



Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-062

Proposal Title: Preserving Minnesota's only Ball Cactus Population

Project Manager Information

Name: David Remucal

Organization: U of MN - Landscape Arboretum

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Project Basic Information

Project Summary: Minnesota's only population of ball cactus is threatened as a significant proportion of the population is on private, unprotected lands. Moving plants to protected land will better protect this species.

Funds Requested: \$103,000

Proposed Project Completion: 2023-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Methods to Protect, Restore, and Enhance Land, Water, and Habitat (F)

Project Location

What is the best scale for describing where your work will take place?

Region(s): SW

What is the best scale to describe the area impacted by your work?

Region(s): SW

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

The ball cactus (*Escobaria vivipara*) is a small cactus whose native range in the US reaches the western edge of Minnesota where it occurs as a single population in Big Stone and Lac qui Parle counties. It lives on thin soils on and around exposed granite outcrops on two larger privately-owned properties and the Big Stone National Wildlife Refuge (NWR). A major concern to both the Minnesota DNR and the US Fish and Wildlife Service that manages the NWR system is that these private properties hold the majority of the genetic variability for this species in the state. The plants in private locations are unprotected as long as they remain on private properties. The NWR subpopulation is on permanently protected public land. The nearby Plover Prairie property, owned by The Nature Conservancy (TNC), has granite outcrops that should also be suitable for the cacti.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

Propagation by seed of this species is slow, therefore collection of seed will occur prior to the granting period with all necessary permits in place. Funding from this grant will be used to address the following issues:

- 1) Translocation of adult plants to the Big Stone NWR and Plover Prairie.
- 2) Translocation of a subset of plants to the University of MN Landscape Arboretum (UMLA) for quarantine (to help remove weeds) and to create a reserve population in the event immediate translocations to Big Stone NWR/Plover Prairie fail.
- 3) Propagation and curation of two separate living genetic banks of material held at UMLA and University of MN College of Biological Science (CBS) Conservatory. These will serve as a failsafe (in addition to the seed bank) to ensure protection of the genetic material should translocations fail as well as a source of plants for augmentation at NWR. This augmentation will help protect against increasing poaching pressures at that site.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

This project will increase protection for ball cactus from current threats and ensure continued presence of the only population in the state. The project will also ensure preservation of the unique genetics represented in this edge-of-range population. Moreover, moving plants to off-site protected locations like UMLA and the CBS Conservatory will help buffer the species against future climate change effects by creating populations effectively protected from climate effects. In a larger sense, partnerships between multiple levels of government units and conservation programs are becoming increasingly important ways of conserving individual species, especially when buying and protecting land is not feasible.

Activities and Milestones

Activity 1: Transplantation of plants from private sites to the NWR and TNC sites and backup at UMLA

Activity Budget: \$66,000

Activity Description:

Plants will be moved from the threatened quarry sites to the NWR and to Plover Prairie. Both locations are permanently protected and have appropriate exposed granite outcrop landscapes within 10 miles of the population. A subset of plants will also be brought to UMLA. UMLA plants will be divided and curated at UMLA and the CBS Conservatory. Plants at UMLA and CBS will be moved to NWR/Prairie Plover to augment the population if plants are lost after the first translocations.

Activity Milestones:

Description	Completion Date
Move remaining plants to UMLA, to be split between UMLA and CBS Conservatory.	2021-11-30
Move majority of plants to Big Stone NWR and Plover Prairie, recording locations of individuals	2021-11-30
UMLA with NWR and TNC staff, monitor translocations annually. Augment subpopulations with reserves if necessary.	2022-07-31
UMLA with NWR and TNC staff, monitor translocations annually. Augment subpopulations with reserves if necessary.	2023-06-30

Activity 2: Propagation of seed material to replace plants that do not survive the transplant process.

Activity Budget: \$37,000

Activity Description:

From seed collected at the quarry sites, plants will be grown as backup material. Because cacti are very slow-growing plants, small amounts of banked seed will be grown in anticipation of attrition of translocated plants. Plants will only be outplanted at NWR and/or Plover Prairie or held at UMLA or CBS Conservatory.

Activity Milestones:

Description	Completion Date
Generate from seed enough plants to replace roughly 25% of the number of translocated plants	2022-02-28

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Joe Blastick	The Nature Conservancy	Plover Prairie, a TNC property will accept cactus subpopulation and manage land	No
Scott Simmons	US Fish and Wildlife Service	Big Stone National Wildlife Refuge will accept cactus subpopulation and manage land	No

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

After the initial two years of transplanting and monitoring additional work will hopefully be minimal, with population supplementation done as necessary and monitoring for at least 5-10 years. This work will be funded similar to other UMLA programs – through a combination of fundraising, earned income, and endowment support. External funding sources (grants, individual giving, corporate support) will continue to be pursued to extend population supplementation and necessary monitoring.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Preserving and Protecting Minnesota Native Orchid Species	M.L. 2015, Chp. 76, Sec. 2, Subd. 08c	\$167,000
Preserving Minnesota's Native Orchids - Phase 2	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 08h	\$259,000

Project Manager and Organization Qualifications

Project Manager Name: David Remucal

Job Title: David Remucal

Provide description of the project manager's qualifications to manage the proposed project.

