

# *A nice place to visit, and a great place to live!*

Town of Terry, Mississippi,  
Urban Forestry Plan 2011



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# A Great Place to Go Green

## A Green Plan for the Town of Terry, Mississippi

About the Plan: The purpose of this plan is to provide general recommendations on how to use community forestry, training, technical tools, and professional assistance to enhance the natural environment of Terry for multiple environmental and social benefits.

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# 1. General Information

## *Terry:*

*A Nice Place to Visit and A Great Place to Live.*

**Terry, population 1,063, is poised for growth while working to provide a higher level of services for its residents.**

**First settled in 1811 by settlers from Virginia, the town was established with the arrival of the railroad in 1867. The historic Terry Depot, built in the early 1880s, continues to be restored by The Friends of Terry.**

**With a land area of 2.3 square miles and no water features, Terry strives to retain its small-town charm. Cunningham Avenue, a main artery in town, has been described as “Americana.” There are a number of homes in the older part of town that are being considered for the National Register of Historic Places in addition to the two local homes that have been on the Register since the 1980s.**

**Two parks, Village Square on Cunningham Avenue and County Park on Morgan Drive, inside the corporate town limits, provide children and adults open space for enjoyment along with options for exercise and recreation. The verdant Village Square features a walking track, playground, tennis courts, and park benches. County Park also offers a playground and tennis courts in addition to a lighted baseball diamond with concession stand and restroom facilities.**

**Town planners project a population increase of almost 50 percent in the next 15 years. Three new subdivisions have been developed in recent years.**

**Perhaps one of the most notable efforts of modern times is the reclamation of the Terry Depot. The Depot was built by the Illinois Central Railroad in the early 1880’s and was moved from Terry to Parham Bridges Park in Jackson in the**



**1950's. A Group called the Friends of Terry was formed who's mission, among others, was the reclamation of the Terry Depot. In the early 1990's, the Friends of Terry, with the assistance of the Hinds County Board of Supervisors, were successful in bringing the depot building back to Terry. The Friends of Terry have conducted a number of fundraising efforts toward the continued restoration of the depot to its original splendor.**

**For a number of years, Terry was the home of Albert Gallatin Brown, the 14<sup>th</sup> Governor of Mississippi. Governor Brown was considered progressive for this time in that he was instrumental in the establishment of public education and mental health treatment. Brown Street in Terry is named in his honor.**

**Pharmacist J.W. Combs, a Terry resident, was President of the local School Board of Trustees for many years.**

**Terry is the birthplace of influential blues musician Tommy Johnson, who had claimed to have sold his soul to the devil at a secluded Mississippi crossroads in exchange for fame and fortune. This legend was later popularized by its attribution to bluesman Robert Johnson.**

**Terry was the adopted home of Luster Willis, a fold-art painter whose works were in such demand for collectors of "outsider art" that he drew copies by tracing the images from plexiglass.**

**The Terry Public Library is named for Ella Bess Austin, a Terry teacher and community volunteer.**

**Other persons of celebrity status who have lived in Terry include writer Rick Bass, rapper/entertainer John Got'ti, and former Chairman of the Mississippi Democratic Party Rickey Cole.**

**Terry is located at longitude 32°6'5"N and latitude 90°17'40"W. The town has a land area of 2.3 square miles, all of which is land. The average land elevation of the town is 296'AMSL according to United States Geological Survey records. The racial make-up of the town is almost evenly divided between 48.5% White, 50.5% Black, and 0.8% two or more races. In 2005, the median age was 36.7 years, and the average median income was \$31,400.**

**There are two parks in Terry. The Village Square is located on Cunningham Avenue, and it has such amenities as playground equipment for children, park benches for visiting, tennis courts, and a walking track for exercise. The**

**Community Center is also located at the Village Square. The Village Square was given its name as part of a high-school “Name the Park” contest won by Jim Eley. Jim Eley is a local architect who grew up in Terry.**

**The County Park is located on Morgan Drive, but is within the corporate limits of the town. The County Park was spear-headed by Terry’s own Hinds County Supervisor George Smith. It has such amenities as a lighted baseball diamond, tennis courts, and a concession stand with restroom facilities.**

## **COST OF LIVING**

**PROPERTY TAXES:** Within Terry’s town limits, estimated property tax rates are as follows

**Age 65 & Over or Disabled (Special Homestead Exemption):** Taxes on a \$100,000 home would be approximately \$320.

**Under 65 with Regular Homestead Exemption:** Taxes on a \$100,000 home would be about \$975.

**AUTOMOBILE LICENSE AND TAX:** Taxes are based on the year and make of the automobile. This amount is available by calling the office of the Hinds County tax collector.

**STATE INCOME AND SALES TAX:** *Qualified retirement income is exempt from state income tax.* Taxable income, after deductions, is taxed at 3% for the first \$5000, 4% for the next \$5000, and 5% for any amount over \$10,000.

**Sales Tax:** The sales tax rate for the state is 7%. Some cities and counties have an additional tax on lodging and restaurant

# 2. Photographic Tour of Terry



### **3. Green Team and Local Recommendations**

Identify and inventory possible planting sites, select right tree species. Develop a local business and homeowner beautification campaign to encourage each citizen to contribute to the Terry plan.

The city or other local non-profit could set up a fund for donations or locate wholesale priced material and volunteer groups could plant. Each business or homeowner would need to commit to maintenance of their respective plant materials.

Compliment the local beautification campaign with educational programs, outreach, and citizen's team. Set goals based on an inventory of sites and citizen participation and time line.

Include in the local campaign the benefits of tree planting and beautification to include property values, increased business and all other benefits that directly impact business and citizen's quality of life.

City employees and citizens need a workshop on pruning and maintenance. Crepe Myrtle should be limbed to look like trees not shrubs.

### **Recommendations from Local Landscape Architect – George Ewing**

Maintenance is an issue that has to be addressed from all stake holders in the community. Whatever is done will need to be maintained by the property owners, as the city does not have the man-power to water, plant and weed planting areas.

Window boxes and planters can be used to accentuate entrances into buildings. Care will need to be exercised in the selection to insure adequate sidewalk width is maintained. I have seen some success in areas like this where tubing is installed from the air condition condensation outlet to the pot. Hanging baskets are also a good option. We have had good success with those in Clinton, but you have to have someone committed to watering and maintaining those baskets. You will want to select good hardy plants that require very little care.

There is a business association in Terry and there is the Friends of Terry that own and maintain the Depot. They also own the Birdsong Building and some other properties in the area. These groups have really got to get behind the beautification efforts and understand the economic impact that landscaping could have in their community. I really think that it is a diamond in the rough. Other communities would kill to have their location on the interstate, their school and their quaint downtown area.

Recommendations by Donna Yowell, MUFC



Use TEA-21 Transportation Funds to plant right tree/right place at the HWY Interchange.

Identify and inventory spaces where a tree could be planted, avoid utility and traffic conflicts.



Each red tree identifies a possible planting site.

Use aerial photography and site visits to identify and inventory possible planting sites, planting size, utility conflicts and species selection.

Trees are a renewable resource, so planting to enhance the community now does not have to be permanent. Of course, the longer trees and landscapes remain in place the more value is obtained plus an increase in social and environmental services are provided by the trees. Planting should be completed based on long term placement, but not always.

Planting does not have to block store fronts, this is a myth. A well landscaped business area actually enhances business and attracts more customers, while increasing property values. Tree planting is the lowest cost way to improve any area.

As business increases, the merchants/city may want to consider developing more behind store parking.

As you can see from this aerial photo, downtown Terry is very barren and not inviting. It does not match the character and charm of the rest of the community.

History is a very important part of the development of Terry and we suggest you enhance this feature and bring it out (only local residents know this history) in any way possible while landscaping it at the same time.



### Railroad Property

Use this site as an educational opportunity (agro-business) for adults and children. Due to this unsightly facility, plant buffers between the rail yard and the depot museum and the downtown business just to soften the impact. Install educational signage at the rail yard and other industry items to emphasize the process of timber marketing etc.

Use the green spaces around the Depot and in the general area to increase beautification by planting a variety of flowering trees, green buffers and pruning existing crepe myrtles to look tree like.





Red trees indicate possible planting site, avoid utilities and traffic conflicts. It is important to plant a diverse variety of trees (never one variety), specific to the site. Never limit tree planting to a straight line. Try to establish as much slow growing, larger canopy trees as space allows. Identify and inventory all existing planting sites along Cunningham Drive, parallel streets and side streets. Obtain collaboration from business and home owners to plant a variety of flowering and green trees in the appropriate spaces.

## 4. Urban Forestry Training and Workshop



### Trees In Our Community

Mississippi Conference of Black Mayors



MISSISSIPPI STATE UNIVERSITY  
EXTENSION SERVICE

**Hosted by: Mayor Rod Nicholson, City of Terry**

**Where: Terry City Hall, 315 W. Cunningham Avenue, Terry, MS 39170, (601) 878-5521**

**When: June 9, 2011 (10 AM - 2 PM ) No registration cost**

**Who Should Attend: This is an opportunity for communities to learn more about revitalizing spaces with trees and landscapes. You will learn about effective ways to ‘green’ your community, grants, and other resources to help you create and enhance local areas.**

**To Register: Send your Name and Email to the Mississippi Urban Forest Council at [dyowell@aol.com](mailto:dyowell@aol.com) or call Donna Yowell (601) 672-0755. Limited Seating**

<u>Time</u>	<u>Topic</u>	<u>Instructor</u>
10: 00 AM	Welcome, Terry’s Green Future	Mayor Rod Nicholson
10:10 AM	Green Re-vitalization, Creating a Green Plan Green Infrastructure	Donna Yowell, Mississippi Urban Forest Council
10:30 AM	Tree Selection and Planting	George Ewing, City of Jackson Landscape Architect
11:00	Tree Assessment/ Grants	Tympel Blansett, MS Forestry Commission
11:30	Box Lunch – Walking Tour	
12:30 PM	Placing Value, i-Tree Demonstration	Wes Jones, Mississippi State University Extension Service

*Continuing education hours for landscape architects, foresters, engineers, elected officials, parks and recreation, planners, Urban Forest Masters, arborists and others.* Funded by an Urban & Community Forestry Grant from the MS Forestry Commission, in cooperation with the USDA Forest Service and the Southern Group of State Foresters" Co-hosted by City of Terry

### Introducing Scenic Communities of Mississippi

## **5. Mississippi Urban Forest Council Sustainable Practices**

**Donna Yowell  
601-672-0755**

If the governing body of a small community is to be sustainable, it must increase its tax base by providing job opportunities to its citizens living within its corporate limits. Sustainable practices can provide the framework to create opportunities for growth in the job market, increased tourism, and provide for a safe and healthy environment.

Manufactured goods and services flowing into a community and cash flowing out, weakens a community, leading to poverty and a decay of environmental services. Cycling goods and services within a community keeps the cash flow within the community's economy, giving citizens control of their own destiny and lessening the effects of outside economic fluctuations.

To jump start this, you must maximize the use of your greatest resources, the imagination and skills of the people (think out of the box) in the community, and make wise choices in regard to the earth's resources, such as, soil, water, fauna and flora.

Sustainable practices can provide for a higher quality of life as well as a healthier environment, but always consider; how can you use this to create jobs and recycle cash flow in your economy?

The following list of sustainable practices should provide a framework for a richer and more diverse community experience.

### **Recycling**

The establishment of a business opportunity- by collecting, recycling and dispersing used debris.

- Sell metal debris that is not restorable or reusable as scrap metal.
- Sell glass, aluminum, plastic, paper, wood and other materials to recycling centers.
- Restore and reuse construction debris, such as, debris of historical significance, hardwood floors, old beams, mantles, rebar and old bricks.
- Create garden art from scrap metal for sale at the First Annual Garden Art and Plant Festival in early spring, at the central lawn by a new farmers market.

## **Recycle Toxins**

- The city should host a citizens hazardous materials recycling day to recycle toxins such as, paint, antifreeze, batteries, oil, pesticides, fuels and other toxic substances and then sell collected materials to recycling centers. Unsalable materials must be disposed of in a safe and legal manner. Consult with the Mississippi Department of Environmental Quality.

## **Recycle Books**

- Book and magazine recycling could take place in a public building (e.g. your local library) to provide free reading material to children and other citizens.

## **Recycle Vegetative Debris**

- Create a business opportunity for the collecting and composting of organic material, and also producing soil amendments and mixes for sale to home owners, the city, and landscape companies.
- After establishing an opportunity for citizens to sell their yard debris the city should develop an ordinance requiring private property owners to keep their yards free of such debris, for the public's health, safety and welfare.

## **Plant Industry**

The following opportunities exist to create an industry around growing, using, and marketing of plant materials.

- Construct a plant nursery – which would entail producing container grown native trees, shrubs and perennials for restoration and landscaping. The production of herbs, vegetables and cut flowers can be produced for retail growers.
- Construct a distribution and production facility which will grow organic vegetables, herbs, and cut flowers. The facility will grow part of their produce and contract grow the other items with local residents, such as, the grandmother growing cut flowers in her front yard.
- Make available products that can be marketed to restaurants, hotels, casinos, and schools.
- Construct a farmers market as an outlet for businesses, the backyard grower and the craftsmen, such as, scrap metal artists.

## **Storm-water**

Storm water collection, storage, use, and discharge provide opportunities for the following:

- Flood control
- A diverse wildlife habitat
- Creation of a diverse visual environment
- Facilitation of higher property values
- Passive recreation, such as, bird watching
- Increased residential development
- Improved water quality
- Irrigation Usage
- Backup water sources for fire departments

The use of rain gardens, bio-swales and green parking lots reduce run-off and allow reductions in the size of storm water structures.

A storm water ordinance will be needed for new construction and renovations.

## **Native Plant Species**

Planting native species reduces the need for chemicals and water and decreases maintenance time providing a much more sustainable landscape.

## **Bio-fuels**

A new practice is the use of vegetation to generate energy for utilities for small public spaces, such as city hall. Small systems are available for this use. For more information:

[http://www.cleanenergystates.org/Publications/NREL\\_Biomass\\_Gasification\\_Mkt\\_Assessment\\_46190.pdf](http://www.cleanenergystates.org/Publications/NREL_Biomass_Gasification_Mkt_Assessment_46190.pdf)

## **Wind and Ice Resistant Plant Material**

Planting with storm resistant, native varieties of trees and shrubs have the added benefit of providing wind buffers to protect homes and reduce energy consumption. This practice also protects utilities and structures during storm events.

## **Low Landscape maintenance**

Using native varieties of grasses, shrubs, and trees and reducing grassed areas will decrease maintenance time and costs.

## **Greenways**

Greenways exist in every community in varying degrees. Most communities have town centers or floodway/riparian along streams and other water/drainage courses. It is important that each community identify these areas and use them to the greatest natural capacity as possible. Connecting greenways for multiple benefits such as wildlife habitat, storm-water management and recreation purposes increase the benefit to the community for a multitude of social, economic and environmental benefits.

