



**Zeitgeist Center for Arts & Lake Superior Steelhead Association Community**

**Lessard Sams Outdoor Heritage Council (LSOHC) Phase 4  
Knife River Habitat Restoration Project  
Middle Reach 4**

**Team of Environmental Troubleshooters, Inc and Cardno, Inc.  
Response to the Request for Proposal (RFP)**



## **Introduction**

Zeitgeist and the Lake Superior Steelhead Association (LSSA) have teamed together to obtain a series of grants to restore Reach 4 in the Main Stem of the Knife River Watershed. On March 12, 2020, Zeitgeist Center for the Arts and Community (Zeitgeist) sent out a Request for Proposal (RFP) to obtain proposals for the continuation of the rehabilitation of trout habitat in the Main Knife River's Middle Reach 4. This proposal is Environmental Troubleshooters, Inc./Cardno's response to Zeitgeist's RFP.

## **Project Administrator Zeitgeist Center for the Arts and Community**

Zeitgeist is a non-profit organization that is committed to sustaining a vibrant artistic community, supporting environmentally conscious endeavors and collaborating with community partners to improve the quality of life in Duluth and the surrounding region. While Zeitgeist is well known for its Zinema Movie Theater and its Renegade Theater Company, it is less known for its environmental initiative work.

The Zeitgeist LSOHC Grant Team will consist Mr. Tony Cuneo, Executive Director and Ms. Amy Demmer, Community Development Director. Mr. Cuneo will act as the Project Administrator for this grant and Ms. Demmer will act as the Fiscal Manager for the grant.

## **Project Manager Lake Superior Steelhead Association**

In the late 1960s steelhead anglers began to observe a decline to the Knife River steelhead fishery. This growing concern among area fishermen resulted in the creation of the Lake Superior Steelhead Association (LSSA) in the early 1970s. For forty years, the LSSA worked with the MN DNR to privately fund projects that would protect and increase the population of steelhead, anadromous Brown Trout and Coaster Brook Trout.

Mr. Kevin Bovee will act as the LSOHC Project Manager for the LSOHC Grant.

## **Lessard Sams Outdoor Heritage Council Grant History**

In 2009, the LSSA applied for its first Lessard Sams Outdoor Heritage Grant. In 2011, the LSSA was awarded a LSOHC grant (Phase 1) to rehabilitate anadromous trout habitat in the West Branch Knife River Tributary and lower Main Knife River. In October of 2013, the LSSA was awarded a second LSOHC grant (Phase 2) to rehabilitate anadromous trout habitat throughout the entire Knife River Watershed. In 2017, the LSSA and Zeitgeist aligned to create a strong grant team and was awarded a grant (Phase 3) to work on Reach 4 within the Main Knife River. Middle Reach 4 (LSOHC Grant 4) is a continuation of the grant project started in 2017.

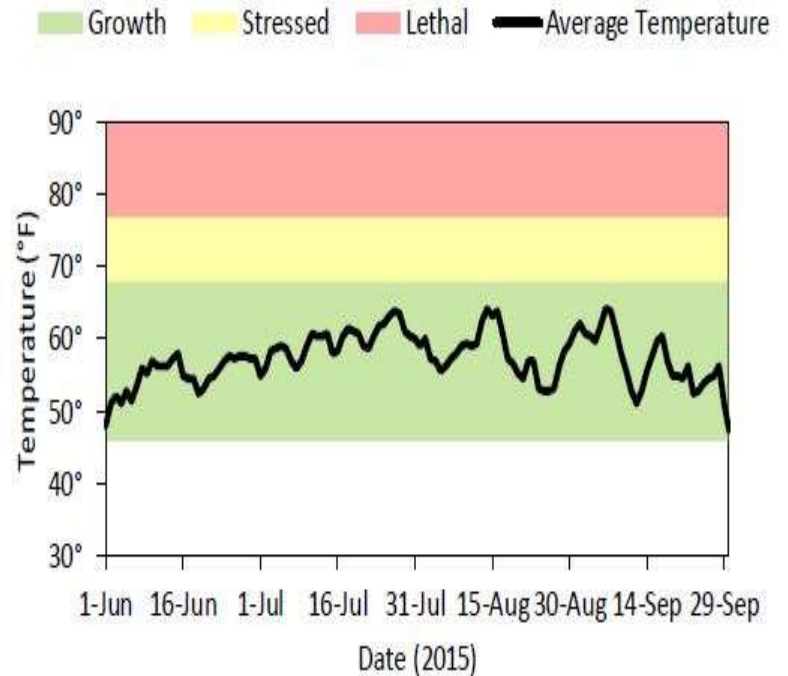
## **Knife River Watershed**

The Knife River historically held one of the largest steelhead (anadromous rainbow trout) runs in the entire Great Lakes. In the 1940s through the early 1960s, it was estimated that over 5,000 adult steelhead returned to the Knife River to spawn annually. Combine this steelhead run with several hundred anadromous Brown Trout and a remnant population of Coaster Brook Trout, and it is no wonder why the Knife River was a nationally recognized trout fishery. Today due to over harvest and loss of key habitat, the average annual steelhead run is less than 500, the anadromous Brown Trout run is less than 50 and the adult Coaster Brook Trout run is less than 25 adult spawners. Since most Angler harvest has been reduced or banned by the Minnesota Department of Natural Resources (MN DNR) regulations, the only measurable way to further restore the population of anadromous trout in the Knife River Watershed is through extensive habitat restoration.

There are several factors why anadromous trout habitat in the Knife River has degraded. These reasons are:

- Historic logging of large old growth trees,
- Loss of big instream woody debris,
- Increased rate of stormwater discharged into the Watershed,
- Decrease in cool water capable of supporting trout.

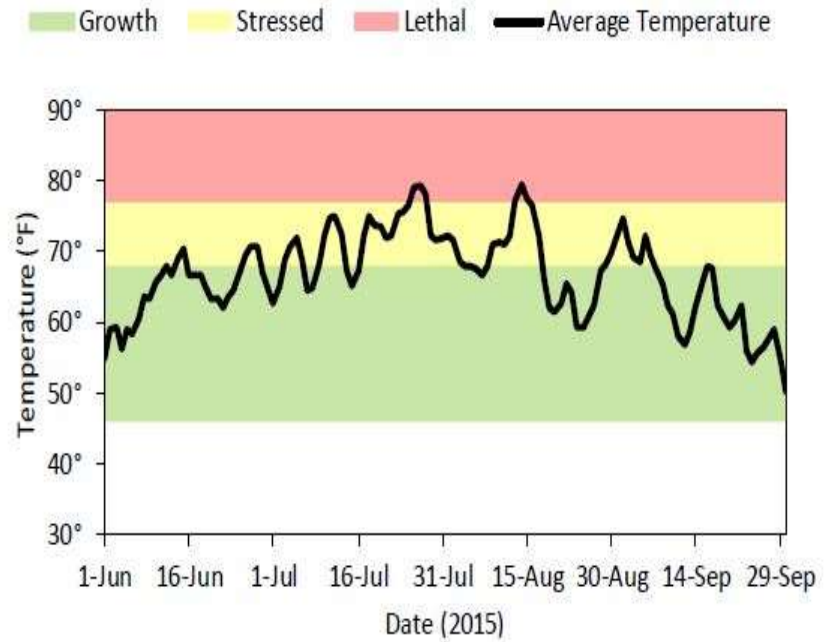
To successfully restore these habitat impacts, it is critical to first understand how these impacts affect the habitat in the Watershed. After studying the Knife River Watershed, ET determined that the upper watershed has the coolest instream water temperatures and is the only Watershed section that can consistently support year-round trout growth. This is because the property is in State of Minnesota or County ownership and the surrounding riparian forest is relatively intact. This relatively intact forested riparian zone provides extensive shade to maintain cooler instream water temperatures and good stormwater retention from its intact floodplain wetlands.



### Upper Watershed Identified by Lush Riparian Zone and Cool Water Temperatures

In the middle watershed, instream water temperatures begin to warm, and we start to observe channel instability and streambank erosion. This middle section does support trout growth water temperatures, but during most summer months the instream water temperatures will elevate into the stressful and even into the lethal ranges especially during drought years. This middle section of the watershed is where we start to see an increase in private land ownership and property development. This development has resulted in the fragmentation of the riparian forest and the alteration of the floodplain.

The lower watershed has instream water temperatures that consistently reach the lethal level to trout most summer months. This stream section is also very unstable and excessive streambank erosion is observed along most outside bends. This lower watershed section is also overwide from extensive bank erosion and is open to direct sunlight. This stream section also has the largest private ownership and use in the Knife River Watershed.



**Lower Watershed Identified by Overwide Channel, Erosion and lack of Riparian Canopy**

Based on main stem watershed observations and in stream temperature monitoring, the best approach for restoring the Knife River’s trout habitat is to prioritize and rehabilitate the upper watershed first, and then proceed downstream. This top/down approach utilizes the existing cool water that supports trout growth and prevents upstream impacts from degrading lower stream reaches. Ultimately as future projects are completed, we would expect to observe a downstream benefit in the form of reduced flood water velocity, a lessening of streambank erosion, a decreased sediment load or level of turbidity and an expansion of cooler water into middle and lower watershed sections.

**Anadromous Trout**

The description of anadromous trout is a trout or salmonid (rainbow, brown or brook trout) that spends the first year or two of its life in the river and migrates to the ocean or lake where it grows for 2 to 3 years until it reaches adulthood. These adults return to their natal stream to spawn. After spawning is completed, they migrate back to the ocean or lake. So adult anadromous trout are essentially seasonal residents in the Knife River Watershed, while their offspring (larval/juveniles) reside and rear in the stream for up to two years. From a steelhead habitat perspective, the lifecycle age group we are most concerned with are these 0 to 1 year old juveniles, because their retention until age 2 is the limiting factor to the Knife River steelhead recovery.

