

TOWN OF HILLSBOROUGH

Kings Highway Park Forest Plan

**1001 Ben Johnston Road
Hillsborough, NC 27278**



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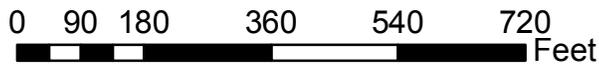




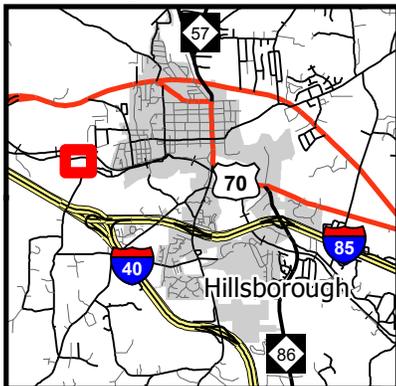
North Carolina Forest Service Forest Management Map



Acreages and Boundaries are Approximate



Vicinity Map



Landowner: Town of Hillsborough
Kings Highway Park
County: Orange
Latitude: 36 04.26
Longitude: 79 07.93
Drawn by: Christian Hirni
Date: 02/22/16
Photo: 2013 Leaf Off
Total Acres: 25

Legend

Stand Boundary

Streams

Secondary Roads

Type

NC Highway

State Road

City Road

Ramp

Railroads



Location and Description

Kings Highway Park is an 18 acre natural area located on both sides of Ben Johnston Road just west of the Town of Hillsborough, NC. The park is a multiple use area that is owned and managed by the Town of Hillsborough and consists of a southern portion of approximately 7 acres with parking and a northern portion of 11 acres. The park is bounded by the Eno River to the south and west and by the North Carolina Railroad system to the north. This park provides multiple recreational opportunities and creates a large opportunity for residents and visitors to explore the natural environment. There is also a 7 acre tract across the Eno River west of the current park development which is landlocked and not accessible from the park. For continuity purposes, the description and recommendations for management of this additional area will be consistent with the rest of southern developed area of the park.

Currently the park has a series of natural walking trails throughout with viewing benches in designated areas, a picnic area, and a small boat launch on the southern portion. The natural trails are largely volunteer created and maintained with a large stretch on the northern end following the historic roadbed connection to the Kings Highway (circa 1650-1735 ad).

The northern and southern portions of the park are mixed age forest stands that have been clearly select harvested over time. The park transitions from a dominate bottomland hardwood stand on the southern tract to more upland mixed pine hardwood species as you progress up hill on the northern portion. The southern portion is a bottomland hardwood stand dominated by yellow poplar, red maple, sweetgum, sycamore, and sourwood. The northern portion is a mixed pine hardwood stand primarily dominated by shortleaf and loblolly pine as well as some large hardwood species such as yellow poplar, red and white oak, red and sugar maple, and sweetgum. The terrain is a gently rolling 2-8% slope with Tatum and Georgeville silt loam soils typical of the area.

Stand Type	Mixed Bottomland Pine/Hardwoods
Species Composition (common names)	Yellow poplar, green ash, sweetgum, loblolly [ine, shortleaf pine, American elm, sycamore, red maple, red/white oak
Understory Species	American beech, sugar maple, red maple, green ash, ironwood, dogwood, elm, red cedar, holly, red/white oak
Tree Ages	65-75 y/o (dominant loblolly pine), 89 (shortleaf pine)
Tree Diameters	6-26 inch range, 28 inches (bottomland loblolly pine)
Tree Heights	85-95 feet (dominant)



Figure 1: Forested area of northern trail



Objectives for Kings Highway Park

The primary objective for Kings Highway Park is to enhance the quality of life for the community around Hillsborough by providing multiple recreational uses while protecting natural and cultural resources.

Secondary Objectives of Kings Highway Park include:

- Maintain a riparian buffer along Lake Ben Johnston that protects water quality and adheres to the Neuse River Buffer Rules
- Maintain a healthy forest throughout the park that provides shade to reduce radiant heat and improves the air quality of the Town of Hillsborough
- To provide access to the parks separate sections without adverse impact to sensitive areas
- To provide educational opportunities where citizens can explore and learn more about their natural environment

Recommendations

The management recommendations for the Kings Highway Park will be combined for both the northern and southern areas as management is very similar and recommendations will be based on objectives and goals listed in the Kings Highway Park Draft Master Plan as has been provided by Stephanie Trueblood.

- Hazard Tree Assessment and Removal

Immediately remove all trees that pose a threat to the general public and employees/park staff. This will consist of removing mostly dead, dying or diseased trees that are within falling distance of parking areas, trails and places of public gathering within park boundaries. Dead trees and large dead tree limbs pose the immediate risk as they can break free and fall at any time. Sometimes removing the entire tree with large dead limbs may be necessary, but with good pruning techniques large limbs can very often be removed while saving the tree. After or even during removal of dead trees the staff can then assess trees for signs of damage, pests and disease.

