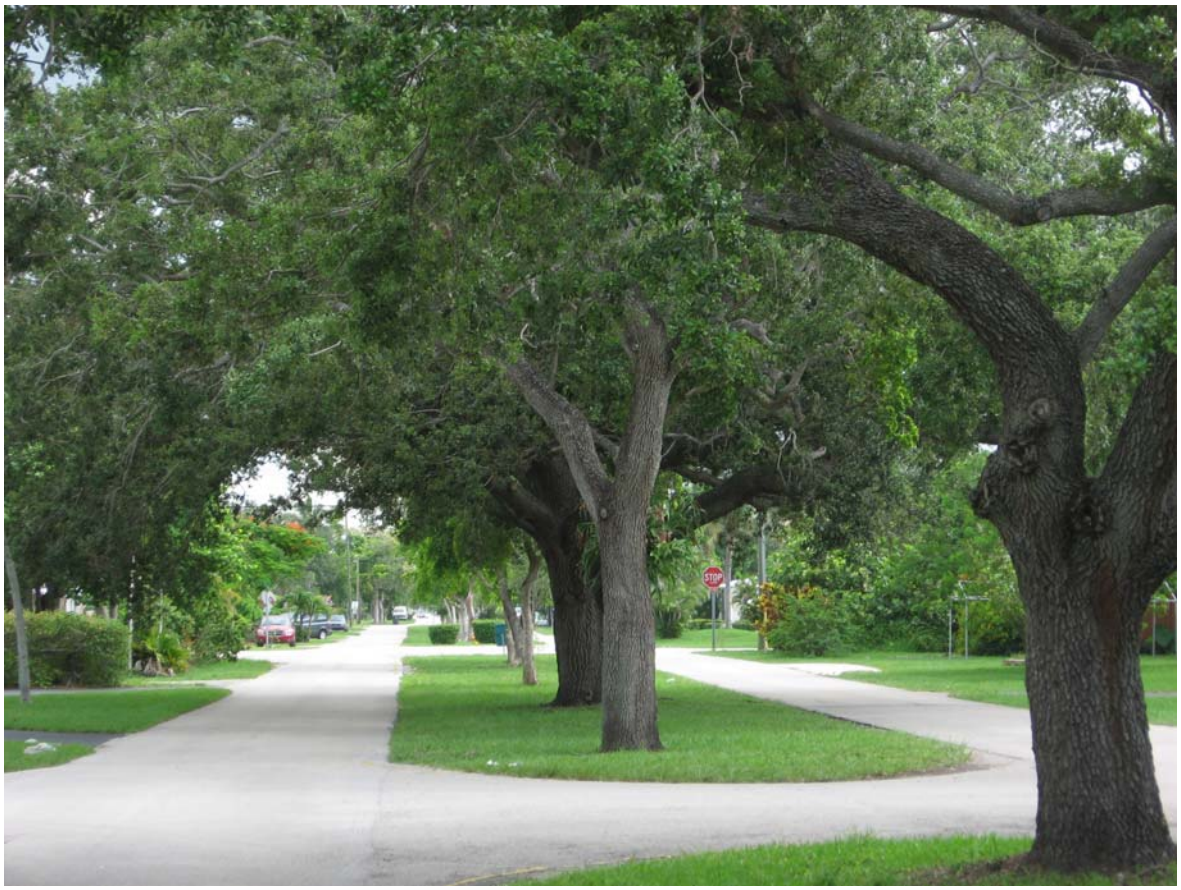
URBAN TREE INVENTORY SUMMARY REPORT

Village of Biscayne Park, Florida



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I. INTRODUCTION

PROJECT SCOPE

The Village of Biscayne Park retained Natural Resource Planning Services (NRPS) to conduct an inventory of all trees standing in public street rights-of-way as well as selected Village-owned properties. Field data collection was completed in July 2005. Information about these trees is included in the accompanying computer database and will be summarized in this report.

REPORT PURPOSE

An urban tree inventory seeks to quantify tree and tree space information with an eye to the future. Appropriate urban forest planning includes decisions that will:

- increase or maintain the health of existing trees;
- develop the proper environment or space in which trees may grow;
- properly establish future trees;
- promote efficient use of tree management resources, and;
- provide a safe living environment for humans.

Management of any resource begins with an inventory. Most urban foresters are managing an extremely valuable urban asset without the benefit of knowing how many trees they are responsible for, what kind they are, where they are located, or what condition they are in. This report will summarize these aspects of Biscayne Park's urban forest.

This inventory provides a record of your trees to be managed. All trees within the project scope were tallied. "Trees" tallied were those plants that appear to have been planted or maintained to produce a tree. For example, crape myrtles were included where they were obviously trimmed into "standards" or small trees.

A "street tree" is defined here as any tree or palm with a one-inch or greater diameter at breast height growing within the Village street right-of-way. **This inventory only included median or 'parkway' street trees and did not include 'swale' trees.** Trees growing on selected Village-owned properties are considered "park" trees.

A prime objective of any management plan should be to maximize benefits while minimizing costs. This inventory can form the basis for planting plans, maintenance work scheduling, and for monitoring tree maintenance work. Additionally, conclusions can be drawn and used in making management decisions, budget requests, grant needs, and

responding to public inquiry. A pro-active approach to urban tree management can save time and money when compared to a reactive strategy. An active Village tree management program also provides a good example for citizens and businesses to follow.

HAZARD ASSESSMENT

Village personnel realize that personal injury and property damage lawsuits are on the rise throughout the country as a result of damage and injuries caused by municipally owned trees. This inventory included a cursory identification and evaluation of obvious hazard trees. It is the Village's intent to implement management practices aimed to reduce or eliminate existing or potential liabilities caused by public-owned trees. Looking at the larger trees of poor condition is a good place to start.

However, a formal hazard tree assessment was *not* completed for each tree in the survey. A complete hazard assessment of larger trees can take much longer than the few minutes spent at each tree during this survey. Our past experience indicates that at least ten minutes per tree is necessary to adequately go through a checklist of possible tree defects and to inspect the area for potential targets to tree failure. During this inventory, NRPS foresters used their best judgment and experience to quickly visually scan each tree for major defects that could result in an imminent hazard.

Inventory data provided by Natural Resource Planning Services, Inc. for this project are based on visual recordings at the time of inspection. This visual record did not include individual testing or analysis and did not include aerial or subterranean inspection, and therefore may not reveal existing hidden hazards. Records may not remain accurate after inspection due to variable deterioration of inventory material. Natural Resource Planning Services, Inc. provides no warranty as to the fitness of the urban forest for safe use.

TREE VALUE

Tree evaluation was taken one step further to derive an estimated monetary value for each tree. Many methods of estimating the value of trees have been proposed over the years. The obvious value in terms of forest products such as lumber or pulp is seldom used in reference to the urban forest. Some methods attempt to estimate the value of "services" provided to the community by trees, such as noise and air pollution abatement, water quality improvement, and reduced heating and cooling costs.

For the purposes of this report, tree value was calculated using standard tree

appraisal techniques and formulae[1], which estimate the value in terms of replacement cost. Since formula constants plus height and diameter *classes* were used instead of actual measurements, ***the dollar values in this report are not accurate for formal appraisal purposes***. Averaging of diameter by use of diameter classes creates a false high value for some smaller trees and a false low value for some larger trees. In addition, palms are normally sold at a unit cost per foot of trunk (height), not by diameter. Therefore values calculated by our program for this report for most palms may be different than the retail installed cost.

If a formal appraisal were being performed, any tree less than or equal to six inches in trunk diameter would be considered "replaceable" (the largest replaceable common tree in Florida being a six inch diameter live oak) and the installed market value of a tree from a nursery would be used rather than a calculated value. The retail installed market value of a replacement tree less than six inches in diameter can be less than the value calculated by formula, depending on the species.

Knowing the approximate "replacement" value of a tree is important when comparing the level of maintenance needed with what the tree could actually be worth. If a tree is in poor health, the best solution may be replacement rather than expensive remedial work that may only slow down (but not stop) declining health. Extensive maintenance or tree protection work can be justified for larger historic trees that cannot readily be replaced.

If the replacement value of a tree is needed for, say, an insurance claim, ***an actual appraisal of the tree should be performed by a qualified urban forestry professional***. More time would then be taken to evaluate the condition and location factors of the formula. Also, the exact diameter of the tree would be used in the formula.

The values in this report are intended for use in budget planning and decision-making concerning acceptable maintenance levels per tree.

II. METHODOLOGY

NRPS foresters examined a total of 1,059 street trees within Village-owned street rights-of-way and 140 trees on selected Village-owned properties. Every tree was inspected and tallied, including dead trees and stumps. Suitable locations for planting trees where none now exist were also identified as Tree Planting Spaces. Twenty one vacant planting spaces were noted along the streets of Biscayne Park.

TREE EVALUATION

Four broad categories of tree characteristics appear in the data: location, physical facts, condition evaluations, and recommendations.

A forester inspected each tree and an ISA Certified Arborist supervised the data collection. The International Society of Arboriculture (ISA) has published a formula for tree appraisal* that calculates replacement value based on a measurable physical characteristic (diameter) and individual judgments of species value, condition class, and location class.

Since tree appraisal work, by nature, involves an element of subjectivity, and time spent per tree was a limiting factor during this inventory, some "standard" values were assigned. The location class for all street trees was assigned a value of 60%. Species values were taken from a list produced by the Southern ISA Chapter where a consensus of urban forestry professionals was used to derive a range of values. These values were then adjusted by NRPS urban foresters based on their experience and observations.

The condition rating is a numeric assessment of the tree's over-all health. It reflects past pruning and maintenance practices, the presence of insect or disease pests, the presence of major structural defects or obvious hazards, the growth and over-all vigor of the tree, and the amount of restorative action necessary to raise the level of vigor. A tree's condition is a subjective matter; a checklist was not used to evaluate the tree point-by-point. A consensus was formed between the foresters conducting the inventory as to the various levels of tree health that correspond to the ratings given.

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* The methodology used for this report was taken from the ISA reference listed previously. The latest methodology developed by International Society of Arboriculture is contained in their publication *Guide for Plant Appraisal*, Ninth Edition, 1999.

TREE LOCATIONS

Figure 1 illustrates the methodology used to establish the location designators for street trees. These codes show up in different location fields in the database provided.

So that a tree can be found without a map or serial number, the *position* of the tree on a lot was determined. Essentially, this is a "sub-serial number" as each tree on a lot is numbered consecutively. Position numbers flow in the same direction as the house numbers and begin with "1" for every lot.

Knowing where on the lot a tree sits is also important, especially for houses on a corner lot. The *location* code indicates whether a tree sits on the street that corresponds with the house number (Lot) or sits on the side street (Corner). For addresses that occupy the entire block or have streets on three sides, the rear (Back) of the address can also be a location designator. Where a Median exists, the tree is assigned to a fictitious address based on the block number of the street; i.e.: 3400X 18 AVE S.

Look at Figure 1 and follow these examples:

There is only one tree at 1078 2nd Avenue South so it's position number is "1" and location code "L". However, there are two trees at 1100 2nd Avenue South so their position numbers ascend in the same direction as the house numbers and the location code remains an "L".

At 201 11th Street South, there are two trees. One tree sits on 2nd Avenue South and is designated a "Corner" tree while the other tree is on 10th Court South, which makes it a "Back" tree. Tree position numbering always starts on a corner or lot tree, unless the back tree is the only one on the lot as is the case at 203 11th Street South.

There are six trees at 1101 2nd Avenue South. If the line of trees were straightened out, you can see that the palm tree just north of 204 11th Street South would be the first in line in the direction of ascending addresses. The position numbering, therefore, begins here but the location code is "C". Once you round the corner after tree "4C", the position numbers continue consecutively. However, the location code changes to "L".

For median trees, look at 3rd Avenue South. There are two median trees designated "1M" and "2M". They are in the 1000 block of 3rd Avenue South so would be addressed as 1000X 3 AVE S in the database.

There is a tree between house 203 and house 205 on 11th Street South. A judgment call would be made as to which house this tree belonged to. For this example, we have placed the tree at address 205. Fences, property corner stakes, and other plantings are used to quickly make the determination.

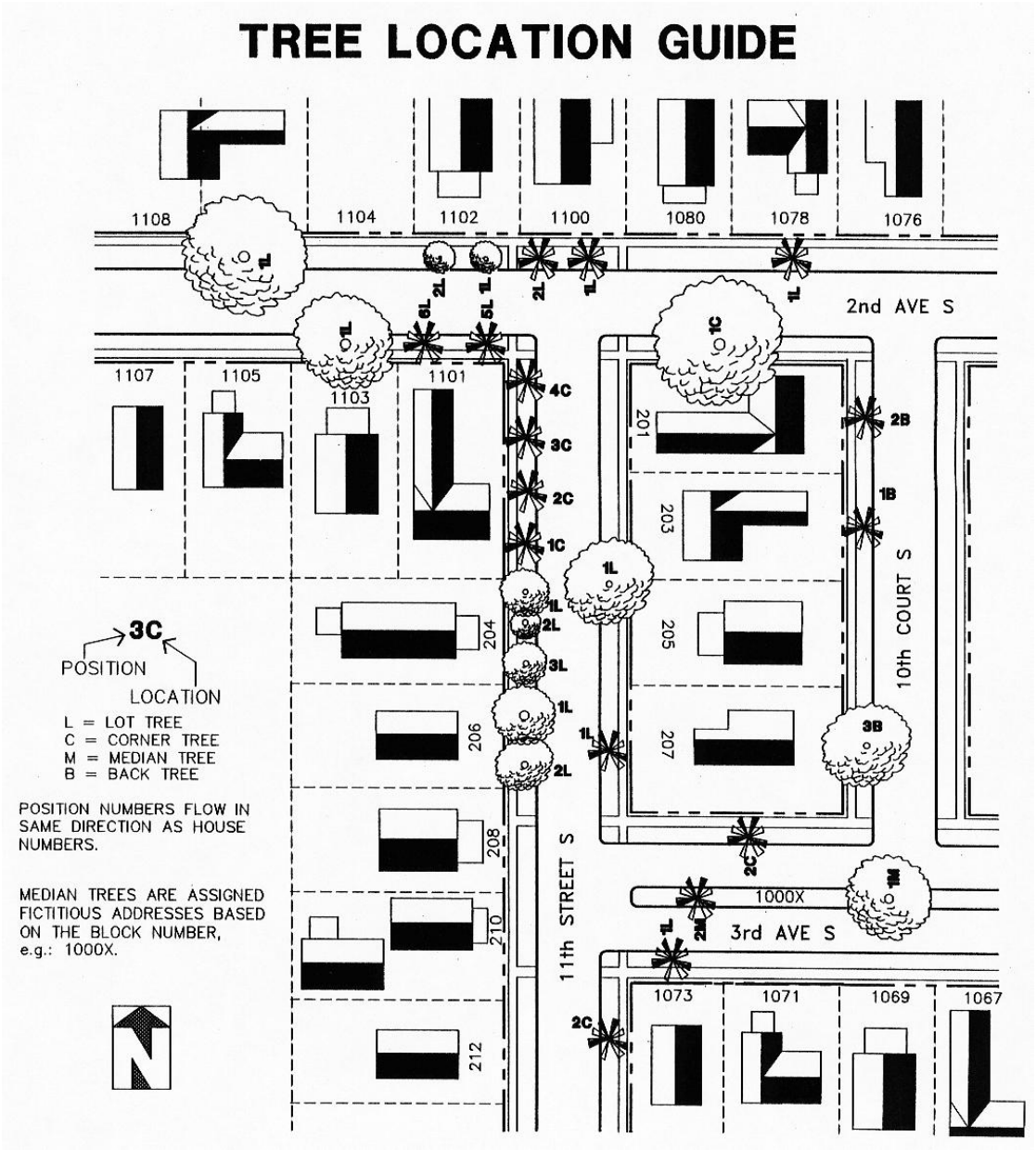

Figure 1. Tree Location Guide for a street tree inventory.

TREE GROWING SPACES

The long-term ability of a tree to survive in the urban environment is directly related to several items including adequate rooting space[2]. When preparing a tree planting plan or evaluating why trees endure or perish in the landscape, a consideration of available rooting space is critical. In general, the larger the area of soil for a tree, the better. Area equates to volume in shallow urban soils where the majority of tree roots generally occupy only the top twelve to eighteen inches of soil.

Each tree growing space was given a designation in the database of large, medium, small, or unrestricted. A minimum of 400 square feet is recommended for trees that ultimately will become large, such as most oaks. A medium sized tree may survive in a 125 square foot space while the smallest recommended area for a small tree or palm is 10 square feet. See the lists of recommended trees in the Appendix.

Where the growing space was a median or tree lawn between the curb and sidewalk, the following green space width guidelines were used when assigning planting space size designation: 3' to 5' = Small, 5’ to 10’ = Medium, and greater than 10' wide = Large. The designation of unrestricted was generally reserved for trees growing in large open areas.

Each planting space or tree growing space was tagged as either having overhead wire conflicts or not. Wires may not have been present directly over the tree or space, but the ultimate size of the existing or proposed tree was considered as to whether a future conflict would occur. About $1 billion each year is spent trimming trees around power lines[*] so avoiding future overhead wire conflicts is important.

MAINTENANCE RECOMMENDATIONS

Once each tree was measured and evaluated, a decision was made as to whether maintenance recommendations were necessary. These maintenance recommendations are listed in the Appendix.

Recommendations are loosely organized by the type of maintenance work involved. Major pruning, tree removal and transplanting, fertilizer and pesticide needs, minor corrective pruning, and planting space works are included.

The overall health of the tree and the results of past trimming practices were considered when making maintenance recommendations. The ultimate life span of the

[*] Gilman, Dr. Edward; Personal Communication; 1991.

tree was also judged when contemplating severe or radical trimming. The Village may be faced, for certain trees, with an economic decision: prune limbs or remove the entire tree.

MAJOR MAINTENANCE GROUPS

A description of selected cultural practices follows. Pruning classes listed here are approved by the National Arborist Association. The American National Standard Institute (ANSI) has published *Tree, Shrub and Other Woody Plant Maintenance – Standard Practices*[3] also known as "ANSI A300 Standards." These ANSI A300 standards are voluntary and replace *Pruning Standards For Shade Trees* published by the National Arborist Association as standard practice for arborists. ANSI A300 Section 5 provides definitions for tree pruning including reasons to prune, tools, pruning cuts, wound treatment, and specific types of pruning. Section 5.3 addresses mature tree pruning, Section 5.4 deals with young tree pruning, and Section 5.7 contains specifications for Utility Pruning.

Maintenance Pruning (ANSI A300 Section 5.3.3.2)

Maintenance pruning is recommended when the primary objective is to maintain or improve tree health and structure. A maintenance prune can be used on larger trees to reduce wind resistance of the crown; this is also known as crown thinning. Normally a maintenance prune would include crown cleaning where all dead, dying, diseased, and weak branches are removed. (Formerly known as Class II Pruning)

Hazard Reduction Pruning (ANSI A300 Section 5.3.3.1)

Hazard reduction pruning is recommended when the primary objective is to reduce the danger to a specific target caused by visibly defined hazards in a tree. This pruning consists of removal of dead, diseased, decaying, and weak branches greater than 2 inches in diameter. Most of the trees with this recommendation were large, older trees with declining crowns. Storm damage coupled with constricted root systems between street and sidewalk are probably the major causes of decline. (Formerly known as Class III Pruning)

Crown Reduction Pruning (ANSI A300 Section 5.3.3.2.d)

This type of pruning is also referred to as drop crotch pruning where entire limbs are cut back to a lateral branch that is at least 1/3 to 1/2 the diameter of the cut being made. Crown reduction pruning is an extreme pruning method and was recommended where entire limbs need weight or length reduction for safety reasons. (Formerly known as Class IV Pruning)

Tree Removal

Complete removal was recommended only in those cases where hazard could not be eliminated any other way. Generally, the trees in the poorest health exhibited extreme rot and dead or dying crowns. In these instances, replacement is the best solution.

Please note the differences between "removal with no replacement" and "replace tree". Some trees are growing in very poor locations and should not be replaced.

Removing or replacing a tree may become an economic decision where extensive remedial work would be necessary to improve tree health.

Clearance Prune

Many small to medium sized trees can benefit from removal of the lower branches (Elevation). Besides removing obstructing branches from sidewalks and streets (Clearance trim), this practice will encourage the tree to grow taller. Keeping signs visible to drivers and unrestricted sight lines at intersections are important safety concerns.

Training Prune (ANSI A300 Section 5.4)

Young trees, especially those planted by homeowners in tree lawns, can greatly benefit from a training prune. This type of pruning seeks to develop a healthy branch structure at an early age so that hazardous branch defects do not occur later.

Miscellaneous Pruning

Other minor pruning recommendations were made which would help to eliminate future tree health problems. The need for removal of smaller of double boles was most often noticed as a miscellaneous pruning need on small trees. For oaks, having a twin leader is one of the most prevalent tree defects that can be corrected with a training prune or maintenance prune.

Root Problems

Much of the decline of older trees can probably be directly related to root damage during construction of curb and gutter, other road improvements, and installation of underground utilities. Enlarging the mulched root zone will eliminate future root injury by lawn mowers and reduce line-trimmer injuries to tree trunks and surface roots.

Fertilizer Recommendations

Most all street and park trees can benefit from regular fertilization. Usually, where major pruning is required a fertilizer treatment would be of benefit. A scheduled fertilizer program can improve tree vigor, particularly for specimens in confined root zones.

MAINTENANCE PRIORITY

Each tree was assigned a priority rating depending on the work recommended. A "Low priority" was given to most works such as fertilizing and minor pruning. A "Medium priority" indicates that the maintenance need is essential and should be scheduled promptly or within the next pruning cycle. A priority rating of "High" means that a tree is likely a public hazard and should be attended to immediately. Trees with much dead wood, hanging limbs, or obvious structural defects were assigned this rating, as were most dead trees.

A tree with no maintenance recommendations automatically received a "Low priority" rating.

III. STREET TREE ANALYSIS & DISCUSSION

Only median street trees were evaluated in the Village of Biscayne Park. These median trees, within public rights-of-way, totaled 1,059. This report section will seek to discuss select aspects of your urban forest and suggest goals that will remedy problems identified.

SPECIES

This urban tree inventory revealed 64 different species among the 1,059 trees tallied. The number of trees found for each species is shown on the Species Distribution listing in the Appendix. The distribution of species is good but dominated by three species: live oak, black olive, and Australian-pine, which together make up nearly 50% of the total tree population. Minor species include Manila palm, coconut palm, *Dracena*, gumbo-limbo, weeping fig, royal Poinciana, and Florida mahogany. Most other species tallied had only a handful of representatives.

In the ideal urban forest, no one genus should make up more than 10% of the population. However, oaks alone make up 24% and black-olives make up 14% of all street trees. Given the wide range of available and suitable species, future plantings can improve these percentages.

Species diversity as a whole in Biscayne Park is good; many kinds of trees were observed within yards on private property. Certainly many of the median trees are the remnants of periodic planting programs where either a limited species selection was available or only a few preferred species were planted. Future plantings should include a broader species mix.

Two issues that the Village is dealing with concerning medians include drivers cutting through or parking on the medians. In many places homeowners have installed dense plantings of small trees and shrubs in the medians in an effort to keep cars out or to block their view across the street. While this is certainly cost-effective for the Village, there is little control of the type and quality of plants being installed. The Village could regulate median planting by ordinance so that a list of approved plant material along with planting and placement instructions can be available to homeowners.

Tree species selection should be based on the environment in which the tree will grow. Poor urban soils, lack of irrigation, and, to a minor extent, the presence of overhead utilities are the major limiting factors in Biscayne Park for tree selection. Selected trees should be able to cope with these adverse conditions and thrive.

In recent years hurricane activity in Florida has raised the awareness of the ability of certain trees to withstand high winds. Dr. Mary Duryea et al of the University of Florida have examined wind resistance of various trees following eleven hurricanes since 1992 that effected the southeast[4]. Their preliminary results have yielded a list of trees most likely to survive high winds (standing, with less than 50% branch loss, and not significantly impacted by flooding). Lists of trees reflecting their preliminary findings are included in the Appendix of this report along with our list of recommended tree species for Biscayne Park.

GOAL: Enhance the species diversity of Biscayne Park's street tree population over the next ten years.

TREE GROWING SPACE

Nearly 90% of the trees in Biscayne Park are growing in large spaces. The large park-like medians have plenty of unrestricted rooting area to allow trees to grow large.

Roots are a tree's life support system, and the first rule of tree care is to understand root zones[5]. Activities within the root zone can either help or hurt a tree. The vast majority of a tree's fine feeder roots live in the top twelve to eighteen inches of soil. Continued root system damage will lead to tree decline and death. This is why enlarging mulched areas around trees is beneficial: it reduces impacts to surface roots and the base of the tree by mowers.

Only 14% of the tree spaces have overhead wires in close proximity and so limit the size of the tree that could be growing there. Overhead wires are generally present along only one side of the street and interfere with median trees only when they cross from one side of the street to another.

Where possible, consolidation of utility lines is desirable both from a tree conflict position and from an aesthetics point of view. Tighter control should be taken by the Village where overhead utility easements are granted to reduce both tree and eye confrontations.

GOAL: Decrease the number of overhead utility conflicts with street trees and planting spaces wherever possible.

DIAMETER

Figure 2 in the Appendix shows the number of trees by diameter class. The figure shows that the street tree population diameter distribution is shifted toward trees 18 inches or less in diameter. At first glance, the distribution would

seem to indicate an abundance of younger to middle-aged trees in the population due to domination in the 6” and 12" diameter classes. This actually reflects the large number small trees and palms which remain in these diameter classes most of their lives.

At the opposite end of the spectrum, most of the 30” to 50" class trees are Australian-pine and are in relatively poorer condition compared to the rest of the population. These trees make up over 17% of the population.

While many residents enjoy having a uniformly mature tree canopy in their neighborhood, storms can quickly mutilate or eliminate a large portion of that canopy. As an urban forest ages in the absence of tree planting, the population diameter distribution moves toward the larger caliper end with smaller diameter classes being vacated. Since the recent hurricanes, there are suitable vacant planting sites in some neighborhoods. Annual planting and tree replacement programs can serve to diversify the street tree population both in species and by age.

GOAL: Increase the age diversity of the urban forest by planting small quantities of trees every year.

TREE CONDITION

The distribution of trees by condition class is depicted Figure 3 in the Appendix. A condition rating of 70% is considered “good” with higher rates being “excellent” and lower ratings being “fair” to “poor.”

The distribution peaks at the 60% condition level with 16% of the population falling in higher classes (>=70% Condition Rating). A condition rating above 95% is almost impossible except for the "tree of perfect health." Some recently planted trees and young palms were given higher ratings.

Similarly, a rating of 10% or less is hard to achieve without being dead (which was tallied as 0% Condition Rating) and always results in a "removal" recommendation. Only 40 dead street trees and stumps were tallied in Biscayne Park.

On average, about 47% of the tree population was found to have a condition rating of 50% or less and only 2% of the tree population had a condition rating of greater than 75%. The average condition rating of all street trees is 51%. Therefore, the over-all street tree population health can be characterized as "poor" which reflects the damaged trees remaining after the recent hurricanes.

The degree of tree maintenance required is related to tree health. A large number of Biscayne Park's street trees are larger, older specimens that will require more costly maintenance activities. About 10% of the street tree population requires medium or high priority maintenance (usually large trees). Many smaller trees are also in only fair condition. If left without maintenance pruning, these poorly structured small trees will grow into big problems. Some storm damage is uncorrectable by pruning. In those cases, the trees were tagged for removal or replacement.

GOAL: Increase average street tree condition by implementing a regular tree maintenance schedule with a balanced emphasis on young tree corrective pruning and big tree maintenance/removal.

PRUNING

Of the total population, over 40% of Biscayne Park's street trees require some form of pruning. Many large trees were rated poor in condition but without a maintenance recommendation, other than possible economic removal. In these situations, there was little or no dead wood to remove and it was too late in the tree's life for corrective pruning. Refer to Table 1 for a summary of this information.

Five street trees were considered to be "hazard" trees correctable by pruning (ANSI A300 5.3.3.1 Hazard Reduction Pruning); high-hazard trees not correctable by pruning were recommended for removal. Trees may constitute a hazard wherever dead wood is present. However the trees scheduled for a Hazard Reduction Prune generally had large diameter branches to be trimmed that would remove the hazard without seriously deforming the crown.

Crown reduction (ANSI A300 5.3.3.2.d Crown Reduction Pruning), which can reduce the weight of large limbs, may reduce the chance that larger trees will become hazards in the future. In essence, Crown Reduction Pruning is an attempt to extend the life of mature trees rather than remove those trees today. Crown Reduction, or "drop-crotch" pruning is usually performed in situations where branches interfere with utility lines. This is a severe pruning remedy and was recommended for only four trees. The trees of poorest form or health were scheduled for removal rather than pruning.

