BGCI/ArbNet Partnership Programme
Grant Conditions & Agreement

14 September, 2020

Dear Ryan Russell,

I am writing to confirm that we have reviewed your recent application to BGCI/ArbNet Partnership Programme and have agreed to offer you a grant of **USD $2500**. The BGCI/ArbNet Partnership Programme is a joint initiative between BGCI and ArbNet. The grant you are receiving is provided by ArbNet via The Morton Arboretum (Lisle, IL, USA). Below are conditions which must be adhered to in the use of any funds granted for the Partnership Programme Grant.

Use of Funds: The funds provided pursuant to this grant in the amount of **$2500** may be spent only in accordance with the provisions of your original funding proposal and budget (attached) as submitted through the BGCI Global Botanic Garden Fund. Any variation in the originally proposed project or budget must be submitted in writing and approved by ArbNet. Awarded funds must be spent by December 31st, 2021. Any grant funds not expended for purposes of the grant must be returned.

Fiscal Responsibility. City of Columbia is responsible for the expenditure of funds and for maintaining adequate supporting records (e.g. receipts, invoices) consistent with generally accepted accounting practices.

Reporting Requirements. City of Columbia will provide a final summary report, via the online reporting tool provided by BGCI, by December 31st, 2021. The report must include the following:

- A short narrative report describing the outcome of the project using the method of evaluation described in the application
- Photos and videos where applicable that BGCI and/or ArbNet might use on their websites and/or reports
- A report of actual expenditure against the budget submitted with the application (a template will be provided by BGCI).

If you do not provide sufficient reporting information, or fail to take reasonable steps to provide sufficient information as outlined above, we reserve the right to obtain reimbursement of the grant in full.

Important dates:

- **September 14, 2020:** Notification of the decision of the grant review panel
- **October 31, 2020:** Deadline for receipt of signed contract
- **2-4 weeks after receipt of the signed contract**: Grant monies distributed
- **December 31, 2021**: Deadline for completion of project and spending of award money

- **December 31, 2021**: Deadline for summary report to ArbNet.

Publicity. We ask that you include BGCI and ArbNet's logos (provided in your award notification email) in any marketing opportunities (including but not limited to: press releases, conference presentations, public programs, announcements, social media, feature stories, and print materials) produced in conjunction with the activities supported by the grant. This is a very positive way you can support the efforts of BGCI and ArbNet.

ACCEPTANCE

By accepting the Grant you agree that you will comply with the terms of the Grant as set out in this offer letter. BGCI, ArbNet, and The Morton Arboretum do not assume or accept any liability in any matter arising out of or incidental to the execution of the project.

We will make payment to the bank account specified in the Bank Transfer Details section (below) within 2-4 weeks of receiving this signed contract. To accept the terms of this Grant, please return one signed copy of this Grant Offer Letter and the bank details to Amy Byrne, abyrne@mortonarb.org by September 28, 2020.

On Behalf of City of Columbia

_____
Name and Title (*print or type*)

_____
Signature

_____
Date

On Behalf of ArbNet

Sue Paist, ArbNet Coordinator
Name and Title

Sue Paist
Signature

9/30/20
Date

Bank Transfer Details

Preferred currency:

Bank Account Name:

Bank Account Number:

SWIFT code:

IBAN number:

Bank Name:

Bank Address:

Approved as to form:

City Counselor

Ex situ* conservation of *Quercus acerifolia* and *Q. arkansana

Executive Summary

The goal of this project is to supplement previous collection efforts of *Quercus acerifolia* made in 2019 by Mr. Ryan Russell for Stephens Lake Park Arboretum (SLPA) (https://www.como.gov/parksandrec/park/stephens-lake-park/, http://www.arbnet.org/morton-register/stephens-lake-park-arboretum) located in Columbia, Missouri. In addition, this project envisions a new collection initiative for *Q. arkansana* beginning in 2020. Both of these species are listed as either vulnerable or endangered in the IUCN Red List for the genus (https://www.iucnredlist.org/species/35039/2858212, https://www.iucnredlist.org/species/30953/88108282). Collections of acorns were previously made in three of the four known locations of *Q. acerifolia* in 2019, but unfortunately one site produced poor germination rates, and Mr. Russell was unable to obtain the proper permits to collect at the fourth site, which necessitates a second collection trip. To augment these seed collections, a trip in the winter of '21-'22 is also planned for the purpose of collecting scions from mature specimens (including as many seed parents as possible) from each of the four known *Q. acerifolia* locations, for the establishment of a clonal planting, in addition to the seed derived planting, to be established at SLPA. As there are known sites of Arkansas oak (*Q. arkansana*) within short driving distances from the maple-leaf oak sites, we will attempt to locate and collect this species as well during the fall 2020 collection trip.

