Environment and Natural Resources Trust Fund

M.L. 2021 Draft Work Plan

General Information

ID Number: 2021-062

Staff Lead: Rory Anderson

Date this document submitted to LCCMR: October 15, 2020

Project Title: Preserving Minnesota's Only Ball Cactus Population

Project Budget: $103,000

Project Manager Information

Name: David Remucal

Organization: U of MN - Landscape Arboretum

Office Telephone: (612) 301-1838

Email: remucald@umn.edu

Web Address: http://www.arboretum.umn.edu/

Project Reporting

Date Work Plan Approved by LCCMR:

Reporting Schedule: December 1 / June 1 of each year.

Project Completion: June 30, 2023

Final Report Due Date: August 14, 2023

Legal Information

Legal Citation:

Appropriation Language:

Appropriation End Date: June 30, 2023

Narrative

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.

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.

While official landowner permits won't be sought until final approval by the MN DNR Rare Species Coordinator, informal cooperation from all parties (including DNR) has been obtained, and the USFWS and TNC are supporting partners on this proposal signalling their approval.

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.

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

Activities and Milestones

Activity 1: 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	February 28, 2022

Activity 2: 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.	November 30, 2021
Move majority of plants to Big Stone NWR and Plover Prairie, recording locations of individuals	November 30, 2021
UMLA with NWR and TNC staff, monitor translocations annually. Augment subpopulations with reserves if necessary.	July 31, 2022
UMLA with NWR and TNC staff, monitor translocations annually. Augment subpopulations with reserves if necessary.	June 30, 2023

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

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.
We will display plants at the Arboretum, where we can share the story of the individual project as well as the general importance of Minnesota native plant conservation through educational flyers, displays, and interpretive signage. We will also provide project updates and additional information on the Arboretum and Plant Conservation Program websites, https://arb.umn.edu/ and https://arbconservation.cfans.umn.edu/. Education, information, and outreach are important aspects of the Arboretum's conservation work. Additionally, we will give presentations at several local or national conferences or meetings each year, which are additional opportunities to share this project and our conservation work. Our collaborators in this project, The Nature Conservancy and US Fish and Wildlife, will also have the opportunity to inform their stakeholders about this work through their separate networks.

Finally, because this work will be done under several different permits, we will be making official reports of this project to the DNR.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the ENRTF Acknowledgement Guidelines.

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

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
UM CBS Conservatory Student worker		Field and greenhouse assistance			0%	0.46		$11,000
UM CBS Conservatory Horticuluralist		Conservatory plant management and field work			23%	0.4		$28,000
Curator of Endangered Plants		Principal Investigator and project coordinator			26.7%	0.2		$19,000
UMLA Greenhouse Technician		Propagation and Greenhouse specialist at UMLA			24.1%	0.2		$9,000
UMLA Field Botanist		Field coordinator and main botanist			24.1%	0.4		$26,000
							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								

							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

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

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

Added dissemination information, but otherwise unchanged. [10-10-2020] Added requested expanded information about dissemination and permit process.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I agree to the UMN Policy.

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven 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 Koebler

The Arb

U of MN CBS Conservatory

Big Stone NWR

Plover Prairie

LANDSCAPE ARBORETUM
UNIVERSITY OF MINNESOTA
Driven to Discover®

CONSERVATORY & BOTANICAL COLLECTION
COLLEGE OF BIOLOGICAL SCIENCES

The Nature Conservancy

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR