Members may serve more than one term.*
- 3. Compensation. Members of the tree advisory board shall serve without compensation. Members shall be reimbursed for any expenses incurred as a result of authorized business related to their responsibilities as member of the board.*
- 4. Organization. The board shall, immediately upon its appointment and taking office, elect a chair and vice-chair from among its membership, and thereafter at its regular meeting closest to and following February of odd numbered years. The board shall be subject to all local and state laws relating to meetings of public bodies, adopt and operate under its own rules of order and procedure as may be necessary, establish dates for its regular meetings which shall be held at least twice per year or more often*

as needed at a time and place determined by the board, and determine the method of calling the special meetings. Minutes shall be kept of all meetings by the city clerk or his designee, who shall serve as secretary to the board.

5. Attendance. In the event a member of the board shall not attend two consecutive regular meetings, unless excused by the chairman of the board for good cause, the position of such member shall be deemed to be vacant, and the term of such member terminated, and the mayor notified immediately by the chairman of such termination.

6. Duties and Responsibilities. In addition to all other duties and responsibilities set forth in this chapter, the board shall act in an advisory capacity to the city council, city manager and city staff in the administration of this chapter and with regard to all street tree matters.

(Center of Excellence for Sustainable Development 1999)

- City tree manager. *† 65 ILCS 5/11-42-13

This provision designates either a city tree manager, forester, director, or an arborist and lists their responsibilities.

Responsibilities may include, but not be limited to, tree inspection, permit issuance, ordinance enforcement, tree maintenance, and implementation of a city tree management plan.

§ 306-4. City Forester.

- A. The office of the City Forester is hereby established in the Department of Public Works.*
- B. The City Forester, in consultation with the Shade Tree Advisory Committee (STAC) and the Board of Public Works, shall have the authority to implement and enforce the provisions of this chapter.*
- C. In furtherance of the purposes of this chapter, the Board of Public Works, in consultation with the City Forester and the STAC, shall have the authority to adopt rules and regulations regarding arboricultural specifications and standards of practice and such additional rules and regulations as the Board determines are necessary. These regulations shall govern the planting, maintenance, removal, fertilization, pruning and protection of trees and shrubs on public streets, parks or other city property.*
- D. In the absence of the City Forester, the duties of that office shall be the responsibility of the Supervisor of Parks and Forestry within the Department of Public Works.*

(City of Ithaca 1999)

- **Permits.**

The Permits provision lists tree related activities that require a permit from the city tree manager.

Before removing, trimming, or planting a tree within the Public Right-of-Way or Village Park land any person or entity must complete a Tree Maintenance Permit form at the Village Building Department.

The following information is provided to guide those who wish to perform the above tree maintenance activities.

(Village of Milford 1997)

- Public Nuisances. † 65 ILCS 5/11-60-2, 65 ILCS 5/11-80-3

This is a provision that can be used to list types of public nuisance trees and gives the city the right to inspect and remove trees included on the list.

The following are hereby declared public nuisances under this ordinance.

- 1) Any dead or dying tree, shrub, or other plant, whether located on city owned property or on private property.*
- 2) Any otherwise healthy tree, shrub, or other plant, whether located on city owned property or on private property, which harbors insects or diseases which reasonably may be expected to injure or harm any tree, shrub or other plant.*
- 3) Any otherwise healthy tree, shrub, or other plant, whether located on city owned property or on private property, which by reason of location or condition constitutes an imminent danger to the health, safety or welfare of the general public.*

- Maintenance and establishment. † 65 ILCS 5/11-72-1, 65 ILCS 5/11-73.1-2

This provision sets standards for planting and care of city trees.

- X-2-5.01 Care and Maintenance: The Public Works Maintenance Manager shall initiate and administer a program to provide for the planting, maintenance, care, removal, and replacement of official street trees, consistent with resources available.*
- X-2-5.01-1 The City may require the property owner to remove, thin, prune, spray, stake, and otherwise maintain street trees, as may be deemed necessary and feasible. The property owner shall water and may fertilize street trees adjacent to his or her property, provided however, the City may perform necessary care in selected non-residential areas, along undeveloped property, or in planting areas separated from adjoining property by a fence required as a condition of development. All incurred costs are to be borne by the property owner.*
- X-2-5.02 Removal of Trees or Plantings in Public right-of-way: The City may remove any other planting which constitutes a hazard or may endanger the health, well-being or property of the public or which constitutes an obstruction to the vision of traffic.*
- X-2-5.03 Tree Replacement: The City may replace an approved street tree or other planting which has died or may have been removed for any reason, or plant additional street trees deemed appropriate consistent with available resources. X-2-5.06 Abuse or Mutilation: It shall be unlawful for any person to break, destroy, or mutilate any*

approved street tree, or tree stake, or any public tree, shrub or plant in any public place.

(City of Milpitas 1999)

- Species.

This provision may include a list of recommended tree species, cultivars, or varieties to be planted in areas with specific site conditions. Great care must be taken to a) list only appropriate species and b) list sufficient numbers of species to ensure a diverse urban forest.

The species listed below shall constitute the official Street and Park Tree species for the Village of Milford. No species other than those listed in this handout may be planted without the written permission of the Village of Milford.

LARGE TREES - (40' TO 75')

Shademaster Honeylocust - (Gleditsia Shademaster)

Skyline Honeylocust - (Gleditsia Skyline)

Sugar Maple - (Acer Saccharum)

Varieties: Green Mountain Legacy

White Ash - (Fraxinus Americana)

Varieties: Autumn Applause, Autumn Purple, Rosehill, Patmore.

