



Environment and Natural Resources Trust Fund

M.L. 2023 Approved Work Plan

General Information

ID Number: 2023-237

Staff Lead: Corrie Layfield

Date this document submitted to LCCMR: May 29, 2023

Project Title: Didymo II – The North Shore Threat Continues

Project Budget: \$394,000

Project Manager Information

Name: Mark Edlund

Organization: Science Museum of Minnesota - St. Croix Watershed Research Station

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Project Reporting

Date Work Plan Approved by LCCMR: June 22, 2023

Reporting Schedule: April 1 / October 1 of each year.

Project Completion: June 30, 2026

Final Report Due Date: August 14, 2026

Legal Information

Legal Citation: M.L. 2023, Chp. 60, Art. 2, Sec. 2, Subd. 04k

Appropriation Language: \$394,000 the first year is from the trust fund to the Science Museum of Minnesota for the St. Croix Watershed Research Station to identify North Shore streams with didymo, determine the risk of invasion to other streams, document didymo impacts to stream functioning, and develop strategies to prevent further spread of didymo.

Appropriation End Date: June 30, 2026

Narrative

Project Summary: Didymo or rock snot has invaded our North Shore streams. We must prevent its further spread and adapt our management approaches to this new invader.

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

In 2018, the first nuisance growth of rock snot (aka *Didymosphenia geminata* or, more simply “didymo”) developed in the North Shore’s Poplar River and we didn’t know why. Didymo is a freshwater diatom (a type of algae) that can form nuisance mats of goo in coldwater streams worldwide, both in its native range and where it is invasive. Formation of didymo mats in streams has aesthetic, economic, and recreational impacts, including impacting angling and recreational activities. Local economic impacts to tourism have exceeded \$20 million per year following other worldwide invasions, a serious threat to the North Shore’s \$250 million summer economy. Didymo mats disrupt community structure and ecosystem function in streams, alter habitat and food web dynamics, impact fish and invertebrate community composition, abundance, diversity, and result in major shifts in bacterial composition.

Initial ENTRF funding is being used to assess the scope of the problem and determine the source of North Shore didymo. Initial results have been shocking—in 2021, didymo was found in seven additional North Shore streams forcing us to change our strategy from containment to preventing further spread and adaptive management in a future likely to include didymo.

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.

Moving beyond the knowledge that didymo is established in many North Shore streams requires that we shift our emphasis to preventing its spread further and better understanding the full impact of didymo on stream functioning—from how nutrients are processed with and without didymo to how didymo will impact fisheries. Early funding focused on survey, seasonality, and sources of didymo. To prevent further spread of didymo and to develop a regional management response, we will show how didymo affects stream health, and how we must plan for the future by:

- 1) Continued survey of streams for didymo—the conditions that foster its invasion and which waters are vulnerable;
- 2) Intensive monitoring of streams with and without didymo to determine how didymo changes streams, their nutrient flow, algae, and lower food webs;
- 3) Stream fisheries assessment to quantify trout habitat, reproduction, and growth comparing fish population metrics to stream habitats to understand how didymo alters energy flow from nutrients to fisheries.

Because of the importance of these results to resource managers, anglers, and all North Shore visitors, our proposed project also includes a robust plan for:

- 4) Communication of results and solutions for how to protect streams from didymo.

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?

The project will benefit Minnesotans by:

- 1) identifying North Shore streams with didymo and the risk of invasion that other streams face;
- 2) showing how didymo impacts stream functioning from nutrient flow to fish production; and
- 3) developing strategies to prevent further spread of didymo and management tools to best protect and enhance our North Shore streams and their fisheries in the face of didymo.

This project will first understand the linkages between didymo and stream risk and function and then develop policy and management strategies for our North Shore streams.

Project Location

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

Region(s): NE

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

Statewide

When will the work impact occur?

