

MEMORANDUM

To: Mr. Lee Bowman
Beechwood Carolinas

From: Emma Radford, ISA Certified Arborist (SO-10804A)
Kimley-Horn

Date: July 19, 2022

Subject: South Creek Project - Summary of Findings Relating to Arborist Services

Background

The South Creek Site ("Site") is a 45-acre plot that is generally located south of the Town of Chapel Hill in Orange County, NC. The Site is situated east of US Highway 15-501 and west of Obey Creek, with undeveloped forestland and single-family, multi-family, and commercial developments located within the vicinity of the Site.

In 2014, a previous developer contracted Biohabitats, Inc. to conduct an ecological assessment of the Site. Biohabitats, Inc. summarized their findings in the "Ecological Analysis and Comparison of Two Proposed Obey Creek Development Concepts" report on September 17, 2014 and submitted it to the Town of Chapel Hill for review. Since then, the Site has continued to progress towards development and the Town of Chapel Hill planning staff have requested an update of the general canopy characteristics within the Site.

Based on the Town's request, an International Society of Arboriculture (ISA) Certified Arborist with Kimley-Horn conducted a field visit of eight 0.1-acre sample plots within the differing canopy types of the greater 45-acre Site on June 28, 2022. Kimley-Horn identified and GPS-located representative trees and documented the average characteristics of tree stands throughout the Site based on the sample plot locations. Data collected included DBH, species, and general health conditions of trees within each sample plot. Trees observed that are non-native invasive species were not documented as representative trees. The following memorandum outlines the findings of the field visit.

General Observations

The Site is primarily comprised of undeveloped forestland with a perennial stream running along the eastern boundary. The northern portion of the Site is transected by a gravel road and overhead powerlines with an associated easement running perpendicular to the Site. Additionally, a church building and associated parking lot are located in the northern portion of the Site along US Highway 15-501. Multiple abandoned homesites were observed throughout the eastern portion of the Site during the field visit.

Sample plot locations were chosen prior to the field visit based on canopy differences observed on the most recent aerial imagery available. Generally, the Site primarily consists of four canopy types of differing ages:

- **Canopy Type 1 (Areas 1 and 8)**
 - Natural area of native, mature hardwoods along Obey Creek, with undergrowth consisting of a variety of understory trees such as umbrella magnolia (*Magnolia tripetala*), with herbaceous species and ferns such as cinnamon fern (*Osmunda cinnamomea*) and Christmas fern (*Polystichum acrostichoides*). Area 1 is located along the floodplain within the riparian buffer zone of Obey Creek and primarily consists of tulip poplar (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*). Area 8 is also located within the riparian buffer zone of Obey Creek along a steep hillslope and primarily consists of various oak and hickory species (*Quercus* sp.

and *Carya sp.*). These areas were generally healthy, with evidence of some invasive growth throughout (*Eleagnus umbellata* and *Ligustrum sinense*).

- **Canopy Type 2 (Areas 2 and 3)**
 - Natural area with mature hardwoods and softwoods, with undergrowth consisting of a variety of young saplings and woody vines. Areas 2 and 3 are located along terraces within the central portion of the Site and are lacking an herbaceous layer. Area 2 primarily consists of tulip poplar (*Liriodendron tulipifera*) and loblolly pine (*Pinus taeda*). Evidence of some invasive growth was observed within Area 2 (*Eleagnus umbellata* and *Ligustrum sinense*). Area 3 primarily consists of mature tulip poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), and loblolly pine (*Pinus taeda*), with understory growth of young flowering dogwood (*Cornus florida*) and sapling oak species (*Quercus sp.*). These areas are generally healthy.
- **Canopy Type 3 (Areas 5 and 6)**
 - Natural area of native, immature hardwoods and softwoods with undergrowth consisting of a variety of young saplings and woody vines. Areas 5 and 6 are located along slight hillslopes within the central portion of the Site and are lacking an herbaceous layer. Areas 5 and 6 primarily consist of immature loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*), with the understory growth of young black cherry (*Prunus serrotina*) and sourwood (*Oxydendrum arboretum*). These areas are generally healthy.
- **Canopy Type 4 (Areas 4 and 7)**
 - Natural area of native, mature hardwoods with undergrowth consisting of a variety of young saplings and woody vines. Areas 4 and 7 are located along slight hillslopes within the central and southern portions of the Site. Area 4 primarily consists of tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and sourwood (*Oxydendrum arboretum*), with scattered southern red oak (*Quercus falcata*) observed. Area 7 primarily consists of similar species, with red mulberry (*Morus rubra*) also present as a dominant species. Evidence of some invasive growth was observed within Area 7 (*Eleagnus umbellata* and *Ligustrum sinense*). These areas are generally healthy.