GOAL: Reduce public health and property risk by immediately performing hazard reduction tree maintenance work on street

trees.

TREE REMOVAL

NRPS recommended that 13 street trees (1% of the total population) be removed without replacement. These trees were in poor condition, were seriously interfering with other trees or over-head wires, or were generally growing in a poor place for a tree. ANSI A300 Section 5.7.2.1.3 addresses Utility pruning in the urban environment: “Trees directly under or growing into the facility/utility should be removed or pruned.” If a large tree will continue to require pruning because it is growing directly under overhead utilities, we recommended that the tree be removed, often without replacement unless a small tree could be planted.

NRPS recommended that 170 street trees be replaced. These are trees growing in a suitable location but of poor health, of poor condition, or are an invasive exotic species. We were conservative in this recommendation but, where the tree was clearly dead or where we felt that trimming would only be "throwing good money after bad," only then did NRPS recommend the tree be removed or replaced.

Reasons for tree removal vary from profound storm damage, pathetic form of large trees from line clearance which could not be easily corrected by pruning, or extreme stem and branch defects (i.e.: included bark on trees with large double boles, stem or root rot cankers, major stem defects, or advanced crown decline due to age or root problems). In addition, all species listed by the Florida Exotic Pest Plant Council were also recommended for removal regardless of condition.

GOAL: Reduce public health and property risk by removing and replacing street trees of poor health within the next twelve months.

WORK PRIORITY RATINGS

Figure 4 in the Appendix shows the relationship of the three priority ratings assigned to street trees in Biscayne Park. One percent of these recommended activities are urgent (High).

Low priority recommendations should not be put off indefinitely. A scheduled pruning regimen is recommended so that the "Medium" and "High" priorities are kept to a minimum in the future. A "Low" priority was also assigned to trees where no maintenance was recommended.

GOAL: Reduce public health and property risk by performing

immediate and high priority tree maintenance work on street trees within the next twelve months.

TREE VALUE ($)

The total monetary value of Biscayne Park's street tree population is estimated to be over $1.9 million based on the ISA tree appraisal trunk formula and the assumptions and caveats mentioned earlier. The average value per tree is approximately $1,800. Please note that individual tree values are an approximation of the actual value at the time of the inventory.

The relative value of your street tree population is important when considering the cost to maintain those trees. As mentioned in the introduction, most caretakers of trees are managing an extremely valuable asset without the benefit of knowing much about it. "Hard" infrastructure, such as roads and water pipes, has real value in the price of materials, cost of installation, and the service it provides to citizens. Your "green" infrastructure, likewise, has real value in the cost of planting and maintenance and the values enjoyed by residents and visitors.

GOAL: Increase the annual budgeted amount spent on tree care and replacement.

STREET STATISTIC	NUMBER OF TREES	PERCENT OF TOTAL
Total Trees	1059	100%
Maintenance Prune	170	16%
Hazard Reduction Prune	5	< 1%
Crown Reduction Prune	4	< 1%
Removal - No Replacement	13	1%
Replacement	170	16%
Stumps to be Removed	36	3%
Dead Trees	4	< 1%
Low Work Priority	952	90%
Medium Work Priority	97	9%
High Work Priority	10	< 1%
Condition Rating <= .30	143	14%
Condition Rating > .30 but <= .50	390	37%
Condition Rating > .50 but <= .70	498	47%
Condition Rating > .70	28	3%
Possible Economic Removal	115	11%
Training Prune	29	3%
Clearance Pruning	136	13%
Enlarge & Mulch Root Zone	48	5%
Small Tree Growing Space Width	0	0%
Medium Tree Grwoing Space Width	111	10%
Large Tree Growing Space Width	669	63%
Unrestricted Tree Growing Space	279	26%
Trees with Overhead Wires	149	14%

Table 1. Major Statistics of Biscayne Park, Florida Street Tree Population

RECOMMENDED TREES TO PLANT

Biscayne Park has several wide medians, or parkways, that truly serve as neighborhood parks for the residents who live along them. Some of these parkways seem to have been planted with a "theme" in mind, such as all live oaks, all Australian-pines, all black-olives, etc. Others just have a variety of flowering and non-flowing trees and palms near the streets. Generally there are power lines running down the center of these parkways which precludes tree planting while allowing open space for recreation.

Tropical palms of various species make up nearly 10% of the street trees in Biscayne Park. Tall palms, such as coconut, make up nearly 4% of the population. Given the range of sizes and forms appropriate for planting in the Village, palms can continue to be used as accents at the ends of medians or in tight areas where a large tree is inappropriate.

Care should be taken to avoid palm species (and screw-pine *Pandanus utilis*) subject to lethal yellowing disease. Lethal yellowing (LY) is an incurable disease of palms caused by a mycoplasma-like organism (MLO) vectored by a leafhopper bug, *Myndus crudus*. As of 1996, the disease organism is now resident or has been at least reported in Broward, Collier, Dade, Hendry, Lee, Martin, Monroe and Palm Beach counties[6]. Table 2 is a short list of palms known to be susceptible to lethal yellowing.

Scientific Name	Common Name	Susceptibility
Arenga engleri Becc.	sugar palm	moderate
Borassus flabellifer L.	Palmyra palm	moderate
Caryota mitis Lour.	fishtail palm	moderate
Chrysalidocarpus cabadae H.E. Moore	cabada palm	slight
Cocos nucifera L. (Non-resistant cultivars:Jamaican /Atlantic Tall)	coconut palm	high
	Malayan Dwarf coconut palm	slight
	Maypan hybrid coconut palm	slight
Corypha utan Lam.	gebang palm	moderate
Dictyosperma album (Bory) H.A. Wendl. & Drude ex R. Scheff.	princess palm	moderate
Hyophorbe verschaffeltii H. A. Wendl.	spindle palm	slight
Latania spp.	latan palm	moderate
Livistona chinensis (Jacq.) R. Br. ex Mart.	Chinese fan palm	moderate
Livistona rotundifolia (Lam.) Mart.	footstool palm	moderate
Neodypsis decaryi (Jumelle)	triangle palm	slight
Phoenix canariensis hort.ex Chabaud	Canary Island date	moderate
Phoenix dactylifera L.	date palm	high
Phoenix reclinata Jacq.	Senegal date palm	slight
Pritchardia spp.	Pritchardia palms/loulu palms	high
Syagrus schizophylla (Mart.) Glassm.	arikury palm	slight
Trachycarpus fortunei (Hook.) H. A. Wendl.	windmill palm	moderate
Veitchia merrillii (Becc.) H. E. Moore	Manila (Christmas) palm	high
Veitchia montgomeryana H. E. Moore	Montgomery palm	slight

Source: Florida Department of Agriculture and Consumer Services, 2003

Table 2. List of Ornamental Palms Susceptible to Lethal Yellowing

Several species, however, are not susceptible to lethal yellowing, including royal palm (*Roystonea regia*), cabbage palm (*Sabal palmetto*), and Florda Thatch palm (*Thrinax radiata*). Since these three species are native to Florida, they are highly recommended for landscaping. Other non-susceptible palms include Bismark palm (*Bismarckia nobilis*), silver palm (*Coccothrinax argentata*), MacArthur palm (*Ptychosperma macarthurii*), solitare palm (*Ptychosperma elegans*), Washington palm (*Washingtonia robusta*), and foxtail palm (*Wodyetia bifurcate*).

We found no **small** street growing spaces during this inventory. However, smaller trees and palms are the best choice to plant near or under overhead wires. The Yaupon Holly (*Ilex vomitoria*) and Dahoon Holly (*Ilex cassine*) make fine urban trees with their columnar form, leaves with no points, drought-tolerance, and ability to thrive in cramped spaces. Other trees suitable for small and medium spaces include: bottlebrush (*Callistemon spp*.), silver buttonwood (*Conocarpus erectus, var. sericeus*), Geiger tree (*Cordia sebestena*), wax myrtle (*Myrica cerifera*), Oleander Standard (*Nerium oleander*), and frangipani (*Plumeria rubra*).

Crape myrtle (*Lagerstroemia indica*), sometimes called the "Lilac of the South," is very versatile in its use. They are available as small trees, shrubs, and ground covers. For street tree use, choose specimens having a single trunk (known as a “standard”). While the summer flowering, fall leaf color, and decorative bark are unsurpassed for beauty in the landscape, crape myrtle are attacked by two pests: powdery mildew and crape myrtle aphids.

Crape myrtles require more care than other tree species, so be prepared to regularly inspect for insect and disease problems and prune to achieve small tree form. Initial irrigation is necessary but in general they do not like "wet feet." Light fertilizer application for the first few years is all that is needed. The following crape myrtle cultivars, based on their demonstrated resistance to pest problems, should be used for street tree planting: Miami (dark pink), Natchez (white), Sioux (dark pink), Tuscarora (coral pink), and Zuni (lavender).

Shade trees that are suitable for planting in large spaces or tree lawns greater than ten feet wide with no overhead utilities include: live oak (*Quercus virginiana*), gumbo-limbo (*Bursera simaruba*), Florida mahogany (*Swietenia mahogoni*), black-olive (*Bucida buceras*), wild tamarind (*Lysiloma latisiliqua*), golden trumpet-tree (*Tabebuia chrysotricha*), pongam (*Pongamia pinnata*), pigeon-plum (*Coccoloba diversifolia*), south Florida slash pine (*Pinus elliottii var. densa*), and bald cypress (*Taxodium distichum*).

Homeowners should be encouraged to plant larger shade trees in their yards well back from pavement or overhead wires. Don't put these potentially large trees in a small

or medium space. A well-formed young tree planted under wires is destined to endure a shortened life span due to topping or cramped root space.

The Appendix contains a list of trees that may be grown in Biscayne Park. Admittedly, not all species are native or "bullet-proof," that is, not all will survive the worst of winters or droughts. Some species were included to lend a bit of variety to the list. You may wish to experiment with limited plantings of the uncommon species. Your final list of preferred species may be much shorter than the one contained here but we offer it as a place to start.

TREES AND OVERHEAD UTILITIES

The following graphic shows minimum recommended tree planting setbacks from overhead wires in the urban environment.

TREES TO AVOID

Trees to avoid planting in Village rights-of-way regardless of width include: Melaleuca (*Melaleuca quinquenervia*), Australian-pine (*Casuarina spp.*), and Brazilian-pepper (*Schinus terebithifolius*). These are all trees that quickly become a pest in the landscape. Don't plant them anywhere. Wherever they occurred, no matter their condition, NRPS recommended removal for these three species since the Florida Exotic Pest Plant Council[‡] classifies them as “Category I” invasive exotic plants. These three species alone have invaded millions of acres in south Florida.

Many plants on the EPPC list thrive in south Florida. The following trees should be removed whenever possible: earleaf acacia (*Acacia auriculiformis*), woman's tongue (*Albizia lebbeck*), carrotwood (*Cupaniopsis anacardioides*), Cuban-laurel (*Ficus microcarpa*), and sapodilla (*Manilkara zapota*).

[‡] Florida EPPC Website: http://www.fleppc.org

BUDGET PLANNING AND TREE PLANTING

Annual budget needs should always be considered when planning to plant trees. The cost of installing any tree on public property is never a one-time expense. All planted trees in the urban environment should have appropriately scheduled maintenance to promote good health for the tree and safety to the public.

Adequate care of trees after planting helps insure tree survival and good health as it develops. Proper irrigation during tree establishment is imperative for long-term good health. For most trees, this establishment period extends through at least one growing season and into the second so plan to irrigate trees during the first year after planting.

Proper use of organic mulch around trees can reduce moisture stress of newly established trees and help keep mowing and trimming equipment away from the trunk. Mulch should totally cover the root zone of newly planted trees plus a bit beyond at a depth of two to four inches (usually 5-6 feet in diameter). Keep mulch back from the trunk of the tree, however. Mounding mulch directly against the stem can form a haven for slugs, borers, and rotting fungi.

TREE PLANTING PLAN

Whenever an NRPS forester made a "Replace Tree" or "Remove Stump" recommendation, a tree planting recommendation was also made for that site. Table 3 summarizes the sizes and numbers of trees that could be planted if all the "Replace Tree" and "Replace Stump" recommendations are completed. NRPS foresters also identified 21 vacant planting sites that were suitable for tree planting and had no stump.

Situation	Recommendation	# Trees
Replace Existing Tree/Stump		
	Plant Large Tree	96
	Plant Medium Tree	46
	Plant Small Tree	33
	Plant Small Palm	7
	Plant Tall Palm	24
	Total	206
Fill Tree Planting Space		
	Plant Large Tree	13
	Plant Medium Tree	5
	Plant Small Tree	2
	Plant Tall Palm	1
	Total	21
	Total Street Trees to be Planted	**227**

Table 3. Tree Planting Plan Summary, Biscayne Park, Florida.

IV. PARK TREE ANALYSIS & DISCUSSION

All trees within five parks or public areas were evaluated in the Village of Biscayne Park. The public areas included are: Bennett, Carver, Ferran, the Historical Museum, and Pendleton. Table 3 summarizes the number of trees found in each park or public area. No planting spaces were identified in parks.

SPECIES

This park tree inventory revealed 29 different species among the 140 trees sampled. The number of trees found for each species is shown on the Species Distribution listing in the Appendix. The distribution of species is good but dominated by two species: live oak, and coconut palm, which together make up 44% of the total park tree population. Oaks alone account for 30% of the total, so planting more oaks now is not appropriate.

Park	# Trees
Butterfly	13
Ed Burke Rec	49
Griffing	16
N. Water	19
Police	24
Public Works	19
Total	140

Table 4. Number of Park trees tallied in Biscayne Park, Florida.

Tree species selection should be based on the environment in which the tree will grow. Parks normally afford wide-open spaces in which trees can grow freely. However, many times poor urban soils, lack of adequate irrigation, mower damage, vandalism, and soil compaction can cause poor planting survival or limit growth. Selected trees should be able to cope with these adverse conditions and thrive. See Section III of this report for more discussion on species selection. The Appendix of this report contains a list of recommended tree species for Biscayne Park.

GOAL: Enhance the species diversity of Biscayne Park's park tree population over the next ten years.

DIAMETER

Figure 5 in the Appendix shows the number of park trees by diameter class. Knowing that live oak and coconut palms dominate the species mix helps explain the 12” diameter “spike” in the distribution. Figure 5 shows that the park tree population diameter distribution is shifted toward smaller diameter trees.

At the opposite end of the spectrum, most of the larger trees greater than 30” are oak and are in relatively poorer condition compared to the rest of the population. These trees make up about 12% of the population. Small annual planting projects can serve to replace older declining trees as removals are

preformed.

GOAL: Increase the age diversity of the urban forest by planting small quantities of trees every year.

TREE CONDITION

The distribution of trees by condition class is depicted Figure 6 in the Appendix. A condition rating of 70% is considered “good” with higher rates being “excellent” and lower ratings being “fair” to “poor.”

The distribution peaks at the 65% condition level with 36% of the population falling in higher classes (>=70% Condition Rating). Most recently planted trees and palms of all ages were given higher ratings.

Similarly, a rating of 10% or less is hard to achieve without being dead (which was tallied as 0% Condition Rating) and always results in a "removal" recommendation. Two dead trees were tallied in Biscayne Park’s parks.

On average, about 26% of the park tree population was found to have a condition rating of 50% or less and 2% of the tree population had a condition rating of greater than 75%. The average condition rating of all park trees is 59%. Therefore, the over-all park tree population health can be characterized as "fair" which reflects the damaged trees remaining after the recent hurricanes.

Approximately 2% of Biscayne Park’s park trees are larger, older specimens that will require more costly maintenance activities. While many large trees are not in great condition after the recent storms, none of the park tree population requires medium or high priority maintenance.

Some smaller trees are also in only fair condition. Many park trees were found to have severe surface root and basal trunk damage from mowing and trimming equipment. Most park trees could benefit from enlargement and mulching of the root zone to eliminate future damage from equipment.

GOAL: Increase average park tree condition by implementing a regular tree maintenance schedule with a balanced emphasis on young tree corrective pruning and big tree maintenance/removal.

TREE REMOVAL

NRPS recommended that 14 park trees be replaced. These are trees growing in a suitable location but of poor health, of poor condition,, are an invasive exotic

species, or are dead. Since parks and public areas often experience intense periodic use, NRPS felt that park trees should be of highest quality with the least chance for an incident to occur. In addition, all species listed by the Florida Exotic Pest Plant Council were recommended for removal regardless of condition.

GOAL: Reduce public health and property risk by removing and replacing park trees of poor health within the next twelve months.

PRUNING

Of the total population, 21% required some form of pruning. Refer to Table 5 for a summary of this information.

None of the park trees were given a Hazard Reduction Pruning recommendation. This indicates that Village tree care crews have been vigilant in keeping trees in public areas clear of large dead or hanging limbs.

Maintenance pruning can keep middle-aged trees from needing more severe pruning later in their life. In addition, some smaller trees can benefit by a training prune.

GOAL: Reduce public health and property risk by immediately performing hazard reduction tree maintenance work on park trees.

WORK PRIORITY RATINGS

While 21% of the park tree population requires pruning, replacement, or removal, none of these activities are urgent (Medium or High Priority).

Low priority recommendations should not be put off indefinitely. A scheduled pruning regimen is recommended so that the "Medium" and "High" priorities are kept to a minimum in the future. A "Low" priority was assigned to trees where no maintenance was recommended.

GOAL: Reduce public health and property risk by performing immediate and high priority tree maintenance work on park trees within the next twelve months.

PARK STATISTIC	NUMBER OF TREES	PERCENT OF TOTAL
Total Trees	140	100%
Maintenance Prune	22	16%
Hazard Reduction Prune	0	0%
Crown Reduction Prune	0	0%
Removal - No Replacement	0	0%
Replacement	14	10%
Stumps to be Removed	2	1%
Dead Trees	2	1%
Low Work Priority	140	100%
Medium Work Priority	0	0%
High Work Priority	0	0%
Condition Rating <= .30	11	8%
Condition Rating > .30 but <= .50	28	20%
Condition Rating > .50 but <= .70	97	69%
Condition Rating > .70	4	3%
Possible Removal - Economic Factors	8	6%
Enlarge/Mulch Root Zone	24	17%

Table 5. Major Statistics of Biscayne Park, Florida Park Tree Population

TREE VALUE ($)

The total monetary value of Biscayne Park' park urban forest is over $370,000 based on the ISA tree appraisal trunk formula and the assumptions and caveats mentioned earlier. The average value per park tree is approximately $2,700, which is twice the average street tree value. This difference is probably due to the fact that many park trees are larger live oaks.

GOAL: Increase the annual budgeted amount spent on tree care and replacement.

PLANTING AREAS

No planting spaces were identified in parks or public areas. Some general guidelines are offered here which can be applied to any proposed planting area. Additional information is offered in the Appendix.

- First identify the locations of all above- and below-ground utilities. Trees should never be planted where they might interfere with wires or pipes. Always keep in mind the mature size of the tree to be planted

- Larger tree stock (greater than six feet tall, installed height) should be used to deter vandalism. Smaller trees can suffer from broken leaders, which will result in trees turning into small bushes.

- A minimum area should be prepared depending on the size of tree to be planted: 25 sqft for a small tree; 100 sqft for a medium tree; 400 sqft for a large tree.

- Site preparation may include: removal of paving, stabilized base material, and rocks, plus the addition of top soil, and incorporation of organic matter into the soil by use of a rota-tiller. A deep hole is not needed but do till the entire surface area to a depth of eighteen inches. As any farmer knows, good site preparation is essential to planting success.

- Provision for irrigation during tree establishment and periods of drought is important. Parking areas tend to be hotter and drier than other sites due to reflected heat from pavement and buildings so irrigation is crucial to success.

- A two- to four-inch blanket of organic mulch should cover the entire prepared area after the tree is planted. Keep mulch away from direct contact with the tree trunk, however. Avoid using black plastic sheets to keep out weeds unless it is a woven “weed block” material.

- Trees near parking areas initially need more frequent trimming to reduce or eliminate branch/car conflicts. Always prune a tree "up" by removing lower branches and suckers at the base. Don't top trees to make them bush out. More tree pruning guidelines are offered in the Appendix.

PARK TREE RECOMMENDATIONS

All park trees can benefit from the following recommendations:

- Enlarge and mulch the root zone of all trees surrounded by turf to reduce lawn mower damage to trunks and surface roots. Large trees (> 24" diameter) should be mulched to a distance of five feet from the trunk. Smaller trees should be mulched to a distance of three feet from the trunk. Again, keep deep piles of mulch away from direct contact with the tree trunk.

- All trees should be fertilized, at the drip-line and beyond, on a regular basis.

- Large old trees should be systematically replaced over time. Once all high and immediate pruning and tree removal is complete, begin to plant new, healthy stock in open areas.

V. ANNUAL URBAN FORESTRY WORK SCHEDULE

Table 6 outlines the basic and additional services that make up a municipal urban forestry program. You may choose not to implement some of these items immediately or ever. However, this list can form a basis for developing Biscayne Park's urban forestry plan. This table was modified from a schedule suggested in an *URBAN FORESTS* magazine article[*]. While some functions have specific time value, others can occur all year or periodically. Each line item would be developed into an annual work plan item that includes details, dates, personnel, equipment, and budget needs. This work plan was developed around the calendar year; your budget year may differ so budget-planning events should be adjusted accordingly.

The Village's greatest need at this time is to remove dead or dying trees and to prune hazardous trees. Initially, these activities will account for a large volume of work (and budget monies). However, once the immediate needs are satisfied, lower priority tree maintenance and improvement can be scheduled over a five-year period.

Public relations items may appear at different times of the year than shown here. NRPS suggests, however, that the public be informed prior to the beginning of major tree work. Also, training opportunities may come at different times of the year than listed here.

Medium and High priority tree pruning and removal should be accomplished before any further tree planting. Once all imperative maintenance of existing trees is complete, start planning to replace trees that were removed.

[*] *URBAN FORESTS*, December/January 1994.

ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. PLANNING												
a. Rank work to be done	.	.	.	.	.	.	.	.	■	■	.	.
b. Organize Activities	.	.	.	.	.	.	.	.	.	.	■	.
c. Budget Preparation	.	.	.	.	.	.	.	.	.	.	■	■
2. TREE PLANTING												
a. Survey potential sites	■	.	.	.	.	.	.	.	.	.	.	.
b. Decide locations, species	■	.	.	.	.	.	.	.	.	.	.	.
c. Order trees	.	.	■	.	.	.	.	.	.	.	.	.
d. Inspect/tag trees in nursery	.	.	.	■	.	.	.	.	.	.	.	.
e. Receive/inspect/plant trees	.	.	.	.	■	■	.	.	.	.	.	.
f. Water trees periodically	.	■	■	■	■	■	■	.	.	.	.	.
3. TREE PRUNING												
a. Survey trees/decide which to prune	.	.	.	.	.	.	.	.	.	.	■	■
b. Send out Bid Requests	.	.	.	.	.	.	.	.	.	.	■	■
c. Supervise pruning/trim disposal	■	■	■	.	.	.	.	.	.	.	.	.
4. TREE REMOVAL												
a. Survey trees/decide which to remove	.	.	.	.	.	■	■	.	.	.	.	.
b. Notify adjacent property owners	.	.	.	.	.	.	■	.	.	.	.	.
c. Send out Bid Requests	.	.	.	.	.	.	■	■	.	.	.	.
d. Supervise contract/wood disposal	.	.	.	.	.	.	.	.	■	■	.	.
e. Grind stumps	.	.	.	.	.	.	.	.	■	■	.	.
5. PUBLIC RELATIONS												
a. Report to City officials	■	■	■	■	■	■	■	■	■	■	■	■
b. News releases	■	.	.	■	.	.	■	.	.	■	.	.
c. Submit grant applications	Periodically, As Needed											
d. Develop interpretive programs	.	.	.	.	.	.	■	■	■	.	.	.
e. Hold Arbor Day ceremony	.	.	.	■	.	.	.	.	.	.	.	.
f. Research & review grants available	.	.	■	.	.	.	.	.	.	.	■	.
6. OTHER TASKS												
a. Water trees during drought	Periodically, As Needed											
b. Fertilize trees	.	.	.	■	.	.	.	■	.	.	.	.
c. Control insects/disease	Periodically, As Needed											
d. Clean up storm damage	Periodically, As Needed											
e. Training/Professional development	.	.	.	.	.	■	.	.	■	.	.	.
f. Training/Safety education of workers	.	.	.	.	.	.	.	■	■	.	.	.

Table 6. Suggested Annual Work Schedule for Biscayne Park.

VI. URBAN FORESTRY BUDGET

STREET TREE BUDGET

NRPS identified tree maintenance needs of street trees within the Village of Biscayne Park. Table 7 outlines approximate costs to complete the tasks identified for street trees, for all levels of priority. These numbers are contract averages and may not reflect the actual "cost of cure" for the largest or smaller trees.

TASK	AVERAGE PER-TREE COST	# TREES	APPROXIMATE TOTAL COST
Tree Removal	$2,500	183	$457,500
Maintenance Prune	$400	170	$68,000
Hazard Reduction Prune	$1,000	5	$5,000
Crown Reduction Prune	$1,000	4	$4,000
TOTAL		**362**	**$534,500**

Table 7. Major Pruning/Removal Costs By Task for Street Tree Population, Biscayne Park, Florida.

As one can see, the cost of *NOT* having a regular tree maintenance plan in Biscayne Park has grown quite large. This table shows a "worst-case" scenario with the total cost of all major tree work.

Table 8 shows the approximate cost to correct or remove all MEDIUM and HIGH priority street trees in Biscayne Park. These numbers are a subset of the tree maintenance costs identified in Table 6.

TASK	AVERAGE PER-TREE COST	# TREES	APPROXI-MATE TOTAL COST
Tree Removal	$2,500	89	$222,500
Maintenance Prune	$400	2	$800
Hazard Reduction Prune	$1,000	5	$5,000
Crown Reduction Prune	$1,000	3	$3,000
TOTAL		**99**	**$231,300**

Table 8. Approximate Tree Maintenance Costs By Task for Street Tree Population with Medium and High Maintenance Needs, Biscayne Park, Florida.

PARK TREE BUDGET

NRPS identified tree maintenance needs of park trees within the Village of Biscayne Park. Table 9 outlines approximate costs to complete the tasks identified for street trees, for all levels of priority. These numbers are contract averages and may not reflect the actual "cost of cure" for the largest or smaller trees. Note that the average cost per task is slightly lower than those quoted for street trees due to the general absence of overhead wires in parks.

TASK	AVERAGE PER-TREE COST	# TREES	APPROXIMATE TOTAL COST
Tree Removal	$2,500	14	$35,000
Maintenance Prune	$400	22	$8,800
Hazard Reduction Prune	$1,000	0	$0
Crown Reduction Prune	$1,000	0	$0
TOTAL		**36**	**$43,800**

Table 9. Major Pruning/Removal Costs By Task for Park Tree Population, Biscayne Park, Florida.

Any tree maintenance contractor, and those people who supervise and inspect their work, should adhere to ANSI A300 pruning standards and be familiar with modern tree care techniques[7]. The Village of Biscayne Park should also seek tree maintenance contractors that are Certified Arborists by the International Society of Arboriculture (ISA). Information on selecting an arborist as well as large tree pruning recommendations is included in the Appendix.

VII. RECOMMENDATION SUMMARY

Based on the findings of this urban tree inventory and the analysis above, Natural Resource Planning Services provides the following recommendations relating to Village-owned trees. The goals stated earlier are listed here with specific activities:

GOAL: Reduce public health and property risk by immediately performing hazard reduction tree maintenance work on 5 street trees.

GOAL: Reduce public health and property risk by performing Medium and High priority tree maintenance work on 99 street trees within the next twelve months.

GOAL: Reduce public health and property risk by removing/replacing 89 street trees of poor health (Medium and High priority) within the next twelve months.

GOAL: Increase street and park tree condition by implementing a regular tree maintenance schedule.

- Train Village workers or hire a competent arborist to perform corrective pruning on all existing young trees (training prune).

- Implement a regular schedule of corrective pruning to increase the condition class of all trees. This program should occur at least annually, in January and February preferably, to reduce sprouting near cuts and in V-crotches around wires.

- Begin a regular schedule of fertilization for all trees less than six inches diameter or large trees in small root spaces. A controlled-release fertilizer is best applied at least two times per year for newly established trees.

  The recommended fertilizer formula recommendations are expressed as *ratios* of Nitrogen, Phosphorus, Potassium, and Magnesium (N-P-K-Mg). For trees, the ratio should be 10-3-10-3.

  Fertilization may be accomplished through neighborhood associations. "Tree-Keeping" seminars may be conducted by Village employees, Extension Service "Master Gardeners," or NRPS foresters to help train homeowners in proper tree selection, planting, and care.