## **Forest Canopy**

Target tree canopies for most communities should be around 40% of surface space. This will provide maximum benefits derived from shade, water, air, and many other resources.

## **Ordinance Development**

Sustainability plans should include a variety of policies in regard to storm-water management, land development, street and yard maintenance, tree and landscape ordinances, conservation easements, land use zoning for green areas, many other facets of green community development.

## **Local Citizen's Teams and Resources**

During this time of limited resources most communities find it necessary to rely on citizens to become a key part of the improvement strategy for their communities. After all, it's the citizen that truly benefits from the improvements. Organizing volunteers in efforts to promote and implement sustainable community practices is key to a successful program.

## 6. Urban Forestry Management Plans

### Chapter 1 - Guidelines for Sustainable Community Forest Management

#### 1. Conducting a Community Resource Inventory.

Every community possesses an array of resources and qualities that give it unique character and a sense of pride. These resources are vital to the well-being and long-term success of the community and must be protected. Communities desiring to embark on a resource-based planning process, with an ultimate goal of sustainable development, are well-advised to conduct an inventory of the community's resources.

The City of \_\_\_\_\_ in partnership with the Mississippi Urban Forest Council (MUFC) held planning sessions with the community leaders and local citizens. These sessions provided an opportunity to inventory and develop a list of amenities to include in the plan. Not only were the natural aspects of community planning included, but also included were the social and economic inventories and assessments such as natural resources, historic resources, people resources, churches, parks, schools, public lands, public buildings, business opportunities, community festivals and activities and other amenities. Recommendations suggested by citizens to enhance the community were developed based on both need and opportunity. The list below includes some of the activities suggested for revitalization through community forestry and are to be included in a "Green infrastructure" plan.

Our approach included Street Tree Inventories, local training, recommendations from local citizens, a professional arborist and an urban planner.

Sample inventories provide information needed for a community to make informed and rational decisions about future plantings and development of green spaces.

1. Assemble a small working group of knowledgeable citizens. This group should acknowledge the responsibility of other civic boards and commissions for the creation and maintenance of the inventories.
2. Determine the study area of the inventory. The inventory process is fundamentally the same, no matter the scale (e.g., site, town, watershed, or region.) The best scale for a community to use is that which best suits its needs.
3. Review existing documents that were previously completed by the community. These documents may include conservation and development plans, resource inventories, and special studies or plans. Work of adjacent jurisdictions and/or the help of a regional planning agency may also be helpful.

4. Assemble maps and information from local and state sources. Maps are available from a variety of different sources. When assembling the maps, caution should be taken to *not* get overwhelmed by details. Remember to gather only that information which will help the community make better land use decisions.
5. Write a draft report. The report should include both a map and sources, along with a narrative that describes that map and how it may or may not be used.
6. Publicize and solicit information to both the town's boards and commissions and to its citizens. Use all available resources to publicize the importance of this information to the community. Solicit input from citizens and incorporate constructive and improved information into the inventory. Information from the CRI can be incorporated into nearly all planning decisions that affect the community, from open space to economic development. If the CRI information is to be effective, commissions assigned the responsibility for the inventory must keep it up to-date. The inventory should be revisited to ensure that the most current information available is provided to the community's decision makers.

## **2. Natural Resource-Based Planning**

When community planning and decision-making revolve around natural resources, a thorough and correct natural resource inventory is essential. The inventory should first be conducted at the landscape-level by an interdisciplinary team comprised of individuals from natural resource professions, civic, federal, state and local governments, concerned community organizations and nonprofit organizations. The inventory should include a woodland survey and resource assessment and should produce a Comprehensive Landscape Resource Map, containing all pertinent survey and assessment information. Following the inventory, communities can begin developing an open space plan that is sensitive to the area's unique sense of place and its natural resources. Open space can best be categorized by the functions that it achieves.

Six functional types of open space include:

1. natural resource protection areas, (e.g., animal and vegetative habitat, stream corridors, and rock ridges);
2. outdoor recreation; active, (e.g., parks, pocket parks, playgrounds, beaches, and trails); and passive, (e.g., plazas, sitting areas, arboretums);
3. resource management, (e.g., forests, fisheries, and farmland);
4. protection of public health and safety (e.g., floodplains, wetlands, in unbuildable areas, or areas with limitations for development);
5. areas that shape community character or design (e.g., buffer strips, front, back, and side yards, urban plazas, greenways, open space dedications);
6. historic or archeological sites (e.g., battlegrounds, historic structures and their grounds, historic districts, town greens).

No matter what the intended function for open space, it is important that a community possess a unifying game plan to address new development with a directive, rather than reactive approach. The desires and needs of the community regarding any new development should be communicated clearly and frequently so that irreversible, harmful mistakes are not made. After the open space plan has been developed, a more thorough plan of conservation and development can be created. This plan consists of designating areas of no new development, limited development, and suitable future development. Examples of areas not to be developed include existing developments, committed open spaces, and regulated wetland areas. These areas can be permanently protected through conservation easements. Areas with limited development include those with little net buildable area or those with large lots. These areas can be designed with conservation in mind, making shorter, narrower roads and creating new open space. Areas suitable for future development are those areas considered “growth areas” by communities (e.g., shopping centers, new subdivisions). Whenever possible, areas of limited or new development should be viewed in a regional perspective and possibly linked to form greenways. Additionally, any new developments or alterations to existing developments should incorporate native natural vegetation and trees.

### **Question 1 - What do you have?**

#### **Step A - Assess the tree resource.**

An assessment of tree resources is advisable for the city. The assessment will provide the basic information necessary for making management decisions and provides a baseline against which change can be measured. Ideally, this assessment should include all tree resources within the planning area of the municipality. Tree resource assessments are based on various inventory methods, most of which require some type of survey.

Sample survey method would use the iStreets platform and would be carried out by a registered forester familiar with the software. A more complete sample of the town could be performed, but will be more costly and require permission from private landowners. This type of survey would show a more complete representation of the forest as a whole. Again, the sample inventory should not exceed 6% of the total\*.

#### **Step B. Review tree management practices.**

Understanding the status of the urban or community forest requires knowing how it has been previously managed. Some information that should be collected on past and current management methods and actions include:

1. municipal tree care cycles, practices, including planting, maintenance, and removal,

2. existing ordinances, and level of enforcement practiced (i.e., numbers of violations, permits and citations issued, penalties and fines collected),
3. planning regulations and guidelines pertaining to trees, and numbers of tree-related permits granted, modified, or denied,
4. activities of municipal departments and public utilities that impact trees.

The purpose of reviewing past and current tree management practices is to identify all activities affecting trees in the community, especially those falling under municipal control. For instance, seemingly unrelated ordinances and planning regulations may directly or indirectly impact forest resources and, therefore, must be taken into account.

## **Question 2 - What do you want (i.e., goal setting)?**

### **Step C - Identify Needs.**

Once information on the status of tree resources and tree management is in hand, a community can assess its urban forestry needs. Urban and community forestry needs can be grouped into three broad categories, with some needs falling into more than one category.

#### ***Biological needs*** (i.e., related to the tree resource itself):

1. increase species and age diversity to provide long-term forest stability,
2. provide sufficient tree planting to keep pace with urban growth and offset tree removal,
3. increase proportion of large-stature trees in the forest for greater canopy effects, and guarantee proper compatibility between trees and planting sites to reduce sidewalk damage and conflicts with overhead utilities that lead to premature tree removal.

#### ***Management needs*** (i.e., needs of those involved with the short and long-term care and maintenance of the urban forest):

1. develop adequate long-term planning to guarantee the sustainability of the urban forest,
2. optimize the use of limited financial and personnel resources, increase training and education for tree program employees to ensure high quality tree care, and coordinate tree-related activities of municipal departments.

***Community needs*** (i.e., those that relate to how the public perceives and interacts with the urban forest and the local urban forest management program):

1. increase public awareness of values and benefits associated with trees,
2. promote private tree care through better public understanding of the biological needs of trees,
3. foster community support for the urban forest management program, and promote conservation of the urban forest by focusing public attention on all tree age classes, not just large heritage trees.

Although the needs listed above are common in many communities, specific needs of each community will vary, and may include others not noted here.

### **List of Community Forestry Needs for the City**

#### **1. Maintenance and Training Needs:**

- Planting replacement trees to avoid sidewalk damage
- Utility Pruning (High Need)
- Local Value of Trees and Boulevards
- Small Business Outreach
- Housing and other low income audience education

2. **Green Campaign Development:** Develop a local campaign that includes business, chamber, low income neighborhoods and MDOT. Be sure that the retirement community is involved or leading.... Include city's colorful history in the campaign. Another opportunity is to include high school students in communicating and participating in an active "Green Campaign" to include a series of sustainable activities.

3. **Private Participation:** Many of the green spaces along the highways and other access roads to the city are on private property. Develop a Right Tree, Right Place campaign and a local tree nursery could provide free trees to those property owners. Use the CanVis program to help citizens visualize and understand the benefits associated with a "greener community." Develop a method for home and business owners to plant trees in private green spaces to assist in canopy development. Inventory possible places to plant trees.

4. **City Activities:** The City already does a good job in planting and planning, continue this effort and strive to increase local citizen participation to conduct part of the work.

**Other Needs:**

- Continued community tree planting programs, education and involvement would be beneficial
- Increased green infrastructure, such as; recycling, bio-swales, rain gardens, pocket parks downtown, green materials and home vegetable and flower gardens.

**Step D - Establish Goals and Recommendations.**

With information on resources and needs collected, goals to address local urban forestry needs can be set and a management strategy formed. To establish realistic goals, it is important to consider limitations posed by the level of community support, economic realities, and environmental constraints. Limitations on resources may make immediate addressing of all identified needs impractical and, in this case, it will be necessary to prioritize goals. Community involvement and support are critical in the establishment of goals since most urban and community forestry ordinances rely heavily upon voluntary compliance by the public, and compliance will only occur if the public supports the goals set. Involving the public in the goal-setting process allows them to reflect on the values of their community as well as educate themselves on how urban forest management affects their community.

Since goals are tangible ends that the management strategy seeks to achieve, it is important to set goals which are quantifiable, so that progress toward achieving these goals can be monitored. Typical tree program goals, as well as corresponding ordinance provisions for each goal, consistent with good urban forest management are discussed in detail in Appendix B.

**Question 3 - How do you get what you want?****Step E - Select tools and formulate the management strategy.**

This step develops a management strategy addressing specific goals. It is important to remember there are many approaches that can be used to address each goal and the pros and cons of each approach should be considered. Feasibility, practicality, legality and economics should be considered in selecting appropriate management tools.

Some typical tools include:

1. public education programs,
2. assistance and incentive programs,

3. voluntary planting programs,
4. mitigation guidelines,
5. planning regulations and guidelines, including the general plan and specific plans, and
6. ordinances.

Community involvement and support continues to be important in this phase of the process; if management approaches and tools are unacceptable to the community, they are unlikely to succeed. Your assessment of current and past management practices should provide ideas about the effectiveness of various methods used in your community and public input and comment should be sought for any new approaches being contemplated or developed. The role of an ordinance becomes apparent at this stage, when it may become necessary to establish new positions, require development and implementation of a community forest master plan, mandate a program of public education, or outlaw destructive practices. Any provisions placed in ordinances should be directly related to the goals your community has established for its community forest, and all ordinances should include all of the essential components previously listed.

#### **Step F - Implement the management strategy.**

No matter how ideal a plan may appear on paper, it cannot achieve its goals until it is implemented. Implementation of the management strategy requires several steps, which may differ between communities and include:

1. passing an ordinance,
2. budgeting necessary funds,
3. hiring a municipal forester or arborist,
4. appointing a citizen tree advisor board,
5. formulating a master tree management plan, and
6. developing public education programs.

The above steps need not require funding if a volunteer tree board can be formed and ordinances are in place. Cities can implement a management strategy without funding; planting and conserving many trees. It is often useful to map out an implementation schedule to accomplish the steps involved in your community's management strategy. The schedule should show the steps involved and the time frame within which they should be completed. Additionally, progress checks in the form of required progress reports to the city council or county board of supervisors should be built into the schedule to make certain that delays or problems are detected and addressed. Maintaining a high profile for the management program during implementation will help foster public interest and maintain the commitment of local government.

#### **Question 4 - Are you getting what you want?**

##### **Step G - Evaluate and revise.**

Monitoring of your implemented management strategy is essential to make certain that progress is being made and standards are being met. Evaluation provides feedback on the effectiveness of the strategy, it also provides opportunities to reassess the needs and goals of the community and it allows readjustments and changes to goals before a crisis develops.

#### **Question 1 - What do you have?**

##### **Step A - Assess the tree resource.**

A sample tree inventory was undertaken to ecologically and environmentally assessed areas including street tree resources. The aim of the sample inventory was to provide a quick estimation of street tree species, diversity, ecological and environmental benefits. A more complete survey is highly advised.

##### **Step B - Review tree management practices.**

Data collected during the sample inventory facilitates assessment of structural components and management practices (i.e., canopy coverage, conditions, distribution, pruning needs) as well as other conflicts associated with public safety for city street trees. This assessment can be categorized by ward and zone type to show where management is needed most to improve street tree health and sustainability and to show how investing in a management program has provided benefits through maintenance of street trees.

#### **Question 2 - What do you want (i.e. goal-setting)?**

##### **Step C - Identify Needs.**

Calculations of overall canopy cover, condition of street trees, street tree distribution by land use and pruning and maintenance needs aided the city in an assessment of overall management needs. Canopy cover is the driving force behind an urban forest's ability to produce benefits in the community. As canopy cover increases, so also do the benefits afforded by increased leaf area (e.g., greater rainfall interception, shade, cooling, CO<sub>2</sub> reduction, pollutant uptake, aesthetics). Residents pay the city to manage street trees for the benefit of the community and to realize the maximum return on this investment. A city should strive to maintain present canopy cover in a way that promotes annual increases. The recommended canopy cover of an area is 40%

(*Green Infrastructure*, Benedict and McMahon, 2006). Increasing canopy cover now can be a tremendous investment in the future health of the urban forest, especially canopy cover. Unfortunately, budget constraints of municipal tree programs often dictate the length of pruning cycles and maintenance regimes rather than the needs of the urban forest and its constituent components. In fact, many cities do not have a programmed pruning plan, but maintain trees under “request” and “crisis” mode, finding them further and further behind every year. Programmed pruning, under a reasonable timeline, can improve public safety by eliminating conflicts, reducing costs by improving program efficiency and increasing benefits by improving tree health and condition. Any short-term dollar savings realized by cities deferring pruning only do so at the expense of lost tree value.

