

## **2017 Project Abstract**

For the Period Ending June 30, 2021

**PROJECT TITLE: Developing Youth Watershed Stewardship in Northwest Minnesota**

**PROJECT MANAGER: Lee Furuseth**

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**FUNDING SOURCE: Environment and Natural Resources Trust Fund**

**LEGAL CITATION: : M.L. 2017, Chp. 96, Sec. 2, Subd. 05f as extended by M.L. 2020, First Special Session, Chp. 4, Sec. 2**

**APPROPRIATION AMOUNT: \$121,000.00**

**AMOUNT SPENT: \$121,500.00**

**AMOUNT REMAINING: \$500.00**

## **Project Abstract**

The project entitled Developing Youth Watershed Stewardship in Northern Minnesota established the Environmental Science Club. Goals were established, pursued and met:

skill development, enhanced understanding, recognition of relationships between actions and outcomes, provided positive experiences, shared similar information through presentations, and demonstrated deeper understanding of ecosystems.

## **Final Work Plan**

Environmental Science Club was established in early 2019 for 10 to 18 students led by HSC staff in each of 2-hour club sessions. Members came to HSC from two sources: Boys & Girls Club of Bemidji with students from fifth grade to eight grades along with HSC's youth participants. Students explored ground-water, examined rivers & built models of watersheds; culminating with a lakeshore clean-up. The club was expanded into summer where Voyageurs Expeditionary High School students participated in a four-day outdoor ecological study as part of their summer school course curriculum requirements.

Club activities resumed heading into the fall and winter of 2019. Specimens from area water were gathered and examined. Eighteen students participated in Environmental Science Club.

With the turn of the new year, HSC headed into 2020 with twelve more club sessions in January, February, and early March. Then Covid-19 struck & we were soon surrounded by uncertainty with hybrid models for students attending class & afterschool activities virtually. In this phase we co-opted our “Daily Live Science Show” -once a week- with labs testing for chloride & then showing E. coli sampling & lab technique for various local stream studies.

Our hybrid approach shifted again to macroinvertebrate assays, crowd sourced, demonstrating how to gather, sort, classify & count organisms for our pollution intolerance index. With this scale we were able to determine water quality by presence, or lack thereof, pollution intolerant organisms, as well as diversity. This scale allowed us to determine, and present electronically degree of ecological integrity. Despite most environmental news being dire and even depressing, we are pleased to present our findings of excellent condition for many streams and even found pollution sensitive organisms in places way downstream. We are thankful that this LCCMR grant allowed us to share these insights.

#### **Project Results Use and Dissemination**

Club participants always focused on results -via exploration & the scientific method- utilizing various skills learned for water examination. In the first thirty months of the project, participants presented knowledge they had gained at science fairs & peer-to-peer feedback sessions. Student field journals, notes & posters accompanied project presentations. Final professional production of posters was not completed. Funding for this portion of the project was remains unspent and this portion of the grant should be returned to the ENRTF.

During the last six months of the grant cycle the pandemic overtook us, so we shifted to a hybrid virtual model. Our 3:30 show became a regular afternoon session on three platforms: YouTube, Facebook and Twitch TV with final selected videos appearing on the <hscbemidji.org> Website.



# Environment and Natural Resources Trust Fund (ENRTF) M.L. 2017 LCCMR Work Plan

**Date of Submission: August 15, 2021**

**Date of Next Status Update Report: Final Report**

**Date of Work Plan Final Report Approval: 06/07/2017**

**Project Completion Date: June 30, 2021**

**PROJECT TITLE: Developing Youth Watershed Stewardship in Northwest Minnesota**

**Project Manager:** Lee Furuseth

**Organization:** Headwaters Science Center

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**Location: Beltrami, Cass, Clearwater, Hubbard**

**Total ENRTF Project Budget: \$121,000**

**ENRTF Appropriation: \$121,000.00**

**Amount Spent: \$120,500.00**

**Balance: \$500.00**

**As of June  
30, 2021**

**Legal Citation: M.L. 2017, Chp. 96, Sec. 2, Subd. 05f** as extended by M.L. 2020, First Special Session, Chp. 4, Sec. 2

**Appropriation Language:**

\$121,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with the Headwaters Science Center to accelerate a multiyear environmental science club for middle-school students focused on water quality, watershed evaluation, and aquatic invasive species in northwestern Minnesota. This appropriation is available until June 30, 2020, by which time the project must be completed and final products delivered.

M.L. 2020 - Sec. 2. ENVIRONMENT AND NATURAL RESOURCES TRUST FUND; EXTENSIONS. [to June 30, 2021]



## **I. PROJECT TITLE:** Developing Watershed Stewardship in Northwest Minnesota Youth

### **II. PROJECT STATEMENT:**

Science stirs the imagination. It opens minds to new and exciting frontiers, from ridiculously tiny things in an atom to the mind-boggling hugeness of the universe. Sometimes it takes a spark to ignite a sleepy imagination to undertake the discovery of things yet to be found and to understand the complexities of our world. Headwaters Science Center (HSC) encourages these sparks through hands-on and authentic learning experiences, including our weekly after school science clubs for elementary students that focus on Science, Technology, Engineering, Math (STEM) topics during 30, 90-minute sessions during the school year.

HSC will implement an environmental science club for 20 late elementary and middle school students with a focus on environmental science concepts, including watershed evaluation, aquatic invasive species, sustainable communities, and climate change. The proposed club will meet 30 times during the school year for 90 minutes and combine hydrologic field work and water quality education. We plan to partner with the Boys and Girls Club of the Bemidji Area to enroll more students, including those from traditionally underserved populations, in the environmental science club. Participants in the program will learn skills by actively engaging in the field and classroom work. Students and professionals from local natural resource employers and academic institutions, including the Leech Lake Tribal College, will join with Headwaters Science Center for single sessions as mentors and professional advisors related to the topic of the session.

The environmental science club emphasizes quality contact hours with a cohort of 20 students, over a high volume of youth with limited instruction or contact time. This approach will result in 30-35 contact hours per participant and 600 to 650 contact hours per year per cohort. The environmental science club will repeat annually with new cohorts of 20 students for a total of three years. We request three years of funding to implement, evaluate, and establish this effort.

Environmental Science Club participant goals are

- develop skills for water quality testing and demonstrate importance of each parameter
- enhance understanding of scientific thinking, processes, and decision making through authentic outdoor learning experiences
- create awareness of aquatic invasive species, nutrient loading, shore land alteration, littering, and disposal of personal products such as pesticides, road salt, or petroleum products, and
- understand the relationship between watershed management practices and water quality
- share information with others through peer to peer feedback sessions, science fair posters, and/or websites.

