CANE CREEK MOUNTAINS NATURAL AREA

PARK MASTER PLAN

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Introduction & Site Analysis

Overview

The Cane Creek Mountains Natural Area is located in Alamance County approximately 8 miles south of the City of Graham. The property is located in the Cane Creek Mountains, a Piedmont Monadnock range that makes up the headwaters of Varnals Creek and Cane Creek. The range runs in a southwesterly direction towards Liberty in Randolph County, covering much of the southwest quadrant of Alamance County. Characterized by rolling Piedmont hills, the range also has several visible peaks, the highest of which reaches 987 feet and is the highest elevation in North Carolina east of Greensboro. It hosts the largest area of natural woodland in Alamance County and is part of the Cape Fear River Basin.

The site is connected to other conserved areas in Alamance County such as Cedarock Park, a 500-acre nature park, located about 2.5 miles northwest, YMCA's Camp Frontier, and the Three College Observatory. In the coming years Alamance Parks will connect the park through the Deep River State Trail – N.C. Mountains-to-Sea Trail Connector.

Land for the park has been acquired through support from Alamance County, The Clean Water Management Trust Fund, The Conservation Fund, Piedmont Land Conservancy, and private donors. Approximately 622 acres comprised of 3 separate land tracts have been acquired at the time of publication. Purchase of the fourth and final land tract is underway once funding sources are confirmed. (A grant award is pending from the Clean Water Ma nagement Trust Fund). Upon completion, the Cane Creek Mountains Natural Area will total over 1,000 acres. No other parks in the area approach the size and scope of this park.

Natural Resources

The Cane Creek Mountains range are a unique and invaluable natural resource. The range supports Piedmont Monadnock Forest (S4), Dry-Oak Hickory and Dry-Mesic Oak-Hickory Forests (S4), as well as low elevation seeps (S3). Within a one mile radius of the project there is also a Piedmont Boggy Streamhead natural community (S2). These communities represent mature, healthy ecosystems.

Listed below is information obtained in regard to the natural and cultural significance of the area through site surveys and natural heritage reporting. The reports are listed by land tract, as applicable.

Faircloth Tract - Observatory Woods

The below information is excerpted from: Site Survey Report — Cane Creek Mountains/Observatory Woods, Schafale 2016. The full report is included in Appendix A.

LOCATION / ACCESS: This tract is east of Bass Mountain Road and extends eastward nearly to Thompson Mill Road. Access is from the end of Eagle's Nest Trail, a newer subdivision road running eastward from Bass Mountain Road. It is about 6.5 air miles northwest of Eli Whitney.

GENERAL DESCRIPTION: The Cane Creek Mountains/Observatory Woods site, including this tract, consists of collection of steep, rocky knobs which are monadnocks, erosional remnant hills that stand well above the surrounding landscape. The upper parts of the hills are quite rocky, with numerous granite boulders and ledges. Extensive Piedmont Monadnock Forest, dominated by chestnut oak, covers the upper parts of the hills. Lower slopes support Dry Oak— Hickory Forest. Dry-Mesic Oak—Hickory Forest was reported in parts of the site but was not found on this tract. The several small drainages that dissect the slope on the tract have a series of small springs and more extensive seepage along them. Much of their courses is saturated soils with wetland communities best classified as Piedmont Boggy Streamhead. They have canopies of tulip poplar, red maple, and black gum, and have extensive beds of cinnamon fern, royal fern, and a variety of wetland herbs and shrubs. The forest on this tract were selectively cut in patches, leaving a fine-scale mosaic of young regeneration mixed with forest that is quite mature.

SIGNIFICANCE OF SITE: Very high (R2/C4) for the site as a whole. The most significant feature is the extensive, very mature Piedmont Monadnock Forest (Typic Subtype) community, which was found to be in better condition than previously was clear, over much of the site (despite not being in such excellent condition on this tract).

SPECIAL STATUS SPECIES: None known.

POTENTIAL FOR OTHER SPECIAL STATUS SPECIES: None are likely, given the communities present, but animal survey in particular, would be worthwhile.

OTHER NOTEWORTHY SPECIES AND FEATURES:

SIZE: 98.85 acres in the county park tract.

ELEVATION: 650-850 feet.

TOPOGRAPHY: Moderate to steep slopes and spur ridges.

HYDROLOGY AND MOISTURE: Dry over most of the site. Stream courses are mostly permanently or semipermanently saturated, though seldom flooded.

PRESENCE OF STREAMS AND SEEPS: Several intermittent streams are present, all with substantial seepage areas and multiple flowing springs along them. Flow in the channel occurs for some distance downstream of springs and then disappears into the streambed.

GEOLOGY: Mapped as metamorphosed granite on most of the tract, with felsic volcanic rocks on the lower, northern end. Granite ledges and spheoidal granite boulders are extensively present on the tract, including in the area mapped as volcanic rocks.

SOIL:

Herndon (Fine, mixed, semiactive, thermic Typic Hapludults): Makes up most of the tract, on the rocky slopes.

Appling (Fine, kaolinitic, thermic Typic Kanhapludults): Limited areas on lower slopes.

The seepy stream corridors are too small to be distinguished on soil maps.

COMMENTS ON PHYSICAL DESCRIPTION:

NATURAL COMMUNITY DESCRIPTION

Piedmont Monadnock Forest (Typic Subtype): Ridge tops and upper to mid slopes, occupying a large majority of the tract. Canopy dominated by chestnut oak (Quercus montana), with only small numbers of other species: white oak (Quercus alba), red maple (Acer rubrum), and black gum (Nyssa sylvatica). The understory is moderate in density in mature areas, and consists primarily of sourwood (Oxydendrum arboreum) and red maple, with some black gum, and in a few young areas, Virginia pine (Pinus virginiana). In patches that were logged, there are scattered larger unmerchantable trees, and dense regeneration stands dominated by tulip poplar (Liriodendron tulipifera). There is a patchy short shrub layer, consisting of hillside blueberry (Vaccinium pallidum), deerberry (Vaccinium stamineum), and southern blueberry (Vaccinium tenellum). There are fairly extensive patches of muscadine grape (Muscadinia rotundifolia). True herbs are scarce, but include small numbers of dry-site species such as little bluestem (Schizachyrium scoparium), goldenaster (Pityopsis graminifolia), fragrant goldenrod (Solidago odora), and threadleaf coreopsis (Coreopsis major), along with more widespread species such as bluets (Houstonia cerulea) and hawkweek (Hieracium venosum).

Dry Oak—Hickory Forest (Piedmont Subtype): One sizeable patch was found, on the north slope. The canopy is dominated by white oak, with some chestnut oak, red maple, black gum, scarlet oak (Quercus coccinea), and black oak (Quercus velutina). The understory is dominated by red maple, with abundant sourwood and some black gum, flowering dogwood, and other species. In patches that were cut, tulip poplar is dominant. The shrub layer is patchy, with deerberry dominant in some areas, hillside blueberry elsewhere, and substantial areas with little shrub cover. Herbs are sparse. It is notable that, although there were numerous granite boulders in this community as there were in the Piedmont Monadnock Forest, this community was found only in the area mapped as felsic volcanic rocks.

Piedmont Boggy Streamhead: Occurs along all of the small drainages in the tract. The small streams are not perennial, but a series of flowing springs occur along their length, along with a few seep springs either along the channel or off to the side of it. Seepage also must be present some distance uphill from the stream channel, as the wetland ferns extend into these areas. The canopy consists primarily of tulip poplar and red maple, which includes both mature trees 10-12” dbh or larger and an excess of small trees 3-6” dbh. The dominance of small regenerated trees seems greater and more consistent than in the adjacent drier forests. Also of note are a large number of black gums in the canopy, dominating in some portions. The understory consists primarily of canopy species, but a few sourwood are also present. Also present, unusual for this community but in most patches in this tract, are umbrella magnolia (Magnolia tripetala) and fringe tree (Chionanthus virginicus). The wettest central parts of the seeps are shrubby, with alder (Alnus serrulata), southern wild raisin (Viburnum nudum), and coastal fetterbush (Eubotrys racemosa) dominant. Tangles of greenbrier (Smilax rotundifolia) are common. The herb layer is fairly dense, with patches dominated by netted chainfern (Lorinseria areolata), cinnamon fern (Osmundastrum cinnamomeum), royal fern (Osmunda spectabilis), New York fern (Thelypteris noveboracensis), several species of Carex, and jack-in-the-pulpit (Arisaema triphyllum). Other characteristic herbs of this community are present, including cowbane (Oxypolis rigidior), bugleweed (Lycopus), bluet (Houstonia cerulea), and yellow stargrass (Hypoxis hirsuta).

This is an unusual setting for Piedmont Boggy Streamhead and it is not clear why so much seepage is present on streams with such high gradients. Fractures in the underlying granite, and perhaps the sandy soils derived from the granite, may be the explanation, but most other granite terrain is not known to have such extensive seepage.

OTHER COMMUNITIES PRESENT:

ANIMAL HABITAT COMPONENTS

POOLS AND SEEPS : Numerous small seeps.

ROCK DENNING SITES: Probably abundant small rock dens.

BIG TREES/LARGE CAVITIES: A few trees 24" dbh or more are present.

SNAGS AND LOGS: Abundant in mature forest areas. Most appear to date from Hurricane Fran, but a few more recent wind throws and standing dead trees are present. In logged patches, cut tops of trees and previously wind thrown trees also provide abundant down wood. Dead black gums were particularly common in the canopy for their abundance in the forest.

AQUATIC HABITAT FACTORS: Only intermittent streams are present. Some reaches may be permanent because they are fed by seepage but permanently flows segments are not continuous.

SITE INTEGRITY

LAND USE IMPACTS: There was extensive logging in the tract, apparently not much before 2002. Coomans (2002) suggested it may have salvage after Hurricane Fran, which would be consistent with the partial decay of the cut tops, but most cut stumps were not tipped up and generally only smaller and crooked trees were left in the logged patches. The logging consisted of near clearcutting in small patches, scattered throughout much of the tract. The logged patches have sparse remaining trees, generally 10-12" dbh, but occasional larger crooked trees. Dense young regeneration of weedy species, primarily tulip poplar, is present in the cut areas, along with understory red maple that have gained the canopy. Oak saplings and seedlings are present, but generally are overtopped by the weedy regeneration. The previous logging must have been many decades ago. Where not cut, canopy trees average 12-14" dbh or larger, and trees 18" dbh and more are common.

There are a few old road beds running through the tract. There are several man-made rock piles, including piled stones that may have been barbecue pits or perhaps furnaces for stills.

EXOTIC/WEEDY SPECIES: Exotic plants were noted only on the forest road, where stilt grass (Microstegium vimineum) was abundant. No exotic plants were noted in the Piedmont Boggy Streamhead, but they would be vulnerable to invasion by stilt grass and several other species.

DIRECT HUMAN INTRUSION: Low at present, but presumably will be high if the tract is opened as a county park. With new houses being built to the west, intrusion likely will increase regardless.

DISTURBANCE SENSITIVE SPECIES: None noted.

FIRE REGIME: No sign of recent fire. The site is dominated by communities that burn naturally. Prescribed burning is recommended, at moderate frequency (perhaps about 10 years, more frequent at first) and low intensity. With periodic fire, the understory would be reduced and herb cover and diversity could be expected to increase. Fire in the short run would be particularly helpful in reducing the abundant of tulip poplar regeneration and favoring oaks in the logged patches. Fire may be crucial in the long run to create conditions for oak regeneration throughout the site.

ADJACENT LAND USE/OFFSITE STRESSES: There are new rural subdivisions to the west and southwest of the tract, and these are likely to lead to increased human intrusion and possible sources of invasive plants. To the southeast is the UNC-Greensboro observatory. It has a small clearing, but the surrounding forest is mature. To the north is Camp Frontier, a YMCA camp with intensive use but generally contiguous forest cover.

RELATION/CONNECTION TO OTHER SITES AND HABITAT PATCHES: This tract is part of a larger natural area. The nearest other natural area is Cedarrock Park, 2.1 mile to the north. Several other natural areas are present within 3 miles of the tract.

DEGREE OF THREAT/POTENTIAL FOR CHANGE: Without protection, development or further logging are imminent threats. If protected, the risk of further invasion by exotic plants and the gradual deterioration in the absence of fire are the main threats.

BOUNDARY EXPLANATION/JUSTIFICATION: The site boundary is based on the extent of mature or fair quality forest. Portions of the site have been removed because of recent house construction.

RECOMMENDATIONS FOR PROTECTION: The tract would be appropriate for dedication, all as a primary area, or largely primary area with a few logged patches removed.

MANAGEMENT RECOMMENDATIONS AND RESTORATION NEEDS: Prescribed burning is recommended. See recommendations under Fire Regime. Monitoring for appearance of exotic plants, and removal of those present along the forest road, is recommended.

NEED FOR FURTHER STUDY: Animal survey might yield rare species.

REFERENCES: Coomans, R. 2002. Alamance County Natural Areas Inventory

MAPS

Map of natural area boundaries

Map of natural community observations (GPS points labeled with community type) (below)

PLANT SPECIES OBSERVED: (indicate community type and stratum)

THOROUGHNESS OF LIST: (Casual, moderate, thorough, nearly complete.)

