System Integration Plan

Sierra Drive Property

Raleigh, North Carolina

June 18, 2013

Raleigh Parks and Recreation Land Stewardship
Feb 7, 2013

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System Integration Plan
Sierra Drive Property
Executive Summary

The City of Raleigh Parks and Recreation Department has developed a System Integration Plan for the Sierra Drive Property in southwest Raleigh. The System Integration Plan is part of the Park Master Plan process and involves a public input component. The intent of the System Integration Plan (SIP) is to document existing site conditions and develop a set of guidelines for interim management of the park property. The site specific SIP incorporates consultation with both internal and external Subject Matter Experts, and is developed with input and oversight from the Parks, Recreation and Greenway Advisory Board.

The Sierra Drive Property is located at 2640 Sierra Drive, on the northwest corner of Lineberry Drive and Sierra Drive. This 2.42 acre vacant property was acquired by Raleigh Parks and Recreation in 2009 in anticipation of developing a Neighborhood Park. Funding for the Sierra Drive Neighborhood Park Master Plan is included in the current Capital Improvement Plan. The Sierra Drive Master Plan process will align with the staff-led System Integration Plan (SIP) for this park site.

The subject property is zoned Residential 10. Adjacent property use includes residential multifamily and single family. The property is adjacent to a residential subdivision with 0.12 acre lots and an apartment complex with a density of 11 units per acre. There are several nearby condominium and townhome complexes. Adjacent property owners living along the northern property boundary, and a majority of property owners along the eastern property boundary have installed fences along the property line. There are no buildings or structures on the property.

The property was cleared for development in approximately 2005. Some construction materials are present on the east side of the property (concrete culvert pipes and small piles of gravel). A large electrical transformer is located near the southwestern property boundary. The Phase 1 Report was not able to determine if the transformer contains PCBs. An electrical distribution line, phone hardware, fiber optic cable box, fire hydrants, and water system are all present on the site. Sierra Drive and Lineberry Drive are fully developed, with existing sidewalks on the west side of Sierra Drive and the south side of Lineberry Drive.

Natural resources inventory and historical site use are evaluated as part of the SIP. The site condition is currently disturbed, with weeds and tree seedlings becoming established. Mature tree cover is very light, and essentially occurs only along portions of the property boundary and within a wooded draw on the western portion of the property. There are a variety of non-native invasive plant species occuring at the site, including callery pear, mimosa, and bamboo. The soils are Cecil sandy loam.

There is an overhead powerline easement along the northern portion of Sierra Drive Property that supports some desirable native vegetation. A variety of butterflies and other pollinators were observed in this utility easement.

Adjacent to the apartment complex is the only wooded portion of the site, where there is a small draw. There is some household solid waste and debris in this area of the property. This area is used for stormwater conveyance and may or may not be an intermittent stream branch. This drainage area is visible on the 1970 NRCS soils map as an intermittent channel, but based on current condition may be removed from jurisdictional regulations by the North Carolina Department of Environment and Natural Resources Division of Water Quality (DWQ). There are no other surface water features on the property.

Sierra Drive Property has been evaluated using City of Raleigh Nature Preserve Criteria. A detailed application of the Nature Preserve Criteria to the Sierra Drive Property is included in Appendix A. There are no known occurrences of protected plant or animal species on the property. At the time of this report no significantly high quality natural areas fitting the Nature Preserve Criteria have been observed on the property, and it is recommended the Sierra Drive Property remain classified as a Neighborhood Park.

Interim management recommendations proposed for Sierra Drive Property are organized into three categories: Safety, Environment, and Property Issues. Highlighted interim management recommendations include installing signage, verifying stream jurisdictional status, and communicating with Duke Energy Progress to encourage best stewardship practices for the powerline easment. The City of Raleigh Land Stewardship Coordinator will be responsible for initiating requests to appropriate staff to conduct the interim management tasks. The SIP is intended to be a useful tool to facilitate site management and land stewardship and is a baseline document to promote ongoing site inventory, evaluation, and management.

System Integration Plan
Sierra Drive Property
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Introduction

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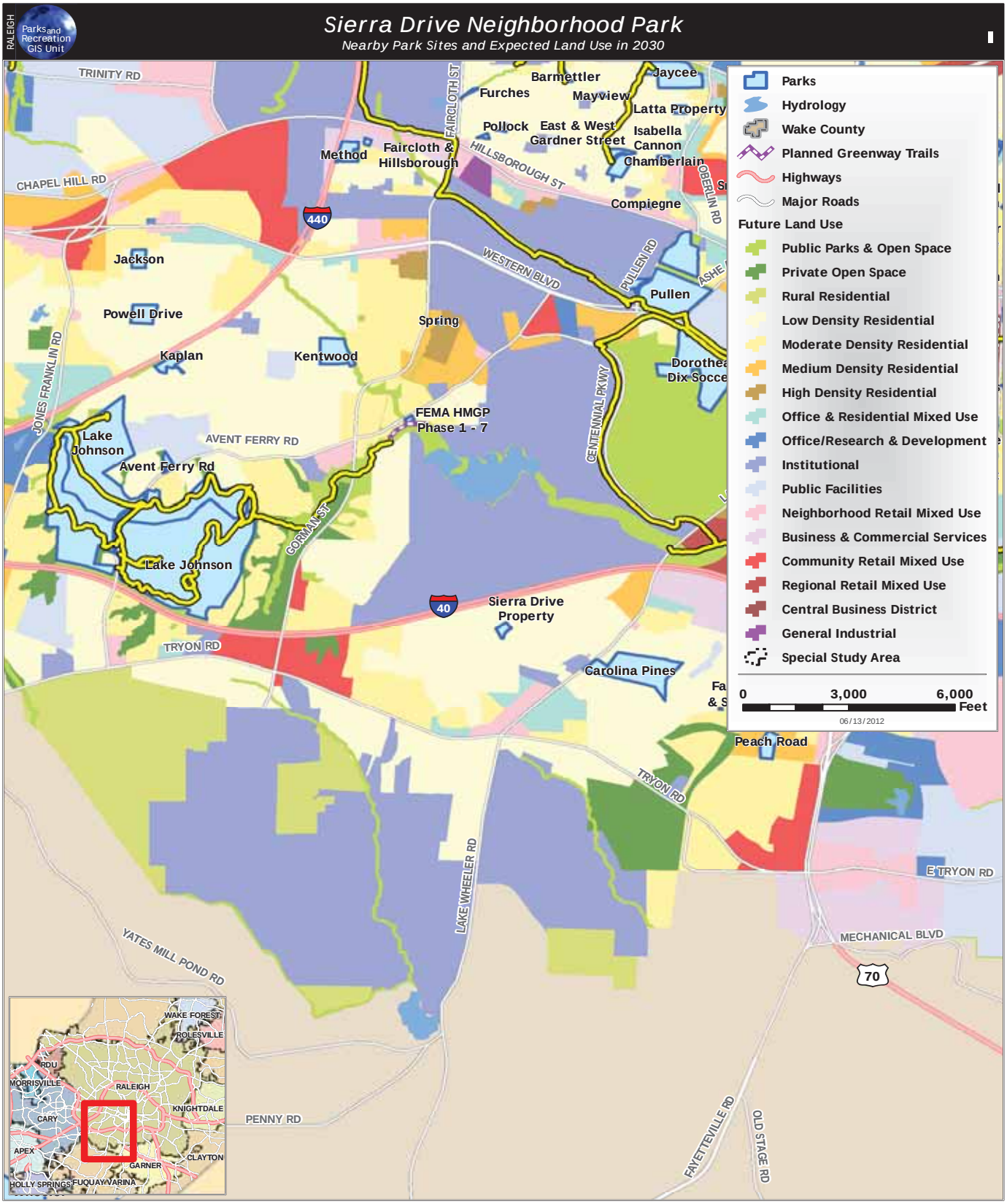
- Greenways in Vicinity
- Neighborhood Park Classification
- Nature Preserve Criteria

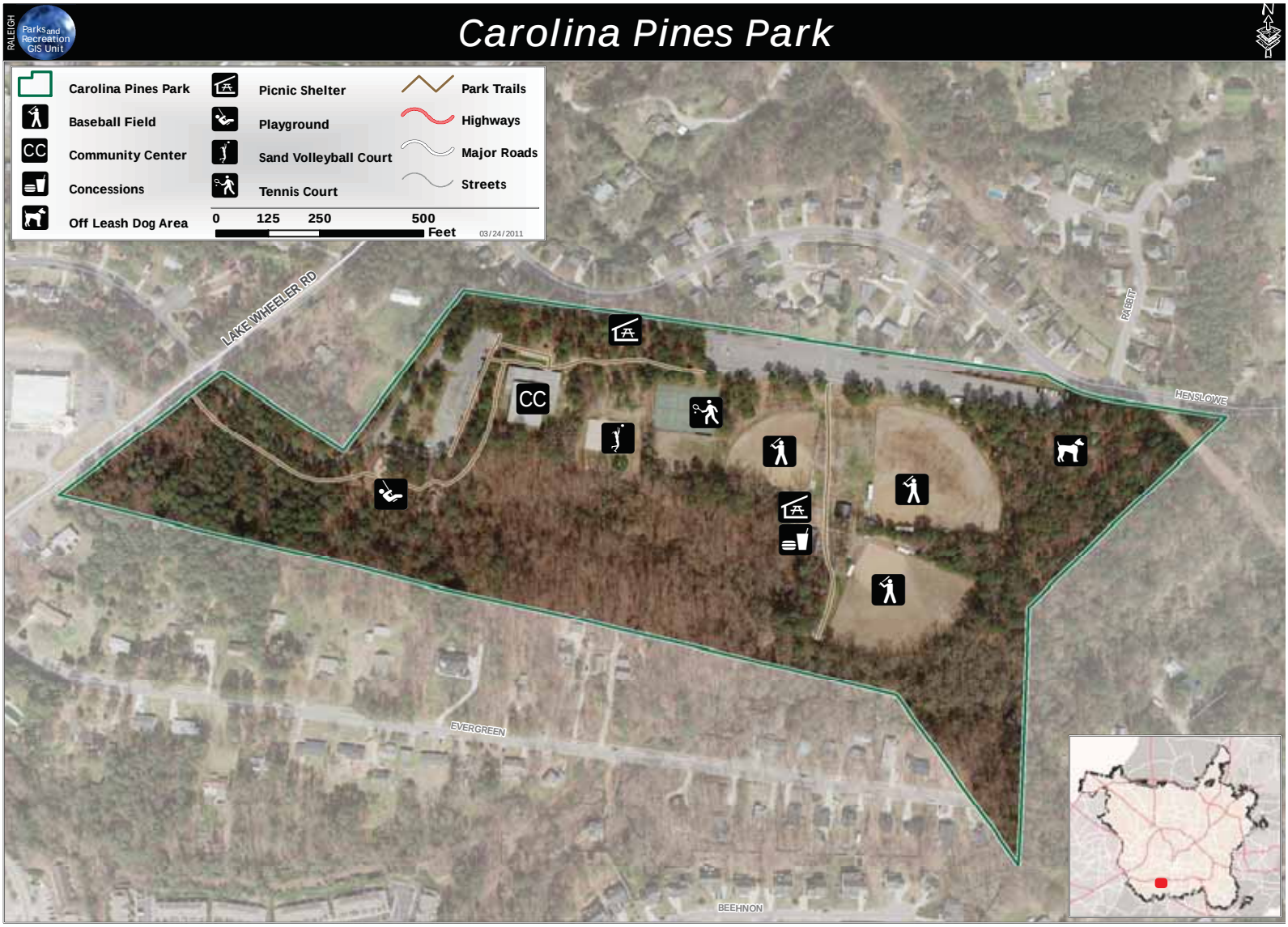
Property Location

Sierra Drive Property is located at the intersection of Lineberry And Sierra Drive. The map below shows additional City of Raleigh parks in the vicinity of Sierra Drive Property, and Future Land Use projected for the year 2030.

