

**Environment and Natural Resources Trust Fund**

# M.L. 2021 Approved Work Plan

## **General Information**

**ID Number:** 2021-159

**Staff Lead:** Corrie Layfield

**Date this document submitted to LCCMR:** July 21, 2021

**Project Title:** Collaborative State and Tribal Wild Rice Monitoring Program

**Project Budget:** $644,000

## **Project Manager Information**

**Name:** Josh Knopik

**Organization:** MN DNR - Ecological and Water Resources Division

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## **Project Reporting**

**Date Work Plan Approved by LCCMR:** July 20, 2021

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

**Project Completion:** June 30, 2024

**Final Report Due Date:** August 14, 2024

## **Legal Information**

**Legal Citation:** M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 03i

**Appropriation Language:** $644,000 the first year is from the trust fund to the commissioner of natural resources to work with Tribal partners to create a collaborative and comprehensive monitoring program to conserve wild-rice waters, develop remote sensing tools for statewide estimates of wild rice coverage, and collect consistent field data on wild rice health and abundance.

**Appropriation End Date:** June 30, 2024

## **Narrative**

**Project Summary:** Work with tribal partners in the conservation of wild rice waters, creating a collaborative monitoring program and developing remote sensing tools for statewide assessment of natural wild rice abundance.

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

Minnesota supports the largest abundance of natural wild rice in the United States, yet less than three percent of Minnesota’s wild rice lakes are monitored, and that data is fragmented and isolated. Both the Governor’s and the Minnesota Tribal Wild Rice Task Forces identified the need for a statewide monitoring program in 2018. DNR has no dedicated funds for wild rice monitoring, and limited funds for wild rice management. Adopted as the state grain in 1977, wild rice has declined in statewide distribution.

Wild rice is important to the state of Minnesota. In lakes, wild rice reduces phosphorous, protects shorelines from erosion, and provides habitat for, fish, birds, muskrats, and dragonflies. In the fall, wild rice lakes are important feeding areas for waterfowl during migration. Wild rice is culturally and spiritually significant to Minnesota tribes, and both tribal and non-tribal citizens harvest the seed.

Monitoring of wild rice has been initiated in parts of the state. The 1854 Treaty Authority began a program in 1998 to document wild rice abundance in northeastern Minnesota. From their initial program, a wild rice monitoring field guide and handbook was developed with partners, providing a tool for a more consistent approach.

**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.**

We propose to create a tribal-state wild rice monitoring program to develop a coordinated baseline of wild rice abundance in Minnesota. Data collected from the field will be used to improve a remote sensing tool for assessing statewide abundance of wild rice, analyze trends, and support investigations of challenges facing wild rice.

Current wild rice mapping efforts include the use of new technologies. Tribal entities are using drones for lake wide assessment, and Colorado State University developed a remote sensing application using Google Earth Engine (GEE) to identify wild rice stands across Minnesota. While the initial GEE process shows utility, refinement is necessary before the tool can be operational.

We are seeking funding to:
1. Build and develop a collaborative for comprehensive wild rice monitoring.
2. Use developed methods to collect field data on wild rice abundance and disease assessment on a selected set of wild rice lakes.
3. Improve and operationalize the existing Google Earth Engine tool to estimate annual coverage of wild rice statewide.

Support has been expressed by the following Tribes: Fond du Lac, Leech Lake, Grand Portage, Mille Lacs, White Earth, and Red Lake Nations, and inter-tribal organizations including the 1854 Treaty Authority, MCT and GLIFWC

**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?**

A state-tribal collaborative for monitoring wild rice will:
• Increase consistency among data sets on wild rice density, coverage, disease and phenology;
• Improve our understanding of wild rice abundance and coverage at the state level;
• Enhance our collective understanding of cultural perspectives and approaches to conservation of wild rice;
• Develop more robust tools for monitoring wild rice;
• Reveal long-term changes in wild rice that may result from a variety of factors such as climate change, land use change and lake shore development;
• Improve relationships between state and tribal resource staff engaged in wild rice management.

## **Project Location**

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

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

**When will the work impact occur?** During the Project

## **Activities and Milestones**

### **Activity 1: Coordinate and collect field data on wild rice abundance and health across a sub-set of wild rice lakes**

**Activity Budget:** $451,000

**Activity Description:**Annually coordinate and assess a minimum of 15-20 wild rice lakes using agreed upon monitoring methods and guidance. Depending on collaboration process, this number could increase substantially (50-100). Assessments on each wild rice lake may include: mapping of floating and emergent aquatic plants, collection of water samples for water quality, sediment sampling, and water level data. Multiple sample sites (minimum of 40 per lake) will be used to collect detailed plot data, including wild rice stem density, water depth, presence of other aquatic plants, sediment characteristics, and presence of disease (such as brown fungal spot and rice worms).

