

City of Prairie du Chien Tree Planting Plan



The best time to plant a tree was 20 years ago. The next best time is now. ~Chinese proverb

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No town can fail of beauty, though its walks were gutters and its houses hovels, if venerable trees make magnificent colonnades along its streets. ~Henry Ward Beecher, Proverbs, 1887

CHAPTER ONE: INTRODUCTION

The City of Prairie du Chien is pursuing a tree planting campaign aimed at filling available planting sites throughout the community. These trees and others will grow to shade sidewalks, beautify city parks and provide a myriad of environmental benefits.

SCOPE & PURPOSE OF PROJECT

The scope & purpose of the tree planting site project was to identify suitable planting sites in City parks based on a reasonable set of criteria. The scope & purpose of the plan is to discuss findings, recommend proper species for planting, outline proper planting techniques and provide the tools for a successful municipal tree planting operation.

BENEFITS OF TREES

The City of Prairie du Chien is well aware of the many benefits trees provide to our communities or would not have chosen to proceed with a tree planting plan. A few of the many statistics and values of the urban forest are:

"The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day."—*U.S. Department of Agriculture*

Trees in Davis, California, parking lots reduced asphalt temperatures by as much as 36 degrees Fahrenheit, and car interior temperatures by over 47 degrees Fahrenheit – I Scott, James Simpson, G. McPherson

"Landscaping can reduce air conditioning costs by up to 50 percent, by shading the windows and walls of a home." — *American Public Power Association*

"A mature tree can often have an appraised value of between \$1,000 and \$10,000." —*Council of Tree and Landscape Appraisers*

"In one study, 83% of realtors believe that mature trees have a "strong or moderate impact" on the salability of homes listed for under \$150,000; on homes over \$250,000, this perception increases to 98%." —*Arbor National Mortgage & American Forests*

"Landscaping, especially with trees, can increase property values as much as 20 percent."—*Management Information Services/ICMA*

Amenity and comfort ratings were about 80% higher for a tree-lined sidewalk compared with those for a nonshaded street. – K. Wolf, National Urban Forest Conference

Fifty million shade trees planted in strategic, energy-saving locations could eliminate the need for seven 100-megawatt power plants – G. McPherson

"One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people."—*U.S. Department of Agriculture*

"Trees properly placed around buildings can reduce air conditioning needs by 30 percent and can save 20 - 50 percent in energy used for heating."—*USDA Forest Service*

"Trees can be a stimulus to economic development, attracting new business and tourism. Commercial retail areas are more attractive to shoppers, apartments rent more quickly, tenants stay longer, and space in a wooded setting is more valuable to sell or rent."—*The National Arbor Day Foundation*

"Healthy, mature trees add an average of 10 percent to a property's value."—*USDA Forest Service*

TREE SPECIES DIVERSITY

Sixty-one different species were identified within Prairie du Chien's urban forest. This is a very diverse number of species; however, only two genera represent 58.2% of the total population. These two tree genera are maple (45.1%) and ash (13.1%). Ideally, the forest should be comprised of not more than 5% of any one species and 10% of any one genus. For illustration, maple is considered a genus and includes each different type of maple. Each type of maple such as sugar maple is considered a species. In Prairie du Chien, silver maple is the most heavily represented of the maples with 698 trees or 23.3% of the total population. Other maples include: sugar maple, red maple, Norway maple (including Crimson King a red-leaved maple), boxelder and amur maple. Limited species distribution could result in a population crash if an insect or disease were to attack any one particular species.

One specific example of poor species diversity is Lochner Park. Overall the trees in Lochner Park are quite healthy, but only 5 different tree families are represented. These are: ash (41.6% of population), honeylocust (35.8%), maple (18.8%), oak (1.8%) and walnut (1.8%). It isn't that these aren't quality species, but there should simply be more different species. More oak and walnut are appropriate as they grow well on the soils in the park and other non-represented species should be present. Ideally, 15-20 species should be present so that a particular insect or disease would not decimate the park tree population. This illustrates the idea of overall diversity within a community, but also diversity within specific areas, parks and neighborhoods. But oak may represent 5% of the total population, but if they are all growing within one park or on one street, it is still not an ideal situation. Species diversity means many different tree species throughout the city without large concentrations of any single tree species. The goal is to minimize the impact of an insect or disease so that large swaths of urban forest are not killed. The global economy continues to introduce invasive species that threaten our native species. From buckthorn, to EAB to Asian carp, it is unlikely that invasive threats will decrease. Properly managing the urban forest thru species diversity is the single greatest tool we have to prevent large scale forest destruction in our urban forests.

