VEGETATION INVENTORY OF JIMMY CARTER NATIONAL HISTORICAL PARK: BOYHOOD FARM SITE

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Josephine Duffy, Scientists-in-Parks intern

PROJECT AREA

LAND USE HISTORY

Prior to European settlement, the Boyhood Farm site fell within the historic range of the longleaf pine ecosystem [Fig. 1]. Land lottery survey plats from 1826 [see Appendix 1.] recorded pine, hickory, and oak trees (specifying red, post, and blackjack oak) surrounding what would become the Carter's home. While surveyors lumped all pine species into the indistinct annotation of 'pine', the geographic setting and soils of the site are congruent with the preferred conditions of longleaf, shortleaf, and loblolly pines. Longleaf pine ecosystems are highly fire-dependent, with frequent, low-intensity burns acting as a dominating force shaping the plant community. Plains was likely in a transitional region, where longleaf pine stands met the oak-hickory forests of the Piedmont.

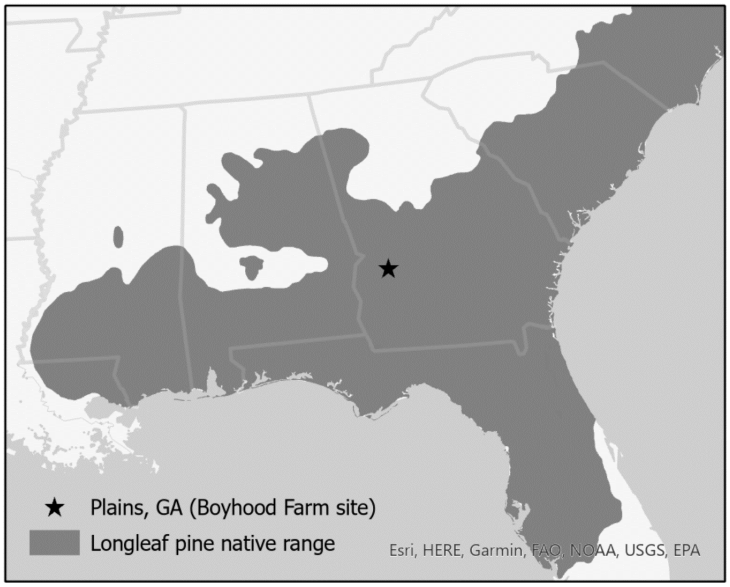


Fig. 1 – Boyhood Farm location compared to the historic range of the longleaf pine ecosystem (Historic range map from Prasad & Iverson 2003).

The earliest documented farmstead at the site was that of J.S. Plexico, who between 1911-1917 acquired land of unspecified acreage in Sumter and Webster counties (Cultural Landscape Index 1998). A 360-acre parcel, including a bungalow built by Plexico in 1922, was sold to James Earl Carter, Sr., in 1928. During the period of Carter ownership, multiple structures were built, including four tenant houses, a commissary, various sheds, animal pens, a windmill, and a tennis court, among other assets. The area surrounding the house was kept as a 'swept yard' of compacted sand, and unpaved roadways connected the various structures. The Carter family kept a sizeable garden on the site, and each tenant house had its own vegetable garden. Ornamental plantings were sparce, but President Carter and relatives have

recalled plantings of magnolia, spirea, kudzu, mulberry, chinaberry, walnut, kumquat, and pineapple pear.

In 1949 T.R. Downer purchased approximately 410 acres from James Earl Carter, Sr., including the Boyhood Farm site. Under Downer's ownership, the land surrounding the house and store was seeded with turf grass and a variety of unspecified ornamentals were planted, including flowering shrubs, fruit trees, and herbaceous perennials. Farming at the site ceased by the 1990's, and volunteer species along with ornamentals were permitted to grow unchecked. Observations of plant species during this time period are recorded in Appendix 2.