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Work flow developed and guidance documents created (database and field applications) | June 30, 2022 |
| Long-term monitoring lakes selected and monitoring tiers developed per collaborative agreement | June 30, 2022 |
| Wild rice lakes sampled and monitoring data entered into database (annually) | December 31, 2023 |
| Annual Review and Presentation of Data to Collaborative | February 28, 2024 |

### **Activity 2: Build and develop a collaborative for comprehensive wild rice monitoring.**

**Activity Budget:** $73,000

**Activity Description:**Building trust and developing relationships are critical for creating a long-term wild rice monitoring Collaborative. The milestones described below are potential milestones, recognizing that the point of the Collaborative is to share, discuss and build a framework for the collaborative that we construct together. Discussions have begun online, showing interest in a collaboration, however each tribal entity will decide whether to participate and at what level, should the proposal be funded.
Support for early and regular communication, and building awareness of cultural values and differences have been part of our first conversations. It is our intent to continue communication during the entire LCCMR process. Suggested milestones for the Collaborative include monthly coordination and collaborative meetings in the first year. Coordination prior to monitoring season and an annual meeting to discuss and present monitoring results has been identified as a priority.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Meet monthly with tribal and state partners to develop collaborative guidance. | June 30, 2022 |
| Hold annual Collaborators Wild Rice Symposium | February 28, 2023 |
| Wild Rice Conservation Report | June 30, 2024 |

### **Activity 3: Improve and operationalize Google Earth Engine remote sensing tool to estimate statewide wild rice coverage.**

**Activity Budget:** $120,000

**Activity Description:**Operationalize and refine the Google Earth Engine (GEE) wild rice mapping application initially developed by Colorado State University. Use the field data from the annually monitored wild rice lakes, and satellite imagery, to improve accuracy of the GEE model. With each year of lake monitoring, improve and assess wild rice mapping methods. The final product will include a consistent data workflow, resulting in annual, statewide wild rice coverage maps.

One of the constraints with the current model is accuracy in stands of wild rice that are sparse and stands which consist of mixed vegetation. In the first year, additional data will be collected to determine at what point (stems per square meter) accuracy of the model declines. A benefit of refining the model is that the incorporated satellite imagery and radar data is available back to 2017. This can potentially provide an extended look at wild rice abundance through the years, prior to the project years.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Trial and test field assessment/ ground truthing methods to enhance density gradients | January 31, 2022 |
| Refine GEE model using increased stand density data and methods (DNR Resource Assessment) | June 30, 2022 |
| (DNR Resource Assessment) develops annual statewide map of wild rice coverage (2023, 2024) | January 31, 2024 |
| Statewide wild rice coveragemaps using 2017-2021 satellite imagery/radar data | June 30, 2024 |

