APGA/USFS Tree Gene Conservation Partnership:
Report on Scouting and Collection Efforts targeting
Quercus oglethorpensis

Prepared by

Matthew Lobdell (The Morton Arboretum)
Patrick Thompson (Donald E. Davis Arboretum of Auburn University)

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Project Overview

*Quercus oglethorpensis* (oglethorpe oak) is a species of conservation concern distributed sparsely throughout the Southeastern United States, with small documented populations in Louisiana, Mississippi, Alabama, Georgia, and South Carolina. Due to the recalcitrant nature of the seeds, traditional seed banking methods are insufficient for *ex-situ* conservation of the species. The Morton Arboretum and Donald E. Davis Arboretum of Auburn University, two member gardens of the PCN *Quercus* Curatorial Group partnered to scout and assess populations of the species through the Southeastern United States and collect acorns from fruiting individuals across this range. Chicago Botanic Garden, Starhill Forest Arboretum, The Holden Arboretum, and Moore Farms Botanical Garden have all agreed to accession germplasm acquired during this project, allowing for an effective distribution of *ex-situ* conservation of the species through living collections.

Figure 1: Leaves of *Quercus oglethorpensis* as observed in Bienville National Forest, Jasper County, Mississippi (Photo Credit: Matthew Lobdell)

Objectives

1. Document occurrences of *Quercus oglethorpensis* in Bienville National Forest, Sumter National Forest, Sumter County (AL), Wilcox County (AL), Marengo County (AL) and York County (SC).
2. Record observations on any potential threats to populations.
3. Note status of acorn production and determine if any individuals were suitable targets for fall collection.
4. Collect acorns and scion wood for production and distribution by The Morton Arboretum to member gardens in the PCN *Quercus* group.
Summary of Daily Activities

Wednesday, July 15th
Departing well before sunrise, Patrick Thompson travelled from Auburn to meet Dr. Barger and Chris Taylor at a recently documented population of *Quercus oglethorpensis* in Marengo County, AL. The oaks were easy to locate along the roadway, and several individuals had heavy fruit set. The morning was spent moving along the road recording coordinates of specimens with acorns and counting specimens identifiable from the right of way. The majority of the population occurred in Marengo county. Occasional specimens along an unpaved side road lead to the single fruited specimen found in Wilcox County.

Around lunchtime the group proceeded to a second elemental occurrence reported from Wilcox County. A most likely specimen was located, though without acorns it could not be definitively distinguished from *Q. sinuata*.

The group then travelled to the Sumter county site. The rest of the day was spent scouting the area southeast of Alamuchee creek with no success. The group stayed in the nearby town of Demopolis for the night.

![Twig and leaves of *Quercus oglethorpensis* as observed in Catherine, Alabama area (Photo Credit: Patrick Thompson)](image-url)
Thursday, July 16th
After studying maps and talking to Alfred Schotz, the botanist who first identified the plant at the Sumter site, Thompson returned to Alamuchee creek to explore areas west and north of the original record to see if any individuals could be identified. No individuals were located after a thorough four to five hours of searching. The rest of the day was spent driving back across the width of the state to Auburn.

Monday, July 27th
Matt Lobdell arrived in Mississippi mid-afternoon and met with Dean Elsen at the Bienville Ranger District Office. Elsen provided a map of the Forest District including any known locations of *Quercus oglethorpensis* located within. He gave a brief overview of the area and discussed criteria for working in the district, which mainly included a thrice daily check-in with Mickey Esters. Lobdell spent the remainder of the day studying the map and preparing for the next two days in the region.

Tuesday, July 28th
Lobdell checked in with Mr. Elsen at 6:30 AM and was provided with access to the Caney Creek Wildlife Management area, where most of the Scott County locations were documented. The region was currently undergoing a drought, and many of the streams or bottoms were almost completely dry. Lobdell followed one such stream on foot for approximately one kilometer and found several individuals which were undocumented by the forest service. Lobdell spent the remainder of the day scouting along the roadsides of FR-518A, FR-518F, and other forest roads in the Caney Creek Wildlife Area. Several voucher specimens were collected (see attachment).

Figure 3: Trunk and upper canopy of *Quercus oglethorpensis* as observed in Scott County, Mississippi (Photo Credit: Matthew Lobdell)
Wednesday, July 29th
Lobdell checked in with the Forest Service in the morning and received a gate key allowing access to the Jasper County site. Lobdell drove to FR-547 C, where a population was documented. The species was far less common in the area. No trees were seen on the western roadsides, and two attempts to follow dry streams/bottoms on foot in hopes of discovering individuals were unsuccessful. While departing the area, Lobdell found one individual located directly on the eastern roadside and collected a voucher specimen (see attachment). The tree was branched low to the ground and would be suitable for collection of scion wood, though was not producing acorns.

At the end of the day, Matt Lobdell gave a one hour presentation/discussion about the project to the USFS staff at Dean Elsen’s request. They seemed very interested in conservation efforts of *Quercus oglethorpensis* and seemed to see the benefit of working with APGA to help with *ex-situ* conservation of the species. They will likely continue to be valuable local collaborators, and offered to send scion wood from the individuals visited.
Saturday, August 1st
Matt Lobdell and Ethan Kauffman spent the day visiting five sites in McCormick County and one site in Greenwood County. Four sites have established populations of the species, ranging from merely a few saplings at one site, to a large ca. 100’ tree with a multitude of seedlings and saplings at another site.

No individuals of *Quercus oglethorpensis* were observed at the Greenwood County site, and one site in McCormick County also appeared to be absent of the species. One tree located in McCormick County was noted to have a significant fruit set worthy of further collection.
Figure 6: Twig of *Quercus oglethorpensis* exhibiting immature fruit. In McCormick County, SC. (Photo Credit: Matthew Lobdell)

**Sunday, August 2nd**
Matt Lobdell and Ethan Kauffman traveled to a documented population of *Quercus oglethorpensis* in York County, SC. No individuals were located after a thorough four hours of searching.

**Thursday, October 15th**
Patrick Thompson returned to the population 3.5 air mi W of Catherine, AL spanning both Marengo and Wilcox counties. Seed was collected from seven individuals in Marengo County, and one individual in Wilcox County. A 9th specimen which was believed to have had sufficient acorns for collecting was in fact severely infested with galls of a similar size and color of acorns.
Wednesday, November 4th
Matt Lobdell, Ethan Kauffman, and Andrew Bunting revisited the same tree scouted on Saturday, August 1st. Acorn maturation and drop had progressed more rapidly than expected, though a total of 40 seeds were collected from the ground beneath the plant.
Wednesday, December 2\textsuperscript{nd}
Matt Lobdell established contact with Dean Elsen (Bienville National Forest), who agreed to send scion wood from populations in Bienville National Forest. Shipment will occur in January, 2016 when wood is sufficiently hardened and dormant.
Summary of Populations

Bienville National Forest (Scott and Jasper Counties, Mississippi)

*Quercus oglethorpensis* appears to be uncommon in Scott County, tending to occur along narrow stream banks or “bottoms”, or frequently along ditches on the sides of forest roads. Other plants existing in these habitats included *Acer rubrum, Aralia spinosa, Carya tomentosa, Cornus alternifolia, Liquidambar styraciflua, Nyssa sylvatica, Pinus taeda, Quercus marilandica, Quercus nigra, Quercus pagoda, Quercus phellos, Toxicodendron radicans*, and *Ulmus alata*. Soil pH where surveyed was between 5-6. No trees seemed to be producing a significant acorn crop, though several had young, low branches suitable for collecting scion wood.

In Jasper County, *Quercus oglethorpensis* appears to be far rarer, with only a single individual located given a six hour scouting period. It also occurred with *Carya tomentosa, Pinus taeda, and Quercus nigra*. No seedlings or saplings were present here.