#### **Step D - Establish Goals.**

#### **Guidelines for Effective Urban and Community Forest Management**

The city’s first tree board, along with a professional urban forester should provide oversight and guidance in establishing a community forestry program and influence decision-makers to pass the second tree-related ordinance. This ordinance could provide for a broader spectrum of professional expertise on the board (i.e., an arborist, a landscape architect, a horticulturist) and more community involvement by expanding the board to seven members. Part of the work of the board is securing much needed funding through grants.

#### **Question 3 - How do you get what you want?**

#### **Steps E and F - Select Tools, Formulate and Implement the Management Strategy.**

With respect to street trees; plan goals and objectives by outlining what any city would be proud to achieve: “Main Goal – protect existing trees and increase tree cover in the city.” City street trees and trees within public facilities are to be maintained in a healthy, vigorous condition to provide numerous benefits including shade, wind barriers, improved air quality, and visual relief. The city’s comprehensive urban tree management plan selected tools such as ecologically and horticulturally sound pest and disease control; a high standard of pruning; proper planting and establishment methods; and a timely response to complaints and safety concerns to implement their management strategy. In other words, the city sought to maintain a functional municipal forest that is both healthy and safe, with street tree populations that yield numerous benefits without compromising environmental quality or the well-being of the citizens who live, work, and play there. Ultimately, the city should “get what it wants” by accomplishing their objectives of maintaining mature trees, tree planting, establishing a tree nursery, supplying trees to residents, maintaining young trees and improving tree ordinances. These ordinances can apply to any city wanting to protect, maintain and restore its trees and are, in fact, a good set of objectives and goals for which to strive.

## **Question 4 - Are you getting what you want?**

### **Step G - Evaluate and Revise.**

Although street tree inventories can and do occur as a precursor to new community forest management plans, they can also be helpful in evaluating and revising management plans already in place. As discussed above, this tool was used to evaluate the city's management plan and will, no doubt, be used to make any necessary revisions for the future. As part of the natural resource based plan or overall urban forest management strategy, municipal officials, committees, tree boards and commissions and other affiliated parties must determine and carefully examine any codes, regulations, ordinances, or laws that may affect, however remotely, the plan or strategy. Any and all codes, regulations, ordinances or laws must then be addressed and the plan or strategy altered, prior to approving or initiating any activities.

Some examples of codes, regulations, ordinances or laws that may be in place in Mississippi communities include:

1. subdivision ordinances, (exercise power in subdivision design, including physical layout, street standards, utility service, and open space);
2. zoning regulations, (control land use by dividing the land into different use districts and setting standards for development, including parcel use, lot size, density, street and property line setbacks, and structure size);
3. building codes, (dictate to what standards structures must adhere, including fire resistance, capacity, size and height, and appearance);
4. vegetation ordinances, (address undesirable plants, municipal trees, and arborist certification and licensing);
5. tree protection ordinances, (protect existing trees and other vegetation during development and regulate tree removal by establishing definitions, procedures, penalties and appeals necessary for enforcement);
6. special tree, species, and ecosystem regulations and laws, (often require specific guidelines for their maintenance and protection);
7. landscape ordinances, (require submission and approval of landscape plans, tree location plans, or new tree planting for new developments or development rehabilitation);
8. screening ordinances, (set standards for structural and/or vegetation screening on lot peripheries and vegetated islands within the lot); and
9. energy conservation regulations, (reduce wind speed, mitigate urban heat islands, and reduce overall energy use and waste).

Although not all of the above codes, regulations, ordinances or laws will be in effect in or applicable to, all communities or situations, many will apply and can affect plans or strategies. Communities should take steps to ensure that the review of all

future development includes checking the plan against their Community Forest Management Strategy. Careful examination and attention to detail can help avoid potential conflicts of interest and ensure plan success.

The City Tree Ordinance was reviewed and recommendations were made to be included in this plan.

Tree Ordinance Recommendations:

### **Revision and Addition Suggestions**

#### **Revisions:**

- Refine Master Tree List of species

#### **Additions:**

- Add Section “Authority, Intent, and Purpose” of Tree Board for public awareness of intentions
- Expand by adding sections to include forester/arborist duties and authority
- Form a solid Community Tree Plan along with a registered forester and include for implementation
- Review adding Section “Enforcement, Penalties, and Appeals”
- Require Permits for certain tree/shrub work? If so, add Section “Permits”
- Protection for public trees and tree abuse?
- Yearly review

**Air and water quality** remain two of the most critical issues in sustainable environmental planning. Concern over the effects of carbon accumulation in the environment and the potential for long-term climate change have prompted many municipalities to increase their enforcement of urban forestry and landscape ordinances. “Green Laws,” as they are commonly called have taken on a new significance at both the state and local level, as communities strive to maintain and improve the quality of life for their residents and visitors. Standardizing and strengthening these types of guidelines has the obvious potential to enhance the aesthetics and economic property value of an area but may also generate additional economic returns in the form of lower maintenance costs and improved public health.

Along with tree ordinances, Green Laws may be crafted in the form of landscape laws and other codes or regulations designed to address land usage, development and post construction issues. While they are developed with similar purposes and expected outcomes in mind, agencies responsible for each level of responsibility may vary considerably depending upon a community’s size and funding capability. Some of the most comprehensive examples and strategies for implementing rural Green Laws can be found at the Louisiana State University Web site.

## **Chapter 2: Guidelines for Conserving Wooded Areas**

### **Conserving Wooded Areas**

#### **Best Management Practices (BMPs) to Conserve Wooded Areas at the Landscape Level**

Conservation of wooded areas should be an essential part of any land development project.

Conserving and incorporating trees into existing neighborhoods, new developments, and the watershed can lead to more livable communities that retain the integrity and benefits of natural resources and are ultimately more sustainable. Community planners can more easily conserve wooded areas by adopting and following a step-by-step land-use approach that consists of defining goals, conducting an inventory and assessing resources, creating a conservation plan and identifying and selecting land protection options.

#### **Define Goals**

Goals to conserve wooded areas across the landscape should include:

- protection and/or restoration of ecological integrity and functions,
- protection and promotion of connectivity and continuity of wooded areas across the landscape and political boundaries,
- establishment or creation of networks of forest communities as open space,
- definition of neighborhood and community boundaries,
- concealment of unsightly or incompatible land-use practices, and
- protection of wildlife habitat and corridors.

#### **Inventory and Assessment of the Resource**

A landscape-level resource inventory that includes a woodland survey, resource assessment and produces a Comprehensive Landscape Resource Map should be conducted. The woodland survey and resource assessment consists of:

- delineating tree stands,
- identifying and classifying wooded areas by type and condition,
- assessing ecological functions as well as conservation values of wooded areas within the jurisdiction and adjacent jurisdictions,
- identifying, classifying, and assessing other natural resources (i.e., wetlands, farmlands, areas occupied by rare plant and animal species, and projected green spaces), and
- identifying watershed, drainage, topography, soil types, existing infrastructures, and areas of significant historical and cultural values.

Following the woodland survey and resource assessment, a Comprehensive Landscape Resource Map, containing all pertinent survey and assessment information, can be created.

### Creating a Conservation Plan

A conservation plan, based on the resource inventory and assessment data and Comprehensive Landscape Resource Map should be created by:

- identifying and locating wooded areas,
- identifying and locating sites for main transportation systems and utility infrastructure,
- selecting wooded areas to conserve, including:
  - larger tracts or remnant wooded areas,
  - wooded areas that have potential to be connected to others,
  - wooded areas with significant ecological functions and conservation values,
  - wooded areas occupied by rare plant and animal species,
  - areas with reforestation and restoration potential.
- identifying developable areas.

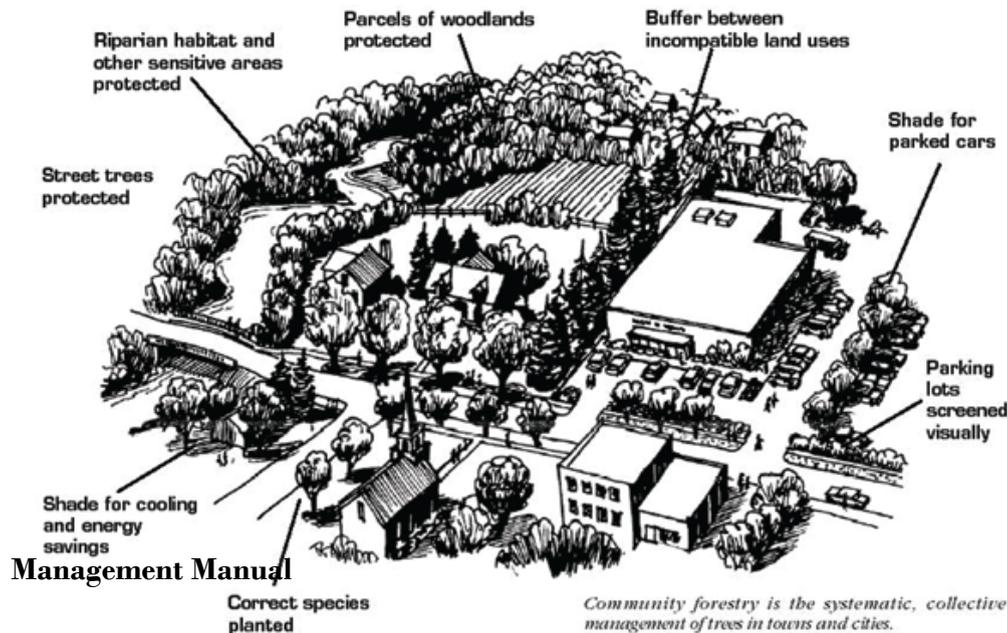


Figure 3-1. Examples of methods to incorporate trees into existing neighborhoods, new developments, and watersheds. Source: Fazio 2003

Once all of the above areas have been identified and recorded on the Comprehensive Landscape Resource Map, the map should be entered in a Geographic Information System (GIS) and shared with other local and regional units of government, developers, builders, and private organizations to promote continuity and connectivity of wooded areas across the landscape and enhance coordination and partnerships among all stakeholders. Developers and builders should also be included in this process and be informed of conservation goals and wooded areas set aside for conservation.

### **Identify and Select Land Protection Strategies**

Following the development of a Comprehensive Landscape Resource Map and identification of wooded areas to conserve, appropriate land-protection options should be selected. Options available to local and regional units of government include use of zoning and subdivision ordinances and consideration of other conservation and protection options.

When drafting ordinances to promote conservation of wooded areas:

- gather input from developers, builders, and citizen organizations,
- integrate conservation values in zoning codes and policies,
- identify developable subdivisions and conservation zoning districts in the comprehensive plans,
- determine the type of development to be allowed using information contained in the Comprehensive Landscape Resource Map,
- promote flexible subdivision ordinances that encourage variable lot sizes and configurations, street width and setbacks according to traffic, utility types and easements and creative development plans,
- draft local woodland and tree-protection ordinances for both public and private property,
- provide incentives to reduce impervious surfaces (including reduced road width, setbacks, parking lots or provision of additional lots, tax incentives and public recognition or awards),
- promote the use of joint utility easements and trenches for underground utilities and rights of way for overhead lines,
- create a local natural resource advisory board to foster participation of community organizations including citizens, nonprofit organizations, developers, builders, and contractors,
- create conservation overlay districts in the jurisdiction using comprehensive plans and zoning ordinances and determine urban growth boundaries for infrastructure (i.e., new water and sewer lines),
- provide incentives to promote or mandate implementation of conservation designs such as conservation zoning designs, open space designs, conservation subdivision designs, and cluster development designs.

- set up conservation standards based on sound protection options of wooded areas (e.g., promotion of the conservation of 50 to 70% of wooded areas in residential zoning districts as natural wooded open space),
- promote new and flexible approaches to conservation (e.g., dedicate 15 acres of land for park, playground, and public open space for every 1,000 residents or prohibit development on wooded areas of 10 acres or larger) and
- provide a management strategy to maintain and enhance the quality of protected wooded areas (the strategy should have an education component for the public and include frequent assessments of tree and forest health, fire hazards, and wood utilization).

Other conservation and land protection options that have been developed to assist landowner and local units of government include:

- conservation easements,
- land-retirement programs,
- property tax-relief programs,
- restoration cost-share programs,
- registry programs,
- land transfers,
- deed restrictions,
- mutual covenants,
- management agreements,
- land donations,
- land sales to conservation buyers,
- land exchanges, and
- transfer of development rights.

### **BMP's to Conserve Wooded Areas at the Subdivision Level**

#### **Define goals**

Goals to consider in land development should include:

- conservation of green corridors,
- conservation of wooded areas as natural open space or a conservancy area, and
- protection of individual trees.

## **Inventory and Assessment of the Resource**

Resource inventory and assessment at the subdivision level should follow the same steps as those conducted at the landscape level but at the smaller scale of the subdivision. Generally, the resource inventory and assessment for a subdivision is accomplished in three steps:

1. evaluate existing resource information (obtained from larger scale resource inventory and assessments, including any local zone and tree preservation ordinances),
2. conduct site review and survey trees (including identification and location of wooded areas and other natural resources, and delineation of potential wooded areas to protect).

The site review and tree survey is conducted by:

- obtaining aerial photography (available through tax assessor),
  - incorporating remote sensing data,
  - identifying and locating wooded areas and other land types, and
  - delineating potential wooded areas to protect, such as:
    - wooded areas protected or identified by local, state, and federal laws, policies, and/or regulations (i.e., wetlands, greenways, and natural areas),
    - wooded flood plains, wooded stream corridors, steep wooded slopes, and buffer zones, and
    - remnant tracts of wooded areas at least one acre in size with healthy trees.
3. create a Comprehensive Landscape Resource Map for the subdivision that will be used as the basic tool from which all decisions related to the development will be made.