Trees outstrip most people in the extent and depth of their work for the public good. ~Sara Ebeneck, American Forests

CHAPTER TWO: PLANTING SITE RECOMMENDATIONS

SITE SELECTION METHODOLOGY

During the summer of 2011, Bluestem Forestry Consulting, Inc. completed a tree inventory for the City of Prairie du Chien in parks and street rights-of-way. This inventory included planting site recommendations for street rights-of-way. After analysis of park species composition and site usage, planting site recommendations were determined for each park excluding La Riviere Park. Park maps with planting site locations can be found as Attachment 1.

Many factors contribute to a suitable planting site. Each of the following was taken into consideration prior to identifying a planting site:

~Usage pattern of each park. It is not appropriate to plant a tree in a ballfield, but it is appropriate to plant a tree for shade where spectators will be viewing the game.

~Planting sites must remain a safe distance from obstructions such as buildings, intersections, driveways, signs and railroad crossings.

~A boulevard must be large enough to sustain a tree (generally over 4' in width and 20-50' in length depending upon the mature size of the tree).

~Surrounding space must be sufficient to grow a tree to maturity. Overhang or competition from other trees results in poor opportunity for survival.

~Growing site quality. If it was apparent that a site was too compacted or too wet to grow a tree properly a planting site was not placed in this area. Limited resources such as funding and staff time to plant trees should be focused on the best quality growing sites.

The planting sites identified are *suggested* locations for tree planting only. Sound judgment and good decision-making including these and all criteria should be used by on-site personnel when tree planting a tree.

INVENTORY & RECOMMENDATION FINDINGS

Each park (excluding Hoffman Hall & La Riviere Park) and street rights-of-way have planting sites suitable for planting a tree. The planting site summary is:

<u>Name</u>	<u># of Sites</u>
Street Rights-of-way	-
sites for small trees	91
sites for large trees	421
sites for medium trees	23
Cecil Smith Ballfields	23
Fort Fun Park	39
Hoffman Hall*	0
Lochner Park	12
Michigan Street Park	10
St. Feriole Island	520
Washington Street Park	54
Waterworks Park	8

*no planting sites at this time due to construction

Individual considerations were given to each particular park or area. These include:

Street rights-of-way. In addition to the factors listed on page 5, some unique street considerations:

~ Size of tree suitable for each site. For example, a boulevard with overhead power lines recommended a small tree be planted, a large boulevard with no competing trees recommended a large tree be planted.

~Spacing generally followed the following guidelines: 40' growing distance along a boulevard for large trees, 30' for medium sized trees and 20' for small trees.

Sites were selected on all of the factors discussed and only reasonable sites were chosen to assure tree success.

St. Feriole Island. This park has the largest number of planting sites due to its large size. After consultation with park volunteers and city staff, different planting approaches were determined for different use areas in the park.

It was determined that areas with existing trees should be planted as trees are removed on a tree-for-tree basis. If one tree is removed in a particular block, one tree should be planted in the same block to replace it. The stocking in most areas of the park is appropriate and these areas merely need to be maintained to retain around the same number of trees.

Because the park is used for large-venue events such as festivals and concerts, a pattern suitable for parking and camping has been developed for the northern-most blocks that are largely devoid of trees. Open space is desired for various reasons and is a vital component to this and most parks. Open space has been left on the Island to assure a variety of recreational opportunities. The goal is not to eliminate open

space, it is to carefully and thoughtfully plant trees that will provide the most benefit to users and the environment. Planting site spacing was varied to allow for car parking (based on current transportation standards) or RV parking. Car parking rows total 70', allowing tree planting in the middle. RV parking/other camping rows total 150' allowing for tree planting in the middle. The goal is to provide shade cover for users while protecting trees from injury from cars/campers while providing ample growing space. Each tree was spaced at 50' distance from other trees to allow a large tree to be planted.

The area maintained as a garden should continue to be planted as specimen/historical trees are donated. A number of trees were recommended for removal in this area and presents an opportunity to plant a wide variety of all sized and shaped trees. In fact, this area already functions as a mini-arboretum and can easily accommodate other unique trees.

Fort Fun Park. Fort Fun Park received random plantings to increase overall shade coverage and species diversity. Particular areas recommended for planting include those along the entrance/exit to the park, near the parking lots to reduce heat radiation from pavement and along the volleyball court viewing areas.

Cecil Smith Ballfields. This park is devoted to athletics, primarily baseball and softball. As a result, there aren't many planting sites. However, users do enjoy watching games from a shady spot and planting sites have been added with this in mind. Bleachers, sidelines and perimeter areas received planting site recommendations.

Lochner Park. Lochner Park has a healthy tree population and only presented a few opportunities for planting. To preserve the open space interior of the park for recreation, sites have been added along the perimeter and on the boulevards to shade streets and sidewalks.

Michigan Street Park. Michigan Street Park has a handful of trees. Similar to Lochner Park, trees were added along boulevards and recreation viewing areas.

Washington Street Park. Washington Street Park has ample room for tree planting and a couple of areas are preferred for planting. These include planting along the shoreline to stabilize soils and reduce erosion and along the road to improve pavement life and create a tree lined effect.

Waterworks Park. Waterworks Park is fairly well stocked with trees, but a few planting sites were located near the boulevard and throughout to increase overall canopy coverage.

PRIORITIZING PLANTING SITES

It will take the City of Prairie du Chien many years to fill all of the available planting sites identified. To manage tree planting, the City will need a way to prioritize planting sites. The goal of most tree plantings is to plant trees that will impact the most number of people. Identifying which areas receive the most usage usually leads to a planting priority plan. The Tree & Parks Committee and Director of Parks & Recreation should have intimate knowledge of usage patterns and can determine which sites should receive the most trees.

A tree never hits an automobile except in self defense. ~American Proverb

CHAPTER THREE: PLANTING GUIDELINES

PLANTING BASICS

New research on trees has changed the traditional method of planting, where a hole was dug slightly deeper and wider than the rootball or container. Scientists now recognize that tree roots are naturally shallow and wide spreading, with the majority found in the top 18 inches of soil.

The basic steps to follow when tree planting are:

DIG THE HOLE: Dig a hole no deeper than the root flare, but much wider—at least twice as wide, but three to five times is best—so the roots can spread quickly into the loosened adjoining soil and anchor the tree against winds and storms. The depth of the hole is critical. It should be the distance from the bottom of the ball to the root flare (not the top of the ball), or an inch or two shallower in heavy soils. Break up the soil in a large area surrounding the tree. This provides emerging roots room to expand into loose soil to hasten establishment.

IDENTIFY THE ROOT FLARE: Roots begin to grow and spread at the base of the tree at the trunk flare. If the trunk flare is not partially visible, you may need to remove some soil from the top of the root ball. Identifying the root flare and planting at the proper depth is the single greatest advantage you can give a newly planted tree. This is the appropriate time to be sure that any containerized or balled and burlapped material does not have circling roots. If they do, use a shovel to slash the outside of the rootball.

PLANT THE TREE AT THE PROPER DEPTH: Make sure the hole is dug to the proper depth and no deeper. It is better to plant the tree a little high, 1-2 inches above the base of the trunk flare, than too deeply. Planting a tree at the same depth it was planted at the nursery is almost always too deep. Always lift the tree by the root ball, never by the trunk, to avoid damage when setting the tree in the hole.

STRAIGHTEN THE TREE: View the tree from several directions to confirm the tree is straight before you begin backfilling.

BACK FILL THE HOLE: Initially, fill the hole about 1/3 full, then settle the soil by watering. If the tree is balled and burlapped, then cut and remove the strings, burlap and wire from around the trunk and top 1/2 of the root ball. Fill the remainder of the hole with existing soil, not amendments. Using existing soil will encourage roots to grow into the surrounding soil. Then water again to eliminate air pockets, which may cause roots to dry out. Add soil a few inches at a time and settle with water to avoid this problem. Make sure not to tamp soil. Continue this process until the hole is filled and the tree is firmly planted.

