SITE SURVEY REPORT

SITE NAME: Dry Creek/Mount Moriah Bottomland – Eastowne tract

DATES VISITED: August 7, 2019

INVESTIGATORS: Mike Schafale, with Allison Weakley (Town of Chapel Hill) and Jennifer Burdette (McAdams Company).

REPORT AUTHOR: Mike Schafale
DATE OF REPORT: August 2019

BACKGROUND INFORMATION/PURPOSE OF VISIT: The Eastowne tract was visited at the request of the Town of Chapel Hill, because the tract was part of a natural area previously identified by NHP. The tract is part of a larger master planning effort that includes adjacent developed areas, and is the subject of a Development Agreement being negotiated between the town and the landowner.

The area of the Eastowne tract was first identified in the Orange County Natural Areas inventory under the name of Cedar Terrace Bottoms. The report emphasized the floodplain communities but included the upland area in the natural area boundary. Cedar Terrace Bottoms was later combined with the adjacent Mount Moriah Bottomlands natural area recognized in the Durham County Natural Areas Inventory.

OWNER: Health Systems Properties, LLC
OWNER CONTACT + NOTES: The owner was contacted by the McAdams Company for permission to survey the tract, prompted by a request from the Town of Chapel Hill... Permission for the survey was given by Simon George of UNC Health Care Real Estate and Development (email July 25 to Bill Derks).

COUNTY: Orange **QUAD:** Chapel Hill

LOCATION / ACCESS: The Eastowne tract is located on the northeastern edge of Chapel Hill, on the west side of I-40 and north of US 15-501 and its service road. Eastowne Drive runs along the west side of the tract. Providence Road is just west of the tract.

GENERAL DESCRIPTION: The Eastowne tract consists primarily of upland slopes, broad ridges, and a gentle knoll. A substantial stream valley with an intermittent to perennial stream and several ephemeral stream courses dissect the area. The north edge of the tract extends to the larger floodplain of Dry Creek. The site occurs within the Durham Triassic basin geological region but is unusual in having substantial relief rather than the subdued topography more typical of that region. In addition to sandstone substrate, diabase dikes are present, which produce soils with higher pH and higher base saturation than is typical in most of the Piedmont. The predominant natural community of the site is Dry-Mesic Basic Oak—Hickory Forest. Small areas of Basic Mesic Forest, Piedmont Headwater Stream Forest, Piedmont Alluvial Forest, and

Piedmont Swamp Forest are present. All of these forest communities are unusually mature, with large old trees.

SIGNIFICANCE OF SITE: The overall Dry Creek/Mount Moriah Bottomland natural area is currently rated at Moderate significance (R5 C4). Besides its natural community occurrences, it is an important landscape linkage. It provides biological connection for wildlife movement between the extensive conservation lands around Jordan Lake and those of Duke Forest upstream, with a partial connection to the Eno River basin. In the heavily urbanized areas of Chapel Hill and Durham, this natural area is the last such link remaining. The Eastowne tract is not in the direct line of the landscape connection. It contains a small portion of the floodplain communities but is particularly notable in being one of the few parts of the site with significant intact mature upland hardwood communities to complement the floodplains. Uplands around most of the site have been developed or have successional vegetation. The communities are unusual in having base-rich soils, because of one or more dikes of diabase underlying the area.

SPECIAL STATUS SPECIES: None noted. Gray petaltail dragonfly (*Tachopteryx thoreyi*), reported in the earlier survey, is no longer tracked as a rare species but is uncommon. It likely is still present.

POTENTIAL FOR OTHER SPECIAL STATUS SPECIES: Low, but *Enemion biternatum* or other plants of base-rich soils but not visible in late summer could possibly be present,

OTHER NOTEWORTHY SPECIES AND FEATURES:

SIZE: The Eastowne tract is 20.5 acres. The overall Dry Creek/Mount Moriah Bottomland natural area is approximately 485 acres.

ELEVATION: 265-335 feet.