Our primary goal for the proposed environmental science club is to deliver high quality, hands-on environmental and STEM education curriculum to students living and working in the watershed via citizen science opportunities and watershed research.

### **III. OVERALL PROJECT STATUS UPDATES:**

**Project Status as of January 2018:** Headwaters Science Center (HSC) has successfully established an “Environmental Science Club” for 5<sup>th</sup>- 8<sup>th</sup> graders in the Bemidji area, partnering with the Boys and Girls Club of Bemidji; they provide a staff member and ten youth. HSC advertised and recruited youth and were successful in getting seven to sign up. Between September and January, the club met 2 hours each session a total of eleven times.

In good weather the club met outside where participants surveyed Lake Bemidji, looking at chemical and biological components as they’ve built living and permanent collections. Participants were each given their own field notebook and taught how to log data and capture meaningful field observations. This occurred five times, before the onset of much colder weather and plummeting water temperatures.

In the cold months, participants have established club aquaria, begun a dichotomous key for fish identification in the northern MN area, explored aquatic nutrient dynamics and established our “Adopt a Lake” strategy. One significant difficulty that we had was recruiting an intern for fall semester, even though we advertised on local college campuses and our website. Because we couldn’t hire an intern in the fall months we had two of our current HSC staff members work additional hours as “interns” to help complete project goals for this grant. In January after additional recruiting, we were successfully able to hire a very qualified college student, majoring in Secondary Education and Environmental Science, to help with the club.

**Project Status as of July 2018:** Between January and April the club had twelve two-hour sessions. Because most of these sessions occurred during the winter, we focused on lab and indoor activities to augment our field days of the fall. We explored groundwater dynamics through models and presentations. Our club aquaria were monitored for chemical and biological components and further maintained at the start of every session. Changes in water chemistry and/or fish health were discussed and remedied. We spent two sessions using river models to investigate river processes and simulate how water flow affects substrate, biological presence and diversity and overall water quality. Fish physiology was explored through dissection of yellow perch specimens caught by students in Lake Bemidji. The dichotomous key was used to identify species. Through the necropsy we analyzed the health of the specimen and inferred the health of the body of water the animals came from. We studied soil, soil identification, and how soil and water interact and affect each other. Our last official session was the first week of April due to staffing issues at the Boys and Girls Club. We finished up with a lakeshore clean-up of the downtown shore of Lake Bemidji and a short wrap session.

We have planned a summer day camp focused on local lake and water ecology which will take place at the end of August. This camp is a highly condensed version of our Environmental Science Club, but it affords us a chance to take advantage of prime sampling weather and to get the word out for our next cohort of possible students.

**Project Status as of January 2019:** Through the summer, we partnered with Voyageurs Expeditionary High School to bring their summer science students out into the field to sample Lake Bemidji, study shoreline ecology and discuss powers of ten as they relate to water quality sampling. We sampled three public beaches and sent the samples off to a lab to help determine the cleanest swimming beach on the lake.

In August we successfully held a 4-day outdoor aquatic ecology camp focusing on water sampling, water safety, ecology and responsible recreation. It was a highly condensed, less formal version of our school year club. We only had 5 participants, but each one wished the camp was longer and anxiously wait for the next summer’s camp.

Using the above mentioned activities as recruiting tools, we were able to have 18 students sign up to be part of the club in early September, compared to 15 the year before. Between September and January, the club met 11 times for two hours each session. Students were given field notebooks and showed how to log data and observations. While weather permitted, club members were taken to local aquatic sites to monitor and measure various biological and chemical parameters of waters. On the main exhibit floor of the museum, the club has established and maintained a large aquarium displaying local flora and fauna collected during our field outings. Club members have also established and maintain a number of smaller tanks in our club space filled with various species of fishes, both native and exotic.

**Project Status as of July 2019:**

Between January and May, we held 12 two-hour club sessions. Because of the season, much of our time was spent indoors at our home base. The club conducted experiments and made microscopic observations which covered many topics from animal morphology, animal behavior, and water quality. Water quality through healthy community living was the theme throughout the entire semester.

The club continued to monitor and maintain the large, main-floor native tank exhibit, adding perch and various local invertebrates that were caught during spring sampling events. The smaller club aquaria in our club area houses local and exotic species of fishes with plants and other animals which are monitored and maintained by students.

This year again, we have been fortunate to partner with Bemidji State University and are grateful for the attention the University Professors have shown us for our efforts and activities. In the winter of 2019 the club was allowed usage of Bemidji State University's *Aquatic Biology Hardwater Lab*. This heated, portable lab-space, positioned on the ice of Lake Bemidji, expanded our ability to experience, sample and study the water even on the coldest of winter days. In spring of 2019 the club was given permission to use Bemidji State University's Hobson Memorial Forest which is a 240-acre stretch of hard and soft woods, wetlands, wildflowers, trails with bodies of water, including Lynn Lake. The club uses the forest as a rich site to experience natural life and the benefits that follows from immersion in it. Students created, logged, and hid geocaches throughout the forest focusing on placing them in different eco-zones. Once again we are invited into an area middle school's (Voyagers Expeditionary School's) summer school classes for students working toward graduation requirements. There are plans to use BSU's pontoon and aquatic lab for a short summer day camp as well and with summer on and the area ripe with opportunity; let the bounty that is a Minnesota summer begins!

We currently have 3 ESRI digital maps in progress: invasive species, Hobson Forest geocaches, and a Club Story map which details sample sites, experiment sites, and many other features that will be added as the club story continues.

#### **Project Status as of January 2020:**

Between July and January 2020, we held twelve two-hour club sessions and four five-hour summer sessions with the Voyagers Expeditionary School. July, August and Sept provided opportunities to "be in the lake" examining water, fish and aquatic species (bugs). The club conducted experiments and made microscopic observations which covered many topics from animal morphology, animal behavior, toxicology, erosion, chemical infiltration, river morphology and water quality. Water quality through healthy community living was the theme throughout the entire semester.