Conclusions

Overall, the Site has remained consistent with the original forest characteristic documentations completed by Biohabitats, Inc. in 2014. No significant tree stands were observed during the field visit. Refer to EXHIBIT A for locations of sample plots and approximate locations of tree data points collected during the field visit.

Two areas of concern located in the central portion of the Site were found to primarily consist of wisteria (*Wisteria floribunda*) and bamboo (*Phyllostachys aurea*). These are considered non-native, invasive species dominating portions of the landscape. The majority of native vegetation in these areas has been outcompeted to the point of severe stress or canopy death. Refer to EXHIBIT B for examples of these unhealthy areas.

Supporting Documentation

Exhibit A – SAMPLE PLOT AREAS MAP
Exhibit B – SITE PHOTOS

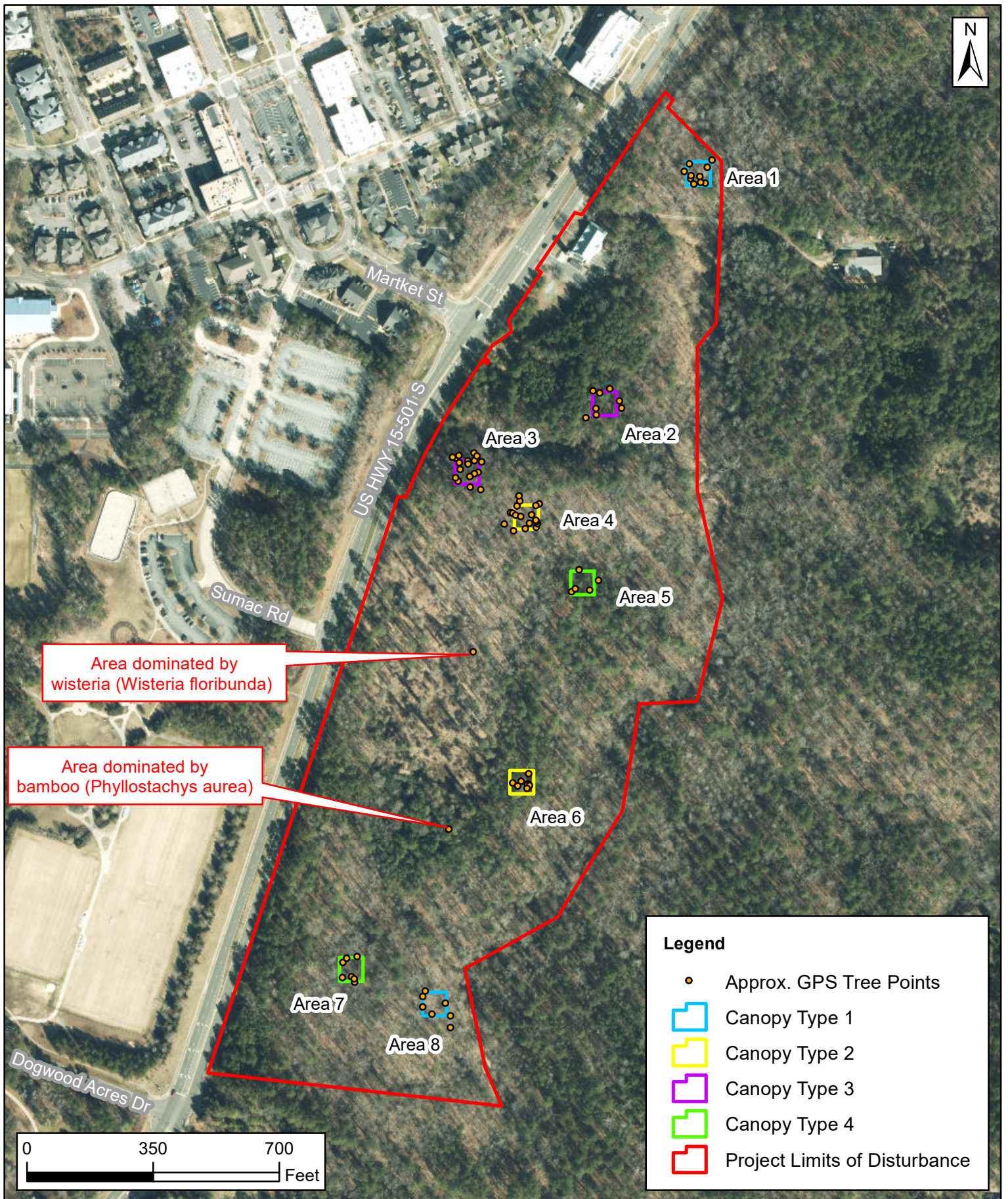


Figure 1: Sample Plot Areas
 South Creek Site
 Chapel Hill, Orange County, NC
 July 2022

