NEON Site-Level Plot Summary
Talladega National Forest (TALL)

Document Information

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Site Background

The Talladega NEON Site is approximately 25 miles southeast of Tuscaloosa, AL in the southern district of the Talladega National Forest. The site is on the western edge of Bibb County, AL and resides within the Southern Coastal Plains (MLRA 133A), Major Land Resource Area. The site consists of 12,951 acres on dissected uplands within the South Sandy Creek watershed.

Site Information

The site elevation ranges from approximately 175 to 600 feet above sea mean level.

The soil parent materials at the Talladega site consist of undifferentiated marine sediments of the Cretaceous age Tuscaloosa Group. The soils are dominantly varicolored sandy, loamy, and clayey developed from the marine sediments. Some soils may have local, thin beds of indurated ironstone. The Soil Series mapped in the marine sediments include Boswell, Boykin, Colwell, Conecuh, Luverne, Maubila, Smithdale, Wadley, and Wilcox. The key soil landforms on site are ridgetops, shoulder slopes, backslopes footslopes, toeslopes, narrow drainageways, and seeps within the steep and very steep, dissected hills, and floodplains.

Land use on site is mainly forest land. A few open wildlife plantings occur within the site, as well as some natural wetland areas.

Plant communities were dominated by conifers, with some minor areas of intermixed conifer and hardwood, and bottomland hardwood forest. Longleaf and Loblolly pine are the dominant overstory plant with mixed species of oak in the understory.

Plot Analysis for Sampling

The NEON distributed plots are situated across several slope positions across the dissected hillslopes. We selected plots for sampling based on elevation, physiography, vegetative communities, and soil map units. Soils on site encompass 11 different soil map units but the plots occurred within only 8 of the map units. The analysis resulted in 20 plots being selected for field description, sampling, and lab characterization. Of the 20 total plots, 16 were sampled by small pits and 4 tower plots were sampled via bucket auger.

Roughly 5 percent of the NEON site area at TALL consisted of map units that were not sampled. These include:

Map unit symbol	Map Unit Name	% Total site area
BaB	Bama fine sandy loam, 2 to 5 percent slopes	2.7
FaA	Fluvaquents ponded	0.9
CmA	Columbus loam, 0 to 2 percent slopes, occasionally flooded	1.8
	Total	**5.40**

Sampled map units represent approximately 95 percent of the NEON site area.

Map unit symbol	Map Unit Name	% Total site area
MsG	Maubila-Smithdale complex, 35 to 45 percent slopes	6.6
WdE	Wadley-Smithdale-Boykin complex, 5 to 20 percent slopes	13.8
MkC2	Maubila flaggy loam, 2 to 8 percent slopes, eroded	33.1
MsF	Maubila-Smithdale complex, 15 to 35 percent slopes	14.7
BdA	Bibb-Iuka complex, 0 to 1 percent slopes, frequently flooded	7.3
SmC	Smithdale sandy loam, 2 to 8 percent slopes	9.1
MsD	Maubila-Smithdale-Boykin complex, 5 to 20 percent slopes	6.4
WbF	Wadley-Boykin complex, 15 to 35 percent slopes	3.6
	Total	**94.60**

The selected sample plots occupy landscape positions typical for the map unit delineation. Thus, the selected plots should represent the Soil Series named in the map units, but similar soils (inclusions) of different series could be encountered. For the most part, the soils sampled in the plots fell within or near the Range in Characteristics (RIC) of the named Soil Series or the dominant component of the map unit, except for a few outliers. Key elevations (slope positions) across the upland including seep areas and narrow drainage ways are represented in the sampling plots.

Plot Findings

The 20 pedons sampled represent eight soil map units. The major soils series with in these map units are: Maubila, Boykin, Wadley and Smithdale. Inclusions or minor components are the

Luverne, Sunlight, and Bibb series, and unnamed hydric soil components occur in seep areas and narrow drainageways. It is important to note that inclusions of sandstone and ironstone occur in these soils, which made hand excavation difficult. Elevation changes and landscape positions are related to skeletal variations of the soils series. Most of these series vary only by one or two physical characteristics from the non-skeletal analogue. Some series encountered were not represented in the original soil survey, and under present standards these soils would be named components of the map units. All plots (100%) sampled were in forest vegetation.