- o Many of the trees on the very edge of the most used walkways and trails may have been damaged in the past either by construction or traffic and may need to be removed as they are showing signs of or are now more susceptible to disease. As trails are maintained or constructed, care should be taken to avoid compacting and/or severing many of the underground root systems of trees that border the trail as this will cause an adverse effect in the trees crown and may stress many forest grown trees to the point of mortality. Hazard tree assessment as well as signs and



Figure 2: Dead hazard Tree at trailhead, front entrance



symptoms of pest/disease will be discussed in more detail later in this document or through attachments.

- A large component of the stand is pioneer species such as the loblolly pine and hardwoods such as sweetgum, red maple and yellow poplar. These species have a relatively shorter life span as it pertains to a forest lifespan. They grow tall and large very quick and tend to have a ranged ecological lifespan of around 80-100 years old. At this time their growing tends to slow and they become more stressed, therefore more susceptible to insect and disease infection. The town staff would be wise to monitor the trees of certain species that exist close to public area for as time goes on more of these early successional species will naturally die off and pose a greater risk due to their sheer size.



Figure 3: 28 Inch diameter loblolly pine on northern trail, 16 inch drill for scale

- **Maintain and Improve Aesthetics Throughout the Park**

There are many different opinions as to what is aesthetically pleasing in a park setting. While many who would utilize the park would prefer the traditional “city park” setting with an open understory and manicured lawns, other prefer the natural setting with a dense closed forest canopy and minimum intrusion. The natural setting and the stated desire for it to remain as well as the opportunities for environmental education lean the forest management recommendations towards the minimalist approach. There can be a compromise in management around the public areas and trails while maintaining the natural setting and beauty of the area.

- **Fallen Trees/Limbs and Debris**

Many park users have commented on a preference for an open understory free of limbs and natural debris. This “park-like” setting is common in urban areas but is contrary to the natural setting which has been outlined in the Master Plan. The natural decomposition of debris within a forest is beneficial for its nutrient redistribution well as for wildlife in increased habitat and foraging opportunities. The clearing of debris around the trails and



area of public gathering may be accomplished without disturbing the natural processes that occur within the forest. The Town can choose to create trail corridors and public buffer zones around public gathering areas to keep clear of fallen limbs and large debris while allowing natural accumulation of leaf litter for environmental process and erosion control. This can be accomplished by setting a distance on the edge of determined areas to clear debris and either pulling the debris further into the woods or removing the debris altogether.

- **Understory Management and “Daylighting”**

The perpetuity of the natural setting in the park is completely reliant on the continued management of the forest setting. The trees currently growing in the understory are what will become the dominant canopy trees in the distant future. The understory can be managed in such a way to provide some through stand visibility without undermining the natural setting and also providing the park with the next generation of trees. The easiest and most economical management would be to cruise the stand, identifying any damaged or diseased trees and removing those trees first. Then certain species can be identified as the preferred species based on any set amount of factors such as longevity and aesthetics. Other less desirable species can be thinned out providing space and nutrients to the preferred trees.

The “daylighting” of parking areas and other public areas which have commented as to being too shaded or not appropriately visible can be achieved by almost the same practice but on a larger scale. The focus then being converted to the management of the larger canopy trees around the areas, removing any damaged and/or diseased trees first and then removing the less desired species. This “thinning” can quickly increase natural light and visibility while removing just a few large trees combined with some understory thinning.



Figure 4: The entrance and edge to the future expanded parking area, which can be "Daylighted" by removing just a few larger pines and encroaching hardwoods, improving visibility from Ben Johnston Road and increasing natural light penetration.



○ **Debris Utilization**

The utilization of the debris removed in these management recommendations would be left to the discretion of the park staff and all persons involved in park planning. A good suggestion of the use of debris would be to have a large amount of the trees, logs and limbs chipped on site to be utilized as mulch within the park. The mulch can be used for new plantings and flower beds as well as an alternative “natural surfacing” of the trails throughout the park. Larger chips can aid in reinforcing the natural soil surfaces and reducing the amount of erosion and trenching that commonly occurs in high traffic areas.

Larger logs and limbs can be utilized to border trails and construct water bars throughout the park. If some larger trees are removed or thinned out the Town could utilize the services of a portable sawmill to cut lumber to be used on larger park projects such as signage, picnic benches or even structures. This wood would need to be either kiln dried or chemically treated to withstand the elements. Large stumps can even be utilized as natural seating in some of the larger public gathering areas and tend to last a long time.

○ **Invasive Species**

As with much of the neighboring areas and communities, there is a substantial issue with invasive species within the park. There are several established nonnative species such as Chinese Privet, Japanese stiltgrass and Tree-of-Heaven. The area of most concern is the southern section primarily around and below the dewatering basin.



Figure 5: Tree-of-Heaven growing on berm of Dewatering Basin. Opposite: Chinese Privet growing on edge of the Eno River along southern trail.



Invasive species management will prove difficult due to the close proximity to the river and the lack of desire to use herbicides near one of the Town of Hillsborough's water supply resources. The management of Tree-of-Heaven and Chinese Privet can be achieved through repeated removal but do note this option will need to be repeated annually as re-sprouting will most definitely occur. The control of Japanese stiltgrass is virtually impossible without the use of herbicide. Any removal or repeated removal should be done with care due to the proximity of some of these infestations to the Lake Ben Johnston (Eno River). The work should be done in a way to minimize the impact to the river bank and not to increase any sediment or erosion into the lake or surrounding streams.