EXHIBIT B – SITE PHOTOS



Photo 1 – Typical view of Area 1 located along the floodplain of Obey Creek within the northern portion of the Site. Understory species such as umbrella magnolia (*Magnolia tripetala*) were observed in Area 1.

Photo 2 – Typical view of general tree density within Area 1 located along the floodplain of Obey Creek within the northern portion of the Site.



Photo 3 – Typical photo of herbaceous layer, primarily cinnamon fern (*Osmunda cinnamomea*) and Christmas fern (*Polystichum acrostichoides*), observed in Area 1.

Photo 4 – Typical view of canopy coverage within Area 1.



Photo 5 – Typical view of Area 2 located along a terrace within the northern portion of the Site.



Photo 6 – Typical view of general tree density within Area 2.



Photo 7 – Typical view of herbaceous coverage along a terrace within Area 2.



Photo 8 – Evidence of invasive growth throughout (*Eleagnus umbellata* and *Ligustrum sinense*) was observed within Area 2.



Photo 9 – Typical view of sapling coverage within Area 3.



Photo 10 – Typical view of Area 3 located along a slight hillslope within the central portion of the Site.

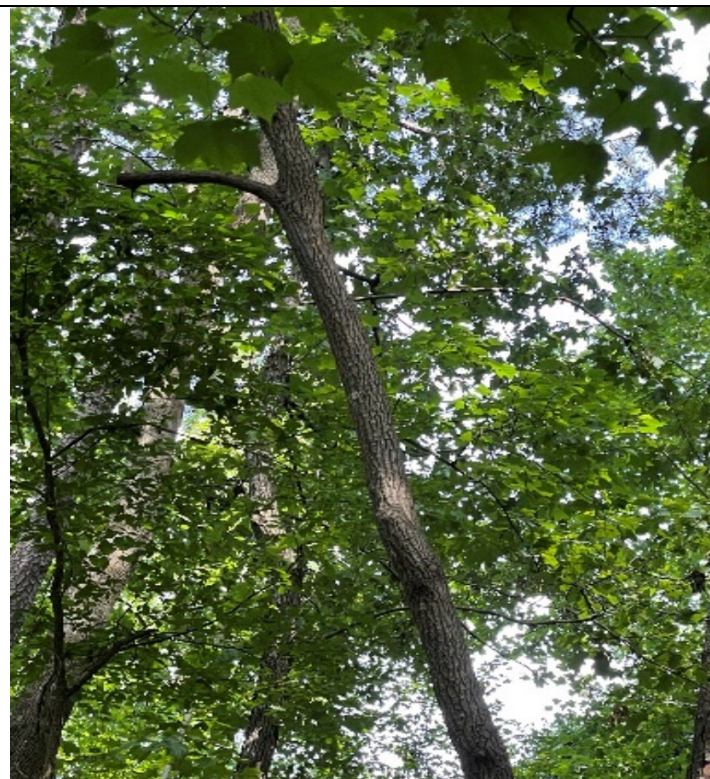


Photo 11 – Typical view of canopy coverage within Area 3.



Photo 12 – Typical view of general tree density within Area 3 located along a slight hillslope within the central portion of the Site.



Photo 13 – Typical view of forest floor within Area 4. No herbaceous vegetation was observed in this area.



Photo 14 – Typical view of Area 4 located along a slight hillslope within the central portion of the Site.



Photo 15 – Typical view of general tree density within Area 4 located along a slight hillslope within the central portion of the Site.