Landforms—NEON Plots TALL_005, TALL_006, TALL_007, TALL_009, TALL_012, TALL_013, TALL_015, TALL_016, TALL_017, TALL_018, TALL_021, TALL_025, TALL_026, TALL_029, TALL_031, TALL_032, and TALL_044 are on hillslopes; Plot TALL_011 is on a flooded area. Plot TALL_030 is on a seep areas plain, and TALL_027 is on a narrow drainageway. Eighty percent of the plots occur on hillslopes; ten percent on floodplains, and ten percent in a poorly drained narrow drainageway/seep area. Plot TALL_030 was located in a seep area at the base of hillslopes and TALL_027 was in a narrow drainageway within the hills. These positions are hydric (wet soil) components within the mapping unit.

Summary of Soils

The soils sampled generally had very thin organic horizons. These horizons ranged from 1 to 5 cm in thickness. The O horizons found in many of the pedons are not accounted for in the aggregated NASIS horizon data. Where surface stoniness and horizon thickness allowed, the O horizons were sampled for organic matter and bulk density determination following normal protocols.

The dominant soil among the plots was the Maubila series (7 plots: TALL_007, TALL_009, TALL_015, TALL_016, TALL_017, TALL_018, and TALL_044), which occurs on the backslopes. These plots contain the Maubila series and similar soils that have > 35% rock fragments and < 35% clay in the control section. The Maubila soils developed in clayey marine sediments and are >2.0 meters to bedrock (very deep). They are moderately well drained, slowly permeable and average 45 percent clay in the particle size control section. Only one of the pedons sampled as Maubila (TALL_044) did not fit the Maubila range of characteristics (RIC) in that it had a loamier epipedon and the particle size control section by field estimate was < 35% clay.

The second most common soil series encountered on site was the Boykin series, which occurred on three plots: TALL_005, TALL_025, and TALL_026. These plots are within the WdE and MsD mapping units and occupy backslope positions.

The Wadley series occurred on three plots: TALL_006, TALL_029, and TALL_032 and were within WdE or WbF map units. These soils occur on side slopes and backslopes. Both Boykin and Wadley soils form in sandy and loamy marine sediments. The Wadley soils differ from Maubila in that they are in Arenic (> 50 cm sand) and Grossarenic (> 100 cm sand) subgroups. Boykin soils are Arenic and have a sandy epipedon 50-100 cm thick overlying an argillic horizon. Wadley soils are Grossarenic with an epipedon with > 100 cm of sandy textures that overlie an argillic horizon.

The Bibb series occurred in two plots: TALL_011 and TALL_027; these soils occupy narrow drainageways. One plot, TALL_030, occurs in a seep area **(unnamed hydric area)** in narrow

low-order, drainageway. This soil formed in stratified loamy and sandy alluvium, is poorly drained and coarse loamy. This is an unnamed series that has limited soil development because of wetness and flooding, however it closely resembles Bibb series.

The Smithdale soil series occurred on two plots TALL_012 and TALL_031. The Smithdale soil occurs on ridgetops and side slopes and formed in loamy marine sediments, which results in a fine loamy particle size in the control section. This soil is well drained and decreases in clay content with depth. Longleaf pine is the dominant vegetation.

The Bonneau series occurred in one plot, TALL_021. This soil occupies upper side slopes and forms in sandy marine sediments. As a result, Bonneau soils have a sandy surface epipedon that is 50-100 cm thick (Arenic) overlying an argillic horizon. Smithdale soils differ from Boykin in that the subsoil is a yellowish brown color, whereas Boykin has a red subsoil.

The Columbus soil series occurred on one plot, TALL_013. This pedon was located on a toeslope position and is a moderately well drained, fine-loamy soil with decreasing clay content throughout the profile. The Columbus series is a minor inclusion in the WdE mapunit.