

2015 USDA-APGA/NAPCC Partnership –Tree Germplasm Conservation Project Report

Submitted to:

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Background:

In April of 2015 Rancho Santa Ana Botanic Garden (RSABG) and Botanic Gardens Conservation International, US office (BGCI-US) were awarded funds by the American Public Gardens Association to collect and distribute germplasm of Nuttall's scrub oak (*Quercus dumosa* Nutt., Fagaceae) to public gardens. As part of the Plant Collections Network (formerly the North American Plant Collection Consortium (NAPCC)) Oak Curatorial Group, RSABG is involved in *ex situ* conservation efforts for oak taxa which occur in California and Baja California, Mexico. Working with BGCI-US, a gap analysis of oak collections and review of conservation data showed that Nuttall's scrub oak are reported in less than ten *ex situ* collections, and that its native range is very small and much of its habitat has been lost to development. Further, most oak taxa are not able to be seed banked using conventional methods and are considered exceptional species. Thus, this taxon is a high priority target for *ex situ* conservation via botanic garden living plant collections.

Species Information:

Nuttall's scrub oak (*Quercus dumosa*) is a shrubby oak that occurs in coastal sage scrub vegetation and is a narrow endemic, restricted to the southern coast of California, USA and northern Baja California, Mexico. *Quercus dumosa* was reclassified in the early 21st Century. The name *Quercus dumosa* previously applied to all scrub oaks in southern California and Baja California that belonged to the white oak group, but recent studies now recognize a narrowed concept of *Quercus dumosa*, and several additional segregate species. It blooms February-April and acorns mature in October to early November.

Acquisition of Collecting Permits:

Collection permits were issued to RSABG by the County of San Diego for collection at San Elijo Lagoon. Collections at properties owned by the city of San Diego were made under the permit of Kimberly Roeland, Conservation Biologist for the city of San Diego who accompanied us in the field on two occasions.

A variety of factors led to difficulty in acquiring collection permits at other sites. Nuttall's scrub oak occurs on a patchwork of private land as well as state and regional parkland. Due to ongoing drought in southern California, land managers were reluctant to approve acorn collection and several denied permits for this project. This included all state parks in Orange and Santa Barbara counties, although several managers suggested that we apply in subsequent years with higher precipitation. A private land owner in Santa Barbara who owns a property which contains a population was identified and contacted. Initially, the landowner agreed to allow collection on his property, but subsequently ceased responding to email and phone messages. For these reasons, collections were limited to San Diego County.

Field Work:

Due to drought and difficulty in receiving collection permits, collection sites were limited to four populations, all within San Diego County: San Elijo Lagoon, Mount. Soledad, Penasquitos Canyon/Del Mar Mesa Corridor and Deer Canyon. Scouting trips were made on June 9th and July 16th 2015 to observe acorn development. A collection trip was conducted on September 18th 2015, and three collections were made that day. Another collection was made on October 16th 2015, targeting the Mount Soledad population, but no acorns were observed on any of the trees in this location. In general, acorn production was sporadic and unpredictable due to unusual weather patterns in the region.

Acorns were collected in plastic bags that were filled with moist sphagnum moss. At each population an accompanying herbarium voucher was made, and subsequently deposited at the RSABG herbarium. For the successful collections made, acorns from each individual maternal line were collected and stored separately. Associated location data was collected and documented for all herbarium specimen and acorn collections. A summary of accession data and acorn quantities per population (Table 1) is listed below.

Summary of accessions:

24225 *Quercus dumosa* Fagaceae

(Nuttall's Scrub Oak, coastal scrub oak)

24225 ... SD wild collected in USA

United States: California: San Diego: San Diego: Sco:

Corridor between Penasquitos Canyon and Del Mar Mesa.

Southern Maritime Chaparral. 217 ft.

32.93892°N, 117.16937°W. Meyer, Evan P 229. 18 Sep 2015.

24228 *Quercus dumosa* Fagaceae

(Nuttall's Scrub Oak, coastal scrub oak)

24228 ... SD wild collected in USA

United States: California: San Diego: San Diego: SCo: Deer

Canyon, just north of Del Mar Mesa, In Canyon Bottom. Oak

woodland. 243 ft. 32.95477°N, 117.16550°W. Semi-shade,

moist. Meyer, Evan P 230. 18 Sep 2015.

24229 *Quercus dumosa* Fagaceae

(Nuttall's Scrub Oak, coastal scrub oak)

24229 ... SD wild collected in USA

United States: California: San Diego: SCo: East side of San

Elijo Lagoon, south side or Orilla trail, accessed from El

Camino Real. Southern Maritime Chaparral. 2 ft. 33.01005°N,

117.24342°W. Full sun, dry;

Meyer, Evan P 231. 18 Sep 2015.

Quantities per population:

Table 1: Acorn Quantities per Population

Population Location	Estimated Remaining Population Size	Number of mother plants collected from	Number of total acorns collected
Penasquitos Canyon/Del Mar Mesa Corridor	1000s	11	34
Deer Canyon	100s	10	229
San Elijo Lagoon	50-100	11	264

Distribution:

The following gardens received wild-collected acorns and associated provenance data:

Table 2: Distribution of Acorns to Receiving Gardens

Garden Name	Number of acorns received	Number of populations represented
Rancho Santa Ana Botanic Garden	191	3
UC Davis Arboretum	100	1
Huntington Botanical Gardens	104	1
UC Berkeley Botanic Garden	99	1
UC Fullerton Arboretum	103	1

Outcomes to-date:

Data collected at each population visited, including exact location, population status, existing or potential threats or disturbances, habitat, and associated species were reported to The Morton Arboretum as part of their effort to conduct IUCN Red List assessments of all North American oaks. This information will also be sent to the California Natural Diversity Database.

As of December 17, 2015 200 acorns had germinated at RSABG, with germinations ongoing. We plan to check back with the other gardens in the spring of 2016 to compare germination rates and exchange seedlings as necessary or desired.

Summary of expenses:

Item	Date(s) (2015)	Staff	Cost	In-kind contribution	In-kind Cost
Planning	May-June	RSABG, BGCI	\$1,437.50	RSABG 50% time, BGCI overhead	\$1,097.50
Scouting and Collecting	16JUL/18SEP/16OCT	RSABG, BGCI	\$2,150.00	RSABG partial time, BGCI overhead	\$1,750.00
Vehicle Mileage	16JUL/18SEP/16OCT	RSABG	\$712.50	Vehicle Maintenance	\$100.00
Field Supplies	July-October	RSABG	\$0.00	Supplies	\$50.00
Processing	October	BGCI	\$240.00	BGCI overhead	\$50.00
Acorn Distribution	30OCT	BGCI	\$40.00	Plastic bags, envelopes, sphagnum moss	\$20.00
TOTAL:			\$4,590.00		\$3,067.50
Proposed:			\$4,442.00		\$3,030.00
Difference:			\$148.00		\$37.50

Photos:

Figure 1: Nuttall's scrub oak habitat, San Elijo Lagoon, San Diego County



Figure 2: Nuttall's scrub oak acorns in the field



Figure 3: Acorns processed for shipment



Figure 4: Seedlings growing at the Rancho Santa Ana Botanical Garden Nursery.