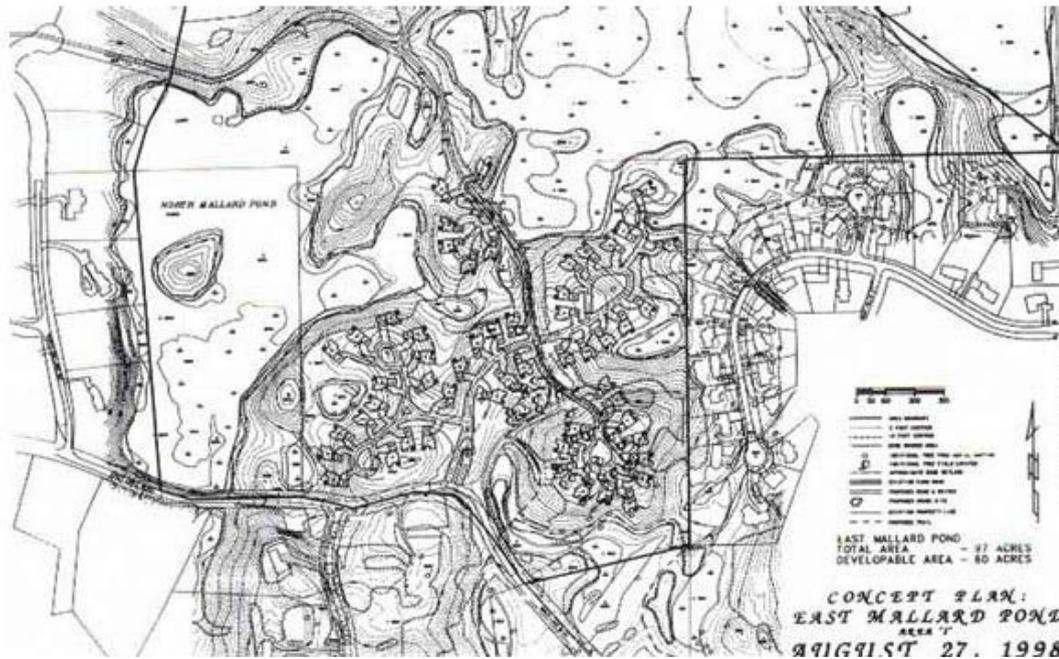


Figure 3-2. A comprehensive Landscape Resource Map of a subdivision such as this example from North Oaks, Minnesota shows location of wooded areas, individual trees, water bodies, proposed developable sites, and conservancy areas. Source: Minnesota DNR 2000.

### Create a Wooded Area Protection Plan

Using the subdivision Comprehensive Landscape Resource Map, develop a protection plan which includes:

- selection and delineation of wooded areas to protect, considering the following steps:
  - record location of wooded areas to be protected based on the goals and information provided on the resource map,
  - record all areas likely to be adversely impacted during construction,
  - record areas that can be used for reforestation and/or restoration, and
  - locate and delineate developable and buildable sites, and
- submission of development plan for approval which should be collectively reviewed by the developer and the county, city, or township planner.

## **Select a Protection Method**

Once the development plan is approved, the developer and/or builder should select the protection method that consists of several steps:

- determine the protected root zone, which is:
  - off limits to all construction activities, and
  - should be determined and protected prior to construction.
- mark the protected root zone,
- determine the grading area and method,
- define reforestation plan and method (should select suitable tree species planting design to meet intended goals), and
- record trees to be transplanted to other locations.

## **Monitor and Evaluate the Conservation Plan**

If a conservation plan is to succeed, participation and commitment of all parties involved in the development project is essential.

Plan monitoring and evaluation should include:

- education of those involved regarding goals and tree protection measures,
- site inspection which includes frequent visits to the site to check for violations of tree protection plans, and
- financial penalties for violations (may be monetary or replacement of trees).

## **BMPs to Protect Trees at the Lot Level: New Construction, Remodeling, and Redevelopment Recommended Practices**

Proactive planning and use of appropriate approaches and tools can guarantee greater protection and conservation of wooded areas and trees during construction.

To achieve protection goals, the following steps should be taken:

- Define goals, including:
  - protection of wooded areas and trees from construction damage,
  - compliance with zoning regulations, conservation easements, and

- maintenance and enhancement of community aesthetics and property values.
- Inventory and assess trees by:
  - obtaining or drawing a boundary map of the lot,
  - recording the location of all trees and wooded areas,
  - conducting a tree survey and health assessment, including:
    - tree species and age class, and
    - health condition (i.e., trunk form, crown form, and overall condition), and
  - recording tree survey and health assessment information on the Comprehensive Landscape Resource Map.
- Select trees or groups of trees to protect, using these criteria:
  - select trees or groups of trees as needed to comply with any local tree preservation ordinances,
  - select trees and wooded areas found within conservation easements or covenants,
  - select trees that are suitable to the site conditions (e.g., native species and trees with desirable growth characteristics),
  - select trees that provide direct benefits (e.g., wildlife habitat, shade, windbreak, screening, privacy, etc.),

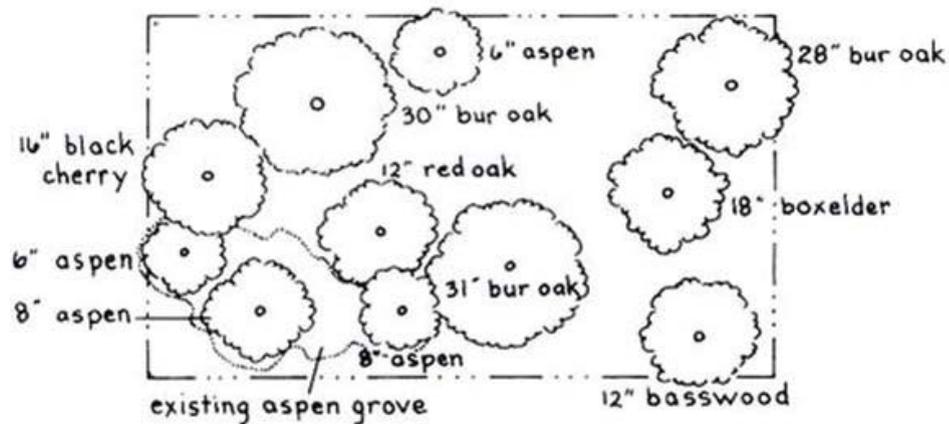


Figure 3-3. A resource map at the individual lot level shows the location of the wooded area and individual trees, species composition, and diameter of trees at breast height.

- select trees that are connected to other trees (e.g., groups or lines of trees) on adjoining property to achieve connectivity,

- pay particular attention to younger trees that may have greater tolerance for site disturbance during construction,
- identify protected trees with colored ribbon, and
- record location of tree and species name on the Comprehensive Landscape Resource Map.
- Select building sites and construction zones and identify other areas such as setbacks, easements, and areas dedicated to conservation.
- Create a tree protection plan by determining and delineating the protected root zone.
- Select and implement tree protection method, and
- Monitor and evaluate by:
  - visiting the building site to check for any disturbance or violation of the tree protection plan,
  - calling for a tree survival and replacement plan to be extended from two to five years following construction,
  - imposing financial penalties, and
  - making referrals to other clients for builders or contractors who do an exceptional job of protecting trees during construction.

### **Chapter 3: Guidelines for Protecting Urban and Community Streams Protecting Urban and Community Streams**

Areas containing community streams must be given special consideration because development in these areas can have a profound impact on stream hydrology, morphology, water quality and biodiversity. Because development is often a gradual process spanning decades and wide regions of the landscape, stream protection strategies must address the comprehensive protection of stream quality throughout the entire development process.

A local urban stream protection strategy has six primary components roughly corresponding to each stage of a normal development cycle from zoning, planning, site design, construction, stabilization, to final occupancy. These components are watershed-based zoning or land use planning, protection of sensitive areas, establishment of buffer networks, reduction of impervious cover in site design, limitations on erosion during construction, quantity and quality treatment of storm-water runoff and maintenance of stream protection measures.

#### **Watershed-based Zoning or Land Use Planning**

To a large extent, the future quality of a stream is determined by community land use decisions. Therefore, careful consideration must be given to these streams during the zoning planning process.

The underlying premise of watershed-based zoning holds that impervious cover, not population density, is a superior measure of growth impact. Based upon the variable of impervious cover, it is possible to classify and manage streams within a community using the sequence of steps involved in watershed-based zoning below.

- Step 1 Conduct a comprehensive physical, chemical, and biological stream inventory to assess the current quality of the community streams.
- Step 2 Refine/verify impervious cover/ stream quality relationships and identify sensitive stream systems.
- Step 3 Measure and map existing and future impervious cover at the sub-watershed level and, if possible, project future impervious cover growth based on the build-out of existing zoning.
- Step 4 Designate sub-watersheds into one of three stream quality categories (sensitive, degrading, non-supporting), based on growth patterns and attainable stream quality under existing environmental conditions and the ultimate level of impervious cover.
- Step 5 Modify the existing master plan to meet sub-watershed targets and assure that future growth and impervious cover is compatible with the designated stream classification for each sub-watershed.
- Step 6 Adopt specific stream protection strategies for each sub-watershed (including, but not limited to, watershed or site limits on impervious cover, BMP selection criteria, stream buffers, land acquisition or other protection measures).
- Step 7 Incorporate any management priorities that may arise from larger watershed planning efforts (e.g., at the scale of watershed, sub-basin, or basin).
- Step 8 Implement long-term monitoring and enforcement programs to provide management feedback and assess whether the stream management strategies are achieving stream quality goals set for each sub-watershed. Specific examples of stream protection strategies from watershed-based zoning.

### **Protection of Sensitive Areas**

Sensitive areas such as wetlands, flood plains, steep slopes, critical habitats, shorelines and mature forests can and should be protected through the development, adoption and enforcement of ordinances that prevent development in these areas. Ordinances should describe how each area will be delineated onsite and what protective measures will be taken during all stages of any development process. Additionally, it is a good idea to establish a set of performance criteria to protect these areas.

### **Establishment of Buffer Networks**

There are a number of reasons for creating urban riparian forests or urban stream buffers. In both residential and commercial areas, runoff can contain fertilizers, herbicides, pesticides and other pollutants that can be filtered out by plant roots and broken down by microorganisms and ultimately help add and maintain biodiversity in the urban and community environment.

## **Benefits of Urban and Community Riparian Forests and Stream Buffers**

The buffer's primary value is physical protection of the stream channel from future disturbance or encroachment. A network of buffers acts as a right-of-way for a stream and functions as an integral part of the stream ecosystem but also provides many additional benefits. Benefits are amplified when the streamside management zone is kept in a forested condition. One of the most important benefits of urban and community streamside buffers is their potential ability to remove harmful pollutants from urban storm-water runoff. On the basis of performance data from related vegetative systems, it is possible to estimate the pollutant removal capacity of an urban riparian or stream buffer. A three zone buffer system like the one described below has the potential to achieve the following pollutant removal rates:

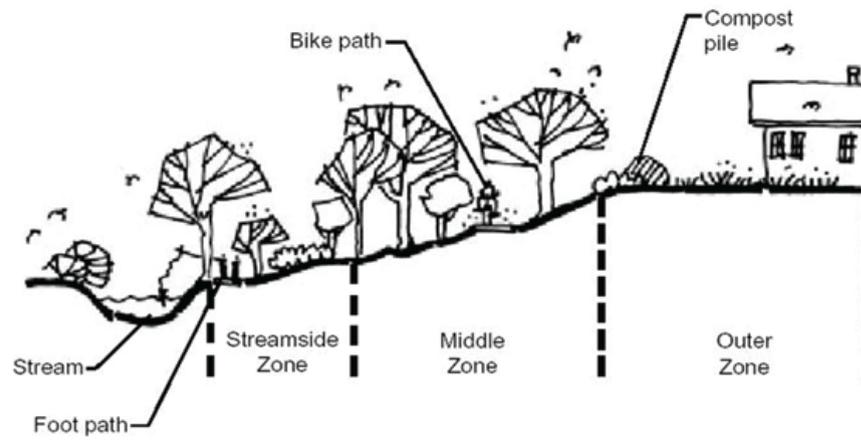
- sediment – 75%,
- total nitrogen – 40%,
- total phosphorus – 50%,
- trace metals – 60 to 70%, and
- hydrocarbons – 75%.

The ability of a particular buffer to remove pollutants, however, depends on many site specific factors. In the case of storm-water runoff treatment, stream buffer use should be restricted to those conditions where site-specific factors assure reliable pollutant removal.

## **Performance Criteria for Stream Buffers**

Planning, design and maintenance of buffers largely affects the ability of a buffer to realize its many benefits. Examples of practical performance criteria are listed below to govern buffer size, management, crossings and storm-water treatment. The 10 example criteria include:

1. Minimum total buffer width—According to a national survey, urban stream buffer sizes range from 20 to 200 ft. in width, with a median of 100 ft. In general, a minimum base width of at least 100 ft. (e.g., 3 to 5 mature trees wide on each side of the channel) is recommended for adequate stream protection.
2. Three-zone buffer system—Riparian or stream buffers are typically broken up into three zones; the Undisturbed Forest or Streamside Zone (Zone 1). Three zone urban buffer system. Source: MDEQ 1994 . The Managed Forest or Middle Zone (Zone 2) and the Runoff Control or Outer Zone (Zone 3), each of which performs a different function, has a different width, vegetative target, and management scheme (Figure 4-1)



Prescriptions are usually based on climatic zone, soil types, soil drainage characteristics, and available and desired tree and shrub species. As an example, on a poorly drained site in the South, recommendations may call for:

- Zone 1 river birch and black willow for bank stabilization,
- Zone 2 cherrybark oak and loblolly pine as filtering mechanisms, and
- Zone 3 maidencane and gray dogwood for grass and shrub runoff control.

For prescriptions on various soil types and drainage capacities and planting recommendations for urban riparian forests in the South see Appendix C.

3. Pre-development vegetative target – Generally, the vegetative target should be based on the natural vegetative community present in the floodplain, as determined from reference riparian zones.
4. Buffer expansion and contraction–The average width of Zone 2 can be expanded to include:
  - the full extent of the 100-year floodplain,
  - all undeveloped steep slopes (greater than 25%),
  - four additional feet of buffer for each 1% increment of slope above 5%, and
  - any adjacent delineated wetlands or critical habitats.

The buffer can also be contracted to accommodate unusual or historical development patterns, shallow lots, stream crossings, or storm-water ponds.

5. Buffer delineation – Three key decisions must be made when delineating buffer boundaries.
  - At what mapping scale will streams be defined? The traditional scale is the blue lines present on the United States Geological Service (USGS) 7.5 minute quadrangle maps 1:24,000 (1in=2,000 ft.).
  - Where does the stream begin and the buffer end? Generally, the stream origin is the point where an intermittent stream forms a distinct channel.
  - From what point should the inner edge of the buffer be measured? Inner edge can be measured from the centerline of small first- or second-order streams and from the top of each stream bank for third and higher order streams.
6. Buffer crossings – Provisions must be made for linear forms of development that must cross the stream or buffer such as roads, bridges, fairways, underground utilities, enclosed storm drains, or outfall channels. Performance criteria such as crossing width, crossing angle, crossing frequency and crossing elevation should be used to minimize impact to the continuity of the buffer network and fish passage.
7. Storm-water runoff – Buffers can be an important component of the storm-water treatment system at a development site. This role is discussed later in the Section “Treatment of Storm-water Runoff.”
8. Buffers during plan review and construction – During each stage of the development process, limits and uses of stream buffer systems should be well-defined.
9. Buffer education and enforcement – Creating high buffer visibility and encouraging greater buffer awareness and stewardship among adjacent residents will help protect the integrity of a buffer system. Steps that will aid in increasing visibility and awareness include:
  - marking buffer boundaries with permanent signs that describe allowable uses,
  - educating buffer owners about benefits and uses of buffers with pamphlets, stream-walks, and meetings with homeowners associations,
  - ensuring that new owners are fully informed about buffer limits/uses when property is sold or transferred,
  - engaging residents in a buffer stewardship program that includes reforestation and backyard “buffer-scaping” programs, and
  - conducting annual buffer-walks to check on encroachment.