TOPOGRAPHY: Upland slopes and broad ridges, dissected by several small drainages. The north end of the tract is in the wide floodplain of Dry Creek.

HYDROLOGY AND MOISTURE: Most of the acreage is dry-mesic uplands and slopes. The lower parts of the stream valley and the larger Dry Creek floodplain probably are flooded most years. The mapped 100 year floodplain extends up the lower slopes around them.

PRESENCE OF STREAMS AND SEEPS: One perennial stream is present, along the west side of the tract. A stream determination by Allison Weakley also identified intermittent and ephemeral streams in the smaller drainages.

GEOLOGY: The area lies in the Durham Triassic basin, and is underlain by Triassic sandstone. One or more diabase dikes are present within the tract. Outcrops of both diabase and sandstone were seen in the bed of the creek, and diabase float was also seen on the east side of the tract. Though the substrate is a mix of lithology, the vegetation suggests influence of mafic or calcareous rock throughout the tract.

SOIL: White Store (Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs) is mapped over most of the tract.
Goldston (Loamy-skeletal, siliceous, semiactive, thermic, shallow Typic Dystrudepts) is mapped on the steeper slopes along the drainages. Small areas of alluvial soil are not mapped.

Chewacla (Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts) is present on the larger floodplain to the north and probably occurs as inclusions in the stream valley in the tract.

COMMENTS ON PHYSICAL DESCRIPTION: The site is unusual in having more relief than is typical for Triassic basin sites.

NATURAL COMMUNITY DESCRIPTION
Dry-Mesic Basic Oak—Hickory Forest (Piedmont Subtype): Upland slopes and ridges, occupying most of the tract. The canopy is dominated by Quercus alba and Quercus rubra, with frequent associates being Fraxinus americana, Fraxinus biltmoreana, Carya glabra, and Carya tomentosa. A few Pinus echinata are present. The understory includes Acer floridanum, Acer leucoderme, Cornus florida, Prunus serotina, Cercis canadensis, and a few Carpinus caroliniana. An open shrub layer includes abundant Viburnum rafinesqueanum, Viburnum prunifolium, Viburnum acerifolium, and patches with some Vaccinium pallidum and Vaccinium tenellum. A few Lindera benzoin were present in the upland, as well as small Crataegus sp., Diospyros virginiana, and a few other species. The herb layer is typically low in density, but includes multiple species indicative of base-rich soil, such as Dichanthelium boscii, Elymus virginicus, Phryma leptostachya, and Sanicula sp., as well as widespread upland species such as Tipularia discolor, Hexastylis arifolia, and Galium circaezans. A little Scleria oligantha and Piptochaetium avenaceum were seen. This forest is quite mature. Canopy trees average over 12” dbh and trees 16” are common. A few as large as 24” dbh were seen. The Natural Resources report by McAdams Company reports checking of aerial photos back to 1938 which suggest more than 80 years without disturbance over most of the area, and reports trees exceeding 30” dbh.

Basic Mesic Forest (Piedmont Subtype): Occurs on more sheltered slopes. The only extensive patch is on the east side of the tract, along a ravine. It is too small in extent to be highly significant by itself. The canopy is dominated by Fagus grandifolia. Fraxinus americana, Quercus rubra, Acer floridanum, and one large Liquidambar styraciflua also occur. The understory consists the same species, but a few Carpinus caroliniana are present. There is almost no shrub layer, but a few Aesculus sylvatica are present. Herbs are sparse, except for some beds of Polystichum acrostichoides. Despite the base-rich soil conditions indicated by the presence of Fraxinus and abundance of Acer floridanum, only a few herbs indicative of these conditions (e.g. Elymus virginicus) were seen. This may be due to the late season or to the small extent of the community. This forest is quite mature, with canopy trees averaging 16” dbh.