Acquired by the National Park Service in 1994, the Boyhood Farm has since been restored to represent the state of the farm during President Carter's childhood. The various structures present during Carter ownership have been restored or replicated. Some livestock species have been reintroduced, including goats, chickens, and mules. There is a grass lawn along with some ornamental shrubs and trees.

CLIMATE

Georgia has a humid subtropical climate, with hot, humid summers marked with frequent storms, and mild winters with little to no snowfall. In Plains, the average minimum/maximum temperature for January is 40.3/56.3, and for July is 73/90.3. Plains gets on average 49 inches of rainfall annually.

TOPOGRAPHY

Plains lies in the Upper Coastal Plain region of Georgia on the Flint River basin. The site of the Boyhood Farm in itself has little variation in topography. The surrounding region of Southwestern Georgia is composed of gentle hills. The farm is situated on an upland region about 3.6 miles northeast of the Kinchafoonee Creek.

SOILS

Soils at the Boyhood Farm are of the Greenville and Red Bay series. These series both describe fine sandy loams with a dark, red-brown color. They are very deep, well drained, moderately permeable soils.

TARGET OF STUDY

While the majority of the 21-acre site is maintained to reflect President Carter's boyhood, there is an approximately 1.2-acre section of unmaintained woodland situated in the northeastern corner [Fig. 2]. Another small strip of woodland runs alongside the parking lot, separating it from view of the home site. These areas are the primary target for this study, as a thorough inventory of their vegetation has never been conducted. A vegetation survey is desired to document any presence of invasive species and serve as a baseline to monitor plant community shifts over time.

Fig. 2 – Map of Boyhood Farm site with survey target area highlighted and plots numbered.

METHODS

The survey target area was divided into 14 roughly 450 sq meter plots. All plots were assigned a numerical value for identification. Plots were outlined on the site using a handheld GNSS surveyor (BE-GPS-3300). A mismeasurement on the field resulted in two plots being partially merged (becoming plot 2), leaving a total of 13 plots.

Field survey sheets were adapted from sheets used by Clark (1990) and Schulz and Hall (2011), which were simplified to suit the needs of this survey. Sheets record the percent groundcover of the plot along with the cover class, density, and distribution of each plant species observed in the plot.

All unique plants identified in each plot were recorded. For each species, one or more photos were taken of a representative individual plant. These photos were used to double-check identification and may be used in the future to confirm accuracy of species identification. Forbs and wildflowers along the margin of the plot were recorded along with the interior woodland plant species.

Surveying began on March 21st, 2022 and concluded on April 12th. Given the spring time period, many plant species began filling in after plots were already surveyed. Trees in multiple plots were revisited on April 18th to identify more accurately given new leaf growth. Any species that were not present originally were also recorded, along with changes in species coverage and density. Data for cover class/density/distribution is incomplete; it was collected at a later date than the survey itself to account for species yet to fill in, but was unfortunately not completed by the end date of the internship.

Species were identified using the online database wildflowersearch.org, along with the field guides *Forest Plants of the Southeast and their Wildlife Uses* (Miller & Miller), *Native Trees of the Southeast: An Identification Guide* (Kirkman et al.), and *Field Guide to the Wildflowers of Georgia and Surrounding States* (Chafin).

CONCLUSION

OBSERVATIONS

The vegetation present at the Boyhood Farm is typical of an unmanaged, disturbed site where succession has proceeded unchecked. The overstory consists of many oak trees, primarily water, laurel, and post oak, along with black locust, hackberry, cherry laurel, pecan, loblolly pine, and the invasives chinaberry and Callery pear. Less common trees are American holly, sweetgum, and the invasive Chinese photinia. Below is a shrubby understory thick with cherry laurel saplings and greenbrier vines. Invasive nandina, Chinese privet, and Japanese honeysuckle are also widespread amongst the understory. Poison ivy, Virginia creeper, and catchweed bedstraw are the most frequently occurring groundcover plants, along with the occasional ebony spleenwort fern. Along the margin of the woodland area are common native and naturalized lawn weeds such as clovers, dandelions, thistles, chickweed, speedwell, chervil, and cranesbill. The plots are relatively homogenous, with little significant change in plant species richness and evenness from plot to plot. The only notable change in composition was a higher presence of Nandina on the middle/eastern portions of the main woodland area and along the parking lot. No rare or endangered plant species were observed. A complete list of species observed along with observations and photos from individual plots is included in Supplemental materials 1 – Survey & site photos.

