

## SITE SURVEY REPORT FORM

SITE NAME: Middle Mountain  
DATES VISITED: August 17, 2010 and June 30, 2017

INVESTIGATORS: North Carolina Zoo biologists

The 2017 survey included the project area for a proposed hiking trail across the summit of Middle Mountain, then down the north-facing slopes to Woodell Country Road. Flagging for the proposed trail was followed and surveyed.

REPORT AUTHOR: North Carolina Zoo biologist  
OWNER: Private landowner (2010)  
North Carolina Zoo (2017)  
OWNER CONTACT: Permission granted through the real estate agent (2010)

COUNTY: Randolph County QUAD: Asheboro

SIZE: Total acres: 42.53 (West parcel is 28.53 acres and east parcel is 14.00 acres)  
PIN for west parcel is 7679207881. PIN for east parcel is 7679306639.

HOW DETERMINED: Randolph County GIS

LOCATION: Middle Mountain is south of Asheboro with road frontage on Woodell Country Road. The site is north of and adjacent to the NC Zoological Park.  
Latitude/Longitude: 35° 38' 44.95" N 79° 45' 51.40" W

PROVINCE: Piedmont WATERSHED: Richland Creek/Deep River

GENERAL DESCRIPTION: This site survey included the north-facing slopes of Middle Mountain. Its shared property line with the NC Zoological Park runs east-west across the top of Middle Mountain. Large boulders are located at both the top of the mountain and the upper slopes. The west parcel supports fairly mature hardwoods with an open understory. The east parcel supports dense early successional growth mixed with loblolly pines.

### SIGNIFICANCE OF SITE:

Middle Mountain is significant due to its potential recreational value. It is unique in its location and its suitability for a trail connecting the western portion of the Zoo's existing trail system to a trail along Richland Creek that has been proposed in both the Randolph County Recreational Master Plan and Asheboro Recreation Proposed Master Plan. A sewer easement connects this tract directly to Richland Creek at an Asheboro pumping station. In addition, this is the only tract remaining in hardwood forest along the main north boundary of the Zoo. All other tracts have been developed, clear-cut or converted to pine plantation and are thus less suitable for a greenway than this scenic rocky tract covered with native forest. This property would provide the connection for the western end of the trail loop over Middle and Purgatory Mountains and through the northern half of Zoo property, while the Zoo's Basic Mesic Forest Nature Preserve would provide the return trail to the Randolph County Greenway at the eastern end of the loop.

It is also significant for the hardwood forest that is contiguous with a Piedmont Monadnock Forest on NC Zoological Park property. It also provides buffer habitat to an ephemeral pool that is located on zoo property.

#### PHYSICAL DESCRIPTION

ASPECT: north facing slopes  
SLOPE: 2 to 45 % slope (From NRCS soil survey website)  
ELEVATION: 580 feet at northwest corner and 830 feet at top of Middle Mountain  
TOPOGRAPHY: north-facing slopes of Middle Mountain

HYDROLOGY AND MOISTURE: dry upland habitat with a few moist draws  
GEOLOGY: felsic metavolcanic rock (Geologic Map of North Carolina, 1985)  
SOIL (from USSCS soil map): From NRCS web site:  
Upper and middle slopes are mapped as Georgeville silt loam that is extremely stony and bouldery with 4-45% slope. There is a small amount of Georgeville silty clay loam on the lower slopes that are adjacent to Woodell Country Road with 2-8% slope.

COMMENTS ON PHYSICAL DESCRIPTION: Middle Mountain is approximately 42.5 acres of mature hardwood forests and early successional growth. Large boulders are located on the upper and middle slopes and the soil is rocky. There are no first-order tributaries on the slopes. A few draws from bowls on the north-facing slopes. There are no structures on the parcels.

#### NATURAL COMMUNITY DESCRIPTION

The upper slopes of Middle Mountain support a Piedmont Monadnock Forest that is contiguous with a high quality forest on the NC Zoological Park's property. In this community, *Quercus montana* (Chestnut oak) is the dominant canopy tree. Other canopy trees include *Quercus alba* (White oak), *Quercus velutina* (Black oak), *Quercus coccinea* (Scarlet oak), and *Carya alba* (Mockernut). The understory supports common tree species such as *Oxydendrum arboreum* (Sourwood) and *Cornus florida* (Flowering dogwood). Numerous boulders are scattered throughout the natural community with the dominant vine, *Vitis rotundifolia* (Muscadine grape), weaving through the rocks. The dry upland habitat supports few species in the herb layer and no invasive species were noted in this natural community.