As stated above, adult anadromous trout enter the stream to spawn. These adults deposit their eggs in gravel spawning areas. The trout hatch and live within the gravel until they can swim. These swim-up larvae or age 0 trout are approximately 3/4 inch in size and move to shallow riffle habitat to feed and grow. As they grow and over winter these trout become juveniles and are 3 to 4 inches in length. As summer approaches, these juveniles can no longer survive in the shallow riffle habitat and must move to deeper runs and pools to avoid predation. If suitable habitat is available, these age 1 juvenile trout will continue to rear in the stream for another year. At 2 years of age these juvenile trout are approximate 6 to 7 inches long and are genetically programmed to smolt or migrate to the Lake Superior.

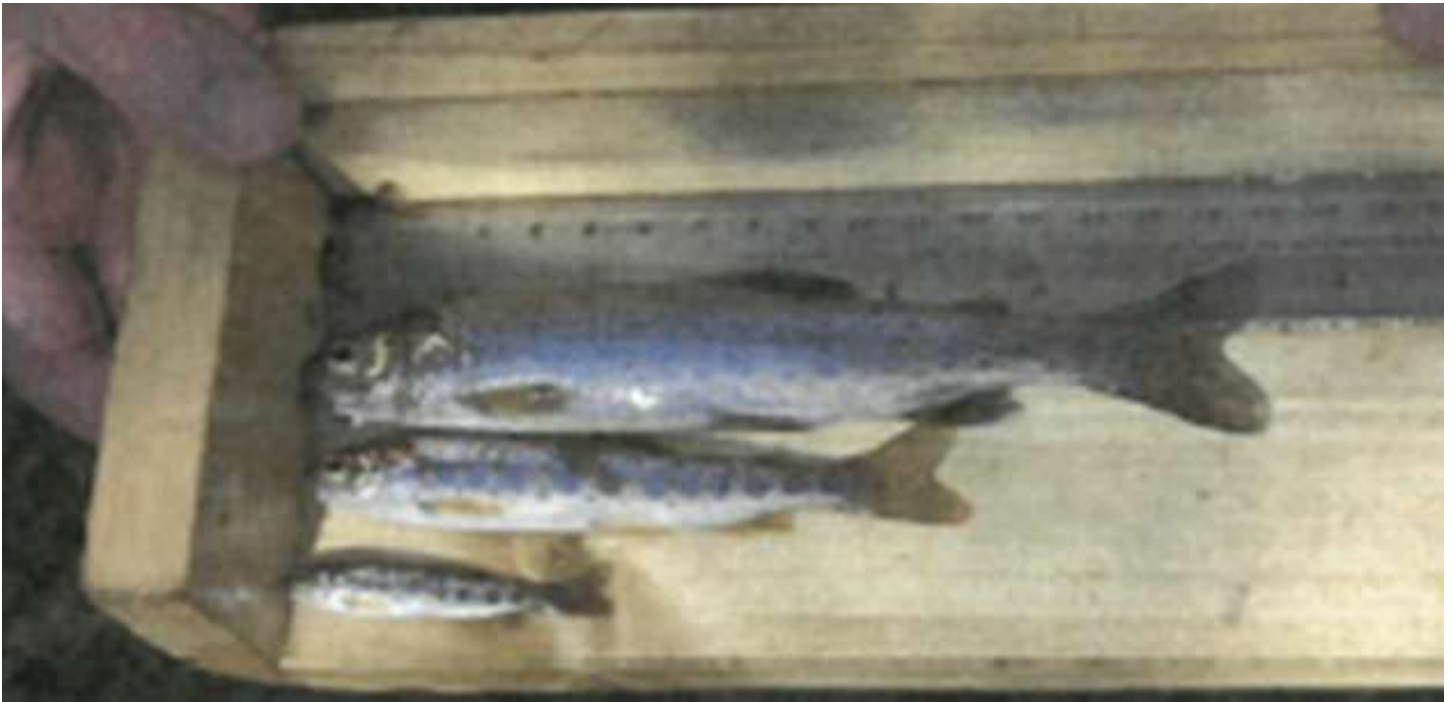


**Age 0 Larval Rainbow Trout**  
~ 2 inches in length

**Newly Hatched Swim-up Rainbow Trout**  
~ 1 inch in length

This two-year rearing life cycle is critical to anadromous trout survival because they need to be large enough to avoid predation in Lake Superior. According to a long term DNR anadromous rainbow study, the most significant survival issue in the Knife River is the premature (age 0 or 1) migration to Lake Superior. When anadromous rainbow trout prematurely migrate to Lake Superior, one adult out of six hundred and fifty smolts return to spawn in the Knife River. When anadromous rainbow trout migrate to Lake Superior on time (age 2), one adult out of ten smolts return to spawn in the Knife River. The adult spawning rate of return for age 2 emigrants is 65 times great than the adult return of age 1 or age 0. So, the ability to restore, create or enhance instream habitat and retain anadromous rainbow trout in the watershed until age 2, is the most significant factor to rehabilitating the Knife River steelhead population.

### **Size Comparison of Rainbow Trout Age 0, Age 1 and Age 2**



Another challenging issue when restoring habitat for anadromous trout is these anadromous trout tend to migrate out of the river system if suitable habitat is not readily available. This is unlike resident stream trout, which continuously migrate throughout the river system to locate suitable habitat to meet their changing life cycle or seasonal needs. When constructing habitat projects for anadromous trout, one must start to consider the need to provide habitat features that can support all or most of the life cycle needs within a single reach. This means designing habitat complexes that incorporate spawning gravel for adults with adjacent riffles and pools for larval and juvenile trout rearing. This is a different approach than traditional resident stream trout projects that tend to focus on creating individual or singular habitat features, such as lunger structures.

### **Previous Lessard Sams Outdoor Heritage Council Grant Project Work**

In 2012, the LSSA contracted with Environmental Troubleshooters, Inc. (ET) to perform work on the first Knife River grant project. Phase 1 restored stream connectivity at the second falls by placing boulders in the stream to allow for unimpeded upstream trout migration to the spawning grounds.



### **Phase I Second Falls Restoration - Placing Boulders in the Streambed**

In 2014, the LSSA contracted with ET to perform Phase 2 of the Knife River Rehabilitation project. During Phase 2, ET teamed with Cardno to assess several upstream reaches in the upper watershed and ultimately stabilized two stream reaches identified as Reach 9 and Reach 12. This Reach 9/12 project stabilized approximately 2,200 linear feet of slumping streambank and enhanced instream trout habitat using Natural Channel Design methodology.



**2015 Pre-Construction**

**2017 Post-Construction**



**Reach 9 Bank Stabilization and Instream Habitat Project**



**2015 Pre-Construction**

**2017 Post-Construction**



### **Reach 12 Bank Stabilization and Instream Habitat Project**

In 2018, ET was contracted to perform Phase 3 of the Knife River Rehabilitation project. During Phase 3, ET teamed again with Cardno to assess, design, and permit Reach 4 in the upper watershed. Reach 4 was divided into three construction sections based on funding availability. These sections became known as Upper, Middle, and Lower Reach 4.

In 2019, ET and Cardno began restoration construction on the Upper Reach 4. In a shortened time-window due to permit delays, the team successfully rehabilitated three slumping clay bank/pinch point sections in four weeks. Five subgrade log structures were also placed instream to create scour pockets and retain gravel. The goal of these structures is to provide 1+ year old rearing in conjunction with adjacent adult spawning habitat. These subgrade log structures were placed instream to incorporate full life-cycle habitat, which has been a continuously reducing habitat feature for a century. Upper Reach 4 was visited 03/27/2020 and the project's goals and expectations have been met, as banks are fully stabilized and habitat features have held through the first winter ice-out event.





**Upper Reach 4 ~30 cfs  
Low Water**



**Upper Reach 4 ~ 150 cfs  
High Water Event**

## Project Description

The primary aspect of this project consists of the continued restoration of Reach 4 in the Upper Main Stem of the Knife River. This phase of construction is to rehabilitate the middle 2,750 feet of Reach 4 from Station 21 + 50 to Station 49 + 00. This consists of 7 toewood sections, 9 constructed riffles, 2 reroutes, and several subgrade and grade control structures. Other project activities include:

- Monitor instream water temperatures using hobo temp logger at approximately 20 location through the entire Knife River Watershed from June 1<sup>st</sup> through September 30<sup>th</sup> each year.
- Complete a post construction as-built survey.
- Planting of trees / shrubs / pollinator flowers following specific provided guidelines.
- Perform other stream assessment walks, monthly meetings, and reporting as required.

## Project Timeline

ET/Cardno anticipate construction efforts to begin immediately with the creation of perpendicular access trails to begin as ground conditions dry out, so we avoid the use of drivepads that could increase the cost of this project by up to 10%. Instream restoration is to begin July 1, 2020, weather dependent. Restoration efforts will proceed to September 15, 2020. Utilizing the complete time window for instream restoration allows the construction crew to magnify each project goals and expectation. Site restoration outside of the floodplain is expected to then land in the fall of 2020, and planting based on approved by the PM.

## Project Scope of Work

Below is the scope of work, listed in the RFP. ET will work as a team with Cardno to complete the below scope of work tasks under the direction and oversight of Zeitgeist/LSSA (Client).

- **Instream construction performed on a Design / Build basis:** The ET/Cardno team will use Natural Channel Design (NCD) methodology and materials to complete the Design / Build construction of Middle Reach 4. The key feature of our NCD process is to restore a stream's geomorphic parameters instead of armoring areas of streambank damage. This is accomplished by placing natural materials in and along the streambed to restore the stream's channel size, configuration and profile and to stabilize its streambanks. This is different from traditional stream projects that attempt to repair isolated damage by applying armor to streambanks and not addressing the underlying stream deficiencies that are causing the problem.