STAKING AND FERTILIZING: For most trees, staking is not recommended. If the tree trunk is not sturdy, however, use two stakes, one on either side of the tree, for the first year only. Avoid fertilizing a tree until late spring of the second year following planting.

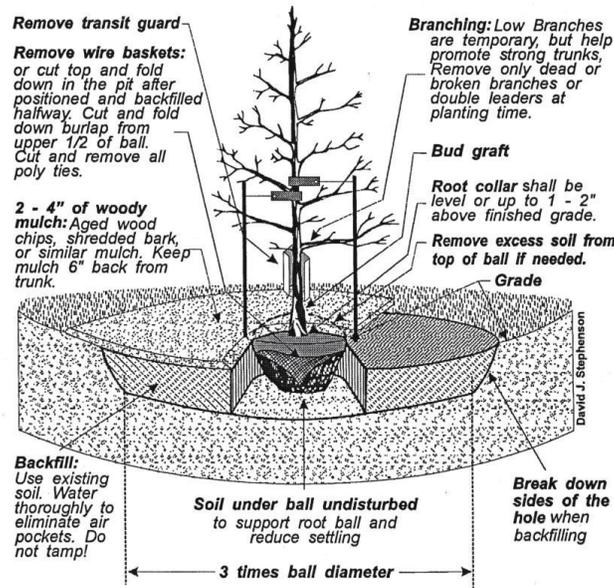
MULCH: Some good mulch choices include leaf litter, pine straw, shredded bark, and aged wood chips. Use two to four inches of mulch to layer the base of the tree. When placing mulch, make sure the actual tree trunk is not covered. A mulch free area about six inches wide at the base of the tree is sufficient to avoid moist bark conditions and decay. This is also a good time to remove all broken branches and tags that may be attached to the tree. Even the smallest tag or ribbon can girdle a tree.

WATER: When the soil is dry below the surface of the mulch, it is time to water. Keep the soil moist, as over watering will cause leaves to turn yellow and fall off. Water the tree at least once a week if it does not rain, and more often during hot weather. Continue to water until mid-fall when temperatures decrease. Most recommendations suggest 1" of water per week in moderate temperature.

PLANTING TIME: Generally, late September to mid-October and May to June are recommended. Fall planting must be undertaken before soils become so cold that roots do not have a chance to grow. Spring planting should be undertaken before leaf or flower buds open

The following diagram illustrates proper planting technique:

Proper Tree Planting Diagram



Stake only if you have to. Use 2-3"-wide webbing straps and secure to stakes with heavy gauge wire. The wire should be able to stick straight out from the stake and hold the webbing strap up, preventing it from sliding down the tree. Do not stake tightly - trees gain strength from movement. Remove all stakes after one year.

Use of tree wrap is not recommended, as it causes a number of problems for the tree.

Wisconsin Dept. Of Natural Resources - Oct. 2000

SAMPLE SPECIFICATIONS FOR TREE PLANTING AND TREE STOCK

While each project will differ, the following can serve as an example for bidding out the purchase and/or planting of nursery tree stock.

2012 TREE PLANTING PROJECT Tree Purchase and Planting Specifications

The City of Prairie du Chien will contract the supplying and planting of 112 trees. It would also like an additional 17 trees to be transported from a holding yard in the city to the sites and planted. The trees will be planted at various locations on the City street right-of-ways, public areas and parks. Specific addresses can be supplied upon request. The tree planting is a joint effort between the City of Prairie du Chien and the Wisconsin Department of Natural Resources Urban and Community Forestry and must meet all WI DNR guidelines for grant funded projects.

Bids will be accepted until Friday September 17, 2012 at 3:00pm. The successful bidder will be notified by Tuesday September 21, 2012.

MATERIAL SPECIFICATIONS:

The following is a complete list of tree species and quantities to be supplied and planted by the contractor: All trees will be 1.5-2.0" balled and burlapped or container grown stock, caliper measured 6 inches above the root collar

TREE SPECIES	TOTAL REQUESTED
Prairie fire crabapple (Malus spp. 'prairie fire')	15
Thornless cockspur hawthorn (Crataegus crusgalli var. inermis)	17
Regal elm (Ulmus x 'regal')	16
Sycamore (Platanus occidentalis)	16
Serviceberry (Amelanchier x grandiflora 'autumn brilliance')	10
Tuliptree (Liodendron tulipifera)	12
Spring snow crabapple (Malus spp. 'spring snow')	15
Swamp white oak (Quercus bicolor)	6
Skyline honeylocust (Gleditsia tracanthos 'skyline')	5
Total Trees:	112

Substitutions of plant materials will not be permitted unless authorized in writing by the City of Prairie du Chien. If proof is submitted and substantiated in writing that a tree specified is not obtainable, consideration will be given to the nearest available size or similar variety, with a corresponding adjustment of the contract price.