10. **Buffer flexibility**—Incorporating several simple measures into buffer ordinances, such as maintaining buffers in private ownership, buffer averaging and density compensation, variances and conservation easements will help alleviate concerns that buffer requirements could represent an uncompensated taking of private property.

### **Ordinances for Stream Buffers**

To better utilize stream buffers as specific planning tools to protect stream quality and aquatic habitat, ordinances specifying the size and management of the stream buffer should be drafted. The model ordinance provided in Appendix C includes 10 sections that provide suggested language or technical guidance to create the most effective stream buffer zones possible. While much of the model is based on Baltimore County, Maryland's regulations for the water quality, stream, wetland and floodplain protection, additional features and language have been added in certain sections to enhance the protective functions of the proposed stream buffer.

The language in the sample model ordinance is only intended to provide suggestions for possible wording of a community's own buffer regulation; it is not meant to be adopted word-for-word. Local situations and concerns will dictate what modifications of the ordinance language will be required. In areas with coastal and estuarine habitats, location- and vegetation specific language should be added. Coastal and estuarine areas will also want to address important offshore features such as shellfish beds and migratory bird nesting areas that are influenced by nutrient and pollutant runoff. Additionally, regions may adjust buffer width sizes according to rain fall amounts or other climatic variables. Finally, political situations within a community may also influence the final choice of buffer width standards, making flexibility in stream buffer zone establishment very important. While the wording of buffer regulations is flexible, several features were determined to be integral in developing the most effective ordinance possible:

- The establishment of a minimum stream buffer width. A width of at least 100 feet is recommended to recognize all the benefits that the stream buffer can provide.
- The creation of a three-zone buffer system with the functions, widths, vegetative targets, and management schemes for each zone explained in detail.
- Language that creates the ability to expand the buffer to include the 100-year floodplain, steep slopes and any adjacent delineated wetlands or critical habitats.
- A thorough explanation of the limits and uses of the stream buffer system and requirements expected for any development plan during the entire development process—from initial plan review through construction.
- A system to permanently mark the buffer, both physically on-site, and in the land records, should be enacted.

- A designated management system for the buffer, detailing permitted and restricted uses within the buffer and an educational program that guarantees future residents know about the buffer.
- Any waivers or variances which may be granted regarding the buffer should be explained in detail to avoid legal challenges.
- Maintenance guidelines and enforcement procedures for buffer violations should be included. A strong buffer ordinance is only the first step to preserving stream buffers. Communities will also need an effective buffer program that includes the stream buffer performance criteria previously discussed to manage buffers and enforce buffer regulations. Additionally, during the construction phase, communities must make sure that the clearing and grading permit is well integrated with the forest buffer application. Following construction, programs educating citizens about the importance of the buffer and how to manage it, can help preserve the buffer's integrity.

## 7. Recommended Tree Species List

List of environmental characteristics & tolerances for tree species suitable for urban & community forestry environments in the Southeast from the Mississippi Urban & Community Forestry Management Manual by Amanda L. Husak & Dr. Stephen C. Grado.

Environmental Characteristics and Tolerances

Common Name	Latin Name	Native Tree to Mississippi	Growth Rate <sup>1</sup>	Average Life Span <sup>2</sup>	Net Effect on Air Quality <sup>3</sup>	Soil Moisture <sup>4</sup>	Drought Tolerances <sup>5</sup>	Preferred Soil pH <sup>6</sup>	Light Requirement <sup>7</sup>	Construction Tolerances/ Limitations <sup>8</sup>	Urban Tolerant Tree <sup>9</sup>
Ash, Green	<i>Fraxinus pennsylvanica</i>	X	F	M	0.09	W	H	sl ac-sl alk	FS	.	
Ash, White	<i>Fraxinus americana</i>	X	M	M	0.1	M	L	sl ac-sl alk	FS	M/IS	
Bald cypress	<i>Taxodium distichum</i>	X	M	L	0.032	M	H	ac-sl alk	FS	G/	X
Beech, American	<i>Fagus gradifolia</i>	X	S	L	0.16	M	L	acidic	FS	P/A	
Birch, River	<i>Betula nigra</i>	X	F	M	0.117	M	L	acidic	PS	G/	
Birch, River 'Heritage'	<i>Betula nigra 'Heritage'</i>	X	F	M	n/a	M	L	acidic	PS	n/a	
Blackgum (Tupelo)	<i>Nyssa sylvatica</i>	X	S	M	-0.053	M	M	sl ac-sl alk	FS	G/	X
Boxelder	<i>Acer negundo</i>	X	F	S	0.036	W	M	adapt	FS	G/	
Catalpa, Southern	<i>Catalpa bignonioides</i>	X	F	S	0.014	M	M	sl ac-sl alk	FS	G/	
Cherry, Black	<i>Prunus serotina</i>	X	F	M	0.083	M	M	sl ac	FS	M/I	
Cottonwood, Eastern	<i>Populus deltoides</i>	X	F	M	-0.708	M	M	sl ac-sl alk	FS	G/	X
Crapemyrtle, Common	<i>Lagerstroemia indica</i>	X	F	M	0.004	M	H	ac-sl alk	FS	n/a	
Dogwood, Flowering	<i>Cornus florida</i>	X	M	M	0.021	M	L	ac-nu	PS	M/IP	
Dogwood, Flow. Pink	<i>Cornus florida var. rubra</i>	X	M	M	n/a	M	L	n/a	PS	n/a	
Elm, American	<i>Ulmus americana</i>	X	M	M	0.143	M	H	sl ac-sl alk	FS	M/P	
Elm, Slippery	<i>Ulmus rubra</i>	X	F	M	0.086	M	M	sl ac-sl alk	FS	M/P	
Elm, Winged	<i>Ulmus alata</i>	X	M	M	0.034	M	H	sl ac-sl alk	FS	G/	X
Hickory, Bitternut	<i>Carya cordiformis</i>	X	F	L	0.069	M	L	acidic	FS	P/S	
Hickory, Mockernut	<i>Carya tomentosa</i>	X	S	L	0.059	D	H	sl ac	FS	MP/S	
Hickory, Pignut	<i>Carya glabra</i>	X	S	L	0.058	M	H	sl ac	FS	M/S	
Hickory, Shagbark	<i>Carya ovata</i>	X	S	L	0.064	M	M	sl ac	FS	P/S	
Hickory, So. Shagbark	<i>Carya ovata var. australis</i>	X	S	L	n/a	M	M	sl ac	FS	n/a	
Holly, American	<i>Ilex opaca</i>	X	S	L	0.013	M	H	acidic	PS	G/	X
Holly, Deciduous	<i>Ilex decidua</i>	X	M	S	n/a	W	H	ac-alk	PS	G/	
Honeylocust	<i>Gleditsia triacanthos</i>	X	F	S	0.009	M	H	sl ac-sl alk	FS	G/	X
Hophornbeam, Am.	<i>Ostrya virginiana</i>	X	S	M	0.032	M	H	ac-alk	SH	M/S	X
Hornbeam, A.	<i>Carpinus caroliniana</i>	X	S	M	0.009	M	M	sl ac-sl alk	PS	M/SC	
Magnolia, Cucumber	<i>Magnolia acuminata</i>	X	F	M	n/a	M	L	acidic	PS	M/I	
Magnolia, Southern	<i>Magnolia grandiflora</i>	X	M	L	0.002	M	M	acidic	FS	M/I	
Magnolia, So.	<i>Magnolia grandiflora</i>	X	S	M	n/a	M	L	acidic	FS	n/a	
Magnolia, Sweetbay	<i>Magnolia virginiana</i>	X	F	M	n/a	W	L	acidic	PS	G/	
Maple, Red	<i>Acer rubrum</i>	X	F	L	0.084	M	L	sl ac	FS	G/	
Maple, Silver	<i>Acer saccharinum</i>	X	F	S	0.084	M	H	ac	FS	P/A	
Maple, Florida Sugar	<i>Acer barbatum</i>	X	M	M	n/a	M	H	ac	FS	M/IS	X

### Environmental Characteristics and Tolerances

Common Name	Latin Name	Native Tree to Mississippi	Growth Rate <sup>1</sup>	Average Life Span <sup>2</sup>	Net Effect on Air Quality <sup>3</sup>	Soil Moisture <sup>4</sup>	Drought Tolerances <sup>5</sup>	Preferred Soil pH <sup>6</sup>	Light Requirement <sup>7</sup>	Construction Tolerances/ Limitations <sup>8</sup>	Urban Tolerant Tree <sup>9</sup>
Maple, Sugar	Acer saccharum	X	M	L	0.1	M	M	sl ac-sl alk	PS	pm	
Maple, Sugar 'Legacy'	Acer saccharum 'Legacy'	X	F	L	0.1	M	M	sl ac-sl alk	PS	n/a	
Mulberry, Red	Morus rubra	X	F	S	0.099	M	H	sl ac-sl alk	FS	G/	
Oak, Cherrybark	Quercus falcata	X	M	L	n/a	M	M	ac	FS	G/	
Oak, Diamond Leaf	Quercus laurifolia	X	M	L	n/a	M	M	ac-sl alk	FS	G/	
Oak, Northern Red	Quercus rubra	X	F	L	0.503	M	M	ac-sl ac	FS	GM/S	
Oak, Nuttall	Quercus nuttalli	X	M	L	n/a	M	M	ac	FS	n/a	
Oak, Overcup	Quercus lyrata	X	M	L	0.159	W	M	ac-sl alk	FS	G/	
Oak, Post	Quercus stellata	X	M	L	0.327	D	H	ac-sl alk	FS	G/	
Oak, Scarlet	Quercus coccinea	X	M	L	0.592	D	H	sl ac	FS	G/	
Oak, Shumard	Quercus shumardii	X	F	L	0.265	M	H	ac-alk	FS	G/	
Oak, Southern Red	Quercus falcata	X	M	L	0.576	M	H	ac	FS	G/	
Oak, Swamp Chestnut	Quercus michauxii	X	M	L	0.544	M	M	n/a	FS	G/	
Oak, Water	Quercus nigra	X	F	M	0.451	M	M	ac-sl alk	FS	G/	
Oak, White	Quercus alba	X	S	L	0.348	M	M	acidic	FS	GM/S	
Oak, Willow	Quercus phellos	X	F	L	0.314	M	H	acidic	FS	GM/S	X
Pecan	Carya illinoensis	X	S	M	0.088	M	L	sl ac-sl alk	FS	mg	
Persimmon, Common	Diospyros virginiana	X	M	S	0.058	M	H	ac-alk	FS	G/P	X
Pine, Loblolly	Pinus taeda	X	F	M	0.016	M	M	acidic	FS	G/	
Pine, Longleaf	Pinus palustris	X	M	L	0.01	M	H	ac-sl alk	FS	GM/C	
Pine, Shortleaf	Pinus echinata	X	M	L	0.008	M	H	ac	PS	GM/P	
Pine, Slash	Pinus elliotii	X	F	M	0.01	M	M	ac-sl alk	FS	G/	
Plum, Chickasaw	Prunus angustifolia	X	F	M	-0.415	M	H	sl ac-sl alk	FS	pg	X
Poplar, Yellow	Liriodendron tulipifera	X	F	M	-0.417	M	H	ac-alk	FS	n/a	
Redbud, Eastern	Cercis canadensis	X	M	L	0.171	M	L	sl ac	FS	P/IS	
Redbud, E. White	Cercis canadensis (alba)	X	F	S	0.012	M	M	ac-sl ac	PS	M/S	
Redcedar, Eastern	Juniperus virginiana	X	M	S	n/a	D	H	ac-sl ac	FS	n/a	
Sassafras	Sassafras albidum	X	F	S	0.022	M	M	ac-sl alk	FS	G	
Sourwood	Oxydendrum arboreum	X	M	S	n/a	D	H	sl ac-sl alk	FS	n/a	X
Sweetgum	Liquidambar styraciflua	X	M	M	0.118	M	M	ac	FS	G/l	
Sycamore	Platanus occidentalis	X	M	M	n/a	M	L	ac-sl alk	FS	n/a	
Willow, Black	Salix nigra	X	M	S	n/a	M	M	ac-alk	FS	G/	

## **Species Recommendation by Jim Heinzl, Certified Arborist #SO – 5803A**

Please try to not get carried away with the crepe myrtles. While being a great tree for under power wires and also beautiful, there are many other trees that can work well for you.

The American holly, while being a taller and fuller tree, is also an evergreen tree so it offers the green color year around. Redbud is also a very beautiful deciduous tree with pink or white flowers in the spring and turning golden yellow in the fall. The fringe tree would also work under power lines as it grows only to 20' tall. It offers clouds of fragrant white flowers in the fall that turn into clusters of blur-purple fruits in the fall. The fruits are a big hit with the birds. The hawthorn produces sprays of white flowers in early spring. The bees and butterflies love them. In late summer and fall it attracts birds with its small red fruits. Then turns an orange red in the autumn. It grows to about 25'.

I am not trying to overwhelm you but instead I am hoping to show you that you have a variety to chose from. All the trees I have mentioned are relatively small trees.