During the Project and In the Future

Activities and Milestones

Activity 1: Measure threat of didymo invasion to North Shore streams with intensive monitoring

Activity Budget: \$230,860

Activity Description:

We will monitor five indicator streams (three had didymo 2018-2021) and the Lake Superior shoreline near the mouth of the streams for two full years to determine year-to-year variability in didymo mat formation and the timing and environmental conditions associated with mat formation in the streams and lake. Efforts in 2023 and early 2024 will center around field preparations and outreach development and activities. We will sample the stream-lakeshore pairs to document changes in environmental conditions, stream function, and food webs monthly from May-November (2024/2025). Sampling will include algae, chemical, and physical characteristics of sites. Invertebrate communities will be sampled for abundance, diversity and diets under didymo and non-didymo conditions. Temperature and discharge will be measured continuously throughout the project. Molecular analyses (DNA) will be used to characterize the bacterial, algal, and animal components of the didymo and non-didymo mats. We will characterize the bacterial community using 16S rRNA metabarcoding from periphyton extractions and shotgun sequencing to predict broader ecological consequences of didymo to learn how nuisance blooms can be triggered in ultra-clean waters. Two annual surveys will target 20 additional major North Shore stream-lakeshore pairs to assess current didymo presence and susceptibility of North Shore resources.

Activity Milestones:

Description	Approximate Completion Date
Describe the environmental conditions, algae, and foodwebs in 5 paired North Shore stream-lakeshore sites, Yr1	April 30, 2025
Survey all major North Shore streams for Didymo and invasion susceptibility during peak growth, Yr1	April 30, 2025
Use molecular tools to analyze lower food webs in didymo/non-didymo streams and shoreline Yr1	April 30, 2025
Use molecular tools to analyze lower food webs in didymo/non-didymo streams and shoreline Yr2	April 30, 2026
Describe the environmental conditions, algae, and foodwebs in 5 paired North Shore stream-lakeshore sites, Yr2	April 30, 2026
Survey all major North Shore streams for Didymo and invasion susceptibility during peak growth, Yr2	April 30, 2026

Activity 2: Measure impacts of didymo on North Shore fisheries

Activity Budget: \$123,855

Activity Description:

Didymo invasions of streams throughout North America have led to documented changes in bacterial, algal, invertebrate, and fish communities. Initial research on the North Shore invasion has only addressed bacterial and algal impacts. We will use this funding to add monitoring of all stream compartments (bacteria to fish) in our intensive sites to determine impacts of didymo on full stream energetics. We will use elemental analysis of stream compartments (algal mats, invertebrates, young of year fishes, adult fish) in didymo vs non-didymo streams and reaches to generate a first-of-its-kind stream energetics model for North Shore streams. These data will guide our Activity 3 management response. Efforts in 2023 and early 2024 will center around field preparations and outreach development and activities. Fisheries will be sampled twice each year (2024/2025) for young-of-year production (July) and adult distribution and health (October) using electrofishing methods appropriate for each stream reach. Fish and gut contents will be sampled for diet. We will measure weight and length of fish and calculate growth of young-of-year trout. We will measure habitat characteristics (temperature, stream size, substrate size) in the streams to quantify trout habitat, comparing fish population metrics to stream habitats.

Activity Milestones:

Description	Approximate Completion Date
Measure foodweb impacts on stream energetics in didymo and non-didymo streams and reaches, Yr1	April 30, 2025
Sample fisheries in didymo and non-didymo streams and reaches, Sampling Yr1	April 30, 2025
Measure foodweb impacts on stream energetics in didymo and non-didymo streams and reaches, Yr2	April 30, 2026
Sample fisheries in didymo and non-didymo streams and reaches, Sampling Yr2	April 30, 2026

Activity 3: Implement management strategy to protect our streams and fisheries**Activity Budget:** \$39,285**Activity Description:**

Understanding the threat and how didymo impacts our streams is the first step in planning for a North Shore future likely to include didymo. Results from Activities 1 and 2 will inform policy on how we prevent further spread of didymo and manage streams and nearshore Lake Superior under didymo threat. We will convene North Shore resource managers after our first and second sampling year to review protocols, help inform stream indexing, and ideate management planning. This activity will result in a) established monitoring protocols for detecting didymo presence, abundance, and food web impact, b) the designation of specific stream index reaches below the fish barrier in North Shore streams for stream and fish monitoring (currently missing for our stream fisheries), and c) a management response and plan for slowing didymo spread and developing adaptive management strategies to protect and enhance our North Shore in a future of change.