## **Reintroduction of Large Wood into the Watershed**

A successful NCD stream project not only stabilizes the stream but also restores, creates and enhances instream habitat features that support trout. These habitat enhancement projects are necessary because most of northeastern Minnesota's trout streams are void of big wood. Prior to the turn of the century, large old growth trees naturally fell into stream channels and provided habitat to invertebrates, trout, and other non-game species. This instream deposition of large wood resulted in the creation of deep rearing pools and retention of spawning gravel. Because these large old growth trees were removed from the landscape during historic logging, large woody debris seldom deposits instream. To restore this lost habitat feature, Knife River NCD stream restoration projects must replace this lost habitat feature. Because the watershed no longer has a plentiful supply of large trees, we salvage big wood from logging sites and recycle it back into the watershed. Many stream restoration specialists use large wood only in the form of bank toe wood. While this stabilizes the eroding streambank, it does little to restore instream habitat. ET/Cardno's use toe wood/root wads to stabilize banks but our stream restoration approach expands the use of large wood by placing it in the streambed. This use of large instream wood restores the structure and function of the stream channel. The proper instream placement and alignment of large wood allows the river to accomplish several goals, including: reconnecting the stream to the floodplain, raising the groundwater table, providing current breaks, deflecting the stream current, creating scour pools, retaining spawning gravel and constructing spawning, holding and rearing habitat. By using woody debris in this fashion, we let the power of the stream's current transport and retain sediment. This ultimately creates the necessary rearing scour pools and spawning gravel redd habitat.

Another key construction technique ET/Cardno will use on this project is the placement or backfill of gravel. While gravel naturally exists in Reach 4, decades of heavy current during flood events have fragmented gravel deposits making the area unsuitable for steelhead spawning. By salvaging or importing spawning gravel, redd habitat can be restored. To ensure the correct size and ratio of gravel is used, ET has collected gravel from several spawning redds and performed a grainsize analysis on the material. This way we were able to utilize the proper size and ratio of gravel preferred by adult steelhead for spawning. Large quantities of this sized gravel will be placed in and around the large woody debris to provide spawning redd substrate or create this habitat. By reestablishing these spawning redds adjacent to rearing scour pools, full lifecycle habitat will be available for immediate use by both adult and juvenile steelhead.



## Stream Habitat Construction Techniques

To execute these NCD projects, ET uses specialized track mounted construction and logging equipment. First, we strategically layout trails to connect to material staging areas running perpendicular to the stream channel. The use of trails and construction material staging areas results in less impacts to the riparian zone than constructing traditional haul roads that run parallel to the stream channel. These parallel haul roads destroy riparian canopy and compact the soils making vegetation regeneration difficult to reestablish. For trail cutting a brush mower mounted on a skid steer is utilized. This mower cut or sheared brush for reuse in bundles that provide chinking between pieces of toe wood. Shearing brush leaves the root mass intact, so the brush can rejuvenate by suckering from the stumps and roots. Large trees are avoided if possible or tipped with our CX160 excavator. These tipped trees are recovered by a logging forwarder and are recycled for toe wood or instream woody debris. Any remaining trunk sections are used for footer logs.

Next, we transport and stack materials in the staging area to simplify handling and minimize our footprint. Boulders are transported using a rubber tracked dump truck, which unlike traditional haul trucks place less stress on the streambanks. This machine is specialized to leave nearly no footprint while stockpiling supplies. Wood and brush are transported using a logging forwarder with specialized tracks. The forwarder can rotate 360-degree, so wood and brush can be picked up from the staging area and handed off to the excavator with minimal movement and damage to the streambank. ET also uses mini excavators to further reduce ground pressure on streambanks and minimize riparian removal. Our mini excavator, skid steer loader, and tracked dump truck have rubber tracks to place even less force into the bank. This reduction in force minimizes ruts, allows for soil compaction of root wads and the grading of steeper slopes.



- **Oversite by a Level IV NCD professional:** ET and Cardno offer the unique ability to provide up to three Level IV NCD professionals onsite during construction and restoration activities. This level of trained professional staff, guaranteeing at least one Level IV trained and certified person will always be

onsite. The benefit to the project is having multiple trained professionals with knowledge and experience performing the work. This leads to an exchange of ideas and methodology, resulting in improved bank stabilization, instream structure design and placement and habitat reaching its maximum potential. This also provides the ability to be working on two completely different banks while maintaining professional oversight, which is one technique to increase construction efficiencies if timetables are compressed due to weather events.

- **Construction Storm water Permit:** ET will provide a certified MPCA storm water construction site supervisor to properly design, install, inspect, and maintain erosion prevention practices within the MPCA guidelines. This site supervisor will be on site at all times along with the Level VI NCD professionals to ensure erosion control is maintained during all instream construction.
- **Toe wood to be either coniferous or deciduous origin:** ET will provide specialized equipment to transport either coniferous or deciduous toe wood. ET has equipment that can properly transport, handle, and place toe wood easily up to 7,000 pounds with the least amount of riparian and bank compaction possible. All riparian materials disturbed onsite will be recycled to increase bank stabilization. Brush cut during site prep is placed between each individual toe wood log placed. Although this slows the process of building toe wood benches, the brush acts as a chinking material to lessening the probability of losing toe wood banks post construction. The recycled brush also provides an immediate food source for macroinvertebrates, therefore improving fish habitat.
- **Boulders to be obtained by the PM:** Any boulder provided, like the toe wood, will be transported with specialized equipment designed to maximize work and minimize environmental impacts. The PM will have adequate notice of the exact number required to complete the Middle Reach 4 restoration, as all three Level VI NCD professionals have built the structures proposed in the same watershed within the last year.
- **Instream Structures:** Every structure provided on page 48-52 has been built by at least one of the three Level VI NCD professionals. Many of the structures designed for this project by these Level 4 Rosgen professionals, were done specifically to enhance fisheries production in the Main Stem of the Knife River. These structures play a critical role in the Middle Reach 4 restoration and the enhancement of fisheries. Any extra material will be utilized to maximize fish habitat while retaining a minimal footprint on the surrounding riparian landscape.
- **Construction outside of time window:** ET/Cardno team have a local presence, so we can conduct restoration efforts throughout the year, taking advantage of seasonal conditions to perform work. We have found this decreases our footprint at construction sites and saves time during the critical time window for instream restoration. Having more time during instream construction allows for more focus to be put on bank stabilization and fish habitat.
- **Pre/post construction elevations:** Pre-construction elevations will be assessed in order to comply with the design and build structures at their proper elevation. An as-built survey will be completed post-construction as coordinated with the Client. A Level VI NCD professional will take both pre/post construction elevations and provide the as-built report to the Client upon completion.

### **Desired Project Goals**

The goals for this project are two-fold. One, to rehabilitate and enhance the instream trout habitat features to support all life cycle stages of anadromous trout. Two, construct a Natural Channel Design (NCD) stream restoration project that permanently minimizes flood damage to the stream channel, streambanks, and riparian zone.

## Desired Project Outcomes

- Reduce sediment input and turbidity by minimizing stream bank erosion.
- Reconnect the stream to its floodplain and provide an appropriately sized floodplain, resulting in dissipated energy in high flow events, decreasing stress to stream banks and reducing erosion.
- Maintain or improve current hydrology.
- Improve base flow conditions for trout, native fish and invertebrates.
- Restore the appropriate dimension, pattern and profile to the river so that the channel is stable and is providing a diversity of habitat and cover for various life stages of trout, native fish and invertebrates.
- Increase the amount and quality of instream habitat.
  - Restore gravels beds for trout spawning areas.
  - Establish overhead cover, toe wood, and deep pools.
  - Create deep pools for thermal refuge and overwintering habitat; use pool maximum depth from reference reach data and create tight radii on bends to lessen gravel deposition.
  - Create in-stream riffle microhabitats with applicable fish condos.
- Improve temperature and water quality for trout, native fish and invertebrates.
  - Shade channel with natural vegetation.
- Reestablish native vegetation in the riparian zone.
  - Maximize diversity.
  - Choose climate resistant species.

## Project Warranty

ET/Cardno are familiar with the damage caused by high water events in the Knife River Watershed. We also understand that large flow events can cause damage to projects before settling has occurred and vegetation as successfully established a root system. The designations of a 1,000 cfs flow event is because this is the typical spring ice-out flood level that is experienced annually or near annually on the Knife River. The 3,000 cfs flow event are typical flood events that occur every 4-5 years and have historically impacted other contractors' projects on the Northshore of Lake Superior. ET/Cardno will warrantee work deficiencies in the event of a 3,000 cfs flood event or until the Grant 4 period ends, whichever may come first.

## Retainage

ET is aware that the project may require a 5% retainage provision in the project agreement.

## Submittal Requirements

- **Description outlining your firm's understanding of the two major parts of this project and your firm's approach to fulfill the goals and expected outcomes of this project.** Described above is a detailed description of our understanding and approach to completing this project.
- **A brief description of at least one and no more than three examples of similar projects that have been performed by your firm in Minnesota, preferably on Minnesota's North Shore streams. Examples supplied must include reference contacts for each example.** The ET/Cardno team is comprised of a diverse group of local experts in the field of steelhead habitat and regional stream restoration experts. Our team has over 150 years of combined Knife River anadromous trout fishery experience on the Knife River. Our team also has 9 years of experience designing and constructing Knife River stream restoration projects. Finally, our team has designed and/or constructed 8 habitat restoration/enhancement projects, 10 stream reconnected projects and 12+ tree planting riparian management projects specifically for anadromous fish in Minnesota and Wisconsin. The ET team has previously performed the consulting work on the three previous projects (Phase 1/Phase 2/Phase 3) and has also been involved with the TMDL and Watershed/Forest Stewardship Committee for the past 10 years. The ET team has worked on other steelhead stream habitat projects besides the Knife River.

These anadromous trout Watersheds are located in Minnesota, Wisconsin and Ontario. Attachment 1 contains three ET/Cardno Project Examples that highlight our project experience.

