

# Environment and Natural Resources Trust Fund 2020 Request for Proposals (RFP)

**Project Title:**

**ENRTF ID: 067-AH**

Minnesota Public Trails and Waterways: A Comprehensive Database

**Category:** H. Proposals seeking \$200,000 or less in funding

**Sub-Category:** A. Foundational Natural Resource Data and Information

**Total Project Budget:** \$ 195,000

**Proposed Project Time Period for the Funding Requested:** June 30, 2022 (2 yrs)

## Summary:

Noteworthy features along select trails in Minnesota will be catalogued in a spatial database and displayed on maps to increase public land usage while fostering natural resource awareness and protection.

**Name:** Andrew Gustin

**Sponsoring Organization:** Outdoor Explorer

**Job Title:**

**Department:**

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St. Paul MN 55108

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**Location:**

**Region:** Central, Northwest, Northeast

**County Name:** Becker, Cass, Clearwater, Cook, Hubbard, Itasca, Lake, Otter Tail, St. Louis

**City / Township:**

## Alternate Text for Visual:

An infographic showing the major activities undertaken by Outdoor Explorer: GPS Data Collection, GIS Data Analysis, Natural Resource Research and Identification, Database Curation, Backcountry Camping, and the creation of Interactive Maps.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity	_____ Readiness	_____ Leverage	_____ TOTAL _____%



**PROJECT TITLE: *Minnesota Public Trails and Waterways: A Comprehensive Database***

**I. PROJECT STATEMENT**

We aim to increase trail usage in Minnesota and collect valuable scientific data on the current distribution of natural resources by creating a database of waypoints that highlight natural features, attractions, and amenities encountered on public land. While the ultimate goal is to map all of the trails and waterways in Minnesota, this pilot project will cover more than 450 miles of lightly-used, continuous hiking and multi-use trails in the northern part of the state. Mapping the spatial and temporal distribution of resource species is critically important as this data offers a snapshot of the way Minnesota exists today. When collated with prior and future mapping efforts, it allows a glimpse at how our natural resources are changing. By documenting a broad variety of features along these publicly accessible routes and freely publishing selected data, people will be encouraged to venture outdoors and safely explore these incredible places.

Natural points to be mapped include wild edible plants, biomes, reliable water sources, vistas, and various biological, geological, and cultural features. Man-made waypoints such as road and trail crossings, signs, parking lots, benches, bridges, and other identifiable amenities will also be cataloged. The database will be populated by hiking and biking the trail corridor to identify the locations of noteworthy waypoints. Whenever features are encountered, they will be photographed and detailed, the spatial coordinates recorded with a hand-held GPS. From east to west, the trail corridor includes the Border Route Trail (65 miles), the Kekekabic Trail (46 miles), the Mesabi Trail (152 miles), and an unpaved portion of the North Country Trail (196 miles).

Waypoint information will be released to the public through the Minnesota Geospatial Data Commons and freely distributed in a series of interactive digital and printed maps once all collected data is compiled and filtered for sensitive content. Species data deemed too sensitive will be provided to the Bell Natural History Museum as scientific data. The identification and publication of select trailside amenities and points of interest will encourage Minnesotans to safely and confidently enjoy these spaces. Increased trail usage will result in a more informed public and a happier, healthier populous. The lesser-used trails will become more naturally established and require less maintenance. The creation of the database and publicly available maps as outlined in this project meet the requirements for priority funding as defined in Minnesota Statue 116P.08 (1a)(6).

Although a limited amount of waypoint data is available through the North Country Trail Open Data Portal, it generally lacks detail. While this data will be utilized and enhanced, the accuracy of crowd-sourced data is limited by the experience and attention to detail of the data collectors; there is no way to control for quality or ensure that all trail segments will be covered equally thoroughly. Outdoor Explorer was formed by dedicated Minnesota Masters Naturalists with a tested history of mapping waypoints through extreme conditions. Our collected data will be more consistent than crowd-sourcing and it will be curated to include a wide variety of features that appeal to people of all walks of life.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1: Identifying and Documenting Pertinent Waypoints**

The trails of focus for this pilot project are some of the most remote and rugged pathways in our state. The distribution of resource species, points of interest, and amenities along these routes will be methodically documented and a wide variety of features will be included for maximum appeal. The mapping effort will require several week-long hiking and backcountry camping trips along the different stretches of the proposed trails coupled with the shuttling of vehicles from one trailhead to the next to restock food and fuel. *Several thousand waypoints* will be identified, marked, detailed, and photographed during this project.

**Activity 2: Curating Data and Generating Maps**

The information will be processed, curated, and displayed on an interactive digital map. Paper maps showing select waypoints will also be distributed at designated locations to reach a larger audience. The impact and success of this project can be directly measured by tracking map usage and distribution. Working with land

management groups, we will further increase exposure to this information and establish methods for quantifying the increases in trail usage related to the mapping effort (polls, log books, etc).