If the Town chooses to be more aggressive in the management of these invasive species, there are herbicides that are recommended for use near aquatic resources but it would be necessary to contact an herbicide application professional to ensure the safety and application of these select herbicides. Some more information on the control of these specific invasive species is attached to this document.

- **Forest Health**

Fortunately, the natural setting of this park and the desire to maintain it as such has allowed the general recommendations to follow along what would be recommended for maintaining forest health. The removal of dead, dying and diseased trees will improve the overall health of the entire stand by removing potential for continued infection of neighboring species. The select cutting and thinning of less desirable species will allow for more sunlight, water and nutrients to get to the remaining trees which should have a noticeable reaction in better growth as well as an increase in regeneration on the forest floor. The removal of the aging early successional species over time will yield to the growth and regeneration of a more late successional forest which will last for generations to come. The removal of invasive species will allow native shrubs and forbs to repopulate the river bank and surrounding park area.

o **Neuse River Buffer Rules**

As you know, there are statewide water quality rules in place that require the protection of streamside buffers and the prevention of sedimentation of our streams known as the NC Forest Practice Guidelines That Relate To Water Quality. In addition, the **Neuse River Watershed Buffer Rules** apply to this area. The Neuse River Watershed Buffer Rules require a 50 foot forested buffer be left on intermittent and perennial streams within the watershed. Landowners, including government entities, are responsible for ensuring that these rules are adhered to during harvesting operations. **So please look over the attached information** to learn more about the environmental concerns associated with harvesting and things you need to consider with all harvesting and or removal of any material within the buffered area.



- **Signs and Symptoms of Pest or Disease**

The best time to observe trees for signs of pest and/or disease is in the spring and summer after the leaves have returned in full “flush”. Evergreens and conifer species can be examined year round but still have some processes that occur in fall and winter which are commonly misconstrued as a health issue. Hardwoods, or deciduous species will lose their leaves every year but certain climate, soil or other abiotic conditions may cause early leaf drop.

If the leaves of a hardwood species appear to be dropping very early, such as in August, this could be a sign of pest, disease or many other factors which would be of concern. If there is any change of leaf color prior to fall leaf drop, this can also be a sign of disease or pest infestation. Evergreen and most conifers, such as pine, are much less difficult as they retain all leaves/needles and only shed the internal, shaded and unnecessary foliage typically once a year around the early to mid-fall season. If a pine tree were to have an entire limb or even larger portion of the crown suddenly turn red or orange in color, this would also be of concern as this is typical of a pest outbreak.

Any damage or noticeable changes in the bark structure and/or color could be early signs of pest and disease. Any time large pieces of bark are peeling or falling off with any discoloration could be a sign of fungal disease. Damage to the bark such as holes and visible sap could be the sign of a pest infestation. There could also be some damage by native bird species feeding on insects on the surface or just under the surface of the bark which may appear damaged but the damage is more superficial as the birds are the greatest defense against pests in the forest.



Figure 6: Damage to a loblolly pine which appears substantial is actually caused by a native wood pecker species.

Attached to this document are several pamphlet and documents referring to tree health and local pests and diseases to look for in this area. If any staff or visitors notice signs or symptoms of concern, please feel free to contact the Orange County office at 919-732-8152.



- **Urban and Community Forest Grant**

The North Carolina Forest Service Urban and Community Forestry Program maintains a grant program that is available to local governments. The goal of the program is to provide monetary assistance to local government programs that enhance the benefits and sustainability of their urban forests. Monies can be used to manage the urban and community forests and improve public understanding of the benefits of maintaining existing tree cover in their communities. The Town of Hillsborough would simply need to have a specific project in mind and apply for the grant providing specific details of the project, projects costs, and the benefits to the community of Hillsborough. There is more information available on our website www.ncforestservice.gov and our urban staff in the Raleigh office would be more than happy to discuss the program in further detail. The contact number for the Urban and Community Forestry office in Raleigh is 919-857-4842.

Conclusion

Thank you for your interest in responsible forest management. We are very happy to continue our great relationship with the Town of Hillsborough. If you have any questions, comments or concerns associated with this plan or for any other forest management, please contact the Orange County office at 919-732-8152. We look forward to continue working with you in the future.

Sincerely,

Christian Hirni
Orange County Ranger

CC: D-11 File
Orange County File

Enclosures:

Map

Forest Health Field Guide

Managing Healthy Forests: Prevention & Control of Major Forest Insects & Diseases in NC

Pruning Trees & Treating Wounds

Tree of Heaven

Chinese Privet

Japanese Grass

Exotic, Non-native & Invasive Plants are a Problem

Neuse River Basin Buffer Rules



Town of Hillsborough
FM Project

February, 2016

Suggested Field Border, Grassland, Food/Clover, Plot Mixtures Beneficial to Wildlife
Wildlife Seed Planting Guide
Recreational Forest Trails: Plan for Success
A Landowners Guide to Working with Recreationist
Portable Sawmill Operators
Herbicide Contractors List