Green Ash - (Fraxinus Pennsylvania)

Varieties: Marshall's seedless, Summit, Blue.

American Liberty Elm - (Ulmus Americana Liberty)

Tulip Tree - (Liriodendron tulipifera)

MEDIUM TREES - (30' TO 40')

Red Maple - (Acer Rubrum)

Varieties: Autumn Blaze, October Glory, Red Sunset.

Red Oak - (Quercus Rubra)

Maiden Hair Tree (Ginkgo Biloba (male only)).

SMALL TREES - (20' TO 30')

Pyrus Calleryana

Varieties: Aristocrat Pear, Bradford Pear, Cleveland Select,

Redspire Pear.

Linden (Tilia Americana)

Varieties: Redmond Linden, Glenleven linden, Greenspire Linden.

(Village of Milford 1997)

- Protection of trees.

This provision lists actions for protecting trees against construction damage and development.

X-2-7.01 Existing Trees Protected: It shall be unlawful to remove existing trees within the City except in accordance with Subsection X-2-4.02.

X-2-7.01-1 Trees protected in the Section are:

- (a) All trees which have a fifty-six inch (56") or greater circumference of any trunk and are located on developed residential property.*

- (b) *All trees which have a thirty-seven inch (37") or greater circumference of any trunk and are located on developed commercial or industrial property.*
- (c) *All trees which have a thirty-seven inch (37") or greater circumference of any trunk, when removal relates to any transaction for which zoning approval or subdivision approval is required.*
- (d) *Any tree that existed at the time of a zoning or subdivision approval and was a specific subject of such approval or otherwise covered by subsection (b) above.*
- (e) *All trees which have a thirty-seven inch (37") or greater circumference of any trunk and are located on a vacant lot, undeveloped or underdeveloped property.*
- (f) *All heritage trees and specimen plantings as defined in Section X-2-2.10.*

(City of Milpitas 1999)

- Unlawful interference.

This provision prohibits interference by individuals or groups with municipal officials or their agents performing tree related activities.

No person, firm or corporation shall interfere with the director of public works or persons acting under his authority while engaged in

planting, mulching, pruning, ..., or removing any tree, shrub or plant in any street, ..., or public place within the city.

(Phytosphere Research 1999)

- Penalty for violation. *

This provision establishes penalties for provision violations.

Any person, partnership, firm, corporation, or other legal entity who violates any provision of this chapter is guilty of a misdemeanor punishable by a fine of not more than one thousand dollars, or by imprisonment in the county jail for a period not exceeding six months, or both such fine and imprisonment. All such violations which are of a continuing nature shall constitute a separate offense for each day of such continuance. Any violation of this chapter shall also constitute a public nuisance and may be enjoined and abated as provided by law.

(Phytosphere Research 1999)

- Enforcement. *

The Enforcement provision directs specific community personnel to handle specific aspects of tree management.

X-2-8.01 Abatement by Trimming on Public right-of-way: The Public Works Maintenance Manager shall be empowered to authorize trimming of any approved street tree, un-

approved street tree, or other planting in the public right-of-way or easement without prior notice to the property owner, if the Public Works Maintenance Manager determines in his or her sole discretion that the approved street tree, un-approved street tree, or other planting constitutes an immediate hazard to the public peace, health or safety and that trimming said street tree or other planting is immediately necessary for the protection of the public peace, health or safety.

X-2-8.03 Collection on Tax Roll: In the event that the cost of abatement is not paid by the property owner within the period required, the amount of the cost of abating such nuisance shall constitute special assessments against such respective lots or parcels of land, and after thus made and confirmed, shall constitute a lien on such property for the amount of such assessments until paid.

X-2-8.05 Abatement by Judicial Action: The City Attorney shall, upon authorization from the City Council, commence an action in a Court of competent jurisdiction to abate any approved street tree, un-approved street tree, or other planting determined by the City Council to constitute a nuisance together with damages therefor.

X-2-8.07 Right to Enter Property: Officers and employees of the City shall be empowered to enter real property at reasonable times to carry out the provisions of this Chapter.

(City of Milpitas 1999)

- Appeals. *

The Appeals provision allows residents to appeal decisions made by officials concerning trees.

X-2-9.01 Any person aggrieved by an act or determination of the Public Works Maintenance Manager or his or her designated representative in the exercise of the authority herein granted may appeal in writing to the Public Works Director.

X-2-9.02 Any person aggrieved by an act or determination of the Public Works Director in the exercise of the authority herein granted may appeal in writing to the City Council in accordance with the procedure set forth in Section 5, of Chapter 20, Title 1, of the Milpitas Municipal Code.

(City of Milpitas 1999)

- Severability. *

This provision prevents the ordinance from becoming defunct in the case that one of the provisions is found invalid.

Should any part or provision of this ordinance be declared by a court of competent jurisdiction to be invalid, the same shall not affect the validity of the ordinance as a whole or any part thereof other than the part held to be invalid.

(Phytosphere Research 1999)

- Liability Disclaimer.

This provision allows the community government to avoid liability for damages to persons or property caused by trees.

Nothing contained in this section shall be deemed to impose any liability upon the city, its officers or employees, nor to relieve the owner of any private property from the duty to keep any tree, shrub or plant upon any street tree area on his property or under his control in such condition as to prevent it from constituting a hazard or an impediment to travel or vision upon any street, park, pleasure ground, boulevard, alley or public place within the city.

(Phytosphere Research 1999)