The middle and lower slopes of Middle Mountain support a Dry Oak-Hickory Forest. *Quercus alba* (White oak) replaces *Quercus montana* (Chestnut oak) as the dominant canopy tree. *Acer rubrum* (Red maple) and *Liriodendron tulipifera* (Tulip tree) become more common on the lower slopes.

A few draws bisect the north-facing slopes of Middle Mountain. These areas support more mesic species and have a higher diversity of shrubs such as *Hamamelis virginiana* (Witch-hazel), *Viburnum acerifolium* (Maple-leaf viburnum), and *Kalmia latifolia* (Mountain laurel). *Liriodendron tulipifera* (Tulip tree) and *Fagus grandifolia* (Beech) occur in the canopy. *Carpinus caroliniana* (Ironwood) is common in the subcanopy. The side slopes of one draw were dominated with *Polystichum acrostichoides* (Christmas fern).

#### 2017 Survey for proposed hiking trail:

The survey for the proposed hiking trail began at Woodell Country Road. It continued, by following the survey flagging that marks the proposed trail, up the north-facing slopes of Middle Mountain to the summit and to the terminus of an existing NC Zoo hiking trail.

The northern section of the proposed trail is dominated with pines and early successional hardwoods

in the canopy. These species include *Pinus virginiana* (Virginia pine), *Pinus echinata* (Shortleaf pine), *Liriodendron tulipifera* var. *tulipifera* (Tulip-tree), and *Quercus falcata* (Southern red oak). The subcanopy includes early successional hardwoods such as *Acer rubrum* var. *rubrum* (Eastern red maple), *Liquidambar styraciflua* (Sweet gum), *Oxydendrum arboreum* (Sourwood), *Nyssa sylvatica* (Black gum), and *Cornus florida* (Flowering dogwood). A few *Cercis canadensis* var. *canadensis* (Eastern redbud) saplings were noted. A few vines were noted, *Muscadina rotundifolia* var. *rotundifolia* (Muscadine), *Toxicodendron radicans* var. *radicans* (Eastern poison ivy), *Campsis radicans* (Trumpet-creeper), and *Smilax rotundifolia* (Common greenbriar). Common shrubs such as *Vaccinium fuscatum* (Hairy highbush blueberry), *Hamamelis virginiana* var. *virginiana* (Northern witch-hazel), and *Styrax grandifolia* (Storax) occur in low density. The herb layer was sparse and included common species such as *Chimaphila maculata* (Striped wintergreen) and *Goodyera pubescens* (Downy rattlesnake-plantain).

The proposed trail crosses a power line right-of-way that supports a higher diversity of herbs than does the regenerating adjacent forest. It also supports invasive species. *Microstegium vimineum* (Japanese stilt-grass) occurs in both the power line and sewer line right-of-ways.

The summit of Middle Mountain supports a more mature hardwood forest than the north-facing slopes. Boulders are scattered along the ridgeline. The hardwood canopy trees include oak and hickory species including *Quercus montana* (Chestnut oak), *Quercus alba* (White oak), and *Carya glabra* (Pignut hickory) mixed with *Liriodendron tulipifera* var. *tulipifera* (Tulip-tree) and *Acer rubrum* var. *rubrum* (Eastern red maple). The shrub and herb layers are sparse.

**OTHER NATURAL COMMUNITIES PRESENT:** The east parcel supports early successional growth mixed with loblolly pines. There is hardwood regeneration in the understory.

**ANIMAL HABITAT FACTORS**

**HABITAT HETEROGENEITY:**

mature hardwoods on lower, middle and upper slopes of Middle Mountain; early successional growth; moist draws that bisect the slopes

**AMPHIBIAN BREEDING SITES:**

an ephemeral pool is located to the north and on NC Zoological Park property

**DENNING SITES:** slopes and boulders

**BIG TREES/LARGE CAVITIES:** a few large trees are located on both parcels

**SNAGS AND LOGS:** few snags and downed logs noted on parcels

**MAST PRODUCING SPECIES:** oaks and hickories

**NECTAR SOURCES:** sourwood and blueberries

**PRESENCE OF WATER:** no water present

**AQUATIC HABITAT FACTORS**

There is a first-order tributary to the west that forms the northwest property line for a short distance until it flows under Woodell Country Road. No other streams are present on the parcels.