No major threats were documented on either population. Evidence of gall insects was present on many individuals, though this did not appear to be out of the ordinary. The main threat appeared to be competition from faster-growing species occurring in the area such as *Liquidambar styraciflua* and *Nyssa sylvatica*. Dean Elsen and his staff have been managing for this species through a “release” procedure where competing vegetation is cut back from around the *Q. oglethorpensis* individual to give it a chance to establish. Burn management has also been utilized to help with the preservation of this species.

Figure 9: Population of *Quercus oglethorpensis* in Bienville National Forest (Photo Credit: Matthew Lobdell)
Cuba area (Sumter County, Alabama)
This occurrence was the first record of the species in the state. It was documented in the bottomlands southeast of Alamuchee Creek in 1998 by Alfred Schotz of Alabama’s Natural Heritage Program. It appears to have become extirpated due to logging activity in the area. Schotz has attempted to relocate the original specimens or outlying members of the population without success. Wayne K. Webb also visited the site in 2012 and 2013 and was unable to locate the species.

West of Catherine (Marengo and Wilcox Counties, Alabama)
This population, first reported by Webb in 2013, appears to be the most robust in the state of Alabama. It occurs around 3.5 air miles west of Catherine, an unincorporated community near the border of Marengo and Wilcox counties. The population spans a zone that goes from dry to moist on shrink swell clays along roadsides between timber and hunting properties. The most southeastern component occurs on the wettest habitat in the observed extent of the population and has the plants that best match the species diagnostic features. Individuals in the more northern parts of the range have noticeably lighter colored pubescence. It is unclear if this is caused by growing conditions or indicative of genetic variation in the population, or perhaps introgression of another species.

Pine plantations east of CR 14 held little diversity, but the western side of CR 14 had been selectively harvested, and in some places the population could be seen extending past the point where we had permission to explore. The roadside population consisted of at least 60 specimens, and included a large specimen (67” circumference) with numerous seedlings growing on the edge of a small creek.

Figure 10: Population of *Quercus oglethorpensis* near Catherine, AL (Photo Credit: Patrick Thompson)

Otherwise, seedling recruitment was virtually nonexistent despite prolific fruit production in 2015. A combination of logging and destructive road work could eradicate this population. Here the species
occurs with *Juniperus virginiana*, *Pinus taeda*, *Quercus austrina*, *Quercus laurifolia*, *Quercus sinuata*, *Cornus florida*, *Liquidambar styraciflua*, *Crataegus marshallii*, *Tillandsia usenoides*, *Ulmus alata*, *Quercus falcata*, *Quercus stellata*, and *Acer rubrum*.

Per Brian Keener, there are two other populations in this region, though one consists only of juvenile plants.

**South of Catherine (Wilcox County, Alabama)**

This site was also reported by Webb in 2013. A single individual was found in this area with a leaf shape characteristic of *Q. oglethorpensis*. The specimen had an approximately 8’ circumference and was in a state of decline. Pubescence on the underside of the leaves was distinctly whitish in color. In Duncan’s initial description of the species he lists this as a diagnostic feature characteristic of *Q. sinuata* which should be used to avoid confusing the two similar species. If acorns had been present, the cap could have been used to verify that this was the reported occurrence at this site, but the tree did not set fruit this year.

![Image of plant specimen](image)

*Figure 11: UWAL0014152 (Wayne K. Webb, 2013) documenting potentially extant population south of Catherine, AL*
Sumter National Forest (South Carolina)
Population appears to be in good health, and the tree is more common here than in either Mississippi population. Of particular interest was a large tree approximately 100’ in height with a multitude of seedlings and saplings present. Only one tree was observed producing a significant fruit set and was revisited for seed collection. Two populations documented as occurring in 1983 were unable to be located during this project (See Figure 12). Associated species in this area included *Pinus taeda*, *Quercus stellata*, *Sorghastrum nutans*, *Andropogon sp.*, *Juniperis virginiana*, *Rhus copallina*, *Ulmus alata*, *Cornus florida*, and *Acer floridanum*.