Aim and Objective

The purpose of this project is to develop a "complete" collection of *Q. acerifolia*, by capturing the maximum amount of genetic variability across the species as possible, through the planting of both seed-derived groves, as well as grafted clones that represent the known four sites where this species exists. The potential for subsequent phenotypic evaluation of both morphological and phenological traits across individuals representing these remaining locations will be useful for the study of adaptive traits that should help to guide future re-introduction efforts for this species. With the seedlings currently on hand from the 2019 trips, and the seed and scions we will hopefully collect in 2021 this effort will represent the most comprehensive collection of wild-sourced plants for this endangered species. While *Q. arkansana* has a broader distribution range than *Q. acerifolia*, we hope to collect from numerous individuals which will represent those populations which have yet to be sampled in existing arboreta collections. Over much of its range, Arkansas oak habitat is being converted into pine stands for paper mills. Mr. Russell has collaborators in the area that are very familiar with several known locations of *Q. arkansana*, and they have agreed to assist in these collection efforts, which will reduce travel time. Provenance information, extra seed, and seedlings from the 2019 collection trip have already been shared with organizations including The Morton Arboretum, The U.S. National Arboretum, Starhill Forest Arboretum and Missouri Botanical Gardens (MOBOT). In addition to the planting that will be established at Stephens Lake Park Arboretum (SLPA) and our partner site, Grigadale Arboretum (http://www.arbnet.org/morton-register/grigadale-arboretum), surplus seeds and plants from the 2021collection will be disseminated among other interested arboreta, primarily through the Plant Collections Network *Quercus* Multi-site (https://www.publicgardens.org/programs/plant-collections-

network/collections-showcase/quercus-multisite) and the Global Conservation Consortium for Oak (GCCO) (https://www.mortonarb.org/science-conservation/global-tree-conservation/projects/global-conservation-consortium-oak), Eastern US working group and safe site members.

Stephens Lake Park Arboretum is participating in the GCCO as a "Safe Site" for both of these threatened species. As a further demonstration of the commitment of the City of Columbia - SLPA to the goals of this newly-formed organization, Mr. Russell will also be serving as the inaugural chair of both the Oak Propagation and Collection Strategies Working Groups for the Eastern Region of the GCCO.

Partner Involvements

Stephens Lake Park Arboretum, as the lead institution for this project, has committed ample space, time and resources for the successful completion of this endeavor. This project anticipates all in-ground plantings to be completed by no later than 2025. The City of Columbia – Parks and Recreation Department (the landowners of SLPA), under the supervision of Mr. Russell, have budgeted ample supplies, labor etc. to complete this project. In addition, "satellite" sites have been identified on other park property for reserve plantings as an extra failsafe.

The old saying of "The best way to keep a plant is to give it away" works well here. Grigadale Arboretum, located in Argentina, under the supervision of Roderick Cameron is not only a well-cared for arboretum, but it is also free from potentially devastating ailments such as oak wilt, or Sudden Oak Death (SOD) that are both problem pathogens in some parts of the U.S. Like Mr. Russell, Mr. Cameron is a longtime member of the International Oak Society and has served on the Board of Directors since 2012. This international collaboration will provide us with a much-needed back-up site outside of the US, which will facilitate the long-term conservation of these two IUCN Red Listed *Quercus* species. Mr. Russell has known and worked with Mr. Cameron for a number of years and anticipates that this relationship will insure the future success of this project.

Dr. Mark Coggeshall will be collaborating with Mr. Russell on the US side of this project. He has over 40 years of forest genetics and tree improvement experience, focused on the genetic improvement, propagation and conservation of a number of oak species native to the eastern U.S. Prior to his recent retirement, Dr. Coggeshall served as Project Leader for the USDA Forest Service, Northern Research Station at Purdue University and as co-Director of the Hardwood Tree Improvement and Regeneration Center (http://www.htirc.org). He also served as Tree Breeder for the University of Missouri Center for Agroforestry (http://www.umca.org), Plant Evaluator and Nursery Manager for the Bernheim Arboretum and Research Forest (http://www.bernheim.org), and Tree Improvement Specialist for the State of Indiana (https://www.in.gov/dnr/forestry/3609.htm). He has extensive experience in plant genetic research, plant propagation and teaching. He is a life member of both the International Oak Society and the International Dendrology Society. He also serves as a member of both the Grove Design and Oak Propagation Working Groups for the Eastern Region of the GCCO.

The City of Columbia has previously demonstrated its support for this project by funding the first collection trips taken by Mr. Russell in 2019. However, due to the fiscal impacts of Covid-19, continued financial support from the City of Columbia will not be possible in the present fiscal year or next, but will

continue to provide labor, supplies and or vehicles to support this project. This financial reality highlights the importance of securing funds through a BGCI grant to complete this critical project that will directly address a number of important tree conservation goals, as stated in the BGCI call for proposals.