**HYDROLOGY** (order, flow rate, persistence):

**DEPTH/WIDTH:**

**SUBSTRATE:**

**WATER QUALITY/CLARITY:**

**BANK CONDITION:**

**VEGETATION:**

**WOODY DEBRIS:**

SPECIAL STATUS SPECIES PRESENT: none noted (2010 and 2017)

POTENTIAL FOR OTHER SPECIAL STATUS SPECIES: A June 15, 2017 NC Natural Heritage Program report describes three listed vascular plant species that are known to occur within a one-mile radius of the project area which includes an approximately 1.5-mile expansion of a hiking trail across Middle Mountain and to Woodell Country Road.

These three species include: *Helianthus schweinitzii* (Schweinitz's sunflower), *Hexalectris spicata* (Crested coralroot), and *Monotropsis odorata* (Sweet pinesap).

No habitat was noted for Schweinitz's sunflower which grows in open canopies of woodlands or right-of-ways of roads, railroad tracks, or other human-created openings. The proposed Middle Mountain trail occurs in a regenerating hardwood forest and no canopy openings were noted in the project area.

Crested coralroot is an orchid that grows in dry to mesic woods on basic soils. It is Significantly Rare in North Carolina because this area is on the periphery of its range. Middle Mountain does not support the basic natural communities that are known to support this species.

Sweet pinesap is a Special Concern – Vulnerable species in North Carolina. This species occurs in dry forests and bluffs. No stems of this species were noted during the 2010 or 2017 survey.

OTHER NOTEWORTHY SPECIES OR FEATURES PRESENT: none noted

SITE ECOSYSTEM INTEGRITY: The west parcel has high integrity because of the mature hardwood forest and lack of invasive species. The east parcel has low integrity because it supports dense early successional growth and loblolly pines.

AVERAGE DBH OF CANOPY TREES:

East Parcel: *Pinus taeda* (Loblolly pine) about 6 inches dbh; hardwoods are small stems resprouting from cut stumps with an average dbh of 5 inches and under. (Note: East parcel was not purchased, only the west parcel is owned by the NC Zoo Society.)

West Parcel: 10 to 16 inches dbh *Quercus montana* (Chestnut oak) with two specimens measured at 16 and 29 inches; 10 to 12 inches dbh *Acer rubrum* (Red maple); 8 to 10 inches dbh *Carya alba* (Mockernut)

MAXIMUM DBH OF CANOPY TREES:

East Parcel: 32 inch dbh *Quercus alba* (White oak); 36 inch dbh *Quercus montana* (Chestnut oak)

DISTURBANCE-SENSITIVE SPECIES: none noted

FIRE REGIME: none noted

OTHER DISTURBANCES OR IMPACTS

LOGGING: high-graded timber, cut stumps, and skid roads noted

FARMING: none noted

DITCHES: none noted

ROADS: Woodell Country Road forms the northwest and northeast property boundaries.

ALTERED FLOOD REGIME: not applicable

EXOTIC/WEEDY SPECIES: none noted, likely present near Woodell Country Road

UNDERSTORY CLEARING: only due to past timbering

DIRECT HUMAN INTRUSION: past timbering; loblolly pines planted on the east parcel

## LANDSCAPE FACTORS

**BOUNDARY INTEGRITY/SHAPE:** Middle Mountain is nearly square in shape.

**ADJACENT LAND USE/OFFSITE STRESSES:** There are low density homes to the north, northwest, and northeast of Middle Mountain. The NC Zoological Park is located to the south.

**RELATION/CONNECTION TO OTHER SITES:**

Middle Mountain is contiguous to the north property boundary of the NC Zoological Park.

**DEGREE OF THREAT/POTENTIAL FOR CHANGE:**

The parcels are currently for sale by the land owner.