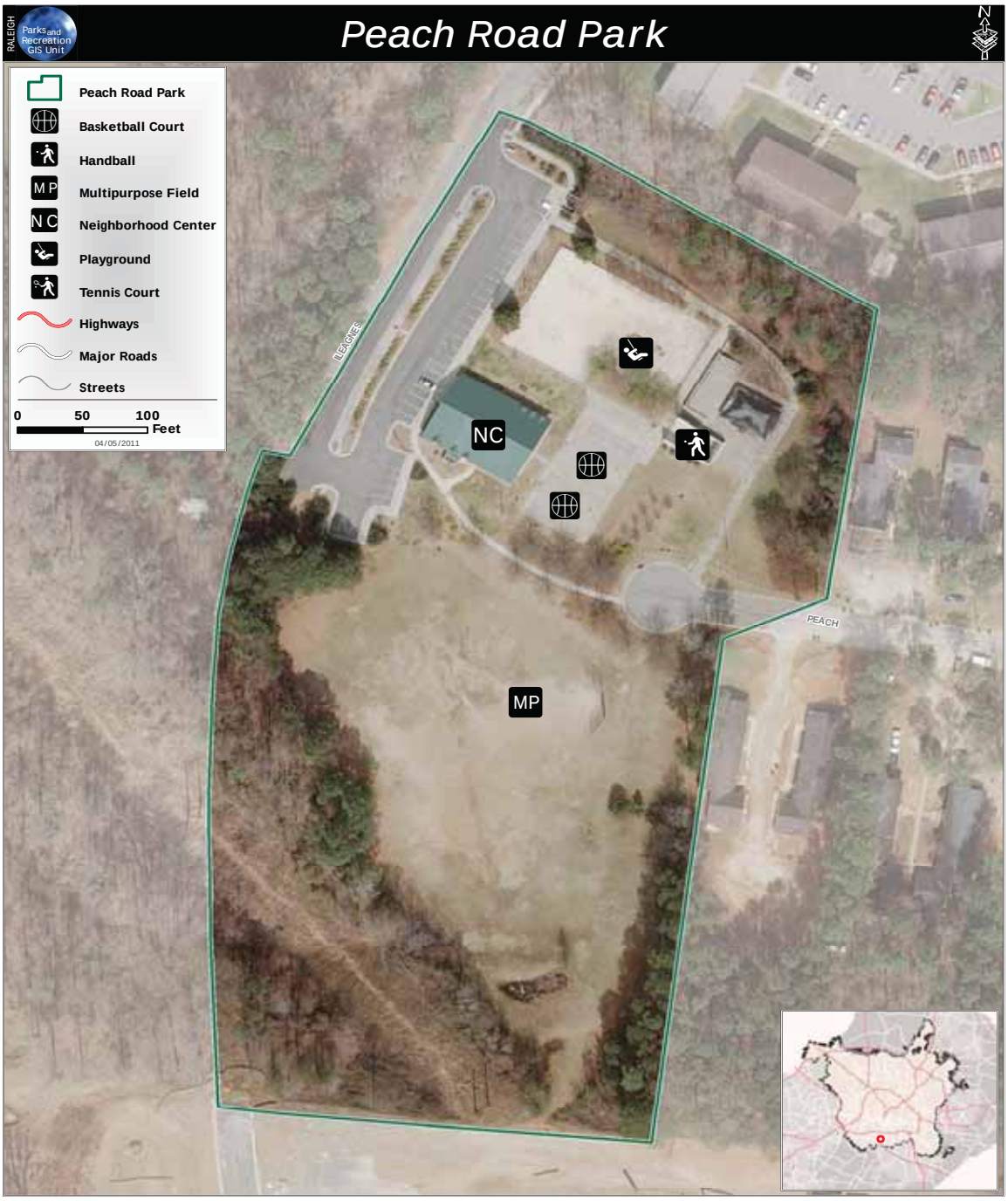


Park Sites in Vicinity

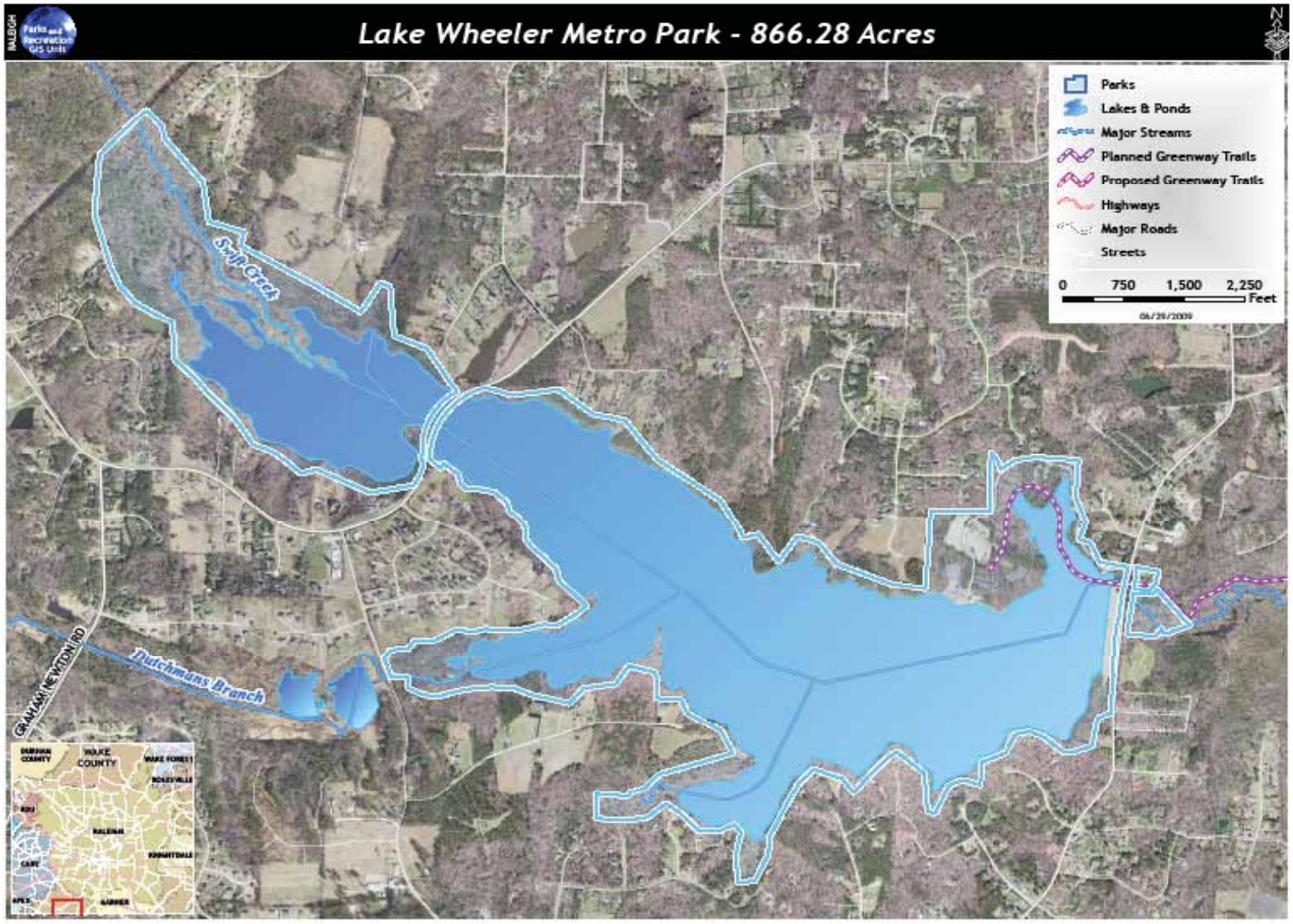
The closest existing park property is Carolina Pines Community Park. This park is 40.06 acres and is located at 2305 Lake Wheeler Rd., approximately 0.70 miles east of the Sierra Drive Property. The park includes a Community Center (renovated in 2012) that offers a range of programs, classes, and camp opportunities for all ages, with a gymnasium, weight room, and meeting rooms. Carolina Pines Park also offers a playground, picnic shelter, ball fields, lighted tennis courts, volleyball court, and dog park.



Peach Road Park and Neighborhood Center is a 5.13 acre Neighborhood Park located approximately 3 miles southeast of the Sierra Drive Property. The Peach Road Neighborhood Center offers a variety of programs and events for all ages, as well as afterschool, teen programming, and summer camps. The park includes a playground, multi-purpose field, outdoor basketball court, and handball court.

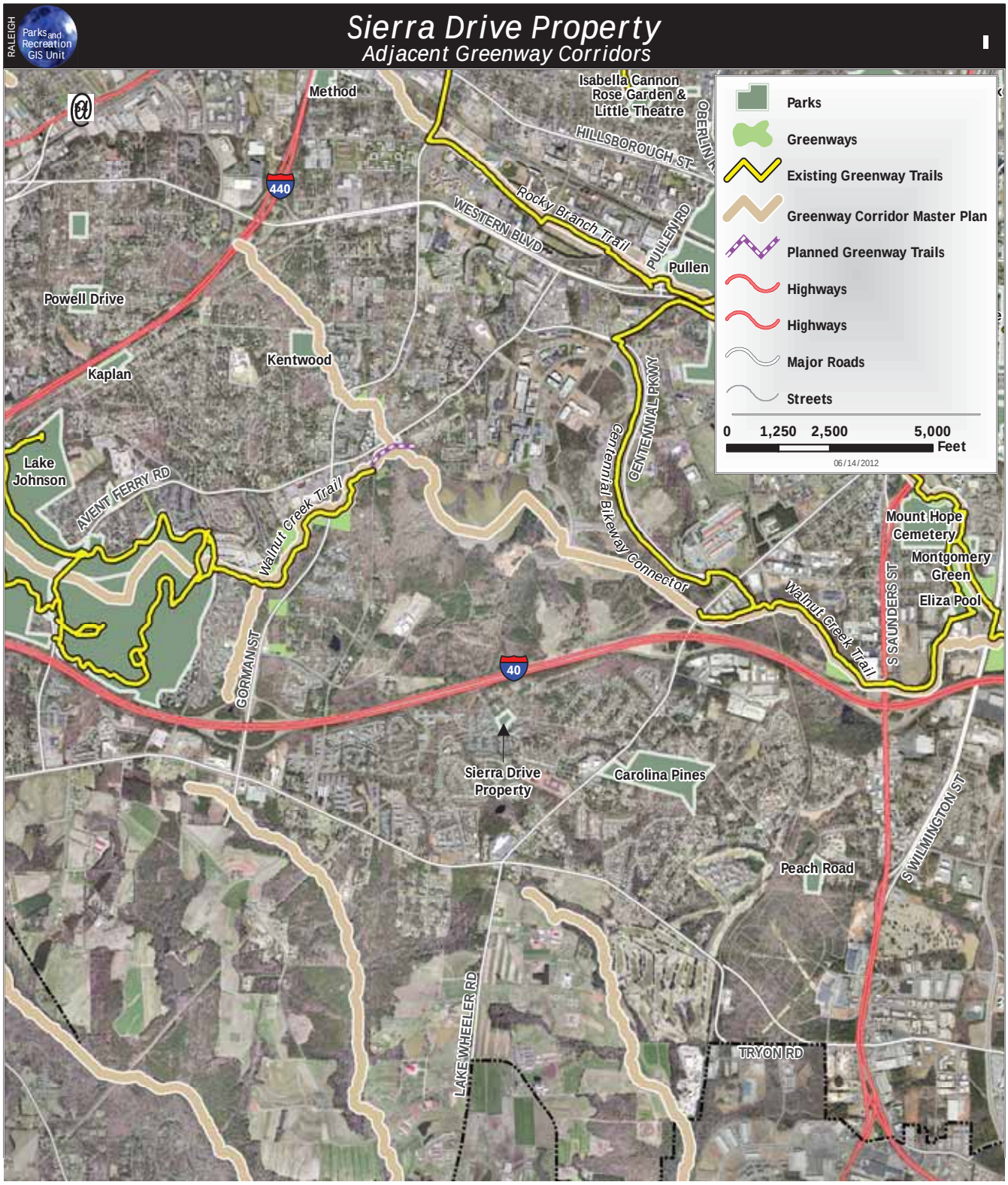


Natural resource-oriented recreation opportunities are accessible at park sites in proximity to Sierra Drive Property. Lake Johnson Metro Park and Nature Preserve is located approximately 3.5 miles to the northwest of the Sierra Drive Property. Lake Johnson is approximately 150 acres with more than 300 acres of land surrounding the lake. There are extensive hiking trails, fishing, boating, picnicing, and wildlife observation opportunities. Lake Wheeler is a 866.28 acre Metro Park located 4.4 miles south of the Sierra Drive Property. Lake Wheeler offers recreation options including fishing, boating, water-skiing, picnicing, hiking, and wildlife observation.



Greenways in Vicinity

Additional natural resource-oriented recreation opportunities in proximity to the Sierra Drive Property include the City of Raleigh greenway system, a network of recreational trails and public open spaces that provide opportunities for a range of activities such as biking, running, hiking, fishing, picnicking, bird watching, and nature study. Walnut Creek Greenway Trail is located northeast of the Sierra Drive Property. Hundreds of acres of conservation land are provided in the Raleigh Parks System through the Neuse River Greenway Trail.



Neighborhood Park Classification

The City of Raleigh park classification system aims to provide a diverse, well-balanced, well-maintained range of recreational opportunities. The five park classifications are Neighborhood Parks, Community Parks, Metro Parks, Special Parks, and Nature Preserves.

The 2.42 acre Sierra Drive Property site was purchased in 2009 to satisfy a documented need for Neighborhood Parks in Southwest Raleigh. Based on the 2004 Park Plan, the number of acres of existing neighborhood parkland compared to the expected population of an area is used to try to meet a Level of Service (LOS) of 2.6 acres of parkland per 1,000 population. Neighborhood Parks are expected to serve the basic daily recreational needs of the surrounding neighborhoods. They most often include playgrounds, court surfaces such as basketball, tennis or volleyball, and open space or multi-use turf areas. Depending on the size, topography, and other site characteristics, neighborhood parks may serve other needs as determined by the master planning process, proximity to other parks and greenway lands, and overall Parks and Recreation Department program needs. Smaller sites may be limited to very few elements; larger sites may present opportunities for elements such as walking tracks, athletic fields, or neighborhood center buildings. In some cases deed restrictions or environmental requirements may dictate the options available. Other considerations, such as the size and character of existing parks in the area, barriers to access (such as major thoroughfares), opportunities for future acquisition, and other City of Raleigh Comprehensive Plan elements are also taken into account when acquiring parkland. A new Park System Plan process is underway at the time of this SIP.

City of Raleigh Nature Preserves Criteria

A Nature Preserves Task Force was established in May 2010 at the request of Raleigh City Council. The Task Force consisted of representatives from the City of Raleigh, Wake Nature Preserves Partnership, and the Parks, Recreation and Greenway Advisory Board (PRGAB). The Task Force developed "Nature Preserves Criteria" for the purpose of evaluating existing park properties to determine whether the properties should be classified as Nature Preserves or Protected Natural Areas.

A "Nature Preserve" park classification is defined as an entire park unit that contains examples of high-quality plant or animal populations, natural communities, landscapes or ecosystems, documented by subject matter experts through local or state programs, that contribute to biodiversity and environmental health. The size of a Nature Preserve should be sufficient to buffer, conserve, and protect the target element or area. Efforts should be made to protect and manage significant natural resources in these areas through stewardship and best-practice management that do not degrade the resources present. Opportunities for the public enjoyment of natural resource based recreation and environmental education may be provided that are compatible with the protection and enhancement of the Nature Preserve and the nature experience.

A "Protected Natural Area" overlay classification is defined as a portion of a park unit that contains examples of high-quality plant or animal populations, natural communities, landscapes or ecosystems, documented by subject matter experts through local or state programs, that contribute to biodiversity and environmental health. In the case of existing parks, Protected Natural Areas should be identified as part of an inventory process based on the natural resources, buffers, educational opportunities, and consistency with adopted master plans. Efforts should be made to protect and manage significant natural resources in these areas through stewardship and best-practice management that do not degrade the resources present. The designation of a Protected Natural Area should be differentiated from areas reserved for future development.

The criteria developed by the Task Force includes both objective and subjective criteria to facilitate evaluation of existing parks for re-classification as "Nature Preserves", or recommendation for a "Protected Natural Area" overlay within a park unit. A copy of the **Nature Preserve Task Force Report** is available at www.raleighnc.gov (search for Nature Preserve Park Classification or NPTF).

Sierra Drive Property has undergone an initial evaluation using City of Raleigh Nature Preserve Criteria. A detailed application of the Nature Preserve Criteria to Sierra Drive Property is included in Appendix A. There are no known occurrences of protected plant or animal species on the property. At the time of this report no significantly high quality natural areas fitting the Nature Preserve Criteria have been observed on the Sierra Drive Property, and it is recommended the property remain classified as a Neighborhood Park.

Cultural Resources and Historical Site Use

A cultural resources background study of Sierra Drive Property was initiated using the following data sources:

1. Historic maps at the North Carolina Department of Archives and History were reviewed. The 1871 and 1878 Wake County Maps by Fendol Bevers show no evident occupancy on the property. The 1871 Fendol Bevers map (with the approximate location of Sierra Drive Property labeled) is included with this report on page 10.
The *Wake County 1914 Soil Survey Map* (with the approximate location of Sierra Drive Property labeled) is included with this report on page 11. The historic soils map does not show any human occupancy features such as buildings, pathways or roads.