Global Strategy for Plant Conservation (GSPC)

We believe this project directly addresses several goals of the Global Strategy for Plant Conservation (GSPC), as stated in the 2020 BCGI call for proposals, including: promotion of *ex situ* conservation of rare and threatened species; development of infrastructure (populations of known provenance) leading to new training opportunities to support plant conservation activities; and the development of a new international partnership focused on the exchange of knowledge, skills and resources within the botanic garden community. In addition, this project will address a number of goals, as outlined in the current GCCO 5-year work plan. This project represents a direct *ex situ* conservation effort for two endangered *Quercus* species. The planting of a grove for both *Q. acerifolia* and *Q. arkansana* will ultimately contribute to the study of *ex situ* populations of known origin that could be of great importance by contributing to the subsequent study of these species with the long-term objective of their successful re-introduction to the wild. This project will also be used as a novel teaching tool for both local and international (hopefully) students and researchers. Our international partner, Grigadale Arboretum, will also be able to use these plants, not only as valuable accessions in their collection, but also as a teaching tool. This project directly addresses the work of the GCCO to establish and manage *ex situ* collections of high conservation value and undertake and facilitate applied research among other goals.

Evaluation

Evaluation of this project is anticipated to be a multi-year process, but initially, the planting of the *Q. acerifolia* grove will be the first priority. After the initial planting and establishment period, we will focus our attention on developing a robust maintenance program while initiating the applied phenoptyping research as described above. The evaluation process for this project will include monitoring of individuals, replacement of damaged or dead individuals, phenotyping of morphological and phenological traits of interest (e.g. leafing date, flowering and fruiting etc.). Dr. Coggeshall's professional expertise in these areas will not only be crucial to this phase of the project, but also important in teaching others such skills and will be used when designing future plantings. In addition, monitoring and treating disease, pests, hydrology issues, etc. will be a priority and necessary records will be kept.

Risk Management

One way we intend to manage risk will be to retain duplicate plants at either our nursery or at backup planting site(s), in case of failure of individual plants in the grove. Great care will be focused on maintaining all individuals in an excellent, vigorous condition, which will help to mitigate any negative effects caused by pests or diseases. They will be monitored routinely and sprayed, pruned, watered, mulched and fertilized as needed. In addition, we anticipate working with Mr. Matthew Lobell, of The Morton Arboretum, who serves as the current Director of the Plant Collections Network *Quercus* Multi-site Project to share materials and information among participating PCN *Quercus* partners. Mr. Russell

has sought accreditation for SLPA with the PCN for a number of years, and this project will help to address that accreditation need as well.

Additional Information

We feel this project fills a number of stated plant conservation needs, as outlined by the BGCI, GCCO, PCN and other conservation groups. Once these species are conserved in a reliable *ex-situ* setting, targeted *in-situ* conservation efforts can begin initiated in true collaboration with those partners listed in this proposal. In the future, we welcome the opportunity to include additional red-listed *Quercus* species to the ongoing plant conservation efforts at SLPA. Matthew Lobdell and Sean Hoban (The Morton Arboretum) have offered to share data with us, such as collection information, gps coordinates, etc. that will help our collection efforts, and we in turn have offered to share seed/seedlings, and resulting information with them. In the future we will share seed from our planting for their genetic research efforts. The City of Columbia – Parks and Recreation Department is dedicated to supporting this project through its completion, by providing "in-kind" labor, park ground and supplies. Despite the current financial short fall the city is experiencing and the inability to fund the proposed collection trips using city funds, we gratefully acknowledge the past and future support provided by the City of Columbia to this project. We feel this commitment to the project is exactly what is needed to insure its success – both initially and into the future.

Ex situ conservation of *Quercus acerifolia* and *Q. arkansana*

BOTANIC GARDENS CONSERVATION INTERNATIONAL

Project Budget for Application to BGCI's Global Botanic Garden Fund

Project Info		Budget Summary
Institution:	Stephens Lake Park Arboretum (SLPA)	Total Budget
Project Lead:	Mr. Ryan Russell	$ 2,500

	Staff Time		Equipment/Supplies		Other Costs	
Personnel (Include Name and Role)	Hrs	Rate/Hour	Units	$/Unit	Other	Budget
Mr. Ryan Russell - Horticulturist City of Columbia - SLPA	64	$0.00				-
Dr. Mark Coggeshall - Forest genetics, and plant breeding expert and project partner	64	$0.00				-
						-
						-
						-
Subtotal of Personnel						$ -
Equipment and Supplies	Hrs	Rate/Hour	Units	$/Unit	Other	Budget
collection materials - baggies, markers, flagging tape etc.						60.00
Incidentals						60.00
						-
						-
						-
Subtotal of Equipment and Supplies						$ 120
Other Budget Items (Travel, etc...)	Hrs	Rate/hour	Units	$/Unit	Other	Budget
Fuel for City of Columbia provided vehicle						300.00
Hotel stay - 8 nights total						1,200.00
Meals - 8 days total $55 per day per person 2020 per diem rate						880.00
						-
						-
						-
Subtotal of Other Budget Items						$ 2,380
					Subtotal of Project	########
					Overhead Percentage (Maximum of 10%)	
					Overhead	$ -
					Total Project Budget (Maximum $2,500)	########

Attachment B