SHORTCOMINGS

It should be recognized that the accuracy and conclusiveness of this survey is hampered by the time period in which it was conducted and the limitations of the surveyor. The survey took place in the springtime as many plants just began growing in, leaving a high probability that late season species were not observed. Trees from the Juglandaceae family were particularly difficult to differentiate, as leaves were just growing in and no fruit were present. Herbs of the Asteraceae family were also particularly difficult, as in many cases the flower had been mowed leaving only the basal leaves. Future management should make note of summer and fall species that come up as time progresses. It should also be acknowledged that the survey was conducted by a single individual with limited prior experience in vegetation surveying. Mistakes and misidentifications are probable as a result. Some plants where identification was uncertain were noted as such in the survey notes. Other plants observed were left unidentified; photos of these species have been saved for reference. While the species list gives a relatively complete record of common species and invasive threats to the area, it should not be taken as 100% accurate and comprehensive.

This survey covered only the unmanaged forested areas of the Boyhood Farm. Historic ornamentals on the farm itself were not considered. Observations of weedy plants along the margins of the woodland were limited to forbs and wildflowers; grasses and sedges were not recorded.

FUTURE MANAGEMENT

The establishment of invasive plant species is a significant issue for the woodland area neighboring the Boyhood Farm. Future management of the area should involve the removal of Chinese privet, nandina, Japanese honeysuckle, Callery pear, and chinaberry, which all have considerable presence throughout the woodland. Resources for managing these invasive species are included in Supplemental materials 2 – Invasive management. Other invasives that

are present but not yet extensive, such as Chinese photinia, should be cleared before becoming a larger issue.

Plans to construct a walking trail in the woodland area have been proposed. However, in its current state there is little recreational or educational value to the area. A potential use for the woodland area could be a small-scale ecological restoration project. While too small to provide a valuable habitat to wildlife, it could instead serve as an educational representation of the historic oak-longleaf forests that covered the area prior to conversion to agriculture. Native plants that would've realistically been present given the location, soils, climate, etc. could be reintroduced for visitors to observe. This project could be connected to the park through President Carter's conservation ethic. More resources for this potential project along with concepts for waysides explaining the history and significance of the native ecosystem are included in Supplemental materials 3 – Restoration project proposal.

Whether a walking trail is established in its current state or after restoration, staff should be aware of the significant presence of poison ivy throughout the woodland. Greenbrier vines are also widespread, posing another hazard via their sharp thorns. Staff constructing the trail should be mindful of these species and take precautions accordingly.

REFERENCES

Bishop, G N. *Native Trees of Georgia.* Revised ed., Georgia Forestry Commission, 2001.

Chafin, Linda G. *Field Guide to the Wildflowers of Georgia and Surrounding States.* University of Georgia Press, 2016.

Clark, Ronilee A., William L. Halvorson, Andell A. Sawdo and Karen C. Danielsen. *Plant Communities of Santa Rosa Island, Channel Islands National Park.* Final Report to National Park Service, October 1990.

Dixon, Sandra. *Research Report on the Structures and Sites for the Proposed Jimmy Carter National Historic Site.* Prepared for the National Park Service Southeast Cultural Resources Preservation Center, 1985.

Environmental Assessment, Jimmy Carter National Historic Site. National Park Service, 1992.

Hitchcock, Susan, Cari Goetcheus, and Lucy Lawliss. *Jimmy Carter Boyhood Home Cultural Landscape Inventory,* draft report. National Park Service, Southeast Regional Office, March 1998.