All trees shall have been grown under climactic conditions similar to the locality of Prairie du Chien and have been freshly dug. Trees shall be trained in development and appearance as to be unquestionably superior in form, compactness and symmetry. They shall be sound, healthy, vigorous, well branched and densely foliated and free of disease and insects or their eggs. They shall have healthy well-developed root systems and be free from physical damage or other conditions that would prevent thriving growth.

Trees with multiple leaders will be rejected. Trees with a damaged, cut or crooked leader, included bark, abrasion of bark, sunscald, disfiguring knots, insect damage, mold, or cut limbs over 3/4 inches that are not completely callused are cause for rejection.

During planting, trees must be protected at all times from sun and drying winds. Those that cannot be planted immediately upon arrival shall be kept heeled in with mulch, well protected from harsh wind and sun and adequately watered. Trees shall not remain unplanted any longer than 3 days.

Trees will be inspected before planting and the City of Prairie du Chien reserves the right to reject any trees that do not meet the standards or that have been damaged during shipment. Such approval shall not impair the right of inspection and rejection during progress of the work.

All trees shall comply with state and federal laws and regulations governing the inspection, shipping, selling and handling of plant stock. A certificate of inspection for injurious insects, plant diseases and other plant pests shall accompany the trees. Additionally, a copy of the nursery license from the grower must accompany the trees.

PLANTING SPECIFICATIONS:

The City of Prairie du Chien will mark all planting sites with a white paint mark on the curb or road in line with the placement of the tree or provide a map.

The planting hole shall be at least two times the diameter of the root structure when spread out and soil shall be loosened beyond the edge of the planting hole.

Trees shall have their roots spread into a natural position, free of bunching, kinking, or circling. All broken or damaged roots shall be cut back to the point where they are clean and free of rot. No other root pruning shall be done.

Trees shall be set with the top of the root collar at or slightly above finished grade. Trees must be centered in the hole and set plumb.

All wire baskets, twine or other non-natural materials surrounding the root ball shall be removed prior to planting.

Planting area shall be finish-graded and mulched over the trees root system with a 2-4 inch layer of biodegradable, aged wood chips, shredded bark or similar mulch. Mulching material shall be pulled back 6" from the trunk.

Trees shall be thoroughly watered immediately after planting.

All twine, rope, wrappings and labels shall be removed after planting is complete.

OTHER CONSIDERATIONS:

Planting shall be completed before ground freeze or October 29, whichever is first

The contractor shall give the City of Prairie du Chien at least 5 days notice prior to beginning any work.

The contractor will notify Digger's Hotline to verify location of underground utilities before excavation begins. The contractor shall be responsible for all damage resulting from neglect or failure to comply with this requirement.

Excavated planting holes that will be left open when work is not in progress or that poses an immediate hazard shall be adequately barricaded with appropriate warning devices.

Reasonable care shall be exercised during excavation, planting, filling, grading and cleanup to protect from damage all existing trees, shrubs and other vegetation as well as utilities, structures and other site features.

Soil, branches, wrapping material or other debris shall be promptly cleaned up and removed. The work area shall be kept safe and neat at all times.

The City of Prairie du Chien shall perform an inspection with the contractor of all trees after the planting to note and correct any discrepancies.

GUARANTEE PERIOD AND REPLACEMENT:

The contractor shall guarantee all plants to be healthy and in a flourishing condition for one year from the completion date. The contractor shall remove and replace, without cost, as soon as weather conditions permit, all trees not in a healthy and flourishing condition as determined by the City of Prairie du Chien any time during the guarantee period.

The contractor is required to supply 1" of water weekly to trees if rainfall is not adequate until ground freeze.

CONTRACTOR REQUIREMENTS:

The contractor shall furnish evidence of Worker's Compensation, public liability and property damage insurance to the City of Prairie du Chien.