**ENRTF BUDGET: \$ 195,000**

Outcome	Completion Date
1. <i>Identifying and Documenting Pertinent Waypoints</i>	12/01/21
2. <i>Curating Data and Generating Maps</i>	06/01/22

### **III. PROJECT PARTNERS AND COLLABORATORS:**

The North Country Trail Association (NCTA) is a nonprofit aiming to develop, maintain, protect, and promote the North Country Trail corridor as an established hiking route across the northern part of the country. The trails to be mapped in this project are all part of the current North Country Trail corridor through Minnesota. The NCTA will offer advice and logistical support for the hike by way of their vast volunteer network. We will work with the Minnesota NCT Trail Coordinator Matt Davis during the mapping phase to facilitate collaboration.

Megan Impson of the Superior National Forest office of the USFS has offered guidance and recommendations for what data to include in the public database. An example of sensitive information to be excluded from the public database is a culturally significant site that might be damaged by increased traffic. We will work within the scope of their goals and land use regulations to ensure that the publicly released data will benefit their mission while also educating the public.

Mike Ireland is the treasurer of Outdoor Explorer (OE) and has over 40 years of experience serving on the boards of nonprofit organizations. Mike is in charge of financial transactions and reimbursements, and will ensure compliance with all grant funding requirements. He has a background in accounting and previously worked at U.S. Bank and at Wells Fargo as the Assistant Vice President. Mike holds a B.A. in Psychology from the University of Minnesota and a Master of Divinity from the United Theological Seminary of the Twin Cities. He is an artist and will offer guidance for the visual aesthetics of the maps.

Madeline Boler is the secretary of OE and a native Minnesotan with a deep passion for the natural world. She has spent a significant amount of time hiking, biking, paddling, and exploring around the globe, but most extensively she has wandered the many parks and forests of Minnesota. She is a certified Minnesota Masters Naturalist and edible mushroom forager with an eclectic set of interests and an unending capacity to learn. Madeline is responsible for field logistics and will be a critical member during the mapping and data acquisition phase of the project.

Rebecca Calvo is a postdoctoral associate currently doing research at the University of Minnesota. She has a PhD in biology from Indiana University and has an extensive background in scientific research. Rebecca will donate her time to assist with remotely identifying features as necessary. She will reference known habitats of species using the Minnesota Biodiversity Atlas at the Bell Natural History Museum.

### **IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

The database of public waypoints will be published to the Minnesota Geospatial Data Commons and provided online as an interactive map on a free website. Minimal funding will be required for long-term implementation. The completed database will be used to educate and inform the public, soliciting donations from patrons to sustain the hosting fees for the website and printing costs, as well as to subsidize future mapping efforts. Other granting agencies will be sought to compliment donor funding. Fund-raising campaigns are in the process of being organized to further supplement donations.

### **V. SEE ADDITIONAL PROPOSAL COMPONENTS:**

**Organization Description, G. Letter or Resolution, H. Financial Capacity**

Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet

Legal Citation: N/A

Project Manager: Andrew Gustin

Project Title: Minnesota Public Trails and Waterways: A Comprehensive Database

Organization: Outdoor Explorer

Project Budget: \$195,000

Project Length and Completion Date: 2 years; 06/01/2022

Today's Date: 04-13-2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
<b>BUDGET ITEM</b>				
<b>Personnel (Wages and Benefits)</b> All personnel have a base salary of \$51k / year		\$-	\$-	\$-
Andrew Gustin: Project manager, cartographer, photographer: \$102,000 (100% salary, 0% benefits); 100% FTE for 2 yrs.		\$102,000		
Madeline Boler: Field operations, data acquisition: \$68,000 (100% salary, 0% benefits); 66% FTE for 2 yrs.		\$68,000		
Michael Ireland: Fiscal agent, grant compliance: \$5,100 (100% salary, 0% benefits); 5% FTE for 2 yrs.		\$5,100		
<b>Equipment/Tools/Supplies</b>				
<u>Technology</u> : Handheld GPS, camera / accessories, solar charger, batteries, field device		\$3,600		
<u>Gear</u> : Sleeping Bags, Tent, Boots, etc.		\$3,000		
<b>Printing</b>				
Printed 8.5"x11" color maps (5,000) for free distribution		\$1,000	\$-	\$-
<b>Travel expenses in Minnesota</b>				
Mileage across state: ~2,000/yr @ \$0.545 / mile		\$2,180		
Lodging fees: ~15 nights in a motel or paid campground (when applicable)		\$3,000		
Food: ~110 days backpacking food per year @ \$12.50 / day / person (2) (required due to lack of food and lodging options during mapping phase of this project)		\$5,500	\$-	\$-
Other: Annual website hosting and maintenance costs for digital maps		\$1,620		
<b>COLUMN TOTAL</b>		\$195,000	\$-	\$-
<b>SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT</b>				
	Status (secured or pending)	Budget	Spent	Balance
Non-State: Donations from the public (filing nonprofit with state)	Secured	\$100	\$-	\$100
State:		\$-	\$-	\$-
In kind: Volunteer time spent researching (Rebecca Calvo) (1% FTE for 2 yrs)	Secured	\$1,020	\$-	\$1,020
<b>Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS</b>				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
		\$-	\$-	\$-