Piedmont Headwater Stream Forest: Small areas of this community occur along the upstream part of the main creek on the tract as well as in narrow bands along several ephemeral tributaries. The canopy is dominated Liriodendron tulipifera and has a typical mix of floodplain and upland species, including Liquidambar styraciflua, Ulmus americana, and Quercus alba. The understory includes Carpinus caroliniana as well as canopy species. Shrubs are sparse. Herbs generally are low in density and are a mix of species, including Polystichum acrostichoides, Dichanthelium

boscii, Prunella vulgaris, Viola sp., Iris cristata, Nabalus sp., and Agrimonia sp. Microstegium vimineum is present but not extensive. This forest is comparable in maturity to the upland forests.

Piedmont Alluvial Forest: Allluvial Forest occurs along the downstream part of the primary stream on the tract, where alluvial soils are better developed and the floodplains are wider. As is characteristic, the canopy is dominated by Liquidambar styraciflua. Other species include Liriodendron tulipifera, Acer floridanum, Quercus alba, and Platanus occidentalis. The understory is dominated by Carpinus caroliniana, but includes some Asimina triloba and Ulmus rubra, as well as canopy species. Lindera benzoin is the dominant shrub. Notable were a number of Styrax grandifolius on the edge of the floodplain. Rosa multiflora is frequent but no large individuals were seen. The herb layer is dense in much of the community. Microstegium vimineum dominates some large patches. A variety of native species are present, including Elymus virginicus, Leersia virginica, Agrostis sp., Rudbeckia laciniata, Sanicula sp., and Viola sp. Spring ephemeral species may also be present but were not visible at this season. The Piedmont Alluvial Forest is quite mature, with many trees 16-20" dbh.

Piedmont Swamp Forest: Present in the floodplain of Dry Creek, at the northern edge of the tract. The canopy is dominated bv Liquidambar styraciflua and Fraxinus pennsylvanica, with some Ulmus americana and Platanus occidentalis. The understory is dominated by Carpinus caroliniana, and some Asimina triloba is present. Shrubs are largely absent, though some large vines are present. The herb layer is dense. Patches are dominated by Saururus cernuus, Impatiens capensis, Microstegium vimineum, or by a mix that includes Agrostis sp., Boehmeria cylindrica, Lycopus sp., Persicaria sp., and other species. The swamp forest is quite mature at its southern end, on the Eastowne tract, with canopy trees averaging 16" dbh. The more extensive floodplain north of that is younger, with canopy trees averaging 8" dbh.

OTHER COMMUNITIES PRESENT:
Two patches of successional pine communities are present on the tract, as well as a small grove on the western periphery. These patches my represent long-abandoned fields, but one is on a fairly substantial slope. The disturbance was many decades ago, and the trees are large – most 12-16" dbh. Notably, Pinus echinata appears to be more abundant than Pinus taeda. There has been much recent concern about declines in Pinus echinata populations. Unlikely Pinus taeda, the species was naturally abundant in oak forests. It once was a predominant invader of abandoned clearings, but has been supplanted by Pinus taeda in more recent decades.

ANIMAL HABITAT COMPONENTS
POOLS AND SEEPS : Small seeps are present.
ROCK DENNING SITES: None noted.
BIG TREES/LARGE CAVITIES: Trees up to 20-24" dbh are present.
SNAGS AND LOGS: Moderate numbers, including some recently fallen trees.

AQUATIC HABITAT FACTORS
The channel of Dry Creek here is about 4 feet wide, with banks 2-3 feet high and a muddy bed. The water appeared fairly muddy at this time. The primary stream within the tract is perennial

along most of its length, intermittent at the upstream end. Its lower reach flows through a broad floodplain to the confluence with Dry Creek. Its bed is predominantly sand, and there are a couple of small rock outcrops along it. The downstream part of it has a braided series of flow paths rather than a single channel.

SITE INTEGRITY

LAND USE IMPACTS: Two old roadbeds cross the tract, running along each side of the primary stream. One especially is much larger than a typical logging road; it is graded as wide as a typical two-lane road. Though no remnants of pavement were seen, this could have been an important road before the construction of US 15-501. Where it crosses the primary stream, just upstream from its confluence with Dry Creek, there is fill some 10 feet deep. The fill has been breached, with a steep-sided gully cut through it down to stream level around the remnants of a culvert.