GOAL: Decrease the number of overhead utility conflicts with street trees and planting spaces wherever possible.

- Make good use of large planting spaces that have no over-head restrictions. Plant potentially larger shade trees here and reserve the smaller sites for smaller trees. Always consider the mature size of trees to be planted.

- Eliminate the planting of inappropriate plant materials under utility lines by specification, enforcement of regulations and public relations.

GOAL: Increase the annual budgeted amount spent on tree care and replacement by the Village.

GOAL: Increase the species diversity of Biscayne Park's street and park tree population over the next ten years.

GOAL: Increase the age diversity of the urban forest by planting small quantities of trees every year.

- **Do not plant any more trees until all the High and Immediate priority maintenance work is complete.** Once the trimming and removal work is done, consider **planting more** of the following species:

  Black-olive, gumbo-limbo, strangler fig, wild tamarind, pongam, paradise tree, royal poinciana, cabbage palm, royal palm, paurotis palm, and foxtail palms, dahoon holly, Geiger tree, silver buttonwood, glaucous Cassia, and insect and disease resistant varieties of crape myrtle. Live oak planting should be limited for at least five years.

- Consider limited **experimental plantings** of the following species to determine their suitability to your site and weather conditions: Bulnesia, satinleaf, pigeon plum, golden trumpet tree, and Silver Dollar Eucalyptus.

- Discourage planting any species to be a known or potential problem, such as Australian-pine, exotic Ficus, or palms susceptible to leathal yellowing disease.

- Educate private citizens about urban forestry issues and the importance of

trees in Biscayne Park by hosting public workshops and holding public Arbor Day programs.

- Build support for the Village urban forestry program by focusing plantings in parks and high-visibility areas. Turn a simple tree planting ceremony into a public workshop on species selection and proper planting techniques with good advance publicity through local media.

Some good Internet web links for urban forestry resources include:

Florida Urban Forestry Council: http://www.fufc.org/

University of Florida Institute of Food and Agricultural Science:
http://www.ifas.ufl.edu/
(Search publications for “urban forestry” and “arboriculture”)

Florida Cooperative Extension On-line Publication Database
http://edis.ifas.ufl.edu/TOPIC_Urban_Forestry
(Topic on Trees and Hurricanes)

Florida Chapter International Society of Arboriculture:
http://www.floridaisa.org/

TreeLink portal site: http://www.treelink.org/

USDA Forest Service: http://www.urbanforestrysouth.org/

International Society of Arboriculture:
http://www2.champaign.isa-arbor.com/welcome.html

Society of Municipal Arborists:
http://www.urban-forestry.com/

National Arborists Association: http://www.natlarb.com/

American Forests: http://www.americanforests.org/

National Arbor Day Foundation: http://www.arborday.org/

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IX. APPENDIX

STREET STATISTICS & GRAPHS

Biscayne Park Street Trees

Species Distribution

TREE COMMON NAME	# TREES	% TOTAL
Acacia, Earleaf	2	0.2%
Almond, Tropical	2	0.2%
Aralia	7	0.7%
Arjuna	3	0.3%
Australian-pine	100	9.4%
Avocado	2	0.2%
Bamboo	1	0.1%
Bischofia	1	0.1%
Black-Olive	151	14.3%
Bottlebrush, Weeping	7	0.7%
Brazilian-pepper	3	0.3%
Crape Myrtle	2	0.2%
Dead Tree/Palm	3	0.3%
Dracena	38	3.6%
Ficus	4	0.4%
Fig, Bo-Tree	7	0.7%
Fig, Cuban Laurel	8	0.8%
Fig, Fiddle-leaf	3	0.3%
Fig, Rubber	3	0.3%
Fig, Strangler	11	1.0%
Fig, Weeping	25	2.4%
Geiger-Tree	1	0.1%
Gumbo-Limbo	35	3.3%
Jacaranda	2	0.2%
Jatropha	3	0.3%
Loquat	5	0.5%
Mahogany, Florida	21	2.0%
Mulberry, Red	2	0.2%
Norfolk Island Pine	19	1.8%
Oak, Live	268	25.3%
Orchid Tree	7	0.7%
Orchid, Hong Kong	5	0.5%
Palm, Areca	19	1.8%
Palm, Cabbage	11	1.0%
Palm, Canary Isl.	2	0.2%
Palm, Chinese Fan	5	0.5%
Palm, Coconut	40	3.8%
Palm, Date	1	0.1%
Palm, Fishtail	1	0.1%
Palm, Florida Thatch	2	0.2%
Palm, Macarthur	1	0.1%
Palm, Majool Date	1	0.1%
Palm, Manila	50	4.7%
Palm, Pygmy Date	2	0.2%
Palm, Queen	4	0.4%
Palm, Sengal Date	1	0.1%
Palm, Solitaire	16	1.5%
Palm, Spindle	1	0.1%
Palm, Washington	1	0.1%
Pine, Slash	1	0.1%
Poinciana, Royal	22	2.1%
Pongam	7	0.7%
Privet, Glossy	1	0.1%
Queens Crape Myrtle	1	0.1%
Sapodilla	4	0.4%
Schefflera	18	1.7%
Seagrape	15	1.4%
Silk-Oak	12	1.1%
Stump	36	3.4%
Tamarind, Indian	6	0.6%
Tamarind, Wild	11	1.0%
Trumpet Tree, Golden	2	0.2%
Trumpet Tree, Pink	1	0.1%
Trumpet Tree, Silver	2	0.2%
Tulip-Tree, African	3	0.3%
Unknown	8	0.8%
Total Trees:	**1059**	
Total Species:	**66**	

Biscayne Park Street Trees

Tree Removal - No Replacement
Medium and High Priority

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
705	700 x NE 115TH ST	M	15	Australian-pine	42	30-39 Feet	30	MEDIUM
17	10850 x NE 8TH CT	M	5	Australian-pine	36	50-59 Feet	30	MEDIUM

Biscayne Park Street Trees

Replace Tree
Medium and High Priority

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
134	11300 x NE 10TH AVE	M	4	Black-Olive	6	20-29 Feet	40	MEDIUM
179	11900 x NE 10TH AVE	M	3	Black-Olive	12	20-29 Feet	30	MEDIUM
190	12000 x NE 10TH AVE	M	6	Oak, Live	6	15-19 Feet	40	MEDIUM
	# Trees This Street: 3							
61	700 x NE 111TH ST	M	5	Silk-Oak	12	30-39 Feet	30	HIGH
78	800 x NE 111TH ST	M	3	Silk-Oak	18	30-39 Feet	40	MEDIUM
	# Trees This Street: 2							
342	700 x NE 113TH ST	M	8	Australian-pine	42	30-39 Feet	40	MEDIUM
351	800 x NE 113TH ST	M	2	Australian-pine	36	30-39 Feet	40	MEDIUM
	# Trees This Street: 2							
412	700 x NE 114TH ST	M	5	Australian-pine	42	30-39 Feet	30	MEDIUM
413	700 x NE 114TH ST	M	6	Australian-pine	36	30-39 Feet	30	MEDIUM
415	700 x NE 114TH ST	M	8	Australian-pine	30	30-39 Feet	30	MEDIUM
416	700 x NE 114TH ST	M	9	Australian-pine	30	40-49 Feet	30	MEDIUM
418	700 x NE 114TH ST	M	11	Australian-pine	18	30-39 Feet	30	MEDIUM
422	700 x NE 114TH ST	M	15	Australian-pine	30	40-49 Feet	30	MEDIUM
423	700 x NE 114TH ST	M	16	Australian-pine	24	30-39 Feet	30	MEDIUM
424	700 x NE 114TH ST	M	17	Australian-pine	36	40-49 Feet	30	MEDIUM
	# Trees This Street: 8							
670	600 x NE 115TH ST	M	4	Ficus	30	15-19 Feet	20	MEDIUM
709	700 x NE 115TH ST	M	19	Australian-pine	36	30-39 Feet	30	MEDIUM
	# Trees This Street: 2							
1337	600 x NE 117TH ST	M	12	Australian-pine	48	40-49 Feet	30	MEDIUM
1339	600 x NE 117TH ST	M	14	Australian-pine	60	40-49 Feet	20	HIGH
1342	600 x NE 117TH ST	M	17	Australian-pine	48	40-49 Feet	20	HIGH
1345	600 x NE 117TH ST	M	20	Australian-pine	42	40-49 Feet	20	HIGH
1351	700 x NE 117TH ST	M	2	Australian-pine	36	40-49 Feet	30	MEDIUM
1353	700 x NE 117TH ST	M	4	Australian-pine	48	40-49 Feet	30	MEDIUM
	# Trees This Street: 6							
919	600 x NE 118TH ST	M	12	Australian-pine	30	30-39 Feet	30	MEDIUM
927	600 x NE 118TH ST	M	20	Australian-pine	36	30-39 Feet	0	HIGH
928	600 x NE 118TH ST	M	21	Australian-pine	30	30-39 Feet	30	MEDIUM
931	700 x NE 118TH ST	M	1	Australian-pine	30	40-49 Feet	20	MEDIUM
932	700 x NE 118TH ST	M	2	Australian-pine	30	40-49 Feet	30	MEDIUM
933	700 x NE 118TH ST	M	3	Australian-pine	36	40-49 Feet	20	MEDIUM
934	700 x NE 118TH ST	M	4	Australian-pine	36	40-49 Feet	20	MEDIUM
935	700 x NE 118TH ST	M	5	Australian-pine	42	40-49 Feet	20	MEDIUM
936	700 x NE 118TH ST	M	6	Australian-pine	30	40-49 Feet	30	MEDIUM
937	700 x NE 118TH ST	M	7	Australian-pine	42	40-49 Feet	20	MEDIUM

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
939	700 x NE 118TH ST	M	9	Australian-pine	36	40-49 Feet	20	MEDIUM
947	700 x NE 118TH ST	M	17	Australian-pine	36	40-49 Feet	20	MEDIUM
948	700 x NE 118TH ST	M	18	Australian-pine	36	40-49 Feet	20	MEDIUM
	# Trees This Street: 13							
975	400 x NE 119TH ST	M	2	Australian-pine	54	40-49 Feet	20	HIGH
978	400 x NE 119TH ST	M	5	Australian-pine	60	40-49 Feet	30	MEDIUM
986	400 x NE 119TH ST	M	13	Australian-pine	54	40-49 Feet	30	MEDIUM
987	400 x NE 119TH ST	M	14	Australian-pine	48	40-49 Feet	30	MEDIUM
988	400 x NE 119TH ST	M	15	Australian-pine	42	40-49 Feet	30	MEDIUM
989	400 x NE 119TH ST	M	16	Australian-pine	36	40-49 Feet	30	MEDIUM
995	400 x NE 119TH ST	M	22	Australian-pine	42	40-49 Feet	30	MEDIUM
996	400 x NE 119TH ST	M	23	Australian-pine	54	40-49 Feet	30	MEDIUM
997	400 x NE 119TH ST	M	24	Australian-pine	42	40-49 Feet	30	MEDIUM
998	400 x NE 119TH ST	M	25	Australian-pine	42	40-49 Feet	30	MEDIUM
999	400 x NE 119TH ST	M	26	Australian-pine	36	40-49 Feet	30	MEDIUM
1000	400 x NE 119TH ST	M	27	Australian-pine	42	40-49 Feet	30	MEDIUM
1124	700 x NE 119TH ST	M	2	Australian-pine	36	30-39 Feet	40	MEDIUM
1125	700 x NE 119TH ST	M	3	Australian-pine	36	30-39 Feet	40	MEDIUM
1126	700 x NE 119TH ST	M	4	Australian-pine	42	30-39 Feet	40	MEDIUM
	# Trees This Street: 15							
1023	400 x NE 121ST ST	M	2	Australian-pine	42	40-49 Feet	30	MEDIUM
1025	400 x NE 121ST ST	M	4	Australian-pine	30	40-49 Feet	30	MEDIUM
1027	400 x NE 121ST ST	M	6	Australian-pine	36	40-49 Feet	30	MEDIUM
1030	400 x NE 121ST ST	M	9	Australian-pine	36	40-49 Feet	30	MEDIUM
1035	400 x NE 121ST ST	M	14	Australian-pine	42	40-49 Feet	30	MEDIUM
1037	400 x NE 121ST ST	M	16	Australian-pine	48	40-49 Feet	20	MEDIUM
1042	400 x NE 121ST ST	M	22	Australian-pine	42	40-49 Feet	30	MEDIUM
1045	400 x NE 121ST ST	M	25	Australian-pine	30	30-39 Feet	30	MEDIUM
1047	400 x NE 121ST ST	M	27	Australian-pine	42	30-39 Feet	30	MEDIUM
1055	400 x NE 121ST ST	M	35	Black-Olive	18	20-29 Feet	30	MEDIUM
1057	400 x NE 121ST ST	M	37	Australian-pine	36	30-39 Feet	30	MEDIUM
1060	400 x NE 121ST ST	M	40	Australian-pine	48	30-39 Feet	30	MEDIUM
1062	400 x NE 121ST ST	M	42	Australian-pine	48	30-39 Feet	30	MEDIUM
1065	500 x NE 121ST ST	M	1	Australian-pine	42	30-39 Feet	30	MEDIUM
1068	500 x NE 121ST ST	M	4	Australian-pine	36	30-39 Feet	30	MEDIUM
1070	500 x NE 121ST ST	M	6	Australian-pine	48	30-39 Feet	30	MEDIUM
488	600 x NE 121ST ST	M	12	Australian-pine	42	30-39 Feet	30	MEDIUM
498	600 x NE 121ST ST	M	22	Australian-pine	60	30-39 Feet	30	MEDIUM
518	600 x NE 121ST ST	M	42	Australian-pine	48	40-49 Feet	40	MEDIUM
520	600 x NE 121ST ST	M	44	Australian-pine	48	40-49 Feet	40	MEDIUM
521	600 x NE 121ST ST	M	45	Australian-pine	60	40-49 Feet	40	MEDIUM
527	700 x NE 121ST ST	M	4	Australian-pine	48	30-39 Feet	40	MEDIUM
529	700 x NE 121ST ST	M	6	Australian-pine	54	30-39 Feet	40	MEDIUM
531	700 x NE 121ST ST	M	8	Australian-pine	36	30-39 Feet	40	MEDIUM

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
537	700 x NE 121ST ST	M	14	Australian-pine	30	30-39 Feet	30	MEDIUM
541	700 x NE 121ST ST	M	18	Australian-pine	36	30-39 Feet	40	MEDIUM
544	700 x NE 121ST ST	M	21	Australian-pine	30	30-39 Feet	30	HIGH
548	700 x NE 121ST ST	M	25	Black-Olive	6	30-39 Feet	40	MEDIUM
556	700 x NE 121ST ST	M	33	Australian-pine	30	30-39 Feet	30	MEDIUM
	# Trees This Street: 29							
96	11100 x NE 8TH AVE	M	4	Dead Tree/Palm	12	15-19 Feet	0	MEDIUM
386	11300 x NE 8TH AVE	M	5	Silk-Oak	12	20-29 Feet	30	MEDIUM
388	11300 x NE 8TH AVE	M	7	Silk-Oak	12	20-29 Feet	30	MEDIUM
817	11900 x NE 8TH AVE	M	8	Mahogany, Florida	24	30-39 Feet	30	HIGH
	# Trees This Street: 4							
8	10800 x NE 8TH CT	M	4	Orchid, Hong Kong	12	20-29 Feet	40	MEDIUM
15	10850 x NE 8TH CT	M	3	Silk-Oak	12	40-49 Feet	30	MEDIUM
33	10900 x NE 8TH CT	M	14	Silk-Oak	18	30-39 Feet	30	MEDIUM
	# Trees This Street: 3							

Total Trees to Replace: 87

Biscayne Park
Street Trees

Replace Tree
All Priorities

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
134	11300 x NE 10TH AVE	M	4	Black-Olive	6	20-29 Feet	40	MEDIUM
179	11900 x NE 10TH AVE	M	3	Black-Olive	12	20-29 Feet	30	MEDIUM
182	11900 x NE 10TH AVE	M	6	Silk-Oak	6	15-19 Feet	40	LOW
190	12000 x NE 10TH AVE	M	6	Oak, Live	6	15-19 Feet	40	MEDIUM
	# Trees This Street: 4							
61	700 x NE 111TH ST	M	5	Silk-Oak	12	30-39 Feet	30	HIGH
68	700 x NE 111TH ST	M	12	Silk-Oak	6	30-39 Feet	40	LOW
78	800 x NE 111TH ST	M	3	Silk-Oak	18	30-39 Feet	40	MEDIUM
80	800 x NE 111TH ST	M	5	Australian-pine	30	30-39 Feet	40	LOW
81	800 x NE 111TH ST	M	6	Silk-Oak	12	15-19 Feet	30	LOW
84	800 x NE 111TH ST	M	9	Australian-pine	36	30-39 Feet	40	LOW
88	860 x NE 111TH ST	M	4	Australian-pine	30	30-39 Feet	40	LOW
	# Trees This Street: 7							
342	700 x NE 113TH ST	M	8	Australian-pine	42	30-39 Feet	40	MEDIUM
351	800 x NE 113TH ST	M	2	Australian-pine	36	30-39 Feet	40	MEDIUM
	# Trees This Street: 2							
403	600 x NE 114TH ST	M	6	Trumpet Tree, Pink	6	15-19 Feet	30	LOW
405	600 x NE 114TH ST	M	8	Trumpet Tree, Gold	12	15-19 Feet	40	LOW
412	700 x NE 114TH ST	M	5	Australian-pine	42	30-39 Feet	30	MEDIUM
413	700 x NE 114TH ST	M	6	Australian-pine	36	30-39 Feet	30	MEDIUM
415	700 x NE 114TH ST	M	8	Australian-pine	30	30-39 Feet	30	MEDIUM
416	700 x NE 114TH ST	M	9	Australian-pine	30	40-49 Feet	30	MEDIUM
418	700 x NE 114TH ST	M	11	Australian-pine	18	30-39 Feet	30	MEDIUM
422	700 x NE 114TH ST	M	15	Australian-pine	30	40-49 Feet	30	MEDIUM
423	700 x NE 114TH ST	M	16	Australian-pine	24	30-39 Feet	30	MEDIUM
424	700 x NE 114TH ST	M	17	Australian-pine	36	40-49 Feet	30	MEDIUM
	# Trees This Street: 10							
670	600 x NE 115TH ST	M	4	Ficus	30	15-19 Feet	20	MEDIUM
672	600 x NE 115TH ST	M	6	Dead Tree/Palm	6	10-14 Feet	0	LOW
677	600 x NE 115TH ST	M	11	Dead Tree/Palm	3	10-14 Feet	0	LOW
703	700 x NE 115TH ST	M	13	Crape Myrtle	3	05-09 Feet	20	LOW
709	700 x NE 115TH ST	M	19	Australian-pine	36	30-39 Feet	30	MEDIUM
717	700 x NE 115TH ST	M	27	Orchid Tree	1	05-09 Feet	40	LOW
723	700 x NE 115TH ST	M	33	Orchid Tree	1	0-04 Feet	30	LOW
735	800 x NE 115TH ST	M	10	Mulberry, Red	6	20-29 Feet	40	LOW
737	800 x NE 115TH ST	M	12	Fig, Weeping	12	20-29 Feet	40	LOW
	# Trees This Street: 9							
1337	600 x NE 117TH ST	M	12	Australian-pine	48	40-49 Feet	30	MEDIUM
1339	600 x NE 117TH ST	M	14	Australian-pine	60	40-49 Feet	20	HIGH

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
1342	600 x NE 117TH ST	M	17	Australian-pine	48	40-49 Feet	20	HIGH
1343	600 x NE 117TH ST	M	18	Tulip-Tree, African	3	10-14 Feet	40	LOW
1344	600 x NE 117TH ST	M	19	Tulip-Tree, African	3	10-14 Feet	40	LOW
1345	600 x NE 117TH ST	M	20	Australian-pine	42	40-49 Feet	20	HIGH
1348	600 x NE 117TH ST	M	23	Schefflera	12	10-14 Feet	40	LOW
1351	700 x NE 117TH ST	M	2	Australian-pine	36	40-49 Feet	30	MEDIUM
1353	700 x NE 117TH ST	M	4	Australian-pine	48	40-49 Feet	30	MEDIUM
1364	700 x NE 117TH ST	M	15	Oak, Live	3	10-14 Feet	50	LOW
786	800 x NE 117TH ST	M	14	Loquat	1	05-09 Feet	50	LOW
789	800 x NE 117TH ST	M	17	Schefflera	6	10-14 Feet	30	LOW
790	800 x NE 117TH ST	M	18	Black-Olive	6	10-14 Feet	30	LOW
193	900 x NE 117TH ST	M	1	Black-Olive	12	30-39 Feet	40	LOW
198	900 x NE 117TH ST	M	6	Loquat	12	10-14 Feet	30	LOW
203	900 x NE 117TH ST	M	11	Black-Olive	12	30-39 Feet	50	LOW
204	900 x NE 117TH ST	M	12	Black-Olive	18	30-39 Feet	40	LOW
206	900 x NE 117TH ST	M	14	Black-Olive	18	30-39 Feet	40	LOW
209	900 x NE 117TH ST	M	17	Black-Olive	18	30-39 Feet	40	LOW
214	900 x NE 117TH ST	M	22	Tamarind, Indian	1	0-04 Feet	50	LOW
219	900 x NE 117TH ST	M	27	Oak, Live	6	20-29 Feet	30	LOW
	# Trees This Street: 21							
972	500 x NE 118TH ST	M	23	Poinciana, Royal	6	20-29 Feet	40	LOW
908	600 x NE 118TH ST	M	1	Australian-pine	30	30-39 Feet	40	LOW
910	600 x NE 118TH ST	M	3	Australian-pine	30	30-39 Feet	40	LOW
911	600 x NE 118TH ST	M	4	Australian-pine	36	30-39 Feet	40	LOW
912	600 x NE 118TH ST	M	5	Australian-pine	36	30-39 Feet	40	LOW
913	600 x NE 118TH ST	M	6	Australian-pine	36	30-39 Feet	40	LOW
914	600 x NE 118TH ST	M	7	Australian-pine	36	30-39 Feet	40	LOW
915	600 x NE 118TH ST	M	8	Australian-pine	24	30-39 Feet	40	LOW
917	600 x NE 118TH ST	M	10	Australian-pine	30	30-39 Feet	40	LOW
918	600 x NE 118TH ST	M	11	Australian-pine	30	30-39 Feet	40	LOW
919	600 x NE 118TH ST	M	12	Australian-pine	30	30-39 Feet	30	MEDIUM
920	600 x NE 118TH ST	M	13	Australian-pine	30	30-39 Feet	40	LOW
921	600 x NE 118TH ST	M	14	Australian-pine	36	30-39 Feet	30	LOW
922	600 x NE 118TH ST	M	15	Australian-pine	24	30-39 Feet	40	LOW
923	600 x NE 118TH ST	M	16	Australian-pine	42	30-39 Feet	40	LOW
924	600 x NE 118TH ST	M	17	Australian-pine	30	30-39 Feet	40	LOW
925	600 x NE 118TH ST	M	18	Australian-pine	36	30-39 Feet	40	LOW
927	600 x NE 118TH ST	M	20	Australian-pine	36	30-39 Feet	0	HIGH
928	600 x NE 118TH ST	M	21	Australian-pine	30	30-39 Feet	30	MEDIUM
931	700 x NE 118TH ST	M	1	Australian-pine	30	40-49 Feet	20	MEDIUM
932	700 x NE 118TH ST	M	2	Australian-pine	30	40-49 Feet	30	MEDIUM
933	700 x NE 118TH ST	M	3	Australian-pine	36	40-49 Feet	20	MEDIUM
934	700 x NE 118TH ST	M	4	Australian-pine	36	40-49 Feet	20	MEDIUM
935	700 x NE 118TH ST	M	5	Australian-pine	42	40-49 Feet	20	MEDIUM

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
936	700 x NE 118TH ST	M	6	Australian-pine	30	40-49 Feet	30	MEDIUM
937	700 x NE 118TH ST	M	7	Australian-pine	42	40-49 Feet	20	MEDIUM
939	700 x NE 118TH ST	M	9	Australian-pine	36	40-49 Feet	20	MEDIUM
940	700 x NE 118TH ST	M	10	Australian-pine	30	40-49 Feet	30	LOW
947	700 x NE 118TH ST	M	17	Australian-pine	36	40-49 Feet	20	MEDIUM
948	700 x NE 118TH ST	M	18	Australian-pine	36	40-49 Feet	20	MEDIUM
662	800 x NE 118TH ST	M	23	Sapodilla	12	15-19 Feet	40	LOW
222	900 x NE 118TH ST	M	3	Black-Olive	12	20-29 Feet	40	LOW
226	900 x NE 118TH ST	M	7	Norfolk Island Pine	24	20-29 Feet	30	LOW
	# Trees This Street: 33							
975	400 x NE 119TH ST	M	2	Australian-pine	54	40-49 Feet	20	HIGH
976	400 x NE 119TH ST	M	3	Oak, Live	6	10-14 Feet	50	LOW
978	400 x NE 119TH ST	M	5	Australian-pine	60	40-49 Feet	30	MEDIUM
984	400 x NE 119TH ST	M	11	Mahogany, Florida	24	20-29 Feet	30	LOW
986	400 x NE 119TH ST	M	13	Australian-pine	54	40-49 Feet	30	MEDIUM
987	400 x NE 119TH ST	M	14	Australian-pine	48	40-49 Feet	30	MEDIUM
988	400 x NE 119TH ST	M	15	Australian-pine	42	40-49 Feet	30	MEDIUM
989	400 x NE 119TH ST	M	16	Australian-pine	36	40-49 Feet	30	MEDIUM
993	400 x NE 119TH ST	M	20	Fig, Rubber	60	15-19 Feet	30	LOW
995	400 x NE 119TH ST	M	22	Australian-pine	42	40-49 Feet	30	MEDIUM
996	400 x NE 119TH ST	M	23	Australian-pine	54	40-49 Feet	30	MEDIUM
997	400 x NE 119TH ST	M	24	Australian-pine	42	40-49 Feet	30	MEDIUM
998	400 x NE 119TH ST	M	25	Australian-pine	42	40-49 Feet	30	MEDIUM
999	400 x NE 119TH ST	M	26	Australian-pine	36	40-49 Feet	30	MEDIUM
1000	400 x NE 119TH ST	M	27	Australian-pine	42	40-49 Feet	30	MEDIUM
1106	600 x NE 119TH ST	M	2	Fig, Bo-Tree	1	05-09 Feet	30	LOW
1115	600 x NE 119TH ST	M	11	Orchid Tree	6	10-14 Feet	60	LOW
1119	600 x NE 119TH ST	M	15	Orchid Tree	3	10-14 Feet	50	LOW
1124	700 x NE 119TH ST	M	2	Australian-pine	36	30-39 Feet	40	MEDIUM
1125	700 x NE 119TH ST	M	3	Australian-pine	36	30-39 Feet	40	MEDIUM
1126	700 x NE 119TH ST	M	4	Australian-pine	42	30-39 Feet	40	MEDIUM
629	800 x NE 119TH ST	M	10	Orchid, Hong Kong	12	15-19 Feet	30	LOW
	# Trees This Street: 22							
1174	700 x NE 120TH ST	M	7	Australian-pine	36	40-49 Feet	40	LOW
1181	700 x NE 120TH ST	M	14	Australian-pine	42	40-49 Feet	40	LOW
1187	700 x NE 120TH ST	M	20	Oak, Live	18	20-29 Feet	40	LOW
291	900 x NE 120TH ST	M	19	Oak, Live	3	10-14 Feet	50	LOW
	# Trees This Street: 4							
1023	400 x NE 121ST ST	M	2	Australian-pine	42	40-49 Feet	30	MEDIUM
1024	400 x NE 121ST ST	M	3	Black-Olive	12	15-19 Feet	40	LOW
1025	400 x NE 121ST ST	M	4	Australian-pine	30	40-49 Feet	30	MEDIUM
1027	400 x NE 121ST ST	M	6	Australian-pine	36	40-49 Feet	30	MEDIUM
1030	400 x NE 121ST ST	M	9	Australian-pine	36	40-49 Feet	30	MEDIUM
1035	400 x NE 121ST ST	M	14	Australian-pine	42	40-49 Feet	30	MEDIUM