The club continued to monitor and maintain the large, main-floor native tank exhibit, perch, walleye and various local invertebrates that were caught during July, August and Sept. sampling events. The smaller club aquaria in our club area houses local and exotic species of fish with plants and other animals which are monitored and maintained by students. This year again, we have been fortunate to partner with Bemidji State University and are grateful for the attention the university professors have shown us for our efforts and activities. Our club continued the usage of Bemidji State University's *Aquatic Biology Hardwater Lab*. This heated, portable lab-space, positioned on the ice of Lake Bemidji, expanded our ability to experience, sample and study the water even on the coldest of winter days. In spring of 2019 the club was given permission to use Bemidji State University's Hobson Memorial Forest which is a 240-acre stretch of hard and soft woods, wetlands, wildflowers, trails with bodies of water, including Lynn Lake. The club uses the forest as a rich site to experience natural life and the benefits that follows from immersion in it. Students created, logged, and hid geocaches throughout the forest focusing on placing them in different eco-zones. Students also did several field experiments in the Hobson forest including tree health assessment, tree aging, wetland plant observation, wetland soil profile and upland soil profiles. Once again we are invited into an area middle school's (Voyagers Expeditionary School's) summer school classes for students working toward graduation requirements. There are plans to use BSU's pontoon and aquatic lab for a short summer day camp as well and with summer on and the area ripe with opportunity; let the bounty that is a Minnesota summer begins! We currently have 3 ESRI digital maps in progress: invasive species, Hobson Forest geocaches, and a Club Story map which details sample sites, experiment sites, and many other

features that will be added as the club story continues. The club story map is home to much of the maps and data collected in the field through a series of mobile GIS based apps and GPX data points.

During Sept., Oct., Nov. ,Dec. and continuing in 2020, Jake S., hired as an HSC intern, was elevated from performing intern job-related responsibilities to becoming a full-time educator. He was promoted, both at the Headwaters Science Center and in the LCCMR to the title of Educator III. Also, another staff person joined the team of educators and replaced Educator II. This replacement of staff was a natural transition and was the result of staff promotion and transfers. Changes for Educator II and Educator III are immediate and do not result from an amendment.

**Amendment:**

The includes two major changes: addition of Lab Managing Educator with funding from Professional Contract(s) and an increase in Equipment and Supplies from Travel. The amendment is that HSC will directly conduct water testing for contaminants. This amendment/change will provide the opportunity to educate our club members on water testing, as opposed to sending samples to a lab 90 miles away. The Lab Manager Educator will be a HSC staff member and will be a 1.0 FTE (full time equivalent).

The focus will be primarily on three types of water testing: 1. E.coli. Testing for bacteria most commonly found in the intestines of humans and other animals, and with some strains causing severe food poisoning. And, 2. testing for algae in water samples. Testing of water that appears very green to determine the type of algae. And finally, 3. Nitrates and other anions in water samples. Nitrates tests will be used to determine the presence of nitrate ion in lakes, ponds, and well water.

Conducting testing of water samples in our own science center, the creation of our own lab, and directly teaching students the processes of water testing, provides a tangible instructional setting for our club members. Furthermore, HSC will slightly modify our target age-group and expand club membership to include high school-age students. It is our intent to have students (club members) teach/mentor other students (younger club members).

HSC will use the budget code 62000 Wages, Benefits and Taxes for 1 FTE for a period of time not to exceed six months and lasting from Jan., 2020 (approval of amendment) through June 30, 2020, removing the current budget line for Professional Contract services. This change is with the addition of a Lab Managing Educator, at 1.0 FTE which at times will include more than one individual sharing the duties and responsibilities of this position.

Included in the amendment of a 1 FTE equivalent staff person, HSC further request to modify the budget to move about ⅓ of the remaining Travel budget, or \$2,500, to the Equipment and Supplies budget. Transportation requirements will be diminished without the need to transport samples to and from a distant town about 90 miles away. It is estimated that the remaining \$750 in the travel budget will be sufficient for collecting samples and delivering them the center. Also, HSC has an existing lab for the testing of water samples, and HSC has conducted waters in past years. Having said that, the Equipment and Supply budget, with the additional of \$2,500, will be needed to up-date equipment and purchase supplies for conducting the water sample testing.

Changes to budget:

Add new budget staff line: Lab Managing Educator: \$18,864.00 for a new total of \$18,864.00  
Decrease Professional Contracts from \$19,200 to \$436.

Increase Equipment and Supplies to from \$31,500 to \$34,000, on the original budget and decrease Travel from \$3,300 to \$715.44.

Amendment approved by LCCMR 2/7/2020.

**Project extended to June 30, 2021 by LCCMR 6/18/20** as a result of M.L. 2020, First Special Session, Chp. 4, Sec. 2, legislative extension criteria being met.

**Project Status as of July 2020:**

Between January 2020 and July 2020, HSC held weekly clubs in January, February and the first two weeks of March as a continuation of typical club procedures. Club participation stayed at 12-16 youth participants each week, though there decline was noted in the first two weeks of March. Club focused on a variety of water quality, forestry, and chemistry topics. HSC prepared to conduct field sampling in the next season. On March 18, HSC closed to the public and remained closed until July 2, 2020.

The clubs switched to virtual meeting, "Live Shows at 3:30 on Facebook. " Facebook, Instagram, Website, Youtube notifications were made and invitations were sent to all current club members. Clubs shows were titled Trout Class, which is a trout aquarium, sponsored by Trout Unlimited, and shows the progression from egg to full grown trout. Also, Fish Necropsy, the dissecting of fish taken from Lake Bemidji. Other titles include: Watersheds, Health of Trees, Bog or Forest, How to Conduct Water Testing, Citizen Science Page and more.

Select 3:30 shows are available on the Headwaters Science Center Facebook page. 3:30 shows were expanded to include Youtube and TwitchTV. Viewership regularly totaled 100-200 views, with instances of more than 250. Clubs were held virtually every day from March 18 through July 1.

During March, April, May and June, the "Shaughnessy Lab" was set up and made ready for water testing on-site by Headwaters Science Center staff. We began converting a section of our club space into a lab designed to do a large variety of tests along with longer running more persistent studies. The goal of this lab was to better allow more students to work at the same time as well as allowing different studies that had not been completed. Some of the major studies we are preparing for include algae studies, chlorophyll, e-coli, and more.

**Project Status as of January 2021:**

From June 15, 2020 through January 1, 2021, HSC experienced shut downs, reduced capacity and limited visitors, and bans on all groups, clubs and group activities. With reduced activities, HSC reduced staff using resignations, requests for long-term unpaid leaves, and furloughs. During extended periods all LCCMR educators were off the payroll. Overall, staff was reduced 42%. Partial return to work occurred in August, but by October, furloughs were reinstated and have remained in place through Dec. 2020. No on-site clubs are reported for this six-month period.

"Live Shows at 3:30 on Facebook "continued. Approximately 100 shows were filmed and uploaded during the months of July through December. Environmental science remained a frequent topic, but shows included other areas of science exploration. Youtube, Facebook Live, and Twitch TV remain the social media sites. Also, videos are available on the website. Viewership has not remained at quite as high levels, but HSC regularly has 100 viewers within the first seven days.

The "Shaughnessy Lab continues to receive regular attention. Modifications to testing equipment, as well as regular cleaning and upkeep continue.