Through reporting, presentations, and outreach (SCWD, angler associations, MNDNR, tribal agencies, MN Waters Conference, social media), we will spread our findings to help stakeholders, agencies, and visitors recognize didymo and partner to slow its spread before it threatens more streams, lakes, and fisheries.

Activity Milestones:

Description	Approximate Completion Date
Convene North Shore resource managers to review protocols, stream indexing, and inform management plan Yr1	May 31, 2025
Convene North Shore resource managers to review protocols, stream indexing, and inform management plan Yr2	May 31, 2026
Inform North Shore stream management to minimize didymo threat and preserve fisheries	June 30, 2026
Develop reports, factsheets, and outreach to inform Minnesotans on protecting their threatened streams	June 30, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Heidi Rantala	MNDNR	Compile fisheries data. Assist with field collection, invertebrate analysis, statistical analyses, interpretation of data, and the creation of outreach materials and reports. Share information about the project and project results with stakeholder groups, partners, and agency scientists and leadership	No
David Burge	SMM-SCWRS	Assist with field collection, laboratory and statistical analyses especially molecular approaches, interpretation of data, and the creation of reports and materials. Share information about the project and project results with stakeholder groups, partners, and agency scientists and leadership.	Yes
Joe Mohan	SMM-SCWRS	Post-doc who will assist with field collection, laboratory and statistical analyses, interpretation of data, and the creation of reports and materials. Share information about the project and project results with stakeholder groups, partners, and agency scientists and leadership.	Yes
Robert Pillsbury	UW-Oshkosh	Laboratory and statistical analyses, especially 16S bacterial molecular approaches, and interpretation of those data for reports and materials. Additional assistance with field collections as available but not funded by LCCMR.	Yes

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.

From our project we anticipate that we will develop scientific publications, reports, informational factsheets, and engage social media to inform resource managers, the scientific community and lay-persons on the state and fate of the threat and impact of didymo on Minnesota's North Shore habitats. Edlund and project personnel are periodically invited to give presentations within their organizations, to agencies, at professional meetings, and to outside groups, and they will present this work upon invitation. We will communicate the findings of this study with the public through factsheets, blogs, and social media (Twitter, Facebook, Instagram) accounts associated with the St. Croix Watershed Research Station. We plan on publishing the results of this work as peer-reviewed publications in relevant scientific journals and communicating results at local, regional, state, and national meetings. All dissemination will include proper acknowledgement of LCCMR/ENRTF support. The following specific deliverables will result from this project:

- i) Final project report to LCCMR documenting results from Activities 1-3
- ii) Fact sheet for broad audiences summarizing the threat, causes, implications, and management response to Minnesota's didymo invasion of the North Shore
- iii) Social media posts through the outreach mechanisms and communication specialists at the Science Museum of Minnesota (e.g. <https://www.smm.org/scwrs/fieldnotes>) including blogs, and field Facebook, Instagram, and Twitter posts
- iv) Peer-reviewed publications (a minimum of 2 anticipated), presentations and technical assistance to local interest groups, county, state, and tribal agencies, and at local, state, or national meetings (e.g. angler associations, MDNR, MN Water Resources Symposium, IAGLR, North American Diatom Symposium, SFS).

We will acknowledge the Environment and Natural Resources Trust Fund through use of the trust fund logo or attribution language on all project print and electronic media, publications, signage, and other communications and outreach. We will use attribution language and social media tags found in the ENRTF Acknowledgment 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 work be funded?