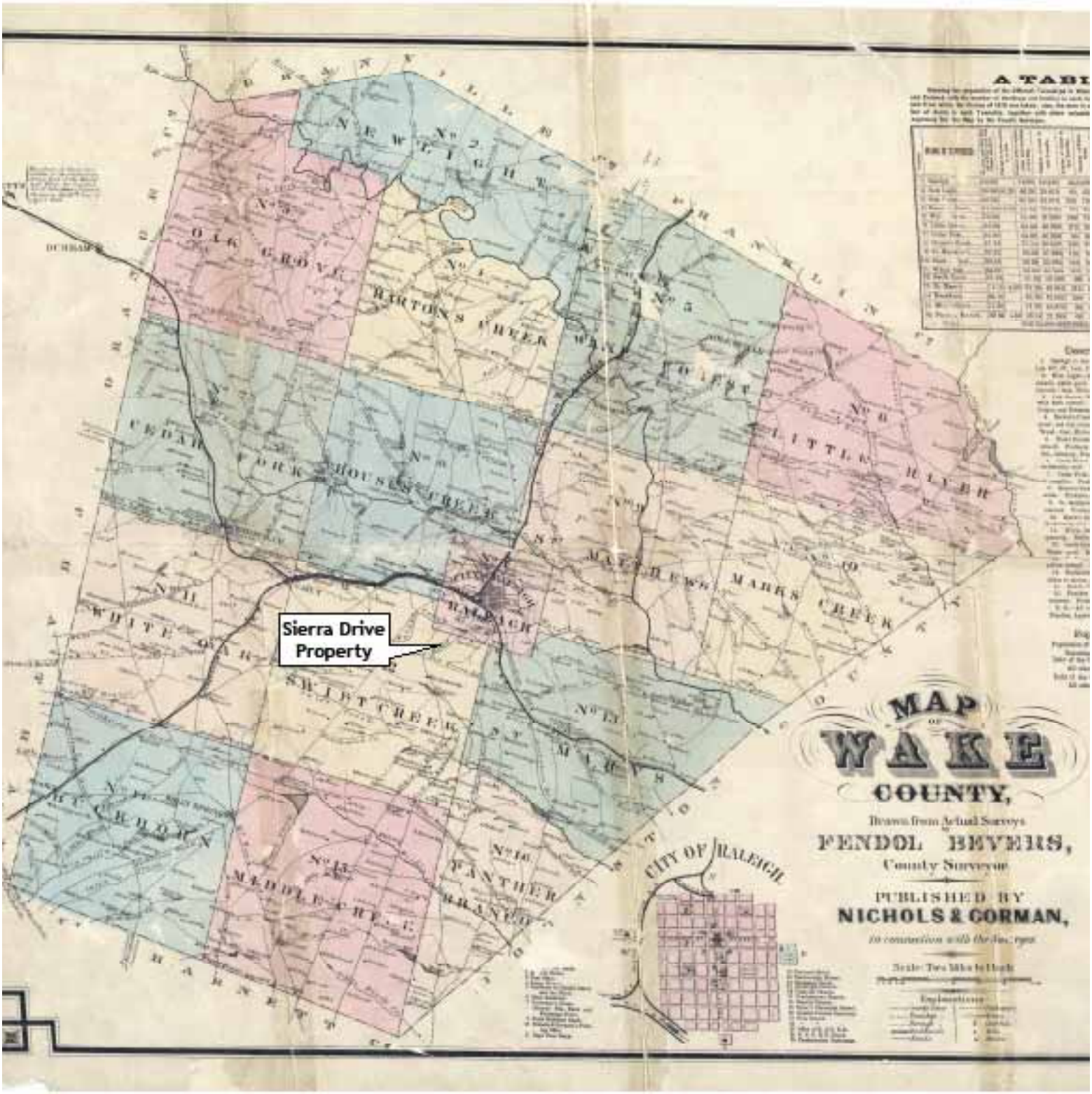
2. Deed records from the parcel.

3. U. S. Department of Agriculture (USDA) Natural Resources Conservation Service in Raleigh North Carolina aerial photographs:

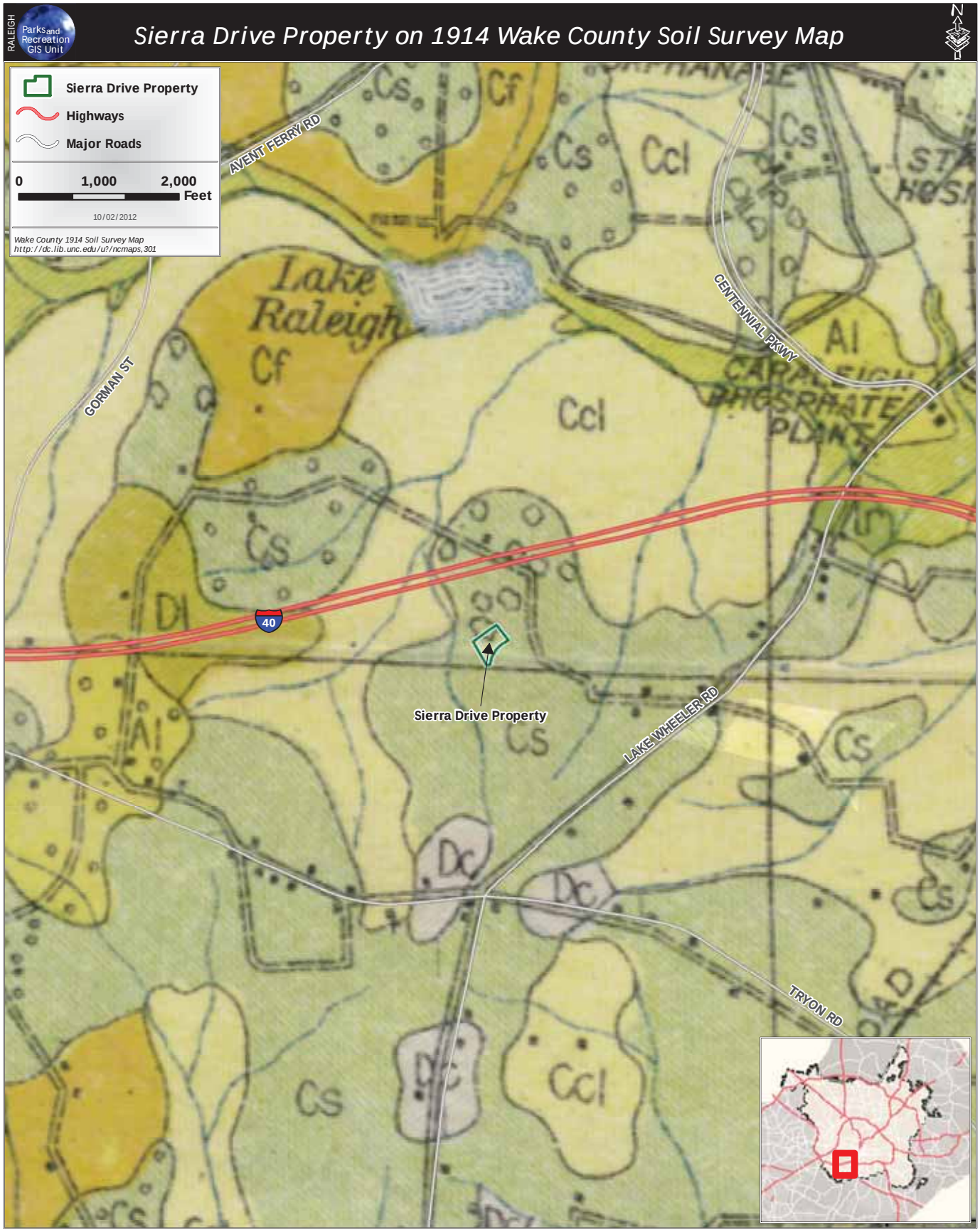
a. Photo BOP-4F-95, Grid I-12a, flown April 9, 1949 - USDA Natural Resources Conservation
b. Photo BOP-5FF-71, Grid J-11, flown March 15, 1965 - USDA Natural Resources Conservation
c. Photo BOP-2MM-19, Grid I-11, flown February 24, 1971 - USDA Natural Resources Conservation
d. Photo USDA 40 37183, Grid 278-44, flown April 27, 1981 - USDA Natural Resources Conservation
e. Photo NAPP 6136-29, Grid F-12, flown February 23, 1993 - USDA Natural Resources Conservation

Aerial photos of the Sierra Drive Property from 1949 to 1993 were reviewed to determine past land use and other potentially relevant historical information. Primary land use from 1949 to 1981 appears to be wooded. In a 1993 photo, the northeastern portion of the Sierra Drive Property is cleared. An aerial photo of the 1993 cleared site condition is included on page 12 of this report.

4. Phase 1 Environmental Site Assessment (ESA) for 2640 Sierra Drive, Raleigh North Carolina, completed July 31, 2009 by GeoLogix Inc Environmental Consulting and Contracting Services. The Phase 1 ESA identified no buildings or structures on the Sierra Drive Property. The Executive Summary for the Sierra Drive Property Phase 1 ESA Report is included in Appendix C.



Approximate location of Sierra Drive Property on 1871 Fendol Bever's map of Wake County. Property is located in Swift Creek Township, north of Old Tryon Road.


RALEIGH
Parks and Recreation GIS Unit
Sierra Drive Property on 1914 Wake County Soil Survey Map
N
Sierra Drive Property
Highways
Major Roads
0
1,000
2,000
Feet
10/02/2012
Wake County 1914 Soil Survey Map
http://dc.lib.unc.edu/u?/ncmaps,301
AVENT FERRY RD
GORMAN ST
CENTENNIAL PKWY
LAKE WHEELER RD
TRYON RD
Lake Raleigh
Cs
Cf
Ccl
Al
Dl
Dc
40
Sierra Drive Property

Site clearing on Sierra Drive Property in 2005 visible on Aerial Photograph from Wake County GIS system

0 50 100 200 Feet

1 inch = 100 feet

Site Description: Adjacent Property Use and Zoning

Adjacent Property Use

The Sierra Drive / Lineberry undeveloped park property is 2.42 acres located on the northwest corner of Lineberry Drive and Sierra Drive, in southwest Raleigh. Road frontage includes 56 feet on Lineberry Drive and 395 feet on Sierra Drive. The physical property address is 2640 Sierra Drive. Adjacent property use includes residential multifamily and single family uses. The property is adjacent to an apartment complex with a density of 11 units per acre and a residential subdivision with 0.12 acre lots (Trailwood Glen subdivision). There are several nearby condominium and townhome complexes.

Zoning

- The Sierra Drive Property is zoned as Residential-10 (R-10)
- The Citizen Advisory Council (CAC) District is Southwest
- The property is located in a **Special Highway Overlay District-1** (**SHOD-1**), intended to protect and preserve the natural scenic beauty along designated major access corridors and specified principal arterials which are located now or will be constructed within this Overlay District. Maintaining the attractiveness of these roadway corridors will enhance the economic value of the community by encouraging tourism and trade. This Overlay District is established also for the purpose of: Protecting the public investment in and lengthening the time during which highways can continue to serve their functions without expansion or relocation by expediting the free flow of traffic and reducing the hazards arising from unnecessary points of ingress and egress and cluttered roadside development; Reducing the costs of future highway expansions by requiring that buildings and structures be sufficiently set back from the right-of-way to provide adequate storage for vehicles until they can safely enter the highway; Reserving adequate roadside space through which neighborhood traffic may be admitted to and from the highway system in a manner that avoids undue traffic concentrations, sudden turnings and stoppings and other hazards; and Achieving a common unified appearance along a roadway with other jurisdictions of the county. A permit is required for existing tree removal.

Special Highway Overlay District-1

N

0 205 410 820 Feet

1 inch = 400 feet

- The Sierra Drive Property is located within a **Supportive Housing Buffer** of 1200 feet. The red dot on the map below represents the Supportive Housing Location. At the time of this report, the Raleigh Unified Development Ordinance (UDO) defines a Supportive Housing Residence as: A facility in which more than four unrelated persons may reside who are battered individuals, abused children, pregnant women and their children, runaway children, temporarily or permanently disabled mentally, emotionally or physically, individuals recovering from drug or alcohol abuse, and all other persons who possess a disability that is protected by the provisions of either the Americans with Disabilities Act 42 USC 12101 or N.C. Gen. Stat. Article 3, Chapter 168, along with family members and support and supervisory personnel. Use Standards in the proposed UDO include (a) The total number of individuals occupying a supportive housing residence cannot exceed twelve. (b)A resident manager must reside permanently on the premise. (c.) No supportive housing residence can be located within 1,125 feet of another multi-unit supportive housing residence or supportive housing residence (determined by a straight line from property line to property line) and (d) The supportive housing residence must conform to one or more of the following: It is licensed by the federal or state governments; It is funded in part by governmental grants or loans.

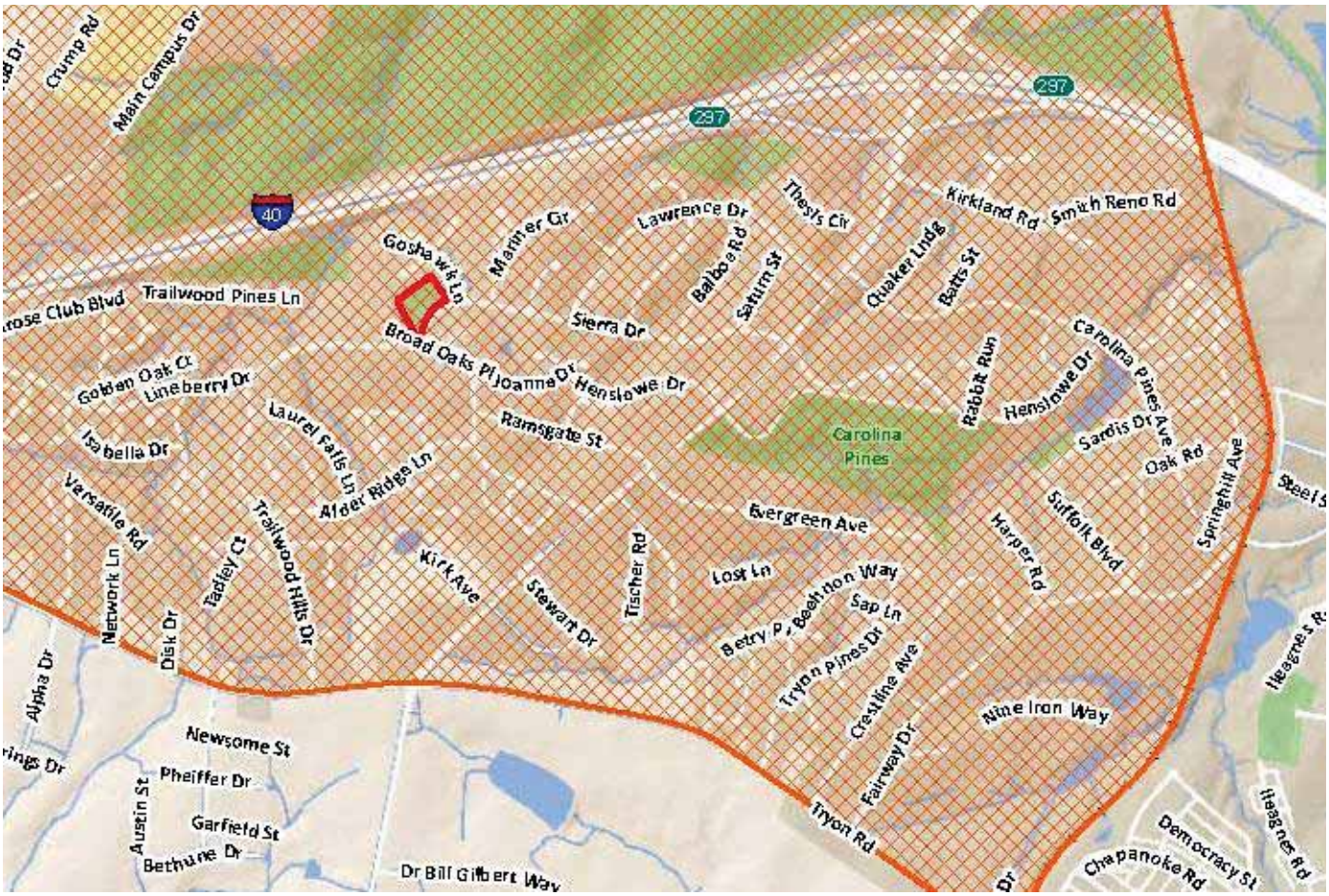
Supportive Housing Buffer of 1,200 feet

N

0 100 200 400 Feet

1 inch = 200 feet

- The Sierra Drive Property is located within a **Special Residential Parking Overlay District**, regulating the amount of front yard area that may be devoted to vehicular surface areas for single family detached dwellings