**Jim Heinzl**  
**Certified Arborist #SO-5803A**  
**GreenScapes Property Management LLC**  
**110 Driftwood Drive**  
**Long Beach, MS 39560**  
**228.493.3223**  
[jim@greenscapesms.com](mailto:jim@greenscapesms.com)

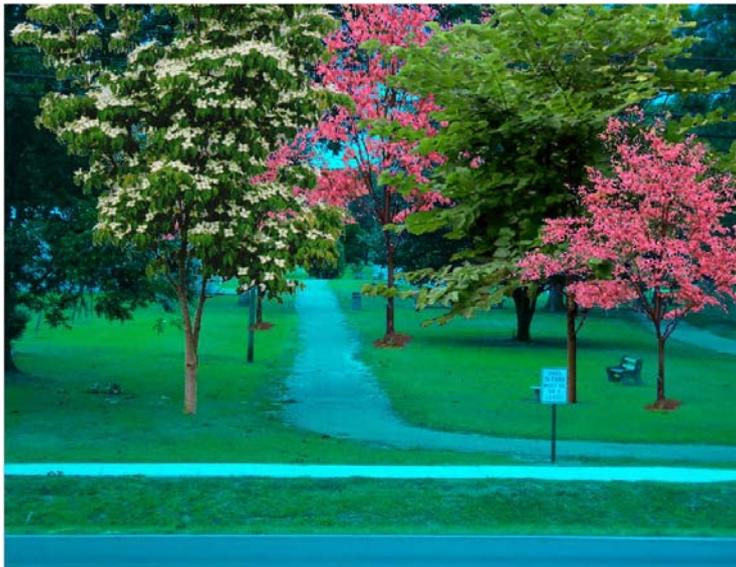
## 8. Photographic Virtual Makeovers- Donna Yowell, MUFC



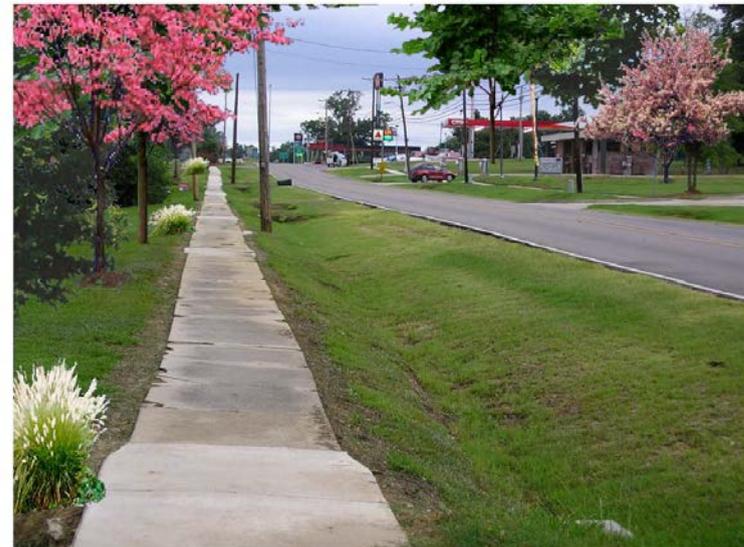
Create Planter Boxes between parking and sidewalks for small tree planting.



**Terry Park**  
Add more large trees (avoid conflict with utilities) for shade and add smaller blooming trees for color.



Develop a campaign to encourage homeowners and business owners to place large canopy trees where possible and small, flowering trees in small spaces, avoid utility conflict.  
Place native bush grasses randomly to create a welcoming sidewalk. Create a landscape from I-55 to Depot to bring in business. Work with HWY commissioner to plant a similar planting project at the Terry exit, both sides.



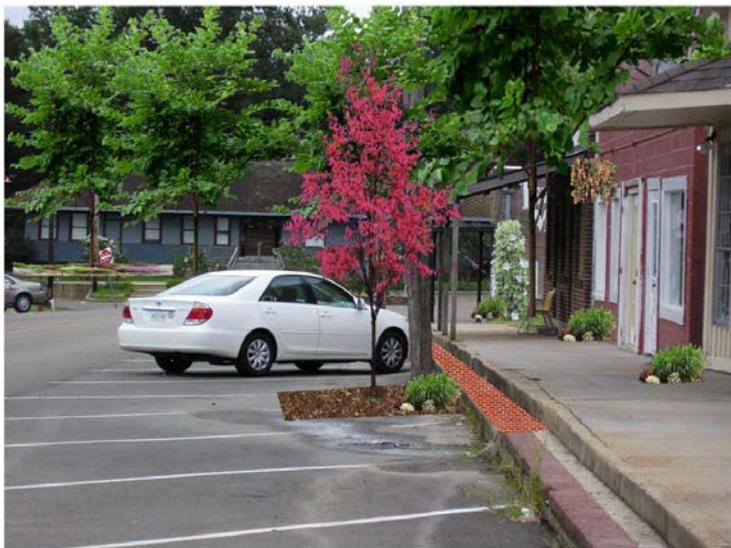


Use empty lot for trees to enhance downtown and bring in more business but also for a city gathering area, events, etc. (Even if temporarily)





Develop planting spaces along Main Street for small trees. Add trees to any open areas, avoid utility conflict, add planter boxes at store fronts, climbing plants, large trees in front of Depot, hanging baskets. Prune Crepe Myrtles to look like trees (not shrubs). Place brick overlay along lower level of sidewalk.



Merchants can add two planter boxes and two hanging baskets at store front.  
Merchants and homeowners should add trees only where there is adequate space and no utility conflicts – right tree, right place.  
City could add planting space and one small tree in no park zones. Brick sidewalk enhancements.



## **9. Tree Ordinance and Recommendations:**

# **"Guide to Writing a City Tree Ordinance"**

Model Tree Ordinances for Southern Communities

[Green Laws Home Page](http://www.greenlaws.lsu.edu) [www.greenlaws.lsu.edu](http://www.greenlaws.lsu.edu)

Prepared by  
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This project was supported by an America the Beautiful Grant to the Louisiana Nursery And Landscape Association (formerly Louisiana Association of Nurserymen) from the Louisiana Department of Agriculture.

### **INTRODUCTION**

Who is responsible for nature in the city? The answer of course is obvious, we are! But often the subtle importance of nature to city livability is overlooked for seemingly more important urban issues such as employment, city services and economic growth.

Environment, we learn from recent research on the subject, is important to all of the above critical urban issues. In fact, recent scientific study indicates that trees do much to make city life more enjoyable thereby increasing employment opportunities, expanding economic growth potential and reducing the cost of energy consumption or other city services. Managing nature in the city requires new legislation.

This information has been prepared to assist any Mississippi city, town, village, planning board, public agency or citizen's group who desire to establish a community "tree management ordinance." Managing city trees helps to manage nature in the city while at the same time improving the visual quality of the landscape. Tree management reduces urban heat build-up, provides critical space for urban wildlife, helps preserve viable topsoil resources, filters water resources and cleans the air. In addition, the urban tree canopy and associated natural resources can be effectively managed by dedicated citizens who look to the future of the community as a place where their children's children may live in harmony with nature.

Two models of a tree management ordinance are contained within this brochure. The Louisiana Association of Nurserymen hope you will find them useful in making your community a better place to live. Both model tree management ordinances are related and closely parallel each other. One model is designed for larger communities while the other is designed for smaller towns and villages where more informality is the rule. The large community version is somewhat more complex but covers tree management issues in significant detail.

Both model ordinances can be used as a starting point to draft a local ordinance. Text can be added or text can be deleted to serve the purposes of each community. Either ordinance can be used in any community. With a little adjustment to the text, these models can be used in nearby states with similar growing conditions or similar social, political needs.

The models contain three Parts. These parts are based upon the accepted structure of a landscape ordinance contained within the publication "Guide to Writing a Landscape Ordinance," previously published by the Louisiana Association of Nurserymen.

The first part of the model tree ordinance states the "contextual conditions" of the ordinance. What is being drafted and under what circumstances? This section places the ordinance in its proper relationship to the community and to legal codes in effect. Sections one (1) and two (2) are contextual in nature.

The second part of the model tree ordinance consists of the "technical requirements" of this ordinance. These sections create a Commission, establish the town/city arborist and promulgate rules and requirements to manage city trees. Sections three (3) through thirteen (13) set forth the technical requirements of this ordinance.

The final sections of this model, Sections fourteen (14) through eighteen (18) deal with the "administrative components" of the ordinance. In these sections the reader will find text that describes how the ordinance will be administered. Enforcement, penalty, appeals, administrative guidelines, conflicts and effective date of the ordinance are typical administrative aspects which are set forth below.

The outline presented here is based in part upon contemporary provisions and language from tree ordinances and codes collected from throughout the country. Consequently the outline ordinances are comprehensive in scope, but limited, in specific detail and reflects state of the art knowledge in the technical aspects of tree ordinances. Additional detail and specific community needs may be incorporated where necessary.

Any community wishing to use this ordinance as a model may do so. It is suggested that any one wishing to use these models should consult with local experts such as an attorney, arborist, forester, horticulturist or landscape architect.

Because legal, political and technical aspects of this outline ordinance may vary from community to community, these experts can help adapt the models to local conditions.

Both of the model ordinances follow this general outline. This outline places contextual, technical and administrative components of the tree management ordinances in a proper and suitable order that makes reading and understanding the ordinance a much easier task.

## OUTLINE TO THE MODEL TREE ORDINANCE

### **I Contextual Conditions**

Section 1 Short Title  
Section 2 Purpose, Intent & Authority  
Section 3 Definitions

### **II Technical Requirements**

Section 4 Establishment of a Tree Board of Commission  
Section 5 Authority of the Tree Board of Commission  
Section 6 Appointment & Qualifications Of The Town Arborist  
Section 7 Duties Of The Town Arborist  
Section 8 Authority Of The Town Arborist  
Section 9 Community Tree Plan  
Section 10 Permits Required (Tree Preservation, Protection and Planting)  
Section 11 Trees On Private Property  
Section 12 Trees On Public Property

Section 13 Interference With The Town Arborist  
Section 14 Protection of Public Trees, Tree Abuse  
Section 15 Placing Materials On Public Property

### **III Administrative Components**

Section 16 Enforcement, Penalty And Appeals  
Section 17 Administrative Guidelines and Development Standards  
Section 18 Conflicts  
Section 19 Severability  
Section 20 Effective Date

## **Model for a Large Community**

This version of the Model Tree Management Ordinance is suitable for larger communities that have existing administrative departments such as Planning & Zoning Commissions, Parks Departments, or multi-professional Public Works Departments. This version is more formal in nature and more detailed in extent. This model will work well in urban and suburban areas where government structure is already working to provide for community needs.

This ordinance establishes a larger Tree & Landscape Commission of appointed citizens who are charged with developing policy for managing public trees and communicating to others the importance of trees in the community. The TLC created by this ordinance is largely educational, but some administrative tasks would be assigned by the City Administration in keeping with the chartering ordinance and the Bylaws adopted by the city.

The Commission under this model holds regular town meetings, prepares an annual tree management plan and undertakes programs to improve the town tree canopy. This model calls upon the Commission to develop programs to involve the community, organizations and families in tree preservation, planting and tree care. City Commissions should become prime sponsors of tree planting programs in town parks, school yards, cemeteries and other public places.

A City Forester trained in urban forestry, arboriculture, horticulture, landscape architecture or closely related fields is employed by the community to undertake day to day tree management responsibilities. Written permits for planting, maintenance or removal of trees from public property are obtained through the City Forester's office. This ordinance may be enacted by organizing a tree support group, holding public hearings and a vote of the city or town council. It would also prove useful for any city using this model to also consider the employment of a city landscape architect who could work with the Tree & Landscape Commission to advise them on design and construction as it applies to trees plantings and tree preservation activities within the community.

# **STANDARD CITY TREE MANAGEMENT ORDINANCE**

## **LARGE COMMUNITY MODEL**

\_\_\_\_\_  
**CREATION OF A COMMISSION TO REGULATE THE PLANTING, MAINTENANCE, AND REMOVAL OF TREES,  
SHRUBS AND OTHER LANDSCAPE MATERIALS ON PUBLIC LAND IN THE CITY OF**  
\_\_\_\_\_, STATE OF MISSISSIPPI.

**ORDINANCE NO.** \_\_\_\_\_

**AN ORDINANCE TO MANAGE CITY TREE RESOURCES BY REGULATING THE PLANTING, MAINTENANCE, AND  
REMOVAL OF TREES ALONG PUBLIC STREETS, IN PARKS, AND ON OTHER CITY OWNED PROPERTY:  
ESTABLISHING A COMMISSION AND CREATING THE OFFICE OF CITY ARBORIST AS THE AGENCY  
PRESCRIBING REGULATIONS RELATING TO THE PLANTING, MAINTENANCE, AND REMOVAL OF TREES,  
SHRUBS AND OTHER LANDSCAPE MATERIALS ON PUBLIC LAND: PROVIDING FOR THE ISSUING OF  
PERMITS FOR THE PLANTING, MAINTENANCE, AND REMOVAL OF TREES ON PUBLIC LAND: PROVIDING FOR  
THE PRUNING AND REMOVAL OF TREES ON PUBLIC AND PRIVATE PROPERTY WHICH ENDANGER PUBLIC  
SAFETY: AND PROSCRIBING PENALTIES FOR VIOLATION OF THESE ARTICLES.**

**BE IT ORDAINED BY THE COUNCIL OF THE CITY OF \_\_\_\_\_, STATE OF  
MISSISSIPPI.**

**Section 1 - Short Title** - This Ordinance shall be known and may be cited as the TREE ORDINANCE, for the City of \_\_\_\_\_.

**Section 2 - Purpose, Intent and Authority**

- A. The purpose of this Chapter is to set minimum standards to protect, preserve or plant trees to enhance the City's environmental, economic and aesthetic resources consistent with the goals of the *Comprehensive Plan*, and zoning policy thereby promoting the public health, safety and general welfare of the citizens and contributing to the quality of life by encouraging preservation of the urban forest canopy and its various resources to ensure and sustain development practices.
- B. It is the intent of this ordinance to promote sustainable development practices in relation to trees and forested areas in order to properly plan development, use and preserve native plant species, minimize the destruction of wooded wetlands, assist in the management of on-site storm water flows and water quality enhancement, provide beneficial wildlife habitat and meet minimum urban forest canopy requirements as set forth below.
- C. Further, the standards and requirements of this Chapter seek to promote the preservation, protection and enhancement of nature and nature's unique features with particular emphasis on trees, the urban forest canopy and vegetative cover of the land.
- D. These regulations are enacted to protect the health, safety and welfare of citizens in the following ways:
  - a) Maintaining and protecting property values;
  - b) Providing an acceptable degree of transition between abutting uses;
  - c) Providing appropriate barriers, landscape buffers, visual screens and relief from traffic, noise, heat, glare, and the spread of dust and debris;
  - d) Conserving and extending the water supply and natural resources through the implementation of water-efficient sustainable landscape practices;
  - e) Enhancing the visual and aesthetic appearance of the community;
  - f) Preserving terrain native habitat and vegetation where possible;
  - g) Protect and preserve native trees of a certain species and size and mitigate the removal of other native trees over eight (8) inches DBH caliper;
  - h) Minimize energy use with properly located canopy trees;
  - i) Reduce urban pollutant movement to natural water ways by using storm water BMP's.

**Section 3 - Definitions.**

For the purpose of this Ordinance the following terms, phrases, words, and their derivations shall have the meaning given herein.

Community Tree Plan shall mean a written document that guides the work of the Commission and envisions a long range plan for the preservation and improvement of the community urban forest. The Community Tree Plan may contain such data as deemed necessary by the Commission to carry out its legal mandate.

City is the City, Town, Village, or otherwise designated area or political unit of \_\_\_\_\_, State of Mississippi.

Tree Department is the department of "Parks and Street Trees", "Parks and Forestry", "Forestry Department", "Street Trees", or other designated department of the municipality under whose jurisdiction park and / or street trees fall.

City Arborist is qualified ISA certified arborist designated official of the city assigned to carry out the enforcement of this Ordinance.

Person is any person, firm, partnership, association, corporation, company, or organization of any kind.

Street or Highway means the entire width of every public way or right-of-way when any part thereof is open to the use of the public, as a matter of right, for purposes of vehicular and pedestrian traffic.