The successional pine stands suggest small fields or other clearings in the past. The forest presumably was logged in the past as well, though possibly only for local use by the landowner. All such activities were many decades in the past, and the forest is comparable to the most mature forests in the Piedmont.

One of the sandstone outcrops near the stream appeared to have been quarried or blasted. Drill holes were visible on the edge of the rock. The outcrop is small and is not along the road bed, so it is unclear why this would have been done.

EXOTIC/WEEDY SPECIES: Exotic plants are widely distributed in the tract but are not dense in most places. Microstegium vimineum dominates some patches in the Piedmont Swamp Forest and Piedmont Alluvial Forest. It is present less extensively in the Piedmont Headwater Stream Forest and a few patches occur even in the upland forests.

Rosa multiflora is frequent in the Piedmont Alluvial Forest and present in the Piedmont Headwater Stream Forest, on the roadbed, and scattered elsewhere, but no large plants or thickets were seen.

One small Nandina domestica bush was seen in the upland.

Glechoma hederacea, common in floodplains, was not noted, and Lonicera japonica is either minor or absent.

Stellaria media is not visible at this time of year, and may or may not be present in the floodplains.

DIRECT HUMAN INTRUSION: Probably low. However, remnants of a tent were found, which Allison Weakley reported was occupied by a homeless person earlier in the year. She also reported a separate camp of homeless people on the I-40 right-of-way near the tract. Both were abandoned at the time of this visit.

DISTURBANCE SENSITIVE SPECIES: None noted.

FIRE REGIME: No sign of fire. The oak forests would naturally burn, and if it were possible to conduct, prescribed burning would be beneficial.

ADJACENT LAND USE/OFFSITE STRESSES: The tract is closely surrounded by developed areas on most sides. Wide busy highways mark two boundaries, while a street borders a third. Large buildings and parking lots border part of it. Stresses from adjacent areas presumably are typical: altered stream hydrology, sediment and chemicals in runoff, penetration of light and weeds along the forest edges, and increased populations of animals associated with forest edges. One stress of adjacent developed areas, domestic pets, may not be present since the surrounding area is not residential, but feral animals are still likely.

RELATION/CONNECTION TO OTHER SITES AND HABITAT PATCHES: The Eastowne tract is connected to the Dry Creek floodplain and, through it, to the rest of the Dry Creek/Mount Moriah Bottomland natural area, the New Hope Creek corridor, Duke Forest, and Jordan Lake. The adjacent lands along Dry Creek are owned by the Town of Chapel Hill and portions are under conservation easement with Clean Water Management Trust Fund.

DEGREE OF THREAT/POTENTIAL FOR CHANGE: Very high. UNC Health Systems is in a negotiated master plan and development agreement process that involves this tract as well as adjacent tracts.

BOUNDARY EXPLANTATION/JUSTIFICATION: No changes have been made in the natural area boundary. It is marked by roads and developed areas. Most of it is the mature forest communities. Small areas of successional forest are included for site continuity.

RECOMMENDATIONS FOR PROTECTION: This tract is worthy of protection in its natural condition, through whatever means are feasible. The tract adjoins conservation lands owned by the Town of Chapel Hill and is connected through them to Durham County lands and to a larger network of conservation lands.

MANAGEMENT RECOMMENDATIONS AND RESTORATION NEEDS: The only significant management need is control of the exotic plants.

NEED FOR FURTHER STUDY: Low. A spring visit likely would find many additional plant species.

REFERENCES:

McAdams Company. 2019. Natural Resources Report and Preliminary Assessment, UNC HCS – Eastowne Campus. EMA-17000.

Sather, D., and S.P. Hall. 1988. Inventory of Natural Areas and Wildlife Habitats for Orange County, North Carolina. Orange County Environment and Resources Conservation Department and North Carolina Natural Heritage Program. Updated by Bruce Sorrie and Rich Shaw 2004.