M=Piedmont Monadnock Forest

D = Dry Oak—Hickory Forest

S = Piedmont Boggy Streamhead

ANIMAL SPECIES OBSERVED

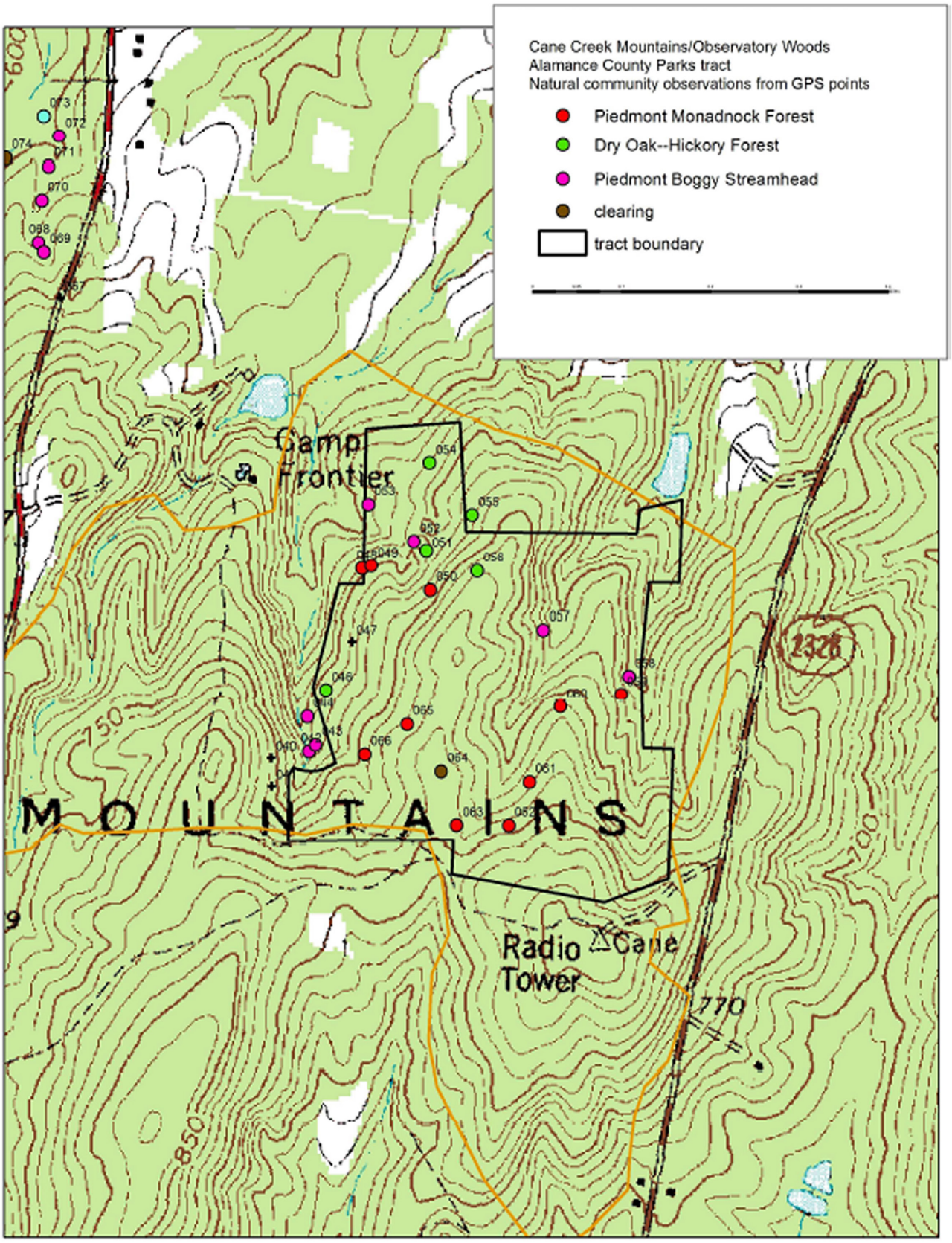
SURVEY CONDITIONS: Very casual noting of bird songs and chance encounters. Midday.

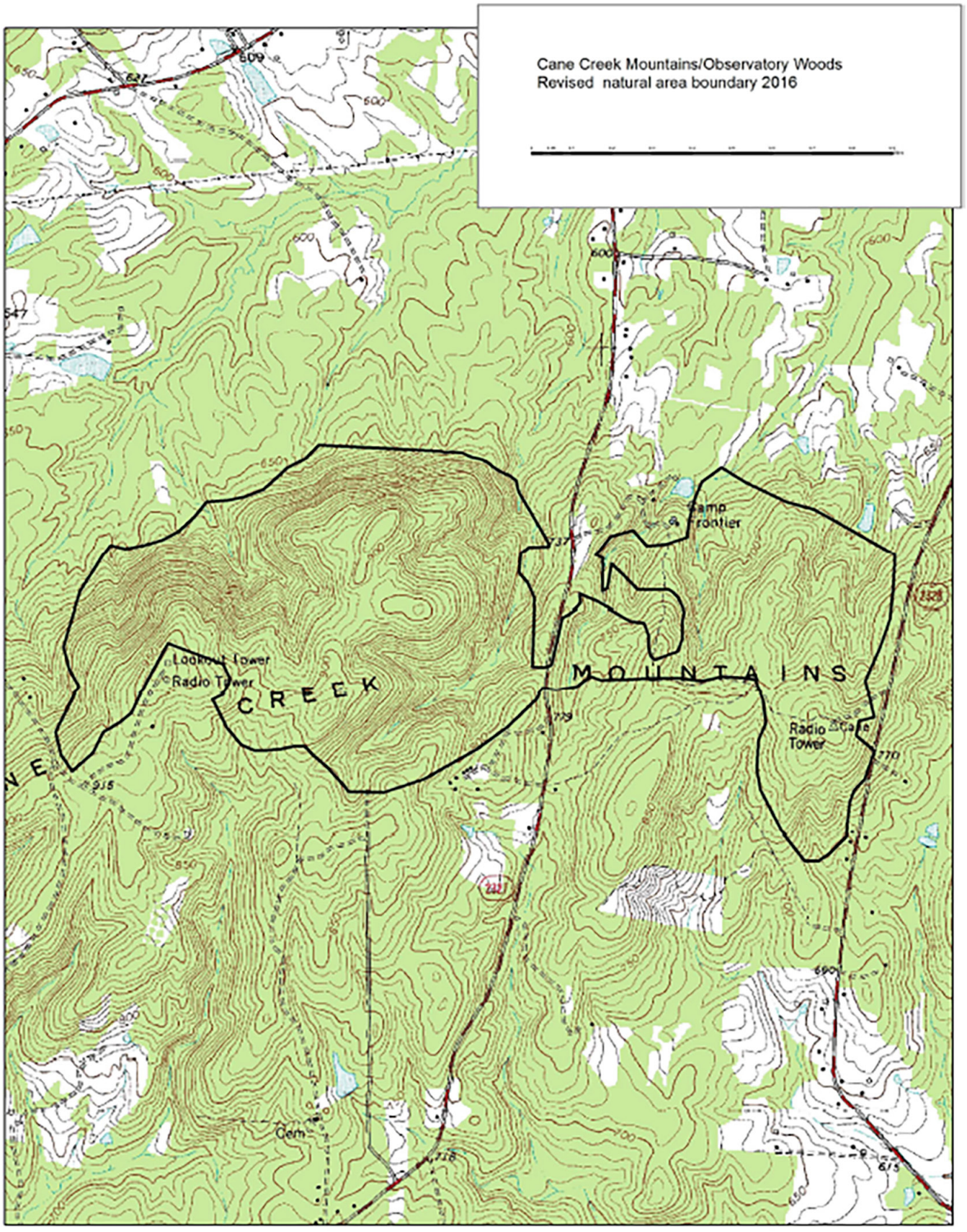
Tufted titmouse

Carolina wren

Overbird

Red-eyed vireo


Cane Creek Mountains/Observatory Woods
Alamance County Parks tract
Natural community observations from GPS points
Piedmont Monadnock Forest
Dry Oak--Hickory Forest
Piedmont Boggy Streamhead
clearing
tract boundary
Camp Frontier
MOUNTAINS
Radio Tower
1326
750
700
770
850


Cane Creek Mountains/Observatory Woods
Revised natural area boundary 2016
Camp Frontier
Lookout Tower
Radio Tower
CREEK
MOUNTAINS
Radio Tower
Cem

Presnell Tract

The below information is excerpted from: Site Survey Report — Presnell Tract, Schafale 2016. The full report is included in Appendix B.

GENERAL DESCRIPTION: The Cane Creek Mountains/Observatory Woods site, including this tract, consists of collection of steep, rocky knobs which are monadnocks, erosional

LOCATION / ACCESS: This tract is west of Bass Mountain Road, on the north slope of Cane Creek Mountain, about 7 air miles northwest of Eli Whitney.

GENERAL DESCRIPTION: The Cane Creek Mountains/Observatory Woods site, including this tract, consists of collection of steep, rocky knobs which are monadnocks, erosional remnant hills that stand well above the surrounding landscape. The upper parts of the hills are quite rocky, with numerous granite boulders and ledges. Extensive Piedmont Monadnock Forest, dominated by chestnut oak, covers the upper parts of the hills. Lower slopes support Dry Oak—Hickory Forest. Dry-Mesic Oak—Hickory Forest was reported in parts of the site but was not found on this tract. Parts of the small drainages that dissect the slope on the tract have a series of small springs and more extensive seepage along them. The seepy areas with saturated soils have wetland communities best classified as Piedmont Boggy Streamhead. They have canopies of tulip poplar, red maple, and black gum, and have extensive beds of cinnamon fern, royal fern, and a variety of wetland herbs and shrubs. The northern half or more of the tract was planted in loblolly pine some years ago. The pines were recently clearcut, and longleaf pine was planted in the cut areas.

SIGNIFICANCE OF SITE: Very high (R2/C4) for the site as a whole. The most significant feature is the extensive, very mature Piedmont Monadnock Forest (Typic Subtype) community, which was found to be in better condition than previously was clear, over much of the site, including on this tract.

SPECIAL STATUS SPECIES: No rare species known.

POTENTIAL FOR OTHER SPECIAL STATUS SPECIES:

OTHER NOTEWORTHY SPECIES AND FEATURES: None are likely, given the communities present, but animal survey in particular, would be worthwhile.

SIZE: 359.80 acres in the Presnell tract.

ELEVATION: 590-910 feet.

TOPOGRAPHY: Moderate to steep slopes and spur ridges, dissected with narrow ravines.

HYDROLOGY AND MOISTURE: Dry over most of the site. Stream courses are mostly permanently or semipermanently saturated, though seldom flooded.

PRESENCE OF STREAMS AND SEEPS: Several intermittent streams are present, all with substantial seepage areas and multiple flowing springs along them. Flow in the channel occurs for some distance downstream of springs and then disappears into the streambed.

GEOLOGY: Mapped as metamorphosed granite on the southern part of the tract, with felsic volcanic rocks on the lower, northern part.

SOIL: Appling (Fine, kaolinitic, thermic Typic Kanhapludults): Extensive on the steep rocky slopes and on the flatter northern area.

Cecil (Fine, kaolinitic, thermic Typic Kanhapludults): Extensive on the steep rocky slopes and on the flatter northern area. Wilkes, Worsham, Helena, and Durham soils occur only on the more gently sloping northern portion, where no extensive natural area remains.

Stony land: This map unit covers the rockiest part of the hill slopes.

The seepy stream corridors are too small to be distinguished on soil maps.

COMMENTS ON PHYSICAL DESCRIPTION:

NATURAL COMMUNITY DESCRIPTION

Piedmont Monadnock Forest (Typic Subtype): Ridge tops and upper to mid slopes, occupying a large majority of the tract. Canopy dominated by chestnut oak (Quercus montana), with only small numbers of other species: white oak (Quercus alba), scarlet oak (Quercus coccinea), pignut hickory (Carya glabra), black gum (Nyssa sylvatica), shortleaf pine (Pinus echinata), and a few others. The understory is moderate in density, and consists primarily of sourwood (Oxydendrum arboreum) and red maple, with some black gum. There is a patchy short shrub layer, dominated mainly by hillside blueberry (Vaccinium pallidum) and deerberry (Vaccinium stamineum). There are fairly extensive patches of muscadine grape (Muscadinia rotundifolia). Herbs are sparse, and consist primarily of widespread dry forest species such as spotted wintergreen (Chimaphila maculata), heartleaf (Hexastylis arifolia), and woodland coreopsis (Coreopsis major). The canopy in this community is quite mature, with trees averaging 12-14” dbh, trees 16-18” dbh common, and a few 24” dbh or more present.

Dry Oak—Hickory Forest (Piedmont Subtype): Intact examples were found only in a narrow band on the lower slopes and in a few dry upper ravines. The canopy is dominated by white oak, with some chestnut oak, red maple, black gum, and other species. The understory is dominated by red maple, with abundant sourwood and some black gum. The shrub layer is patchy, with deerberry dominant in some areas, hillside blueberry elsewhere, and substantial areas with little shrub cover. Herbs are sparse. Canopy stature is comparable to the monadnock forest in mature area. Additional areas were clearcut or heavily cut fairly recently and consist of dense stands of young regeneration which is primarily tulip poplar. Oak regeneration is present but is suppressed by the weedy species.

Dry Basic Oak—Hickory Forest (Piedmont Subtype): One patch was seen, on the flatter northern part of the track. It is too small to be significant. The canopy is dominated by white oak and southern red oak (Quercus falcata), and includes shagbark hickory (Carya ovata), large eastern redcedar (Juniperus virginiana), and a few winged elm (Ulmus alata) and black oak (Quercus velutina). No ash was noted. The understory consists primarily of canopy species, but includes some flowering dogwood (Cornus florida). Shrubs are sparse, but include some coralberry (Symphoricarpos orbiculatus). Herbs are sparse but include a few species not found elsewhere, such as melic grass (Melica mutica). This was the only community where poison ivy (Toxicodendron radicans) was noted.

Piedmont Boggy Streamhead: Occurs along small drainages with seepage or small springs that keep the soils saturated. Two areas were seen in an upper drainage, and one was seen along a stream in the flatter part of the tract. Other patches probably are present on unexplored drainages in the northern portion of the tract. The canopy is dominated by tulip poplar and red maple. The understory consists primarily of canopy species, but also includes some sweetgum (Liquidambar styraciflua) and, unusually, umbrella magnolia (Magnolia tripetala) and fringetree (Chionanthus virginicus). Shrubs are generally sparse, but include southern wild raisin (Viburnum nudum), alder (Alnus serrulata), and coastal fetterbush (Eubotrys racemosa). Tangles of greenbrier (Smilax rotunifolia) are present. The herb layer is fairly dense. Patches are dominated by netted chainfern (Lorinseria areolata), cinnamon fern (Osmundastrum cinnamomeum), royal fern (Osmunda spectabilis), New York fern (Thelypteris noveboracensis), several species of Carex, and jack-in-the-pulpit (Arisaema triphyllum).