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
1037	400 x NE 121ST ST	M	16	Australian-pine	48	40-49 Feet	20	MEDIUM
1042	400 x NE 121ST ST	M	22	Australian-pine	42	40-49 Feet	30	MEDIUM
1045	400 x NE 121ST ST	M	25	Australian-pine	30	30-39 Feet	30	MEDIUM
1047	400 x NE 121ST ST	M	27	Australian-pine	42	30-39 Feet	30	MEDIUM
1055	400 x NE 121ST ST	M	35	Black-Olive	18	20-29 Feet	30	MEDIUM
1057	400 x NE 121ST ST	M	37	Australian-pine	36	30-39 Feet	30	MEDIUM
1060	400 x NE 121ST ST	M	40	Australian-pine	48	30-39 Feet	30	MEDIUM
1062	400 x NE 121ST ST	M	42	Australian-pine	48	30-39 Feet	30	MEDIUM
1065	500 x NE 121ST ST	M	1	Australian-pine	42	30-39 Feet	30	MEDIUM
1068	500 x NE 121ST ST	M	4	Australian-pine	36	30-39 Feet	30	MEDIUM
1070	500 x NE 121ST ST	M	6	Australian-pine	48	30-39 Feet	30	MEDIUM
1082	500 x NE 121ST ST	M	18	Black-Olive	18	15-19 Feet	40	LOW
488	600 x NE 121ST ST	M	12	Australian-pine	42	30-39 Feet	30	MEDIUM
498	600 x NE 121ST ST	M	22	Australian-pine	60	30-39 Feet	30	MEDIUM
509	600 x NE 121ST ST	M	33	Brazilian-pepper	1	05-09 Feet	60	LOW
513	600 x NE 121ST ST	M	37	Brazilian-pepper	1	05-09 Feet	60	LOW
514	600 x NE 121ST ST	M	38	Brazilian-pepper	1	05-09 Feet	60	LOW
518	600 x NE 121ST ST	M	42	Australian-pine	48	40-49 Feet	40	MEDIUM
520	600 x NE 121ST ST	M	44	Australian-pine	48	40-49 Feet	40	MEDIUM
521	600 x NE 121ST ST	M	45	Australian-pine	60	40-49 Feet	40	MEDIUM
527	700 x NE 121ST ST	M	4	Australian-pine	48	30-39 Feet	40	MEDIUM
529	700 x NE 121ST ST	M	6	Australian-pine	54	30-39 Feet	40	MEDIUM
531	700 x NE 121ST ST	M	8	Australian-pine	36	30-39 Feet	40	MEDIUM
537	700 x NE 121ST ST	M	14	Australian-pine	30	30-39 Feet	30	MEDIUM
541	700 x NE 121ST ST	M	18	Australian-pine	36	30-39 Feet	40	MEDIUM
544	700 x NE 121ST ST	M	21	Australian-pine	30	30-39 Feet	30	HIGH
548	700 x NE 121ST ST	M	25	Black-Olive	6	30-39 Feet	40	MEDIUM
550	700 x NE 121ST ST	M	27	Palm, Manila	3	05-09 Feet	40	LOW
552	700 x NE 121ST ST	M	29	Australian-pine	1	10-14 Feet	60	LOW
553	700 x NE 121ST ST	M	30	Australian-pine	3	20-29 Feet	50	LOW
554	700 x NE 121ST ST	M	31	Australian-pine	30	20-29 Feet	30	LOW
556	700 x NE 121ST ST	M	33	Australian-pine	30	30-39 Feet	30	MEDIUM
560	700 x NE 121ST ST	M	37	Black-Olive	12	15-19 Feet	40	LOW
562	700 x NE 121ST ST	M	39	Seagrape	12	15-19 Feet	40	LOW
568	800 x NE 121ST ST	M	6	Seagrape	18	15-19 Feet	40	LOW
569	800 x NE 121ST ST	M	7	Fig, Fiddle-leaf	3	10-14 Feet	30	LOW
576	800 x NE 121ST ST	M	14	Gumbo-Limbo	12	15-19 Feet	50	LOW
	# Trees This Street: 43							
1011	11900 x NE 5TH AVE	M	10	Fig, Fiddle-leaf	3	10-14 Feet	50	LOW
1012	11900 x NE 5TH AVE	M	11	Black-Olive	12	20-29 Feet	30	LOW
1014	11900 x NE 5TH AVE	M	13	Black-Olive	18	15-19 Feet	40	LOW
1015	11900 x NE 5TH AVE	M	14	Black-Olive	18	20-29 Feet	50	LOW
	# Trees This Street: 4							
95	11100 x NE 8TH AVE	M	3	Silk-Oak	12	30-39 Feet	30	LOW

TREE	ADDRESS	LOC	POS	COMMON	DBH	HT	CONDX	PRI
96	11100 x NE 8TH AVE	M	4	Dead Tree/Palm	12	15-19 Feet	0	MEDIUM
103	11200 x NE 8TH AVE	M	2	Silk-Oak	6	20-29 Feet	30	LOW
386	11300 x NE 8TH AVE	M	5	Silk-Oak	12	20-29 Feet	30	MEDIUM
388	11300 x NE 8TH AVE	M	7	Silk-Oak	12	20-29 Feet	30	MEDIUM
391	11400 x NE 8TH AVE	M	3	Black-Olive	12	15-19 Feet	30	LOW
817	11900 x NE 8TH AVE	M	8	Mahogany, Florida	24	30-39 Feet	30	HIGH
	# Trees This Street: 7							
8	10800 x NE 8TH CT	M	4	Orchid, Hong Kong	12	20-29 Feet	40	MEDIUM
15	10850 x NE 8TH CT	M	3	Silk-Oak	12	40-49 Feet	30	MEDIUM
33	10900 x NE 8TH CT	M	14	Silk-Oak	18	30-39 Feet	30	MEDIUM
36	10900 x NE 8TH CT	M	17	Silk-Oak	6	20-29 Feet	30	LOW
	# Trees This Street: 4							

Total Trees to Replace: 170

Biscayne Park Street Trees

Tree Planting Plan
Replacement and New Trees

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
1372	11100 x NE 10TH AVE	Median	4	Tree Planting Space	Plant Large Tree	LOW
1373	11100 x NE 10TH AVE	Median	7	Tree Planting Space	Plant Large Tree	LOW
1374	11200 x NE 10TH AVE	Median	1	Tree Planting Space	Plant Large Tree	LOW
1375	11200 x NE 10TH AVE	Median	2	Tree Planting Space	Plant Large Tree	LOW
128	11200 x NE 10TH AVE	Median	4	Stump	Plant Large Tree	LOW
1376	11200 x NE 10TH AVE	Median	5	Tree Planting Space	Plant Large Tree	LOW
129	11200 x NE 10TH AVE	Median	6	Stump	Plant Large Tree	LOW
130	11200 x NE 10TH AVE	Median	7	Stump	Plant Large Tree	LOW
1377	11300 x NE 10TH AVE	Median	1	Tree Planting Space	Plant Large Tree	LOW
134	11300 x NE 10TH AVE	Median	5	Black-Olive	Plant Large Tree	MEDIUM
143	11400 x NE 10TH AVE	Median	8	Stump	Plant Large Tree	LOW
148	11500 x NE 10TH AVE	Median	5	Stump	Plant Large Tree	LOW
179	11900 x NE 10TH AVE	Median	3	Black-Olive	Plant Large Tree	MEDIUM
182	11900 x NE 10TH AVE	Median	6	Silk-Oak	Plant Large Tree	LOW
190	12000 x NE 10TH AVE	Median	6	Oak, Live	Plant Large Tree	MEDIUM
	# Trees This Street: 15					
61	700 x NE 111TH ST	Median	5	Silk-Oak	Plant Large Tree	HIGH
68	700 x NE 111TH ST	Median	12	Silk-Oak	Plant Small Palm	LOW
78	800 x NE 111TH ST	Median	3	Silk-Oak	Plant Large Tree	MEDIUM
80	800 x NE 111TH ST	Median	5	Australian-pine	Plant Small Tree	LOW
81	800 x NE 111TH ST	Median	6	Silk-Oak	Plant Small Tree	LOW
84	800 x NE 111TH ST	Median	9	Australian-pine	Plant Large Tree	LOW
88	860 x NE 111TH ST	Median	4	Australian-pine	Plant Tall Palm	LOW
	# Trees This Street: 7					
342	700 x NE 113TH ST	Median	8	Australian-pine	Plant Small Tree	MEDIUM
343	700 x NE 113TH ST	Median	9	Stump	Plant Tall Palm	LOW
351	800 x NE 113TH ST	Median	2	Australian-pine	Plant Large Tree	MEDIUM
355	880 x NE 113TH ST	Median	1	Stump	Plant Large Tree	LOW
	# Trees This Street: 4					
403	600 x NE 114TH ST	Median	6	Trumpet Tree, Pink	Plant Large Tree	LOW
405	600 x NE 114TH ST	Median	8	Trumpet Tree, Golden	Plant Large Tree	LOW
412	700 x NE 114TH ST	Median	5	Australian-pine	Plant Medium Tree	MEDIUM
413	700 x NE 114TH ST	Median	6	Australian-pine	Plant Large Tree	MEDIUM
415	700 x NE 114TH ST	Median	8	Australian-pine	Plant Large Tree	MEDIUM
416	700 x NE 114TH ST	Median	9	Australian-pine	Plant Large Tree	MEDIUM
418	700 x NE 114TH ST	Median	11	Australian-pine	Plant Medium Tree	MEDIUM
422	700 x NE 114TH ST	Median	15	Australian-pine	Plant Medium Tree	MEDIUM
423	700 x NE 114TH ST	Median	16	Australian-pine	Plant Large Tree	MEDIUM
424	700 x NE 114TH ST	Median	17	Australian-pine	Plant Large Tree	MEDIUM

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
	# Trees This Street: 10					
670	600 x NE 115TH ST	Median	4	Ficus	Plant Medium Tree	MEDIUM
672	600 x NE 115TH ST	Median	6	Dead Tree/Palm	Plant Medium Tree	LOW
677	600 x NE 115TH ST	Median	11	Dead Tree/Palm	Plant Tall Palm	LOW
684	600 x NE 115TH ST	Median	18	Stump	Plant Large Tree	LOW
703	700 x NE 115TH ST	Median	13	Crape Myrtle	Plant Large Tree	LOW
709	700 x NE 115TH ST	Median	19	Australian-pine	Plant Large Tree	MEDIUM
717	700 x NE 115TH ST	Median	27	Orchid Tree	Plant Medium Tree	LOW
723	700 x NE 115TH ST	Median	33	Orchid Tree	Plant Tall Palm	LOW
729	800 x NE 115TH ST	Median	4	Stump	Plant Large Tree	LOW
731	800 x NE 115TH ST	Median	6	Stump	Plant Large Tree	LOW
735	800 x NE 115TH ST	Median	10	Mulberry, Red	Plant Medium Tree	LOW
736	800 x NE 115TH ST	Median	11	Stump	Plant Small Tree	LOW
737	800 x NE 115TH ST	Median	12	Fig, Weeping	Plant Large Tree	LOW
	# Trees This Street: 13					
756	850 x NE 116TH ST	Median	3	Stump	Plant Small Tree	LOW
	# Trees This Street: 1					
1329	600 x NE 117TH ST	Median	4	Tree Planting Space	Plant Large Tree	LOW
1337	600 x NE 117TH ST	Median	12	Australian-pine	Plant Medium Tree	MEDIUM
1339	600 x NE 117TH ST	Median	14	Australian-pine	Plant Large Tree	HIGH
1342	600 x NE 117TH ST	Median	17	Australian-pine	Plant Small Tree	HIGH
1343	600 x NE 117TH ST	Median	18	Tulip-Tree, African	Plant Small Tree	LOW
1344	600 x NE 117TH ST	Median	19	Tulip-Tree, African	Plant Tall Palm	LOW
1345	600 x NE 117TH ST	Median	20	Australian-pine	Plant Tall Palm	HIGH
1348	600 x NE 117TH ST	Median	23	Schefflera	Plant Small Tree	LOW
1351	700 x NE 117TH ST	Median	2	Australian-pine	Plant Small Tree	MEDIUM
1353	700 x NE 117TH ST	Median	4	Australian-pine	Plant Large Tree	MEDIUM
1364	700 x NE 117TH ST	Median	15	Oak, Live	Plant Medium Tree	LOW
1370	700 x NE 117TH ST	Median	21	Stump	Plant Small Tree	LOW
1371	700 x NE 117TH ST	Median	22	Stump	Plant Tall Palm	LOW
786	800 x NE 117TH ST	Median	14	Loquat	Plant Medium Tree	LOW
789	800 x NE 117TH ST	Median	17	Schefflera	Plant Medium Tree	LOW
790	800 x NE 117TH ST	Median	18	Black-Olive	Plant Large Tree	LOW
193	900 x NE 117TH ST	Median	1	Black-Olive	Plant Medium Tree	LOW
197	900 x NE 117TH ST	Median	5	Stump	Plant Medium Tree	LOW
198	900 x NE 117TH ST	Median	6	Loquat	Plant Tall Palm	LOW
203	900 x NE 117TH ST	Median	11	Black-Olive	Plant Small Tree	LOW
204	900 x NE 117TH ST	Median	12	Black-Olive	Plant Medium Tree	LOW
206	900 x NE 117TH ST	Median	14	Black-Olive	Plant Medium Tree	LOW
209	900 x NE 117TH ST	Median	17	Black-Olive	Plant Medium Tree	LOW
214	900 x NE 117TH ST	Median	22	Tamarind, Indian	Plant Medium Tree	LOW
219	900 x NE 117TH ST	Median	27	Oak, Live	Plant Medium Tree	LOW
	# Trees This Street: 25					

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
951	500 x NE 118TH ST	Median	2	Stump	Plant Medium Tree	LOW
953	500 x NE 118TH ST	Median	4	Stump	Plant Medium Tree	LOW
956	500 x NE 118TH ST	Median	7	Stump	Plant Medium Tree	LOW
958	500 x NE 118TH ST	Median	9	Tree Planting Space	Plant Medium Tree	LOW
970	500 x NE 118TH ST	Median	21	Tree Planting Space	Plant Medium Tree	LOW
972	500 x NE 118TH ST	Median	23	Poinciana, Royal	Plant Small Palm	LOW
908	600 x NE 118TH ST	Median	1	Australian-pine	Plant Large Tree	LOW
910	600 x NE 118TH ST	Median	3	Australian-pine	Plant Tall Palm	LOW
911	600 x NE 118TH ST	Median	4	Australian-pine	Plant Tall Palm	LOW
912	600 x NE 118TH ST	Median	5	Australian-pine	Plant Tall Palm	LOW
913	600 x NE 118TH ST	Median	6	Australian-pine	Plant Tall Palm	LOW
914	600 x NE 118TH ST	Median	7	Australian-pine	Plant Medium Tree	LOW
915	600 x NE 118TH ST	Median	8	Australian-pine	Plant Large Tree	LOW
917	600 x NE 118TH ST	Median	10	Australian-pine	Plant Medium Tree	LOW
918	600 x NE 118TH ST	Median	11	Australian-pine	Plant Large Tree	LOW
919	600 x NE 118TH ST	Median	12	Australian-pine	Plant Large Tree	MEDIUM
920	600 x NE 118TH ST	Median	13	Australian-pine	Plant Large Tree	LOW
921	600 x NE 118TH ST	Median	14	Australian-pine	Plant Large Tree	LOW
922	600 x NE 118TH ST	Median	15	Australian-pine	Plant Tall Palm	LOW
923	600 x NE 118TH ST	Median	16	Australian-pine	Plant Small Palm	LOW
924	600 x NE 118TH ST	Median	17	Australian-pine	Plant Large Tree	LOW
925	600 x NE 118TH ST	Median	18	Australian-pine	Plant Large Tree	LOW
927	600 x NE 118TH ST	Median	20	Australian-pine	Plant Large Tree	HIGH
928	600 x NE 118TH ST	Median	21	Australian-pine	Plant Tall Palm	MEDIUM
931	700 x NE 118TH ST	Median	1	Australian-pine	Plant Large Tree	MEDIUM
932	700 x NE 118TH ST	Median	2	Australian-pine	Plant Medium Tree	MEDIUM
933	700 x NE 118TH ST	Median	3	Australian-pine	Plant Large Tree	MEDIUM
934	700 x NE 118TH ST	Median	4	Australian-pine	Plant Medium Tree	MEDIUM
935	700 x NE 118TH ST	Median	5	Australian-pine	Plant Large Tree	MEDIUM
936	700 x NE 118TH ST	Median	6	Australian-pine	Plant Large Tree	MEDIUM
937	700 x NE 118TH ST	Median	7	Australian-pine	Plant Tall Palm	MEDIUM
939	700 x NE 118TH ST	Median	9	Australian-pine	Plant Tall Palm	MEDIUM
940	700 x NE 118TH ST	Median	10	Australian-pine	Plant Tall Palm	LOW
943	700 x NE 118TH ST	Median	13	Stump	Plant Large Tree	LOW
947	700 x NE 118TH ST	Median	17	Australian-pine	Plant Medium Tree	MEDIUM
948	700 x NE 118TH ST	Median	18	Australian-pine	Plant Tall Palm	MEDIUM
641	800 x NE 118TH ST	Median	2	Stump	Plant Large Tree	LOW
652	800 x NE 118TH ST	Median	13	Stump	Plant Large Tree	LOW
662	800 x NE 118TH ST	Median	23	Sapodilla	Plant Small Tree	LOW
220	900 x NE 118TH ST	Median	1	Stump	Plant Large Tree	LOW
222	900 x NE 118TH ST	Median	3	Black-Olive	Plant Large Tree	LOW
226	900 x NE 118TH ST	Median	7	Norfolk Island Pine	Plant Large Tree	LOW
	# Trees This Street: 42					
975	400 x NE 119TH ST	Median	2	Australian-pine	Plant Large Tree	HIGH

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
976	400 x NE 119TH ST	Median	3	Oak, Live	Plant Small Tree	LOW
978	400 x NE 119TH ST	Median	5	Australian-pine	Plant Large Tree	MEDIUM
982	400 x NE 119TH ST	Median	9	Stump	Plant Small Tree	LOW
983	400 x NE 119TH ST	Median	10	Tree Planting Space	Plant Medium Tree	LOW
984	400 x NE 119TH ST	Median	11	Mahogany, Florida	Plant Large Tree	LOW
986	400 x NE 119TH ST	Median	13	Australian-pine	Plant Large Tree	MEDIUM
987	400 x NE 119TH ST	Median	14	Australian-pine	Plant Large Tree	MEDIUM
988	400 x NE 119TH ST	Median	15	Australian-pine	Plant Small Tree	MEDIUM
989	400 x NE 119TH ST	Median	16	Australian-pine	Plant Small Tree	MEDIUM
992	400 x NE 119TH ST	Median	19	Tree Planting Space	Plant Large Tree	LOW
993	400 x NE 119TH ST	Median	20	Fig, Rubber	Plant Tall Palm	LOW
994	400 x NE 119TH ST	Median	21	Tree Planting Space	Plant Tall Palm	LOW
995	400 x NE 119TH ST	Median	22	Australian-pine	Plant Large Tree	MEDIUM
996	400 x NE 119TH ST	Median	23	Australian-pine	Plant Medium Tree	MEDIUM
997	400 x NE 119TH ST	Median	24	Australian-pine	Plant Small Tree	MEDIUM
998	400 x NE 119TH ST	Median	25	Australian-pine	Plant Small Tree	MEDIUM
999	400 x NE 119TH ST	Median	26	Australian-pine	Plant Large Tree	MEDIUM
1000	400 x NE 119TH ST	Median	27	Australian-pine	Plant Medium Tree	MEDIUM
1106	600 x NE 119TH ST	Median	2	Fig, Bo-Tree	Plant Large Tree	LOW
1115	600 x NE 119TH ST	Median	11	Orchid Tree	Plant Medium Tree	LOW
1119	600 x NE 119TH ST	Median	15	Orchid Tree	Plant Large Tree	LOW
1124	700 x NE 119TH ST	Median	2	Australian-pine	Plant Large Tree	MEDIUM
1125	700 x NE 119TH ST	Median	3	Australian-pine	Plant Small Tree	MEDIUM
1126	700 x NE 119TH ST	Median	4	Australian-pine	Plant Small Tree	MEDIUM
1136	700 x NE 119TH ST	Median	14	Stump	Plant Large Tree	LOW
1148	700 x NE 119TH ST	Median	26	Stump	Plant Large Tree	LOW
627	800 x NE 119TH ST	Median	8	Stump	Plant Medium Tree	LOW
629	800 x NE 119TH ST	Median	10	Orchid, Hong Kong	Plant Small Palm	LOW
262	900 x NE 119TH ST	Median	19	Stump	Plant Small Tree	LOW
	# Trees This Street: 30					
1163	650 x NE 120TH ST	Median	10	Stump	Plant Medium Tree	LOW
1170	700 x NE 120TH ST	Median	3	Tree Planting Space	Plant Medium Tree	LOW
1174	700 x NE 120TH ST	Median	7	Australian-pine	Plant Small Tree	LOW
1181	700 x NE 120TH ST	Median	14	Australian-pine	Plant Small Tree	LOW
1187	700 x NE 120TH ST	Median	20	Oak, Live	Plant Large Tree	LOW
291	900 x NE 120TH ST	Median	19	Oak, Live	Plant Large Tree	LOW
	# Trees This Street: 6					
1023	400 x NE 121ST ST	Median	2	Australian-pine	Plant Small Tree	MEDIUM
1024	400 x NE 121ST ST	Median	3	Black-Olive	Plant Small Tree	LOW
1025	400 x NE 121ST ST	Median	4	Australian-pine	Plant Small Palm	MEDIUM
1027	400 x NE 121ST ST	Median	6	Australian-pine	Plant Large Tree	MEDIUM
1030	400 x NE 121ST ST	Median	9	Australian-pine	Plant Small Tree	MEDIUM
1035	400 x NE 121ST ST	Median	14	Australian-pine	Plant Large Tree	MEDIUM
1037	400 x NE 121ST ST	Median	16	Australian-pine	Plant Large Tree	MEDIUM

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
1038	400 x NE 121ST ST	Median	17	Tree Planting Space	Plant Small Tree	LOW
1042	400 x NE 121ST ST	Median	22	Australian-pine	Plant Tall Palm	MEDIUM
1045	400 x NE 121ST ST	Median	25	Australian-pine	Plant Tall Palm	MEDIUM
1047	400 x NE 121ST ST	Median	27	Australian-pine	Plant Small Tree	MEDIUM
1052	400 x NE 121ST ST	Median	32	Tree Planting Space	Plant Large Tree	LOW
1054	400 x NE 121ST ST	Median	34	Tree Planting Space	Plant Large Tree	LOW
1055	400 x NE 121ST ST	Median	35	Black-Olive	Plant Medium Tree	MEDIUM
1057	400 x NE 121ST ST	Median	37	Australian-pine	Plant Small Tree	MEDIUM
1060	400 x NE 121ST ST	Median	40	Australian-pine	Plant Medium Tree	MEDIUM
1062	400 x NE 121ST ST	Median	42	Australian-pine	Plant Tall Palm	MEDIUM
1065	500 x NE 121ST ST	Median	1	Australian-pine	Plant Tall Palm	MEDIUM
1066	500 x NE 121ST ST	Median	2	Tree Planting Space	Plant Small Tree	LOW
1068	500 x NE 121ST ST	Median	4	Australian-pine	Plant Medium Tree	MEDIUM
1070	500 x NE 121ST ST	Median	6	Australian-pine	Plant Large Tree	MEDIUM
1081	500 x NE 121ST ST	Median	17	Tree Planting Space	Plant Large Tree	LOW
1082	500 x NE 121ST ST	Median	18	Black-Olive	Plant Tall Palm	LOW
1084	500 x NE 121ST ST	Median	20	Tree Planting Space	Plant Large Tree	LOW
488	600 x NE 121ST ST	Median	12	Australian-pine	Plant Small Tree	MEDIUM
498	600 x NE 121ST ST	Median	22	Australian-pine	Plant Medium Tree	MEDIUM
509	600 x NE 121ST ST	Median	33	Brazilian-pepper	Plant Medium Tree	LOW
513	600 x NE 121ST ST	Median	37	Brazilian-pepper	Plant Medium Tree	LOW
514	600 x NE 121ST ST	Median	38	Brazilian-pepper	Plant Medium Tree	LOW
518	600 x NE 121ST ST	Median	42	Australian-pine	Plant Medium Tree	MEDIUM
520	600 x NE 121ST ST	Median	44	Australian-pine	Plant Medium Tree	MEDIUM
521	600 x NE 121ST ST	Median	45	Australian-pine	Plant Medium Tree	MEDIUM
527	700 x NE 121ST ST	Median	4	Australian-pine	Plant Large Tree	MEDIUM
529	700 x NE 121ST ST	Median	6	Australian-pine	Plant Large Tree	MEDIUM
531	700 x NE 121ST ST	Median	8	Australian-pine	Plant Small Tree	MEDIUM
537	700 x NE 121ST ST	Median	14	Australian-pine	Plant Medium Tree	MEDIUM
541	700 x NE 121ST ST	Median	18	Australian-pine	Plant Medium Tree	MEDIUM
544	700 x NE 121ST ST	Median	21	Australian-pine	Plant Medium Tree	HIGH
548	700 x NE 121ST ST	Median	25	Black-Olive	Plant Large Tree	MEDIUM
550	700 x NE 121ST ST	Median	27	Palm, Manila	Plant Small Palm	LOW
552	700 x NE 121ST ST	Median	29	Australian-pine	Plant Large Tree	LOW
553	700 x NE 121ST ST	Median	30	Australian-pine	Plant Small Tree	LOW
554	700 x NE 121ST ST	Median	31	Australian-pine	Plant Large Tree	LOW
556	700 x NE 121ST ST	Median	33	Australian-pine	Plant Large Tree	MEDIUM
560	700 x NE 121ST ST	Median	37	Black-Olive	Plant Large Tree	LOW
562	700 x NE 121ST ST	Median	39	Seagrape	Plant Large Tree	LOW
568	800 x NE 121ST ST	Median	6	Seagrape	Plant Large Tree	LOW
569	800 x NE 121ST ST	Median	7	Fig, Fiddle-leaf	Plant Small Tree	LOW
576	800 x NE 121ST ST	Median	14	Gumbo-Limbo	Plant Large Tree	LOW
	# Trees This Street: 49					
1006	11900 x NE 5TH AVE	Median	5	Tree Planting Space	Plant Large Tree	LOW

TREE	ADDRESS	LOC	POS	TREE TO BE REMOVED	PLANTING REC	PRIORITY
1010	11900 x NE 5TH AVE	Median	9	Stump	Plant Large Tree	LOW
1011	11900 x NE 5TH AVE	Median	10	Fig, Fiddle-leaf	Plant Medium Tree	LOW
1012	11900 x NE 5TH AVE	Median	11	Black-Olive	Plant Large Tree	LOW
1013	11900 x NE 5TH AVE	Median	12	Tree Planting Space	Plant Medium Tree	LOW
1014	11900 x NE 5TH AVE	Median	13	Black-Olive	Plant Large Tree	LOW
1015	11900 x NE 5TH AVE	Median	14	Black-Olive	Plant Large Tree	LOW
1016	11900 x NE 5TH AVE	Median	15	Stump	Plant Large Tree	LOW
1017	11900 x NE 5TH AVE	Median	16	Stump	Plant Medium Tree	LOW
	# Trees This Street: 9					
95	11100 x NE 8TH AVE	Median	3	Silk-Oak	Plant Large Tree	LOW
96	11100 x NE 8TH AVE	Median	4	Dead Tree/Palm	Plant Large Tree	MEDIUM
103	11200 x NE 8TH AVE	Median	2	Silk-Oak	Plant Large Tree	LOW
386	11300 x NE 8TH AVE	Median	5	Silk-Oak	Plant Large Tree	MEDIUM
388	11300 x NE 8TH AVE	Median	7	Silk-Oak	Plant Large Tree	MEDIUM
391	11400 x NE 8TH AVE	Median	3	Black-Olive	Plant Small Palm	LOW
394	11400 x NE 8TH AVE	Median	6	Stump	Plant Large Tree	LOW
751	11500 x NE 8TH AVE	Median	6	Stump	Plant Large Tree	LOW
753	11500 x NE 8TH AVE	Median	8	Stump	Plant Large Tree	LOW
817	11900 x NE 8TH AVE	Median	8	Mahogany, Florida	Plant Large Tree	HIGH
	# Trees This Street: 10					
8	10800 x NE 8TH CT	Median	4	Orchid, Hong Kong	Plant Large Tree	MEDIUM
15	10850 x NE 8TH CT	Median	3	Silk-Oak	Plant Large Tree	MEDIUM
27	10900 x NE 8TH CT	Median	8	Stump	Plant Large Tree	LOW
28	10900 x NE 8TH CT	Median	9	Stump	Plant Large Tree	LOW
33	10900 x NE 8TH CT	Median	14	Silk-Oak	Plant Small Tree	MEDIUM
36	10900 x NE 8TH CT	Median	17	Silk-Oak	Plant Large Tree	LOW
	# Trees This Street: 6					