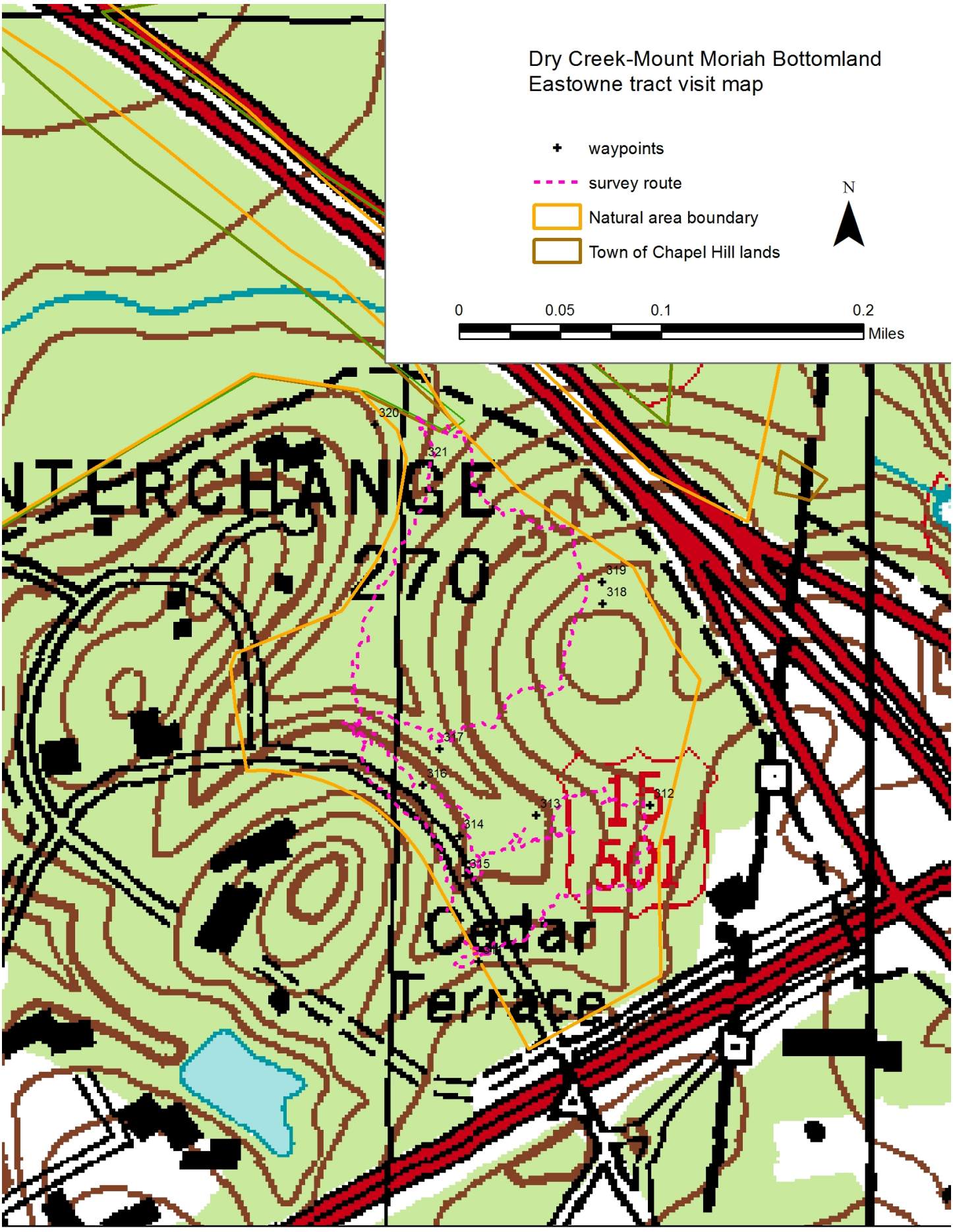
Weakley, A.S. 2019. Stream determination site visit results, May 1, 2019.