The classification of this community has been somewhat confused. Coomans (2002) inititally called it Hillside Seepage Bog, before the concept of Piedmont Boggy Streamhead had been developed. It was initially entered in the Natural Heritage database as Low Elevation Seep. It seems to fit Piedmont Boggy Streamhead best, though some of the characteristic Coastal Plain species present in Uwharrie examples are missing. Coomans reported peat moss being present, but we did not see any in this visit. This is an unusual setting for Piedmont Boggy Streamhead and it is not clear why so much seepage is present on streams with such high gradients. Fractures in the underlying granite, and perhaps the sandy soils derived from the granite, may be the explanation, but most other granite terrain is not known to have such extensive seepage.

Piedmont Headwater Stream Forest (Typic Subtype): Narrow bands occur along some of the drainages that are not seepy. Other drainages have upland vegetation down to the channel. The headwater streams have distinct channels, some of which were flowing at the time of this visit while others were dry. They have narrow floodplains that appear to be alluvial soils. Most of the examples seen were narrow strips left when the uplands were clearcut and planted in pine.

The canopy is generally dominated by tulip poplar and red maple, with a few white oak and, in one place, a green ash. The understory consists of the same species. While tulip poplar is a characteristic dominant of these communities, the limited numbers of other species may be a result of past logging. The shrub layer is generally fairly sparse. Spicebush (Lindera benzoin) is present in small numbers, and there are a few wet spots with southern wild raisin. The herb layer is fairly dense. Wetland ferns, including netted chain fern, dominate limited patches, and sedges, violets (Viola sororia), jack-in-the-pulpit, and a variety of other species are present. In the areas examined, canopy trees average 10” dbh, with some up to 12-14” dbh. With the limited number of tree species and the extensive boundaries with more altered forests, this community is not exemplary here.

Piedmont Alluvial Forest: One area was examined, on a large creek in the northern part of the tract. It had a floodplain 200 feet wide or more. The canopy is a mix that includes tulip poplar, sweetgum (Liquidambar styraciflua), and a few willow oak (Quercus phellos), beech (Fagus grandifolia), and winged elm. The understory is of the same species. Shrubs include spicebush. The herb layer is fairly dense and diverse. Species include Christmas fern (Polystichum acrostichoides), manna grass (Glyceria striata), New York fern (Thelypteris novceboracensis), wood rush (Luzula acuminata), and a number of others. Canopy trees average around 10” dbh, with some larger. As with the Piedmont Headwater Stream Forest, this community is not exemplary on the tract, but serves an important function protecting the stream.

OTHER COMMUNITIES PRESENT:

ANIMAL HABITAT COMPONENTS

POOLS AND SEEPS : Numerous small seeps.

ROCK DENNING SITES: Probably abundant small rock dens.

BIG TREES/LARGE CAVITIES: A few trees 24" dbh or more are present on the steeper areas.

SNAGS AND LOGS: Abundant in mature forest areas. Most appear to date from Hurricane Fran, but a few more recent wind throws and standing dead trees are present. In logged patches, cut tops of trees and previously wind thrown trees also provide abundant down wood. Dead black gums were particularly common in the canopy for their abundance in the forest.

AQUATIC HABITAT FACTORS: The largest stream seen, that flowing through the alluvial forest, was about 3 feet wide and had a substantial current. It probably becomes somewhat larger to the north, before leaving the tract. There are a number of intermittent and first order streams. Water quality appears good in most, but the logging road has shed sediment in some of them where it crosses.

SITE INTEGRITY

LAND USE IMPACTS: Most of the northern part of the tract was in loblolly pine plantation, which was clearcut very recently. Since the plantation occupied only flatter ground, these areas may well have been fields in the past. The logging apparently finished only several weeks before this visit. We met NC Forest Service staff (John Howard and Sam Griffith), who came to inspect the logging road and see the results of the operation. The steams and ravines were not converted to pine plantation and were not logged at this time, but had relatively young forests that appear to show the effect of earlier logging. Some upland forests near the base of the steeper slopes appear to have been logged perhaps 10 years ago, and had dense regeneration of weedy tree species. The steep and rocky areas on the south side of the tract have not been logged in many decades. Despite the harsh site conditions, canopy trees average 12" dbh or more, and trees exceeding 16" dbh are common.

A sizable old house is present in the middle of the tract. This may once have been a prosperous plantation.

PLANTINGS: Seedlings of longleaf pine (Pinus palustris) were planted in the recently clearcut pine plantations in the northern part of the tract. Several areas at the top of the ridge had plantings of longleaf pine and American chestnut (Castanea dentata) seedlings. The ridge top planting areas had been prepared by cutting all of the understory trees and painting them with herbicide, leaving a somewhat open canopy with much less shade then previously.

American chestnut is not known to be a significant component of forests in the Piedmont, but the range map in the Radford, Ahles, and Bell Flora of the Carolinas shows a disjunct location in Alamance County. Longleaf pine is not known to be native to Alamance County. The nearest native location remaining is in southwestern Chatham County, about 25 miles away. No other longleaf pine locations are known so far from the fall zone in North Carolina.

It is not known whether either species will survive in the site. Longleaf pine does occur in similar site

conditions in the Uwharrie Mountains area, but the conditions that kept it from occurring here throughout the historic past may still prevail. Its range limit may be determined by extreme cold temperatures or ice storms, or it may be the long-term result of past fire regimes. Possibly the warming climate will allow it to survive here if it is managed with fire. The habitat for the historic American chestnut population is not known. It may have been a monadnock forest as are present here, or might have been a site with a cool microclimate. In either case, both species are difficult to establish even within their range. In either case, the plantings make an interesting experiment, but it is uncertain whether to regard them as restoration activities.

EXOTIC/WEEDY SPECIES: Invasive exotic plants are present only in the floodplains and seeps in the lower parts of the tract, and along the logging road. Japanese honeysuckle is fairly widespread but not dense. Stilt grass is dense in patches. These species have the potential to become worse.

DIRECT HUMAN INTRUSION: Low at present, but presumably will be high if the tract is opened as a county park.

DISTURBANCE SENSITIVE SPECIES: None noted.

FIRE REGIME: No sign of recent fire, other than a single charred stump near the top of the hill. It may have been burned in a lightning strike that did not spread, or may have been charred after dead, in a fire long enough that charcoal has sloughed off the bark of live trees.

The site is dominated by communities that burn naturally. Prescribed burning is recommended, at moderate frequency (perhaps about 10 years, more frequent at first) and low intensity. With periodic fire, the understory would be reduced and herb cover and diversity could be expected to increase. Fire in the short run would be particularly helpful in reducing the abundant of tulip poplar regeneration and favoring oaks in the logged patches. Fire may be crucial in the long run to create conditions for oak regeneration throughout the site.

In addition, if the longleaf pine plantings are to survive, fire needs to be introduced soon. There is a substantial seed source for weedy hardwoods in the recent clearcuts, and tulip poplar, sweetgum, and red maple can be expected to establish and overtop the seedlings in a couple of years. Fire would also be useful in promoting restoration in the hardwood regeneration on the lower slopes. The young oaks that should be characteristic of these areas are overtopped by weedy hardwoods which now dominate these areas. Fire would reduce their dominance and favor oaks. This likely is an important part of the natural mechanism by which oaks dominated in the Piedmont. The response of American chestnut to fire is not known. Its widespread occurrence in the mountains indicates that it tolerated the widespread low intensity fires that occurred there. Whether it would be benefitted or harmed by fire at the margin of its range and in a warmer than optimal climate is less certain. The chestnut and longleaf pine seedlings that are interplanted likely have incompatible fire requirements.

ADJACENT LAND USE/OFFSITE STRESSES: The adjacent tract to the south is part of the natural area and has similar mature monadnock forest. There are rural subdivisions surrounding the site on several sides.

RELATION/CONNECTION TO OTHER SITES AND HABITAT PATCHES: This tract is part of a larger natural area. The nearest other natural area is Cedarrock Park, 2.1 mile to the north. Several other natural areas are

present within 3 miles of the tract.

DEGREE OF THREAT/POTENTIAL FOR CHANGE: Without protection, development or further logging are imminent threats. If protected, the risk of further invasion by exotic plants and the gradual deterioration in the absence of fire are the main threats.

BOUNDARY EXPLANTATION/JUSTIFICATION: The site boundary is based on the extent of mature or fair quality forest.

RECOMMENDATIONS FOR PROTECTION: The tract would be appropriate for protection by conservation acquisition, conservation easement, dedication, or registry. A dedicated area would be zoned, with primary area on the hills in the southern portion, primary areas protecting the creeks elsewhere, and buffer in the north portion of the tract.

MANAGEMENT RECOMMENDATIONS AND RESTORATION NEEDS: Prescribed burning is recommended, at low intensity and moderate frequency. Monitoring for appearance of exotic plants, and removal of those present along the forest road, is recommended.

NEED FOR FURTHER STUDY: Animal survey might yield rare species.

REFERENCES: Coomans, Roy J. Moni Bates, and Kathy Douglas. 2002. Cane Creek Mountains. Site survey report for Alamance County natural areas inventory.

ATTACH MAPS

Map of natural area boundaries

Map of natural community observations (GPS points labeled with community type) (below)

PLANT SPECIES OBSERVED: (indicate community type and stratum)

THOROUGHNESS OF LIST: (Casual, moderate, thorough, nearly complete.)

M=Piedmont Monadnock Forest

D = Dry Oak—Hickory Forest

S = Piedmont Boggy Streamhead

A = Piedmont Alluvial Forest

H = Piedmont Headwater Stream Forest

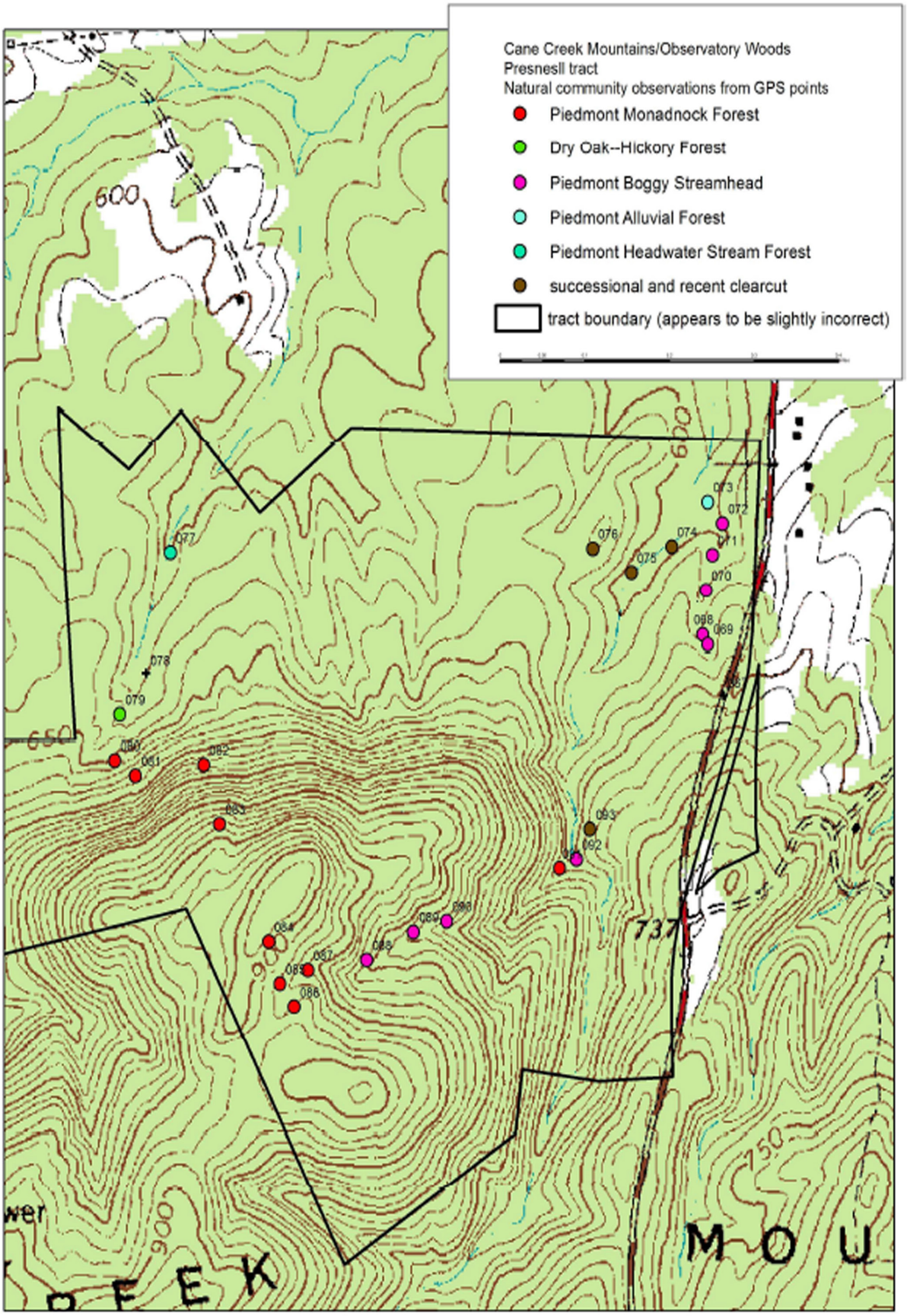
ANIMAL SPECIES OBSERVED

SURVEY CONDITIONS: Casual encounters only.

Cricket frog

Green snake

Box turtle


Cane Creek Mountains/Observatory Woods
Presnesll tract
Natural community observations from GPS points
Piedmont Monadnock Forest
Dry Oak--Hickory Forest
Piedmont Boggy Streamhead
Piedmont Alluvial Forest
Piedmont Headwater Stream Forest
successional and recent clearcut
tract boundary (appears to be slightly incorrect)
600
650
900
750
737
M O U

Henderson-Dixon and Sizemore Tracts

The below information is excerpted from: Site Survey Report — Henderson Dixon and Sizemore Tracts, Schafale 2019. The full report is included in Appendix C.