- **Proof that personnel to be used in obtaining the necessary information has completed professional training in NCD methodology and procedures.** ET/Cardno team anticipates using a crew of 3-5 personnel for this project. Our crew will consist of at least one site supervisor that has Level VI Rosgen Training and two to four equipment operators, one of which has a Level VI certification. All primary equipment operators have over 10 years of experience in the logging, landscaping or construction industry.

ET/Cardno has provided resumes of key staff in Attachment 2.

- **Complete listing of costs expected to be incurred to carry out Part I of this project: labor rates/labor categories and equipment costs, as needed for completion of Part II of this project.** The required RFP Bid Form is provided in Attachment 3. Attachment 3 also has ET/Cardno Unit Costs for any additional out of scope or work requested by beyond the base bid. Attachment 4 contains ET's standard Billing Rates. These rates have been provided in the event additional work is necessary and is not covered in the RFP Unit Rates.
- **Normal work hours for your crew and possibility of overtime to complete the project in a timely manner. Procedures to accomplish work if weather delays are encountered throughout the project.** Due to the duration of this project ET/Cardno plan to work a standard 8 hour day starting approximately at 8:00 am to 5:00 pm.

ET will generally work in the rain unless the stream rises to a point where safety or the work is compromised. Because heavy equipment with extended booms will be used on this project, ET will stop work if lightning is observed. If the construction stage of the project falls behind schedule, ET/Cardno will work overtime hours as necessary to meet a specific deadline.

- **List the equipment that will be used to accomplish the outcomes/goals of this project.** The following is the equipment we propose for this project:



**Class CX 160 Class Excavator with Attached Thumb**



**Terex TC 48 Mini Excavator with Attached Thumb and Dozer Blade**





**Timberjack Logging Forwarder**



**Prinoth T9 Tracked Dump Truck**



**Cat 289 D Skid Steer with the following Attachment**  
Standard Bucket, Grapple Bucket, Articulating Dozer Blade, Power Tiller,  
Street Sweeper with hopper to capture sweepings, Diamond Mower Brush Shear.

- **Explain how your firm could meet the preferred timeline.** A detailed explanation of the timeline is stated above in the Project Timeline section.
- **Proof on all insurance.**
  - **\$ 2,000,000.00 on professional liability/errors and omissions.**
  - **\$ 5,000,000.00 on general liability.**
  - **\$ 2,000,000.00 on auto liability.**
  - **State Statutory benefits on worker's Compensation.**

An Insurance certificate has been provided in Attachment 5 that meets the above criteria.

- **Fill in and submit Bid Form. Attachment D.** As stated above, the required RFP Bid Form is provided in Attachment 3.

**Attachment 1**  
**Three Project Descriptions**



# Environmental Troubleshooters, Inc.

## Knife River Second Falls Restoration

**Client:**

Lake Superior Steelhead Association

**Location:**

Two Harbors, Lake County, Minnesota

**Start/Completion:**

2013

**Key Services:**

- Channel Reconstruction
- Fisheries Rehabilitation
- Site Restoration



Above: The second falls before weir damage, allowing fish passage.

Right: Post weir damage, not allowing for unimpeded fish passage.

**Project Overview:**

A large flood in 1994 severely damaged the Knife River. This flood altered the stream channel, deposited sediment, partially destroying the newly installed DNR fish trap and is the suspected cause for the loss of the concrete weir-like structure at the Second Falls. The Lake Superior Steelhead Association (LSSA) obtained a Lessard Sams Outdoor Heritage Grant (Phase I), which was used in part to restore the second falls passage. The LSSA and Minnesota Department of Natural Resources (MN DNR) teamed to restore the Knife River Second Falls jumping pool.

Environmental Troubleshooters, Inc. (ET) was hired to assess and perform limited restoration design services for the restoration of the second falls purge pool. ET also assisted with the preparation of the bidding documents for the project and provided limited construction related oversight. ET surveyed the Second Falls stream reach, prepared latitudinal and cross-sectional figures, developed restoration design options and completed a permit application so the DNR could finalize the project approach and obtain approval. The permit ultimately was submitted to DNR waters and Army Corp. of Engineers (Corp.) and was subsequent approval.

LSSA and ET personnel located four potential boulders to place into the stream. The DNR selected two of the four boulders for in-stream installation. RJS transported the boulders and provided the in-stream placement. The DNR and ET also provided in-stream support, final positioning and pinning of the boulders. Finally, ET cut fish passage slots into the center and eastern side of the boulders to create a larger migration pathway. ET also restored the site access road, stream trail, construction staging site, and planted several 4-5 foot red and white pine trees.





**Regulatory Programs:**

- MN DNR Fisheries
- MN DNR Waters
- Army Corp of Engineer
- Clean Water Act

**Project Contact:**

Gary Siverson  
LSSA Asst. Grant Manager  
218-390-3916



Boulder placement during the construction of the second falls.



Post construction fish passage connectivity.



High waters, allowing for optimal fish transport.

**Project Outcome:**

The boulders backed up the water below the falls and created a three to four foot deep two tier plunge pool that allows anadromous trout to pass upstream in most water conditions.



**Environmental  
Troubleshooters**

3825 Grand Avenue  
Duluth, Minnesota 55807  
Phone 218-722-6013  
Fax 218-722-6319



# Environmental Troubleshooters, Inc.

## Knife River Stream Restoration

### Reach 9 through Reach 12

**Client:**

Lake Superior Steelhead Association

**Location:**

Two Harbors, Lake County, Minnesota

**Start/Completion:**

2016-2017

**Key Services:**

- Geomorphic Assessment
- Project Permitting
- Channel Reconstruction
- Erosion Control
- Native Landscaping
- Native Planting & Seeding
- Site Restoration



Upper section of Reach 9 before and after



Lower section of Reach 9 before and after

**Project Overview:**

The Lake Superior Steelhead Association (LSSA) obtained a Phase II Lessard Sams Outdoor Heritage Grant to stabilize multiple slumping stream banks and rehabilitate anadromous trout rearing and spawning habitat in the main Knife River. Impacts related to high water events and historic logging have increased eroding stream banks and loss of aquatic habitat. Environmental Troubleshooters, Inc. (ET) was hired by the LSSA to assess, permit, and provide construction services to restore these impacted reaches. ET worked in conjunction with Cardno who was the restoration design consultant and provided construction oversight and project management. ET conducted detailed assessments of Reach 9 and Reach 12 to collect data to restore the stream channel and banks to stable dimensions, according to Natural Channel Design (NCD) practices. After the assessment was completed, construction design plans and specifications were created to restore the impacted reaches and enhance instream trout habitat features.



Environmental  
Troubleshooters



The restoration of Reach 9 and Reach 12 August to September 2016 DNR stream construction window, with a final toewood bend addition coming a year later. ET restored approximately 2,100 linear feet of stream channel. The stream restoration construction included:

- Toewood with soil lifts
- Boulder/Log J-hooks
- Boulder Cross Vanes
- Rock Riffles
- Creation of new sections of stream channel
- Creation of off-channel wetlands

Along with instream restoration efforts landscape alteration also occurred. These alterations included the creation of a floodplain bench and terracing of the streambanks to reduce erosion and stabilize the channel. Finally, erosion control matting or straw was applied to all bare soils with immediate seeding and planting of native vegetation to provide stabilization. Herb species consisted of a wetland mixture and native riparian mixture of grasses, shrubs such as alder and willow, and old growth species such as yellow birch, tamarack, white spruce, oak, and red and white pine.



Reach 12 before and after



Valentine Reach (constructed in 2017) before and after





Construction of Reach 12



Erosion control and planting of Reach 12



Reach 12 response to a 4,000 cfs flood (2018)

### Project Outcome:

The root wads placed on the outer bank to realign the channel and stream bank grading occurred to create a floodplain that connected to the stream channel. This work successfully dissipated flood water energy during multiple high water events since the completion of this project. Boulder/log J-hook and cross vane structures stabilized the channel and continually redirect the thalweg to create scour pools for 1+ year juvenile rearing. The large woody debris from the toewood has also provided riparian habitat for trout and other aquatic species since its 2016 installment. Replanting disturbed areas of herbaceous vegetation, shrubs, and large trees have successfully been established and provided stability to the floodplain and riparian shade canopy to the stream.



**Environmental  
Troubleshooters**

3825 Grand Avenue  
Duluth, Minnesota 55807  
Phone 218-722-6013  
Fax 218-722-6319



# Blackhoof River Stream Restoration Project Phase I



**Client:**  
Minnesota Trout Unlimited

**Location:**  
Carlton County, Minnesota

**Sector:**  
Environmental

**Start and completion dates:**  
2017-2018

**Project Manager or  
Principal-in-Charge:**  
Mark Pranckus  
Aaron Steber

**Key Services:**

- > Construction oversight
- > Natural Channel Design
- > Native Planting and Seeding
- > Permitting
- > Stream assessment
- > Stream design
- > Stream restoration

Cardno assisted Minnesota Trout Unlimited with stream design, permitting and construction oversight for 900 linear feet of the Blackhoof River.

## Overview

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along the Blackhoof River in Carlton, Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 900 feet of stream to move the channel away from two actively eroding 40 foot high collapsing slopes, reducing stream bank erosion and sedimentation to the stream. This design also sought to increase trout habitat by creating deep pools and providing overhead bank cover. As part of the design, streambanks were graded to more stable angles and a floodplain access was created to allow flood flows to access vegetated banks. In-stream structures were installed to re-direct flow away from the streambanks and towards the center of the channel and toewood structures were installed to provide deep pools for holding adult trout as well as overhead cover for juveniles. These habitat enhancement structures were installed utilizing trees removed during bank grading operations. All exposed areas created during construction were seeded with native grasses and forbs endemic to this part of Minnesota. Cardno completed the design, regulatory permitting, and construction oversight for the project.

The project was funded by the grant proceeds from the State of Minnesota's Lessard-Sams Outdoor Heritage Fund.

## **Attachment 2**

### **Resumes of Stream Restoration Personnel**

# Aaron Steber

## Current Position

Senior Consultant

## Discipline Area

- > Stream/Shoreline Restoration Design and Project Management
- > Stream Survey/Assessment
- > Road Streams Crossings
- > Watershed Assessment and Planning
- > ERSRI ArcGIS, EPA SWMM, WinSLAMM, RiverMorph
- > Application of the Rosgen Natural Channel Classification System and Natural Channel Design
- > Permit and Grant writing/management
- > Erosion control design and management
- > Habitat restoration planning, design, installation and management
- > Geographic Information Systems (GIS) analysis and cartography
- > Riparian PFC Assessments

## Years' Experience

17

## Joined Cardno

2008

[www.cardno.com](http://www.cardno.com)

## Summary of Experience

Aaron is a stream restoration specialist managing streambank/shoreline stabilization and habitat enhancement projects including project planning, design, grant administration, permitting, and construction oversight. He has more than 17 years of experience working with streams in: Wisconsin, Minnesota, Illinois, Iowa, Michigan, Ohio, Colorado, Montana and Idaho as well as in Finland and Costa Rica. Aaron conducts geomorphic surveys to review channel morphology/stability, and works with computer modeling software to assess the most effective methods of managing available water resources in designated areas. Aaron also provides design and construction oversight for aquatic organism passage, stormwater and water quality improvement projects as well as wetland, watershed and lake studies.

Prior to joining Cardno Aaron was the state forest hydrologist for the Idaho Department of Lands (IDL). While working for IDL, Aaron provided technical solutions to a variety of water resource issues including: stream crossings, stream restoration, erosion control, wetlands, forest-practices, mining, landslides, groundwater availability and endangered species for more than 800,000 acres of actively managed forests.

## Significant Projects

**Blackhoof River Stream Restoration Project Phase I**, Minnesota. Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along the Blackhoof River in Carlton, Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 900 feet of stream to move the channel away from two actively eroding 40 foot high collapsing slopes, reducing stream bank erosion and sedimentation to the stream. Cardno completed the design, regulatory permitting, and construction oversight for the project. The project was funded by the grant proceeds from the State of Minnesota's Lessard-Sams Outdoor Heritage Fund. Aaron led the design and served as construction manager.

**Newburg Creek Habitat Enhancement Project**, Minnesota. Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along Newburg Creek, located in Fillmore County in southeastern Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 2,400 feet of stream to reduce stream bank erosion and sedimentation to the stream while also increasing brook trout habitat by creating deep pools and providing overhead bank cover. Upland areas near Newburg Creek were seeded in a native oak savanna seed mix to help restore the uplands containing mature oak trees. Cardno completed the design, regulatory permitting, and construction oversight for the project. Aaron was the project manager responsible for design, permitting and construction oversight.

**Knife River Watershed Geomorphic Assessment and Stream Design and Construction Oversight**, Minnesota. Cardno was contracted by Environmental Troubleshooters (ET) to provide technical guidance and support to the Lake Superior Steelhead Association's (LSSA) effort to assess multiple stream reaches

Aaron Steber

### Education

- > MS, Hydrology and Watershed Management, University of Minnesota, 2005.
- > BS, Water and Soil Resources, University of Minnesota, 2002.

for the potential for steelhead spawning, nursery, and overwintering habitat in the Knife River watershed. In 2016, Cardno was contracted by ET to complete the design and construction oversight of two reaches identified in the 2015 stream assessment report. Cardno developed a stream design using Natural Channel Design principles for approximately 2,000 linear feet of stream. Cardno provided on-site construction oversight to the ET construction team in late summer 2016. Aaron was the lead designer and construction manager.

**Swan Creek Stream Restoration and Habitat Improvement Project, Forest County, Wisconsin.** In 2008, the Forest County Potawatomi Community (FCPC) performed a restoration project to two man-made impoundments on Swan Creek. This project established three sediment traps within and downstream of a previously impounded section in order to help prevent sedimentation of important brook trout habitat downstream. In 2012, the channel had stabilized eliminating the need for the sediment traps and Cardno designed in-stream habitat enhancement structures (toewood) to restore them. Five total toewood structures were designed to provide critical under bank habitat, incorporating native woody material into submerged undercut banks to replicate natural undercut streambank habitat. In addition to the five toewood structures, sections of access roads were repaired with water bars designed to direct surface water flows off of the road, while other roads were restored to native prairie grasses. Large woody materials removed on-site were procured for use in the toewood structures and a perched culvert was also replaced. Aaron was the project manager responsible for design and construction oversight.

**Yahara River Streambank Stabilization, Wisconsin.** Cardno developed and implemented low cost environmental approaches to increase bank stability and enhance habitat along the Yahara River in DeForest, Wisconsin. Bio-stabilization techniques in the design planset included: bankfull bench grading, rootwad composites, toewood stabilization and a canoe launch. Cardno also provided construction oversight. Aaron assisted in stream stabilization design and lead construction oversight.

**2017 Pheasant Branch Streambank Restoration and Habitat Enhancement Project North of Century Avenue, Wisconsin.** Cardno was hired by the City of Middleton to stabilize over 1,000 linear feet of severely eroding streambanks and eroded steep slopes using ecologically sensitive techniques along Pheasant Branch Creek streambank north of Century Avenue. Aaron was the project manager responsible for providing design, permitting, and construction oversight.

- > Rosgen Level IV: River Restoration and Natural Channel Design
- > Rosgen Level III: River Assessment and Monitoring
- > Rosgen Level II: River Morphology and Applications
- > Rosgen Level I : Applied Fluvial Geomorphology
- > Wal-Mart Certified Stormwater Professional, 2008, 2009, 2010, 2011
- > Idaho Panhandle Certified Stormwater and Erosion Control Professional
- > OSHA 40-Hour HAZWOPER certification
- > OSHA 10-Hour Construction Outreach certification
- > OSHA General Industry Certification

### Professional Certifications

# Mark Pranckus

## Current Position

Senior Consultant

## Discipline Area

- > Design and construction of agricultural and urban stormwater management techniques and Best Management Practices
- > Design and construction of streambank and shoreline stabilization projects and stream restoration projects
- > Physical and biological stream surveying and evaluation
- > Fish and invertebrate sampling and identification
- > Regulatory permitting, local, state and federal
- > Native plant identification
- > Restoration methods including exotic/invasive species control, native plant installation, erosion control and prescribed burn management

## Years' Experience

18

## Joined Cardno

2004

[www.cardno.com](http://www.cardno.com)

## Summary of Experience

Mark leads engineering feasibility studies and manages construction of water quality improvement projects including stream restoration and watershed BMP projects. He conducts physical and biological stream surveys, aquatic habitat assessments, and fish and invertebrate sampling and identification. He also leads and conducts macroinvertebrate, fishery, habitat, and water quality surveys; develops habitat and fisheries management plans, and leads with federal, state, and local permitting for stream and water-resource related projects. He assists in the development of watershed management plans and lake diagnostic studies.

## Significant Projects

**Newburg Creek Habitat Enhancement Project**, Minnesota. Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along Newburg Creek, located in Fillmore County in southeastern Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 2,400 feet of stream to reduce stream bank erosion and sedimentation to the stream while also increasing brook trout habitat by creating deep pools and providing overhead bank cover. Upland areas near Newburg Creek were seeded in a native oak savanna seed mix to help restore the uplands containing mature oak trees. Cardno completed the design, regulatory permitting, and construction oversight for the project. Mark assisted with the stream survey and provided support for design development. He also acted as lead for U.S. Army Corps of Engineers and Minnesota Department of Natural Resources permitting.

**Knife River Watershed Geomorphic Assessment and Stream Design and Construction Oversight**, Minnesota. Cardno was contracted by Environmental Troubleshooters (ET) to provide technical guidance and support to the Lake Superior Steelhead Association's (LSSA) effort to assess multiple stream reaches for the potential for steelhead spawning, nursery, and overwintering habitat in the Knife River watershed. In 2016, Cardno was contracted by ET to complete the design and construction oversight of two reaches identified in the 2015 stream assessment report. Cardno developed a stream design using Natural Channel Design principles for approximately 2,000 linear feet of stream. Cardno provided on-site construction oversight to the ET construction team in late summer 2016. Mark was the Project Manager.

**Miller Creek Streambank Restoration Design**, Minnesota. Cardno was hired by the City of Duluth to complete a stream design to stabilize approximately 875 feet of eroding stream bank along Miller Creek in Lincoln Park. The stream design will stabilize the stream banks, preserve the character of the walls within the park and provided additional stream function and habitat. Cardno also completed a cultural resource investigation to determine the eligibility of the walls for the National Register of Historic Places and supported the Section 105 process with the City of Duluth and FEMA. Cardno also led the permitting process, coordination with state resource agencies, developed construction bid documents, and provided on-site construction oversight. Mark was the Project Manager.

Mark Pranckus

**Education:**

- > MS, Biology, University of Minnesota-Duluth, 2004.
- > BS, Biology, Indiana University, 1996.

**Skunk Creek Stream Restoration and Bank Stabilization Project, Minnesota.**

The Carlton County Transportation Department hired Cardno, along with our subconsultant, Northflow, to develop a design to restore 200 feet of Skunk Creek and stabilize two severely eroding banks that threaten the integrity of County Road 103. Through the use of Natural Channel Design principles, Cardno has surveyed the project sites and will use reference reach data to develop a stable dimension, pattern, and profile for Skunk Creek. Future design elements include removing the existing pipe, creating a floodplain with a meandering channel, and installing grade control and woody habitat structures such as toewood and log vanes to provide enhanced aquatic habitat for trout and other aquatic organisms. Mark is the Project Manager.

**Knowlton Creek Stream Restoration, Minnesota.** Cardno assisted with the restoration of 5,800 feet of stream channel including 2,600 feet on Knowlton Creek and 3,200 feet on tributaries entering Knowlton Creek. Cardno provided one year of vegetation maintenance. Mark was the Project Manager.

**Blackhoof River Stream Restoration Project Phase I, Minnesota.**

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along the Blackhoof River in Carlton, Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 900 feet of stream to move the channel away from two actively eroding 40 foot high collapsing slopes, reducing stream bank erosion and sedimentation to the stream. Cardno completed the design, regulatory permitting, and construction oversight for the project. The project was funded by the grant proceeds from the State of Minnesota's Lessard-Sams Outdoor Heritage Fund. Mark was the Project Manager for design and permitting.

**Sand Creek and Porter Creek Streambank Stabilization, Minnesota.**

In 2016, the Scott County Watershed Management Organization sponsored a streambank stabilization project at two project locations within the Sand Creek watershed to address turbidity as a stream stressor. The project included construction of approximately 700 feet of Sand Creek, along with 900 feet of an eroding ravine flowing into Sand Creek and 225 feet of Porter Creek. Under a subcontract to Veit Companies, Cardno assisted with the construction of approximately 600 linear feet of fabric encapsulated lifts that were constructed on top of engineered log jams, installed and established native seeding along streambanks and areas disturbed during construction, installed approximately 2,400 square yards of erosion control blanket, installed and establish approximately 2 acres of hay field, installed 700 bare root trees and over 60 containerized trees and shrubs. Mark was responsible for directing Cardno field crews and communicating project activities to the project sponsor and the prime construction contractor. He also provided technical assistance for re-vegetation activities.

- > Rosgen Level III: River Assessment and Monitoring
- > Rosgen Level II: River Morphology and Applications
- > Rosgen Level I: Applied Fluvial Geomorphology Training
- > Professional Certificate of Watershed Management, Indiana Watershed Leadership Academy
- > Stream Assessment and Monitoring Training, Minnesota DNR

**Professional Certifications:**

# Heather Schwar, PE

## Current Position

Senior Water Resources Engineer

## Discipline Area

- > Hydrologic and hydraulic modeling
- > Stream restoration analysis and design
- > Watershed management
- > Stormwater BMP design

## Years' Experience

15

## Joined Cardno

2015

## Education

- > MS, Civil Engineering (Water Resources), University of Wisconsin-Madison, 2002
- > BS, Geological Engineering and Geology, University of Wisconsin-Madison, 2000

## Professional Registrations

Professional Engineer:  
Wisconsin #38355-6,  
Illinois #062068101,  
Minnesota #53062,  
Indiana #PE11500602,  
Michigan #6201063307,  
Ohio #80838, Kentucky  
#31799, Washington  
#51377

## Summary of Experience

As a Senior Water Resources Engineer, Heather leads design and engineering services on watershed management and ecological engineering projects. With 15 years of experience, she focuses on water resources by evaluating and designing various hydrologic and hydraulic (H&H) projects, including stormwater programs with basin, sewer, floodplain, bridge and culvert improvements, scour analyses, stream bank protection, and stream habitat restoration. She also has expertise in numerous hydrologic and hydraulic models including Hydrologic Engineering Centers River Analysis System (HEC-RAS), Geo-River Analysis System (Geo-RAS), Hydrologic Engineering Centers-Hydrologic Modeling System (HEC-HMS), Geo-Hydrologic Modeling System (Geo-HMS), XP-Storm Water Management Model (XP-SWMM), PondPack, Culvert Master and various Geographic Information System (GIS) applications.

## Significant Projects

**Miller Creek Streambank Restoration Design**, Minnesota. Cardno was hired by the City of Duluth to complete a stream design to stabilize approximately 875 feet of eroding stream bank along Miller Creek in Lincoln Park. The stream design will stabilize the stream banks, preserve the character of the walls within the park and provide additional stream function and habitat. Cardno also completed a cultural resource investigation to determine the eligibility of the walls for the National Register of Historic Places and supported the Section 105 process with the City of Duluth and FEMA. Cardno is also leading the permitting process, coordinating with state resource agencies, developing construction bid documents, and providing on-site construction oversight. Heather is performing the hydraulic analysis, coordinating with state resource agencies and providing engineering oversight on the design plan set and construction bid documents.

**Knowlton Creek Stream Restoration**, Minnesota. Cardno teamed with Veit to provide construction support for installation of channel stabilization materials and features and provide seeding and live plantings. Additional design tasks identified during construction included an area of vegetated riprap, a rock chute channel to connect two drainage areas, and an in-line sediment trap to capture sediment generated from construction activities. As Senior Water Resources Engineer, Heather led the design for the additional design tasks for the project.

**Little Mac Ravine Stabilization and Restoration Planning, Design, and Construction**, Michigan. Cardno was contracted to design and permit stream restoration of the existing Little Mac Ravine and stream channel within the Grand Valley State University, Allendale Campus, to prevent catastrophic slope failure at an elevation consistent with the profile before campus construction. The design was achieved beginning with a Level II morphological survey that was performed in the existing channel and in a reference reach. The design incorporates a continuous series of step pools consisting of a boulder vane-pool-glide-riffle sequence that has similar dimensions to those measured in a reference reach. The

Heather Schwar, PE

boulder vanes serve to hold the finer substrates in position and are sized to withstand greater velocities than 100 year discharges. The drop into the pools off the boulder vanes serves to dissipate energy, while the pool provides a place to install woody debris into the channel to increase habitat value. The glide and riffles transition the grade to the next boulder vane. Permits were issued in March 2017. Construction is expected to be completed in October 2017. Heather led the design, performed the hydraulic analysis including sizing of structures and rocks and provided engineering oversight on the design plans and specifications.

**Keith Creek Streambank Stabilization Design**, Illinois. Cardno was hired by the City of Rockford, Illinois, to design to stabilize approximately 350 linear feet of channel work through an exposed pipeline area as well as an additional 150 linear feet of channel work to protect the abutments of two bridges. Heather supported the conceptual design, performed the hydraulic analysis and provided engineering oversight on the design plan set.

**Yahara River Streambank Stabilization**, Wisconsin. Cardno developed and implemented low cost environmental approaches to increase bank stability and enhance habitat along the Yahara River in DeForest, Wisconsin. Bio-stabilization techniques in the design plan set included: bankfull bench grading, rootwad composites, toewood stabilization and a canoe launch. Cardno also provided construction oversight. Heather assisted in the conceptual design and oversaw the development of the design plan set.

#### Continuing Education

- > Road-Stream Crossing Workshop: Inventory, Assessment, Design and Construction, Sponsors and instructors from Trout Unlimited, Wisconsin DNR, TNC, USDA Forest Service, Wisconsin DOT, National Fish Habitat Partnership and University of Wisconsin Platteville, 2017
- > Managing & Understanding Sediments in Your Watershed, U.S. Army Corps of Engineers, 2010
- > LIS training for the Levee Periodic Inspections, U.S. Army Corps of Engineers, 2009
- > Stream Stability & Scour at Highway Bridges, Federal Highway Administration-National Highway Institute-135046, 2008
- > Fish Passage on Midwestern Streams: Evaluation of Stability & Functionality of Dam Removals, Constructed Fishways & Culvert Crossings, Illinois Institute of Technology, 2007
- > Using Geographic Information Systems, Wisconsin Department of Natural Resources, 2005
- > Succeeding with a Dam Removal Project, University of Wisconsin-Madison, Department of Engineering Professional Development, 2004
- > Habitat Evaluation Procedure, U.S. Geological Survey/ U.S. Army Corps of Engineers, 2004
- > Hydrologic Engineering Applications for GIS, 2002
- > River Analysis with HEC-RAS, 2002



## **CRAIG P. WILSON, CHMM**

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### **EXPERIENCE**

40 years of experience and knowledge with the North Shore Trout Fishery.  
30 years in the Environmental, Health and Safety Field and has managed over 1,000 projects.

### **EDUCATION**

Masters Industrial Safety and Hygiene, University of Minnesota-Duluth (UMD), 1992  
Bachelor of Science in Biology with an Aquatics and Fisheries Focus, UMD, 1991.

### **CERTIFICATIONS**

Certified Hazardous Materials Manager (CHMM)

### **RELATED TRAININGS AND SPEAKING PROJECT EXPERIENCE**

Speaker Clean Water Council Seminar involving the Knife River and North Shore streams  
Founding Member of the Cold Water Collision for Western Lake Superior Habitat Projects  
Participated in the Lake Superior Management Plan (LAMP) process and provided LAMP revisions  
Participant Knife River TMDL Meetings and Implementation Report Revisions  
Attended in the Natural Resources Research Institute Weber Stream Restoration Initiative Seminar

### **FISHERY RELATED PROFESSIONAL EXPERIENCE**

- Environmental Troubleshooters, Inc. (President) October 1995-present.
- US EPA Environmental Research Laboratory-Duluth (Lab Technician) May, 1987-August 1991.

### **KNIFE RIVER PROJECT PROFESSIONAL EXPERIENCE**

- Project Manager for Phase 1 and Phase 2 Knife River Lessard Sams Grant project.
- Worked on restoring riparian tree canopy in old beaver meadows on the West Branch of the Knife River. Work consisted of obtaining, transporting and planting 1-gallon White Spruce trees.
- Assessed flood damage to the Knife River Trap and the Lower Knife River Falls. Provide a report with recommendation of concerns to temporarily pass fish above the lower falls. Discussed recommendations and provided photographs of problem areas to the DNR.
- Design and complete a project permit to restore fish passageway at the Knife River Second Falls. Collected elevation data, constructed cross-sections and obtained original photos to recreate the function of the original second falls. Designed four falls modification options to restore the function of the falls.
- Devised DNR policy changes for the Knife River beaver trapping program to address beaver impacts throughout the entire Watershed. Based on my recommendations, the DNR expanded their beaver control program to include additional aerial monitoring and trapping.

### **OTHER STREAM PROJECTS**

- Worked on a stream habitat improvement project for Hartley Creek. Managed one river section of the stream improvement project. Installed a rock wing dam, rock veining and log structure to support the stream bank. The goal of the project work was to provide better habitat for brook and brown trout. A follow-up stream survey concluded that this stream section was supporting an increased trout population.
- Worked with the DNR to change fishing regulations for the Lester River Falls by creating a fish sanctuary. I walked the stream with DNR to highlight the problem. Provided video documentation regarding the falls' vulnerability to fishing. Worked with conservation officers to policy the area and educate the local fisherman. Developed written criteria for the rule change that was added the 2003 fishery rule modification package.

### **OTHER RELATED PROFESSIONAL EXPERIENCE**

- Design options to proceed with projects in wetlands.
- Calculate and mitigate project impacts.
- Complete US Army Corp of Engineer (USACE), Board of Water and Soil Resources (BWSR) Soil and Water Conservation District (SWCD) and Department of Natural Resource (DNR) permits applications for working in waters and wetlands.
- Meet with the Technical Evaluation Panel to review the project, the TEP findings and discuss impacts.

## BRICE WIZNER

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### EXPERIENCE

Seven (7) years of experience with Lake Superior stream fisheries, stream ecology, and environmental practices.

### EDUCATION

Bachelors of Science in Cell and Molecular Biology and a minor in Chemistry, University of Minnesota Duluth, 2013.

### EMPLOYMENT HISTORY

- Environmental Troubleshooters, Inc. (2015 – Present), Duluth, MN, Stream Restoration Specialist
- MN Department of Natural Resources (2014), Duluth, MN, Creel Census - Fisheries Technician
- WI Department of Natural Resources (2013), Superior, WI, Creel Census - Fisheries Technician
- University of Minnesota-Duluth Plant Biology Laboratory (2011 – 2013), Duluth, MN, Laboratory Technician

### PROFESSIONAL CERTIFICATIONS

Rosgen Level I – Applied Fluvial Geomorphology  
Rosgen Level II – River Morphology and Applications  
Rosgen Level III – River Assessment and Monitoring  
Rosgen Level IV – River Restoration and Natural Channel Design  
Construction Site Management  
Design of Construction Stormwater Pollution Prevention  
Storm Water Construction BMP Installer  
OSHA Certified 40 Hour HAZWOPER and Refresher  
MSHA 24 Hour New Miner and Refresher

### PROFESSIONAL EXPERIENCE

- Assess, analyze, and design stream bank stabilization and fisheries habitat projects.
- Complete stream restoration permit applications.
- Management of stream restoration operations.
- Oversee stream construction operations.
- Operate heavy equipment for the placement of natural channel design structures.
- Complete and obtain MPCA construction storm water permits for sites that exceed 1 acre of disturbance.
- Install storm water best management practices.
- Perform storm water inspections.
- Oversee field soil boring operations and monitoring well construction throughout northeastern Minnesota and northwestern Wisconsin.
- Perform field screening and sampling during soil boring operations, excavations, and monitoring well installation.
- Perform groundwater sample collection.
- Measure groundwater aquifer characteristics.
- Conduct vapor sampling for Phase IIs, LSIs and other contaminated sites.
- Sampling and excavation for emergency response projects, including petroleum and non-petroleum cleanup sites.
- Complete MPCA Excavation, Remedial Investigation, Phase I, Phase II, and LSI Environmental Assessment Reports.
- Assisted in tank cleaning and removal.
- Knowledgeable in CAD.

# TRAVIS M. TOLAAS

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## EXPERIENCE

Seven (7) years of experience in environmental remediation and heavy equipment operation.  
Eight (8) years of experience in landscape and construction management and oversight

## EDUCATION

Bachelor of Science Environmental Science, University of Minnesota - Duluth, 2010.

## Trainings

OSHA Certified 40 Hour HAZWOPER and Refresher  
MSHA 24 Hour New Miner and Refresher

## EMPLOYMENT HISTORY

Environmental Troubleshooters, Inc. (2013 – Present), Duluth, MN, Heavy Equipment Operation.  
WLSSD (2017 – Present), Duluth, MN, Senior Solid Waste Operator.

## PROFESSIONAL EXPERIENCE

- Assess and analyze stream bank stabilization and fisheries habitat projects.
- Management of stream restoration operations.
- Oversee stream construction operations.
- Operate heavy equipment for the placement of Toe wood, rock vanes and log/rock “J” Hooks.
- Complete and obtain MPCA construction storm water permits for sites that exceed 1 acre of disturbance.
- Install storm water best management practices.
- Perform storm water inspections.
- Oversee field soil boring operations and monitoring well construction throughout northeastern Minnesota and northwestern Wisconsin.
- Perform field screening and sampling during soil boring operations, excavations, and monitoring well installation.
- Perform groundwater sample collection.
- Measure groundwater aquifer characteristics.
- Conduct vapor sampling for Phase IIs, LSIs and other contaminated sites.
- Sampling and excavation for emergency response projects, including petroleum and non-petroleum cleanup sites.
- Complete MPCA Excavation, Remedial Investigation, Phase I, Phase II, and LSI Environmental Assessment Reports.
- Assisted in tank cleaning and removal.
- Knowledgeable in CAD.

# **JACOB PAULSON**

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## **EXPERIENCE**

Fifteen (15) years of heavy equipment operation and drilling experience.

## **EDUCATION**

Heavy Equipment Operation Certificate, Central Lakes Technical College, 2005.

## **REGISTRATIONS AND CERTIFICATIONS**

Minnesota DOT Class A License  
Job Safety Coursework  
OSHA Certified 40 Hour HAZWOPER and Refresher  
MSHA 24 Hour New Miner and Refresher

## **EMPLOYMENT HISTORY**

Environmental Troubleshooters, Inc. (2005 – Present), Duluth, MN, Heavy Equipment Operation.

## **PROFESSIONAL EXPERIENCE**

- Experienced operating heavy equipment such as: backhoe, dump truck, skid-steer, excavator, dozer, and loader.
- Primary excavator/operator in charge of stream channel excavation, floodplain bench construction, sloping of eroding banks, and natural channel design structures.
- Water management during stream corridor restoration.
- Erosion control and riparian restoration on construction sites.
- Excavator operator on multiple petroleum underground storage tank (UST) removal projects.
- Experienced with performing Geoprobe drilling operation.
- Experienced with performing Hollow Stem Auger (HSA) drilling and well installation.
- Assisted with sample collection, cleaning and decontamination of boring equipment.
- Assisted with soil vapor risk assessments, groundwater receptor surveys, groundwater sampling and assisting with monitoring well sampling.
- Assisted with several limited response actions for emergency response.
- Experience in surveying.
- Experience with remedial system trenching and installation Hinckley, Minnesota and Bagley, Minnesota.

# **TODD SCHULTZ**

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## **EXPERIENCE**

5 years Environmental Contracting Experience.

25 years Logging and Heavy Equipment operation and property maintenance.

## **EDUCATION**

Automotive Service Tech, Wisconsin Indianhead Technical College, 1991.

## **Licenses and Trainings**

Forest Industry Safety and Training Alliance Certification:

Best Management Practices

Equipment Operation

Chain Saw Safety

Michels Pipeline Union Operator Certification

Minnesota DOT Class A Driver's License

OSHA 40-Hour HAZWOPER Training

Annual 8-Hour Refresher Training

Mine Health and Safety Training

## **EMPLOYMENT HISTORY**

Environmental Troubleshooters, Inc. (August 2014 to present)

Duluth, Minnesota

Self Employed Logger/Farmer/Heavy Equipment Operator

## **PROFESSIONAL EXPERIENCE**

- Primary operator of the logging forwarder
- In charge of material handling, stream channel excavation, floodplain bench construction and sloping of eroding hillside for Knife River Stream Restoration project.
- Placed toe wood, boulders and brush bundles on three stream reach projects in the Knife River Watershed.
- Pumped water from stream during high water flows.
- Laid out fabric, plant grasses, sedges, shrubs and trees to revegetate impacted riparian zones.
- Experienced operating heavy equipment such as: backhoe, dump truck, skid-steer, excavator, dozer, and loader.
- Assisted with the placement of storm water silt fence, straw bales and straw rolls to minimize discharge from construction site.
- Restored private property accesses after stream project concluded.
- Excavator operator on petroleum underground storage tank (UST) removal projects.
- Experienced with performing Geoprobe assistance and drilling operation on several sites.
- Experienced with performing Hollow Stem Auger (HSA) drilling and well installation.
- Assisted with soil vapor risk assessments, groundwater receptor surveys, groundwater sampling and assisting with monitoring well sampling.
- Assisted with several limited response actions for emergency response.

## JOE FYE

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### **EXPERIENCE**

Fourteen (14) years of excavation, drilling, spill response, and equipment operations experience.

### **EDUCATION**

High School Diploma.

### **REGISTRATIONS AND CERTIFICATIONS**

DOT Class A Driver's License

OSHA Certified 40 Hour HAZWOPER and Refresher

MSHA 24 Hour New Miner Training and Refresher

Mine Safety and Health Administration Instructor Certification

### **EMPLOYMENT HISTORY**

Environmental Troubleshooters, Inc. (2004-2006, 2008-present), Duluth, MN, Geoprobe Operator.

Mine Safety and Health Administration (2019-present), Duluth, MN, Instructor.

### **PROFESSIONAL EXPERIENCE**

- Mini excavator/operator assisting stream channel excavation, floodplain bench construction and sloping of eroding banks.
- Pumped water from stream during high water flows.
- Laid out fabric, plant grasses, sedges, shrubs and trees to revegetate impacted riparian zones.
- Experienced operating heavy equipment such as: backhoe, dump truck, skid-steer, excavator, dozer, and loader.
- Assisted with the placement of storm water silt fence, straw bales and straw rolls to minimize discharge from construction site.
- Restored private property accesses after stream project concluded.
- Experienced with performing Geoprobe drilling operation on several sites.
- Experienced with performing Hollow Stem Auger (HSA) drilling and well installation.
- Experienced with tank cleaning and waste disposal.
- Skid steer and limited heavy equipment operation.
- Assisted with sample collection, cleaning and decontamination of boring equipment.
- Assisted with soil vapor risk assessments, groundwater receptor surveys, groundwater sampling and assisting with monitoring well sampling.
- Assisted with several limited response actions for emergency response, including boom deployment, decontamination, soil excavation and product pumping.
- Site preparation and construction of bio-piles.

## **Paul V. Sandstrom**

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### **Experience**

40 years of natural resource and conservation work with the Laurentian Research, Conservation and Development (RC&D), Natural Resource Conservation Service (NRCS) and United States Department of Agriculture (USDA)

### **Education**

Bachelor of Science B.S. in Soil Science University of Minnesota 1979.

### **Training and Continuing Education**

- NRCS hydric soils identification.
- Riparian Tree Planting.
- Forestry best management practices.
- Conservation practice needs and feasibility determination,
- Conservation practice installation inspection and project certification of completion.

### **Professional Work Experience**

- Laurentian RC&D, Director September 2011 to present.
- USDA-NRCS, Project Coordinator, Duluth, Minnesota, January 2008 to August 2011.
- USDA-NRCS, District Conservationist, Duluth, Minnesota, April 1987 to January 2008.

### **Knife River Watershed Project Experience**

- Knife River Watershed Forest Stewardship TMDL Development Committee Chair 2009-2011.
- Knife River Watershed NRCS Environmental Quality Incentive Program Technical Leader for conservation practices.
- NRCS Technical Leader for over 50 Knife River Watershed Forest Management Plans.
- NRCS Technical Leader for over 20 Knife River Watershed riparian tree planting projects.

### **Other Lake Superior Watershed Project Experience**

- NRCS Great Lakes Restoration Watershed Coordinator, Nemadji River Watershed.
- USDA Nemadji River Watershed Investigation and Planning.
- Flute Reed River Watershed, Technical Advisor
- Miller Creek Watershed, Technical Advisor
- Wisconsin Brule River Watershed Stream Restoration, Technical Advisor

**Attachment 3**  
**RFP Bid Form (Attachment D)**



**Zeitgeist Center for Arts & Community and the Lake Superior Steelhead Association**

**Lessard-Sams Outdoor Heritage Council Grant**

**Knife River Habitat Rehabilitation-Phase IV RFP**

**Knife River Reach 4/PH IV Bid Form**

- Mobilization. \$ 895.50
- Implement MPCA Storm Water Plan. \$ 6,000.00
- Cut/Create Access trails and Landings. \$ 38,300.00
- Haul Toe Wood and Stage On-Site. \$ 5,000.00
- Haul boulders and stage on-site. \$ 5,000.00
- Rosgen Level 4 Project Design Oversight. \$ 54,000.00
- Restore Approximately 2700 Linear Feet of Upper Reach 4. \$ 502,504.00
- Tree Planting \$ 5,000.00
- Site Restoration \$ 17,405.00
- Demobilization \$ 895.50

**Base BID \$ 635,000.00**

**Unit Rates**

- Level 4 Rosgen Trained Professional \$ 150.00
- Equipment Operator \$ 95.00
- Laborer \$ 85.00
- Excavator Size CX160 Daily Rate \$ 1,200.00
- Excavator Size Mini Ex. Daily Rate \$ 1,000.00
- Skid Steer Daily Rate \$ 680.00
- Skid Steer w/Brush Cutter Daily Rate \$ 760.00
- Other Heavy Equipment List Type Forwarder Daily Rate \$ 1,800.00
- Other Heavy Equipment List Type Tracked Dump Daily Rate \$ 1,680.00

- Labor - Tree Planting Hourly Rate \$ 95.00
- Equipment - Tree Planting List Type Mini Excavator Daily Rate \$ 1,000.00
- MN/DOT Wetland Seed Mix Per Bag \$ 165.54
- MN/DOT Upland Seed Mix Per Bag \$ 113.79
- Matting Coconut including staples per roll Per Roll \$ 166.20
- Matting Coir including wood stakes per roll Per Roll \$ 410.00

**Professional Staff Assigned for the Duration of this Project**

Name of Level 4 Rosgen Trained Professional(s) Brice Wizner, Mark Pranckus, Aaron Steber

**Bid Submission**

Company	Environmental Troubleshooters, Inc
Address	3825 Grand Avenue
City/State	Duluth / Minnesota
Authorized Bidder's Representative (Print)	<u>Brice Wizner</u>
Bidder's Phone Number	(218) 722-6013
Bidder's Email	brice.wizner@etsmn.com
Signature	<u></u>
Title	Project Manager
Date	<u>03/31/2020</u>

If you choose not to bid on this project, please check the **No Bid Box**, fill out the requested information and email this full page back to Tony Cuneo at [Tony@zeitgeistarts.com](mailto:Tony@zeitgeistarts.com).

**NO BID BOX**

Company Not Submitting Bid \_\_\_\_\_

Company's Representative (Print) \_\_\_\_\_

Reason/s For Not Submitting Bid  
\_\_\_\_\_

Date \_\_\_\_\_

**Attachment 4**  
**Standard Billing Rates**

## ET STANDARD BILLING RATES KNIFE RIVER GRANT PROJECT

<b>Professionals / Personnel</b>	<b>Rate</b>
Project Manager (Rosgen Level 4)	\$150.00/hr
Construction Supervisor (Rosgen Level 4)	\$125.00/hr.
Equipment Operator/Dump Truck Driver	\$95.00/hr
Laborer	\$80.00/hr.
After Hours Services (5 p.m. – 8 a.m.) and Weekends	1.5 x Rate
After Hours Services Holidays	2 x Rate
<b>Vehicle / Contracting Equipment (not including Operator)</b>	<b>Rate</b>
CX160 Excavator	\$150.00/hour
Terex Mini-Excavator	\$125.00/hour
Tracked Dump Truck	\$210.00/hour
Timberjack 1010 Logging Forwarder	\$225.00/hour
Cat289D Skid Steer	\$85.00/hour
Gator 825 UTV w/ Trailer	\$150/day
Brush Cutter/Grapple/Tiller	\$100/day
Service Vehicle (Light Duty Vehicle)	\$100.00/day
Service Vehicle (Heavy Duty Truck)	\$2.00/mile
Service Vehicle (Heavy Duty Truck)	\$150.00/day
<b>General Equipment and Supplies</b>	<b>Rate</b>
2" Trash Pump	\$75.00/day
4" Trash Pump	\$125.00/day
Brush Cutter	\$80.00/day
Chain Saw	\$25.00/day
Emergency Lighting	\$25.00/light/day
Generator (6500)	\$100.00/day
Hand Tools	\$100.00/week
PPE/Waders	\$20.00/day/person
Survey Gear	\$50.00/day
Koir	\$372.60/roll
C-125BN	\$128.80/roll
S-150BN	\$77.28/roll
MNDOT Wetland Mix	\$448.50/bag
MNDOT Highland Mix	\$815.06/bag
Straw Bale	\$11.50/bale
Straw Waddle	\$31.23/waddle
Stakes/Staples	\$37.40/box

## ET STANDARD BILLING RATES KNIFE RIVER GRANT CONT.

<b>Containers</b>	<b>Rate</b>
Bladders 100 bbl	\$500.00/day
Drums (55 Gallon Steel)	\$90.00/each
Drum (85 gallons) Over Pack	\$140.00/each
Poly Tank (110 Gallon)	\$25.00/day
Poly Tank (350 Gallon)	\$30.00/day
Poly Tank (500 Gallon)	\$50.00/day

<b>Disposables Supplies</b>	<b>Rate</b>
Caution Tape	\$50.00/roll
Fencing (orange plastic security)	\$100.00/roll
Poly (10 Mil)	\$240.00/roll
Silt Fence	\$25.00/per 100' roll
Fencing Stakes	\$1.00/each

<b>Misc. Expenses</b>	<b>Cost plus 15%</b>
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**Attachment 5**  
**Insurance Certificate Example**



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 07/07/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER: Solutions Insurance Agencies, 215 N Central Avenue, Suite 6, Duluth, MN 55807, Heidi Nessa, 218-628-1878. CONTACT NAME: Heidi Nessa, PHONE: 218-628-1878, FAX: 218-628-3515. INSURED: Environmental Troubleshooters, Craig Wilson, 3825 Grand Ave, Duluth, MN 55807. INSURER(S) AFFORDING COVERAGE: INSURER A: Western National Mutual Ins Co (NAIC # 15377), INSURER B: Colony Insurance Co (NAIC # 39993).

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Table with columns: INSR LTR, TYPE OF INSURANCE, ADDL INSD, SUBR WVD, POLICY NUMBER, POLICY EFF (MM/DD/YYYY), POLICY EXP (MM/DD/YYYY), LIMITS. Rows include: COMMERCIAL GENERAL LIABILITY (Policy # PACEP305454), AUTOMOBILE LIABILITY (Policy # CPP001960013), UMBRELLA LIAB (Policy # UMB001131413), WORKERS COMPENSATION AND EMPLOYERS' LIABILITY (Policy # WCV100324809), Professional Liab (Policy # PACEP305454), Environmental Liab (Policy # PACEP305454).

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required) Zeitgeist Center for Arts and Community are included as an Additional Insured on the Commercial General Liability and Pollution Liability policy when required by written contract.

CERTIFICATE HOLDER: Zeitgeist Center for Arts and Community, 222 E Superior St., Suite 326, Duluth, MN 55802. CANCELLATION: SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE: Heidi Nessa