Figure 12: Summary of locations scouted in Sumter National Forest. Locations marked present were not bearing fruit, and not revisited in fall 2015.
York County (York County, South Carolina)
This population appears to be either extirpated or the result of an erroneous report. There has not been a documented review of this population since 1987. *Quercus phellos* was the only similar looking species observed in the area. The voucher specimen documenting this population should be carefully reviewed, and if found to be legitimate, a concentrated, collaborative effort with the Forest Service or landowner should be initiated in order to determine the status of the population.
Figure 14: Reported population of *Quercus oglethorpensis* south of Rock Hill, SC. This population could not be located.
Material Collected
Poor seed production in Bienville and Sumter National Forests prevented extensive sampling of the species. No fruiting individuals were located in Bienville National Forest. One fruiting tree was observed in Sumter National Forest, from which approximately 40 acorns were collected. Two sets of vouchers were collected to document these populations. One set will be sent to the US National Arboretum Herbarium, with the duplicates held at The Morton Arboretum Herbarium. Scion wood from the population in Bienville will be collected in early 2016 for grafting at The Morton Arboretum.

Figure 15: Acorns of *Quercus oglethorpensis* in Catherine, AL (Photo Credit: Patrick Thompson)
The population near Catherine, AL was the most extensively sampled, with 274 acorns collected. One set of vouchers was collected to document this population, which will be sent to the US National Arboretum Herbarium.

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*Figure 16: Collections made from *Q. oglethorpensis* individuals. #V, #S, and #W indicate number of vouchers, seeds, and scion wood collected from each individual*
Propagation Status
A total of 287 acorns were sent to The Morton Arboretum Production Facility. Acorns were sown in a media containing 50% germination mix and 50% potting mix between 11/11/2015 and 11/30/2015. Following three months of cold stratification, an attempt to germinate will occur in late February or early March 2016. Once the seedlings have gone dormant following the first growing season, a portion will be shipped to The Holden Arboretum, Chicago Botanic Garden, Starhill Forest Arboretum. This will distribute the germplasm over an area approximately 635,000 km².

Figure 17: Institutions agreeing to hold germplasm for ex-situ conservation purposes
Accomplishments and Future Directions

All scouting and collection goals set for the project were met. Occurrences of the species were documented in Bienville National Forest, Sumter National Forest, and the population West of Catherine, AL (Marengo and Wilcox Counties). The lack of occurrence was also documented in the Cuba, AL area (Sumter County), South of Catherine, AL (Wilcox County), and the purported occurrence in York County, South Carolina. This information was submitted to Dr. Murphy Westwood to allow a more accurate assessment when determining the IUCN Threat Level for the species.

A concerted effort was made to observe potential threats on each of these populations. Though the species is documented as susceptible to chestnut blight, no trees were observed to be currently infected during this project. In some areas, particularly in Bienville National Forest, competition from fast-growing species such as *Nyssa sylvatica* and *Liquidambar styraciflua* is a significant issue affecting *Quercus oglethorpensis* seedling recruitment. However, as long as the Ranger District continues their *in-situ* management program for this species, the population is likely relatively safe. The largest threat to the species is likely logging activity, particularly on private land where the species is not extensively documented.

As scouting attempts in Bienville National Forest and South of Catherine, AL failed to locate any fruiting specimens, they were not revisited for collection in fall 2015. Seeds were collected from Sumter National Forest and West of Catherine, AL, with the latter responsible for the bulk of the material collected. Scion wood will be sent from Bienville National Forest in early 2016 with the intent of grafting and distributing in a similar fashion as seedlings.