LOCATION / ACCESS: The Henderson Dixon tract is on the west side of Bass Mountain Road. Access is by a forest road north of Sunrise Trail and south of Broadrock Road. The Sizemore tract is west of the Henderson Dixon tract. It borders Mount Herman Rock Creek Road and Mountain Valley Drive and can be accessed from them.

GENERAL DESCRIPTION: These two tracts include part of the rugged monadnock hills of the Cane Creek Mountains. Much of the higher hills are covered with Piedmont Monadnock Forest, and this community extends well down slope where the soil is very rocky. On less extreme slopes, Dry Oak—Hickory Forest and Dry-Mesic Oak—Hickory Forest communities predominate. All of these forests are unusually mature and appear not to have experienced logging for many decades. Small drainages within the rugged lands contain headwater streams. Seepage is unusually common along them, and most of the small streams are lined with Piedmont Boggy Streamhead communities containing wetland herbs. A minority is Piedmont Headwater Stream Forest, typically more abundant in most Piedmont landscapes. The northern edge of the Sizemore tract has gentle slopes. Most of this area is heavily altered by recent logging or past farming. However, some areas of mature Dry-Mesic Oak—Hickory Forest is present. Better developed stream floodplain in this area are lined with Piedmont Alluvial Forest.

SIGNIFICANCE OF SITE: Cane Creek Mountain/Observatory Woods as a whole is of Very High significance (R2 C4). The most significant feature is the Piedmont Monadnock Forest (Typic Subtype) community, which is one of the most extensive mature examples in the state. A sizeable portion of this community is on the Sizemore and Henderson Dixon tracts.

SPECIAL STATUS SPECIES: None were noted on this visit. No rare species have previously been found on the tract.

POTENTIAL FOR OTHER SPECIAL STATUS SPECIES: Low. Monotropsis odorata could possibly be found.

SIZE: 150 acres in the Henderson Dixon tract. 301 acres in the Sizemore tract.

ELEVATION: 600-975 feet.

TOPOGRAPHY: High hills with relative gently sloping tops but steep side slopes make up the most significant part of the tracts. The steep slopes give way fairly abruptly to gentle northward slopes on the north side of the Sizemore tract.

HYDROLOGY AND MOISTURE: Dry to dry-mesic over most of the site. Some of the small drainages are intermittently flooded but substantial portions are also permanently saturated by seepage.

PRESENCE OF STREAMS AND SEEPS: Intermittent and ephemeral stream occur throughout the tracts. A more substantial perennial streamis present on the Sizemore tract.

GEOLOGY: The state geologic map shows the higher hills as metamorphosed granitic rocks. The gentle slopes on the north side are mapped as felsic volcanic rocks.

SOIL: Appling (Fine, kaolinitic, thermic Typic Kanhapludults): Occupies much of the rugged part of the site, supporting all of the oak communities. Most of the stream communities are on inclusions in this map unit too. "Stony land": Extensive in the rugged area, supporting Piedmont Monadnock Forest.Tirzah (Fine, kaolinitic, thermic Typic Hapludults): Present on the gentle slopes, including on patch of high quality Dry-Mesic Oak—Hickory Forest. Colfax (Fine-loamy, mixed, subactive, thermic Aquic Fragiudults): Larger floodplains with Piedmont Alluvial Forest. Small areas of Iredell, Mecklenburg, and Wilkes soil are present on the gentler slopes, but no substantial patches of intact natural communities occur on them.

COMMENTS ON PHYSICAL DESCRIPTION:

NATURAL COMMUNITY DESCRIPTION

Piedmont Monadnock Forest (Typic Subtype): Occurs on rocky ridge tops, knobs, and slopes. Most of this community is on higher and steeper topography, but it extends to lower slopes and gentle slopes where they are very rocky. While most slopes are convex, it is present even in a few ravines. The canopy is dominated by Quercus montana, usually strongly so. A few Pinus virginiana, Quercus stellata, and Quercus alba are present. The understory is dominated by Oxydendrum arboreum and also includes abundant Acer rubrum and Nyssa sylvatica. A couple of Quercus marilandica were seen. The shrub layer is variable. Dense patches of Vaccinium pallidum are present in some places. Other areas have little or no shrub layer and have ground cover of sprawling Muscadinia rotundifolia. Toxicodendron pubescens was noted in one place. Herbs are sparse. Most are widespread species such as Chimaphila maculata. Most of this community is quite mature, with canopy trees averaging 12-14" dbh and trees up to 20" dbh present. A few areas are in B condition, with trees averaging 12" dbh or slightly less.

Dry Oak—Hickory Forest (Piedmont Subtype): This community occurs on many of the side slopes and some ridges. It is more often on southerly and westerly aspects, and more often on convex slopes, but also occurs on some convex areas within the Piedmont Monadnock Forest. The canopy is dominated by Quercus alba, sometimes with substantial amounts of Quercus montana. Quercus falcata, Carya tomentosa, Quercus coccinea, and large individuals of understory trees also are present. The understory includes Nyssa sylvatica, Acer rubrum, Oxydendrum arboreum, and Cornus florida. Shrubs are patchy. Vaccinium pallidum and Gaylussacia baccata form some dense patches. Vaccinium stamineum, Vaccinium tenellum, Viburnum acerifolium, and Hypericum stragulum are scattered, as are shrub-size Sassafras albidum. Muscadinia rotundifolia dominates some areas. Herbs are sparse. Chimaphila maculata is most abundant, but Baptisia tinctoria, Dichanthelium sp., Hexastylis arifolia, Solidago odora, and Tephrosia virginiana are also present. Most of this forest is quite mature, with canopy trees averaging 12-14" dbh.

Dry-Mesic Oak—Hickory Forest (Piedmont Subtype): Occurs on some lower slopes and on some gentler sloped areas. It probably was extensive on the flatter areas but much is young forest or has been replaced by successional communities. The canopy is dominated by Quercus alba in combination with Quercus rubra, with smaller numbers of Quercus velutina, Carya tomentosa, and small groves and scattered stems of Pinus echinata. The understory includes abundant Cornus florida in some areas, and includes Acer rubrum, Nyssa sylvatica, and Oxydendrum arboreum, with small numbers of other species. The shrub layer is variable. Vaccinium pallidum and Vaccinium stamineum are most frequent. Herbs are primarily widespread species

such as Chimaphila maculata and Hexastylis arifolia, but include a variety of other species such as Nabalus sp., Uvularia pubereula, Hylodesmum nudiflorum, and Agrimonia sp. A few places on the flatter part of the Sizemore tract are transition to a basic community; they lack species in the Ericaceae and have slightly higher herb diversity. Much of the acreage of this community is quite mature, with canopy trees averaging 12-14" dbh and with trees up to 24" dbh present. Some areas are in B condition, with canopy trees 10-12" dbh. Extensive younger areas are also present.

Dry-Mesic Oak—Hickory Forest (Piedmont Subtype): Occurs on some lower slopes and on some gentler sloped areas. It probably was extensive on the flatter areas but much is young forest or has been replaced by successional communities. The canopy is dominated by Quercus alba in combination with Quercus rubra, with smaller numbers of Quercus velutina, Carya tomentosa, and small groves and scattered stems of Pinus echinata. The understory includes abundant Cornus florida in some areas, and includes Acer rubrum, Nyssa sylvatica, and Oxydendrum arboreum, with small numbers of other species. The shrub layer is variable. Vaccinium pallidum and Vaccinium stamineum are most frequent. Herbs are primarily widespread species such as Chimaphila maculata and Hexastylis arifolia, but include a variety of other species such as Nabalus sp., Uvularia pubereula, Hylodesmum nudiflorum, and Agrimonia sp. A few places on the flatter part of the Sizemore tract are transition to a basic community; they lack species in the Ericaceae and have slightly higher herb diversity. Much of the acreage of this community is quite mature, with canopy trees averaging 12-14" dbh and with trees up to 24" dbh present. Some areas are in B condition, with canopy trees 10-12" dbh. Extensive younger areas are also present.

Piedmont Headwater Stream Forest (Typic Subtype): This community occurs in some of the small drainages in the rugged parts of the tracts, where there are intermittent to ephemeral streams. Floodplains and alluvial soils are not well developed but the vegetation is distinctly different from the surrounding uplands. It appears to be present in a minority of such sites; because substantial seepage is common, more are Piedmont Boggy Streamhead. As is typical, patches are long but are only 10-30 meters wide. The canopy is a mix of Liriodendron tulipifera, Acer rubrum, and Quercus alba, with a few Quercus rubra. The understory consists primarily of canopy species and species shared with the oak forests such as Nyssa sylvatica, but Magnolia tripetala was seen in several places and a little Acer floridanum was seen. Shrubs are generally spares. A little Lindera benzoin is present, and there are a few Hamamelis virginiana. Herbs are moderate in density. Parathelypteris noveboracensis, Athyrium asplenioides, Carex spp., and small patches of Osmundastrum cinnamomeum are common. Forest maturity is generally comparable to that of surrounding forests.

Piedmont Alluvial Forest: Occurs on the better developed floodplain of the larger streams in the flatter areas of the Sizemore tract. Soils are distinctly alluvial and heterogeneity caused by variable deposition is apparent. The canopy is dominated by Liquidambar styraciflua and Liriodendron tulipifera. Fagus grandifolia, Quercus alba, Quercus rubra, Carya tomentosa, and Pinus echinata are mixed in in varying numbers. The understory includes Carpinus caroliniana as well as canopy species. The shrub layer generally is sparse, with Lindera benzoin the dominant species. The herb layer is dense. Patches are dominated by Polystichum acrostichoides, and other patches by a large Dichanthelium sp., and limited areas by Microstegium vimineum. Other herbs include Carex spp., Arisaema triphyllum, Athyrium asplenioides, Parathelypteris noveboracensis, Phegopteris hexagonoptera, Salvia lyrata, and Viola sp. Patches in the primary area range from A to B condition, with canopy trees averaging 12" dbh or more.

Piedmont Boggy Streamhead: Narrow bands of this seepage-fed wetland community are surprisingly abundant in the Cane Creek Mountains. Most of the headwater stream valleys in the rugged parts of both

tracts contained it, occurring as narrow bands 10-30 meters wide. Liriodendron tulipifera is the dominant tree, but Acer rubrum and a few Fagus grandifolia are present. Much of the canopy cover is from trees rooted in adjacent oak forests. There is little understory, mostly consisting of canopy species. Shrubs are sparse. Alnus serrulata, Lindera benzoin, Vaccinium corymbosum, and Viburnum nudum are present, and Xanthorhiza simplicissima occurs along some of the small stream channels. Smilax rotundifolia is locally abundant. The herb layer is dense. Osmunda spectabilis and Osmundastrum cinnamomeum dominate some patches. The rest of the area is a mix of herbs that includes Lorinseria areolata, Parathelypteris noveboracensis, Arisaema triphyllum, Athyrium asplenioides, Carex spp., Lycopus sp., Lobelia cardinalis, Viola sp., and Dichanthelium sp. Sphagnum clumps are frequent. Canopy maturity is comparable to the surrounding upland forests. One area was disturbed by an ATV trail, but most of the extent shows no soil disturbance.

OTHER COMMUNITIES PRESENT: A very small Low Elevation Seep was seen on the Henderson Dixon tract. It is an uphill extension of a Piedmont Boggy Streamhead and has similar vegetation dominated by Osmundastrum cinnamomeum. Its canopy cover is from the adjacent upland forest. Successional forests dominated by Pinus virginiana and Pinus echinata are present in several patches on both tracts.

ANIMAL HABITAT COMPONENTS

POOLS AND SEEPS: Seeps are extensive. No pools were seen.

ROCK DENNING SITES: Bouldery rock outcrops are abundant on the monadnocks.

BIG TREES/LARGE CAVITIES: Trees up to 24” dbh are occasional in the mature forests.

SNAGS AND LOGS: Moderate to locally very abundant. Small canopy gaps of several ages are scattered. A large canopy gap of several acres was seen on the Sizemore tract.

AQUATIC HABITAT FACTORS

Numerous headwater streams are present on both tracts, in ravines in the rugged area. Seepage is abundant in these ravines, and small perennial or near perennial flow seems to be present in most. Their beds are sand or muck. On the Sizemore tract, a couple of larger streams are present in the flatter northern part. Where crossed, they have channels 5-6 feet wide, and are entrenched several feet. They have beds of sand or gravel. In one area, a stream was entrenched about 10 feet and there appeared to be active headward erosion. There was a near-vertical fall of some 8 feet at the upstream end of the deep entrenchment, and it appears to be continuing to erode. The surrounding floodplain and uplands had gullies, though it was not obvious that they were still deepening.

SITE INTEGRITY

LAND USE IMPACTS: The rugged parts of both tracts have limited land use impacts. It has been many decades since logging in these areas. The northern part of the Sizemore tract is flatter and has been logged recently. Some parts appear to have been cultivated longer ago. It is largely successional forest and is not included in the natural area. The southern and eastern part of the Henderson Dixon tract appears to have had several fields in the past, which now are successional pine forests. The Henderson Dixon tract was used as a youth camp for some years, and remnants of camp facilities are present. There are abandoned cabins, a rustic dining

hall, a barn, and other small buildings nestled in both successional and mature forests.

EXOTIC/WEEDY SPECIES: Most of both tracts is free from exotic plants. However, Microstegium vimineum is abundant in some of the successional forests. It is locally abundant in Piedmont Alluvial Forest and occasional in Piedmont Headwater Stream Forest.

DIRECT HUMAN INTRUSION: Low at present.

DISTURBANCE SENSITIVE SPECIES: None noted.

FIRE REGIME: No evidence of fire. Fire would be a natural process in all of the oak forests and may be crucial to their long term integrity. Fire would penetrate into the riparian forests as well, but with less ecological effect. Prescribed burning is encouraged for all of the more natural parts of the tract. Burning in the successional forests would also may be beneficial, placing them on a more natural trajectory of succession.