Project results will be implemented with public awareness programming along the North Shore through our and project partner efforts, and using the reach of the Science Museum of Minnesota’s exhibit, virtual, and education programming to target everyone in Minnesota. The Department of Natural Resources, partners in this effort, recognize the threat of didymo and is committed to adapting their North Shore and Lake Superior fisheries management and messaging in response to project results.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Determining Risk of a Toxic Alga in Minnesota Lakes	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 06f	\$200,000
Invasive Didymosphenia Threatens North Shore Streams	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 06g	\$197,000
Unprecedented Change Threatens Minnesota’s Pristine Lakes	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 20a1	\$482,000

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Dr. Mark Edlund, Senior Scientist, SMM/SCWRS		Project mgmt, field, synthesis, outreach and reporting			29%	0.9		\$104,760
Dr. Joe Mohan, Post doc, SMM/SCWRS		Project coordination, field, analytical, reporting and outreach			29%	1.5		\$117,855
Dr. David Burge, Assistant Scientist, SMM/SCWRS		Field assistance, analytical, genomics, reporting and outreach			29%	0.75		\$50,634
Communication Specialist		Outreach			0%	0.1		\$4,000
							Sub Total	\$277,249
Contracts and Services								
SCWRS Analytical Lab	Internal services or fees (uncommon)	Water Quality analytical costs, 200 samples, analysis for TN/TP, DIN/SRP, DSi, DOC, DIC, benthic chlorophyll a, ash free dry mass, TSS/VSS: 200 samples @ \$198 (\$39,600) (unit prices for analysis at SCWRS at \$198 per)				0		\$39,600
UW-Oshkosh or competitive bid	Sub award	UW Oshkosh 16S genomics bacterial communities, 200 samples @ \$180.80 per (\$39160, UW Oshkosh or competitive bid)		X		0		\$39,160
Univ of Minnesota Genomics Ctr	Sub award	UM Genomics Ctr, shotgun sequencing of stream samples, 200 samples @ \$60 per (\$12000 University of Minnesota or competitive bid)				0		\$12,000
							Sub Total	\$90,760
Equipment, Tools, and Supplies								
	Tools and Supplies	Lab and field supplies	Lab and field expendable supplies (bottles, reagents, preservatives,					\$8,619

			consumables, and AIS prevention chemicals for 12 sampling trips - \$8619),					
							Sub Total	\$8,619
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	12 field trips to North Shore streams and lakeshore sites, Marine on St Croix to Grand Portage MN, including associated per diem and lodging costs	Sampling of North Shore streams and lakeshore sites, 2 field years					\$17,372
							Sub Total	\$17,372
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
							Sub Total	-
							Grand Total	\$394,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Contracts and Services - UW-Oshkosh or competitive bid	Sub award	UW Oshkosh 16S genomics bacterial communities, 200 samples @ \$180.80 per (\$39160, UW Oshkosh or competitive bid)	The didymo problem and threat is an emerging issue for Minnesota and using outside expertise is necessary at this early stage. We will be training students as part of this project (through our in-house outreach and training programs at no cost to LCCMR/ENTRF) to gain the expertise in Minnesota and beyond to be able to continue these monitoring and response efforts into the future.

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
State				
In-Kind	MNDNR in-kind, salary, Heidi M. Rantala, fisheries research, 5 % FTE in FY24-FY26, \$5362 per year (salary and benefits), \$16,087 total	Dr. Rantala will compile MNDNR Fisheries and stream data, assist in field work, coordinate invertebrate analysis, perform statistical analyses, and help create reports and outreach materials for the project.	Pending	\$16,087
			State Sub Total	\$16,087
Non-State				
In-Kind	All indirect project costs are provided in-kind by the Science Museum of Minnesota (federal indirect rate 40.09% on all direct costs = \$394,000)	In-kind contribution of indirects	Pending	\$161,146
			Non State Sub Total	\$161,146
			Funds Total	\$177,233

Attachments

Required Attachments

Visual Component

File: [8bf84bd0-84f.pdf](#)

Alternate Text for Visual Component

The Didymo threat to Minnesota's North Shore streams and shorelines is bigger than we thought. We must prevent Didymo's further spread and adapt management approaches to this new invader to protect Minnesota's treasured streams and fisheries....

Optional Attachments

Support Letter, Photos, Media, Other

Title	File
Letter of Support MN DNR	69fa133e-b7f.pdf
Letter of Support SMM	4511392a-240.pdf
Science Museum Non Profit 990 form	c27fa16f-d57.pdf
Background Check	7600ffe0-a6b.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

May 19 2023 Requested changes to Work Plan

Thank you for this final opportunity to make adjustments to our work plan and budgets. To address the requests of Corrie and staff:

1) Add a very brief description to either Activity 1 or 2 about the preparation and planning work that will be done in 2023 and 2024.