**Amendment Request:**

As per the amendment request, HSC is requesting to increase Website uploads by \$800 for a total of \$1,300, which will be used to upload data and information, as of July, 2020, and continuing through the remainder of the project, to the HSC Bemidji Website. The request will increase to 26 uploads at \$50/upload. Furthermore, the request is to reduce Partner Mentor time by \$800 to a total of \$200, and reduce from 10 mentor sessions to 2 mentor sessions.

**Amendment Approved by LCCMR 5/4/2021****Overall Project Outcomes and Results:**

Environmental Science Club was established in early 2019 for 10 to 18 students led by HSC staff in each of 2-hour club sessions. Members came to HSC from two sources: Boys & Girls Club of Bemidji with students from fifth grade to eight grades along with HSC's youth participants. Students explored ground-water, examined rivers & built models of watersheds; culminating with a lakeshore clean-up. The club was expanded into summer where Voyageurs Expeditionary High School students participated in a four-day outdoor ecological study as part of their summer school course curriculum requirements.

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With the turn of the new year, HSC headed into 2020 with twelve more club sessions in January, February, and early March. Then Covid-19 struck & we were soon surrounded by uncertainty with hybrid models for students attending class & afterschool activities virtually. In this phase we co-opted our "Daily Live Science Show" -once a week- with labs testing for chloride & then showing E. coli sampling & lab technique for various local stream studies. Final professional production of posters was not completed. Funding for this portion of the project was remains unspent and this portion of the grant should be returned to the ENRTF.

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**IV. PROJECT ACTIVITIES AND OUTCOMES:****ACTIVITY 1: Environmental Science Club Planning, Programming, Monitoring, and Evaluation****Description:**

Headwaters Science Center (HSC) staff will partner in 2017-18 with the Boys and Girls club of the Bemidji Area to recruit participants for the environmental science club. Twenty participants in environmental science club will create personal field journals, learn how to record field data, review the scientific method, and interact with local scientists to learn more about field work and scientific inquiry. Participants will collectively participate in an in-situ, physical, biological and chemical sampling experience in the Mississippi Headwaters Watershed using Minnesota Pollution Control Agency (MPCA) protocols. Participants will research and identify threats to watershed health including aquatic invasive species, nutrient loading, shoreline use, and climate change. HSC will seek additional partnerships with Cass Lake Boys and Girls Club, Blackduck School District, and Bagley School District. HSC will recruit environmental professionals from the Leech Lake Band of Ojibwe Division of Resource Management, Leech Lake Tribal College, Mississippi Headwaters Audubon Society, Bemidji State University and similar, to serve as advisors for individual sessions and watershed activities.

Headwaters Science Center (HSC) staff will use participant assessment surveys to evaluate progress during the sessions and the learning outcomes. HSC educators plan additional sessions based on feedback. Participants engage with peers, HSC educators, and partner mentors to review and assess their projects. Constructive feedback and interaction provides a base for participants and educators to develop and refine program objectives and outcomes. Watershed data collected during club sessions is compiled and posted as a map or other visual to the HSC website. Participants also present their projects at local science fair, Science Week at the Boys and Girls Club of Bemidji, or science night hosted by HSC.

<b>Summary Budget Information for Activity 1:</b>	<b>ENRTF</b>	<b>\$121,000.00</b>
	<b>Appropriation:</b>	
	<b>Amount Spent:</b>	<b>\$120,500.00</b>
	<b>Balance:</b>	<b>\$500.00</b>
		<b>As of June 30, 2021</b>

<b>Outcome</b>	<b>Completion Date</b>
<b>1.</b> <i>Twenty participants will be given a field notebook and learn how to log data and field notes into the notebook</i>	September 2017
<b>2.</b> <i>Twenty participants will learn to use a portable monitoring device to record physical properties of a water body including: temperature, pH, Dissolved Oxygen (DO)</i>	October 2017
<b>3.</b> <i>Twenty participants will take their field notebooks with them into the field during water quality sampling events and use them to record data.</i>	November 2017
<b>4.</b> <i>Twenty participants will learn and be able to collect water samples for analysis in a qualified laboratory.</i>	April 2018
<b>5.</b> <i>Twenty participants will be able to interpret lab reports and relate them to watershed health.</i>	April 2018
<b>6.</b> <i>Twenty participants will be able to identify at least three (3) aquatic invasive species present in water bodies in the greater Bemidji area and surrounding counties.</i>	May 2018
<b>7.</b> <i>Twenty participants will be able to describe and identify ways that humans can help or harm a watershed</i>	May 2018
<b>8.</b> <i>Twenty participants will adopt a watershed and identify best practices, areas of improvement, human impacts, and other factors and share their findings with fellow participants.</i>	May 2018
<b>9.</b> <i>Staff create a survey for participants to complete post club experience – including Fall and Spring sessions</i>	December 2017 and May 2018
<b>10.</b> <i>Staff use feedback to modify, science club programming to achieve meaningful results and provide enrichment to participants – Fall and Spring Sessions</i>	December 2017 and May 2018
<b>11.</b> <i>Participants and staff use data collected to create a watershed health map or related graphic, and post to Headwaters Science Center website for public access.</i>	June 2018

The above activity outcomes will be repeated during school years 2018-19 and 2019-20 with new cohorts of 15 to 20 upper elementary and middle school youth.

**Activity 1 Status as of January 2018:** During the first session of the Environmental Science Club (ESC) each participant was given a field notebook and showed how to record notes and data along with examples of field

notebooks from famous scientists. Students were given an overall idea of the club's purpose, activities and goals as well as an opportunity to share their goals and ideas for the club. General lab and field safety standards were explained. Students were shown sampling equipment and proper use as well as explaining why those numbers are important. Students were introduced to waders, d-nets, seine nets, probes and probe calibration. Each subsequent session began with students taking field notebooks and sampling equipment outside and recording data. When living organisms were collected, students were familiarized with dichotomous keys and their use. Students identified and cataloged collections. Bio-indicators were explained and explored. Students inferred water health through organisms collected in the field. Students were introduced to the concept of habitats as they relate to pH, DO and other physical and biological indicators. Indoor group aquatic tanks were set up and maintenance was explained. As the weather turned too cold to be outside, we shifted focus to lab work. Through monitoring and maintaining aquaria students were able to see how changes in temperature and water chemistry affected the organisms living in the tanks as well as considering the reason and remedy for those changes. Through games we became familiar with the periodic table in general and then we concentrated on those elements that hold significant importance for aquatic systems. We investigated the nitrogen and phosphorus cycles and their impact on water quality. We also looked how humans affect those cycles both positively and negatively. Challenges we faced early on were largely due to the quick turn-around time after funding was approved by the legislature. We had little time to promote the club so initially participants from outside of the Boys and Girls Club were low. We struggled to find a qualified intern for fall with such short notice, but we were able to fill in with current HSC staff until we found a well-qualified intern from Bemidji State University. The club took a break mid-winter due to school vacation and Boys and Girls Club staffing.

**Activity 1 Status as of July 2018:** After winter break, we continued with classroom and lab activities. Using models and presentations, we delved into groundwater and watershed dynamics utilizing hands on water process models that HSC had from a previous project. Students were able to dissect fish that were collected from Lake Bemidji to familiarize themselves with physiology as well as perform a "Fish Health Assessment" through necropsy. Students continued to monitor and maintain their aquaria and some children felt such ownership over them they even came in during break to work on the tanks. The students were able to use Elwah River models to explore river formation processes and human impacts on aquatic ecosystems involving dam deconstruction. As a group we planned our "Adopt-a-River" activities through the Minnesota Conservation Corps. Students chose a stretch of Lake Bemidji shoreline that we would claim and clean up in the spring after ice-out. The section of shoreline will be regularly cleaned by future groups of ESC. We examined soil formation, texture, and identification and discussed how soil affects water quality and what effects water has on soil, focusing mostly on wetland soils. When weather permitted us to return to the outdoors, we resumed our outings with our field notebooks and sampling devices. We compared our spring readings to our fall readings. Our club officially ended the first week of April. The final day was spent on the shores of Lake Bemidji picking up trash in honor of Earth Day. At the very end we asked for feedback from the students about what they would change, and they all agreed that they wanted more sessions and that they wanted the opportunity to return again the following fall.

As our major challenges have been 1) fewer participants than we desired and 2) cold weather that made water sampling difficult, we have been prepping for the next school year by having HSC (Headwaters Science Center) staff work with the same age students from Voyageurs Expeditionary High School to augment their summer middle school's science programming with all day environmental science programming. Students were familiarized with powers of ten to help understand the scope of millions and billions in preparation for a survey study of public swimming beaches on Lake Bemidji. For the survey students were taught proper protocol for taking lab-quality samples. Once a week students collected several samples from 3 different swimming beaches on Lake Bemidji and these were sent off to RMB laboratory to be tested for E. coli. Students learned how we can extrapolate water quality based on those readings and the presence of indicator species. Students explored pH in the laboratory and conducted an extensive chemical and biotic survey at the shores of Lake Bemidji. This HSC program will help know where we can best sample in the fall and spring, and has already helped recruit students for our ESC.

In August, HSC will be hosting a Water Ecology Summer Camp at Spearhead Nature Conservancy, which is a three-day condensed version of our ESC, where students will have the opportunity to investigate local waters, collect and identify specimens, sample water biochemistry and analyze them in our portable water laboratory. We will use this camp as an opportunity to recruit participants for the upcoming session of Environmental Science Club. We think that these two summer HSC programs will set us up nicely for the upcoming school year for ESC.

**Activity 1 Status as of January 2019:** We began fall session with a general overview of the goals of the club and a discussion about what the students want to get out of the club. Each participant received a field notebook and a lesson on how to use them. Students were shown different examples of field notebooks ranging from famous scientists like Charles Darwin to those of other middle school students to illustrate that there are different ways to collect and record data. Students were introduced to dichotomous keys to identify specimens. Kids were familiarized with sampling equipment such as probes and nets, and how to collect samples with minimal contamination. The final activity of our first meeting was fitting waders and discussing water safety.

As living specimens were collected and identified, healthy creatures were added to a large aquarium the club started at the end of 2018's session. This native species tank is located on the main exhibit floor of HSC, near the entrance. It has become a focal point for club members and visitors alike. Currently this tank has one largemouth bass, crayfish, perch, and native vegetation. This tank works complements and enhances two other exhibits on our floor: 'Mercury in Fish' and 'We are Water MN'. The club has many smaller tanks in our club area that house smaller native and exotic fish species that club members study and maintain.

A favorite activity is looking at and recording micro- and macroinvertebrates, from the tanks under various scopes. We have seen daphnia, rotifers, diatoms, and tardigrades among many others; the students were genuinely surprised at the extensive variety of life that exists at this scale.

Headwaters Science Center was lucky enough to be selected as a stop for the traveling exhibit "We are Water MN". The club spent time interacting with the exhibit and on opening day, some club members volunteered as docents and helpers for our public celebration. This traveling exhibit fits wonderfully with our club and it is a great supplement to our activities.

Environmental Science Club has established a large watershed display tool to model actual human and geological processes. We use real sand and gravel as it is, after initial testing, preferred over the synthetic type for sifting, sorting and realistic representation. We are currently constructing a properly protected stream at farm's edge to highlight the importance of riparian strips and adequate setbacks from water's edge in farming areas. The public is often invited to take experience along with us, on this model, to look and learn. An interesting side note is that Headwaters Science Center's younger, elementary aged science club, which meets on a different day, has found our club intriguing and this stream table captivating as it has become a favorite part of their curriculum.

To finish the fall season, the club gathered several local stream water samples, discussed the significance of indicator organisms and tested for E. coli bacteria, which we cultured in our lab utilizing m-ColiBlue24 Broth PourRite Ampules<sup>1</sup>, Method 10029 for Membrane Filtration, an EPA accepted technique for collective coliform and E.coli detection.

We have decided to create a digital map of invasive species rather than a physical paper map. This decision was made for a few reasons: 1) this medium is more exciting to kids in this age group; 2) a digital medium allows for yearly updates which will be much cheaper and easier to execute than a physical map; and 3) a digital map can be projected on a wall, put on a touch screen kiosk or shared on the internet and social media.

### **Activity 1 Status as of July 2019:**

The basement aquatic zone serves as a meeting zone and a lab for the Environmental Club. This area consists of many tanks that are managed by the club goers. There are tanks consisting of many local species of fish like perch, largemouth bass, rock bass, shiners, Johnny darters, Iowa darters, northern hog suckers, and many more. It has also is home to many native invertebrates like dragon flies, stoneflies, caddis flies, hellgrammites, daphnia, amphipods and more. The knowledge of local species is going to be used in an upcoming project where the club builds an aquatic ecosystem from the bottom up starting at native plants and inverts. The basement is also home to several non-native tanks including a small reef tank bringing a slice of the ocean to our club house.

When the weather turns too cold to meet outside, we spend our time planning and conducting experiments. We explored animal behavior: one of the studies was the "great guppy experiment" where we tested habitat preferences in common guppies. Another was how light color can effect simple organisms like daphnia. This was conducted by shining different color lights on a daphnia and seeing how it affected behavior and heart rate. The concept the light was initiating was the change in light color diffusion while going down the water column. Red diffuses first near surface blue diffuses last deeper down, etc. We also spent several sessions collecting and observing invertebrates. We made a point to demonstrate that invertebrates are not just "bugs" or "pests," but the fundamental building blocks of an ecosystem. We stressed the importance of humans' impact on invertebrates and how those impacts ripple through a system.

There are several online maps in the works and some nearing completion. Maps being worked on right now are the Geocaching map, invasive species map, and Club Story map that will continue with each experiment. The Geocaching map a simple map showing the locations, hints, and descriptions of the geocaches created and hidden by the club goers. The first map will have an output of six unique caches hidden in the Hobson forest. For the future we would like to make a more complex riddle map with multiple steps and caches need to reach an end cache or goal. The invasive species map depicts the invasive species that are prevalent in our area, where they are currently at and how they transfer. This story map is meant to help educate the local community on how to help our club keep our lakes and rivers natural and healthy. This is planned to end up as an interactive kiosk in our lobby to be offered to other establishments in community outreach efforts. The club story map is going to act as a hub for most of the activity going on in our Environmental Club. It currently has many of the field studies conducted as points with description. Future plans of this is to overhaul the features so that when one clicks on a point they can read a little bit about the study and why we did it then click off to more of the detail and data/maps generated by the study. This will be used as a hub so that one web app will have most of our content making access easier and not cluttering up the page. This one web app should be able to stand in for dozens of maps by having them all displayed in one place.

### **Activity 1 Status as of January 2020:**

July and August allowed gathering specimens from local ponds and lakes. Even Sept. remained warm enough to put on waders and step into hip deep lakes and ponds. One particular netting extravaganza replenished two of the large tanks at HSC with perch, bass, and walleye, to name a few.

As is the case in Northern Minnesota, Oct. brings weather temperature that prevent gathering specimens from Lake Bemidji and other ponds and lakes. It is just too cold to have young club members in the lake. The club members moved inside and down to the basement of the Headwaters Science Center.

The basement aquatic zone serves as a meeting zone and a lab for the Environmental Club. This area consists of many tanks that are managed by the club members. The area has tanks surrounding a large classroom area. The tanks are homes to many local species of fish like perch, largemouth bass, rock bass, shiners, Johnny darters, Iowa darters, northern hog suckers, and many more. Furthermore, native invertebrates like dragonflies,

stoneflies, caddis flies, hellgrammites, daphnia, amphipods, and many more are housed in this area. Finally, the basement is also home to several non-native tanks including a small reef tank bringing a slice of the ocean to our club house.

We also studied how rivers work using our em2 stream table. We used this stream table to show the effects of erosion, damming, and how chemicals enter an aquatic system. This table is a great way to observe stream channels being dug, sand bars being created, and sediment deposition, and the effects on natural habitat. Club members witness phenomena, which would take thousands of years in the real systems, replicated in just minutes at this small scale! We also simulated chemical spills near the stream and how the spills can infiltrate through the soil and into the system.

Another study examined the phenomenon known as hormesis, which is the idea that “too much of a good thing” can be fatal. This was shown by growing mung bean sprouts with different concentration of copper mixed in with the water. At lower concentrations, it has a fertilizing effect, but at higher concentrations, it can hinder plant growth. This experiment is designed to mimic the effect of agricultural runoff building up in closed aquatic systems like ponds. This experiment also helped the students practice precise measurement and solution making.

There are several online maps in the works and some nearing completion. Maps being worked on right now are the Geocaching map, invasive species map, and Club Story map that will continue with each experiment. The Geocaching map a simple map showing the locations, hints, and descriptions of the geocaches created and hidden by the club goers. The first map will have an output of six unique caches hidden in the Hobson forest. For the future we would like to make a more complex riddle map with multiple steps and caches need to reach an end cache or goal. The invasive species map depicts the invasive species that are prevalent in our area, where they are currently at and how they transfer. This story map is meant to help educate the local community on how to help our club keep our lakes and rivers natural and healthy. This is planned to end up as an interactive kiosk in our lobby to be offered to other establishments in community outreach efforts.

The club story map is going to act as a hub for most of the activity going on in our Environmental Club. It currently has many of the field studies conducted as points with description. Future plans are to overhaul the features so that when one clicks on a point they can read a little bit about the study and why we did it, followed by clicking off to find more of the detail and data/maps generated by the study. This will be used as a hub so that one web app will have most of our content making access easier and not cluttering up the page. This one web app should be able to stand in for dozens of maps by having them all displayed in one place.

Three educators serve to be the teachers and facilitators for club members. As stated in an early section, HSC elevated our intern to full educator status and changed our budget description with the addition of Educator III in the place of Intern.

### **Activity 1 Status as of July 2020:**

January, February, March provided opportunities to create varieties of outdoor recreation gear including: fishing rods, fishing lures, and tree coring holders. This was done in preparation to our spring and summer clubs. The goal pique student interest to create more engaged with outdoor recreation and to generate more informed conservation attitudes. The focus of the first handful of clubs was to prepare for the upcoming warmer weather. For this we conducted a variety of water quality tests using a variety of methods, including rapids field tests and other more precise lab quality tests. Field sampling seasons (which was missed due to Covid-19) was still on our radar screen. The major water quality issues we were looking at included chlorides, phosphorus, turbidity, e-coli, and nitrogen. The samples were taken from our range of native species tanks, wells, rives, and compared against pure DO to allow students better understand of water chemistry. We were planning to do a range of chemical

and biologic water quality tests in local lakes and rivers focusing on upstream and downstream sections of Mississippi River to see the change in water quality after it passes through Bemidji.

#### **Activity 1 Status as of January 2021:**

Three weeks of water sampling occurred in July, 2020. Water samples came from the Mississippi River. First at the headwaters located at Itasca State Park. Six more samples were gathered between the Headwaters and Lake Bemidji. Water test results were made available for club members. Waters Samples continued, following the Mississippi River south and east.

On July 21, LCCMR-staff were furlough, resigned or reduced in hours. Except for lab maintenance and cleaning, no further activities are reported.

#### **Final Report Summary:**

With the turn of the New Year, HSC headed into 2020 with club activities continuing with twelve more sessions in January, February, and early March. The COVID-19 pandemic halted all on-site activities. Students and staff were not allowed on the HSC campus. HSC requested an amendment and transformed clubs to be virtual. The 3:30 Live Show was born. HSC chose the time (3:30) to coincide with the end of the school day. Starting in late March and continuing through all of 2020, the 3:30 Live Show took the place of all “clubs” including the Environmental Science Club.

The gathering and examination/testing of water samples became HSC responsibility, resulting from another amendment. Testing and the findings were parts of 3:30 Shows. Viewership has been a bit hard to measure. Typically, 100 views were reported on the combination of Youtube, Facebook and Twitch TV. What constitutes a “view”? In the virtual world, someone watching the video. While hundreds of shows have been produced over the fourteen months since the first production back in March 2020, fifteen of the videos have been uploaded on the HSC Webpage and remain available for viewers. The Headwaters Science Center Website is <hscbemidji.org>

#### **V. DISSEMINATION:**

##### **Description:**

Students participating in the environmental science club will showcase their work during Science Week at the Boys and Girls Club of the Bemidji Area in late March and will also have an opportunity to present their work at the annual Bemidji Middle School science fair, hosted annually in February.

Headwaters Science Center will provide updates and activity reports to the public via the quarterly newsletter, “The Current” in addition to the science center web page ([www.hscbemidji.org](http://www.hscbemidji.org)) and social media accounts.

**Status as of January 2018:** ESC updates were included in our quarterly newsletter in December of 2017. ESC was advertised on the HSC web page and on our Facebook and Instagram page. Updates were given on those same media sources as well.

**Status as of July 2018:** HSC and the ESC were represented at the Boys and Girls Club of the Bemidji Area STEM Day on April 10<sup>th</sup>, 2018. The ESC members presented on what they had done in the club to the other children at the STEM Day. In addition, updates were included in our March 2018 quarterly newsletter about the ESC. No students chose to present Environmental Science Club material at their school science fair, even though they were encouraged to. Updates on the club were presented on Facebook and Instagram. Students had an aquaria day where they could present their knowledge to the general public, which was held in April 2018.

**Status as of January 2019:** HSC and the ESC were represented at the Boys and Girls Club of the Bemidji Area Fall STEM Day on Nov 10<sup>th</sup>, 2018. The ESC members presented on what they had done in the club to the other children at the STEM Day. Updates on the club were presented on Facebook and Instagram. Students from the ESC were able to help out on the opening day for We are Water MN and show their tanks and knowledge that they have obtained this year to the general public on December 1<sup>st</sup>, 2018.

**Status as of July 2019:** HSC and the ESC were represented at the Boys and Girls Club of the Bemidji Area Spring STEM Day on Mar 7<sup>th</sup>, 2019. The ESC members presented on what they had done in the club to the other children at the STEM Day. Updates on the club were presented on Facebook and Instagram. In addition, updates were included in our quarterly newsletter about the ESC. No students chose to present Environmental Science Club material at their school science fair, even though they were encouraged to.

**Status as of January 2020:**

Because our club members are products of the newest generation of learners, it only makes sense to communicate using the forms most frequented by them. HSC, largely through the efforts of the Environmental Science Club (ESC), has gone the route of social media.

The first place guests, visitors and the public can hear and see about the ESC activities is through the HSC Website. Posted on the website are photos and descriptions of testing, experiments and summaries of findings. On the website is where the story map is located. Beyond the HSC Website, ESC has created a following through the HSC Facebook page and Instagram.

1. HSC and the ESC will be present when the Boys and Girls Club holds their Spring STEM Day in early March. The ESC members will present on activities over the last six months, but more importantly, the Spring STEM Day will be the time for expanding the club and included club members who will take on the task of conducting water testing.

A final note regarding the amendment. It is the goal of the changes proposed in the HSC amendment to create sustainability in studying water and conducting tests to determine the quality of lakes and ponds in northern Minnesota. The education of young people, the equipping of the HSC lab, and the establishment of staff and students, who are trained to conduct these tests, will provide the opportunity to continue these activities after the conclusion of the LCCMR funding period.

**Status as of July 2020:**

As of July 2020 HSC is ready to resume water sample testing activities. We have spent time, during the closure expanding and improving our lab capabilities. The goal is to be able to add space to conduct long term studies including vegetation toxicology, chloride monitoring, chlorophyll monitoring, phosphorus, nitrogen, and phosphorus. We set up a range of equipment that was underutilized this included colorimeters, spectrometers, multimeters, and staged field equipment. Along with preparing for future studies we conducted a Citizen Science driven water quality assessment of local well water and the Mississippi River. We tested a range of private wells in the area along with 20 locations along the Mississippi River for Coliform Bacteria and nutrients. HSC wants to remain prepared for tests to help monitor our local waterways and groundwater.

**Status as of January 2021:**

No further activities to report as of January 2021.

**Final Report Summary:**

Club participants always focused on results -via exploration & the scientific method- utilizing various skills learned for water examination. In the first thirty months of the project, participants presented knowledge they had gained at science fairs & peer-to-peer feedback sessions. Student field journals, notes & posters accompanied project presentations. Posters not completed professionally. Funds returned to ENRTF. During the last six months of the grant cycle the pandemic overtook us, so we shifted to a hybrid virtual model. Our 3:30 show became a regular afternoon session on three platforms: YouTube, Facebook and Twitch TV with final selected videos appearing on the <hscbemidji.org> Website.

**VI. PROJECT BUDGET SUMMARY:**

**A. Preliminary ENRTF Budget Overview:**

**\*This section represents an overview of the preliminary budget at the start of the project. It will be reconciled with actual expenditures at the time of the final report.**

Budget Category	Budget Revised	\$ Amount	Overview Explanation
Personnel:	\$68,764	\$ 50,000	HSC project manager at 4.3% FTE per year for 3 years (\$8,000), HSC Lab Manager Educator 1.0 FTE at (\$18,864 next six months, or for the total in 3 years), HSC Educator I at 22% FTE per year for 3 years (\$24,000), HSC Educator II at 14% FTE per year for 3 years (\$12,000) and 3 interns at 3% FTE each, one per year for three years (\$6,000)
Professional/Technical/Service Contracts:	\$436	\$19,200	RMB environmental services contracted to process water quality samples (\$336), Spee Dee delivery services to transport samples (\$1,200)
Equipment/Tools/Supplies:	\$34,000	\$31,500	Water quality sampling equipment (\$26,500), water quality sampling supplies (\$7,500)
Printing:	\$500	00	Posters and graphs for science fair, family science night, presentations (\$500). Project not completed. Returned to ENRTF
Travel Expenses in MN:	\$800	\$3,300	Mileage to sampling locations, estimated 500 miles at \$0.55/mile
Other:	\$16,500	\$16,500	Upload information to website <u>\$1,300</u> , Partner mentor sessions, <u>2</u> \$200), Boys and Girls Club partner contract (\$5,000/yr. for 3 years = \$15,000)
<b>TOTAL ENRTF BUDGET:</b>	<b>\$121,000</b>	<b>\$120,500</b>	

**Explanation of Use of Classified Staff:** NA

**Explanation of Capital Expenditures Greater Than \$5,000:** NA

**Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 2.3 FTE ~~1.3FTE~~**

**Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.02 FTE ~~0.42FTE~~**

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
In-kind, through Headwaters Science Center annual budget.	\$12,000	\$12,000	Office space for HSC educators, environmental science club meeting space, consumables, copier, computers, phone, internet, lights, heat, insurance for HSC Van, other overhead.
<b>State</b>			
	\$	\$	
<b>TOTAL OTHER FUNDS:</b>	<b>\$12,000</b>	<b>\$12,000</b>	