ADJACENT LAND USE/OFFSITE STRESSES: Both tracts are bordered by small rural subdivisions to the south. A large expanse of semi-natural and natural land that is part of the county park lies to the north of them.

RELATION/CONNECTION TO OTHER SITES AND HABITAT PATCHES: Haw River Aquatic Habitat approaches Cane Creek Mountains/Observatory Woods at 2.7 miles to the southeast. Kimesville Road Basic Forest is 3.6 miles to the southwest. Several unsurveyed conservation easement lands lie closer to the site.

DEGREE OF THREAT/POTENTIAL FOR CHANGE: Both tracts are in formal or informal conservation ownership, by Alamance County and 130 of Chatham. If intended park development is limited to more altered areas, threats should be low.

BOUNDARY EXPLANTATION/JUSTIFICATION: The existing boundary of the Cane Creek Mountains/Observatory Woods natural area has been modified based on this survey, expanding to encompass additional areas observed to have significant natural communities. Poorer forest areas are included to connect primary areas and to buffer streams.

RECOMMENDATIONS FOR PROTECTION: Recommendations for primary and buffer areas are shown on the map.

MANAGEMENT RECOMMENDATIONS AND RESTORATION NEEDS: Prescribed burning is recommended. Frequency should ultimately be around 10 years, but it may be usual to be more frequent for the first several burns. Intensity should be kept low, especially on the early burns. Fire is important for all the oak forests. While not believed as important for the Piedmont Boggy Streamhead, Piedmont Headwater Stream Forest, or Piedmont Alluvial Forest, lower intensity fires should not be harmful to them and there is no need to exclude them from burn units.

NEED FOR FURTHER STUDY: Several portions of the tracts were not visited, and natural community boundaries remain imprecisely known in those areas. No survey has been done for rare animals.

REFERENCES:

MAPS

Map of community type observations.

Map of revised natural area boundary.

PLANT SPECIES OBSERVED:

THOROUGHNESS OF LIST: (Fairly thorough.)

M = Piedmont Monadnock Forest

D = Dry Oak—Hickory Forest

O = Dry-Mesic Oak—Hickory Forest

H = Piedmont Headwater Stream Forest

A = Piedmont Alluvial Forest

B = Piedmont Boggy Streamhead

S = Low Elevation Seep

x = successional forests

ANIMAL SPECIES OBSERVED

Yellow-billed cuckoo

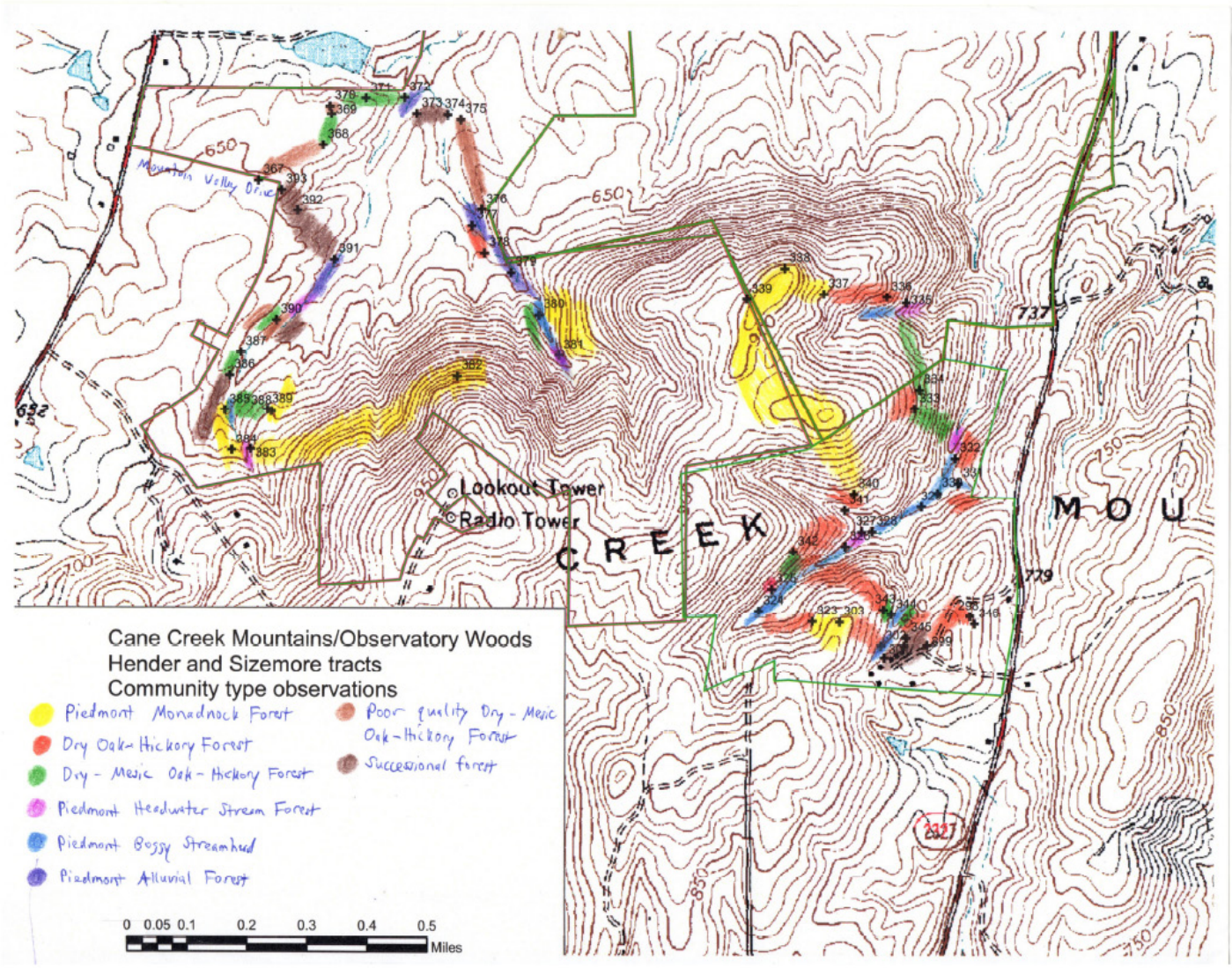
Scarlet tanager

Red-eyed vireo

Eastern peewee

Acadian flycatcher

Overbird


Cane Creek Mountains/Observatory Woods
Hender and Sizemore tracts
Community type observations
Piedmont Monadnock Forest
Dry Oak-Hickory Forest
Dry - Mesic Oak - Hickory Forest
Piedmont Headwater Stream Forest
Piedmont Bogsy Streamhead
Piedmont Alluvial Forest
Poor quality Dry - Mesic Oak-Hickory Forest
Successional forest
0 0.05 0.1 0.2 0.3 0.4 0.5
Miles
Lookout Tower
Radio Tower
CREEK
MOU
Mountain Valley Drive
650
700
737
779
850

Cane Creek Mountains: Faircloth, Presnell, Henderson-Dixon & Sizemore Tracts

The below information is excerpted from: Alamance County Natural Heritage Inventory, Coomans, 2002. The full report is included in Appendix D.

CANE CREEK MOUNTAINS

Site significance: regional

Size: 570 acres

Quadrangle: Snow Camp

Ownership: private

SIGNIFICANT FEATURES:

The Cane Creek Mountains are a series of steeply sloping, rounded peaks that rise dramatically from the surrounding farmland. They are the largest area of natural woodland in the county. The quality of the natural communities on the summit and the northern and eastern slopes is very high. The dry woodlands that are present rival those of the Uwharrie Mountains in size and integrity and represent some of the highest quality upland woods in the northern Piedmont of North Carolina. The bogs and seeps that occur intermittently along the slopes are largely undisturbed and support species not commonly seen in the region. There is the potential for rare species in these wetland pockets.

Landscape Relationships:

Cane Creek Mountains is in south-central Alamance County. The area is one of rural residences and small farms. It is one of three contiguous sites, the others being Bass Mountain and Observatory Woods. It is by far the largest and most significant of the three. A number of smaller sites are within five air miles on the surrounding lowlands.

Site Description:

Cane Creek Mountains encompasses a series of steep hills with rounded peaks. The summits and upper slopes are xeric with much exposed rock. These support Piedmont Monadnock Forest. As is characteristic, the canopy is dominated by chestnut oak (Quercus montana). Other canopy trees include white oak (Quercus alba), post oak (Quercus stellata), scarlet oak (Quercus coccinea), Virginia pine (Pinus virginiana), and pignut hickory (Carya glabra). Though there is a closed canopy in places, rockier, more xeric slopes can have a sparse and open canopy. The understory is dominated by sourwood (Oxydendrum arboreum) and black gum (Nyssa sylvatica); other species present include red maple (Acer rubrum), flowering dogwood (Cornus florida), blackjack oak (Quercus marilandica), and Virginia red-cedar (Juniperus virginiana). The shrub layer is dominated by ericaceous species including deerberry (Vaccinium stamineum), blueberry (Vaccinium vacillans), and blue huckleberry (Gaylussacia frondosa). Also present are sassafras (Sassafras albidum), chinquapin (Castanea pumila), and dwarf pawpaw (Asimina parviflora). The latter two are not commonly seen in this area.

Where the soil is less rocky and xeric, Piedmont Monadnock Forest grades into Dry Oak-Hickory Forest. The

canopy still includes chestnut oak (Quercus montana) but other species such as white oak (Quercus alba)/ black oak (Quercus velutina), scarlet oak (Quercus coccinea)/ pignut hickory (Carya glabra), red maple (Acer rubrum), and tuliptree (Liriodendron tulipifera) increase in frequency. The subcanopy and shrub layers also are more diverse. Included are red maple (Acer rubrum), black cherry (Prunus serotina), flowering dogwood (Cornus florida), sourwood (Oxydendrum arboreum)/ and blueberries (Vaccinium spp.). Herbs are sparse but muscadine (Vitis rotundifolia) is common on the forest floor.

Where undisturbed, the base of the slopes support Dry-Mesic Oak-Hickory Forest. White oak (Quercus alba) is still present in the canopy but it occurs here with more mesophytic species such as red oak (Quercus rubra) and tuliptree (Liriodendron tulipifera). The understory includes species present in the Dry Oak-Hickory Forest such as red maple (Acer rubrum), flowering dogwood (Cornus florida), and black gum (Nyssa sylvatica) as well as species absent or less frequent further upslope. Among these are redbud (Cercis canadensis), umbrella magnolia (Magnolia tripetala), and fringetree (Chionanthus virginicus). The herb layer remains sparse.

At several places on the upper slopes Hillside Seepage Bogs occur at the heads of small creeks. Though they lack the pitcher-plants (Sarracenia spp.) that characterize the Montgomery County examples of Hillside Seepage Bogs they are otherwise similar in species composition to those that occur there. They are dominated by herbs and shrubs. Present in the herb layer are royal fern (Osmunda regalis var. spectabilis), cinnamon fern (Osmunda cinnamomea)/ stiff cowbane (Oxypolis rigidior), small green wood-orchid (Habenaria clavellata), peat moss (Sphagnum sp.), and sedges. In the subcanopy-shrub layer are inkberry (Ilex glabra), common winterberry (Ilex verticillata), southern wild raisin (Viburnum nudum var. nudum), red chokeberry (Aronia arbutifolia), highbush blueberry (Vaccinium corymbosum), and tag alder (Alnus serrulata). The most common canopy species in and around the seeps is red maple (Acer rubrum).

A small Low Elevation Rocky Summit occurs on the northeast crest of the mountains. Bare rock dominates with sparse vegetation in areas where soil development has occurred. Chestnut oak (Quercus montana) and Virginia pine (Pinus virginiana) are present in the sparse canopy and stunted blackjack oak (Quercus marilandica) occurs as an understory species. Blueberries (Vaccinium spp.) are the most common shrub but these are scattered. Herbs are generally absent or confined to the margins where the rocky summit grades into neighboring forest communities, primarily Piedmont Monadnock Forest. Included here are species such as wild glade quinine (Parthenium integrifolium var. auriculatum), silkgrass (Pityopsis graminifolia), butterfly pea (Clitoria mariana), and xerophytic grasses such as panic grass (Panicum spp.).