## **Project Partners and Collaborators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Organization** | **Role** | **Receiving Funds** |
| Michael Northbird | Minnesota Chippewa Tribe Environmental Program | Collaboration building. Serves as central communicator for environmental and natural resource work among the Tribes (Mille Lacs, Bois Forte, Grand Portage, Leech Lake, White Earth and Fond du Lac). | No |
| Katie Draper | Mille Lacs Band of Ojibwe Department of Natural Resources | Collaboration building and wild rice monitoring interest. Sub-award to be determined. | Yes |
| Shane Bowe | Red Lake Nation Department of Natural Resources | Collaboration building; Currently involved in collecting drone imagery for wild rice monitoring. Sub-award to be determined. | Yes |
| Peter David | Great Lakes Indian Fish and Wildlife Commission | Conducts monitoring around Mille Lacs area and works in the 1837 treaty ceded territories. Mille Lacs Band of Ojibwe and Fond du Lac are member tribes. | Yes |
| John Bekkerus | White Earth Nation Division of Natural Resources | Collaboration building. Explore options for monitoring wild rice. Sub-award to be determined. | Yes |
| Nancy Schuldt | Fond du Lac Band of Lake Superior Chippewa Resource Management Division | Collaboration building. Wild rice monitoring and restoration experience. Sub-award to be determined. | Yes |
| Crystal Ng and Cara Santelli | University of Minnesota Interdisciplinary Manoomin Collaboration | Inputs on collaboration; Coordination on field sampling, analysis, and data collection. | Yes |
| Margaret Watkins | Grand Portage Band of Lake Superior Chippewa Environmental and Biology Department | Interested in collaboration building around wild rice monitoring. Sub-award to be determined. | Yes |
| Kate Hagsten | Leech Lake Band of Ojibwe Division of Resource Management | Collaboration building. Currently assessing wild rice on lakes within the reservation, and began a project to look at rice worms. Looking for partners to extend rice worm work. Sub-award to be determined. | Yes |
| Darren Vogt | 1854 Treaty Authority | Collaboration building. Governed by the Bois Forte and Grand Portage bands. Currently monitor wild rice and may be interested in working to develop additional efforts. Sub-award to be determined. | Yes |
| Kristen Blann | The Nature Conservency | Collaboration building, field data collection and analysis. Sub-award to be determined. | No |
| Jody Vogeler | Colorado State University - Natural Resources Ecology Lab | Technology transfer and training on Google Earth Engine model development. | Yes |
| Annette Drewes | The Nature Conservancy | Tribal Collaborative Coordinator | 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.**The end product of this project will be an annual maps of wild rice stands across much of the state of Minnesota. The final database, geographic extent, and map product platform will be decided by the collaborative (to be developed under Activity 2). One potential option that has been discussed is the Minnesota Natural Resource Atlas - host by UMN's NRRI. ENTRF will be acknowledged through use of the trust fund logos and attribution language on all shared products per the ENTRF 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 be funded?**This project will provide the initial foundational framework to build a collaborative effort to monitor wild rice statewide. Increased coordination, expanded monitoring, and consistent data will allow resource managers to better understand impacts to wild rice, plan for protection and identify trends in wild rice distribution. Ongoing efforts will be made to MN DNR management and other organizations to prioritize making this a permanently funded program.

## **Budget Summary**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category / Name** | **Subcategory or Type** | **Description** | **Purpose** | **Gen. Ineli gible** | **% Bene fits** | **# FTE** | **Class ified Staff?** | **$ Amount** |
| **Personnel** |  |  |  |  |  |  |  |  |
| Field technician |  | Field data collection |  |  | 20% | 3 |  | $152,064 |
|  |  |  |  |  |  |  | **Sub Total** | **$152,064** |
| **Contracts and Services** |  |  |  |  |  |  |  |  |
| DNR Resource Assessment | Internal services or fees (uncommon) | Improve the Google Earth Engine remote sensing application, listed in Activity Three, and produce statewide wild rice coverage maps. |  |  |  | 0 |  | $100,000 |
| Colorado State University - Natural Resources Ecology Lab | Professional or Technical Service Contract | Technology transfer of Google Earth Engine remote sensing process and algorithm. Provide training to DNR Resource Assessment staff to operationalize process. This entity developed the initial process and is the sole contractor. |  |  |  | 0 |  | $20,000 |
| TBD | Sub award | Sub Awards granted to collaborative partners. Funds will be used for data gathering efforts such as hiring field staff (interns or seasonal technicians). |  |  |  | 0 |  | $270,000 |
| The Nature Conservancy | Sub award | Funding to provide tribal collaborative coordination. |  |  |  | 0.45 |  | $44,485 |
|  |  |  |  |  |  |  | **Sub Total** | **$434,485** |
| **Equipment, Tools, and Supplies** |  |  |  |  |  |  |  |  |
|  | Tools and Supplies | Water Sampling supplies and analysis | Water sampling supplies and analysis |  |  |  |  | $7,500 |
|  | Equipment | Field sampling equipment | Canoes and other tools for field sampling. |  |  |  |  | $6,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$13,500** |
| **Capital Expenditures** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Acquisitions and Stewardship** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Travel In Minnesota** |  |  |  |  |  |  |  |  |
|  | Miles/ Meals/ Lodging | lodging and meals | lodging and meals during field sampling |  |  |  |  | $12,716 |
|  | Other | DNR Fleet services | truck lease and mileage (3 trucks for 3 months/yr) |  |  |  |  | $10,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$22,716** |
| **Travel Outside Minnesota** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Printing and Publication** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Other Expenses** |  |  |  |  |  |  |  |  |
|  |  | Direct and Necessary | DNR’s direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated projects. HR Support (~$4,983), Safety Support (~$926), Financial Support (~$2808), Communication Support (~$1,324), IT Support (~$10,045), and Planning Support (~$1,149). |  |  |  |  | $21,235 |
|  |  |  |  |  |  |  | **Sub Total** | **$21,235** |
|  |  |  |  |  |  |  | **Grand Total** | **$644,000** |