Total Trees to Plant: 227

Figure 2: Street Tree Diameter Distribution

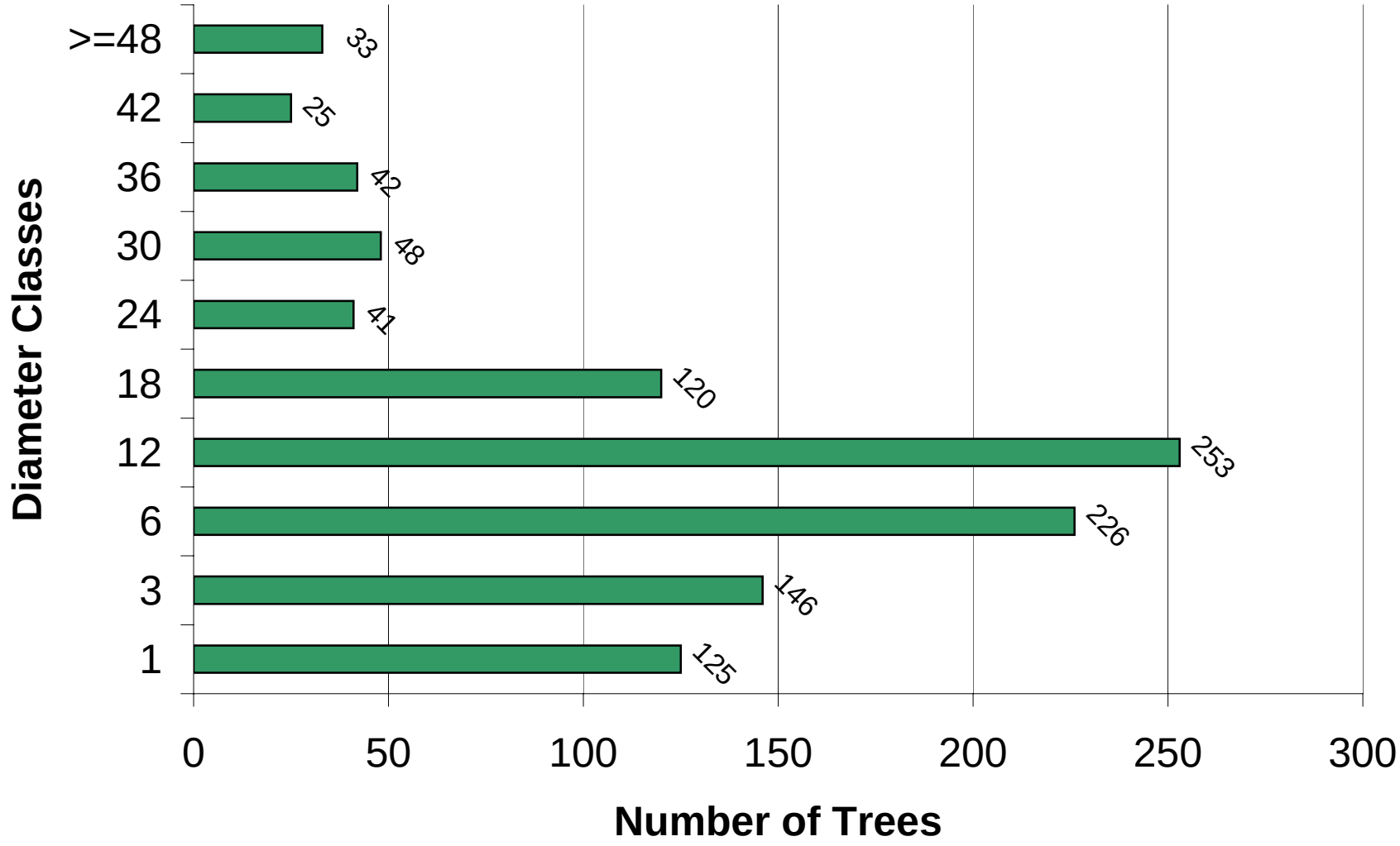


Figure 3: Street Tree Condition Distribution

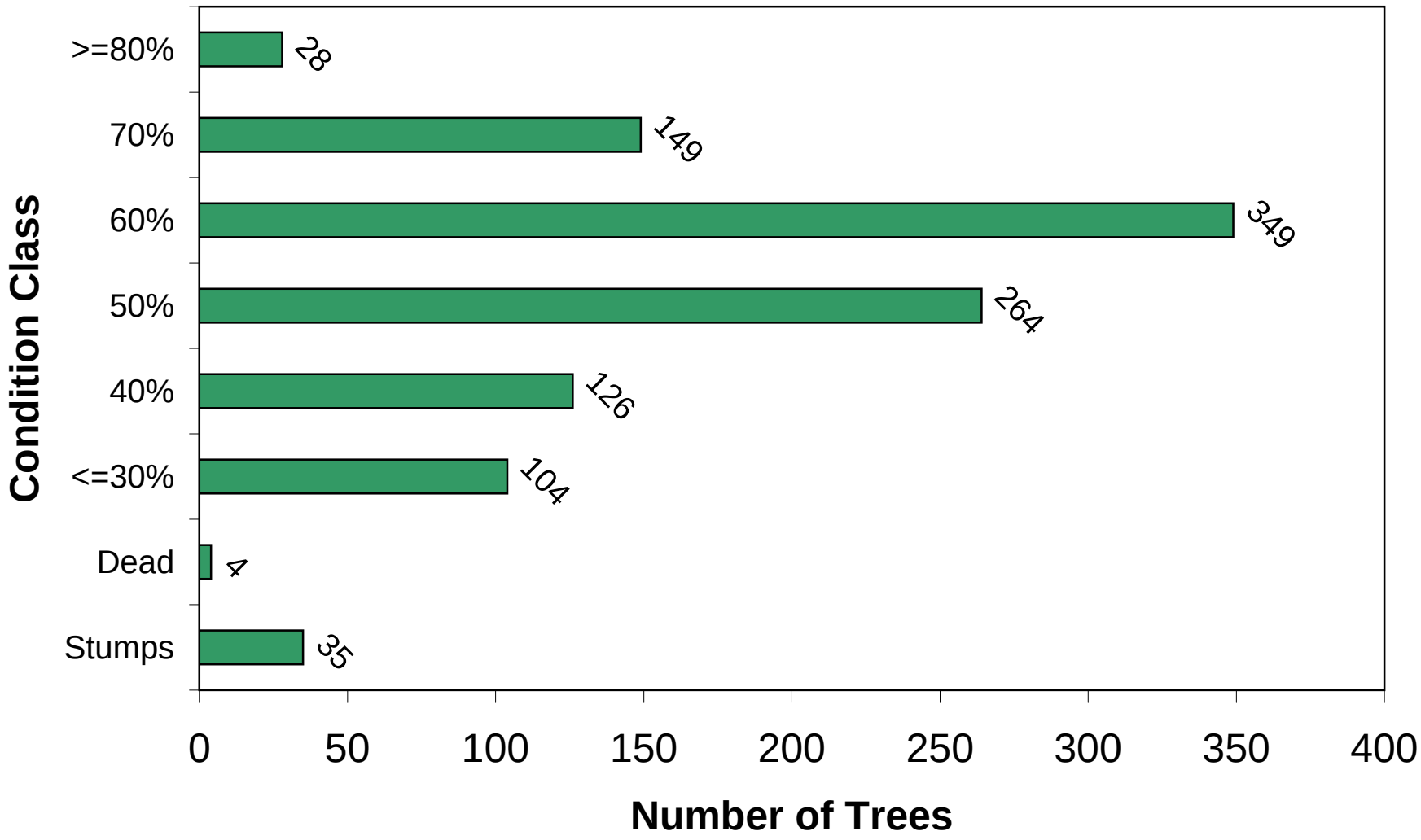
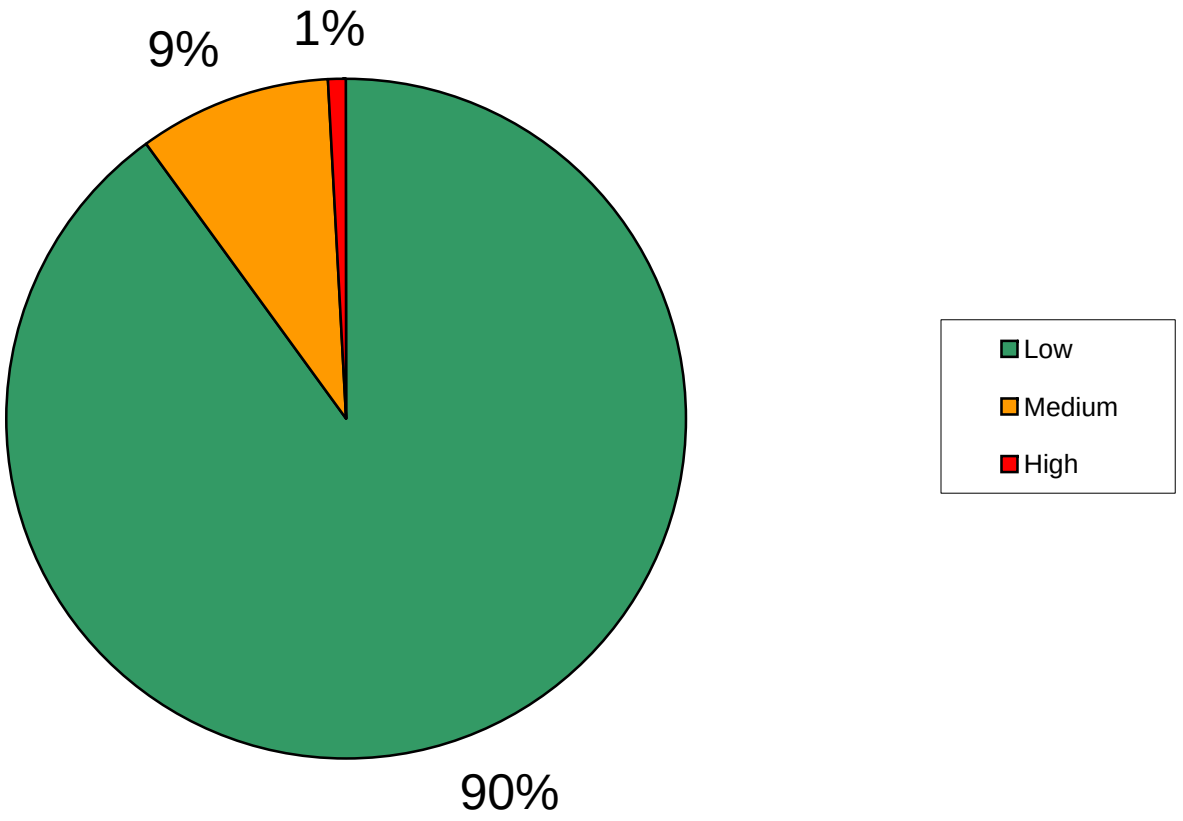


Figure 4: Street Tree Priority Rating Distribution



PARK STATISTICS & GRAPHS

Biscayne Park
Park Trees

Species Distribution

TREE COMMON NAME	# TREES	% TOTAL
Arjuna	3	2.1%
Australian-pine	1	0.7%
Avocado	1	0.7%
Bischofia	1	0.7%
Bombax	1	0.7%
Brazilian-pepper	1	0.7%
Dead Tree/Palm	2	1.4%
Ficus	1	0.7%
Fig, Bo-Tree	1	0.7%
Fig, Strangler	3	2.1%
Fig, Weeping	4	2.9%
Floss-silk Tree	1	0.7%
Jamaica Dogwood	1	0.7%
Mahogany, Florida	9	6.4%
Oak, Live	43	30.7%
Palm, Blue Latan	1	0.7%
Palm, Cabbage	5	3.6%
Palm, Coconut	20	14.3%
Palm, Cuban Royal	2	1.4%
Palm, Florida Thatch	1	0.7%
Palm, Manila	2	1.4%
Palm, Solitaire	1	0.7%
Palm, Washington	7	5.0%
Pine, Slash	7	5.0%
Plum, Java	1	0.7%
Pongam	1	0.7%
Schefflera	1	0.7%
Seagrape	1	0.7%
Stump	2	1.4%
Tulip-Tree, African	1	0.7%
Unknown	14	10.0%
Total Trees:	**140**	
Total Species:	**31**	

Figure 5: Park Tree Diameter Distribution

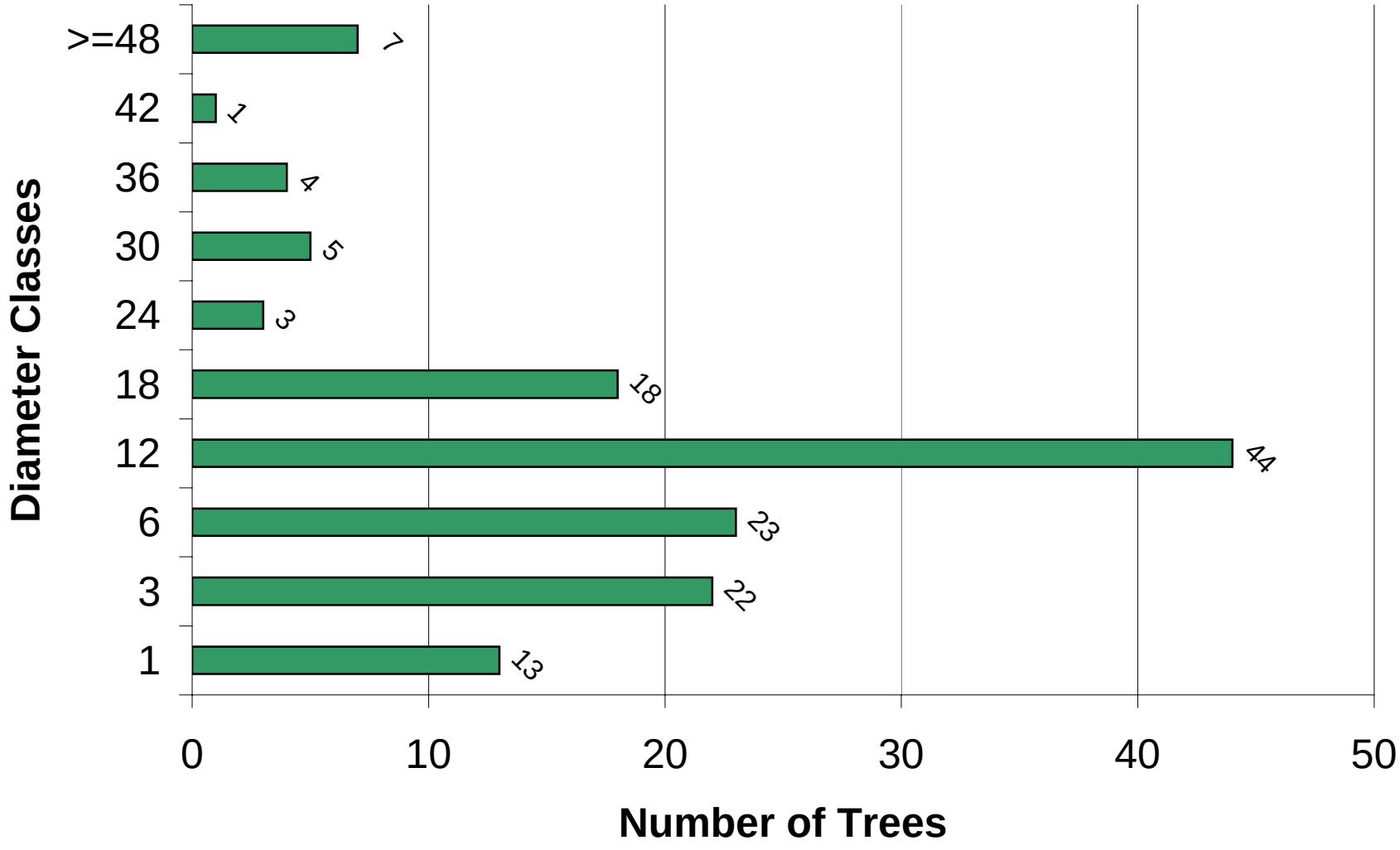


Figure 6: Park Tree Condition Distribution

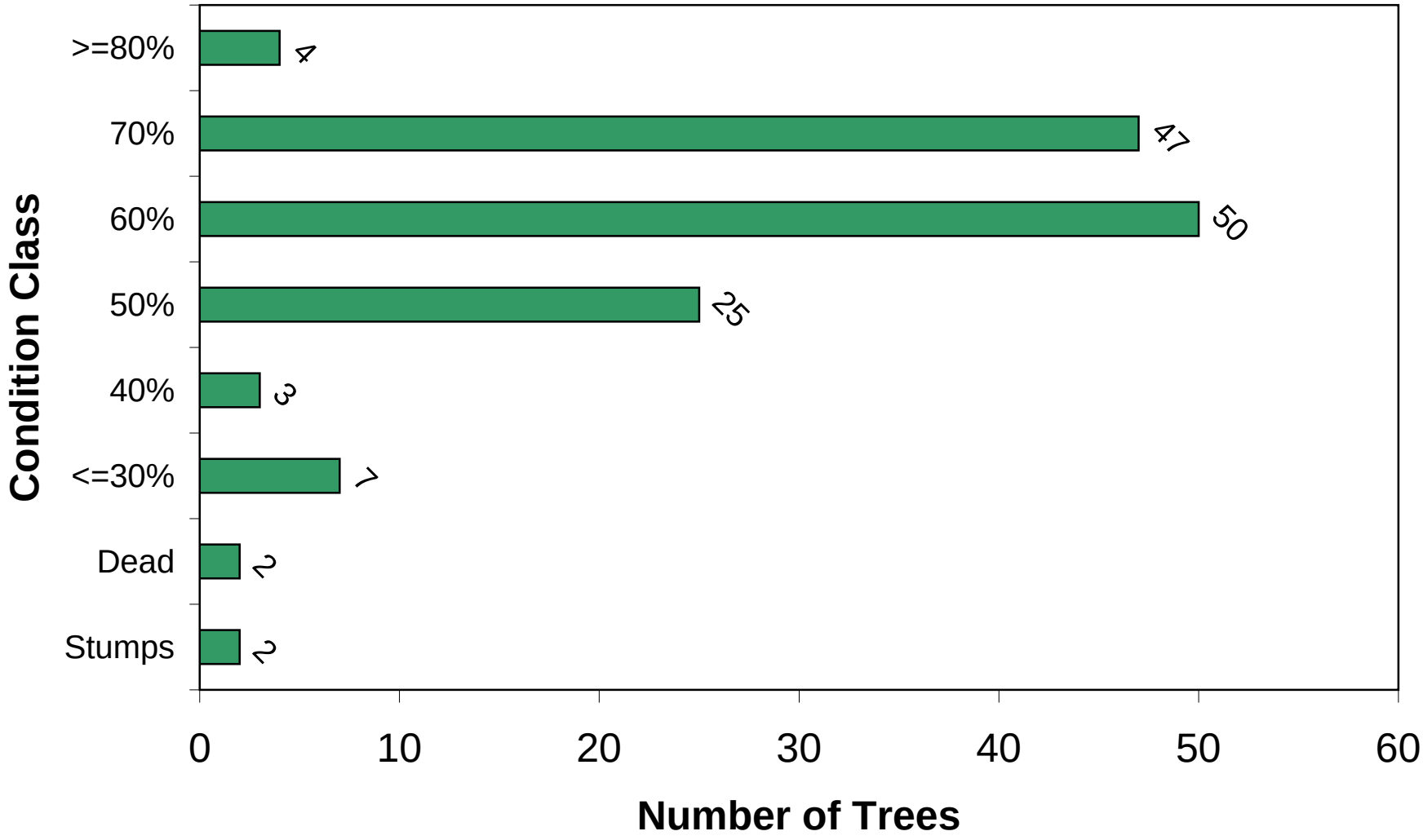
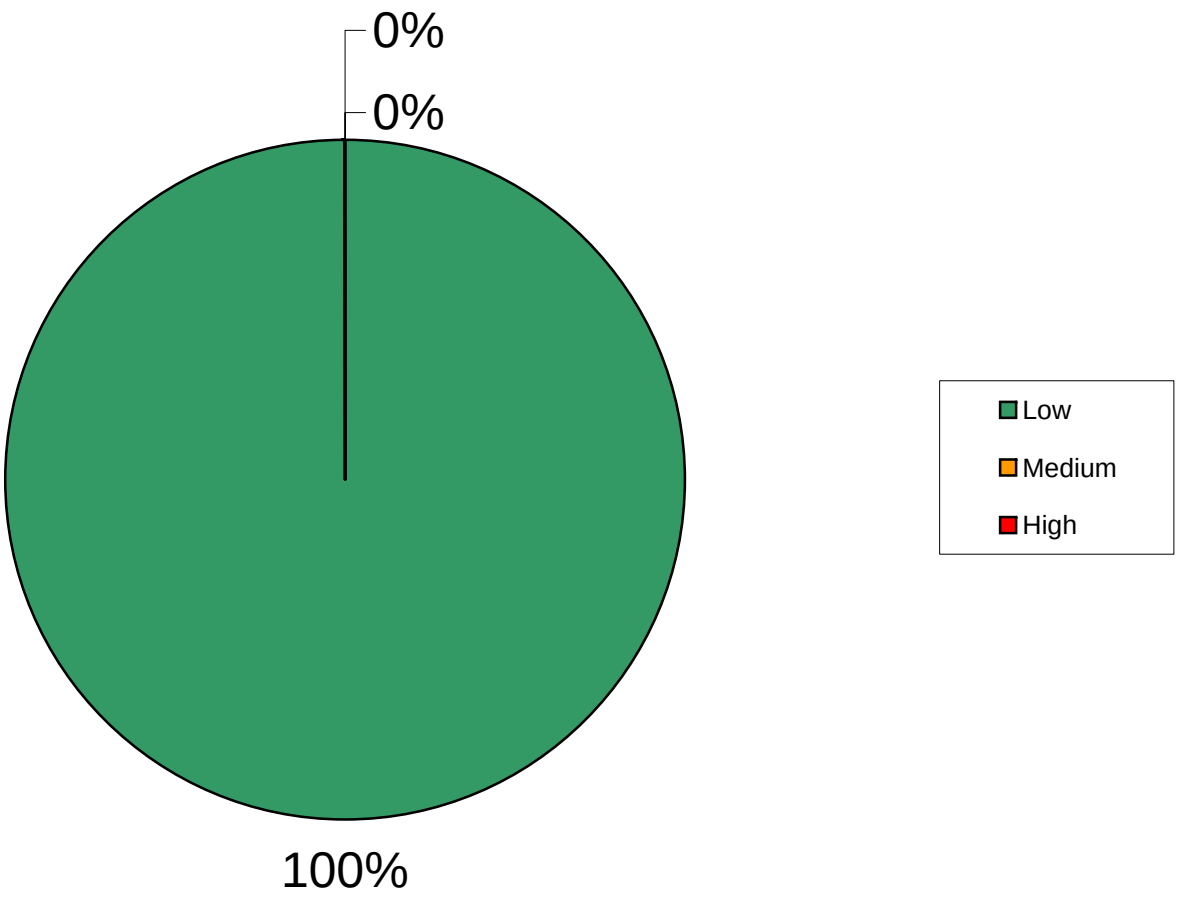


Figure 7: Park Tree Priority Rating Distribution



RECOMMENDED TREES FOR BISCAYNE PARK, FLORIDA

Recommended Trees for Florida Zones 10b to 11

Palm

Small

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Palm, Bottle	Hyophorbe	lagenicaulis	N	0	11 to 11
Palm, Florida Thatch	Thrinax	radiata	Y	0	11 to 11

Tall

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Palm, Bismark	Bismarckia	nobilis	N	15	11 to 11
Palm, Cabbage	Sabal	palmetto	Y	10	8a to 11
Palm, Canary Isl.	Phoenix	canariensis	N	15	9a to 11
Palm, Coconut (Mayp	Cocos	nucifera	N	15	10b to 11
Palm, Foxtail	Wodyetia	bifurcata	N	15	10b to 11
Palm, Majool Date	Phoenix	dactylifera	N	15	9a to 11
Palm, Paurotis	Acoelorraphe	wrightii	Y	20	10a to 11
Palm, Queen	Syagrus	romanzoff	N	10	9b to 11
Palm, Royal	Roystonia	elata	Y	15	10b to 11
Palm, Sengal Date	Phoenix	reclinata	N	15	9a to 11
Palm, Silver	Coccothrinax	argentata	N	15	11 to 11
Palm, Solitaire	Ptychosperma	elegans	N	10	11 to 11
Palm, Triangle	Neodypsis	decaryi	N	15	11 to 11

Tree

Large

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Arjuna	Terminalia	arjuna	N	30	11 to 11
Black-Olive	Bucida	buceras	N	30	10b to 11
Bombax	Bombax	malabaricum	N	30	11 to 11
Brazilian Beautyleaf	Calophyllum	brasiliense	N	30	10b to 11
Bulnesia	Bulnesia	arborea	N	30	10b to 11
Cypress, Bald	Taxodium	distichum	Y	30	8a to 11
Dogwood, Jamaica	Piscidia	piscipula	Y	30	11 to 11
Gumbo-Limbo	Bursera	simaruba	Y	30	10b to 11
Jacaranda	Jacaranda	cuspidifolia	N	30	9b to 11
Mahogany, West India	Swietenia	mahagoni	Y	30	10b to 11
Oak, Live	Quercus	virginiana	Y	30	8a to 11
Paradise Tree	Simarouba	glauca	Y	30	11 to 11
Pigeon-Plum	Coccoloba	diversifolia	Y	30	11 to 11
Pine, S Florida Slash	Pinus	elliottii var densa	Y	30	10a to 11
Podocarpus, Weeping	Podocarpus	gracilior	N	30	9a to 11
Poinciana, Yellow	Peltophorum	pterocarpum	N	30	9b to 11
Pongam	Pongamia	pinnata	N	30	11 to 11
Queens Crape Myrtle	Lagerstroemia	speciosa	N	30	10a to 11
Satinleaf	Chrysophyllum	oliviforme	Y	30	10b to 11
Shower Golden	Cassia	fistula	N	30	10a to 11
Tamarind, Indian	Tamarindus	indica	N	30	10b to 11
Tamarind, Wild	Lysiloma	latisiliqua	Y	30	10b to 11
Tipu	Tipuana	tipu	N	30	9b to 11

Tree

Large

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Trumpet tree, Golden	Tabebuia	chrysotricha	N	30	9a to 11

Medium

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Bottlebrush, Weeping	Callistemon	viminalis	N	20	9a to 11
Crape Myrtle	Lagerstroemia	indica	N	10	8a to 11
Euc. Silver Dollar	Eucalyptus	cinera	N	20	8a to 11
Holly, Dahoon	Ilex	cassine	Y	10	9a to 11
Holly, Yaupon	Ilex	vomitoria	Y	20	8a to 11
Privet, Florida	Forestiera	segregata	Y	20	10a to 11
Seagrape	Coccoloba	uvifera	Y	20	10b to 11
Trema, Florida	Trema	mollis	Y	20	11 to 11

Small

Common Name	Genus	Species	Native?	Distance from Power Lines	USDA Hardiness Zone
Buttonwood, Silver	Conocarpus	erectus var.sericeus	Y	0	10a to 11
Cassia, Yellow	Cassia	bicapsularis	N	0	9a to 11
Citrus	Citrus	spp.	N	0	9a to 11
Frangipani	Plumeria	rubra	N	0	10b to 11
Geiger Tree	Cordia	sebestena	N	0	10b to 11
Hibiscus standard	Hibiscus	spp.	N	0	10a to 11
Privet, Japanese	Ligustrum	japonicum	N	0	8a to 11
Stopper	Eugenia	spp.	Y	0	10a to 11

Tropical/Subtropical Trees

Highest Wind Resistance

Dicots

- *Bursera simaruba*, gumbo limbo
- *Carya floridana*, FL scrub hickory
- *Conocarpus erectus*, buttonwood
- *Chrysobalanus icaco*, cocoplum
- *Cordia sebestena*, geiger tree
- *Eugenia axillaris*, white stopper
- *Eugenia confusa*, redberry
- *Eugenia foetida*, boxleaf stopper
- *Guaiacum sanctum*, lignumvitae
- *Ilex cassine*, dahoon holly
- *Krugiodendron ferreum*, ironwood
- *Lagerstroemia indica*, crape myrtle
- *Magnolia grandiflora*, southern magnolia
- *Podocarpus* spp., podocarpus
- *Quercus virginiana*, live oak
- *Quercus geminata*, sand live oak

Conifers

- *Taxodium distichum*, baldcypress
- *Taxodium ascendens*, pondcypress

Palms

- *Adonidia merrillii*, Manila
- *Butia capitata*, pindo
- *Dypsis lutescens*, areca
- *Coccothrinax argentata*, FL silver
- *Hyophorbe lagenicaulis*, bottle
- *Hyophorbe verschaffeltii*, spindle
- *Latania loddigesii*, blue latan
- *Livistona chinensis*, Chinese fan**
- *Phoenix canariensis*, Canary Island date
- *Phoenix dactylifera*, date
- *Phoenix roebelenii*, pygmy date
- *Ptychosperma elegans*, Alexander
- *Sabal palmetto*, cabbage
- *Thrinax morrisii*, key thatch
- *Thrinax radiata*, Florida thatch

Medium-High Wind Resistance

Dicots

- *Annona glabra*, pondapple
- *Calophyllum antillanum*, Brazilian beautyleaf**
- *Chrysophyllum oliviforme*, satinleaf
- *Coccoloba uvifera*, sea grape
- *Coccoloba diversifolia*, pigeon plum
- *Liquidambar styraciflua*, sweetgum
- *Lysiloma latisiliquuum*, false tamarind
- *Magnolia virginiana*, sweetbay magnolia
- *Nyssa sylvatica*, black tupelo
- *Sideroxylon foetidissimum*, mastic tree
- *Simarouba glauca*, paradise tree
- *Swietenia mahagoni*, mahogany

Palms

- *Caryota mitis*, fishtail
- *Cocos nucifera*, coconut
- *Dypsis decaryi*, triangle
- *Roystonea elata*, royal

Fruit Trees

- *Litchi chinensis*, lychee

Duryea,Kampf,& Littell, UF/IFAS, July 2006
mlduryea@ufl.edu; elianak@ifas.ufl.edu

* Invasive, not recommended by IFAS
** Caution: manage to prevent escape
http://plants.ifas.ufl.edu/assessment.html

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Tropical/Subtropical Trees

Medium-Low Wind Resistance

Dicots

- *Acer rubrum*, red maple
- *Bauhinia blakeana*, Hong-Kong orchid
- *Bucidas buceras*, black olive
- *Callistemon* spp., bottlebrush
- *Cinnamomum camphora*, camphor*
- *Delonix regia*, royal poinciana**
- *Enterolobium cyclocarpum*, ear tree
- *Eriobotrya japonica*, loquat**
- *Ficus aurea*, strangler fig
- *Kigelia pinnata*, sausage tree
- *Eucalyptus cinerea*, silverdollar eucalyptus
- *Quercus laurifolia*, laurel oak
- *Myrica cerifera*, wax myrtle
- *Persea borbonia*, redbay
- *Platanus occidentalis*, sycamore
- *Tabebuia heterophylla*, pink trumpet tree
- *Terminalia catappa*, tropical almond**

Conifers

- *Pinus elliottii* var. *densa*, slash pine
- *Pinus palustris*, longleaf pine

Fruit Trees

- *Averrhoa carambola*, star-fruit, carambola
- *Citrus* spp., oranges, limes, grapefruit
- *Mangifera indica*, mango

Lowest Wind Resistance

Dicots

- *Casuarina equisetifolia*, Australian pine***
- *Cassia fistula*, golden shower
- *Chorisia speciosa*, floss-silk tree
- *Ficus benjamina*, weeping banyan
- *Grevillea robusta*, silk oak
- *Jacaranda mimosifolia*, jacaranda
- *Melaleuca quinquenervia*, melaleuca***
- *Quercus nigra*, water oak
- *Peltophorum pterocarpa*, yellow poinciana
- *Prunus caroliniana*, Carolina laurelcherry
- *Sapium sebiferum*, Chinese tallow***
- *Spathodea campanulata*, African tuliptree
- *Tabebuia caraiba*, silver trumpet tree
- *Ulmus parvifolia*, Chinese elm

Conifers

- *Araucaria heterophylla*, Norfolk Island pine
- *xCupressocyparis leylandii*, leyland cypress
- *Juniperus silicicola*, southern red cedar
- *Pinus clausa*, sand pine

Palms

- *Syagrus romanzoffiana*, queen
- *Washingtonia robusta*, Washington fan

Fruit Trees

- *Persea americana*, avocado

Duryea,Kampf,& Littell, UF/IFAS, July 2006
mlduryea@ufl.edu; elianak@ifas.ufl.edu

* Invasive, not recommended by IFAS
** Caution: manage to prevent escape
*** Prohibited in FL
http://plants.ifas.ufl.edu/assessment.html

TREE PRUNING GUIDELINES

Pruning Do's and Don'ts

DO:

1. Prune with an objective in mind.
2. Prune back to next larger lateral branch.
3. Prune just outside the branch bark ridge
4. Prune to subordinate to a dominant leader.
5. Prune poor branches – weak, diseased, dead, dying, or rubbing.
6. Begin pruning trees at a young age.

DON'T:

1. Prune "just because …"
2. Leave branch stubs.
3. Prune inside the bark branch ridge – "flush-cut pruning"
4. Leave co-dominant leaders.
5. Prune more than 25% of canopy per year.
6. Prune large live branches in mature trees unless absolutely necessary.

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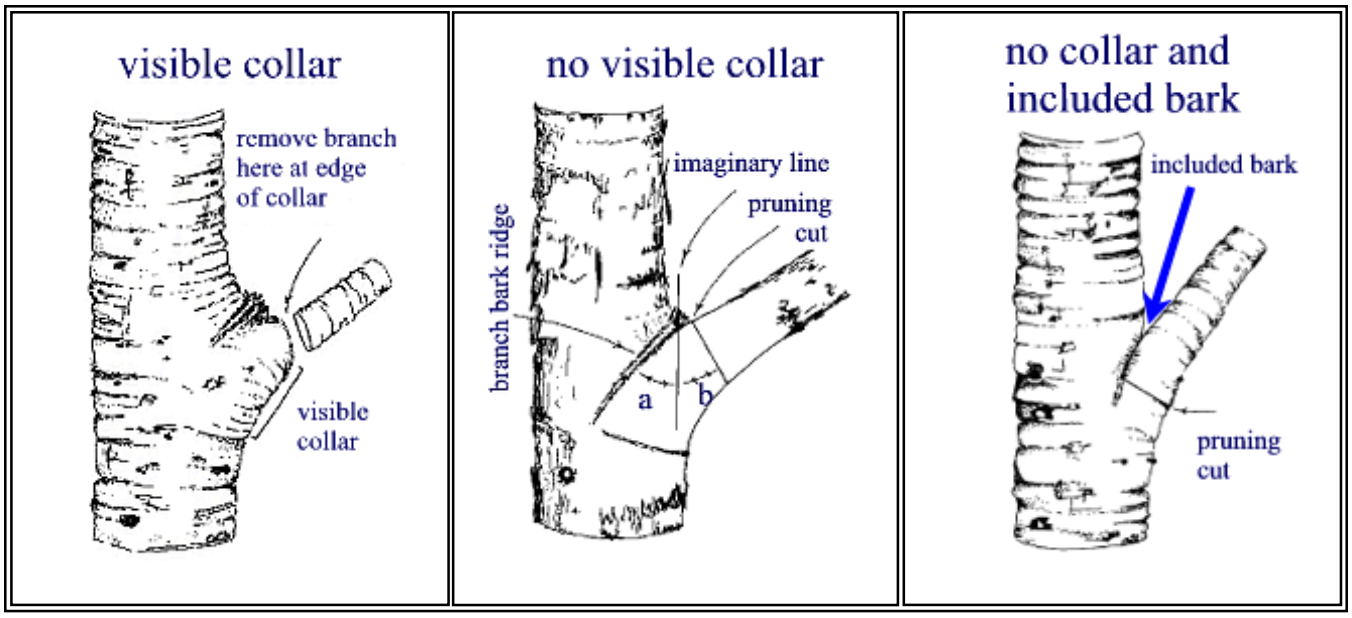
Pruning shade trees in the landscape

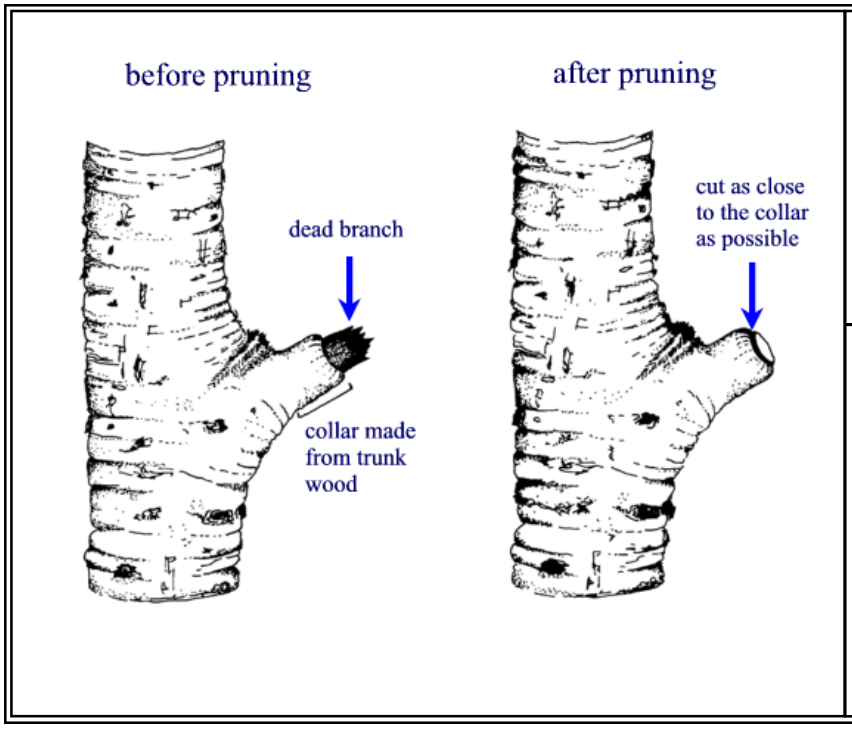
Pruning cut types

Edward F. Gilman[1]

Live branch removal



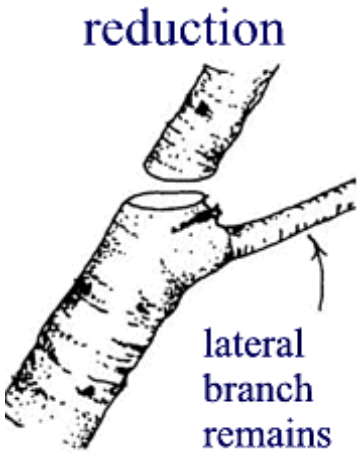
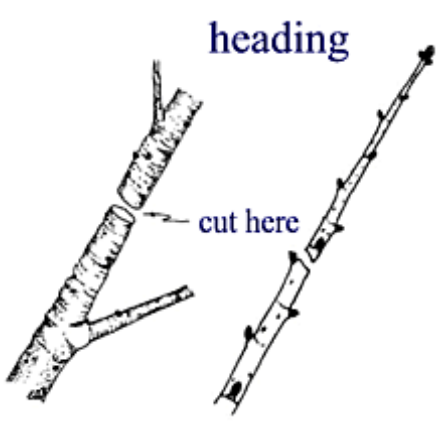
Dead branch removal



Before pruning: A collar of trunk wood begins to grow out onto a dead branch that remains on the tree. Be sure not to cut into this collar. Cutting into the collar amounts to cutting into the trunk. Removing dead branches is good for the health of trees.

After pruning: Cut all dead branch tissue from the tree, but do not injure the collar. If the branch is small or severely decayed, you might be able to simply break the dead branch from the tree. This often allows you to remove more of the dead tissue inside the edge of the collar. Do not break the dead branch if this could injure the collar.

Stem reduction

Appropriate reduction	Inappropriate reduction
	

A reduction cut (also referred to as a drop-crotch cut) removes a stem back to a lateral branch that is at least one-third the diameter of the cut stem. Sprouts commonly follow a reduction cut, especially if a large portion (greater than about one-quarter) of the live foliage was removed with the cut. If the branch that remains is less than one-third the diameter of the cut stem, the cut is considered a heading cut. Reduction cuts are used to reduce the length of a stem or branch. Heading cuts are not considered appropriate in most instances in the landscape.

[1] Professor, Environmental Horticulture Department, 1245 Fifield Hall, Gainesville, FL 32611

UNIVERSITY OF FLORIDA
Florida Cooperative Extension Service

Circular 1019
February 1994

Community Tree Care[1]

Edward F. Gilman[2]

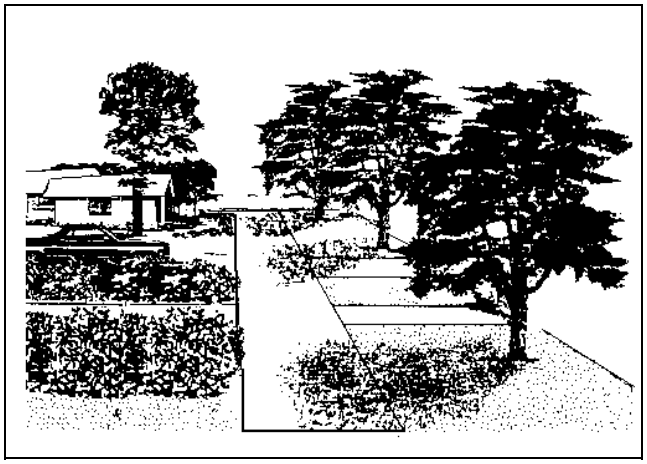


Figure 1. Trees need care in order to provide us with the benefits.

How many miles of roads does your community maintain? How many street and traffic lights are there? What is the condition of your community's bridges? The answers to such questions as these can usually be answered by the engineering department, but few communities know the condition of another part of the infrastructure - the trees! Trees are vital because they provide important benefits, and they can live to be very old. Fortunately, we are beginning to realize the value trees provide. See Figure 1.

Unlike trees in the rural forest, the trees in our communities need care to perform their function safely, particularly when they are young. Today, communities often hire urban foresters or arborists to direct the urban tree care program, but property owners, citizens, tree care firms and municipalities must act together as stewards of community trees.

MANAGE YOUR TREES WITH A PLAN

You can only manage a resource if you understand it. The best way to understand the trees is to take an inventory. A tree inventory and management plan will help determine the number, condition, age, potential planting spaces and other information about your trees. Without this information you will only be reacting to problems in the urban forest, not managing it. The trees under a crisis management system will suffer from lack of directed care and long range planning.

SELECT THE CORRECT TREES

Many communities have developed lists of trees best suited to the area. The Florida Division of Forestry and Cooperative Extension Service Offices located in each county also offer tree lists. Arborists agree, municipalities should strive for diversity of tree species throughout the city. An accepted rule recommends no more than 20 percent of the trees should be from the same genus (for example oak) and no more than, 10 percent from the same species (for example live oak). For instance, a disaster could result if say 60 percent of the trees in a city were live oak and a devastating insect or disease were to strike this particular species.

1. This document is Circular 1019, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: October 1991. Reviewed: February 1994.

2. Edward F. Gilman, associate professor, Environmental Horticulture Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

Table 1. A Selected List of Trees Suitable for Urban Areas in Florida*

North / Central Florida		South Florida	
Live Oak	Hornbeam	Tropical Almond	Jerusalem Thorn
Shumard Oak	Bald Cypress	Pongam	Bald Cypress
Southern Red Oak	Southern Red Cedar	Golden Raintree	Satin Leaf
Swamp Chestnut Oak	Red Buckeye	Silver Buttonwood	Canary Island Date Palm
Cabbage Palm	Hophornbeam	Green Buttonwood	Cabbage Palm
Soapberry	Sugarberry	Yellow Poinciana	Washington Palm
Sycamore	Blackgum	Queen's Crape Myrtle	Royal Palm
Swamp Tupelo	Formosan Sweetgum	Chinese Fan Palm	Pitch Apple
Dahoon Holly	Savannah Holly	Live Oak	Beauty Leaf
East Palatka Holly	Tree Ligustrum	Dahoon Holly	Sea Grape
Winged Elm	Canary Island Date Palm	Pink Tabebuia	Pigeon Plum
Florida Maple	Chinese Pistache	Mahogany	Gumbo Limbo
Southern Magnolia	Jerusalem Thorn	Calabash	Madagascar Olive
Chinese Elm		Tamarind	Wild Tamarind

* For a more complete list and for more information, contact your local Cooperative Extension Service Office or the Division of Forestry in your county.

Strive for diversity on a city-wide perspective; but do not plant a large variety of different trees on the same street. Instead, plant one section of the city (several blocks) with one species, and another with a different one. This allows the development of neighborhoods which will have an identity - the trees.

PLANT TREES IN THE RIGHT SPOT

Tree pruning around power lines costs several hundred dollars each year! To help reduce this cost plant only small maturing trees (less than 25 feet in height) below and within 25 feet of the line. Plant large maturing trees (greater than 25 feet in height) at least 25 feet (preferably 40 feet or more) from the lines. This will help keep utility bills in check and will provide more reliable electric service due to less tree interference with the lines.

Avoid planting large-maturing trees in areas less than 20 X 20 feet unless soil drainage is excellent. This small area will dwarf the tree so it will never reach its natural size, but it is much larger than what current standards provide. In a parking lot, trees grow much better when grouped together in several large planting islands than in numerous small islands distributed over the site. Allow at least 400 square feet of soil space for each tree.

TREE PLANTING MADE EASY

To allow for proper root growth into the landscape soil, the top of the root ball should be positioned even with or slightly above the soil surface, never deeper (Figure 2). There is no need to add organic matter or fertilizer to the backfill soil around the root ball. This addition will not help establishment unless the tree is planted in limestone rock, which is common in some areas of South Florida. Always spread a 3 inch thick layer of mulch over the root ball to conserve soil moisture and aid establishment.

WATER - THE BEST SOIL AMENDMENT

Irrigating recently installed trees is difficult, but essential. Many die or perform poorly from too little or too much water. To establish a tree in sandy, well-drained soil, about 3 gallons of water per inch of trunk diameter are needed almost daily in the first several months after planting. If soil drainage is poor, less is required. Trees larger than about 4 inches in diameter may benefit from nearly daily irrigation for up to a year to become established in well drained sand. Be careful not to overwater if your site is not well drained as is common in many urban areas. In these sites, cut back on the amount of water applied but don't change the frequency.

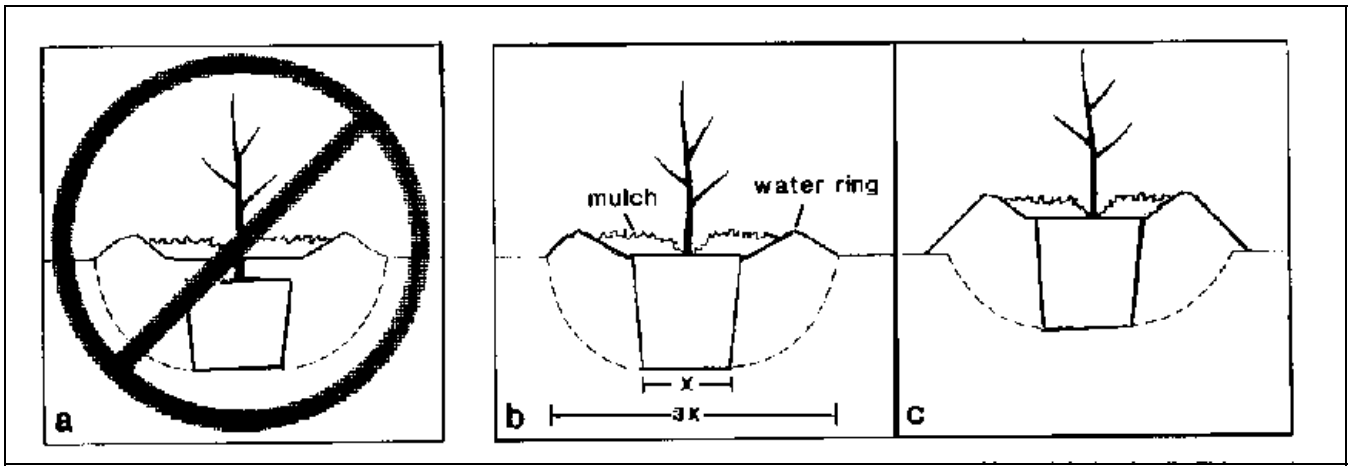


Figure 2. a) Never plant trees deeper than they were in the nursery. b) Plant even with the ground in well drained soil. c) In poorly drained or compacted soil, the top of the root ball should be slightly above the soil surface.

During droughts, established trees in restricted soil spaces (such as street trees) require more irrigation than those in open areas where root systems can develop their normal spread. Trees in these and many other urban situations are irrigated best with a micro-irrigation system which reduces runoff by applying water at a slow rate.

FERTILIZING

Fertilizer helps to maintain healthy trees. Fertilizing some urban trees can be difficult and best done by an arborist. It is best to spread fertilizer over the surface of the soil, but it can be injected 4 to 6 inches into the soil with specialized equipment. This technique helps reduce runoff on sloping ground and in compacted soils. Trunk injections and implants can be used to temporarily correct micronutrient deficiencies in trees which are over 4 inches in diameter if they do not respond satisfactorily to soil treatments.

Fortunately, fertilizing is usually not necessary for trees growing in or near lawns and adjacent to shrub beds treated regularly with fertilizer. This is because most of the tree's fine feeder roots are located near enough to the soil surface to utilize the fertilizer spread on the lawn and landscape beds. On the other hand, trees growing in confined soil spaces such as parking lot islands will benefit from a regular fertilization program.

Many trees respond well to a fertilizer containing nitrogen and potassium. At least 30 percent or preferably more of the nitrogen should be slow release. Palms and other trees may benefit from additions of iron and manganese. Fertilizer mixes that contain weed killers should be used sparingly, if at all, within the root zones of trees because the weed killer could harm the tree.

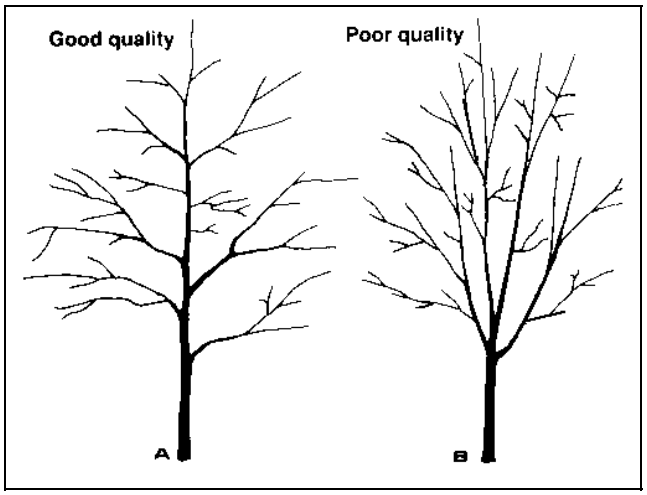


Figure 3. A) Shade trees should be trained to one central trunk. B) Large trees with several trunks (such as oaks) can become a hazard as they grow older.

Read and follow directions printed on the label before applying these products.

PRUNING

An important investment in urban tree care is in a systematic pruning program. The advantages include reduced costs each time the tree is trimmed, reduced service requests, improved safety and reduced liability, improved pest control and healthier trees. However, less than a third of cities in the southern United States prune trees.

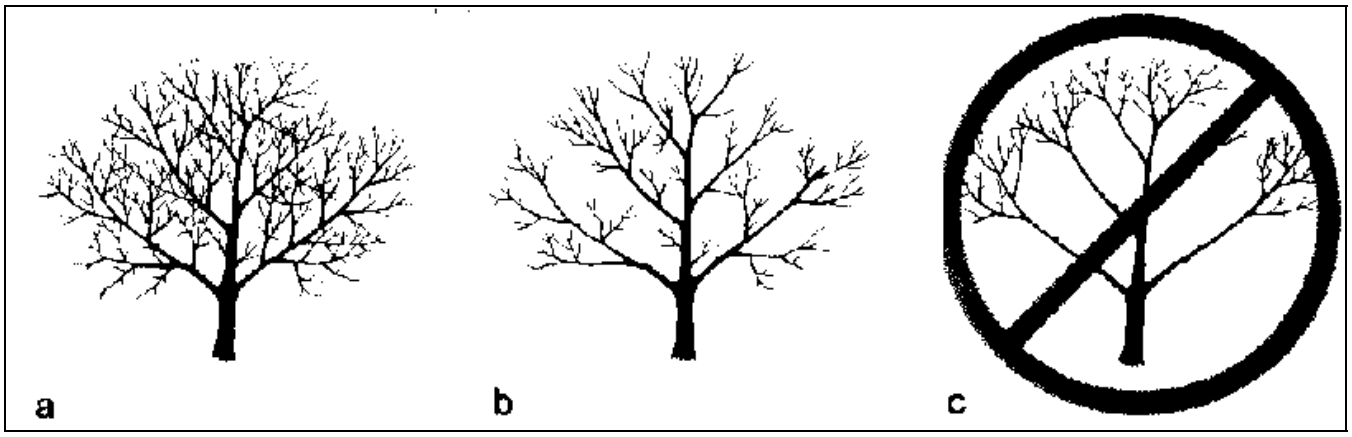


Figure 4. A) Trees benefit from regular thinning. B) Proper thinning reduces the length of some branches from all along the main branch. C) Improper thinning removes all interior branches.

Tree pruning is a special service which should be performed by professionals. City personnel often remove dead or dying trees, but safety and other forms of specialty pruning are best performed by a specialized crew, either in-house or contracted. Homeowners should only prune from the ground. Non-professionals should never climb a tree to prune because of the danger of falling or injury from pruning equipment.

How often - To prevent the need for pruning at planting, purchase quality shade trees. Trees should have one central trunk and branches spaced along the trunk, not clustered at one point (Figure 3). Prune 2 and 5 years after planting, then place trees on a 5 to 7-year pruning cycle.

Safety pruning - Remove immediately any broken or dead limbs. Have an arborist remove branches which are not well attached to the trunk. These potentially hazardous branches may not be apparent from the ground.

Preventing storm damage - Major storms taught us that trees which are properly and regularly pruned are damaged less in a storm than those not regularly pruned. A potentially damaging wind passes through trees which are thinned and trained to the appropriate structure, thus helping keep them intact in a storm (Figure 4).

Techniques - Never top a tree (Figure 6). Topping is the worst thing that you can do to a tree. Topping initiates decay in branches and makes the tree more dangerous than before it was pruned. It costs more in the long run, attracts insects, and is ugly. Topping does not help prevent damage during a storm.

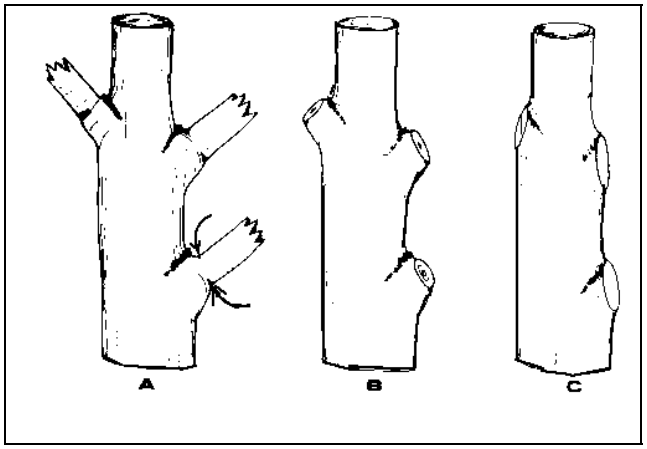


Figure 5. A) The arrows show where to remove the branch. B) Properly removed branches are cut just to the outside of the swollen collar at the base of the branch. C) Improperly pruned branches are cut flush with the trunk.

Pruning around power lines - Existing trees which were mistakenly planted under or those located close to lines can be directionally pruned to reduce the need for topping. Instead of simply removing the entire top of the tree which stimulates rapid regrowth, selected branches are removed to train the tree so it grows away from the lines. This can reduce future pruning requirements. This is a specialized technique requiring skill and training and should only be performed by properly trained professionals.

The method of branch removal has a large impact on tree health. Never remove a branch with a flush cut (Figure 5); instead, use a collar cut. The trunk is likely to decay or crack following a flush cut, making the tree unsafe.

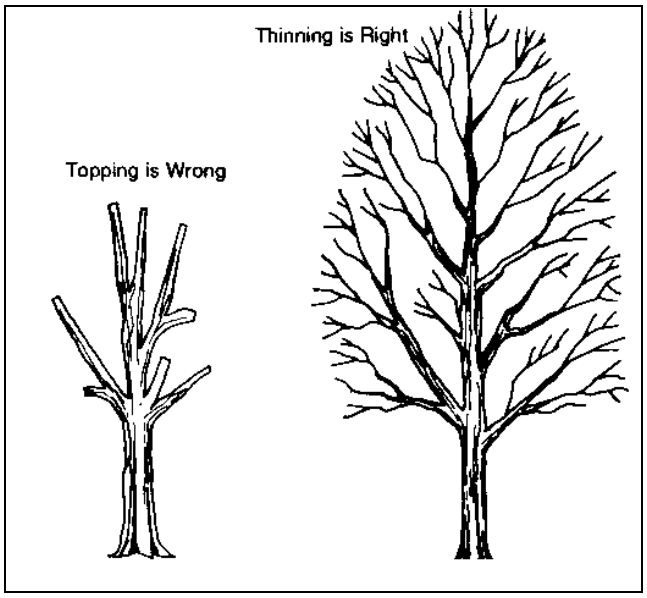


Figure 6. Never top a tree. Prune it to retain the natural shape.