RESPONSE: we have added the following text to Activity 2: "Efforts in 2023 and early 2024 will center around field preparations and outreach development and activities."

2) The UW subaward should be marked as generally ineligible (Budget). Please add reasons for that into the actual budget justification box for documentation's sake.

RESPONSE: We have added this to the justification "The didymo problem and threat is an emerging issue for Minnesota and using outside expertise is necessary at this early stage. We will be training students as part of this project (through our in-house outreach and training programs at no cost to LCCMR/ENTRF) to gain the expertise in Minnesota and beyond to be able to continue these monitoring and response efforts into the future."

3) Please update the title to reflect the title in bill language as - Didymo II The North Shore Threat Continues.

RESPONSE: We have changed the title as requested to match the bill language.

4) All of the items requested on the "Introduction" page have been completed.

Thank you,

Mark Edlund

1) We have added a dissemination plan including language that we will acknowledge ENTRF funding/logos/tags in all dissemination products. 2) I have uploaded a completed Background Check certification form. 3) On the budgets, a) we provided greater detail on field and lab expendables in the Capital/Equip/Tools/Supplies line, and b) we provided greater detail on the 3 budget lines in Technical Services/Contracts including language for competitive bids if necessary. Thank you and please reach out with any additional modifications required.

Oct 24, 2022 Requested Changes to Work Plan

Thank you for the opportunity to review our work plan and provide more detailed documentation on the milestones and budget items. I have listed what we changed in the work plan in the responses given below to each staff request. Please reach out if additional detail is needed in the work plan.

1 Activities and Milestones: Please provide 1-2 additional intermediary milestones in each activity to aid staff in understanding chronology and assist in measuring progress.

RESPONSE: The easiest way to provide intermediary milestones is to separate our sampling years between milestones. For Activities 1 and 2, we have separated each "old" milestone into two milestones that are separated by our sampling years and given them completion dates that are more appropriate. For Activity 3, we added a milestone that we will convene resource managers after our first sampling year to help review our protocols, stream indexing efforts, help refine Year 2 sampling, and invite all to come on board with development of the final management plan. This provides an important and concrete intermediary milestone for our Activity 3. A sentence was also added to the Activity 3 description to better incorporate this additional milestone "We will convene North Shore resource managers after our first sampling year to review protocols, help inform stream indexing, and ideate management planning."

2 Budget: DJ 10/5/22 Under Professional/Technical contracts, please change the Contract or Service Type from Professional/Technical or Service Contract to Subaward for the UMN Genomics Center. If you intend to bid this contract, then keep it as a contract for now. If you ultimately decide to work with UMN, then this will need to be changed to a subaward.

RESPONSE: This budget item was changed to a subaward as suggested by staff.

3 Budget: Please change the UW-Oshkosh contract to a subaward. If you do intend to put this out to bid, then keep as a professional or technical services contract, but if you ultimately work with UW-Oshkosh, this will need to be a subaward as UW is not a for-profit institution

RESPONSE: This budget item was changed to a subaward as suggested by staff. If we need to send it out for competitive bid, I assume we can shift it back to a Professional/Technical or Service Contract.

4 Budget: If the SCWRS is part of SMM, this contract should be classified as an "internal fee"

RESPONSE: As the SCWRS is part of SMM, this budget item was changed to an "internal fee" as suggested by staff.

5 Budget: Please indicate if this travel costs include only travel or also includes lodging and per diem.

RESPONSE: We added to the description that this travel budget item does include per diem and lodging costs.

30 Nov 2022 Requested Changes to Work Plan

Thank you for the opportunity to review our work plan and provide more detailed documentation on staff concerns. I have listed what we changed in the work plan in the responses given below to each staff request. Please reach out if additional detail is needed in the work plan.

Regards,

Mark Edlund

1) Activities and Milestones--Please provide 1-2 additional intermediary milestones in each activity to aid staff in understanding chronology and assist in measuring progress.

