



Environment and Natural Resources Trust Fund

2024 Request for Proposal

General Information

Proposal ID: 2024-202

Proposal Title: Post-Baccalaureate Teacher-Researchers at Macalester's Ordway Field Station

Project Manager Information

Name: Mike Anderson

Organization: Macalester College

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Project Basic Information

Project Summary: A pilot post-baccalaureate program at Macalester's Ordway Field Station. Recent graduates will be recruited, preferentially from underrepresented groups, for 1-year terms to conduct place-based environmental research, education, and outreach activities.

Funds Requested: \$555,000

Proposed Project Completion: May 31, 2027

LCCMR Funding Category: Environmental Education (C)

Project Location

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

Region(s): Metro

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

Region(s): Metro

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 proposed pilot program addresses several recognized needs in environmental science that align with LCCMR's stated educational goals. First is a nationally recognized need for more pathways from undergraduate studies into further training and careers, particularly for historically marginalized groups. This need, exacerbated by COVID-19, has recently prompted the US National Science Foundation to initiate a post-baccalaureate ("post-bac") grant program. However, this program is too large for many small colleges to implement. Our proposal is to pilot a smaller program at Macalester College's "Ordway" Field Station, in partnership with Friends of the Mississippi River (FMR), drawing on our collective expertise in environmental science, education, and outreach.

Unlike the NSF program, ours will leverage post-bac training, and Ordway's unique location, into opportunities for broader environmental education and outreach, addressing widely recognized needs for environmental education of K-12 students and the general public. Lack of knowledge and general apathy regarding the environment - underlaid by increasing disconnection from nature - are understood by social scientists as major hurdles to collective action toward solving environmental problems. Engagement with nature, particularly through 'place-based' experiences in participants' local environment, has been shown to foster both retention of environmental information and motivation to address environmental issues.

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

The pilot post-bac program will last three years. Each year two one-year, fixed-term positions will be offered to recent graduates within and outside Macalester, making special efforts to target candidates from underrepresented groups.

Broadly, post-bac activities will include learning to do ecological/environmental research (50%), educating college and K-6 students (25%), and public outreach (25%). Research will include two foci: 1) contributing to Ordway's existing research program, and 2) conducting their own, potentially more broadly-based, project. For the latter, a range of topics will be offered by a broad pool of mentors from across Macalester's campus. Expertise from interested participants includes several sub-fields of ecology (aquatic, terrestrial, ecosystem, community, restoration, plant, animal, theoretical), and several fields within environmental studies (psychology, history, policy, justice).

Education and outreach activities will take a "place-based" approach centered on Ordway, but fostering connections across disciplines at Macalester and across organizations in the Metro. At Macalester, post-bacs will serve as co-teaching personnel in several courses, providing logistical support, guest lectures, and hands-on teaching and mentorship. Outreach activities will aim to strengthen Ordway's existing connections with Twin Cities organizations, and to form new ones. Finally, post-bacs will produce a public-facing "capstone" product for online audiences.

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?

Recruitment of candidates from underrepresented groups will enhance diversity of Minnesota's environmental workforce.

Training of post-bacs in research and education will provide expertise to Minnesota's workforce that directly applies to environmental awareness and solutions.

Education by post-bacs of Macalester students (~120/year), interest group participants (~200/year), and elementary students (~300/year) will disseminate knowledge of Minnesota's environmental issues across a diversity of local communities.

Post-bac outreach activities and products will raise public awareness of environmental issues in their community.

Shared mentorship of post-bacs will foster interdisciplinary collaboration within Macalester, and inter-organizational collaboration between Macalester, FMR and others.

Activities and Milestones

Activity 1: Post-bacs learn to conduct ecological, restoration, and environmental research

Activity Budget: \$321,598

Activity Description:

Roughly one-half of each appointment will be research: learning concepts and developing skills in field ecology and restoration, and developing an independent project tailored to their interests. All research activities will take a ‘place-based’ approach, applying broad ecological concepts and practical restoration knowledge to Ordway. Place-based approaches are inherently interdisciplinary, since the successful application of broad ecological understanding to a specific place requires understanding the history of that place and its surroundings, the connections between the place and its surroundings, and its multifaceted relationship to humans. Training for this activity will consequently draw from a large pool of mentors with varied expertise: our core team of two community ecologists (Dosch and Anderson), a restoration ecologist (Domyancich-Lee, FMR), and an environmental historian (Wells), and a secondary pool of potential independent project mentors drawn from across Macalester's campus.

Under this mentorship, the post-bacs will work to maintain and expand current research and restoration at Ordway. They will design experiments to supplement our long-term projects, and develop new projects to explore further avenues. The broad nature of place-based research, and the variety of independent project mentors available, will provide the post-bacs autonomy to pursue their own research interests and design their own project.

Activity Milestones:

Description	Approximate Completion Date
Each 1-year term: Presentation of research results at an appropriate professional conference	September 30, 2026
Each 1-year term: Presentation of summer research findings at Macalester's Summer Research Showcase	October 31, 2026

Activity 2: Post-bacs gain teaching experience, and educate college and elementary students

Activity Budget: \$106,702

Activity Description:

Roughly one-quarter of each appointment will focus on a variety of education activities at Macalester, with a three-fold aim: 1) help post-bacs gain teaching skills and experience, and 2) teach undergraduates about ecology and restoration work, and environmental issues at Ordway, 3) seek to form new connections with other disciplines at Macalester.

In fall semester, post-bacs will serve as instructional mentees for Dosch's Outdoor Environmental Education course, in which Macalester students develop outdoor environmental curriculum for use at Ordway, then teach it to K-4 students drawn from local public schools. Post-bacs will help with course design, teaching, student feedback, logistics and course management. In spring, post-bacs will serve as teaching assistants for laboratory sections of Ecology and the Environment, helping especially with field trips to Ordway. Both semesters, post-bacs will provide guest lectures in both introductory and upper-level ecology courses describing their research work at Ordway, the ecosystems and history of Ordway's land, and the broader importance of ongoing restoration and conservation work. Macalester students will benefit from near-peer teaching and place-based approaches.

During the pilot phase we will actively seek new collaborators for teaching activities across disciplines at Macalester. Faculty from several departments have already expressed interest.

Activity Milestones:

Description	Approximate Completion Date
Each 1-year term: Serve as teaching staff for Outdoor Environmental Education	December 31, 2026
Each 1-year term: Serve as teaching staff in Ecology and the Environment Labs	May 31, 2027

Activity 3: Post-bacs help conduct outreach activities and strengthen Ordway's connections within and beyond Macalester

Activity Budget: \$126,700

Activity Description:

Roughly one-quarter of each appointment will consist of outreach, both within and outside Macalester. Within Macalester, the post-bac will help foster interdisciplinary connections by visiting classes in other departments, and helping host visits to Ordway from other departments' courses, labs, and faculty.

Outside Macalester, post-bacs will seek to strengthen existing connections with partner organizations (e.g., Mississippi Park Connection, National Park Service, Friends of the Mississippi River, Scouts) by acting as co-hosts and guides during regularly scheduled events at Ordway, and by working with the organizations' staff to develop new opportunities and events. They will also work to establish new partnerships with local groups interested in environmental concerns, targeting especially under-represented communities (e.g., Hispanic, Hmong, Native American). These will be fostered through outdoor learning events such as seed collection or knowledge-sharing. We will take advantage of opportunities to expand inter-organizational connections provided by FMR's extensive local network and Macalester's recently-acquired Humanities for all Time grant from the Mellon Foundation.

During their term, post-bacs will also produce a 'capstone' product focused on continuing web-based outreach, e.g., a regularly-updated natural history blog focused on Ordway, an interactive data dashboard that allows users to explore some of Ordway's data, etc.