Park shall include all public parks having individual names.

Public Places shall include all grounds owned by the city or other properties owned by State of Federal Government in which the Commission has established a cooperative arrangement for tree care.

Property Line shall mean the outer edge of a street or highway right of way (R.O.W).

Treelawn (R.O.W edge) is that part of a street or highway, not covered by sidewalk or other paving, lying between the property line and that portion of the street or highway usually used for vehicular traffic.

Private Trees are trees of the urban forest growing on private property. Private trees are an important part of the urban forest and within the purview of the City.

Public Trees shall include all shade and ornamental trees now or hereafter growing on any street or on any public land where otherwise indicated.

Large Trees known as Class A trees are designated as those attaining a height of forty-five (45) feet or more with a mature spread of 40 feet or more. This is the normal native canopy tree species of the community.

Medium Trees known as Class B trees are designated as those attaining a height of thirty (30) to forty-five (45) feet with a mature spread of 30 feet or more. These trees are normally used as landscape trees, garden trees or open space trees in private gardens, parks, public places and commercial districts..

Small Trees known as Class C trees are designated as those attaining a height of twenty (20) to thirty (30) feet with a mature spread of 20 feet or more. These are small trees with small root structures for use in areas of high concentration of pavement such as parking lots or pedestrian ways.

Principal Thoroughfare shall mean major cross town streets upon which trucks are permitted.

Property Owner shall mean the person owning such property as shown on the Municipal Plat Maps.

Urban Forest shall mean the collection of trees, shrubs, other vegetation and associated natural features that make up the urban tree canopy and its growing zone.

#### **Section 4 - Establishment of a Tree & Landscape Commission.**

There shall be created a commission to be known and designated as "Commission."

The Commission shall be composed of nine (9) knowledgeable citizens, a majority of whom shall be residents of \_\_\_\_\_. Members shall be knowledgeable citizens including citizens with experience, formal training or knowledge of: tree care, gardening, forestry, landscape architecture, horticulture, public utilities, civil engineering, architecture, contracting, arboriculture or planning.

1. Six (6) voting members shall be appointed by the Mayor with approval of the City Council. The seventh (7th) voting member shall be the City Arborist, the eighth (8th) member shall be the Superintendent of the Department of Parks, and ninth (9th) member shall be the Director of Public Works, The latter two shall all be ex-officio members.

2. The six (6) members initially appointed by the Mayor shall be appointed as follows: two (2) for two (2) years; two (2) for three (3) years, and two (2) for four (4) years, and serve until their successors are duly appointed and approved by the Council.
3. Successors to those members appointed by the Mayor shall, thereafter be appointed for terms of four (4) years. Vacancies caused by death, resignation, or otherwise, shall be filled for the unexpired term in the same manner as original appointments are made.
4. All members of the Commission shall serve without pay.

### **Section 5 - Authority of the Commission.**

The duties of the "Commission" shall be as follows:

- A. To study the urban forest including problems involving the city tree population, determine needs, compose and annually review a Community Tree Plan and seek ways to implement needed work.
- B. To recommend to the proper authority, streetscape landscape designs illustrating type and kind of trees to be planted upon each municipal street or parts of municipal streets or in parks or other public lands as is designated in the Community Tree Plan.
- C. To assist the properly constituted officials of the city as well as citizens and community groups, in the dissemination of news and information regarding the selection, planting, and maintenance of trees within the corporate limits, whether they be on private or public property.
- D. To provide regular and special meetings at which time the subject of the urban forest may be discussed by the members of the Commission, officers and personnel of the city and its several divisions, and all others interested in a community tree program.
- E. Within a reasonable time after the appointment of the Commission, the Commission shall meet and organize by the election of a chairman, vice-chairman, and standing committee chairs. The Commission shall recommend to the Mayor and City Council, who will appoint, a City Arborist who will act as secretary and conduct the daily affairs of the Commission.
- F. A majority of voting members shall constitute a quorum for the transaction of business. Any member who regularly fails to attend scheduled meetings will be subject to removal by the Chairman and will be replaced for the balance of his/her term by the appointing authority.
- G. The Commission shall provide for the adoption of rules and procedures and for the holding of regular and special meetings as said Commission shall deem advisable and necessary in order to perform the duties set forth. A journal of proceedings and activities is to be recorded. The Commission shall adopt Bylaws to manage the public service they are charged with carrying out on behalf of citizens.

- H. The Commission shall meet and hold public hearings at least six times a year at a public place and time of their choosing. The meeting shall be open to the public.
- I. The Commission shall propose such legislation as may be needed to pursue the purposes for which the Commission was created.
- J. The Commission shall review design or construction plans for public or private improvements that may call for the removal or planting of trees.
- K. The Commission may assess fines for the unlawful removal of trees.
- L. The Commission may engage in any other lawful activity in pursuit of the mission of this commission which may benefit the urban forest including such activities as:
  - 1. Apply for Tree City Status with the National Arbor Day Foundation
  - 2. Conduct seminars and public education programs
  - 3. Plan and coordinate an annual Arbor Week Observance
  - 4. Develop a community tree bank
  - 5. Develop of a botanical garden
  - 6. Develop a community forest preserve(s)
  - 7. Provide technical advise and assistance to developers, builders, contractors, public utilities, public agencies, homeowners and community groups in the selection of tree species to be planted or naturally occurring trees to be protected during the development of wooded areas.
  - 8. Organize community tree planting projects.
  - 9. Seek grant money, public funding and private contributions to further the work of the Commission

**Section 6 - Appointment & Qualifications of the City Arborist.**

A City Arborist shall, where possible, be appointed from a Civil Service roster established by competitive examination and interview by the Commission, or where Civil Service does not exist, by interview given by the Commission.

- 1. He/she shall be a person skilled and trained in the arts and sciences of urban forestry, and shall hold a college degree or its equivalent in urban forestry, landscape architecture, horticulture, forestry, arboriculture; or other closely related field.
- 2. In Mississippi, where there is a Mississippi Horticulture Commission, he/she shall have passed a state examination and hold a valid license as an arborist, landscape architect or landscape contractor. He/she shall have had at least three (3) years experience in municipal shade tree work or its equivalent.

3. Upon satisfactory completion of a six (6) months probationary period he/she shall hold office as long as he/she satisfactorily performs the duties of the office.
4. Salary - The City Arborist shall receive a salary commensurate with his training and experience as full compensation for all services rendered.

### **Section 7 - Duties of the City Arborist.**

The City Arborist shall have the following duties.

- A. The City Arborist shall have the authority to promulgate rules and regulations, including arboricultural specifications governing the planting, maintenance, removal, fertilization, pruning, and bracing of trees on the streets or other public sites in the municipality, and shall direct, regulate, and control the planting, maintenance, and removal of all trees growing now or hereafter in any public area of the municipality.
- B. He/she shall cause the provision of this Ordinance to be enforced. In the absence of the City Arborist these duties shall be the responsibility of a qualified alternate designated by the Commission.
- C. He/she shall review planting plans for all projects on public property that may impact existing vegetation or propose new plantings that may affect public safety.

### **Section 8 - Authority of the City Arborist.**

- A. The City Arborist shall report to the Commission on a monthly basis and shall be in attendance at all regular and special meetings of the Commission, Commission Sub-committees or other community meetings as designated by the Chairman.
- B. The City Arborist shall record all activities of the Commission or subcommittees of the Commission.
- C. The City Arborist shall have the authority and jurisdiction of regulating the planting, maintenance, and removal of trees on streets and other publicly owned property to insure safety or preserve the aesthetics of such public sites.
- D. The City Arborist shall have authority over city tree crews or staff as required to pursue the work of the Commission.
- E. The City Arborist shall advise all other city work crews on matters relating to planting, maintenance, or removal of trees on public lands as requested by the various Department heads.
- F. Supervision. The City Arborist shall have the authority and it shall be his duty to supervise or inspect all work done under a permit issued in accordance with the terms of this Ordinance.
- G. Condition of Permit. The City Arborist shall have the authority to affix reasonable conditions to the granting of a permit in accordance with the terms of this Ordinance.

## **Section 9 - Community Tree Plan.**

Community Tree Plan. The City Arborist shall have the authority to formulate a Community Tree Plan with the advice of consultants, city agencies, public hearings, and approval of a Commission.

- A. The Community Tree Plan shall include but not be limited to the goals and mission of the Commission, an inventory of resources, needed work, associated cost and time schedules for such work and relevant information such as activities of the Commission, standard tree maintenance and planting specifications and permit application procedures.
- B. The Community Tree Plan following review and acceptance by the Commission shall be sent forward to the Mayor and City Council with recommendations for action.
- C. The City Arborist shall consider all existing and future utility, public works and environmental factors when recommending improvement for each street, park and other public lands of the municipality.
- D. The City Arborist, with the approval of the Commission, shall have the authority to amend or add to the Community Tree Plan at any time.

## **Section 10 - Permits Required.**

The following permits are required for activities that effect the growth or health of plants.

- A. Planting Maintenance and Removal Permits
  1. No person shall plant, remove, maintain or disturb any tree or shrub on any street or municipal owned property without filing an application and procuring a permit from the City Arborist.
- B. Planting Permit.
  1. Application Data. When making an application for a planting permit the Applicant shall submit a landscape design which illustrates the number of trees or other plants to be planted; their location, grade, species, or variety of each plant; the method of planting; and such other information as the City Arborist shall find reasonably necessary to a fair determination of whether a permit should be issued.
  2. Proper Planting. Whenever any tree shall be planted on public land it shall be planted, fertilized, staked, watered and mulched in accordance with proper planting specifications issued by the City Arborist. All trees planted on public property under this ordinance must be replaced if they fail to survive three growing seasons.
  3. Improper Planting. Whenever any tree shall be planted in conflict with the provisions of this section, it shall be lawful for the City Arborist to have removed and the exact cost thereof shall be assessed to the owner as provided by law.

C. Maintenance Permit.

1. Application Data. When making an application for a maintenance permit the Applicant shall state the number and kinds of trees to be sprayed, fertilized, pruned or otherwise treated; the composition of the spray material to be applied; and such other information as the City Arborist shall require determining whether a permit should be issued.
2. The City Arborist shall annually issue area permits granting permission to public utilities to trim and maintain vegetation on public places. Non emergency trimming shall be done in accordance with standard arboriculture practices and nearby neighbors must be informed by posted door knob notices at least three weeks in advance.

D. Removal and Replacement Permit.

1. When making application for a tree removal permit the Applicant shall illustrate the number and kinds of trees to be removed, their size, locations, health/age condition and their method of removal and such other information as the City Arborist shall find reasonably necessary to a fair determination of whether a permit should be issued.
2. Wherever it is necessary to remove a public tree or trees from a treelawn (R.O.W edge) in connection with the paving of a sidewalk, or the paving or widening of the portion of an entrance drive from a street or highway used for vehicular traffic, the Applicant shall replant such trees or replace them. If site conditions prevent planting on treelawns, this requirement will be satisfied if any equivalent number of trees of the same size and species are planted in an attractive manner on adjacent public property.
3. The Applicant or property owner shall bear the cost of removal and replacement of all trees removed.

**Section 11 - Trees on Private Property.**

It shall be the duty of any person or persons owning or occupying real property bordering on any street upon which property there may be trees, to prune such trees in such a manner that they will not obstruct or shade the street lights, obstruct the passage of pedestrians on sidewalks, obstruct vision of traffic signs, or obstruct views of any street or alley intersection.

- The minimum clearance of any overhanging portion thereof shall be ten (10) feet over sidewalks, and twelve (12) feet over all streets except truck thoroughfares which shall have a clearance of sixteen (16) feet.

It shall be the duty of any person owning or occupying real property, bordering on any street, park or other public land, on which there may be trees that are diseased or insect infested, to remove, spray or treat such trees in such a manner that they will not infect or damage nearby public vegetation or cause harm to the community or citizens therein.

- The City Arborist may order trees on private land that cause obstructions, present insect or disease problem or otherwise present a danger to public health or safety be pruned, removed or treated.
- Notice to Prune Should any person owning real property bordering on any street fail to prune, remove or treat trees as herein above provided, the City Arborist shall order such person, within three (10) days after receipt of written notice, to so prune, remove or treat such trees.
- Order Required - The order required herein shall be served by mailing a copy of the order to the last known address of the property owner, by certified mail.
- Failure to Comply When a person to whom an order is directed shall fail to comply within the specified time, it shall be lawful for the municipality to prune, remove or treat such trees, and the exact cost thereof shall be assessed to the owner as provided by law in the case of special assessments.

### **Section 12 - Abuse of Public Trees.**

No person shall intentionally damage, cut, carve, transplant, or remove any tree; attach any rope, wire, nails, advertisements, posters, or other contrivance to any tree, allow any gaseous liquid, or solid substance which is harmful to such trees to come in contact with them; or set fire or permit any fire to burn when such fire or the heat thereof will injure any portion of any tree.

### **Section 13 - Interference with the City Arborist.**

No person shall hinder, prevent, delay, or interfere with the City Arborist or any of his assistants while engaged in carrying out the execution or enforcement of this Ordinance; provided, however, that nothing herein shall be construed as an attempt to prohibit the pursuit of any remedy, legal or equitable, in any court of competent jurisdiction for the protection of property rights by the owner of any property within the municipality.

### **Section 14 - Protection of Municipal Trees.**

All public trees shall be protected during construction.

- All trees on any street or other publicly owned property near any excavation or construction of any building, structure, or street work, shall be guarded with a good substantial fence, frame, or box. The "Construction Tree Guard" shall be not less than four (4) feet high and eight (8) feet square, or at a distance in feet from the tree trunk equal to the diameter of the trunk at breast height (D.B. H.) in inches, which ever is greater. All building material, dirt, or other debris shall be kept outside the Construction Tree Guard.

- No person shall change natural drainage, excavate any ditches, tunnels, trenches, or lay any drive within a radius of ten (10) feet from any public tree without first obtaining a written permit from the City Arborist.

#### **Section 15 - Placing Materials on Public Property.**

No person shall deposit, place, store, or maintain upon any public place of the municipality, any stone, brick, sand, concrete, or other materials which may impede the free passage of water, air, fertilizer to the roots of any tree growing therein. Sunlight to any public tree can not be permanently blocked by placement of materials without written authorization of the City Arborist.

#### **Section 16 - Enforcement, Penalty and Appeals.**

Any person, firm, or corporation violating or failing to comply with any of the provisions of this Ordinance shall be guilty of a misdemeanor, and upon conviction thereof shall be fined a sum no less than one hundred (\$100.00) dollars, nor more than five thousand (\$5,000.00) dollars, or may be imprisoned for a term not exceeding sixty (60) days, or both.

#### **Section 17 - Administrative Guidelines and Development Standards**

Permits may be applied for as set forth below.