PLANT SPECIES OBSERVED:
THOROUGHNESS OF LIST: (moderate)
O = Dry-Mesic Basic Oak—Hickory Forest
M = Basic Mesic Forest
H = Piedmont Headwater Stream Forest
A = Piedmont Alluvial Forest
S = Piedmont Swamp Forest

canopy		
Acer floridanum	M, H, A	c
Carya glabra	O	c
Carya tomentosa	O	c
Fagus grandifolia	M	c
Fraxinus americana	O, M	c
Fraxinus biltmoreana	O	c
Fraxinus pennsylvanica	S	c
Liquidambar styraciflua	A, S, H, M	c
Liriodendron tulipifera	H, A	c
Pinus echinata	succ, O	c
Pinus taeda	succ	c
Platanus occidentalis	A, S, H	c
Quercus alba	O, H, A	c
Quercus rubra	O, M	c
Ulmus americana	A, S, H	c
Understory		
Acer floridanum	O	u
Acer leucoderme	O	u
Acer rubrum	O	u
Amelanchier arborea	O	u
Asimina triloba	A, S	u
Carpinus caroliniana	A, S, H, O, M	u
Carya ovata	O	u
Cercis canadensis	O	u
Cornus florida	O	u
Juniperus virginiana	O	u
Prunus serotina	O	u
Quercus falcata	O	u
Ulmus rubra	A	u
shrubs		

Aesculus sylvatica	M	s
Crataegus sp.	O	s
Diospyros virginiana	O	s
Ilex decidua	O	s
Lindera benzoin	A, O	s
Nandina domestica	O	s
Rosa multiflora	A	s
Styrax grandiflora	A	s
Vaccinium pallidum	O	s
Vaccinium tenellum	O	s
Viburnum acerifolium	O	s
Viburnum prunifolium	O, H	s
Viburnum rafinesqueanum	O, M	s
vines		
Campsis radicans	H	v
Lonicera sempervirens	O	v
Muscadinia rotundifolia	H, A, S, O, M	v
Parthinocissus quinquefolius	O	v
Smilax rotundifolia	O	v
Thyrsanthella difforme	A	v
Toxicodendron radicans	S	v
herbs		
Agromonia pubescens?	H	h
Agrostis sp.	S, A	h
Asclepias sp.	H	h
Boehmeria cylindrica	S	h
Carex spp.	A, M	h
Carex typhina?	S	h
Clitoria mariana	succ	h
Coreopsis verticillata	O	h
Dichanthelium boscii	O, H	h
Dichanthelium sp.	S	h
Dioscorea villosa	O	h
Elephantopus nudatus	H	h
Elymus virginicus	H, A, O, M	h
Euphorbia pubentissima	O	h
Galium circaezans	O	h
Hexastylis arifolia	O	h
Hexastylis virginica	M	h
Impatiens capensis	S	h
Iris cristata	H	h
Leersia virginica	A	h
Ligusticum canadense	S	h
Lycopus sp.	S	h

Maianthemum canadense	O, H	h
Microstegium vimineum	S, A, H, O	h
Nabalus sp.	H	h
Persicaria sp.	S	h
Persicaria virginiana	S	h
Phryma leptostachya	A, O	h
Piptochaetium avenaceum	O	h
Polystichum acrostichoides	M, H	h
Prunella vulgaris	A, H	h
Rudbeckia laciniata	A	h
Ruellia caroliniana	H	h
Sanicula sp.	S, A, O	h
Saururus cernuus	S	h
Scleria oligantha	O	h
Tipularia discolor	O	h
Uvularia perfoliata	O	h
Viola sp.	O, M, H, A	h


Dry Creek-Mount Moriah Bottomland
Eastowne tract visit map
waypoints
survey route
Natural area boundary
Town of Chapel Hill lands
N
0
0.05
0.1
0.2
Miles
320
321
319
318
317
316
315
314
313
312
15
501
Cedar
Terrace