Special Residential Parking Overlay District

N

0 800 1,600 3,200 Feet

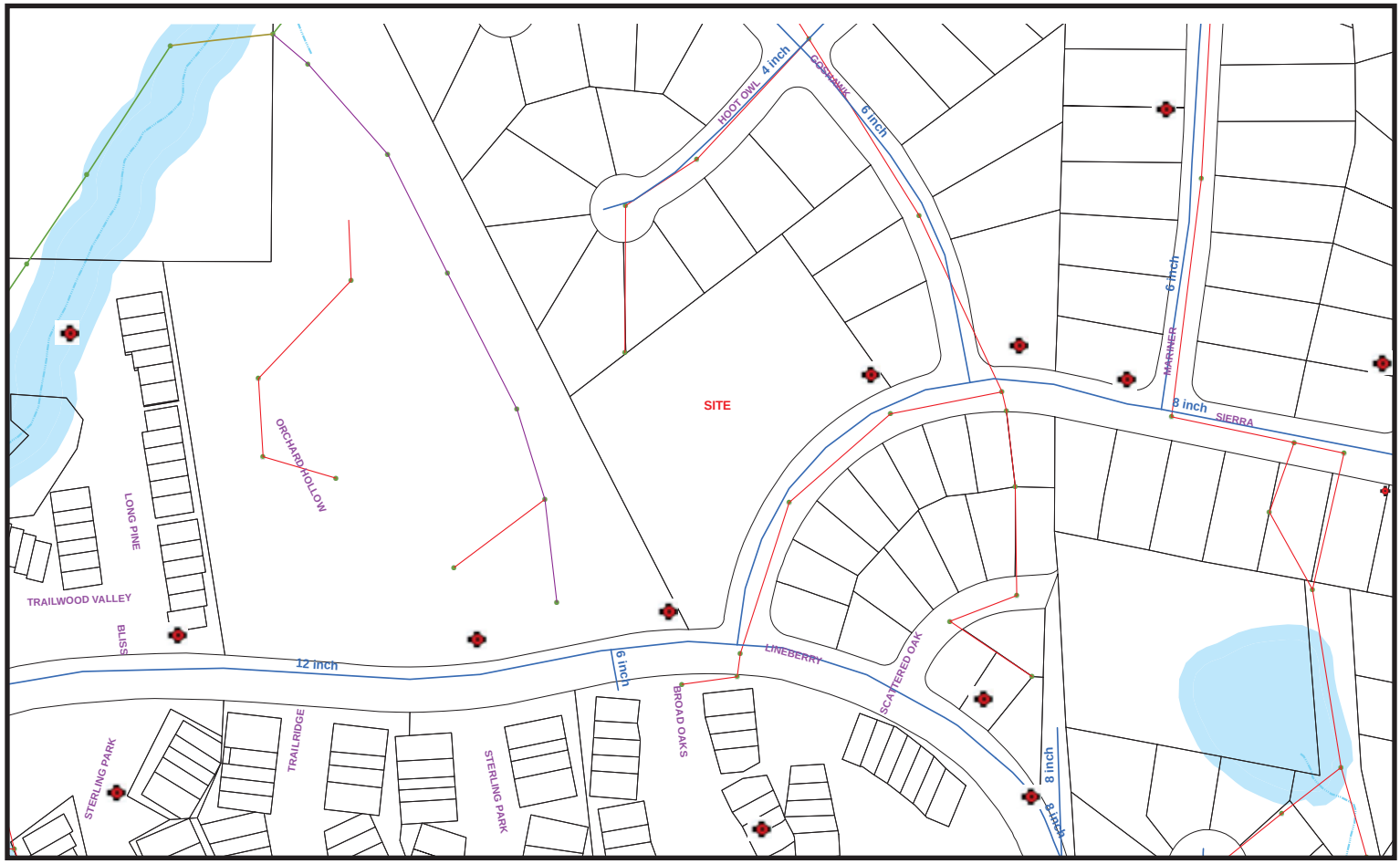
1 inch = 1,600 feet

Existing Facilities and Site Conditions

Site investigations for the purpose of developing a System Integration Plan for Sierra Drive Property were conducted during August 2010, July 2011, and August 2012. Survey and installation of property boundary signage along the perimeter of the parcel has been completed. There are currently no significant encroachment issues along the property boundary of the park.

Public Utilities: Sewer and Water

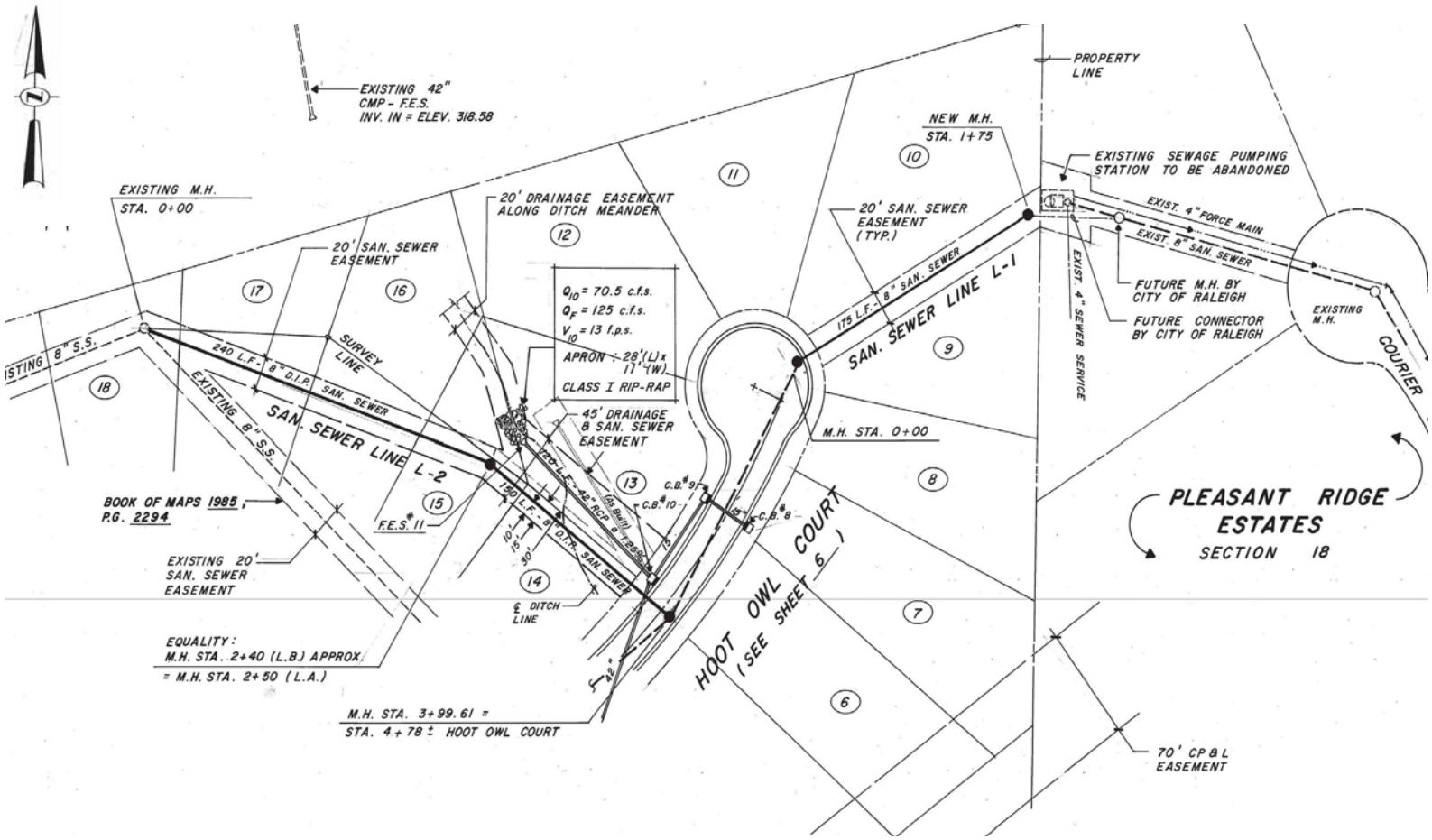
The sewer and water map below was provided by the City of Raleigh Public Utilities Department. Location of fire hydrants are approximate (fire hydrant symbol is red circle with black dot). Blue lines represent water lines, red lines represent sewer, purple lines represent private sewer lines. Sanitary Sewer As Built information is provided on the following 2 pages of this report. "As Built" drawings show the actual existing conditions and are documented either after or during construction.

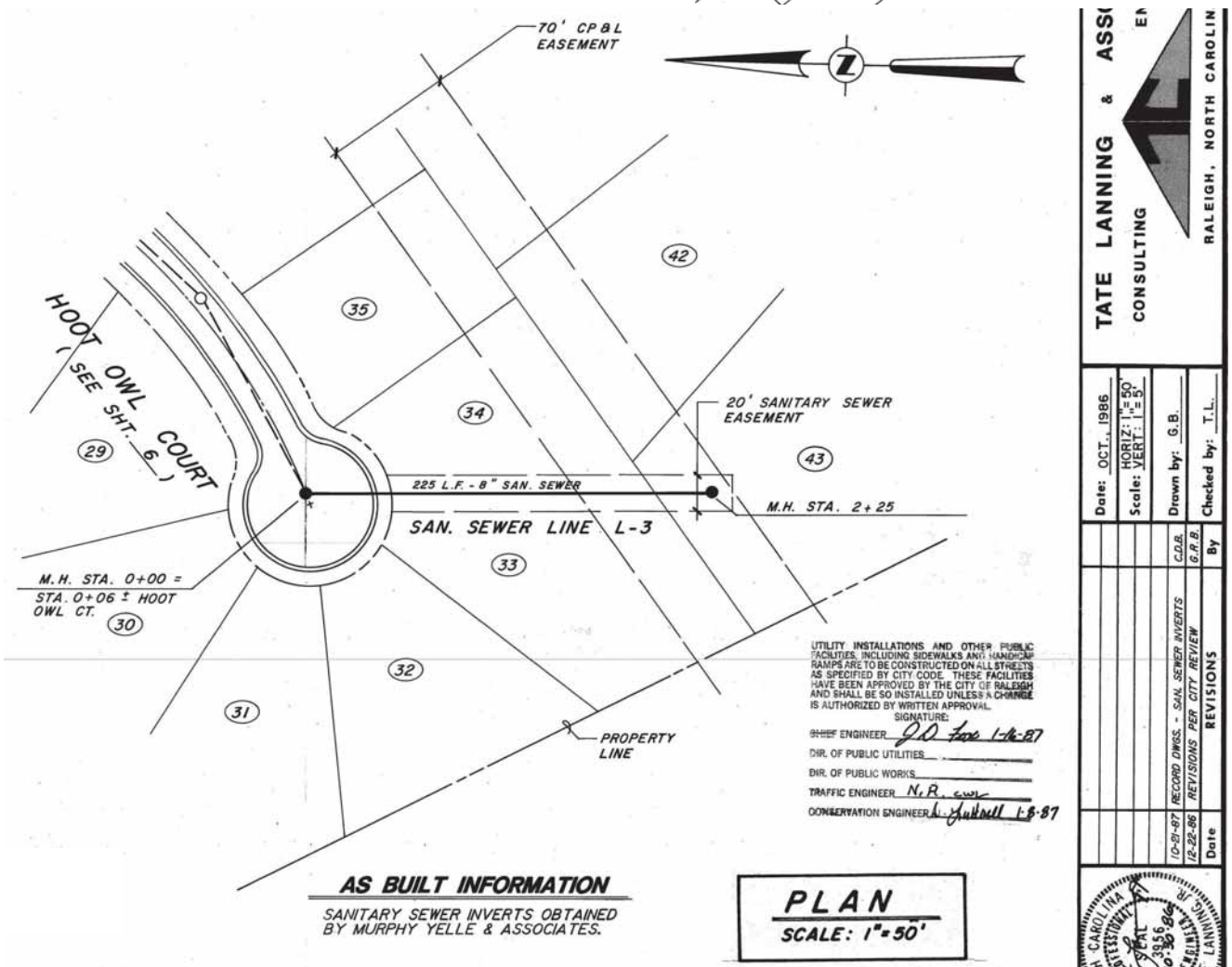


Sewer and Water in vicinity of Sierra Drive Property

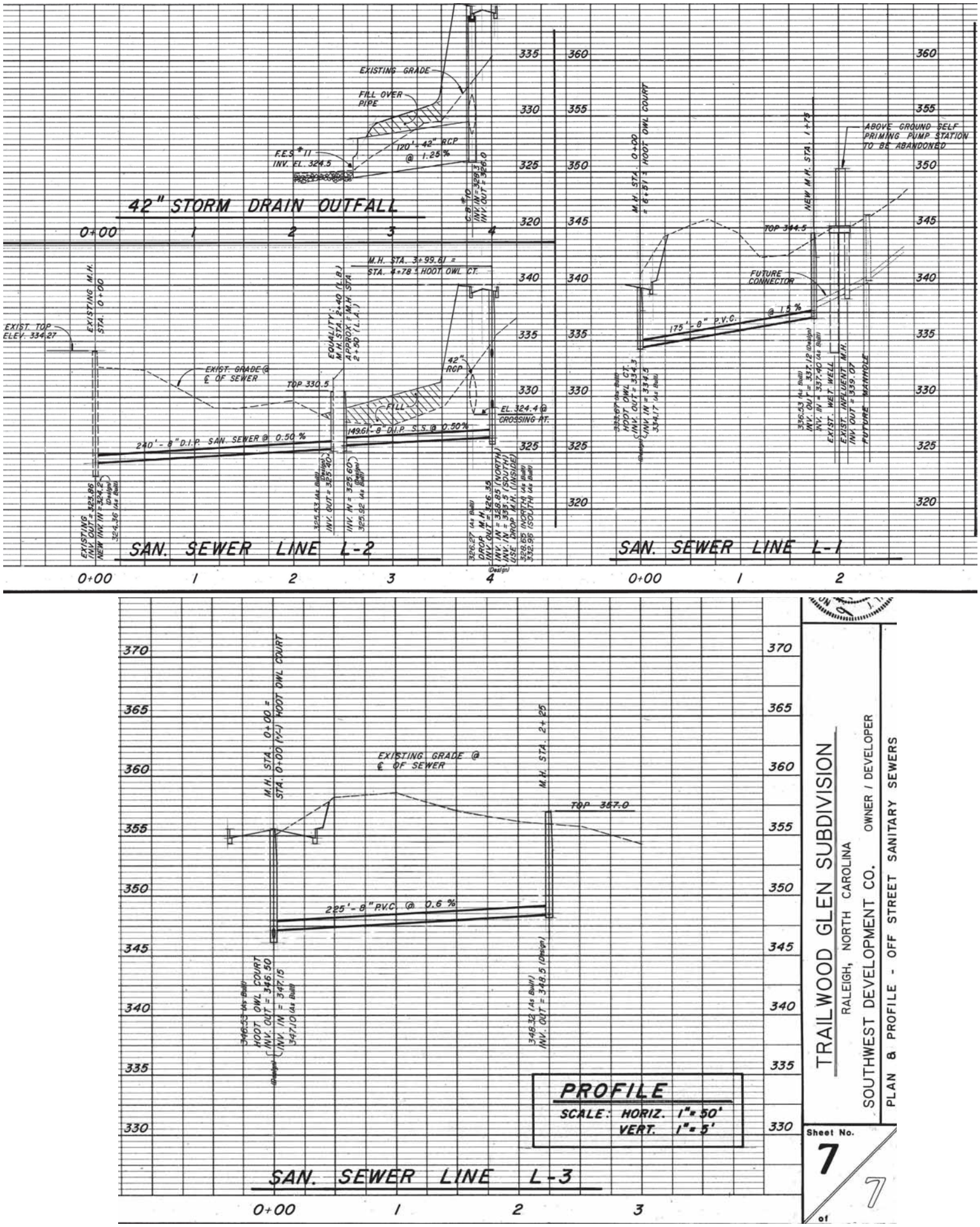
fire hydrants

Sewer As-Built for vicinity of Sierra Drive Property part 1





Sewer As-Built for vicinity of Sierra Drive Property part 2



Fire hydrant and mowed strip along Lineberry Drive (56 linear ft of road frontage). Sidewalk is installed on south side of Lineberry Drive.