**BOUNDARY JUSTIFICATION:**

Only surveyed the two parcels that are currently for sale.

**RECOMMENDATIONS FOR PROTECTION:** Acquisition by the NC Zoological Park to include in their regional trail vision and protect the hardwood forest which is an extension of the mature Piedmont Monadnock Forest the zoo's property.

**MANAGEMENT RECOMMENDATIONS:** Allow the hardwoods on both parcels to mature and, eventually, remove the loblolly pine on the east parcel.

## PLANT SPECIES OBSERVED

Thoroughness of list: thorough on the west parcel and casual on the east parcel due to density of young growth

### CANOPY

*Acer rubrum* (Red maple)

*Carpinus caroliniana* (Ironwood)

*Carya alba* (Mockernut)

*Carya glabra* (Pignut hickory)

*Fagus grandifolia* (Beech)

*Liriodendron tulipifera* (Tulip tree)

*Nyssa sylvatica* (Black gum)

*Pinus taeda* (Loblolly pine)

*Pinus virginiana* (Virginia pine)

*Quercus alba* (White oak)

*Quercus coccinea* (Scarlet oak)

*Quercus montana* (Chestnut oak)

*Quercus rubra* (Red oak)

*Quercus velutina* (Black oak)

### UNDERSTORY

*Acer rubrum* (Red maple)

*Amelanchier arborea* (Serviceberry)

*Cercis canadensis* (Redbud)

*Chionanthus virginicus* (Fringe-tree)

*Cornus florida* (Flowering dogwood)

*Diospyros virginiana* (Persimmon)

*Fraxinus pennsylvanica* (Green ash)

*Ilex opaca* (American holly)

*Juniperus virginiana* (Red cedar)

*Magnolia acuminata* (Cucumber tree)  
*Oxydendrum arboreum* (Sourwood)  
*Prunus serotina* (Black cherry)  
*Sassafras albidum* (Sassafras)

#### SHRUB LAYER

*Euonymus americanus* (Strawberry bush)  
*Hamamelis virginiana* (Witch-hazel)  
*Kalmia latifolia* (Mountain laurel)  
*Rhododendron* sp. (Wild azalea)  
*Rhus copallina* (Winged sumac)  
*Symplocos tinctoria* (Horse sugar)  
*Vaccinium pallidum* (Dryland blueberry)  
*Vaccinium stamineum* var. *stamineum* (Common deerberry)  
*Viburnum acerifolium* (Maple-leaf viburnum)

#### VINES

*Amphicarpaea bracteata* var. *bracteata* (Hog-peanut)  
*Dioscorea villosa* (Wild yam)  
*Lonicera japonica* (Japanese honeysuckle)  
*Parthenocissus quinquefolia* (Virginia creeper)  
*Rhus toxicodendron* (Poison ivy)  
*Vitis rotundifolia* (Muscadine grape)

#### HERB LAYER

*Asplenium platyneuron* (Ebony spleenwort)  
*Botrypus* sp. (Rattlesnake fern)  
*Carex* sp. (A Sedge)  
*Chasmanthium laxum* (Slender spike grass)  
*Chimaphila maculata* (Striped wintergreen)  
*Cunila origanoides* (Wild-oregano)  
*Galium circaeazans* (Forest bedstraw)  
*Goodyera pubescens* (Rattlesnake plantain)  
*Hexastylis arifolia* (A Ginger)  
*Hieracium venosum* (Rattlesnake weed)  
*Lysimachia ciliata* (Fringed loosestrife)  
*Polygala verticillata* var. *isocycla* (Whorled milkwort)  
*Polystichum acrostichoides* (Christmas fern)  
*Prenanthes serpentaria* (Lion's foot)  
*Scleria* sp. (A Nutrush)  
*Smilacina racemosa* (False Solomon's-seal)  
*Smilax glauca* (A Greenbrier)  
*Tipularia discolor* (Crane-fly orchid)

#### ANIMAL SPECIES OBSERVED

Thoroughness of list: casual

*Dryocopus pileatus* (Pileated woodpecker) – fresh holes noted in a tree

*Terrapene carolina* (Eastern box turtle) – one large turtle noted that measured 6” long by 4.5” wide

*Vireo olivaceus* (Red-eyed vireo)