**VII. PROJECT STRATEGY:**

**A. Project Partners:**

Headwaters Science Center (HSC) will partner with Boys and Girls Club of Bemidji Area to recruit at least ten (10) participants for each of the three cohorts. Participants will be identified by Boys and Girls Club staff and HSC staff as

**Partners receiving ENRTF funding**

- *Boys and Girls Club of Bemidji Area, \$15,000, recruit 10 participants from Boys and Girls club members per session, assist HSC Educator 1 and 2 with managing club participants during each meeting of the environmental science club. Assist with dissemination sessions including science fair, family science night, science week at the Boys and Girls Club.*
- *Partner Mentors from Leech Lake Tribal College, Bemidji State University, Minnesota Department of Natural Resources, Leech Lake Division of Resource Management and/or other regional partners, \$1,0000, mentors who attend environmental science club and assist participants will receive a \$100 stipend to compensate them for their time, mileage, and sharing of professional knowledge with participants.*

**Partners NOT receiving ENRTF funding**

**B. Project Impact and Long-term Strategy:**

The proposed afterschool environmental science club focuses on environmental education of youth so that they can protect and advocate for their watershed. The goals of our project align with ENRTF goals of public awareness of human impact on watersheds, the unique connection that people have with water in Minnesota, the relationship of biodiversity with water quality, and the importance of good watershed management practices for enjoyment by future generations. Good watershed management practices improve water quality, which will benefit fishing, tourism, swimming, boating, and waterfowl production, and will generally improve the quality of life that Minnesota residents and tourists embrace.

Participants in environmental science club may pay a nominal fee in subsequent years as a way to pay for the cost of the environmental science club after the grant ends.

**C. Funding History:**

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
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MPCA Surface Water Assessment Grant – “River Watch” program at HSC. A Physical, Chemical, Biological assessment of Leech Lake and Pine River Watersheds	2/13/2012-5/30/2014	\$45,229.85
MPCA Surface Water Assessment Grant - “River Watch” program at HSC. A physical, chemical, biological assessment of the Upper Mississippi Headwaters Watershed	4/1/2013 – 6/30/2015	\$27,890.10
MPCA Surface Water Assessment Grant - “River Watch” program at HSC. A physical, chemical, biological assessment of the Mississippi River – Grand Rapids Watershed	3/16/2015-3/15/2017	\$36,053.10
MPCA Surface Water Assessment Grant - “River Watch” program at HSC. A physical, chemical, biological assessment of the Otter Tail River Watershed	3/2/2016 – 1/15/2018	\$57,028.61
Minnesota Department of Education- Single Source Legislative Grant. Minnesota Omnibus E-12 Education Act (Chapter 116) signed into law May 22, 2013, amended May 20, 2014. “\$50,000 is to provide hands-on science, technology engineering, and math (STEM) education.”	7/25/14 – 6/30/2016	\$50,000

**VIII. REPORTING REQUIREMENTS:**

- The project is for 4 years, will begin on 07/01/17, and end on 06/30/21.
- Periodic project status update reports will be submitted January 15 and July 15 of each year.
- A final report and associated products will be submitted between June 30 and August 15, 2021.

**IX. VISUAL COMPONENT or MAP(S):**

**X. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS: NA**

**Environment and Natural Resources Trust Fund  
M.L. 2017 Final Project Budget**



**Project Title:** Developing Youth Watershed Stewardship in Northwest Minnesota

**Legal Citation:** M.L. 2017, Chp. 96, Sec. 2, Subd. 05f

**Project Manager:** Lee Furuseth

**Organization:** Headwaters Science Center

**M.L. 2017 ENRTF Appropriation:** \$ 121,000

**Project Length and Completion Date:** 4 Years, June 30, 2021

**Date of Report:** August 15, 2021

<b>ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET</b>	<b>AMENDED Budget 5/4/21</b>	<b>Amount Spent</b>	<b>TOTAL BALANCE</b>
<b>BUDGET ITEM</b>	<b>Lab Management Education and Testing,</b>		
<b>Personnel (Wages and Benefits)</b>	\$68,764.00	\$68,764.00	\$0.00
HSC Project manager: \$8,000 (90% salary, 10% benefits): 4.3% FTE per year for 3 years.			
Lab Management and Education. \$18,764 (90% salary, 10% benefits): 1.0 FTE for 5 months (<1/2 yr)			
HSC Educator I, \$24,000 (90% salary, 10%benefits), 22%FTE each year for 3years			
HSC Educator II, \$12,000 (90% salary, 10% benefits); 14% FTE each year for 3 years			
HSC Intern, \$6,000 (100% salary 0% benefits) 3% FTE each year for 3 years			
<b>Professional/Technical/Service Contracts</b>			
Contract with RMB Environmental Services in Detroit Lakes MN for lab analysis. Estimated cost for one lab analysis = \$120. Multiplied by 5 samples/ sampling event, 5 sampling events per session 2 sessions per year for 3 years	\$436.00	\$436.00	\$0.00
<b>Equipment/Tools/Supplies</b>			
Water quality sampling equipment: Dissolved Oxygen (DO), conductivity, and pH replacement probes, multip-parameter meters, singlets, filters, alconox, gloves, membranes,	\$26,500.00	\$26,500.00	\$0.00
Water quality sampling supplies: pens, notebooks, flashdrives, batteries, ziploc bags, educational materials, gloves, nets, waders	\$7,500.00	\$7,500.00	\$0.00
<b>Printing</b>			
Printing posters and graphs for dissemination sessions, science club presentations, and science fair/science night.	\$500.00	\$0.00	\$500.00
<b>Travel expenses in Minnesota</b>			
Mileage to sampling locations from Bemidji. Estimated mileage = 150-200 miles round trip, 5 sampling events per session, 2 sessions per year, over 3 years at \$0.55/mile. Total estimated miles = 6,000	\$800.00	\$800.00	\$0.00
<b>Other</b>			
Upload information to HSC website for dissemination, \$50/web upload, 26 uploads planned	\$1,300.00	\$1,300.00	\$0.00
Partner mentor time, \$100/mentor, 2 times = \$200	\$200.00	\$200.00	\$0.00
Partner with Boys and Girls Club - Bemidji, at a rate of \$5,000 per year for 3 years.	\$15,000.00	\$15,000.00	\$0.00
<b>COLUMN TOTAL</b>	<b>\$121,000.00</b>	<b>\$120,500.00</b>	<b>\$500.00</b>