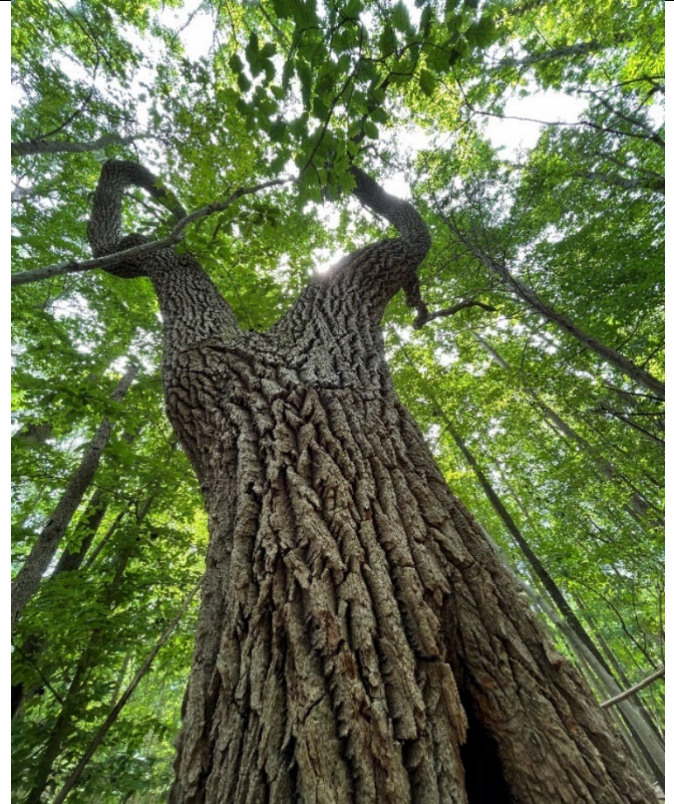


Photo 16 – Typical view of canopy coverage within Area 4. This photo depicts a large sourwood observed within this area.



Photo 17 – Typical view of Area 5 located along a slight hillslope within the central portion of the Site.



Photo 18 – Typical view of general tree density within Area 5. Area 5 primarily consists of immature loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*).



Photo 19 – Typical view of sapling and woody vine coverage within Area 5.



Photo 20 – Typical view of canopy coverage within Area 5.



Photo 21 – Typical view of Area 6 located along a slight hillslope within the central portion of the Site.



Photo 22 – Typical view of sapling coverage within Area 6.



Photo 23 – Typical view of general tree density within Area 6 located along a slight hillslope within the central portion of the Site.



Photo 24 – Typical view of canopy coverage within Area 6.



Photo 25 – Typical view of Area 7 located along a slight hillslope within the southern portion of the Site.



Photo 26 – Typical view of general tree density within Area 7 located along a slight hillslope within the southern portion of the Site.



Photo 27 – Typical view of forested herbaceous cover within Area 7.



Photo 28 – Typical view of canopy coverage within Area 7.



Photo 29 – Typical view of Area 8 located along a steep hillslope within the riparian buffer of Obey Creek.



Photo 30 – Typical view of forested herbaceous cover within Area 8.



Photo 31 – Typical view of general tree density within Area 8 located along a steep hillslope within the riparian buffer of Obey Creek.

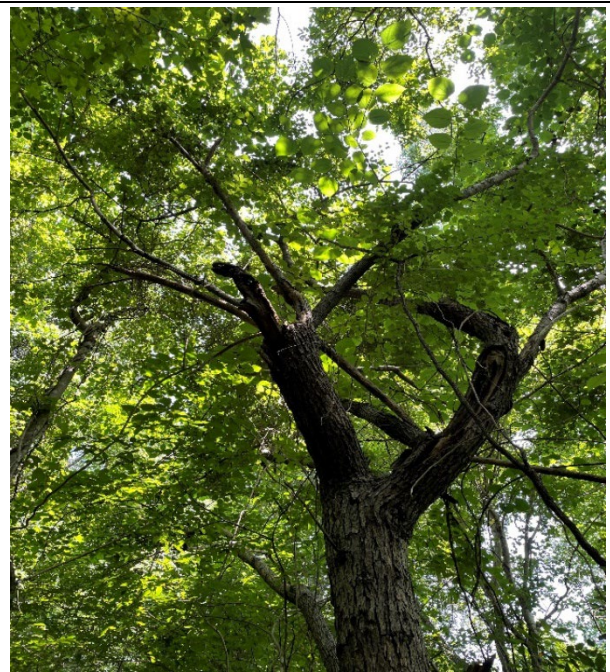


Photo 32 – Typical view of canopy coverage within Area 8.



Photo 33 – Typical view of overgrowth of Japanese wisteria (*Wisteria floribunda*), an invasive species, within the Site.



Photo 34 – Typical view of overgrowth of Japanese wisteria (*Wisteria floribunda*), an invasive species, facing east into the Site along US Highway 15-501 S.