Sidewalk, fire hydrant, mowed strip along Sierra Drive (395 linear ft of road frontage)

Public Utilities: Electric

A Duke Energy Progress overhead powerline easement runs along the northern boundary of the property. The easement width is 70 feet. A detailed description of vegetation within the easement begins on page 41 of this report.

Duke Energy Progress Powerline Easement

N

0 50 100 200 Feet

1 inch = 100 feet

Overhead powerline easement along northern property boundary, view from multi-family housing unit at northwestern corner of property (facing northeast toward park property)

Overhead powerline easement (approximately 70 feet wide) from northwest corner of property, facing west toward adjacent multi-family housing unit

A majority of property owners along the northern and eastern property boundaries have installed fences along the property line. There are no buildings or structures on the property.

Wooden fences along northeastern and eastern property boundary (facing northeast)

Wooden and chain link fences run the length of the northern property boundary, adjacent to the overhead powerline easement (facing west)

Additional Utilities

Utilities along Sierra Drive, at intersection with Lineberry Drive

Large electrical transformer box in woods at southern corner of park property. This transformer box DIS No. 13086 is described in the Phase 1 ESA Report as unlabeled for PCB content.

Additional utility boxes located in the woods at the southern corner of park property.

Site Conditions

The majority of the Sierra Drive Property was previously cleared (see aerial photo from 2005 on page 12 of this report). The site is currently disturbed and early successional, with vegetation consisting primarily of weeds, tree seedlings, and nonnative invasive plants. Mature tree cover is limited and occurs only along portions of the property boundary and within a wooded draw on the western portion of the site. There are a variety of non-native invasive plant species established, including callery pear, mimosa, bamboo, and lespedeza. The soils are Cecil sandy loam.

Tree seedlings such as pine and sweet gum interspersed with herbacious vegetation

Site appears disturbed and includes areas of exposed, eroded Cecil soils

Small trees along Sierra Drive (invasive species such as Mimosa and Callery Pear)

Wooded area along western property boundary, facing southwest toward multi-family housing unit. The wooded draw is described in greater detail beginning on page 32.

A *Phase 1 Environmental Site Assessment* was completed for the Sierra Drive Property during the site acquisition process in 2009; the Executive Summary of the report is included in Appendix C. Construction materials, including concrete culvert pipes and small piles of gravel, were observed on the site. During the Phase 1 Assessment there was no evidence of landfilling or burial of wastes on the subject property, no evidence of hazardous or toxic substances, wastes, materials or other environmental contaminants currently being used on or stored on the property.

Concrete culverts on eastern portion of property.

Cinder blocks in central portion of property

Dumping and potential vandalsim occurs in the wooded area near the intersection of Sierra Drive and Lineberry Drive. The photo above was taken in Aug 2010.

Vandalized or discarded utility box in August 2012.

This photo of the multi-family housing complex sign “Trailwood Glen” was taken in Aug 2010 near the intersection of Sierra Drive and Lineberry Drive.

Potential vandalsim or dumping of the “Trailwood Glen” sign, photo taken in Aug 2012.

Inventory of Natural Resources: Soils, Water Resources, Flora and Fauna

Soils of Sierra Drive Property

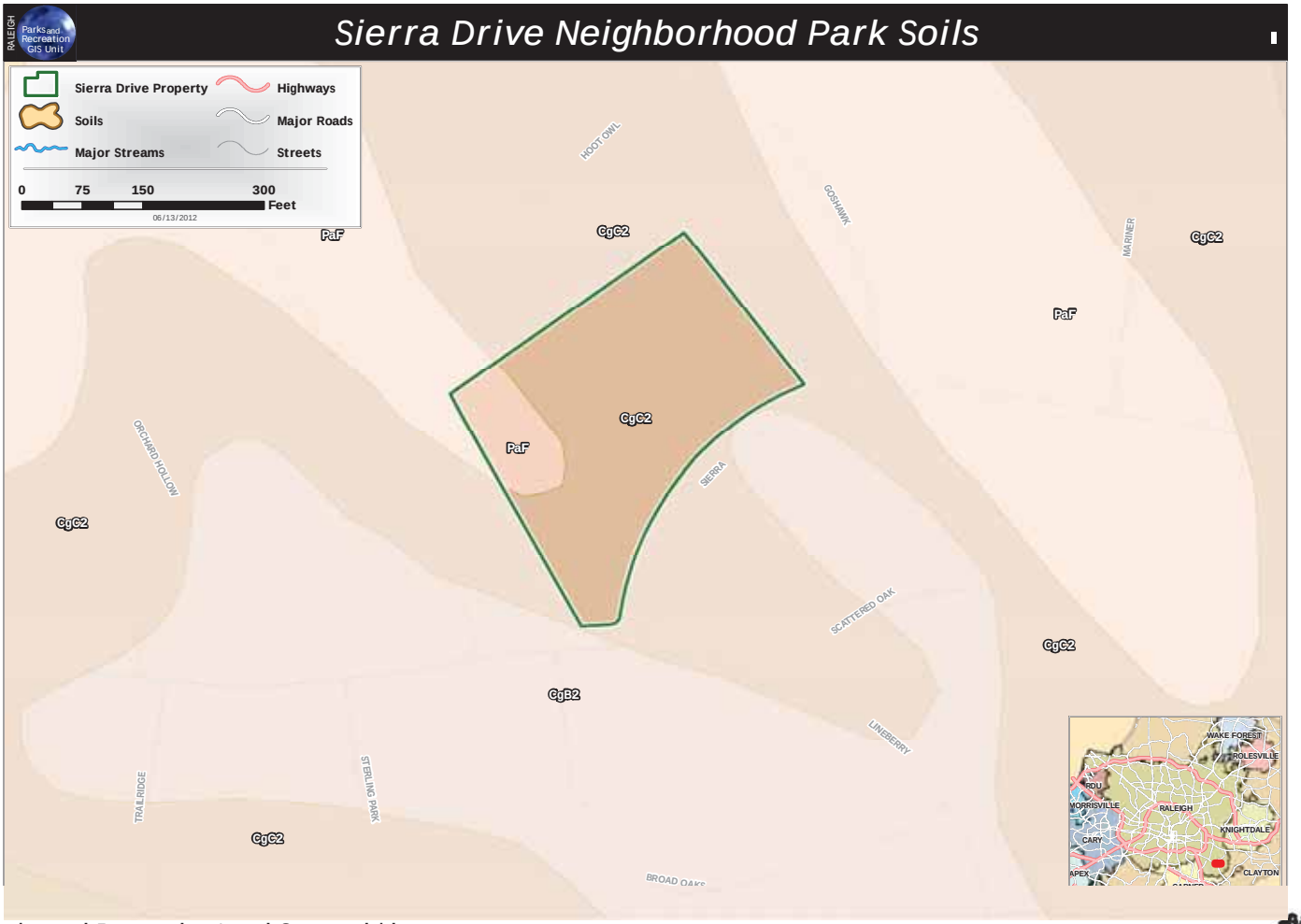
The following soil data was created by the USGS and the North Carolina Center for Geographic Information and Analysis. Sierra Drive Property is underlain by the Cecil soil association. This soil association is described in the *Wake County Soil Survey* as gently sloping to steep, deep, well-drained soils that have a subsoil of firm red clay, derived mostly from gneiss and schist. The Cecil soils of Wake County are acidic and low in natural fertility and organic matter content (Cawthorn 1970). There are two soil mapping units within the property.

CgC2 **Cecil Gravelly Sandy Loam 6 to 10 percent slopes, eroded**

This soil is on short to long side slopes in the uplands. The surface layer is 3 to 7 inches thick and is a mixture of the original surface soil and material from the subsoil. The content of gravel in the surface layer ranges from 15 to 30 percent. The subsoil is red firm clay 30 to 45 inches thick. Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe.

CeF **Cecil Sandy Loam 15 to 45 percent slopes**

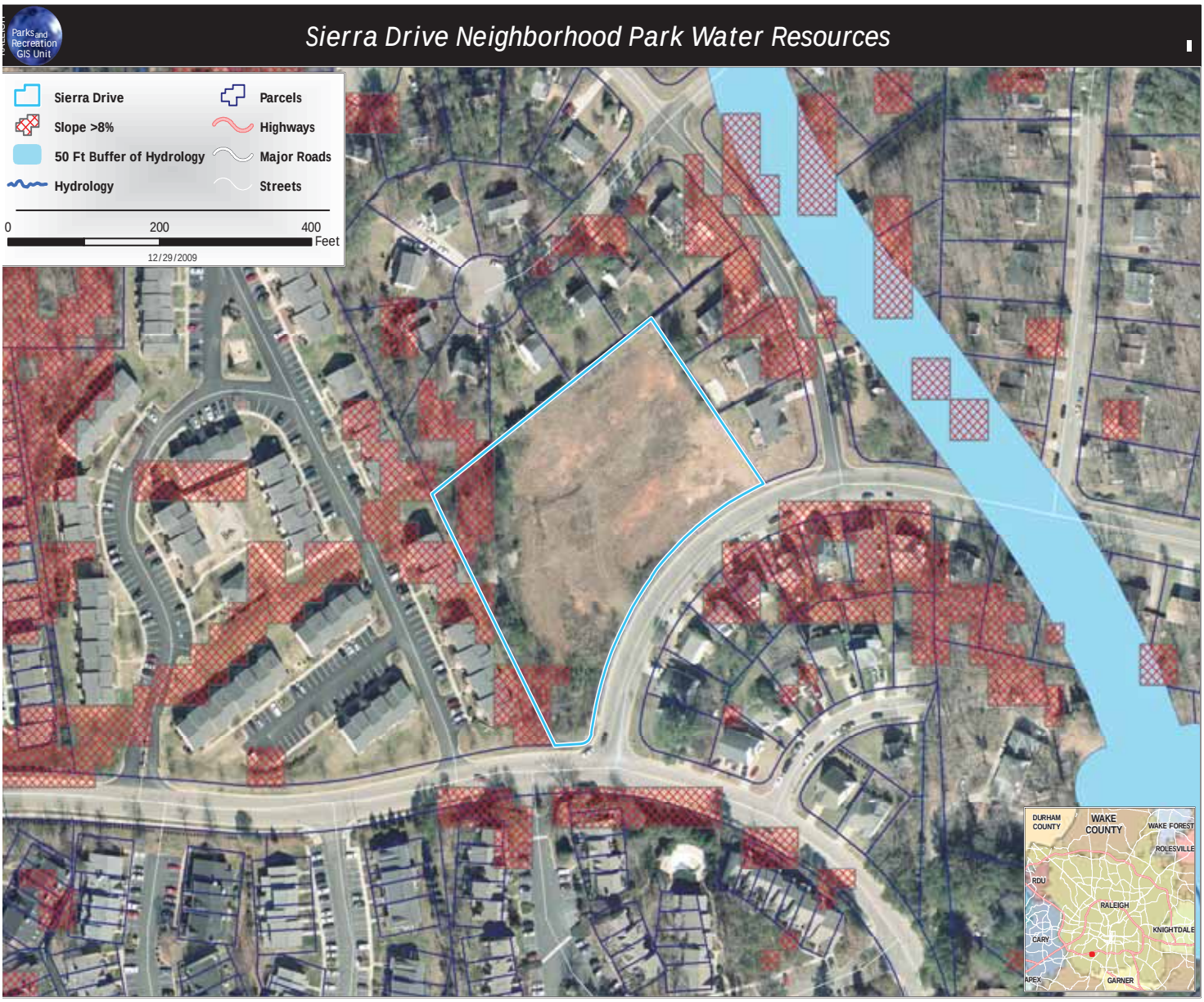
This soil is on narrow side slopes bordering upland drainageways and is slightly to moderately eroded. The surface layer is sandy loam 5 to 9 inches thick, where erosion is only slight. The surface layer is clay loam 3 to 6 inches thick where erosion is only moderate. The subsoil is red firm clay 30 to 36 inches thick. Infiltration is fair to good, and surface runoff is very rapid. This soil is highly susceptible to erosion.