NATURAL COMMUNITIES

Low Elevation Rocky Summit

Piedmont Monadnock Forest

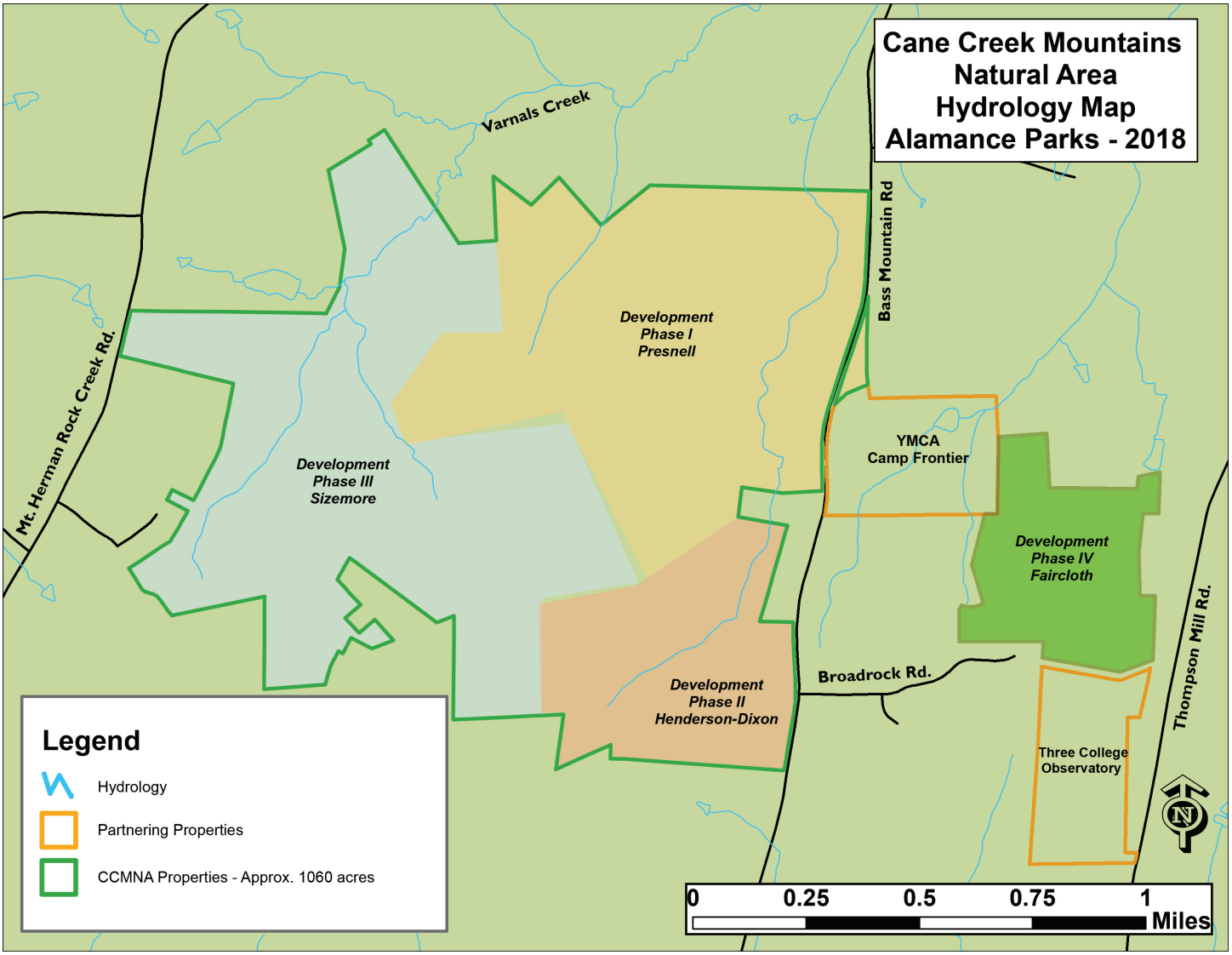
Dry Oak-Hickory Forest

Dry-Mesic Oak-Hickory Forest

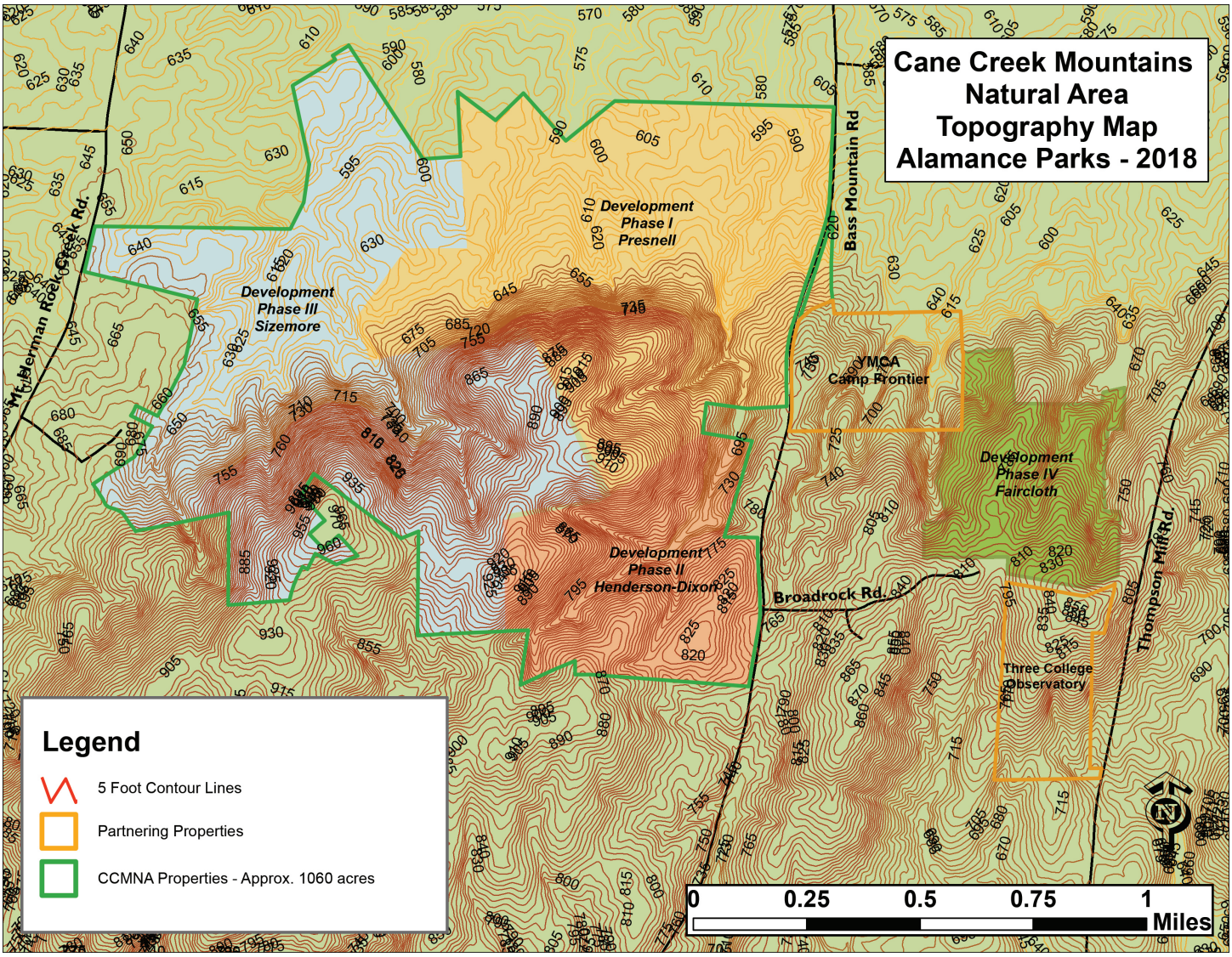
Hillside Seepage Bog

Site Maps

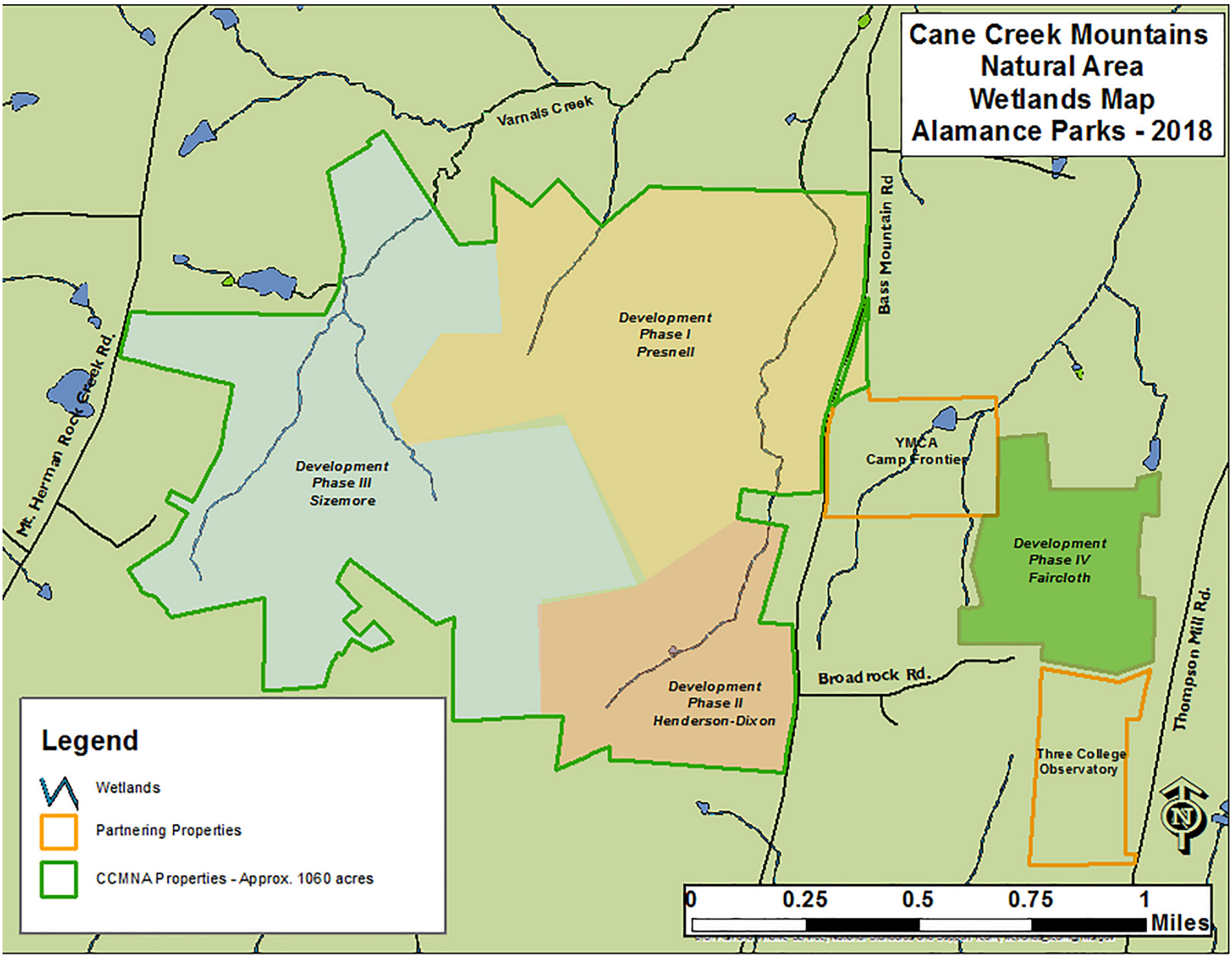
Hydrology



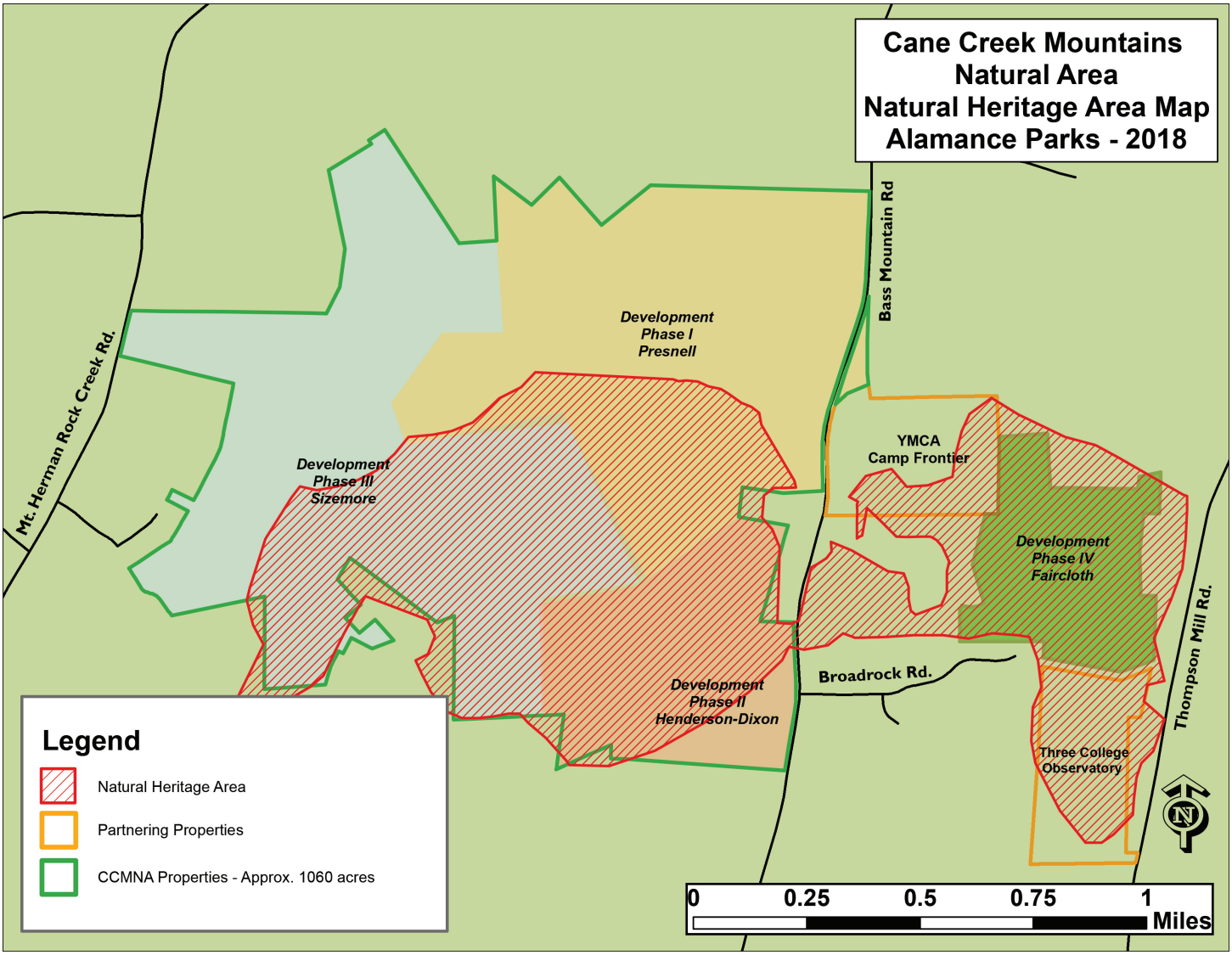
Topography


Cane Creek Mountains
Natural Area
Topography Map
Alamance Parks - 2018
Development
Phase I
Presnell
Development
Phase III
Sizemore
Development
Phase II
Henderson-Dixon
Development
Phase IV
Faircloth
YMCA
Camp Frontier
Three College
Observatory
Bass Mountain Rd
Broadrock Rd.
Thompson Mill Rd
McPherman Rock Creek Rd.
Legend
5 Foot Contour Lines
Partnering Properties
CCMNA Properties - Approx. 1060 acres
0
0.25
0.5
0.75
1
Miles