MONITORING FOR INSECTS AND DISEASES

Generally, a well-cared-for tree will not succumb to lethal insect or disease problems. However, some insects and diseases (such as borers and hypoxylon canker) can be deadly to trees, especially if trees are under stress from another problem. Have a professional arborist or forester check the trees regularly as part of a preventive maintenance program to help keep these and other pests from becoming problems. As with people, the best way to ensure continued health is with preventive maintenance.

CONSTRUCTION AND TREES

Perceptions about tree roots are quite different from reality. Trees growing in urban areas seldom develop tap roots. In fact most roots are located within the top 12 inches of soil because this is where aeration, nutrients and moisture are abundant. The feeder roots grow just below the surface of the soil or mulch, or among the lawn and shrub roots. About 50 percent of the tree root system grows beyond the canopy, and the tips of the roots are three times as far from the trunk as the canopy (Figure 7). Construct a fence around the tree at the edge of the canopy (dripline) to reduce root damage during construction.

Due to the extent and shallowness of the roots, much of the root system is frequently removed from existing trees during construction of a home or other building. This causes decline and tree death in the years following construction. The best treatment for trees damaged by construction is irrigation. Heavy fertilizing may make the problem worse by forcing undesirable top growth, which cannot be supported by the reduced root system.

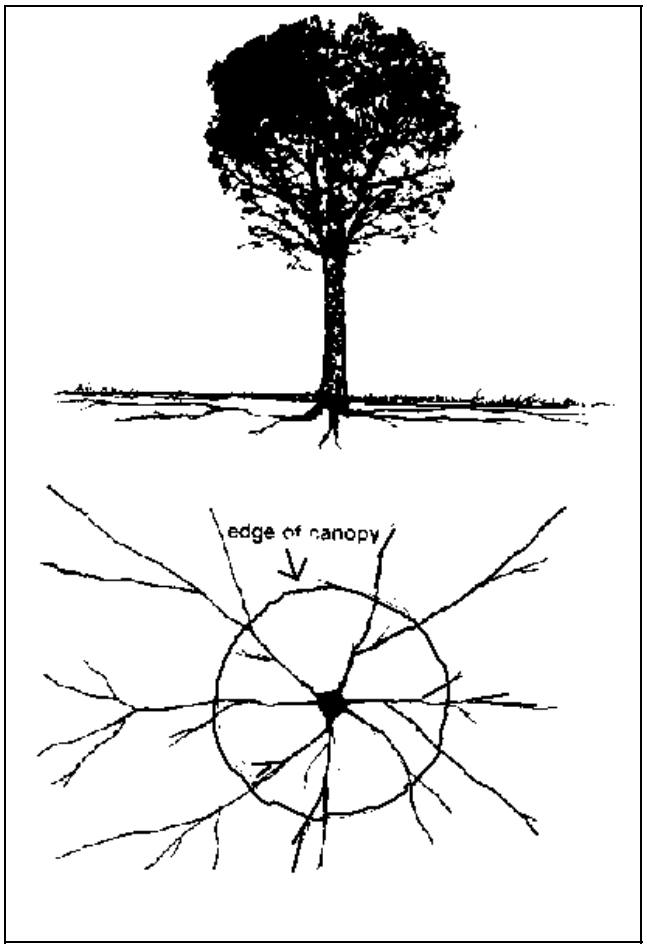


Figure 7. Roots spread to three times the edge of the canopy. Trees often decline following construction of a building because a large mass of roots was damaged.

HOW TO HIRE AN ARBORIST

Arborists make a career of caring for trees. Here are several tips for selecting an arborist:

- Avoid arborists who routinely top trees.
- Have more than one arborist look at the job, and get a written bid specifying work to be done. Ask for and check local references.
- Beware of an arborist who wants to remove a living tree. Removal of live trees is sometimes needed, but should be the last resort.

- Determine if the arborist is a member of the International Society of Arboriculture or the National Arborist Association. Membership does not guarantee quality, but lack of membership casts doubt on the person's professionalism.

- Ask for certification of personal and property liability insurance and workman's compensation. Then phone the insurance company to make certain the policy is current.

- Low price is a poor gauge of a quality arborist. Often, the better ones are more expensive because of more specialized equipment, more professional help and insurance costs.

ADDITIONAL RESOURCES

These resources are available at your local cooperative extension service office:

- Landscape Plant Selector - CDROM computer program
- Landscape Design Selector - CDROM computer program
- SS-ORH-903 - *Dispelling misconceptions about trees*
- Circular 853 - *Pruning landscape trees and shrubs*
- SS-ORH-905 - *Tree training and pruning*
- SS-SOS-909 - *Soil pH and landscape plants*
- Circular 489 - *A guide to selecting existing vegetation for low energy landscapes*
- Circular 948 - *Fertilizer recommendations for trees and shrubs in home and commercial landscapes*
- SS-ORH-02 - *Palm nutrition guide*
- SP 51 - *Florida insect control guide*
- SP 52 - *Florida disease control guide*
- Circular 922 - *Florida Guide to Environmental Landscapes*

TREE PURCHASE AND PLANTING GUIDELINES

UNIVERSITY OF FLORIDA
EXTENSION
Institute of Food and Agricultural Sciences

ENH856

Specifications for Planting Trees and Shrubs in the Southeastern U.S.[1]

Edward F. Gilman[2]

Digging the Hole

Before digging the hole in well drained soil:

1) Locate the point where the topmost root emerges from the trunk (it should be within the top 2 inches of the ball), and

2) Measure the distance between the topmost root and the bottom of the root ball. Dig the hole about 10% less than this distance and as wide as possible (at least 1.5 times the width of the ball). Remove excess soil to ensure that the topmost root is no more than 2 inches below the surface. Sever circling roots where appropriate. The root ball should be positioned in the hole so the finished grade of the landscape soil is even with or slightly lower than the point where the topmost root emerges from the trunk (Figure 1 and Figure 2). Then apply soil or mulch so it covers the sides of the root ball.

Be sure that when you are finished planting, there is *no landscape soil* and little or no mulch placed on top of the root ball. Landscape soil (as well as thick mulch layers more than 1 or 2 inches deep) spread over the root ball can prevent water and air from entering the root ball. When finished planting, the point where the topmost root in the root ball originates from the trunk should be within the top two inches of the root ball. The trunk flare might be visible on some trees depending on age and tree type. **In poorly drained soil**, position the top of the root ball 10% or more above the surrounding landscape soil.

Tip: Never place any soil over the root ball.

Fertilization

Slow-release (or controlled-release) fertilizer can be applied on top of the root ball and backfill soil or on top of the mulch at planting. There is no need to mix it with the backfill soil or place it at the bottom of the planting hole because most roots end up close to the soil surface in urban and suburban landscapes. Under most circumstances, mulch will not steal the fertilizer from the tree. Adding slow-release fertilizer at planting has not been associated with either improved survival or increased growth after planting. It will not hurt the plant provided it is applied according to the directions on the product. On the other hand, adding soluble fertilizer to a newly installed plant could burn roots if too much is applied. This will injure the plant and could kill it. Any

1. This document is ENH856, one of a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date March 12, 2002. Revised July 2, 2003. Visit the EDIS Web Site at http://edis.ifas.ufl.edu.

2. Edward F. Gilman, Professor, Environmental Horticulture, University of Florida, Gainesville, FL 32611

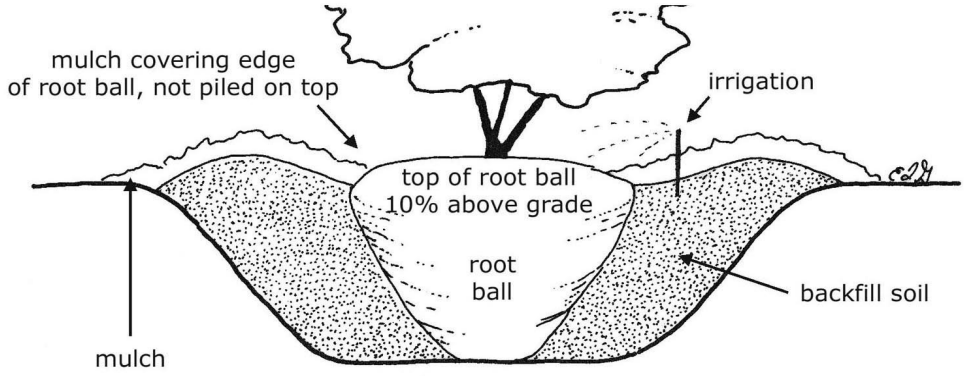


Figure 1. The root ball should be positioned in the hole so that the finished grade of the backfill soil and landscape soil is lower than the top of the root ball

nitrogen source can be applied to established trees with about the same effect.

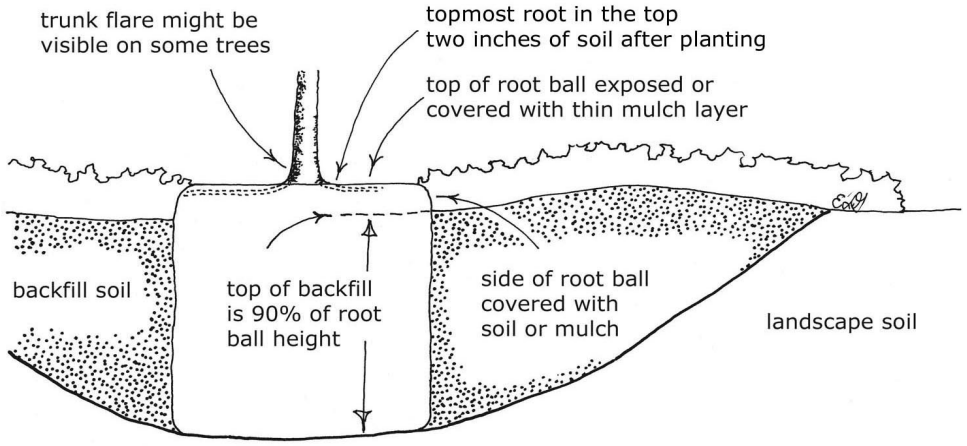


Figure 2. Apply a 3-inch-thick layer of mulch around the plant to help discourage weeds. Apply only a thin layer over the root ball.

Mulching

Weed and turf suppression during establishment is essential. Apply a 3-inch-thick layer of mulch around the plant to help discourage weeds (Figure 2). An area 2 feet in diameter for each inch of tree trunk diameter (minimum diameter should be 8 feet for trees with a trunk diameter less than 3 inches) should be maintained during the establishment period. If you wish to place mulch over the root ball, apply only a thin layer over the outer half of the root ball. This keeps the trunk dry and allows rainwater, irrigation, and air to easily enter the root ball. Mulch resting on the trunk or layered too thick can kill the plant by starving it of oxygen, killing the bark, causing stem and root decay, preventing hardening off, encouraging rodent damage to the trunk, keeping soil too wet, and repelling water. Mulch on the root ball has little impact on water lost from the tree since most of the moisture that leaves the root ball does so by transpiration, not evaporation. Only a small amount (< 10%) leaves the root ball by evaporation from the surface of the root ball.

Staking

In many instances, if root balls are heavy enough, stakes are not necessary. Stake to stabilize the root ball (Figures 3, 4 and 5). Many field-grown trees do not need staking because their root balls are heavy enough to stabilize the tree in the ground. Some container-grown trees will require staking in

open areas because root balls are much lighter in weight.

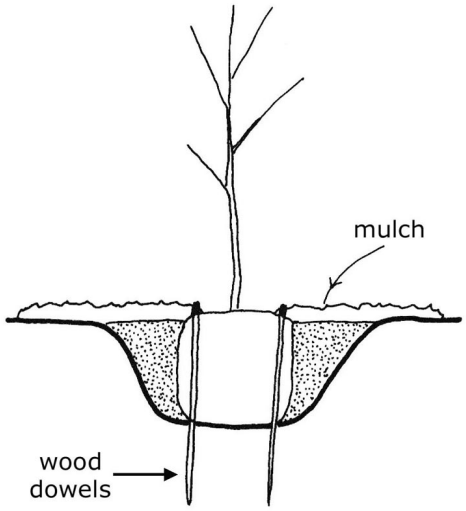


Figure 3. Two or three (2 shown) wood dowels driven through edge of root ball. These do not have to be removed because they simply rot in place. There is no danger of this system girdling the trunk since nothing is attached to the trunk.

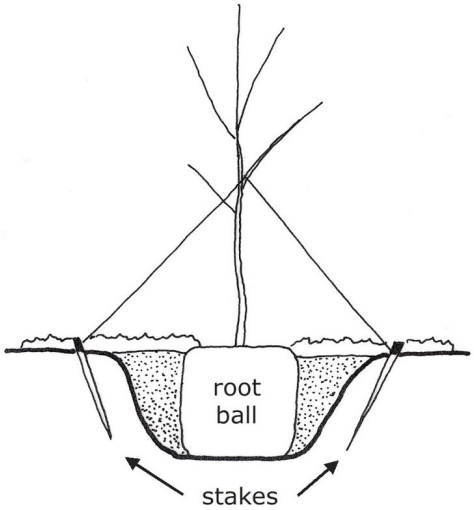


Figure 4. Traditional staking could girdle the trunk.

Establishment

Trees and shrubs provided with regular irrigation through the first growing season after transplanting require about 3 months (hardiness zones 9-11) to 6 months (zones 7-8), per inch of trunk diameter to fully establish roots in the landscape soil. Plants that are under-irrigated during this establishment period often require additional time to establish because roots grow more slowly. Most trees are

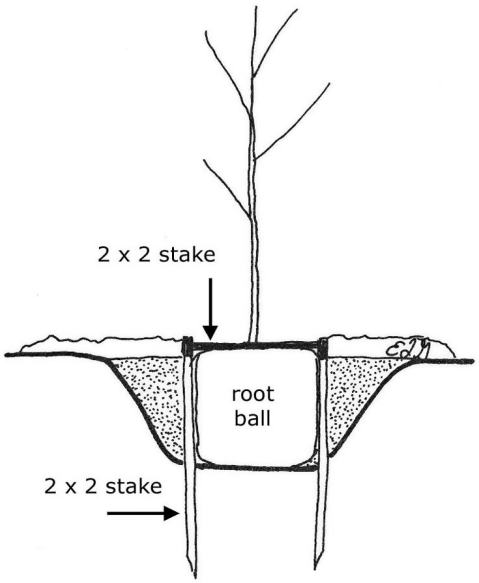


Figure 5. One horizontal 2-inch x 2-inch stake screwed to two vertical 2 x 2s against the side of the root ball. A second set is used on the other side for larger trees if needed.

under-irrigated during the establishment period. Because roots are not fully established, be prepared to irrigate through the entire establishment period, especially in drought.

Irrigation

Unlike established plants, research clearly shows that recently transplanted trees and shrubs establish most quickly with light, frequent irrigation. For trees planted in spring or summer, provide two (cooler hardiness zones) to three irrigations (warmer hardiness zones) each week during the first few months after planting (Table 1). Daily irrigation in the warmest hardiness zones provides the quickest establishment. Following the initial few months of frequent irrigation, provide weekly irrigation until plants are fully established. At each irrigation, apply about 2 to 3 gallons of water per inch of trunk diameter (e.g. 4-6 gallons for a 2-inch tree) over the root ball. There is no need to wet the soil outside the root ball in most instances in the eastern U.S. where rainfall is plentiful. There may be a benefit to wetting soil outside the root ball in drier climates. Never add irrigation if the root ball is saturated.

Table 1. Irrigation Scheduling for Recently Planted Trees

Size of Nursery Stock	Irrigation Schedule for Vigor [1,3]	Irrigation Schedule for Survival [2,3,4]
< 2 inch caliper	Daily for 2 weeks; every other day for 2 months; weekly until established.	Twice weekly for 2-3 months
2-4 inch caliper	Daily for 1 month; every other day for 3 months; weekly until established.	Twice weekly for 3-4 months
> 4 inch caliper	Daily for 6 weeks; every other day for 5 months; weekly until established.	Twice weekly for 4-5 months

[1] Delete daily irrigation when planting in winter. Irrigation frequency can be reduced slightly (e.g. two to three times each week instead of every other day) when planting hardened-off, field-grown trees that were root-pruned during production. Establishment takes three (hardiness zones 10-11) to four (hardiness zones 8-9) months per inch trunk caliper.

[2] Irrigation frequency can be reduced slightly (e.g. to once or twice each week) when planting hardened-off, field-grown trees that were root-pruned during production.

[3] At each irrigation, apply 2 to 3 gallons per inch trunk caliper to the root ball. Ensure that all water soaks into the root ball. Do not water if root ball is wet/saturated on the irrigation day.

[4] Trees take much longer to establish than 3 to 4 months per inch trunk caliper when under-irrigated. Be prepared to irrigate the following summer.

UNIVERSITY OF FLORIDA
Florida Cooperative Extension Service

Circular 858
February 1991

Selecting and Planting Trees and Shrubs[1]

D. L. Ingram, R. J. Black and E. F. Gilman[2]

Success of landscape plantings depends upon an orderly process of site analysis, plant selection, site preparation, planting procedures and post-planting care. Plantings properly incorporated into an overall design create a landscape that is beautiful and functional.

SITE ANALYSIS

The long term value of a landscape plant depends on how well it performs in the planting site. Therefore, the first step in selecting plants for a landscape planting is to conduct a site analysis. Site analyses consist of studying planting site characteristics such as amount of sun or shade, salt spray, exposure, water drainage, soil type and pH. These characteristics will most likely differ between areas on the same property. For example, the area on one side of a house may have significantly different light conditions than an area on the other side.

Light characteristics of a planting site can vary from direct sun all day to dense shade. The amount of light affects rate of photosynthesis, plant water loss, growth, and ability of plants to tolerate dry soils and winds. Most plants grown in shade require less irrigation than plants grown in full sun. Ornamental plants can be selected which will grow in almost any sun or shade level around the home. Contact your County Cooperative Extension Office or a local bookstore for publications regarding the suitability of specific landscape plants for various microclimates.

Saline irrigation water and/or salt spray limits the number of plants suitable for that particular site. Plant tolerance of salt water and salt spray is of particular concern to people living in Florida's coastal areas. Plants should be selected that are well-adapted to soils and exposures of coastal areas.

There are usually several microclimates on a property, particularly where temperature is concerned. Therefore, the average minimum and maximum temperature of specific areas of the property should be measured or estimated. Generally, the minimum winter temperatures occur on the northern side of the house. Southern exposures will be the warmest during the winter but there can be dramatic temperature fluctuation during a given day on the south side of a house that may predispose plants to winter damage. Western exposures will be the hottest during summer months. The amount and type of existing vegetation and architectural features such as arbors and roof overhangs will modify these stated generalities. For example, plants protected by tree canopies are less subject to cold injury than those in exposed locations because tree canopies reduce radiant heat loss from these plants. Shade during early morning slows the rate of thaw and can reduce the amount of cold damage in some species.

1. This document is Circular 858, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. This information supports Environmental Landscape Management, i.e., landscape design and management for environmental horticulture. First published: June 1990. Reviewed: February 1991.

2. Dewayne L. Ingram, former extension horticulturist and professor; Robert J. Black, consumer horticulturalist and associate professor; Edward F. Gilman, assistant professor, Environmental Horticulture Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

The surface and subsurface drainage of areas on the site must be determined. Poor soil drainage may cause roots of some plants to rot while other plants adapt to wet areas. However, even plants recommended for wet areas which are produced in containers or in a well-drained nursery soil may not be able to adapt quickly enough to survive on the site. If a surface drainage problem exits, possible solutions should be considered. Consider adding gutters to the house to direct water flow. Another solution is to correct the drainage problem in the landscape before planting by altering surface or subsurface drainage patterns with tiles, proper grading, or other methods. The feasibility of this solution must be determined as part of the site analysis. For example, determine the options for where runoff water should be directed if surface drainage modifications are necessary to direct water away from the foundation of a house. If this is not possible, planting plants in soil mounded above the water table has been successful in some areas.

A thorough site analysis will include determination of soil pH, type, and compaction. A landscape site may contain several different soil types with fill soils provided to various depths throughout the site. In some cases, samples of the different soil types should be taken and sent to a professional soil testing laboratory for analysis. Soil pH in the range of 5.5 to 6.5 is best for most plants, but some plants can grow on more alkaline or more acidic sites. Compacted soil is a common characteristic of a new building site. Take note of areas where heavy equipment and high traffic volume may have compacted the soil. Soil compaction reduces aeration and water penetration which present problems for plant establishment. It may be possible to loosen the soil by plowing or rototilling, but generally these practices are effective to a depth of one foot or less. Such cultivation around large trees and shrubs may damage the root system, because most of the actively absorbing roots are located in the surface one foot of soil. Amending or changing soil conditions to suit a particular type of plant may be temporary and costly.

PLANT SELECTION

Plants should be selected that are suited to the environmental conditions on the site that were determined during the site analysis. Good landscape design requires that plants be used to serve a particular function(s). Plants should reduce cooling and heating costs and improve the appearance or usefulness of the home grounds. They should be selected and positioned for specific functions such as to provide a transition between the structure and the landscape, a screen for privacy, shade for comfort, or direct traffic flow onto and within the property. Select plants that will not out-grow the allotted space. Even though smaller cultivars of landscape plants may require more time to reach the desirable size, they will not have to be pruned as frequently and are less likely to need replacing in a few years.

Landscapers and gardeners often select plants with unusual colors or growth habit. A limited number of such plants can be used effectively in the landscape, but their location must be skillfully planned. Trees should be selected for shade or used to accent an area.

Unfortunately, few plants in retail outlets are tagged according to grades and standards as established by the Florida Division of Plant Industry. A plant graded as a Florida Fancy is a healthy and vigorous plant that is well shaped, densely branched, and densely foliated. A Florida No. 1 grade is a healthy vigorous plant that is well shaped, branched and foliated. The Florida No. 2 is healthy, vigorous, and fairly well shaped, with fair branching and foliage density. Any plant not meeting the above standards is a Florida No. 3. Plants graded as No. 2 or No. 3 may not grow as well after planting as one of higher quality. However, in most cases the grades are not indicated on plants in retail nurseries and the customer must be able to discern plant quality.

Plants should be inspected closely. Do not purchase plants with an unhealthy appearance or with weak, poorly formed, scarred, or cracked trunks or branches. Do not purchase trees with main double leaders or with branches clustered together on the trunk. Poorly distributed branches on the main stem usually result in weak or leggy plants that should be avoided. Leaves of abnormal size or with excessive yellowing are an indication of a plant health problem. Plants should be examined for insects, diseases, and mechanical damage.

The root system of a container-grown plant should be well established so that the root ball stays intact when the container is removed; however, the plant should not be root-bound. Root-bound plants have a mass of roots circling near the outside surface of the container medium and may present difficulty in establishment in the landscape. Roots should be distributed throughout the container medium and not protruding outside the container or penetrating into the ground. The root ball of balled and burlapped

trees and shrubs should be moist with the soil firmly held around the roots. Root balls greater that 18 to 24 inches in diameter should be secured by a wire basket if the plant was harvested from a sand soil. A broken or cracked root ball indicates the plant received rough treatment during shipping and may result in poor establishment and growth of the plant in the landscape.

A relatively new method of producing plants in field nurseries involves planting them in a fabric bag-like container that restricts root development outside the fabric. Generally, only small fibrous roots grow outside this fabric container and large structural roots are confined to the soil within the container. Plants field-grown in fabric containers must be harvested at the proper stage of development. They should have adequate roots in the fabric container to hold the soil together during transport and planting, yet the canopy size should not be greater than can be supported by the limited root system.

The cultural and environmental conditions at the retail nursery are also important. Plants that are placed in an unshaded area for even one afternoon during summer months may have received substantial root injury due to heat stress caused by direct solar radiation on container walls. Dark brown roots can often be found on the outside of the root ball on the side receiving the direct exposure. Such injury will reduce the odds of achieving satisfactory growth and quality in the landscape. Holding plants in areas with 30 to 50 percent shade will reduce or eliminate heat stress to plant roots. Also, spacing plants close enough to provide mutual shading without injuring branches or leaves will reduce heat stress to plant roots. Plants on the outside edge of the block will not be protected from one direction and may still be injured. Stems and roots of plants unprotected from cold or freezing temperatures may be damaged. Cold injury to roots and stems may not be obvious until the plant is stressed by warmer weather in the spring. Therefore, roots and stems of plants should be inspected closely for signs of root injury or bark splitting.

SITE PREPARATION

Proper site preparation may include grading, dealing with soil compaction, and managing runoff water from the roof with gutters and connecting pipe. The first operation in preparing a planting site is to grade the soil to achieve the desired land form. Adequate surface drainage that directs water flow away from structures and into the appropriate path of water movement for the area must be achieved at this stage.

Soils may be modified somewhat by the incorporation of amendments before planting. In some special cases the soil in a small area may be replaced with a suitable top soil. However, this can be extremely costly and must be reserved for those cases where the existing soil is unsuitable for plants because of some chemical residue or excessive compaction. Soils can be amended to adjust the soil (pH), add nutrient elements, increase organic matter content, and alter soil drainage and aeration.

Soil pH has an important influence on nutrients available for plant uptake and influences soil organisms, and availability of toxic elements. Florida soils that are well outside the desired pH range of 5.0 to 6.5 may need to be amended with lime to raise the pH, or with elemental sulfur to lower the pH. A lime requirement soil test is recommended to determine the amount of lime needed for raising soil pH. When soil pH is high because of naturally-occurring lime (like limestone, marl or sea shells), there is no practical way of lowering the soil pH. There simply is too much lime present to neutralize. However, where accidental overliming has occurred (such as where concrete or mortar were spilled or dumped during construction), soil pH can usually be lowered. Use elemental sulfur (yellow color) incorporated before planting. Approximately 1 to 4 pounds of wettable sulfur per 100 sq. ft. (0.5 to 2.0 kg/10 sq. meters) is required to lower the pH one unit in the first 6 to 8 inches (15 to 20 cm) of soil. Generally, the more organic matter and/or silt and clay content of the soil, the more sulfur that is required to adjust the pH. Not more than 1 pound per 100 square feet (488 grams per 10 sq. meters) should be applied at one time. Sulfur should not be reapplied for 4 months. Sulfur oxidizes to form sulfuric acid when added to soils and should be used with caution.

Normally, calcitic limestone or dolomitic limestone that contains calcium carbonate as well as magnesium carbonate is used to increase soil pH. This change may be slow and short-lived in highly buffered soils. Ground limestone is recommended over hydrated lime because it is less likely to "burn" plants. The greater the organic matter or clay content of a soil, the more lime that is required to change the pH. Generally, 3 to 4 pounds of limestone per 100 sq. ft. (1.5 to 2.0 kg/10 sq. meters) is required to raise the pH of a sand soil to a depth of 6 to 8 inches (15

to 20 cm) one unit. A sandy soil with moderate to high organic matter content (2 to 4%) may require as much as 7 to 8 pounds per 100 sq. ft. (2.4 to 2.9 kg/10 sq. meters).

The level of nutrients and carbohydrate reserve in a woody landscape plant is important to that plant's ability to extend roots into the landscape soil. A low nutrient status in plants generally can not be overcome by application of fertilizers at planting. Therefore, purchasing vigorous, healthy plants is the way to ensure rapid root extension into the landscape soil.

Several of the essential nutrients, especially nitrogen and potassium, readily leach from Florida's sandy soils. Therefore, a general broadcast application of fertilizer at transplanting is not recommended because it will be several weeks to months before roots will grow into the landscape soils to absorb applied nutrients. Proper irrigation is much more important to plant establishment than applications of fertilizers at the time of planting. Soluble fertilizers incorporated or surface applied are leached from the soil in a few weeks. Therefore, soluble fertilizers applied to the general area at transplanting is an inefficient means of increasing the nutrient status of plants. If a fertilizer is added at the time of planting, make it a light application of a slow-release fertilizer to deliver nutrients over an extended period. Optimally, fertilizer application would begin a few months after planting.

Micronutrients are essential nutrients that are required in relatively small quantities and do not readily leach from soils. Most Florida soils are not deficient of micronutrients. Micronutrient deficiencies are generally related to lack of chemical availability of these nutrients in the soil or the inability of plants to absorb the nutrients. Soil micronutrient content can be determined by special soil test procedures but this is seldom necessary. Materials containing these elements individually can be purchased but formulations containing many micronutrients are more convenient. Fertilizers containing macronutrients as well as micronutrients are probably the most convenient method for home gardeners to apply micronutrients, but repeated use of fertilizers containing micronutrients could result in a build-up of some elements to toxic levels over time. Read and follow fertilizer label recommendations.