Assuming all propagation and distribution efforts are successful, there will only be two documented populations of *Quercus oglethorpensis* not represented in cultivation by the PCN *Quercus* group: the disjunct populations in Greene County, Georgia and Caldwell Parish, Louisiana. Scouting and collection in these two localities would be valuable to complete the project. Further scouting may also be desirable in York County, South Carolina.
List of Participants and Contact Information

<table>
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<th>Name</th>
<th>Title/Position</th>
<th>Organization</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew Lobdell (Primary Contact)</td>
<td>Head of Collections and Curator</td>
<td>The Morton Arboretum</td>
<td><a href="mailto:mlobdell@mortonarb.org">mlobdell@mortonarb.org</a>, 630-719-2435, 4100 Illinois Route 53, Lisle, IL 60532-1293</td>
</tr>
<tr>
<td>Patrick Thompson</td>
<td>Conservation Gardener</td>
<td>Donald E. Davis Arboretum of Auburn University</td>
<td><a href="mailto:thomppg@auburn.edu">thomppg@auburn.edu</a>, College of Sciences and Mathematics, 101 Rouse Life Sciences Building, Auburn, AL 36849</td>
</tr>
<tr>
<td>Wayne Barger, PhD</td>
<td>Botanist/Curator</td>
<td>AL Nat Heritage Section Herbarium (ALNHS)</td>
<td><a href="mailto:wayne.barger@dcnr.alabama.gov">wayne.barger@dcnr.alabama.gov</a>, Dept. of Conservation and Natural Resources, State Lands Division, Natural Heritage Section, 64 North Union Street, Montgomery, AL 36130</td>
</tr>
<tr>
<td>Andrew Bunting</td>
<td>Assistant Director of the Garden and Director of Collections</td>
<td>Chicago Botanic Garden</td>
<td><a href="mailto:abunting@chicagobotanic.org">abunting@chicagobotanic.org</a>, 1000 Lake Cook Rd, Glencoe, IL 60022</td>
</tr>
<tr>
<td>Ethan Kauffman</td>
<td>Garden Director</td>
<td>Moore Farms Botanical Garden</td>
<td><a href="mailto:ekauffman@moorefarmsbg.org">ekauffman@moorefarmsbg.org</a>, 100 New Zion Rd, Lake City, SC 29560</td>
</tr>
<tr>
<td>Guy Sternberg</td>
<td></td>
<td>Starhill Forest Arboretum</td>
<td><a href="mailto:strhlfrst@aol.com">strhlfrst@aol.com</a>, 12000 Boy Scout Trail, Petersburg, IL 62675</td>
</tr>
<tr>
<td>Charles Tubesing</td>
<td>Plant Collections Curator</td>
<td>The Holden Arboretum</td>
<td><a href="mailto:ctubesing@holdenarb.org">ctubesing@holdenarb.org</a>, 9500A Sperry Road Kirtland, OH 44094-5172</td>
</tr>
<tr>
<td>Peter Linsner</td>
<td>Manager of Plant Production</td>
<td>The Morton Arboretum</td>
<td><a href="mailto:plinsner@mortonarb.org">plinsner@mortonarb.org</a>, 4100 Illinois Route 53, Lisle, IL 60532-1293</td>
</tr>
<tr>
<td>Murphy Westwood, PhD</td>
<td>Tree Conservation Specialist</td>
<td>The Morton Arboretum</td>
<td><a href="mailto:mwestwood@mortonarb.org">mwestwood@mortonarb.org</a>, 4100 Illinois Route 53, Lisle, IL 60532-1293</td>
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Maps of Collection Sites
Maps depicting collections in Bienville National Forest, Sumter National Forest, and West of Catherine are below and available in full print-quality PDF upon request.

Figure 18: Location of Collections made in Bienville National Forest. Inset in upper right depicts location in State of Mississippi.
Figure 19: Collections made in population located west of Catherine, AL. Inset in upper right depicts location within State of Alabama.
Figure 20: Location of Collections made in Sumter National Forest. Inset in lower right depicts location within state of South Carolina.
Permits and Correspondences

All occurrences for this species reported in Alabama are on right of ways and do not require state permits for collection. Collection permit for Sumter National Forest is attached below.

Figure 21: Permit authorizing collection in Sumter National Forest
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