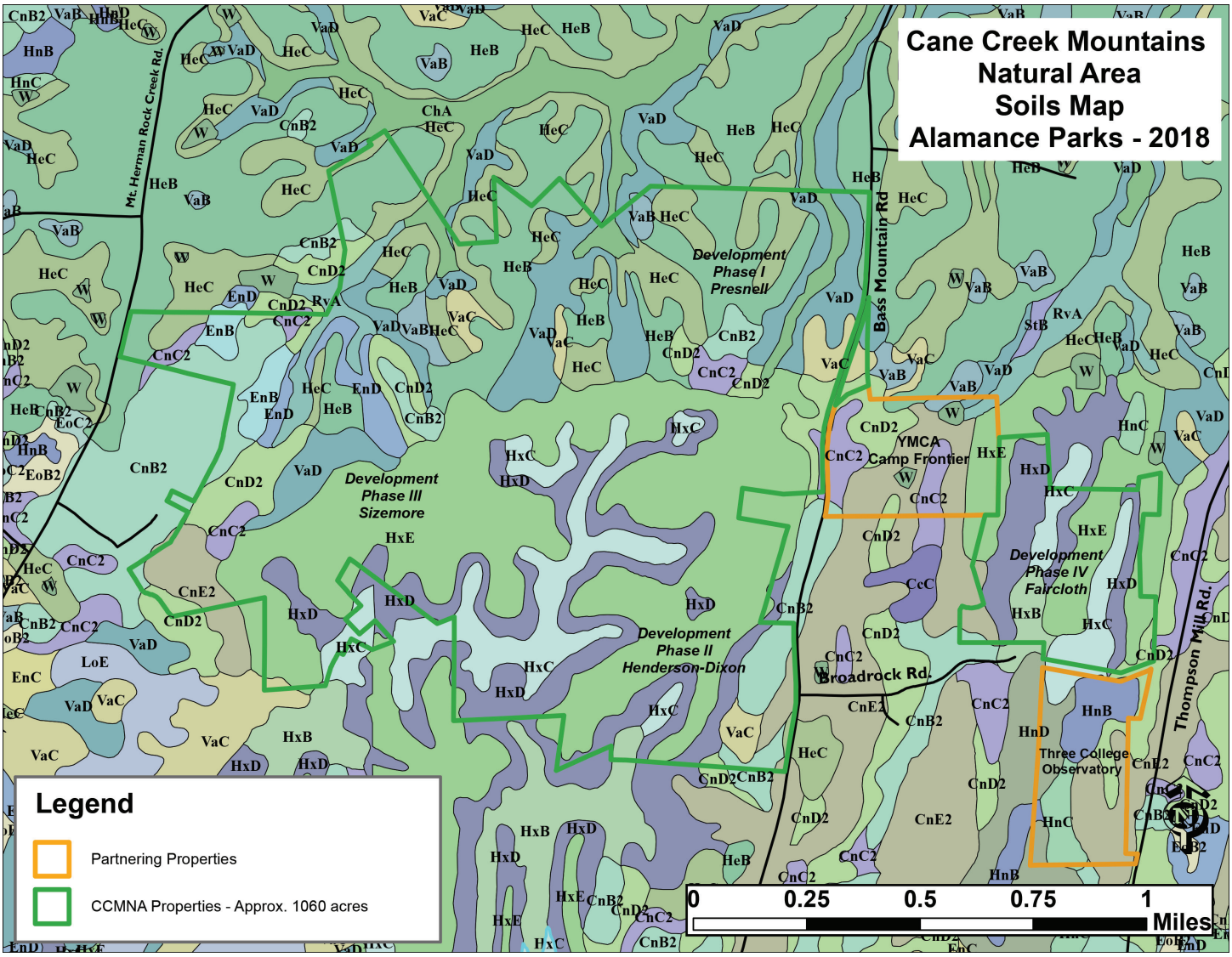
Wetland


Cane Creek Mountains
Natural Area
Wetlands Map
Alamance Parks - 2018
Varnals Creek
Bass Mountain Rd
Mt. Herman Rock Creek Rd.
Development
Phase I
Presnell
Development
Phase III
Sizemore
YMCA
Camp Frontier
Development
Phase IV
Faircloth
Development
Phase II
Henderson-Dixon
Broadrock Rd.
Thompson Mill Rd.
Three College
Observatory
Legend
Wetlands
Partnering Properties
CCMNA Properties - Approx. 1060 acres
0
0.25
0.5
0.75
1
Miles

Natural Heritage



Soils



Soils List:

CnB2	Cullen clay loam, 2 to 6 percent slopes, moderately eroded
CnC2	Cullen clay loam, 6 to 10 percent slopes, moderately eroded
CnD2	Cullen clay loam, 10 to 15 percent slopes, moderately eroded
CnE2	Cullen clay loam, 15 to 45 percent slopes, moderately eroded
EnB	Enon sandy loam, 2 to 6 percent slopes
EnD	Enon sandy loam, 10 to 15 percent slopes
HeB	Helena sandy loam, 2 to 6 percent slopes
HeC	Helena sandy loam, 6 to 10 percent slopes
HnC	Herndon silt loam, 6 to 10 percent slopes
HxB	Herndon silt loam, 2 to 6 percent slopes, bouldery
HxC	Herndon silt loam, 6 to 10 percent slopes, bouldery
HxD	Herndon silt loam, 10 to 15 percent slopes, bouldery
HxE	Herndon silt loam, 15 to 45 percent slopes, bouldery
VaB	Vance sandy loam, 2 to 6 percent slopes
VaC	Vance sandy loam, 6 to 10 percent slopes
VaD	Vance sandy loam, 10 to 15 percent slopes
W	Water

Recreational Needs

Recreation Master Plan

The Alamance County Recreation and Parks Department adopted a Comprehensive Master Plan in 2007 designed to reflect Alamance County's recreational needs and plans to fulfill these needs through the year 2020. Additionally, the Department issued an addendum to this document in 2017 containing key updates to reflect changes over the past ten years, including updates to the Department's organization and mission, county demographics, the Department's structure and facilities, programs, and recreational facilities available in the county as a whole. The 2017 plan addendum also reflected current recreational needs as identified by the community through a recreational needs survey, public meetings, and focus groups. The Recreation Master Plan was also informed by the Alamance County Trails Master Plan which was adopted in 2015 *(See Appendix E for the full Recreation Master Plan document including detailed response data and collection information. See Appendix F for the Alamance County Trails Plan.)*

Community Needs Assessment

A critical component of a recreation master plan is the identification and incorporation of community feedback and needs. The Department took several approaches to acquire updated feedback from the community. To identify the recreation and parks needs of the Alamance County community, the Department administered an online and on paper Recreational Needs Survey in early 2017; held focus groups in early 2017 to identify parks and recreation needs; and incorporated feedback from public meetings held in conjunction with the County's strategic plan meetings which convened throughout 2016.

The following table quantifies a summary of the distribution scheme for the surveys. An "NA" indicates that the number of recipients was unknown (ex. for website distribution and press releases).

Distribution Method	Number of Recipients
Email listservs (non-Departmental)	8,468
Email listservs (ACRPD)	2,456
Cedarock Park Facebook Page	7,791+
Other Social Media (non-ACRPD)	NA
Websites (ACRPD & non-ACRPD)	NA
Press Release (newspaper, TV, radio)	NA
Libraries	250
Schools	4,210
ACRPD facilities	325
ACRPD programs	260
City of Burlington Outdoors programs	60
Locations Around County	175
In Person Distribution	260
Total Surveys Distributed	**24,255+**

Table 1. Recreational needs survey distribution. ACRPD=Alamance County Recreation & Parks Department.

The Department received 1,765 responses to the Alamance County Recreation & Parks Survey (Recreational Needs Survey). Of these responses, 159 came from paper surveys returned to distribution locations or mailed in; 488 came from online responses using the link only available on paper copies of the survey (i.e. the respondent obtained a paper copy then took the survey online); and 1,118 of the responses came from the online link.

See Appendix E for full questions/answer options and complete responses.

Public Meetings

In 2016, County staff held community forums in seventeen locations that involved more than 190 participants from across the County. The forums were designed to gather community input regarding the County's strategic plan, which focuses on all aspects of County services including Recreation & Parks.

Participants were given a guide containing three main questions and seven categories for discussion during the forums. They were then divided into small groups with staff members available to answer questions and were given a specific amount of time to discuss each of the three questions.

See Appendix E for list of meetings held as part of the Recreation Master Plan development process.

Focus Groups

Two focus group sessions were also held to solicit feedback from key organizations involved in health, wellness, and leadership in Alamance County. Focus group participants were asked to each write down three priorities for future recreational facilities, services, and/or programs to be provided by Alamance County Recreation & Parks. The first focus group session was held on March 8, 2017 at a meeting of the Alamance Leadership class, a group of selected community members representing emerging leaders in the County. This focus session had 17 participants. The second focus group session was held on March 16, 2017 at a meeting of the Wellness Collaborative, a community coalition focused on improving health and wellness in Alamance County. This focus session had 27 participants.

These groups' recommendations were collected and compiled, then organized into groups of related themes. There were 73 total responses.

See Appendix E A list of participants and the raw data for responses.

Alamance County Trails Master Plan

In 2015, Alamance County adopted the new Alamance County Trail Plan providing a guideline for future trails and greenways in Alamance County. The Trails Plan outlines all future trails and greenway routes throughout the County. This plan incorporated the feedback of stakeholders and leaders across Alamance County, municipalities, and regional and state organizations to establish a vision and goals for the county. A major long-term goal of the plan is the extension of trail networks and identification and implementation of trail connections throughout the county.

Please refer to the trails plan document for a full report of the planned trails and greenways (Appendix F).

Conclusions

Through development of the Alamance County Comprehensive Recreation Master Plan, informed by public meetings, focus groups and surveys responses we have learned much about the recreational needs of the county. Public support is high for new parks and amenities in our area. The recreational needs survey reveals that the community is eager for the development of trails and natural areas. Over 90% of survey respondents expressed interest in trails and regard the preservation of open space in our community as an area of high importance. Additionally, attendance numbers at parks within our county continue to rise, more than tripling since 2010 and is expected to continue to increase as our county grows. Our community is eager for the development of parks, trails and natural areas. As a result, the Alamance County Comprehensive Recreation Master Plan, updated and re-adopted by the Alamance County Board of Commissioners in 2017, incorporates this public feedback and charges the Department with acquiring natural, passive use parks in the unincorporated areas of Alamance County. Furthermore, the Alamance County Trail Plan, which informs trail development for government and municipalities for the county as a whole, prioritizes the extension of trail networks and trail connectivity throughout the county. As such, the development of Cane Creek Mountains Natural Area as a priority project for Alamance Parks.

Alamance County has a strong network of existing parks and other open spaces but it is not adequate for the rate of growth in our county. Alamance County is an area of steady population growth. As development continues to expand in this area, it is increasingly important that we focus on the preservation of natural resources as well as expansion of access to responsible recreational opportunities in order to balance that growth. The Carolina Population Center projects that Alamance County will experience growth between 12-18% by the year 2020. This is higher than the national average which is estimated to be around 8.3%. (Carolina Population Center, 2015). Additionally, Alamance County is surrounded by counties to the south and east that are in even higher growth projection ranges and we see many visitors to our parks from these counties. Currently no other parks in our area approach the potential size and scope of the proposed Cane Creek Mountains Natural Area. The hiking trails, observation tower, and other amenities of this park will provide the public with the opportunity to observe the unique natural resources present from an unparalleled viewpoint.

Development of the Cane Creek Mountains Natural Area is critical to ensuring we can sufficiently meet the citizens needs for recreational opportunities both now and in the future. As Alamance County continues to grow at a rapid rate and commercial development takes up much of our area real estate, it is increasingly important that as a department, we prioritize the preservation and development of space for public recreational use.

Program Description

Overview

The Cane Creek Mountains Natural Area will be a passive use nature park open to the public year round and managed by Alamance County Recreation and Parks Department staff. The park was conceived from feedback from public surveys, public meetings, and the Trails Master Plan all of which pointed to the need for a large nature park in southern Alamance County. Creation of the park was adopted as a priority in the Alamance Parks Comprehensive Master Plan which was created in 2007 and updated and re-adopted in 2017.

Land Acquisition

Land for the park has been acquired through support from Alamance County, The Clean Water Management Trust Fund, The Conservation Fund, Piedmont Land Conservancy, and private donors. Approximately 622 acres have been acquired at the time of publication. Upon completion, the Cane Creek Mountains Natural Area will total over 1,000 acres. No other parks in the area approach the size and scope of this park

Given the size and situation of the property, this site is ideally suited for use as a passive use natural area with sustainably designed nature trails and other low-impact amenities which showcase the natural beauty and unique environmental resources on the property. Alamance Parks will ultimately develop between 10 and 15 miles of trail network throughout the park including multiple trailhead accesses, with 2-3 of these miles contributing to the Deep River State Trail – N.C. Mountains-to-Sea Trail Connector. Ultimately these trails will connect to nearby trails and parks such as Cedarock Park, YMCA's Camp Frontier, and the Three College Observatory, leveraging the potential for local education opportunities within the park. In addition to trail, the park will feature an observation tower to showcase the exceptional view of the mountain. Other planned park amenities include picnic areas, camping facilities, a wildlife observation platform, creek & wetland interpretation area, historical interpretation area, boardwalk and outdoor classroom.

Development Restrictions

All development activities on the property are subject to restrictive covenants set forth by the Clean Water Management Fund and will comply with appropriate permitting requirements. All trailheads will be situated outside of the 300 foot riparian buffer. All trails will be natural surface, pervious trails, sustainably designed to prevent trail erosion. Trails will have a 50 foot buffer from the creeks. No activities will adversely impact the important environmental resources present on this property.

Park Maintenance & Management

Alamance Parks has the staff, experience, and routine maintenance budget required to maintain the park. Cane Creek Mountains Natural Area will be open to the public on a regular basis and routinely managed and maintained by Parks staff under the supervision of the Department's Trails and Open Space Coordinator.