### **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** |  |  |  |  |
| In-Kind | Natural Resources Specialist - Aquatic Ecologist, Clean Water Funded | Project Manager (0.25 FTE): Writing contracts, participating in collaborative development, budgeting, and some field sampling. | Secured | $70,200 |
| In-Kind | Natural Resource Specialist - Aquatic Biologist, Heritage Enhancement Funded | Field Coordinator: Hire, and train technicians, Coordinate sampling efforts with partners, field sampling | Secured | $70,200 |
| In-Kind | State Program Administrator - Clean Water Specialist : Water Recreation Funded | Tribal Collaborative Coordinator - Bring together tribal and other organizations, through meetings and workshops, to develop a wild rice monitoring collaborative. some field sampling | Secured | $28,080 |
| In-Kind | Professor - Hydrology/Hydrogeology, funded by University of Minnesota, Twin Cities, Dept. of Earth & Environmental Sciences | University collaborative fieldwork coordinator - Assist with training field crew on hydrological monitoring and water/sediment sampling, coordinate field visits, participate in collaboration meetings with tribal partners and MN-DNR | Secured | $5,368 |
|  |  |  | **State Sub Total** | **$173,848** |
| **Non-State** |  |  |  |  |
| In-Kind | Freshwater ecologist, The Nature Conservancy in MN, ND, SD | Collaboration building, field data collection and analysis | Secured | $25,000 |
| In-Kind | Environmental Program – Program Manager, Minnesota Chippewa Tribe (MCT) | MCT Coordinator – participation and oversight through meetings and/or workshops related to project and Tribal collaboration | Secured | $2,500 |
| In-Kind | Program Director, Red Lake Nation Water Resources Program | Collaboration building and field protocol development | Secured | $10,000 |
| In-Kind | Water Projects Coordinator, Fond du Lac Band of Chippewa | Collaboration building, field monitoring development | Potential | $10,000 |
| In-Kind | Resource Management Director, 1854 Treaty Authority | Collaboration building and field monitoring development | Potential | $10,000 |
| In-Kind | Natural Resources specialist for Mille Lacs Band of Ojibwe, and associated staff and resources | Collaboration building, monitoring resources and staff time. | Potential | $7,500 |
|  |  |  | **Non State Sub Total** | **$65,000** |
|  |  |  | **Funds Total** | **$238,848** |

## **Attachments**

### **Required Attachments**

#### ***Visual Component***

File: [28056695-850.pdf](https://lccmrprojectmgmt.leg.mn/media/map/28056695-850.pdf)

#### ***Alternate Text for Visual Component***

Title: Collaborative State-Tribal Wild Rice Monitoring Program. Pictures of a wild rice plant; a person measuring wild rice stems in the field, from a canoe; a map of Minnesota and the current and past distribution of wild rice; an aerial photo of Upper Rice Lake with areas of wild rice shown in dark purple and areas in the lake of mixed vegetation with shown in light purple. A three bulleted list of project activities and the logos from the natural resource divisions of Red Lake, Fond du La...

### **Optional Attachments**

#### ***Support Letter or Other***

|  |  |
| --- | --- |
| **Title** | **File** |
| UMN\_Ng\_LetterOfSupport | [95434c20-d98.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/95434c20-d98.pdf) |
| TNC letter of support for wild rice proposal | [ddc4460f-52c.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/ddc4460f-52c.pdf) |
| Leech Lake Band of Ojibwe Letter of Support | [42f0f3ab-b90.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/42f0f3ab-b90.pdf) |
| Background Check Certification Form 2021\_159\_Knopik | [b9a9fd2f-6ee.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/b9a9fd2f-6ee.pdf) |

## **Difference between Proposal and Work Plan**

#### ***Describe changes from Proposal to Work Plan Stage***

Cuts were made to field sampling (Activity 1), $130,000 was cut from tribal sub awards, and $85,000 was cut from DNR technician FTE, Annette Drewes (Tribal Collaborative Coordinator) line was for moved from the personnel budget line item, and added as a sub award received by The Nature Conservancy. This was done to reflect her change of employment, from a classified position with MN DNR to a coordinator with the non-profit organization, The Nature Conservancy. She will continue to fulfil her role within this project despite her change of employment.

## **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?**
 No

**Does the organization have a fiscal agent for this project?**
 No