RESPONSE: Activity 1- I've split the molecular analyses into two separate milestones to provide a stronger timeline of progress in this activity, essentially separating this work into a milestone that reflects each field year of sampling. Activity 3 – We added in the description that we'll convene North Shore resource managers and after our first and second years of sampling to review results, protocols, help inform stream indexing, and ideate management planning. We have separated these into two milestones to reflect their different end dates. It will be an important discussion to have both mid project and near-end project to address this critical resource issue to make sure all stakeholders and policy makers are at the table.

2) Budget--Please clarify if funds besides the 16S bacterial communities samples will be spent at UW Oshkosh. Keep in mind that out-of-state spending should be marked as generally ineligible and documentation provided to justify why the role cannot be fulfilled using in-state expertise and also how this expenditure will benefit the state.

RESPONSE: Dr Pillsbury at UW Oshkosh is the recognized expert on bacterial communities in didymo/non-didymo mats and has worked in other states (e.g. Michigan) on didymo outbreaks. Other than funding for the 16S bacterial communities sample analysis, no additional funding will be spent at UW Oshkosh or to support Dr Pillsbury (his participation in fieldwork will be opportunistic if he is in Minnesota and not supported by LCCMR). I've changed the project partner description for Dr. Pillsbury to read as "Laboratory and statistical analyses, especially 16S bacterial molecular approaches, and interpretation of those data for reports and materials. Additional assistance with field collections as available but not funded by LCCMR." The didymo problem and threat is an emerging issue for Minnesota and using outside expertise is necessary at this early stage. We will be training students as part of this project (through our in-house outreach and training programs at no cost to LCCMR/ENTRF) to gain the expertise in Minnesota to be able to continue these monitoring and response efforts into the future.

3) Activities and Milestones--Please provide some detail, either in the activity descriptions or in the milestones, about what will be occurring in 2023 and 2024?

RESPONSE: As noted above and repeated below, we've further adjusted Activities 1 and 3 to reflect a more detailed timeline of milestones. With funding starting in July 2023, we have developed our field sampling strategy to take place in 2024 and 2025. Early project efforts in 2023 and early 2024 will center around field preparations and outreach development and activities. It didn't seem appropriate to develop Activity 1&2 milestones around field preparation (but would be happy to do so if staff feels it would help track the project). The outreach development and activities are included as a project-long milestone in Activity 3; we will be doing outreach during the full timeline of this project. Again, if it would help we could break those outreach events into yearly milestones. Please advise.

Changes to Activity 1- I've split the molecular analyses into two separate milestones to provide a stronger timeline of progress in this activity, essentially separating this work into a milestone that reflects each field year of sampling. Changes to Activity 3 – We added in the description that we'll convene North Shore resource managers and after our first and second years of sampling to review results, protocols, help inform stream indexing, and ideate management planning. We have separated these into two milestones to reflect their different end dates. It will be an important

discussion to have both mid project and near-end project to address this critical resource issue to make sure all stakeholders and policy makers are at the table.

31 Jan 2023 Requested Changes to Work Plan

Thank you for providing details on clarifications needed in our work plan. We have made those changes as described below. Please reach out if additional detail is needed in the work plan.

Regards,

Mark Edlund

1) Budget -- Please mark the UW-Oshkosh subaward generally ineligible and add a justification.

RESPONSE: We marked the UW-Oshkosh subaward as "generally ineligible" in its budget category and added this wording for justification: "The didymo problem and threat is an emerging issue for Minnesota and using outside expertise is necessary at this early stage. We will be training students as part of this project (through our in-house outreach and training programs at no cost to LCCMR/ENTRF) to gain the expertise in Minnesota to be able to continue these monitoring and response efforts into the future."

2) Activities and Milestones -- Please include the following information on project activities occurring in 2023 and early 2024 to allow staff members to more easily reviewing the work plan updates.

RESPONSE: We updated both Activity 1 and Activity 2 descriptions to include this statement "Efforts in 2023 and early 2024 will center around field preparations and outreach development and activities." Other minor wording was adjusted to stay within word count limits. We did not specifically list this additional detail in the activity milestones, only in the activity descriptions, as per Corrie's recommendations.

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 Commissioner's Plan.

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?

Yes

Does the organization have a fiscal agent for this project?

No