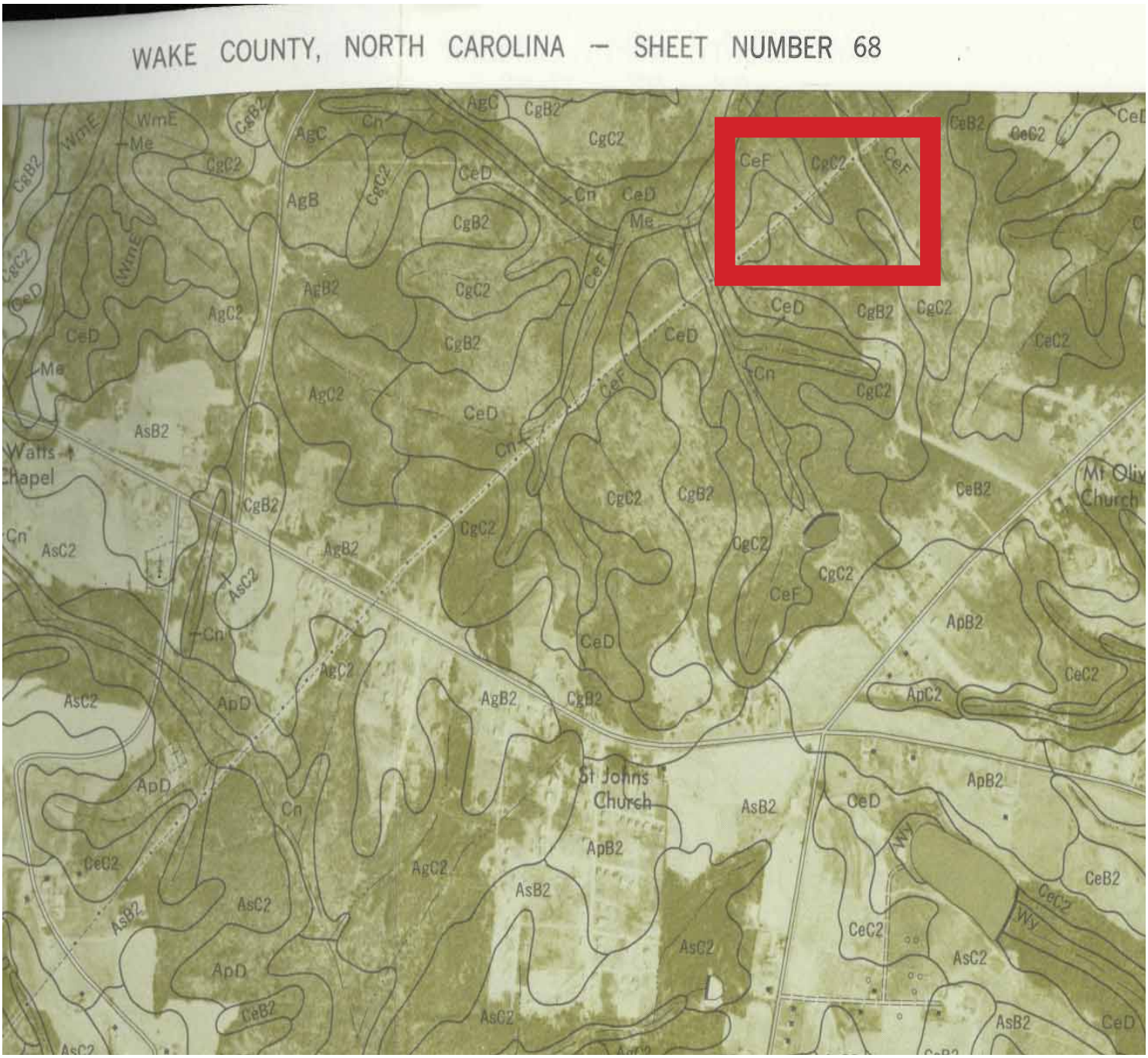
RALEIGH
Parks and Recreation GIS Unit
Sierra Drive Property Topography
Contour Lines
Sierra Drive Property
Highways
Streets
0 20 40 80
Feet
01/11/2013
GOSHAWK
SIERRA
ORCHARD HOLLOW
LINEBERRY
WAKE FOREST
DURHAM
ROLESVILLE
RDU
MORRISVILLE
RALEIGH
WENDELL
KNIGHTDALE
CARY
APEX
CLAYTON

Water Resources of Sierra Drive Property

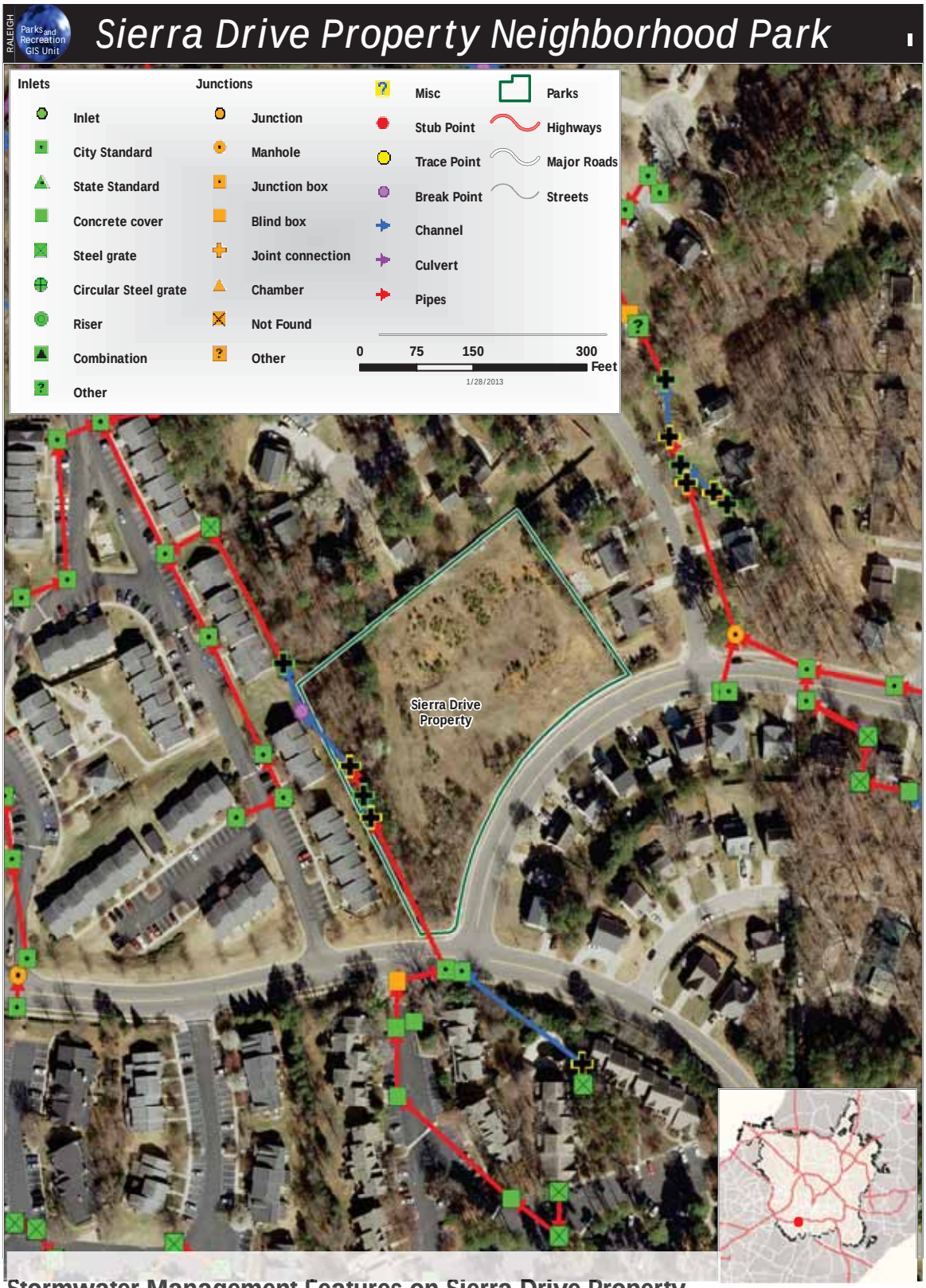
Drainage on the property is directed toward the southwest where there is a small draw within the only wooded portion of the future park site. There is some household solid waste and debris in this area of the property, adjacent to a multi-family housing unit. This area is used for stormwater management (see map on page 34) and may or may not be an intermittent stream branch. This drainage area is visible on the 1970 NRCS soils map as an intermittent channel, but based on current condition may be removed from jurisdictional regulations by the North Carolina Department of Environment and Natural Resources Division of Water Quality (DWQ). There are no other surface water features on the property.



The NRCS 1970 Soils Map (Sheet Number 68) is provided below. An intermittent stream channel is visible within the highlighted red square, the current approximate location of Sierra Drive Property. Perennial and intermittent streams are subject to state and federal jurisdictional regulation under Section 404 of the Clean Water Act and North Carolina's Neuse River Riparian Buffer Rules. The Neuse River Riparian Buffer Rules require a minimum 50-foot wide riparian buffer directly adjacent to surface waters in the Neuse River Basin. The first 30 feet on all sides of a stream or other water body must be undisturbed forest plus another 20 feet of grass, trees, or other vegetation.



Stormwater management features are utilized within the western portion of the Sierra Drive Property. The blue lines represent channels, the red lines represent stormwater pipes.



Stormwater Management Features on Sierra Drive Property

When it rains, runoff flows over driveways, sidewalks, streets and parking lots in our urban environment and sends pollutants such as litter, oil, pet waste and pesticides, into the storm drain system. Trash such as plastic water bottles accumulates in low places. Until we can change human behavior and prevent littering, it can be very challenging to control and manage this problem. The frequency with which new trash comes in, the city-wide scale of the stormwater system, and often the inaccessibility of the locations where trash accumulates can make regular cleanup difficult.

Stormwater Outlet Pipe in wooded draw

Stormwater Pipe

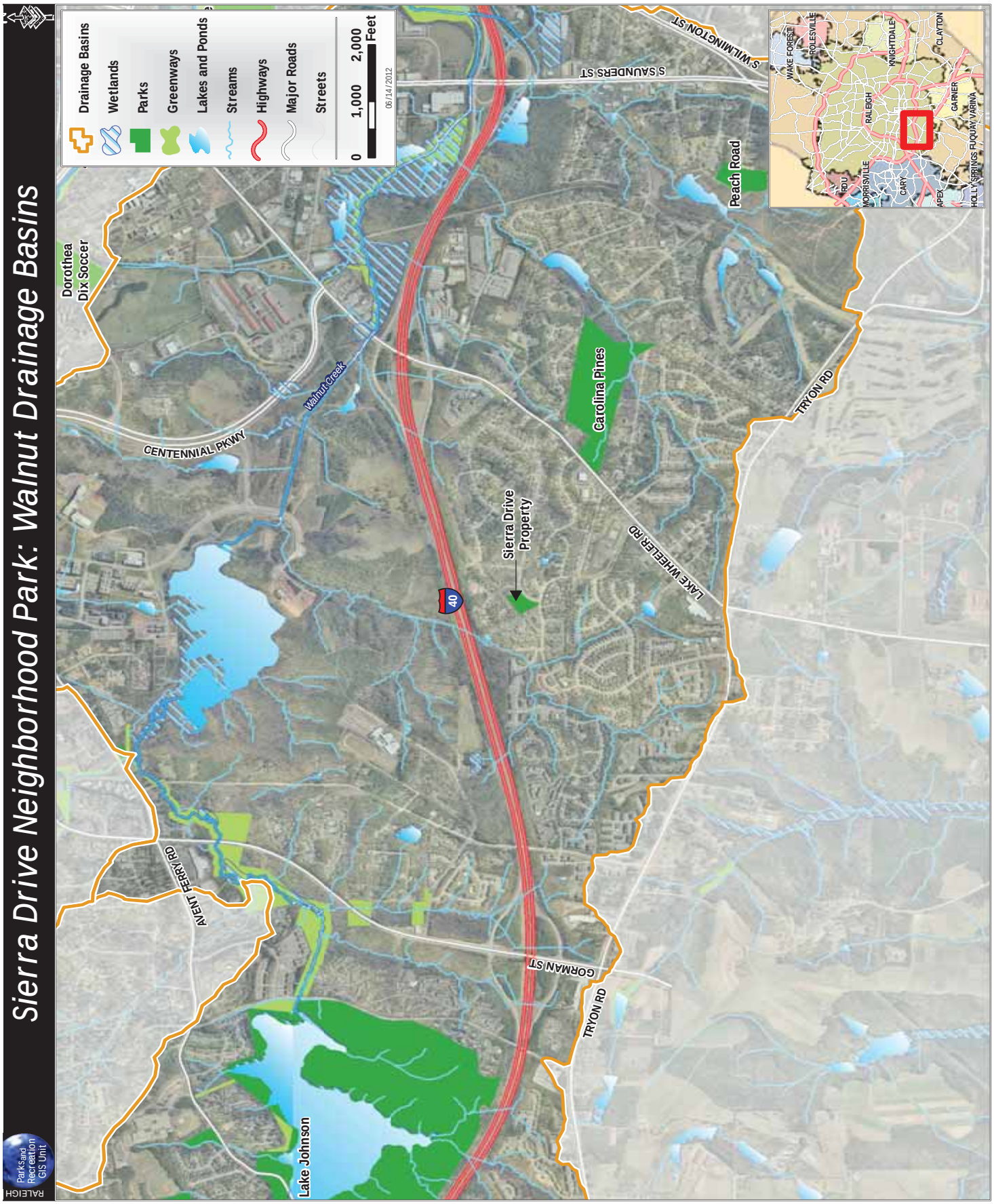
PVC pipe from multi-family housing unit, routing water to wooded stormwater draw. A section of chain link fence is located between the housing unit and woods.

Stormwater draw at intersection with powerline easement, northwest corner of park property. Brown property boundary marker is visible in the foreground.

The Sierra Drive Property is located in the Walnut Drainage Basin, and ultimately drains to the Neuse Basin. A map of the Walnut Drainage Basin is provided on page 36 of this report. All waters of the Neuse River Basin have been classified as "Nutrient Sensitive Waters". Nutrient Sensitive Waters is a classification (developed by NC Department of Environment and Natural Resources) for certain waters of North Carolina with a history of exceeding nutrient and chlorophyll standards and negatively impacting water quality. Nutrient Sensitive Waters may have more stringent laws and regulations than conventional statewide water quality regulations. The standard Best Management Practice (BMP) required for Nutrient Sensitive Waters in the Neuse River Basin is the protection of the 50 foot forested riparian buffer known as the Neuse River Riparian Buffer Rules.

Groundwater Characteristics

The following description of groundwater characteristics on the Sierra Drive Property is from the *Phase 1 Environmental Site Assessment* provided by GeoLogix on July 31,2009: The geology in the area of the tract is dominated by metamorphic rocks of the Raleigh Belt (Geologic Map of North Carolina - 1985). Rock types anticipated in the area of the subject property would include biotite gneiss and schist. The hydrogeological system in the area of the subject property includes both the surficial sediments and underlying bedrock. Groundwater in sediments is present in pores between individual sediment grains. In bedrock, groundwater is present predominantly in horizontal and subhorizontal unloading fractures, and in near, vertical stress fractures. Groundwater depths are variable and generally approach ground surface near streams and rivers. Based on the historical groundwater flow characteristics in this area, groundwater flow typically mirrors surface topography. Accordingly, groundwater flow in the vicinity on the subject property would be expected to be directed generally to the southwest. No source of environmental contamination was identified upgradient which would significantly impact groundwater in the vicinity of the subject property.