Most Florida soils are extremely low in organic matter content. The notable exception is muck soils in central Florida. It is extremely difficult to increase the organic matter of sand soils because of the high rate of organic matter decomposition due to the consistently high soil temperatures. A one-time application of organic matter such as peat, composed leaves, or pine bark will have little lasting effect on soil organic matter content. A short-lived increase in waterholding capacity of sand soils can be achieved by incorporation of organic matter, but the relative size of this increase would seldom warrant the practice.

Many Florida soils have sufficient drainage and aeration that incorporation of organic matter or other materials of relative large particle size in the planting zone is usually not justified. Most drainage problems in Florida soils can not be appreciably modified by amending the surface layer of soil. Drainage tiles, deep excavation, or land form changes are the primary methods of alleviating subsurface drainage problems caused by soil conditions such as an impermeable hard pan or layer of soil.

PLANTING PROCEDURES

Container-Grown Plants

Container-grown plants are readily available in Florida and can be planted anytime of the year provided proper soil moisture levels are maintained. Plants grown in containers too long become root bound and should be avoided. This condition is difficult to overcome. Although cutting or breaking up the root mass during planting has been recommended in the past, there is no strong scientific evidence to support the benefit of this practice. The best recommendation is not to invest your money and effort in a root-bound plant.

A common procedure for transplanting container-grown plants involves amending the backfill around the root ball with an organic material such as peat. However, a significant amount of research over a range of irrigation schedules, plant materials, and soil types provides no evidence that this practice is beneficial. In fact, incidences where roots remain in the amended backfill soil and do not grow into the undisturbed field soil have been reported. The argument for amending backfill soils centers around the fact that peat increases the waterholding capacity of a sand soil. What actually happens is the water in the adjacent landscape soil is held at greater tensions than the water in the amended backfill. The result is

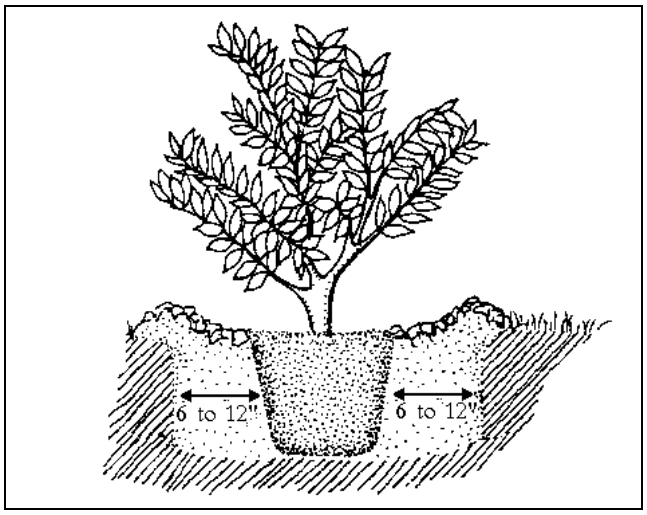


Figure 1. Planting container grown plants.

a drying container root ball as water moves from the container medium and the amended soil into the adjacent landscape soil as it dries.

The following are guidelines for installing container-grown plants (Figure 1).

1. In loose soils, dig the planting hole 1 foot (30.4 cm) wider and as deep as the container is tall. In some cases where the soil is hard or compacted, it may be advisable to dig a planting hole 3 times wider than the container and half as deep. Then mound the soil to cover the sides of the root ball. A plant installed in this manner might require more frequent irrigation during dry periods, but is not likely to suffer from subsurface drainage problems. Another possible solution for subsurface drainage problems is to dig a small diameter hole in the bottom of the planting hole to penetrate the compacted layer and allow water percolation. Most shrubs and trees normally develop shallow root systems and the wider planting hole can make a significant difference in the rate of establishment in hard or compacted soils.

2. Gently place the plant straight in the hole and be sure the top of the root ball is no deeper that the existing landscape soil surface. In areas of compacted or poorly drained soils, the top of the root ball may be positioned slightly above the soil surface to provide an adequate volume of well-drained soil for root development. Fill around the ball with soil and gently firm the soil. Do not pack the soil. Water thoroughly while planting to remove air pockets.

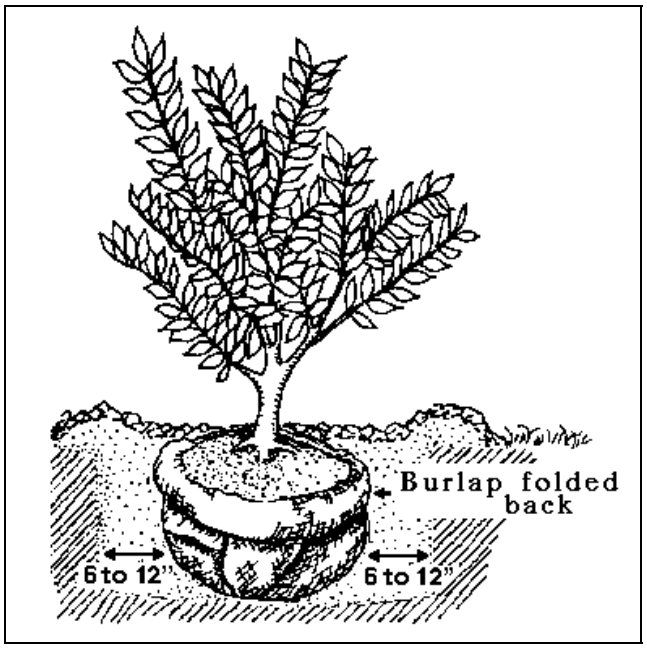


Figure 2. Planting balled and burlapped plants.

3. Do not mound soil over the roots but form a saucer-like catchment basin around the edge of the root ball with a soil ridge 3 to 6 inches (10.2 to 15.2 cm) high to facilitate watering.

4. Mulch with 3- to 4-inch (7.6 to 10.2 cm) layer of organic material to buffer soil temperature, reduce weed competition, and conserve moisture. Be sure to keep the mulch layer approximately 3 inches (10.2 cm) away from the plant stem.

Balled and Burlapped Plants

Planting procedures for balled and burlapped plants are similar to those for planting container-grown plants (Figure 2). Always move balled and burlapped plants by the root ball only. Never use the trunk as a handle to pick up or move these plants. Care should be taken not to disturb the root ball, as this would severely damage the root system. Removal of all the burlap before planting is not necessary, although the top one-third of the burlap should be pulled back from the stem as shown in Figure 2. Removal of woven plastic wraps completely after setting the plant in the hole is recommended. Nondegradable, woven plastic fabrics can girdle roots as they expand through the material. However, this practice may not be feasible when moving large trees that have been sleeved in woven plastic materials before being placed in wire baskets. Slice the material through the wire basket to facilitate healthy root growth into the landscape soil. Always remove nylon twine tied around the plant stem. Nylon twine

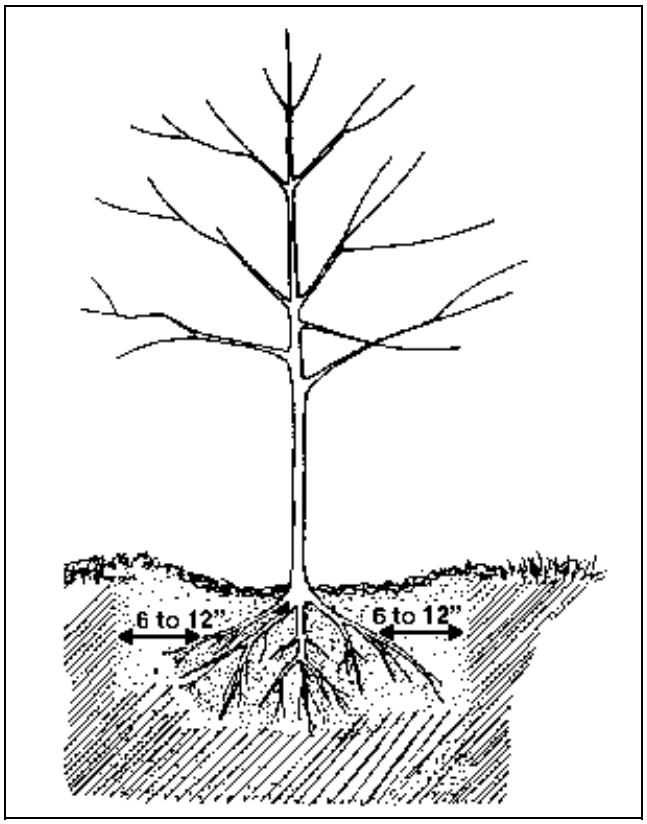


Figure 3. Planting bare root plants.

does not rot and will eventually girdle the stem if left in place.

Most balled and burlapped trees and shrubs are best harvested and transplanted during the cooler months. Plants harvested at other times must be given extra care and acclimated in a holding area before transporting to the retail nursery or landscape site. Trees and shrubs may be harvested during the cooler months and held for planting during the hotter, more stressful periods of the year.

Generally, procedures for planting balled and burlapped shrubs and trees are suitable for palms. Palms should be harvested with a root ball appropriate for the size and species of palm. Although a 2 foot (61 cm) diameter root ball would be adequate for a palm 3 to 6 feet (91 to 182 cm) in height, a root ball of 4 to 5 feet (122 to 152 cm) in diameter is recommended for larger palms. In the past, it has generally been thought that if you damage or cut a palm root, the remaining attached portion of the root would die back to the trunk where new roots would be initiated.

Research has revealed that this characteristic varies with the palm species. This root dieback is apparently true in the cabbage palm (*Sabal palmetto*); however, coconut palm (*Cocos nucifera* 'Malayan Dwarf') cut roots do not die back, but regenerate new roots near the cuts. Queen palms (*Arecastrum romanzoffianum*) and royal palms (*Roystonia regia*) often regenerate new root tips if the roots are cut 2 to 3 feet (61 to 91 cm) from the trunk. The majority of roots die back to the trunk on smaller root balls. Coconut, queen and royal palms are transplanted most successfully when a large root ball is harvested. Although cabbage palms can be transplanted successfully with relatively small root balls, root pruning 6 to 8 weeks before transplanting decreases transplant shock and increases survival. Root pruning allows time for new root initials to develop near the trunk. Palms transplanted with small root balls require a higher irrigation frequency after planting than those moved with a larger root ball.

It is important that root balls should not be allowed to dry during transport and holding. Palms should be planted during the warm rainy months for optimum success because root growth is stimulated by moist warm soils. They should be planted at the same depth as they grew in the nursery and watered frequently when planted in well-drained soils. Planting palms deeper than they were grown in the nursery reduces survival and subsequent growth.

Bare-root Plants

Few bare-root plants are installed in Florida landscapes. Bare-root materials are generally available only during late fall, winter, and early spring and should only be planted at these times (Figure 3).

Follow these steps when planting bare-root plants:

1. Protect plant roots from drying. Keep roots moist and plants in shade prior to planting.

2. Dig a hole 1 foot (30.4 cm) wider than the root spread and about the same depth as the root system. As with container-grown plants, disturbing the soil to a greater depth than the root system may be advisable if the compacted soil layer can be penetrated. Generally, a wide hole that provides ample room to spread the roots out in the hole is more important than digging a deep hole. Roots crowded into a small hole will restrict plant growth.

3. Inspect the root system and cut off roots broken or damaged.

4. Make a shallow, rounded mound of soil in the bottom of the planting hole. Place the plant on the mound and spread the roots to their natural, nearly horizontal position. Set the plant upright and at the same depth it was grown in the nursery.

5. Hold the plant upright and fill the hole half to two-thirds full of soil. Work the soil around the roots to eliminate air pockets.

6. Settle the soil around the roots with water before filling the remainder of the hole. Compacting the soil around the roots with your foot could damage the root system.

7. Form a saucer-like catchment basin around the edge of the planting hole to aid in watering.

Plants Field-Grown in Fabric Containers

Plants that have been grown in field soils using a fabric container or bag as described previously should be handled similarly to balled and burlapped plants. **The fabric container *must be removed* before planting.** The most common means of removing the fabric is by making approximately 4 equally-spaced cuts down the side of the container. The fabric may then be gently pulled away from roots that have grown into the fabric or in some cases the root may have to be cut on the inside of the fabric. Do not shake soil from the root mass while removing the fabric. Trees and large shrubs harvested from this production system almost always have to be staked when planted in the landscape.

Transplanting Established Plants

Nursery-grown plants are preferred over plants collected from the wild. Nursery plants have a more compact and well-distributed root systems due to routine root pruning, spacing, and cultivation. However, it is sometimes necessary to move plants that are established in the landscape because of construction, landscape renovation, or lack of plant availability.

The success of moving established plants can be improved by root pruning. Proper root pruning encourages development of a compact, fibrous root system and may reduce shock and increase the portion of root system harvested when the plant is moved.- Schedule root pruning and subsequent transplanting when shoots are not elongating. Plants moved from their native environment or within the home landscape can be root pruned 10 to 12 weeks prior to moving, provided irrigation can be supplied after pruning. Do not root prune if irrigation can not be provided since root regeneration after pruning is largely governed by available soil moisture. Early spring is often the best time to root prune because roots generally grow best during this season. Only half the root system should be pruned if the plant is in an exposed location in danger of blowing over in a strong wind. Plants should be root pruned with a sharp spade to minimize injury behind the cut. Roots should be cut in a circular pattern around the plant stem. Generally, cut the roots 3 inches (7.5 cm) inside the area to be the root ball when moved.

Heavy pruning of shoots of transplanted trees and shrubs to compensate for loss of a portion of the root system has proven to be unnecessary and in some cases detrimental. Prune only to obtain the desired shape. Loss of foliage through pruning decreases the ability of the plant to synthesize the carbohydrates necessary to support root regeneration.

Antitranspirants are available for spraying broad and narrow leaf evergreens and actively growing deciduous plants before digging. Antitranspirants are chemicals which reduce water loss from leaves. These antitranspirants have mixed reviews in scientific literature. They appear to work sometimes, but no one product has been shown to be beneficial in a range of environmental conditions. Generally, any effect is short-lived.

Mulching

Provide a 2- to 3-inch (5.1- to 7.6-cm) layer of mulch at the base of newly installed plants. Mulches reduce soil temperature fluctuations, prevent packing and crusting, conserve moisture, help control weeds, add organic matter to the soil, and improve the appearance of the landscape. Generally, a 2 foot (61 cm) circle of mulch per inch of tree trunk caliper will give adequate mulch area for newly planted trees. Entire beds of mass-planted shrubs should be mulched.

Common mulch materials include leaves, pine needles, compost, bark, wood chips, sawdust, and bagasse (sugar cane by-product). Peats should not be used since once dry they are very difficult to wet and may restrict water movement into the soil. Inorganic materials such as glass wool, gravel, and crushed stone can also be used. Avoid using black plastic

sheets around plants. They are undesirable barriers for water and gas exchange. A woven plastic fabric or other types of porous ground cloths can be used to help stabilize the soil, reduce weed penetration, and conserve moisture. These materials should be covered with a mulch to prevent degradation of the material by sunlight and to increase the landscape's aesthetic quality.

Some organic mulches, such as fresh sawdust, are decomposed rapidly by soil microorganisms and must be replenished periodically. Microorganisms decomposing organic mulches can remove nitrogen from the soil. Application of additional nitrogen fertilizer to the mulched area may be justified if the organic mulch has not been composted.

Keep a 2- to 3-inch (5.1- to 7.6-cm) circular area around the stem of plants free of mulch. Mulches against the stem of plants may increase the chance of stem rots.

Staking and Guying

Most shrubs and many trees installed in landscapes do not require support from stakes or guy wires following planting. Their trunks are strong enough to hold them upright and they are relatively small so wind will not blow them over. There are 3 reasons to stake or install guy wires on plants: 1) to protect the tree from mechanical injury; 2) to support the trunk in an upright position and 3) to anchor the tree to stabilize it against wind. Determine why staking or guying is necessary before choosing materials.

Protective stakes are meant to signal equipment operators to stay clear of trees or shrubs planted in a lawn. Three or more are required to provide adequate protection. Half of a 36-inch (90-cm) long stake is driven into the ground at the edge of the mulch around the trunk. Protective stakes are not attached to the tree and can stay in the ground for an unlimited period of time. They should be made of a rot resistant material if they will remain in the ground for more than 2 years. They are usually unnecessary in a residential landscape since the home gardener knows to prevent lawnmowers and other equipment from damaging the trunk. They are more commonly installed in commercial landscapes where larger equipment operates and trunk injury is more common.

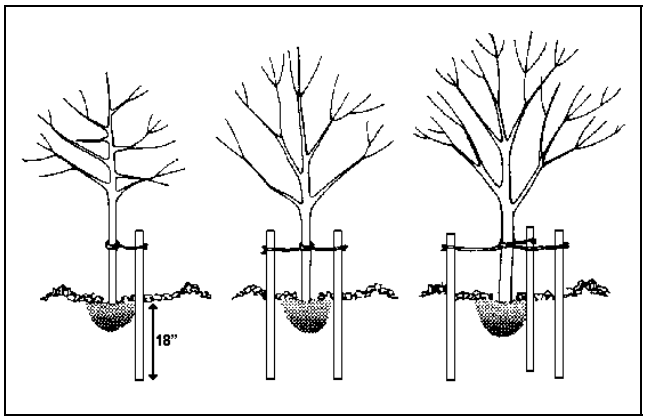


Figure 4. Tree size dictates the required number of stakes.

Support and anchor stakes and guy wires must be connected to the tree to fulfill their function. Support stakes secure trees in the upright position until the trunk is strong enough to hold the tree erect (Figure 4). These are only necessary if the trunk is too thin or weak to support the top. Bamboo or similar support stakes are often taped to young tree trunks in the nursery to help develop straight trunks. If a tree stands upright, it does not require support staking.

Support stakes should be secured to the trunk at the lowest position which will hold the tree erect. This is accomplished by holding the top of the trunk with your hand so the tree stands upright, and sliding down the trunk to a point where the top of the tree bends over. Move up 6 inches (15.2 cm) and attach the stake. Cut the stake above the point of attachment to prevent trunk damage. It is important to remove the stake from the tree as soon as possible because supportive trunk tissue develops slowly on staked trees. Unfasten the stake from the trunk 6 months after staking. Do this immediately following a rain shower since the weight of the water can cause the trunk to bend over if the tree is still too weak. If the plant stands erect, remove the stake. If not, repeat the process approximately every 2 months until sufficient strength develops in the trunk. If the tree requires staking for more than one year, it may never develop the strength needed to support itself. Leaving small branches along the lower trunk will also help the trunk increase in diameter and strength. These branches can be removed once the tree can support itself.

Trees or shrubs with a large canopy can be injured by winds before their roots become established. Winds push against the canopy as it does against a sail and can blow the tree over or move it in the soil. Anchor stakes function to stabilize the tree

until regenerated roots grow into the landscape soil far enough and in great enough numbers to hold the tree firmly in the soil (Figure 4). Even slight root ball movement can break new roots and slow plant establishment. Trees in areas open to the wind such as commercial parking lots and parks are more likely to require anchor staking than those planted in protected areas. All trees field-grown in fabric containers require anchor staking.

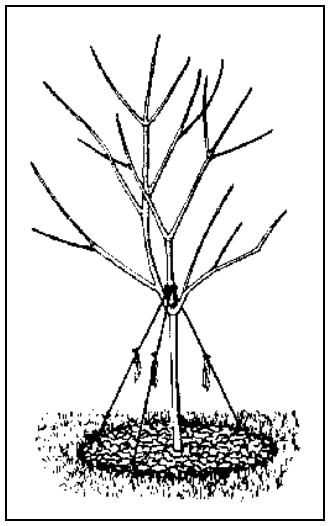


Figure 5. Staking a tree with guy wires.

Trees with trunk diameters less than 2 inches (5.1 cm) can usually be anchored by a single 36 inch (90 cm), 2 x 2 inch (5.1 x 5.1 cm) wood stake. Trees 2 to 3 inches (5.1 to 7.6 cm) in diameter require 2 to 3 stakes (Figure 4). The stakes should be placed next to the root ball and inserted 18 inches (45.7 cm) into the soil. Secure the stake to the trunk with ties made from wide, smooth material or hose-covered cable or wire. Check ties periodically during the year for tree injury and adjust accordingly.

Larger trees, 4 inches (10.2 cm) or larger in diameter at chest height, should be guyed with 3 or 4 wires or cables. The guy wires are secured to deeply driven short stakes evenly spaced 6 to 8 feet (1.8 to 2.4 m) from the base of the tree. Guy wires should be run through rubber hose and secured to the trunk at only one level (Figure 5). Guy wires can be kept tight by twisting the wires or by using turnbuckles. Mark the support wires with bright materials to prevent accidents. In all but exceptional cases, anchor stakes or guys should be removed within one year after planting since most trees should have developed enough new roots to anchor the tree. Unfortunately, this does not always happen and trees have died due to the trunk girdling effects of attached wires and other supports.

Trunk movement is necessary for the development of a strong and well proportioned trunk. Rigid anchor-staking and guying restrict trunk movement and reduce development of proper supportive tissue.

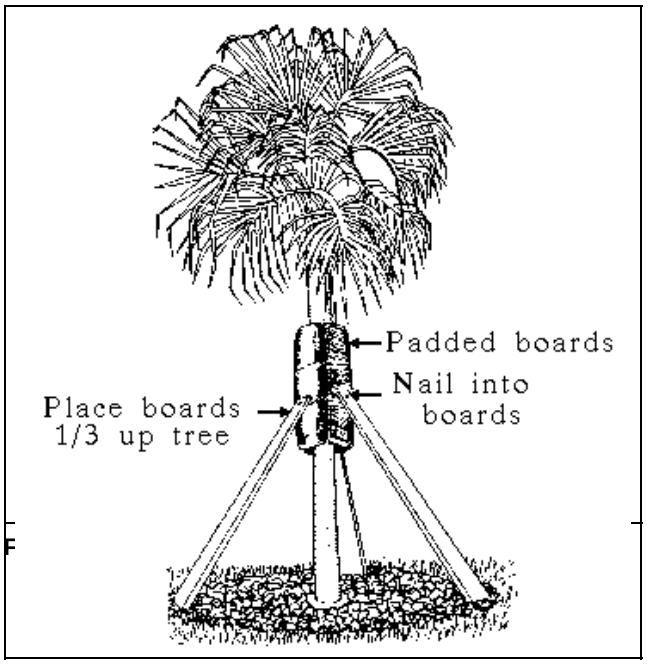


Figure 7. Padded supports necessary when staking large palms.

Staking should allow some trunk movement, however, the stakes should be rigid. Ties should be somewhat flexible and attached to the stem at one level (Figure 6).

Large transplanted palms must be anchored (as shown in Figure 7). They can be anchored with guy wires or wood supports. Wood supports should not be nailed to the palm. Instead, wrap 3 boards about 4 feet (1.2 m) long in 20 layers of burlap and fasten these to the trunk of the palm with wire or metal strap. Then nail support posts to the padded boards being careful that the nails do not penetrate into the trunk of the palm.

Trunk Wraps

Burlap and paper trunk wraps have been recommended for years to protect trunks and large branches of newly planted trees from excessive moisture loss and sun scald. However, there is little scientific evidence that this procedure is beneficial or cost effective. It has been suggested that trunk wraps can hold too much moisture against the trunk and may cause disease in some instances. If a tree wrap is used, begin wrapping at the ground and spiral the tree wrapping material around the trunk up to and including the first major branches. Overlap each layer by a half width. Tie the wrap at the top and bottom, and at two-foot intervals in between with

twine or heavy cord. Inspect the cord or twine often because many trees have died due to cords girdling the trunk. Tree wraps should be removed after the first season.

Watering

Plants should be watered thoroughly after planting and during the establishment period. Adjust the watering schedule to provide moist but not saturated conditions until the plant is well established. The establishment period varies from a few months for some one-gallon size plants to several years for trees 6 inches (15.2 cm) or greater in trunk diameter. Water the plants "as needed" after establishment. Water should be applied directly to the root ball by filling the catchment basin constructed around each plant. Small trees and shrubs transplanted into sand soils should be watered daily for the first week by filling the catchment basin around the tree. Fill the basin every two days for the next 4 to 6 weeks and one day per week for weeks 7 to 12. Continue once-a-week watering for 1 to 2 years for transplanted trees with trunks larger that 4 inches (20 cm) in diameter. Soils that retain more moisture than deep sands may require less frequent irrigation. Judgement must be used to maintain the proper moisture level, i.e. moist but not consistently wet.

Recently transplanted field-grown trees require frequent and generous irrigations because less than 20% of the root system is harvested with the plant. Although roots begin to regenerate within a week or two after severing, the water demand of the top requires that the remaining roots not dry out, not even for a short period of time. In most landscape sites the existing irrigation system can not meet the demand of the recent transplant without over watering the rest of the landscape. Large trees will usually require hand watering or installation of a temporary irrigation system which can supply a measured and controllable amount of water to each tree. The amount and frequency will depend on the tree species and size, site water table depth, soil type, slope, and the amount of irrigation the existing system can supply to the recent transplant. Across the board recommendations are not practical; however, except on a poorly drained site, it is probably safe to error on the wet side for several months to a year following planting.

Container-grown plants require frequent irrigation when planted in well-drained soils. Water will not move from the landscape soil into container media until the landscape soil is almost saturated with water. Water should be directed on the root ball surface at least until the root system is established.

Established plants in the landscape require watering to wet the soil to the bottom of the root system at each irrigation. This depth varies but averages 12 to 18 inches (30 to 45 cm) in a well-drained soil. Roots will be shallower in hard, compacted soils. Applying a greater volume of water than it takes to wet this root zone is a waste of water and energy. Frequent, light watering of established plants is undesirable as it may encourage development of a shallow root system. Apply water only as fast as the soil can absorb it to prevent runoff.

NEW TREE SPECIFICATIONS

by Dr. Kim D. Coder, University of Georgia

NOV. 1993

Below are listed ideal specifications to consider in procuring or purchasing trees for shade and street trees. Because no tree is perfect, compromises will be needed to maintain a cost-effective tree program. Select the individual specifications that could help meet your management objectives. Remember that after-care maintenance is as important to long functional tree life as are these ideal specifications. After-care and maintenance is often not adequately provided or is neglected.

The objective of approaching these specifications is to improve the quality of life for both the tree and the people around the tree over a long period of time while minimizing future liability and management costs. Good quality control on trees being produced and purchased will be the foundation of cost-effective urban forest management program.

1) Tree should be unwrapped to examine. Stems should be wrapped for shipment and installation. Remove wrap promptly.

2) Tree should have been properly target pruned -- never flush cut, trimmed, rounded-over, hedged, tipped, or topped.

3) Tree should be fully open-grown for wind-firmness.

4) Tree should have a root ball size that minimally meets nursery standards. Strive for a root ball at 150% of standard root ball size. Root ball should be lifted and contained to minimize air exposure and root damage.

5) Tree should have been root pruned one or more times. The last root pruning should have occurred at least one full growing season before installation.

6) Tree should have a good crown shape and color (if evergreen).

7) Tree should be entirely free from pest signs and symptoms.

8) Tree should show vigorous and substantial growth for at least the last two growing seasons.

9) Tree should be certified in writing as to scientific, variety, and/or cultivar name.

10) Tree should have a single dominant leader with no side branches taller than the main leader. Tree should not have a flat top.

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11) Tree should have approximately two-thirds of its total height in living branches.

12) Tree should have branches distributed along the stem in an alternating pattern and not occurring horizontally opposite each other across the stem.

13) Tree should have no basal, stem, or main root base scars.

14) Tree should have no stub or tip cutting wounds.

15) Tree should not have any visible branch stubs or internodal cuts present.

16) Tree should have no forks or dead leaders even on opposite branching species.

17) Tree should have no bark damage.

18) Tree should not have been staked in the nursery.

19) Tree should not have been treated at any time with wound paint.

20) Trees should not have all branches growing from a single area on the stem (clustered or crowned). Trees with branches normally growing in whorls should have only 3-4 branches per whorl.

21) Tree should not appear "leggy" or excessively slender. Tree must stand on its own and resist wind deflection.

22) Tree should have no narrow crotches with included bark.

23) Tree should have no side branches taller than the main leader.

24) Tree should not be leaning or have significant sweep, crook, or bend.

25) Tree should have no branch more than one-half the diameter of the main leader.

26) Tree should not have basal sprouts or first-year stem sprouts.

27) Tree should not have sprouts from around wound areas or branch bases.

28) Tree should not have vertical crack closures over old wounds. Proper pruning wound closures should be circular.

29) Tree should not have branches that cross-over each other or rub against each other.

30) Tree should not have branches growing upward inside the crown.

31) Tree should not have large roots cut close to the root crown/stem base.