Site Plans & Physical Needs

Plan Overview

Land acquisition for the Cane Creek Mountains Natural Area is complete (as of January 2021). The combined land tracts total approximately 1,060 acres and together form the park.

Plans for developing the park will be done in a multi-phase approach to align with acquisition time lines and funding sources. Between 10-15 miles of trail network will be developed throughout the park, along with multiple trailhead accesses. In addition, the park will feature amenities such as: an observation tower, picnic access, camping facilities, a wildlife observation platform, creek & wetland interpretation area, historical interpretation area, boardwalk and outdoor classroom.

Site Plans

Phase 1

Phase 1 will include an access road and development of the lower trailhead. This phase will be completed on the Presnell land tract. Funding for this phase has been secured through a 2018 Recreational Trails Program grant.

Phase 2

Phase 2 will include an observation tower, trailhead, hiking trail, trail connection, camping facilities, and a wildlife observation platform. In addition, in this phase, we will improve upon existing picnic areas, and creek exploration and interpretation areas and install a vault restroom facility. The site focus of this phase will be the Presnell and Henderson-Dixon tracts. Funding for phase two was secured with a 2020 Parks and Recreation Trust Fund Grant.

Phase 3

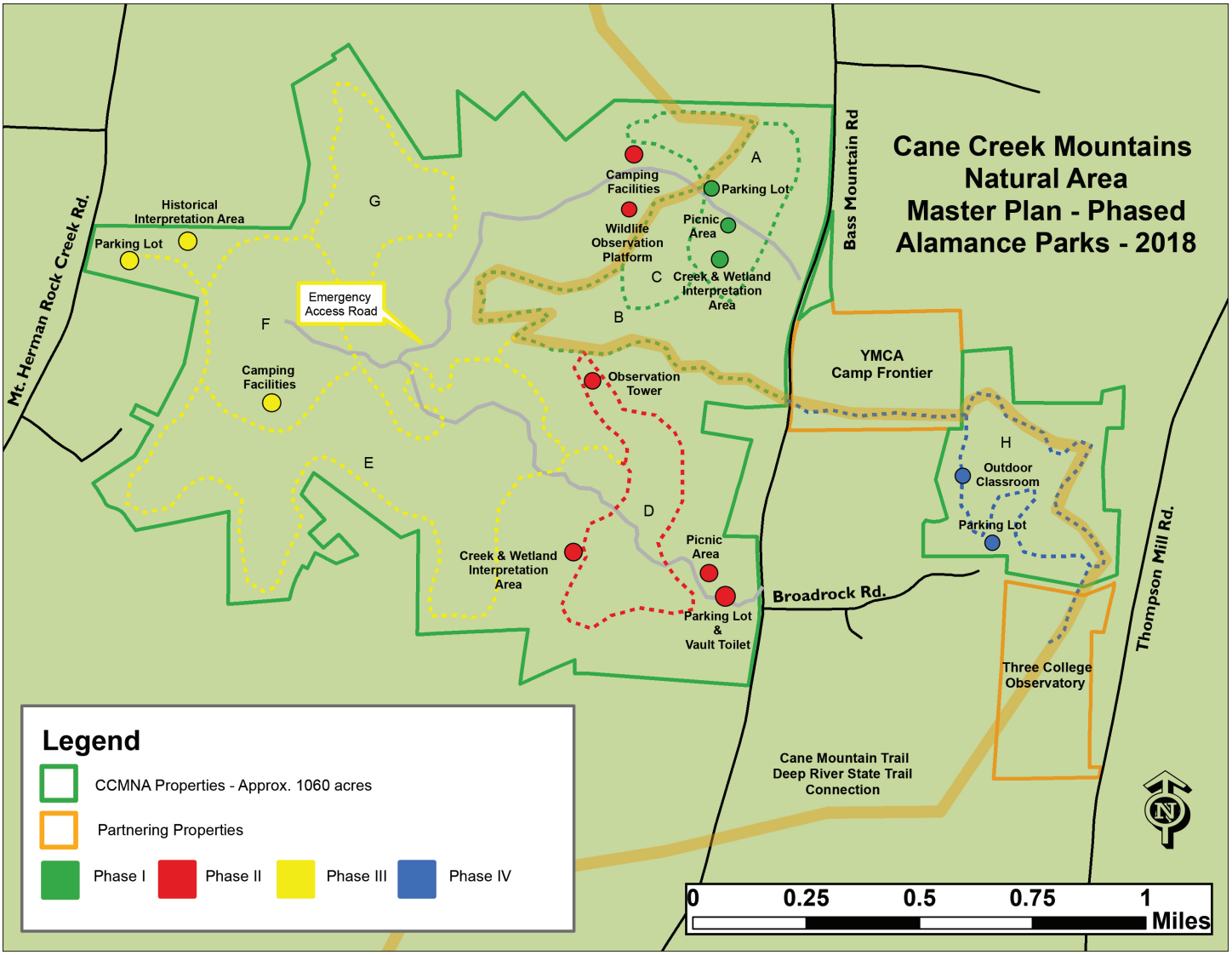
Phase 3 will include construction of additional trailhead, trail, camp sites, bridges, boardwalks, and a historical interpretation area. Additionally, in Phase 3 we will build emergency access roads throughout the park. The site focus of this phase will be the Sizemore tract. Funding for this phase will be sought through state and local grant funds.

Phase 4

Phase 4 will include construction of additional trailhead, trail, camping facilities, and a restroom facility. Additionally, connection with YMCA and Three College Observatory will be completed in this phase as well as an outdoor classroom in conjunction with Three College Observatory. The site focus will be the Faircloth land tract. Funding for this phase will be sought through state and local grant funds in addition to county support.

Comprehensive Site Map

The map below incorporates all development phases.



Trail List

Below is a list of the planned trailheads and trail networks that will make up the Cane Creek Mountains Natural Area.

Table 1:

Table 1. Trail List					
Trail	**Distance**	**Difficulty**	**Width**	**Surface**	**User Group**
A	**1.5 Miles**	**Easy**	**8 ft.**	**Dirt**	**Hiking**
B	**2 Miles**	**Hard**	**3 ft.**	**Dirt**	**Hiking**
C	**.75 Miles**	**Moderate**	**3 ft.**	**Dirt**	**Hiking**
D	**1.75 Miles**	**Moderate**	**8 ft.**	**Dirt**	**Hiking**
E	**4.5 Miles**	**Hard**	**3 ft.**	**Dirt**	**Hiking**
F	**1.5 Miles**	**Easy**	**3 ft.**	**Dirt**	**Hiking**
G	**2.0 Miles**	**Moderate**	**3 ft.**	**Dirt**	**Hiking**
H	**1.5 Miles**	**Moderate**	**3 ft.**	**Dirt**	**Hiking**

Project Costs

Below is a breakdown of project costs for both acquisition and development phases of the project.

Table 2. Acquisition Phases		
Phase/Land Tract	***Valuation***	***Funding Secured***
Phase 1: Faircloth Tract	$ 810,000	Yes
Phase 2: Presnell Tract	$2,050,000	Yes
Phase 3: Henderson-Dixon Tract	$ 640,000	Yes
Phase 4: Sizemore Tract	$1,930,000	Yes

Table 3. Development Phases		
Phase/Land Tract	***Amount***	***Funding Secured***
Phase 1	$100,000	Yes
Phase 2	$470,000	Yes
Phase 3	$375,000	No
Phase 4	$150,000	No

Public Involvement

Overview

The Cane Creek Mountains Natural Area park has been a multi-year project which included the involvement of many citizens and stakeholders in order to help define and shape the vision of the park. Table 4 lists county commission, Recreation & Park Commission, and public meetings held to discuss and plan the project, as well as meetings attended with the goal to seek approval from the appropriate governing bodies to proceed with project steps.

In addition to the list in Table 4, feedback from meetings held as a part of the Alamance County Comprehensive Recreational Master Plan (See Appendix E), as well as the Alamance County Trails Plan (See Appendix F) further informed our planning for this project and identified the Cane Creek Mountains as a desirable site for a trail and open space project.

Table 4. Public Meetings

Date	***Meeting Type***	***Purpose***
1/18/2011	County Commission	Approval to apply for CWMTF grant funding – Faircloth tract
9/16/2014	Recreation & Parks Commission	Approval to accept CWMTF funding & acquire Faircloth property
10/6/2014	County Commission	Approval to accept CWMTF grant funds & acquire Faircloth property
12/16/2014	Recreation & Parks Commission	Adoption of the Alamance County Trail Plan
1/5/2015	County Commission	Adoption of the Alamance County Trail Plan
2/6/2017	County Commission	Approval to accept CWMTF grant funds & acquire Presnell property
4/17/2017	County Commission	Adoption of addendum to Alamance County Comprehensive Recreation Master Plan
9/19/2017	Recreation & Parks Commission	Approval to accept CWMTF grant funds & acquire Henderson-Dixon property
6/18/2018	County Commission	Approval to accept CWMTF grant funds & acquire Henderson-Dixon property
7/19/2018	Public Hearing	Regarding the application for grant funds from the NC RTP for Development of the CCMNA - Phase 1
2/18/2019	County Commission	Approval to accept RTP grant funds and begin CCMNA Development Phase 1

Table 4. Public Meetings		
1/15/2019	Recreation & Parks Commission	Approval to apply for CWMTF grant funding - Sizemore tract
2/18/2019	County Commission	Approval to apply for CWMTF grant funding - Sizemore tract
3/19/2019	Recreation & Parks Commission	Approval to apply for PARTF funding for CCMNA Development Phase 2
3/19/2019	Public Hearing	Regarding the application for grant funds from the PARTF for Development of the CCMNA - Phase 2
4/15/2019	County Commission	Approval to apply for PARTF funding for CCMNA Development Phase 2
4/18/2019	Alamance Wellness Collaborative, Regular Meeting	Presentation regarding the application for grant funds from the PARTF for Development of the CCMNA - Phase 2
4/29/2019	Burlington Rotary Club, Regular Meeting	Presentation regarding the application for grant funds from the PARTF for Development of the CCMNA - Phase 2
5/19/2020	Recreation & Parks Commission	Presentation and Approval to apply for RTP grant funding for Phase 2 Trails

Key:

CWMTF = Clean Water Management Trust Fund

CCMNA = Cane Creek Mountains Natural Area

County Commission = Alamance County Commission Meeting

RTP = Recreational Trails Program

Conclusions

In each of the meetings listed in Table 4, the Cane Creek Mountains Natural Area was included as part of the meeting agenda. The County Commission meetings, Recreation & Parks Commission meetings, and Public Hearings were all open to the general public with advance notification and with opportunity for public comment as is usual for these meetings. The Alamance Wellness Collaborative and Burlington Rotary Club regular meetings were attended specifically by members of these community groups.

In the County Commission and Recreation & Parks Commission meetings we learned that Alamance Parks' governing bodies support the acquisition of grant funds for the purposes of acquiring land and developing the Cane Creek Mountains Natural Area Park. Our requests to apply and accept grant funds were approved in each instance that we sought governing body approval. Furthermore, the Alamance County Commissioners and Recreation & Parks Commission members applaud our vision for addressing the goal identified in the Alamance County Comprehensive Recreation Master Plan to acquire natural, passive use parks in unincorporated areas of Alamance County.

Members of the community have provided valuable input through public hearings and community meetings regarding the project. In the public meeting held on March 19, 2019, we learned from citizens that the Cane Creek Mountains Natural Area will enhance the community's goals of creating additional outdoor space for recreation and play and expanding local trail network. Additionally, participants were supportive of having a new amenity to the area of a high elevation observation tower. One resident noted that the Cane Creek Mountains Natural Area appeals to her because it will provide the community with a unique, large-scale park without having to travel out of the area.

The Alamance Wellness Collaborative voiced their support for the project. One of the Collaborative's main focuses on activity transportation including increasing the trail network throughout the county. They believe the trail network proposed in the Cane Creek Mountains Natural Area aligns with their goals in this area and will be a benefit to the residents of Alamance County by offering an additional resource for physical activity.

The Burlington Rotary Club, comprised of business and community leaders in Alamance County, supports the project. The Cane Creek Mountains Natural Area complements their goal of the betterment of the community resources for the health and prosperity of local citizens.

Through community input, Alamance Parks understands that the community desires and supports trails and open space projects and we are confident that development of the Cane Creek Mountains Natural Area project will meet this community need.

See Appendix G for Public Support Documents.

References

- **Carolina Population Center**

  https://demography.cpc.unc.edu/2015/12/08/population-growth-in-the-carolinas-projected-vs-observed-trends/

- **Site Survey Report — Cane Creek Mountains/Observatory Woods**

  Mike Schafale, April 2016

- **Site Survey Report — Cane Creek Mountains/Observatory Woods - Presnell Tract**

  Mike Schafale, April 2016

- **Site Survey Report — Cane Creek Mountains/Observatory Woods - Henderson-Dixon and Sizemore Tracts**

  Mike Schafale, April 2016

- **Alamance County Natural Heritage Inventory**

  Roy J. Coomans, PhD, July 2002

Appendices

Appendix A: Site Survey Report — Cane Creek Mountains/Observatory Woods

Appendix B: Site Survey Report — Cane Creek Mountains/Observatory Woods - Presnell Tract

Appendix C: Site Survey Report -- Cane Creek Mountains - Henderson-Dixon and Sizemore Tract

Appendix D: Alamance County Natural Heritage Inventory

Appendix E: Alamance County Comprehensive Recreation Master Plan, 2007 & Master Plan 2017 Addendum

Appendix F: Alamance County Trails Plan

Appendix G: Public Support Documents

Appendix A

Site Survey Report — Cane Creek Mountains/Observatory Woods

Appendix B

Site Survey Report — Cane Creek Mountains/Observatory Woods - Presnell Tract

Appendix C

Site Survey Report — Cane Creek Mountains - Henderson Dixon and Sizemore Tracts

Appendix D

Alamance County Natural Heritage Inventory

Appendix E

Alamance County Comprehensive Recreation Master Plan, 2007 & Master Plan 2017 Addendum

Appendix F

Alamance County Trails Plan

Appendix G

Public Support Documents