Sierra Drive Neighborhood Park: Walnut Drainage Basins
Drainage Basins
Wetlands
Parks
Greenways
Lakes and Ponds
Streams
Highways
Major Roads
Streets
0
1,000
2,000
Feet
06/14/2012
Dorothea Dix Soccer
CENTENNIAL PKWY
Walnut Creek
AVENT FERRY RD
Lake Johnson
GORMAN ST
TRYON RD
40
Sierra Drive Property
Carolina Pines
LAKE WHEELER RD
Peach Road
S SAUNDERS ST
S WILMINGTON ST
WAKE FOREST
ROLESVILLE
KNIGHTDALE
CLAYTON
RALEIGH
GARNER
RDU
MORRISVILLE
CARY
APEX
HOLLY SPRINGS
FUQUAY-VARINA
Parks and Recreation GIS Unit
RALEIGH

Flora Resources of Sierra Drive Property

Site investigations of flora resources were conducted by City of Raleigh staff during the months of July and August. Flora identification will be ongoing at this site. Additional plants that are identified during annual site inspections and work days will be added to the plant inventory. Species naming follows "*Flora of the Carolinas, Virginia, and Georgia, and Surrounding Areas*" by Alan S. Weakley, 2008.

The majority of the Sierra Drive Property is a disturbed, early successional habitat, with vegetation re-establishing after being cleared in approximately 2005 (see aerial photograph on page 11 of this report). Tree seedlings are early successional weedy species such as sweet gum and loblolly pine. There are also a large number of callery pear trees becoming established on the site. A mature mimosa tree is present along Sierra Drive and is producing seedlings. Brachen fern, smooth sumac and winged sumac are present. Herbacious vegetation includes broomsedge (*Andropogon virginicus*), partridge pea (*Chamaecrista fasciculata*), pineweed (*Hypericum gentianoides*), goldenrod (*Solidago* spp.) and lespedeza (*Lespedeza* spp.).

The western portion of Sierra Drive Property contains a small wooded draw with a young Piedmont Dry-Mesic Mixed Harwood Forest. Red maple, sweet gum, oak, American holly (*Ilex opaca*), and red cedar (*Juniperus virginiana*) are present. There are some areas of invasive Japanese stilt grass (*Microstegium vimineum*) in the lowest portions of the stormwater draw where it meets the overhead powerline easment.

A comprehensive list of flora observed on the Sierra Drive Property during site inventory is included in Appendix D. The inventory will be updated as additional flora is observed.

Flora in the overhead powerline easement is a mix of many native herbacious species and some non-native species including scattered lespedeza. Butterflies and other pollinators are abundant in the powerline easement. A list of butterflies observed on the Sierra Drive Property is included in Appendix E.

An uncommon Gulf fritillary (*Agraulis vanillae*) nectaring on verbena in the powerline easement

The photograph above shows the diversity of herbacious vegetation present in the powerline easement along the northern boundary of the Sierra Drive Property. Large flowered aster, an uncommon wildflower in the Piedmont, is visible in the foreground, and attracted a variety of butterflies and other pollinators during the site investigation (August 2012). Other native vegetation visible in the photograph includes pineweed (*Hypericum gentianoides*), partridge pea (*Chamaecrista fasciculata*), St. Andrew's cross (*Hypericum hypericoides*), goldenrod (*Solidago* sp.), eupatorium (*Eupatorium* sp.), an unidentified yellow composite flower, native grasses and sedges. Additional inventory in the powerline easement will increase both the plant list and the butterfly list for this area.

There is a patch of nonnative bamboo growing within the powerline easement near the northern property boundary. If not controlled, the bamboo will continue to spread and will outcompete the desirable native vegetation growing in the powerline easement.

Non-native, invasive bamboo (Phyllostachys sp.) at the northern property boundary

Tree Conservation Ordinance

The City of Raleigh Tree Conservation Ordinance (TC-7-04) is designed to protect trees during pre-development of a site by defining allowable tree removal activity. During site development, Sierra Drive Property will be required to establish Tree Conservation Areas (TCAs).

The following tree removals and disturbance are not allowed in the TCA without a Tree Conservation Permit:

- Champion trees
- Trees in Resource Management Districts
- Trees in natural protective yards
- Timber harvests
- Trees related to installation of a use, structure, driveway, or facility improvement
- Trees related to a subdivision or a site plan
- More than 15 trees on parcels greater than or equal to 2 acres in size
- Healthy trees greater than or equal to ten inches dbh within the following protected buffer areas: 50 feet of a thoroughfare, 32 feet of a vacant property line, 65 feet of any other property line including non-thoroughfare roadways

Control and removal of non-native invasive tree species to promote the vigor and diversity of native trees is appropriate under "Urban Forestry" practices within the context of the Tree Conservation Ordinance.

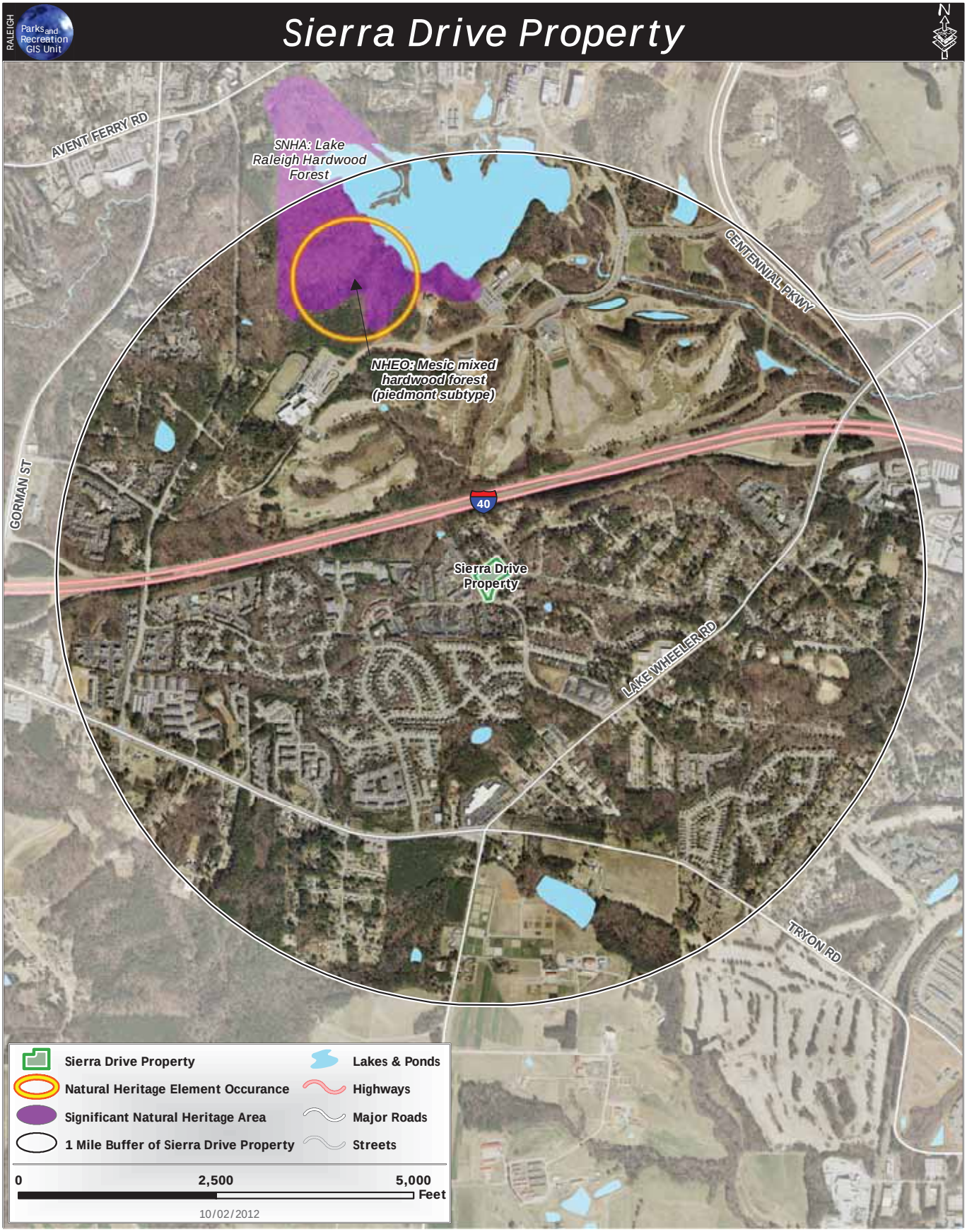
At present, four types of Primary TCAs must be identified and established wherever they occur on a site: tree protection areas required in Resource Management Districts and conditional-use zoning or re-zoning tree protection areas, Champion Trees, Neuse River Riparian Buffer Zone 2, and slopes greater than or equal to 45% adjacent to or within floodways.

At the time of this report, TCA requirements for Sierra Drive Property will be 10% of 2.42 acres. Identifying an appropriate area for TCA will be challenging on this site because of the lack of quality tree cover. TCAs are not dedicated until the site development phase.

Rare and Protected Plant Species

Michaux Sumac (*Rhus michauxii*) is a federally protected plant known to occur in Wake County and listed as "Endangered" by the U.S. Fish and Wildlife Service (USFWS) *Endangered Species Act of 1973*. The Endangered Species Act requires that any action likely to adversely affect a federally protected species is subject to review by USFWS. No specimens of this endangered plant have been found on Sierra Drive Property. The USFWS lists four federal plant species of concern (FSC) in Wake County: Bog Spicebush (*Lindera subcoriacea*), Sweet Pinesap (*Monotropis odorata*), Grassleaf Arrowhead (*Sagittaria weatherbiana*), and Virginia least trillium (*Trillium pusillum* var. *virginianum*). No specimens of these plants have been observed on the Sierra Drive Property during site investigations to date.

The North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (2008) was reviewed. There are no known Element Occurences on the Sierra Drive Property. One known Element Occurence (Mesic Mixed Hardwood Forest) and a Significant Natural Heritage Area (SNHA: *Lake Raleigh Hardwood Forest)* occur within an approximate one mile radius of the Sierra Drive Property (*see map on page 42 of this report*).


Sierra Drive Property
RALEIGH
Parks and Recreation GIS Unit
N
AVENT FERRY RD
SNHA: Lake Raleigh Hardwood Forest
CENTENNIAL PKWY
NHEO: Mesic mixed hardwood forest (piedmont subtype)
GORMAN ST
40
Sierra Drive Property
LAKE WHEELER RD
TRYON RD
Sierra Drive Property
Natural Heritage Element Occurance
Significant Natural Heritage Area
1 Mile Buffer of Sierra Drive Property
Lakes & Ponds
Highways
Major Roads
Streets
0
2,500
5,000
Feet
10/02/2012

Fauna Resources

Rare and Protected Wildlife

Three wildlife species known to occur in Wake County are listed as endangered or threatened through the *Endangered Species Act of 1973*: bald eagle (*Haliaeetus leucocephalus*), red-cockaded woodpecker (*Picoides borealis*), and dwarf wedgemussel (*Alasmidonta heterodon*). The Endangered Species Act requires that any action likely to adversely affect a federally protected species is subject to review by USFWS.

The bald eagle is listed as federally *threatened* and has a *threatened* state status in North Carolina. No bald eagles or bald eagle nests were observed during field investigations of Sierra Drive Property. The NCNHP has no records of known populations of bald eagle on the Sierra Drive Property. Development of this park site is not expected to adversely affect the bald eagle.

The red-cockaded woodpecker is listed as federally *endangered* and has an *endangered* state status in North Carolina. The red-cockaded woodpecker is found in open, old-growth pine stands greater than sixty years old. No red-cockaded woodpeckers or their cavity trees were observed during field investigations of Sierra Drive Property. The NCNHP has no records of known populations of this bird within a one mile radius of the park site. Development of this park site is not likely to adversely affect the red-cockaded woodpecker.

The dwarf wedgemussel is listed as federally *endangered* and has an *endangered* state status in North Carolina. The dwarf wedgemussel is known to occur in the Neuse River basin, inhabiting large rivers to small streams. In the southern portion of its range it is often found buried under logs or root mats in shallow water (USFWS 1993). Habitat for the dwarf wedgemussel is not available on the Sierra Drive Property. The NCNHP has no records of known populations of the dwarf wedgemussel on Sierra Drive Property.

The USFWS lists twelve federal species of concern (FSC) in Wake County. A table is included listing habitat requirements of the twelve species, and whether suitable habitat for them is available on Sierra Drive Property.

	Habitat Requirements	**Habitat available on Sierra Drive Property**
Bachman's sparrow *Aimophila aestivalis*	Prefer longleaf pine woodlands with grassy areas, particularly those that have been burned recently; 'Special Concern' in North Carolina	No
Carolina darter *Etheostoma collis lepidinion*	Small to moderate sized streams with low current velocity, preferring substrates of mud, sand and sometimes bedrock; tolerant of fine sediments covering the substrate; 'Special Concern' in North Carolina	No
Carolina madtom *Noturus furiosus*	Occupies relatively larger streams that flow into the Neuse and Tar rivers; commonly seen in mussel shells, under logs and rocks, in piles of leaves and sticks; 'Threatened' in North Carolina	No
Roanoke bass *Ambloplites cavifrons*	Creeks to medium rivers with rock, gravel, sand and silt substrates	No
Southeastern myotis *Myotis austroparius*	Roost in caves or abandoned buildings with standing water and forage over open water; Can also roost in hollow trees	No
Southern hognose snake *Heterodon simus*	Open xeric areas with well-drained sandy soils, and river floodplains	possible but unlikely
Atlantic pigtoe *Fusconaia masoni*	Inhabits mostly medium to large streams with moderate gradients, clean fast water, and sand or gravel bed under riffles	No
Diana fritillary *Speyeria diana*	Breed in deciduous or mixed woods; feed in grasslands and shrub lands	possible but unlikely
Green floater *Lasmigona subviridis*	Small to medium freshwater streams with slow current gravel and sand substrates, in water depths of one to four feet, in the Neuse River Basin	No
Yellow lance *Elliptio lanceolata*	Freshwater streams and rivers with clean coarse to medium sized sandy substrates, rocks, and in mud in slack water areas of Neuse River Basin	No

Interim Management of Sierra Drive Property

Interim management of the Sierra Drive Property will be ongoing until future park development and the initiation of a Master Plan for this site.

The Sierra Drive Property is monitored by Parks staff. Site issues are addressed as needed. Parks staff patrols the park boundaries and continues to conduct site investigations for the purposes of natural resources inventory. Illegal dumping is monitored.

The City of Raleigh Land Stewardship Coordinator shall conduct a site review on an annual basis to review existing site conditions, review the status of recommended interim management activities, and determine whether interim management recommendations should be modified.

Interim Management Recommendations

The following interim management recommendations are proposed for Sierra Drive Property. The management tasks should be completed on the site as resources and staff are available. The City of Raleigh Land Stewardship Coordinator should prioritize the interim management recommendations and identify specific staff to complete the tasks. The Land Stewardship Coordinator will be responsible for initiating a request to appropriate staff to conduct the specific action recommended for the site. Work progression and updates will be recorded in the final section of this report.

Interim management recommendations are organized into three categories: Safety, Environment, Property Issues:

Safety

- Sierra Drive Property is undeveloped and therefore is not maintained for public safety. The property could contain unknown conditions such as unstable trees, barbed wire, or other hazards. Public access to the site should be discouraged until a full site hazard evaluation and remediation is completed.