Dr. Remucal is the Curator of Endangered Plants at the Minnesota Landscape Arboretum where he has developed and managed the Plant Conservation Program since its inception in 2013. A graduate of Carleton College, he received his PhD in plant reproductive ecology and evolution from the University of Colorado. He will provide overall project direction. As manager of the Plant Conservation Program, he has demonstrated the ability to manage and develop budgets, direct volunteers and staff, work with stakeholders, coordinate with remote and local partners, communicate program information and results to a variety of audiences, and expand the scope and influence of the MLA Conservation Program. As part of outreach and education for the program, he teaches and presents to multiple groups every year and works to reach a broad audience around the state. The Plant Conservation Program strives to work with a broad coalition of partners for its work, engaging with regional NGOs, federal, state and local governmental agencies and researchers and groups nationally and internationally-based. Remucal and the Plant Conservation Program has parlayed two previous LCCMR grants into a nationally-recognized orchid research and conservation program.

Organization: U of MN - Landscape Arboretum

Organization Description:

The U of MN Landscape Arboretum, founded in 1958, is a 1,200-acre premier northern garden that includes 28 specialty

gardens, 45 plant and tree collections, 18 model landscapes and natural areas, and an extensive collection of northern hardy plants. Located 35 minutes west of Minneapolis-St. Paul, the Arboretum's 12.5 miles of garden paths and hiking trails welcome 500,000 visitors each year who are inspired by their explorations of nature, the many seasonal displays and exhibits, and hands-on educational programming. The Arboretum's mission is to welcome, inform and inspire all through outstanding displays, protected natural areas, horticultural research and education. Its vision is to be the premier northern landscape arboretum, welcoming all to enjoy, learn from and connect with nature.

The U of MN Landscape Arboretum was born out of the University of Minnesota's Horticultural Research Center and is an established, nationally recognized research institution that includes a Plant Conservation Program focused on developing and implementing conservation strategies for imperiled native plants of the upper Midwest region.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Curator of Endangered Plants		Principal Investigator and project coordinator			26.7%	0.2		\$19,000
UMLA Field Botanist		Field coordinator and main botanist			24.1%	0.4		\$26,000
UMLA Greenhouse Technician		Propagation and Greenhouse specialist at UMLA			24.1%	0.2		\$9,000
UM CBS Conservatory Horticulturalist		Conservatory plant management and field work			23%	0.4		\$28,000
UM CBS Conservatory Student worker		Field and greenhouse assistance			0%	0.46		\$11,000
							Sub Total	\$93,000
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Tools and Supplies	Greenhouse and planting supplies: Including soil, digging and potting material	These tools and supplies will be needed for both the translocation of living plant material to various destinations and for propagation and maintenance of plant material at greenhouses at MLA and the CBS Conservatory.					\$4,000
							Sub Total	\$4,000
Capital Expenditures								

5/17/2020

							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Food and lodging during seed and/or live plant collection trips in Greater Minnesota more than 200 miles round trip for 4 people - \$133/day x 4 overnight trips per yr x 2 years. Reimbursed based on University of Minnesota plan.	Lodging and per diem for UM staff to survey, plan and execute translocation and planting of cacti.					\$4,500
	Miles/ Meals/ Lodging	Mileage reimbursement for seed and/or live plant collection trips - 300 miles round trip - .575 per mile x 4 round trips per yr x 2 years. Reimbursed based on University of Minnesota plan 2020 rate.	Travel mileage for UM staff to survey, plan and execute translocation and planting of cacti.					\$1,500
							Sub Total	\$6,000
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
							Sub Total	-
							Grand Total	\$103,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Attachments

Required Attachments

Visual Component

File: [8756ae9a-374.pdf](#)

Alternate Text for Visual Component

Visual representation of activities for proposal, moving unprotected plants to two protected locations as well as backed up at University of Minnesota locations. Previously banked seed at the UMLA long-term seedbank will be used to help replace plants that do not survive the move.

Optional Attachments

Support Letter or Other

Title	File
USFWS Letter of Support	9cf4e9c5-87d.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

No

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration



PRESERVING MINNESOTA'S ONLY BALL CACTUS POPULATION



Important but unprotected subpopulations will be relocated to nearby protected habitat; a small number of plants will be held at two U of MN locations as redundant backups.

Ball cactus on unprotected land



Photo by Stephanie Bishir

The Arb Seed Bank



Plants grown from previously banked seed will be used to replace attrition at protected sites until stable populations are established.

Four-month-old cactus seedling



Photo by Angie Koehler

The Arb

U of MN CBS Conservatory

Big Stone NWR

Plover Prairie