- Application for permits must be made at the Office of the City Arborist not less than forty-eight (48) hours in advance of the time the work is to be done.
- Standards of Issuance. The City Arborist shall issue the permit provided for herein if, in his judgment, the proposed work is desirable and the proposed method and workmanship thereof are of a satisfactory nature. Permits shall be void if terms are violated.
- Notice of completion shall be given within five (5) days to the City Arborist for his inspection.
- Arboriculture specifications, horticultural standards and workman's qualifications are available from the City Arborist. These specifications, standards and qualifications are to be followed by any person or firm seeking a permit for tree work on public trees.
- Arboriculture specifications include accepted approved methods for maintenance and tree care including fertilization, feeding, insect control, disease prevention and storm damage preparation and repair.
- Horticultural standards include accepted methods for tree planting, mulching, staking, guying, wrapping, balling, tree relocation, pruning, removal, stump grinding and clean up. Recycling of vegetative parts is also addressed in these standards.

- Workman's qualifications include suggested education and training, practical experience, licensing and insurance requirements for workmen and companies doing tree work in the municipality.

Approved Tree List. The following list constitutes the Official Tree Species for the Municipality of \_\_\_\_\_.

This list has been extracted from the official Community Tree Plan (See Section 4.A.1.). No other species other than those included in this list may be planted as street trees, park trees or ornamental trees on public property without the written consent of the Commission.

Small Trees

Medium Trees

Large Trees

Figure 1 - Official Tree List for Streets, Parks, Cemeteries and Other Public Places

**Development Standards.** This section of the Tree Management Ordinance shall be carefully connected to the community Landscape Ordinance under which special development standards for trees is written for both trees on private development as well as public trees. Any of the following standards shall be adopted by ordinance as needed and included within the Zoning Code under the Landscape Ordinance and Tree Management chapter.

1. Street Trees. Street trees on public streets and private streets shall be designed, planted and maintained as set forth in this Part as well as in the community landscape code.
2. Tree Inventory. Trees shall be inventoried at the town scale, neighborhood scale or lot scale as set forth in this Part as well as in the community landscape code.
3. Tree Preservation. Preserving trees, natural habitat and transplanting trees with mechanical tree spades shall be done following the standards as set forth in this Part as well as in the community landscape code.
4. Minimum canopy requirements and replacement plantings of trees for the urban forest shall be as set forth in this Part as well as in the community landscape code shall be per trees per acre, caliper inches per acre, or shade distribution pattern

per acre or by other such means that will preserve a minimum canopy standard in this community and within the various zoned land uses of this community.

5. Tree protection standards for trees on development site shall be protected as set forth in this Part as well as in the community landscape code.
6. Standards for the planting and maintenance of trees, shrubs, and ground covers for street yards, side and rear buffers, parking lot screens, parking lot interiors, service areas screening, street wall planting areas and onsite storm water BMPs shall be as set forth in this Part as well as in the community landscape code.
7. Standards for sustainable development as it pertains to trees, landscape or the urban forest shall be as set forth in this part as well as in the community landscape code.
8. Disposal and Recycling of community trees and vegetative matter shall as set forth in this part as well as in the community landscape code.
9. Standards for Special Trees. Standards for official trees, memorial trees, ancient trees, unique trees shall be set forth by ordinance and as set forth in this Part as well as within the community landscape code.

**Section 18 - Conflicts.**

Should any section, clause, or provisions of this Ordinance be declared by the Courts to be invalid, the same shall not affect the validity of the Ordinance as a whole, or parts thereof, other than the part so declared to be invalid.

**Section 19 - Severability.**

If any subsection, sentence, clause, provision of part of this Ordinance shall be held invalid for any reason, the remainder of this Ordinance shall not be affected thereby, but shall remain in force and effect.

**Section 20 - Effective Date.**

This Ordinance is hereby declared to be of immediate necessity for the preservation of public peace, health, and safety, and shall be in full force and effective from and after its passage and publication as provided by law.

Passed this \_\_\_\_\_ day of \_\_\_\_\_, 19 \_\_\_\_ .

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 19 \_\_\_\_ .

\_\_\_\_\_,  
Mayor

Attest: \_\_\_\_\_,  
City Clerk

**END OF MODEL TREE ORDINANCE**

**END OF MODEL TREE ORDINANCE**

Prepared for educational purposes only for the Mississippi Urban Forestry Council  
Shaping Public Policy Toward Trees Workshop  
Pass Christian Mississippi – Jackson, Mississippi May 26, 27 & June 23, 24, 2010  
Prof. Buck Abbey, ASLA  
LSU Green Laws Research Project

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## 10. Urban Foresters Reports and Recommendations:

### a. Importance Value of Most of Abundant Trees

- The following reports have been prepared using the computer program STREETS to illustrate the dollar value benefits produced by street trees and the makeup of the population. A sample of street trees was collected along Cunningham Street in Terry, Mississippi, from Madison Avenue to Utica Street. The town of Terry chose this street as the area on which benefits would be reported.
- The following variables were used for Terry: Hinds County, Mississippi; Municipal Budget \$950,000; Population 1,030; Total linear miles of streets 25 miles; Total square miles of land area in city 8; Average width of streets 24 feet; and Average width of sidewalks 4 feet.
- It was recommended that the city use grant funds to plant crape myrtles along the walking track on both side as to provide shade to those using the track in the summer. It was recommended that Natchez crape myrtles be used to provide a vibrant white flower for show in the summer and for its distinctive cinnamon colored bark in the fall. The annual benefits, population summary, species distribution, and importance values for the trees occurring along Cunningham Street are reported as follow.

#### Annual Benefits of All Trees by Species (\$/tree)

7/7/2011

Species	Energy	CO <sub>2</sub>	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error
Water oak	19.92	6.30	-10.58	75.13	33.60	124.37	(N/A)
Pecan	25.55	7.14	-24.74	108.21	35.55	151.71	(N/A)
Crape myrtle	0.68	0.06	0.24	0.65	0.34	1.97	(N/A)
Southern magnolia	11.36	2.03	2.47	36.78	11.09	63.73	(N/A)
Live oak	28.04	8.52	-17.27	115.55	35.55	170.39	(N/A)
Southern red oak	20.54	6.04	-17.13	80.63	31.86	121.95	(N/A)
Red maple	39.55	18.79	9.51	169.98	33.60	271.42	(N/A)
Silver maple	2.76	0.60	0.96	2.96	4.50	11.78	(N/A)
Sugarberry	16.22	4.51	6.61	46.26	14.40	87.99	(N/A)
Loblolly pine	13.59	4.07	-12.97	50.46	22.42	77.57	(N/A)
Callery pear	16.50	0.74	7.72	37.76	16.00	78.72	(N/A)
American elm	36.56	9.19	-45.67	179.14	40.13	219.35	(N/A)
OTHER STREET	0.00	0.00	0.00	0.00	0.00	0.00	(N/A)

#### Importance Values for Most Abundant Trees (All)

7/7/2011

Species	Number of Trees	% of Total Trees	Leaf Area (ft <sup>2</sup> )	% of Total Leaf Area	Canopy Cover (ft <sup>2</sup> )	% of Total Canopy Cover	Importance Value
Water oak	12	28.6	113,953	29.9	19,283	29.8	29.4
Pecan	8	19.0	116,096	30.5	16,838	26.1	25.2
Crape myrtle	5	11.9	49	0.0	240	0.4	4.1
Southern magnolia	5	11.9	12,879	3.4	4,820	7.5	7.6
Live oak	4	9.5	59,274	15.6	9,580	14.8	13.3
Southern red oak	2	4.8	20,953	5.5	3,290	5.1	5.1
Red maple	1	2.4	22,384	5.9	3,476	5.4	4.5
Silver maple	1	2.4	80	0.0	198	0.3	0.9
Sugarberry	1	2.4	3,155	0.8	1,260	2.0	1.7
Loblolly pine	1	2.4	3,785	1.0	1,132	1.8	1.7
Callery pear	1	2.4	3,271	0.9	1,335	2.1	1.8
American elm	1	2.4	25,192	6.6	3,164	4.9	4.6
OTHER TREES	0	0.0	0	0.0	0	0.0	0.0
Total	42	100.0	381,073	100.0	64,616	100.0	100.0

## Population Summary of All Trees

7/7/2011

Species	DBH Class (in)										Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42		
<b>Broadleaf Deciduous Large (BDL)</b>											
White oak	0	0	2	1	3	4	2	0	0	12	
Pecan	0	0	0	0	3	2	1	1	1	8	
Southern red oak	0	0	0	1	0	0	1	0	0	2	
Silver maple	0	1	0	0	0	0	0	0	0	1	
American elm	0	0	0	0	0	0	0	1	0	1	
BDL OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>24 (NaN)</b>	
<b>Broadleaf Deciduous Medium (BDM)</b>											
Red maple	0	0	0	0	0	0	0	0	1	1	
BDM OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1 (NaN)</b>	
<b>Broadleaf Deciduous Small (BDS)</b>											
Grape myrtle	4	1	0	0	0	0	0	0	0	5	
Gallery pear	0	0	0	0	0	1	0	0	0	1	
BDS OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6 (NaN)</b>	
<b>Broadleaf Evergreen Large (BEL)</b>											
Live oak	0	0	0	0	2	0	1	0	1	4	
BEL OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4 (NaN)</b>	
<b>Broadleaf Evergreen Medium (BEM)</b>											
Southern magnolia	0	0	0	3	2	0	0	0	0	5	
BEM OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5 (NaN)</b>	
<b>Broadleaf Evergreen Small (BES)</b>											
BES OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Conifer Evergreen Large (CEL)</b>											
Sugarberry	0	0	0	0	1	0	0	0	0	1	
Loblolly pine	0	0	0	0	1	0	0	0	0	1	
CEL OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2 (NaN)</b>	
<b>Conifer Evergreen Medium (CEM)</b>											
CEM OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Conifer Evergreen Small (CES)</b>											
CES OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Palm Evergreen Large (PEL)</b>											
PEL OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Palm Evergreen Medium (PEM)</b>											
PEM OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Palm Evergreen Small (PES)</b>											
PES OTHER	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (NaN)</b>	
<b>Grand Total</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>12</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>42 (H0)</b>	

## b. Tree Population Summary

### c. Benefit Values for Southern Region of U.S.

#### Definitions of Environmental Characteristics and Tolerances

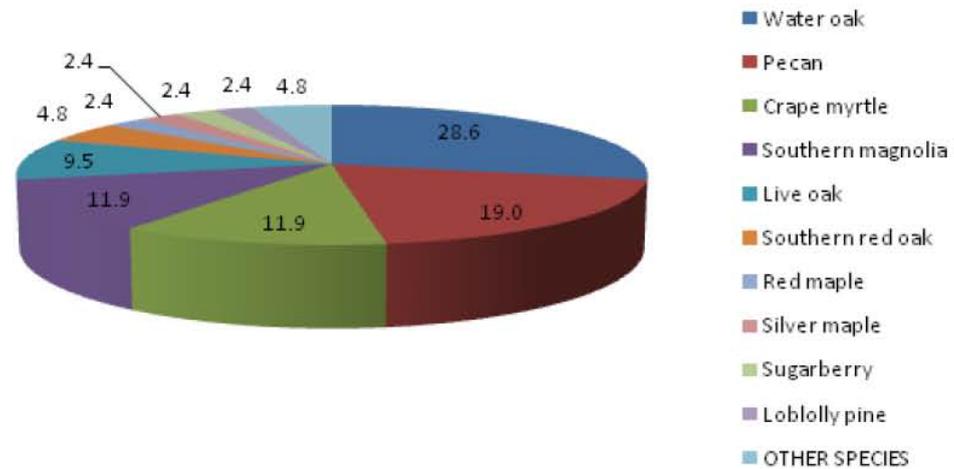
1. Typical rate of growth under urban conditions. S = Slow: 1/2 to 1-1/2 feet/year; M = Moderate: 1-1/2 to 2-1/2 feet/year; F = Fast: 2-1/2 to 3+ feet/year.
2. The average life span (useful service life) of the species when growing under average urban conditions. A tree is at the end of its useful service life when its risk of failure becomes unacceptable and cannot be improved or when the tree is no longer an asset due to its appearance or condition. S = Short: less than 25 years useful service life; M = Moderate: 25 to 40 years useful service life; L = Long: 50 years or greater useful service life.
3. The net monetary effects in cents attributable to the species on air quality; listed as a benefit (positive) or cost (negative). This monetary effect includes the species net effect on ozone, sulfur dioxide, nitrogen dioxide, particulate matter (PM<sub>10</sub>), and carbon monoxide.
4. The typical soil moisture conditions for the species in its native habitat. H = Hydric: wet and may be occasionally flooded for short periods; M = Mesic: moist but moderately well- to well-drained; X = Xeric: dry and very well-drained.
5. Tolerance of the species to infrequent rain, low soil moisture, full sun, and high temperatures. Low = not tolerant to drought; Moderate = tolerant to mild drought; moderately tolerant to severe drought; High = very tolerant to mild, severe, and prolonged drought.
6. Relative soil acidity or alkalinity preferred by the species. In many cases, a range of pH preference is given if it was available. In other cases, a general level is given. A pH of 7.0 is neutral, a pH of less than 7.0 is acidic, and a pH of greater than 7.0 is alkaline. Ac = acidic (5.0 to 6.0); sl ac = slightly acidic (6.0 to 7.0); nu = neutral (7.0); sl al = slightly alkaline (7.0 to 8.0); al = alkaline (8.0 to 8.5); n/a = no information available.
7. The amount of sunlight the species prefers or will tolerate. Trees that are typically found in the understory or are characteristic of late forest succession stages prefer shade or at least partial shade, while trees that typically form the overstory or are characteristic of early succession stages prefer full sun. FS = Full Sun; PS = Partial Shade; SH = Shade.
8. The broad tolerance of the species in its home range to construction damage, and the limitations that constrain a species tolerance to damage. Tolerances: P = Poor; M = Moderate; G = Good; Limitations: I = physical injury, wood compartmentalization and decay; P = pest complications, including chronic and acute attacks; S = soil conditions, including aeration and water availability; C = limited climatic tolerances, including native range, hardiness, and micro-climate change; A = all of the limitations described above.
9. This recommendation is based upon other characteristics and tolerances to urban conditions; and an "X" indicates the species is suitable for planting under "tough" urban conditions.

d. Benefits and Population Summary

**Terry**

**Species Distribution of All Trees (%)**

7/7/2011



<u>Species</u>	<u>Percent</u>
Water oak	28.6
Pecan	19.0
Crape myrtle	11.9
Southern magnolia	11.9
Live oak	9.5
Southern red oak	4.8
Red maple	2.4
Silver maple	2.4
Sugarberry	2.4
Loblolly pine	2.4
OTHER SPECIES	4.8
<b>Total</b>	<b>100.0</b>