Environment

- Determine jurisdictional status of stormwater draw on western portion of property

- Forest management may be needed, for example to address storm damage, serious disease, insect infestations

- Continue inventory and mapping of natural resources including flora and fauna

- Consider collecting seed from uncommon plants growing in the powerline easement, such as the large flowered aster and the southern rosinweed

- Communicate with overhead powerline company (Progress Energy/Duke) to encourage best stewardship of the powerline easement, including use of mowing to maintain vegetation rather than herbicide application

Property Issues

- Signage at the site should include a Parks and Recreation phone number, and possibly website information, to report non-emergency site issues

- Facilitate removal of debris from property

- Determine if old transformer box is still functioning and request removal of non-functioning utility equipment from site

- Monitor potential vandalism in southwestern portion of property

<u>Completed and Ongoing Interim Management responsibilities</u>

- Inventory of natural and cultural resources initiated
- Park surveyed and boundaries marked (October 2010)

Appendix A

City of Raleigh Nature Preserves Criteria

applied to

Sierra Drive Property

RALEIGH

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Sierra Drive Property

2.42 acres

OBJECTIVE CRITERIA: GIS Evaluation

1. Parcel contains species or natural communities that are endangered, threatened or rare as identified by the NC Heritage Program (Element Occurrence).

No, there are no known Element Occurrences on this property.

2. Parcel contains identified area or species within the Wake County Natural Areas Inventory as identified by the NC Natural Heritage Program.

No, there are no Significant Natural Heritage Areas (SNHA) known to occur on this property.

3. Parcel is in close proximity to or provides connection between other properties that are currently protected.

No. Currently there are no additional protected areas in proximity to the property.

4. Parcel contains appreciable water features in the landscape, such as wetlands, lakes, ponds, perennial stream systems, or floodplains.

No. There may be an intermittent stream channel on the property, but there are no perennial water features.

5. Parcel contains hydric soils which may be indicative of wetlands.

No. There are no hydric soils located on the property.

6. Parcel contains steep slopes (> 8%) near streams or river.

There are small wooded areas with slope greater than 8% near a potential intermittent channel.

ADDITIONAL CRITERIA:

7. The property contains species that are uncommon as identified and mapped by staff.

An uncommon species of aster has been observed within the powerline easement at Sierra Drive Property.

Large Flower Aster *Symphyotrichum grandiflorum*

8. The property contains outstanding geologic characteristics, such as cave, waterfall, cliffs, granite outcrop, etc. as identified and mapped by staff.

No areas of outstanding geologic characteristics have been observed on the property.

9. The conservation benefit outweighs the expense of stewarding the property due to location, maintenance of structures, resource management (invasives), liability, multiple owners, trespassing concerns, irreparable contamination, cost prohibitive cleanup, or other factors.

Considerations:

Sierra Drive Property does not appear to include high quality natural areas with significant conservation value. A majority of the property was cleared in approximately 2005 for site development, and many invasive plant species have become established on the property.

10. The property is of sufficient size and shape that its conservation resources are likely to remain intact, even if adjacent properties are developed; or sufficient neighboring property is either already protected or to be included as to achieve the same result.

The property is only 2.42 acres and does not adjoin any protected open space.

11. The area can be sufficiently buffered.

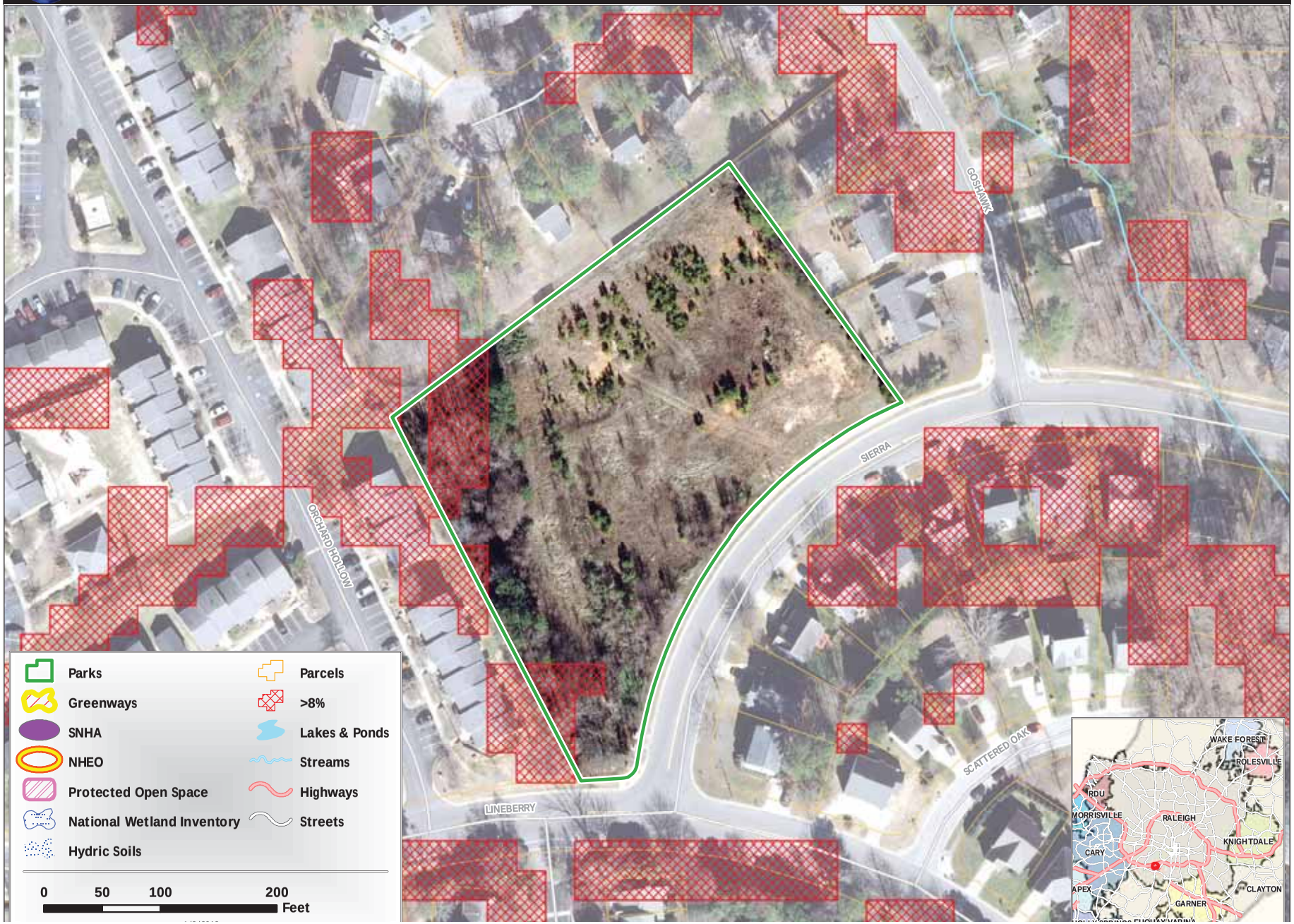
No. The vicinity is highly developed with small lot residential and multi-family housing in all directions.

12. Compatibility of existing use or condition, in whole or part, is conducive to being a Nature Preserve.

No.

13. The larger context for Park Planning should be considered when designating new Nature Preserves and Protected Natural Areas.

Sierra Drive Property Neighborhood Park Nature Preserve Criteria



Appendix B

Contributors to Sierra Drive Property

System Integration Plan

RALEIGH Parks and Recreation
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Contributing Staff and Agencies to the Sierra Drive Property System Integration Plan

City of Raleigh Parks and Recreation Staff:
Melissa Salter, Land Stewardship Coordinator
David Shouse, Senior Planner
Andy Hayes, Planner

City of Raleigh staff:
Mark Senior, Senior Project Engineer, Public Works Department
Paul Kallam, City of Raleigh Transportation Engineer
Cesar Sanchez, City of Raleigh Public Utilities Project Engineer

Parks Committee, Parks, Recreation and Greenway Advisory Board

Southwest Citizen's Advisory Council

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Appendix C

Sierra Drive Property Phase 1 Summary

conducted July 31, 2009

by GeoLogix Inc.

RALEIGH

Parks and Recreation

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SIERRA DRIVE PROPERTY EXECUTIVE SUMMARY

A Phase I Environmental Site Assessment was conducted by GeoLogix personnel on a 2.42-acre parcel of land located at 2640 Sierra Drive in Raleigh, Wake County, North Carolina. The subject property is located at the intersection of Sierra Drive and Lineberry Drive. The property studied in this report may be referred to as the "subject property" or "tract". Information regarding the subject property was gathered through an on-site reconnaissance, a review of aerial photographs, an interview, and a review of environmental regulatory agency database information.

No buildings or structures were observed on the subject property during the site reconnaissance. An electrical distribution line parallels the northwestern property boundary. Aerial photographs were reviewed from years 1949, 1965, 1971, 1981, 1993, and 2006. In the 1949 thru 1981 photos, it appears that the subject property was generally wooded. In the 1993 photo, it appeared that the northeastern half of the subject property had been cleared. In the 2006 photo, the subject property appeared similar to its current appearance but with less of a vegetative cover. Copies of the aerial photographs reviewed as part of this study are contained in Appendix C.

Some solid waste was observed disposed on the subject property during the site reconnaissance. Much of the debris was observed in the southwestern region of the tract in the wooded area and in a draw/intermittent branch. Items observed included a piece of furniture and domestic waste. Construction materials, including concrete culvert pipes and small piles of gravel, were observed on site apparently from an earlier attempt to develop the tract. However, there was no evidence of landfilling or burial of wastes on the subject property. There was no evidence of hazardous or toxic substances, wastes, materials or other environmental contaminants currently being used on or stored on the subject property.

There was no physical evidence observed during the site reconnaissance to indicate the existence of an underground fuel storage tank (UST) on the tract. It is unknown for certain if any old, unregistered UST(s) may have existed on site in association with previous activities on the subject property. No above ground fuel tanks were observed on site.

One (1) UST/groundwater/release incident and one (1) State Hazardous Waste Site (SHWS) were identified within or close to standard ASTM search distances of the subject property in a review of environmental agency informational databases. The UST incident identified was the Texaco Food Mart at 2618 Lake Wheeler Road, roughly one-half mile from the subject property. The SHWS site, formerly Wake Auto Parts at 3520 Tryon Road, is roughly one mile from the subject property. Due to the location of the incidents relative to the subject property, no adverse environmental impact to the subject property would be anticipated. No NPL sites, CERCLIS facilities, RCRA hazardous waste notifiers, permitted solid waste landfills, or Hazardous Substance Disposal sites were identified in the EDR database search.

No potential environmental concerns were identified on adjacent properties.

There were some "data gaps" of ten to fifteen years encountered in conducting this Phase I ESA. However, the use of the property appears has been documented. Based on information gathered during this study, the property, from the late 1940's until at least the 1980's, remained generally wooded. At some time in the 1980's or early 1990's, it appears that an attempt was made to develop the subject property. Accordingly, the data gaps encountered are considered inconsequential.

In summary, this Phase I ESA study revealed no evidence of significant environmental contamination, environmental impairment, or Recognized Environmental Conditions (REC) in association with the subject property for in-scope items. The potential for significant surface and/or subsurface environmental contamination to currently exist at the subject property appears to be low based on available information.

Appendix D

Flora Resources

Sierra Drive Property

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Inventory of Flora Observed:
Sierra Drive Property

Trees and Shrubs

Acer rubrum	Red maple
Baccharis halimifolia	Groundseltree
Carya spp.	Hickory
Cornus florida	Flowering dogwood
Fraxinus americana	White ash
Hypericum hypericoides	St. Andrew's cross
Juniperus virginiana	Eastern redcedar
Liquidambar styraciflua	Sweet gum
Morella cerifera	Wax myrtle
Pinus taeda	Loblolly pine
Platanus occidentalis	American sycamore
Prunus serotina	Black cherry
Quercus sp.	Oak
Rhus copallina	Winged sumac
Rhus glabra	Smooth sumac
Rubus sp.	Blackberry
Sassafrass albidum	Sassafrass
Ulmus alata	Winged elm

Vines

Parthenocissus quinquefolia	Virginia creeper
Passiflora incarnata	Maypops
Smilax sp.	Greenbriar
Toxicodendron radicans	Poison ivy
Vitis spp.	Muscadine grape

Ferns

Athyrium filix femina	Southern lady fern
Pteridium aquilinum	Bracken fern

Herbacious Plants

Andropogon virginicus	Broomsedge
Artemisia vulgaris	Mugwort
Chamaecrista fasciculata	Partridge pea
Desmodium sp.	Tick-trefoil
Diodia teres	Poor joe
Erigeron strigosus	Daisy fleabane
Eupatorium hyssopifolium	Hyssopleaf
Euphorbia corollata	Flowering spurge
Hypericum gentianoides	Pineweed
Lobelia sp.	Lobelia
Oxalis stricta	Yellow wood sorrel
Phytolacca americana	Common pokeweed
Potentilla sp.	Cinquefoil
Rudbeckia hirta	Black-eyed susan

Silphium asteriscus	Southern rosinweed
Solidago spp.	Goldenrod
Symphyotrichum spp.	Asters
Symphyotrichum grandiflorum (formerly *Aster grandiflorus*)	Large flower aster (uncommon)
Tridens flavus	Purpletop

Invasives

Albizia julibrissin	Mimosa
Ampelopsis brevipedunculata	Porcelain berry
Cupressus leylandii	Leyland cypress
Daucus carota	Queen Anne's lace
Elaeagnus sp.	Olive
Ipomoea sp.	Morning glory
Lagerstroemia indica	Crape myrtle
Lamium amplexicaule	Henbit deadnettle
Lespedeza spp.	Lespedeza
Lespedeza cuneata	Lespedeza
Ligustrum japonicum	Japanese privet
Ligustrum sinense	Chinese privet
Liriope sp.	Monkey grass
Lonicera japonicum	Japanese honeysuckle
Microstegium vimineum	Japanese stiltgrass
Morus sp.	Mulberry
Nandina sp.	Heavenly bamboo
Phyllostachys sp.	Bamboo
Pyrus calleryana	Callery pear
Robinia pseudoacacia	Black locust
Verbina sp.	Vervain
Vinca minor	Variegated periwinkle
Wisteria sinensis	Chinese wisteria

Appendix E

Fauna Butterflies

Sierra Drive property

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Butterflies observed on Sierra Drive Property

Monarch	*Danaus plexippus*
Eastern tiger swallowtail	*Papilio glaucus*
Orange sulphur	*Colias eurytheme*
Cloudless sulphur	*Phoebis eubule*
Fiery skipper	*Hylephila phyleus*
Red-banded hairstreak	*Calycopis cecrops*
Eastern-tailed blue	*Cupido comyntas*
Gulf fritillary	*Agraulis vanillae* (uncommon in Piedmont)
Common buckeye	*Junonia coenia*
Pearl crescent	*Phyciodes tharos*
Cloudywing?	

Sierra Drive Property

System Integration Plan

Comments and Records

RALEIGH Parks and Recreation
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Sierra Drive Property

System Integration Plan

Work Progression and Updates

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