Activity Milestones:

Description	Approximate Completion Date
Each 1-year term: Present education/outreach work at an appropriate professional conference	September 30, 2026
Each 1-year term: Co-lead volunteer events with FMR and MPC	May 31, 2027
Each 1-year term: Produce a web-based capstone outreach/education product	May 31, 2027

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Jerald Dosch	Ordway Field Station Director. Macalester College, Biology and Environmental Studies	Co-PI	Yes
Dr. Chris Wells	Chair, Environmental Studies, Macalester College	Environmental Studies Department, Macalester College. Chris will co-mentor post-bacs in his field of expertise, environmental history, in order to help contextualize the ecosystem research being conducted on site.	Yes
Laura Domyancich-Lee	Friends of the Mississippi River, Restoration Ecologist	Laura will be FMR's project lead, coordinating labor, working with FMR staff and partners to organize events, and monitoring and evaluating contracted and volunteer restoration results at Ordway Field Station. Laura will mentor post-bac candidates in the principles of ecological restoration, including training, independent project development and feedback.	Yes
Dr. Alex Roth	Friends of the Mississippi River, Land Conservation Director	Alex will assist with project outreach and candidate recruitment with FMR's network of BIPOC, youth-centric, and Native-led partners, and will provide mentorship and feedback to post-bac candidates.	Yes
Laura Mann-Hill	Friends of the Mississippi River, Stewardship and Education Program Director	Laura will conduct outreach and candidate recruitment with FMR's Environmental Stewardship Institute (ESI) alumni, as well as connect current ESI youth participants to the program, providing the post-bac candidate with their own mentorship, teaching, and engagement opportunities.	Yes

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 work be funded?

Based on broad discussions with multiple stakeholders (recent graduates, Ordway researchers, Macalester faculty and administration, local environmental organizations) we anticipate significant interest in continuation of our post-bac program beyond the pilot period. Expanding use of Ordway is a major focus of Macalester's current Strategic Plan. Both Anderson and Dosch are currently participating in across-campus working groups focused on developing the Strategic Plan into a new Capital Campaign, and are strategizing with staff from the Development office to locate potentially interested alumni, corporate and foundation donors. Proof-of-concept demonstration via the pilot program should greatly improve our chances for securing ongoing funding.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Long-Term Efficacy Of Invasive Removal In Floodplain Forests	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 06b	\$25,000

Project Manager and Organization Qualifications

Project Manager Name: Mike Anderson

Job Title: Associate Director, Ordway Field Station

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

Mike Anderson has extensive experience conducting ecological field studies and teaching undergraduates, and has a unique knowledge of the Ordway site. He received his PhD from the University of Alaska, Fairbanks in 2011, where he trained in field ecology. He has worked and lived at Macalester College's "Ordway" Field Station since 2004, where he currently serves as the Associate Director and Resident Naturalist. In this position, he has conducted – individually and in collaboration with other researchers – over two dozen scientific studies, primarily focused on the causes and effects of plant species invasions. This work has resulted in the training of 61 undergraduate students, mostly participants in Ordway's residential summer program. It has produced several publications in peer-reviewed journals including *Ecosphere* (2019), the *Journal of Vegetation Studies* (2015), and *Biological Invasions* (2015), representing the work of 29 student co-authors. In addition to the research program at Ordway, Mike has 20 years of experience teaching undergraduate biology and mentoring students on a variety of extended projects and outside-the-classroom experiences. Finally, living at Ordway and exploring its grounds for 19 years has provided Mike with a uniquely comprehensive knowledge of the site and understanding of its logistical possibilities and constraints with respect to student training.

Organization: Macalester College

Organization Description:

Macalester College is a highly selective liberal arts college in St. Paul, Minnesota committed to academic excellence, internationalism, multiculturalism, and service. For first-year students entering in the fall of 2021, only 31% of the 9,046 applicants were admitted. A 10:1 student/faculty ratio ensures that Macalester's 2,244 students receive intensive instruction both in and out of the classroom. U.S. students of color comprise 31% of the Macalester student body. 16% of students are first generation college students. Consistent with broader trends in higher education, the majority of our students are female (55% in Fall 2021). In addition, 14% of Macalester students are international, representing 73 countries by citizenship. To ensure that students from all backgrounds can attend, Macalester meets the full financial need of admitted students. Two-thirds of our students receive need-based financial aid, with an average award of \$57,801 for full-time students in 2022.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Jerald Dosch, Primary Supervisor 1		Compensate extra time devoted to project			10%	0.39		\$40,455
Chris Wells, Primary supervisor		Compensate extra time devoted to project			10%	0.33		\$44,652
Alex Roth, Outreach coordinator & post-bac mentor		Compensate extra time devoted to project			10%	0.03		\$4,950
Laura Domyancich-Lee, Post-bac mentor		Compensate extra time devoted to project			10%	0.06		\$9,900
Laura Mann Hill, Outreach coordinator & post-bac mentor		Compensate extra time devoted to project			10%	0.03		\$4,950
First post-bac researcher/educator		Provide compensation for work and time			35%	3		\$174,331
Second post-bac research/educator		Provide compensation for work and time			35%	3		\$174,331
Secondary Supervisor 1		Compensate extra time devoted to project supervisors TBD by the post-bacs each year			10%	0.24		\$16,500
Secondary Supervisor 2		Compensate extra time devoted to project for a secondary supervisors TBD by the post-bacs each year			10%	0.24		\$16,500
Primary Supervisor 2		Compensate extra time devoted to project			10%	0.51		\$37,688
							Sub Total	\$524,257
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Tools and Supplies	Disposables: Material budget available to support independent projects	\$1,000 per project, for 6 student-mentor combinations					\$6,000

							Sub Total	\$6,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
							Sub Total	-
Travel Outside Minnesota								
	Conference Registration Miles/ Meals/ Lodging	One trip per year for 1 faculty and 2 students for 3 days	Includes airfare, hotel, conference fees and per diem for 3 people for 3 days.	X				\$19,950
							Sub Total	\$19,950
Printing and Publication								
	Publication	Open access fees	Publishing of two publications over the grant period					\$4,793
							Sub Total	\$4,793
Other Expenses								
							Sub Total	-
							Grand Total	\$555,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	One trip per year for 1 faculty and 2 students for 3 days	<p>The overarching purpose of our pilot post-bac program is to provide recent graduates with the training they need to enter the environmental science and education workforce. A fundamental skill in the skillset of any scientist is the ability to present their preliminary and/or most recent research findings to other scientists in the forum of a professional meeting. These meetings allow the budding researcher to get real-time, face-to-face feedback from experienced professionals, meet peers from all over, and network with potential graduate school or professional mentors to take the next step in their career. There is no substitute for these experiences.</p> <p>The largest and most impactful professional organizations that hold such meetings are national or international in scale and are therefore likely to hold their meetings outside Minnesota in any given year. This is true for the professional organizations most closely matched to the focus of Ordway's research, including the Ecological Society of America, the Organization of Biological Field Stations, the Ecological Research as Education Network, and the Society of Conservation Biology. These large meetings provide the best chance to meet workers of all seniority levels (senior PIs, post-docs, graduate students, and undergraduates) doing the most current and relevant work in ecology, including the top researchers from Minnesota. There are no within-Minnesota analogs to these organizations.</p> <p>This budget item is aimed at providing these crucial experiences and opportunities to our post-bac workers.</p>

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: [94f1c709-701.pdf](#)

Alternate Text for Visual Component

Images from Ordway Field Station showing participants engaged in activities related to the foci of the proposed post-bac program. Summer research students measuring plant cover; Fall semester Macalester students in Outdoor Environmental Education teaching local elementary students; Winter volunteers clearing invasive shrubs from the Ordway prairie....

Financial Capacity

File: [b993e370-a77.pdf](#)

Optional Attachments

Support Letter, Photos, Media, Other

Title	File
Letter of support and statement of interest from independent project mentors	5674686f-008.pdf
Letter of support from Friends of the Mississippi River	5bd874fc-c67.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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?

No

Does your project include the design, construction, or renovation of a building, trail, campground, or other capital asset costing \$10,000 or more?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services, as defined in Minnesota Statutes section 299C.61 Subd.7?

No