Kirkman, L. Katherine, Claud L. Brown, and Donald J. Leopold. *Native Trees of the Southeast: An Identification Guide.* Timber Press, 2007.

Miller, James H., and Karl V. Miller. *Forest Plants of the Southeast and their Wildlife Uses.* Revised ed., University of Georgia Press, 2005.

Pate, Stephen Matthew. *A Development Plan for the Jimmy Carter Boyhood Home, Jimmy Carter National Historic Site, Plains, Georgia.* Master of Landscape Architecture Thesis, University of Georgia, 1994.

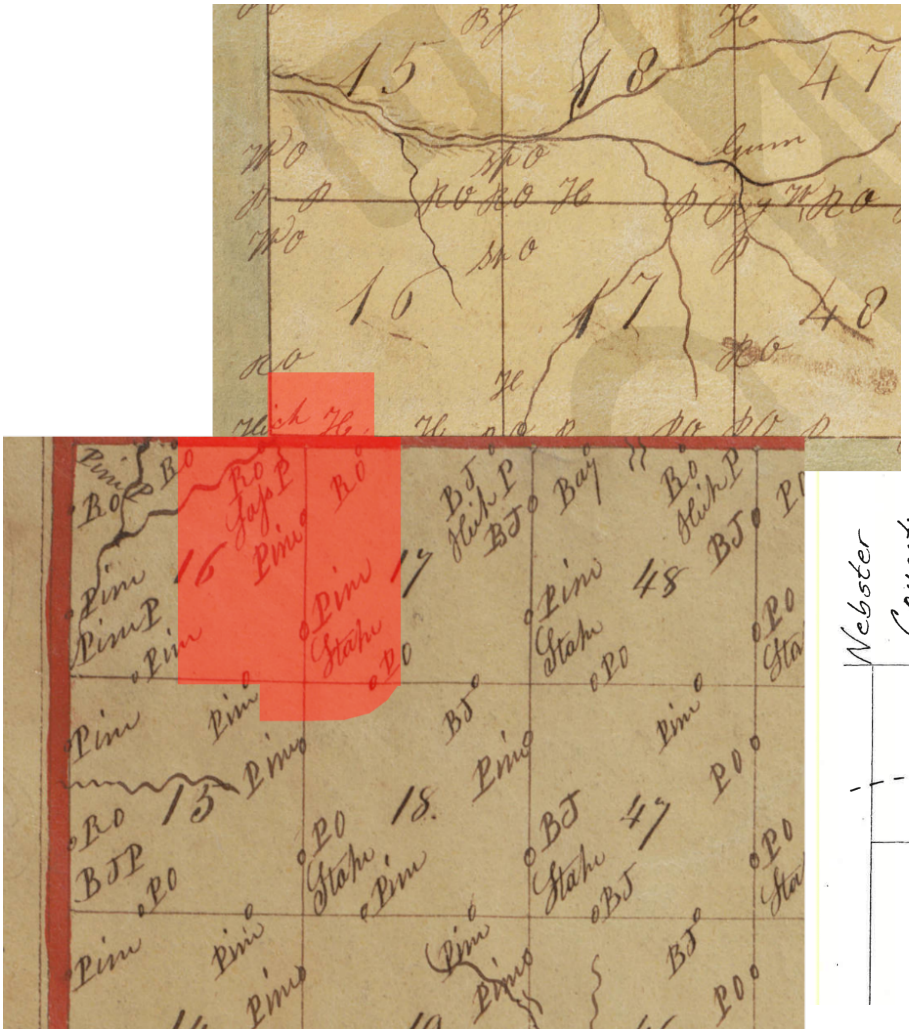
Prasad, A. M. and L. R. Iverson. *Little's range and FIA importance value database for 135 eastern US tree species.* Northeastern Research Station, USDA Forest Service, 2003.

Schulz, Keith A. and Mark Hall. *Vegetation Classification Report: Great Basin National Park.* Unpublished Report submitted to USDI, National Park Service, Mojave Desert Inventory and Monitoring Network. NatureServe, Western Regional Office, March 2011.

Tuttle, Julie P. and Elizabeth A. Kramer. *Georgia Historic Vegetation Reconstruction Pilot Project.* Natural Resources Spatial Analysis Laboratory, University of Georgia Institute of Ecology, May 2005.

APPENDIX 1.

1826 Land lottery survey plat map, with land purchased by James Earl Carter Sr. highlighted in red. The location was derived from a map from Dixon 1985 (right) and verified through georeferencing. Surveyor abbreviations with probable scientific names (below) are derived from Tuttle 2005.



Common Name & Surveyor Abbreviations	Probable Scientific Name
Red oak (RO, Red O, R oak)	*Quercus rubra* or *Q. falcata*
Southern red/Spanish oak (Sp O, Span O, SO)	*Quercus falcata*
Black oak (BO, Blk O)	*Quercus velutina*
Blackjack Oak (BJO, B Jack, BJ oak)	*Quercus marilandica*
Post oak (PO, P oak)	*Quercus stellata*
Hickory (Hick, Hky, Hcky)	*Carya* spp.
Pine (Pine)	*Pinus* spp.

APPENDIX 2.

Species observed prior to National Park Service restoration of the Boyhood Farm (1990's).

Common Name	Scientific Name	Source
Redtop	*Agrostis gigantea*	Pate 1994
Mimosa	*Albizia julibrissin*	Pate 1994
Azalea	*Azalea indica*	Pate 1994, EA 1992
Paper mulberry	*Broussonetia papyrifera*	CLI 1998, EA 1992
Pecan	*Carya illinoinensis*	Pate 1994, CLI 1998
Chrysanthemum	*Chrysanthemum* spp.	EA 1992
Cocculus	*Cocculus carolinus*	Pate 1994, CLI 1998
Winter Jasmine	*Fasminum nudiflorum*	Pate 1994
Ivy	*Hedera helix*	Pate 1994
Iris	*Iris* spp.	Pate 1994
Red cedar	*Juniperus virginiana*	Pate 1994, CLI 1998, EA 1992
Crepe Myrtle	*Lagerstroemia indica*	Pate 1994
Privet	*Ligustrum sinensis*	Pate 1994
Lily	*Lilium* spp.	Pate 1994
Sweetgum	*Liquidambar* spp.	CLI 1998
Liriope	*Liriope spicata*	Pate 1994, EA 1992
Honeysuckle	*Lonicera* spp.	CLI 1998, EA 1992
Magnolia	*Magnolia grandiflora*	Pate 1994, EA 1992
Apple	*Malus* spp.	CLI 1998
Chinaberry	*Melia azedarach*	Pate 1994, CLI 1998, EA 1992
Mulberry	*Morus alba*	Pate 1994
Nandina	*Nandina domestica*	Pate 1994, EA 1992
Daffodil	*Narcissus* spp.	Pate 1994
Photinia	*Photinia* spp.	EA 1992
Peach	*Prunus persica*	Pate 1994, EA 1992
Black cherry	*Prunus serotina*	CLI 1998, EA 1992
Firethorn	*Pyracantha coccinea*	Pate 1994, EA 1992
Pear	*Pyrus communis*	Pate 1994, CLI 1998, EA 1992
Water oak	*Quercus nigra*	Pate 1994, CLI 1998
Rhododendron	*R. catawbiense*	Pate 1994
Blackberry	*Rubus* spp.	EA 1992
Sassafras	*Sassafras albidum*	CLI 1998, EA 1992
Winter Rye	*Secale cereale*	Pate 1994
Greenbrier	*Smilax spp.*	EA 1992
Spirea	*Spiraea* spp.	EA 1992
Poison ivy	*Toxicodendron radicans*	CLI 1998, EA 1992
Verbena	*Verbena* spp.	Pate 1994