The contractor shall possess a nursery license and furnish a copy upon request.

A performance bond (in the form of a certified bank check) for 10% of the bid price will be required from the successful bidder. **Note:** No performance bond is required to submit a bid.

Bidders will need to provide two references from similar projects that have been completed within the past three years.

Minimum salaries and fringes to be paid on the project shall be in accordance with the prevailing wage rate scale established by the Federal Department of Labor (DOL). Attention is called to the fact that not less than the minimum salaries and fringes set forth in the Contract Documents must be paid on this project and that the Contractor must ensure that employees and applications for employment are not discriminated against because of their race, color, religion, sex, national origin, or other protected class. Federal Labor standards program laws, including, but not limited to the Davis Bacon Act, the Copeland Anti-Kickback Act and the Contract Work Hours and Safety Standards Act will apply to all projects.

No bidder may withdraw his/her bid within 30 days after the actual day of the opening bid thereof.

Prairie du Chien reserves the right to waive any informalities or to reject all bids.

Additional information can be obtained from City of Prairie du Chien.

PLANTING ONLY REQUIREMENTS AND SPECIFICATIONS

17 trees will be transported from a city owned site within the city limits to planting sites on St. Ferirole Island. These trees will be 1.25-2.0" caliper American elms that may be balled & burlapped or container grown trees. The planting holes will need to be hand dug as the sites are on a slope. All planting will follow the guidelines listed in this prospectus. No guarantee applies to these elms.

Breeze is the conductor, trees the musicians, leaves the instruments. ~Nathaniel LeFonnerre

CHAPTER FOUR: SPECIES SELECTION

Prairie du Chien is a Zone 4 climate and types allow for some good street and park tree planting selections. A comprehensive list of tree plantings including varieties can be found as an Attachment in the companion EAB Readiness Plan. The list below is a quick general list for review. Any of these trees would be suitable for any of the parks, following species diversity guidelines. This list is suited for dry-sites unless noted. Some **larger** trees include:

Tuliptree (*Liriodendron tulipifera*)
Sycamore (*Platanus occidentalis*) (wet site)
hackberry (*Celtis occidentalis*)
burr oak (*Quercus macrocarpa*)
swamp white oak (*Quercus bicolor*) (wet site)
American linden (*Tilia americana*) 'Redmond', 'Fastigiata'
elm (*Ulmus* spp.) 'Accolade', 'New Horizon', 'Discovery' (wet or dry site)
American elm (*Ulmus americana* 'Valley Forge') (wet or dry site)
Kentucky coffeetree (*Gymnocladus dioica*)
ginkgo (*Ginkgo biloba*)

Good **medium** selections include:

Amur cork tree (*Phellodendron amurense* 'macho')
Flowering pear (*Pyrus* spp.)
amur chokecherry (*Prunus maackii*)
horsechestnuts (*Aesculus* spp.)
river birch (*Betula nigra*) (wet site)

Smaller sites can be filled with:

Japanese tree lilac (*Syringa reticulata*)
serviceberry (*Amelanchier arborea*) 'Autumn Brilliance', 'Princess Diana'
hophornbeam (*Ostrya virginiana*)
American hornbeam (*Carpinus caroliniana*)
crabapple (*Malus* spp.)
 white cultivars: 'Spring Snow', 'Snowdrift'
 red/pink cultivars: 'Prairiefire', 'Red Jade', Red Barron'
Hawthorn (*Crateagus* spp.)

A complete evaluation of the site needs to be completed before selecting a species. Additionally, "Choosing the Right Landscape Plants" (publication number A3864) by Laura Jull is an excellent publication to assist with selecting species. It is available online at <http://learningstore.uwex.edu/Choosing-the-Right-Landscape-Plants-Factors-to-Consider-P1371.aspx>

It is important to diversify the urban forest as much as possible. Every effort should be made to continue diversification. Planting many different species and varieties keeps the urban forest healthy and attractive.

Ideally, no more than 5% of any one species and 10% of any one family should comprise the City's trees. Again, maples are over represented. These should be planted only in extremely special circumstances. No ash should be planted due to the emerald ash borer.

ATTACHMENT 1:

Park Maps with Planting Site Locations