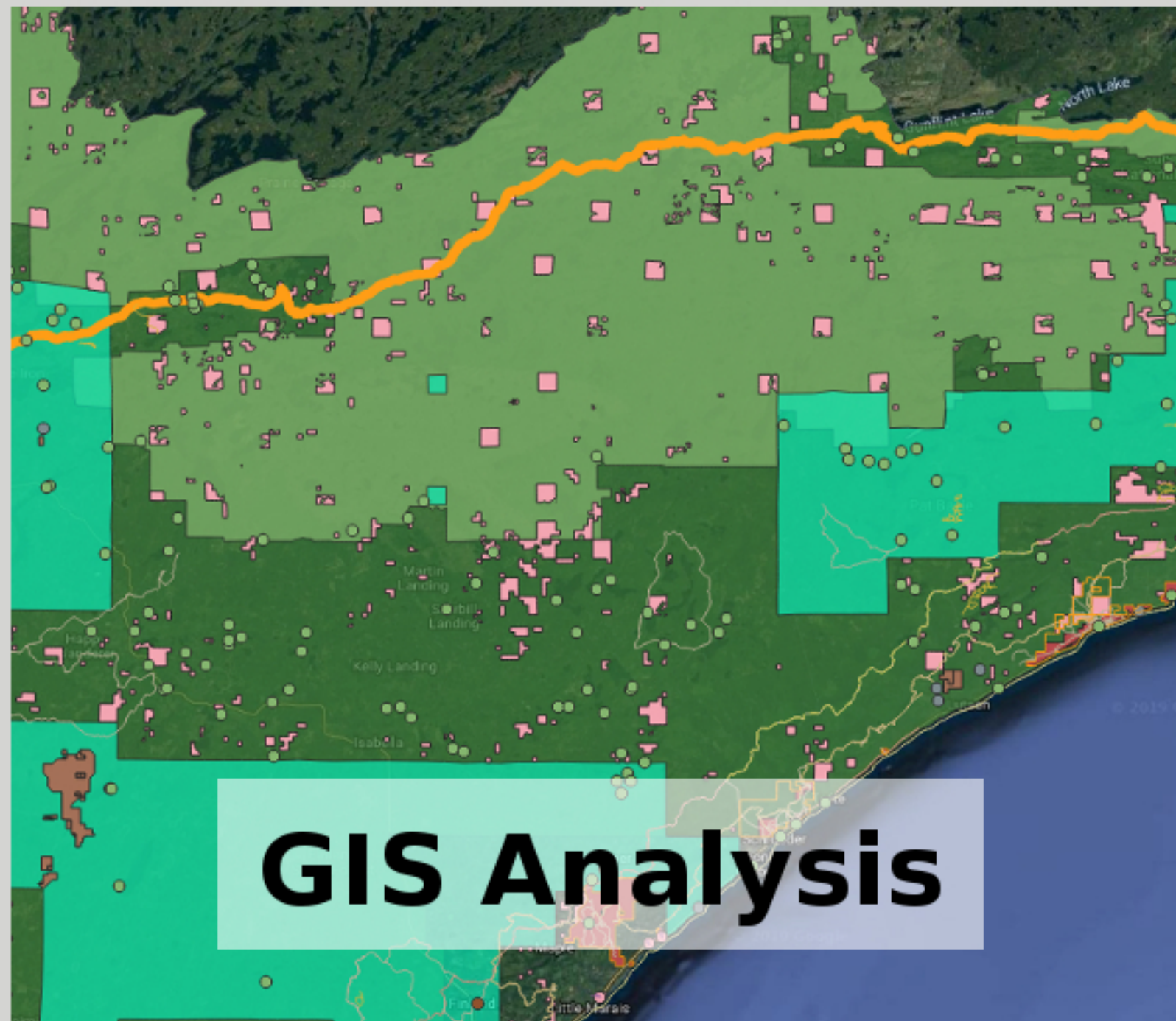




## GPS Data Collection



## Backcountry Camping



## GIS Analysis



## Interactive Maps



## Research & Identification

1746	1298.7	Reeves Falls Campsite	Campsite	0	0	1746	3	Benches=20', Latrine Q...
1745	1261.4	Reeves Falls Campsite Trail	Trail Junction	0	4	1745	0	x
235	880.6	Kadunce River Water	Water	0	5	279	0	Nice water fill up, swi...
234	838.1	West Fork Kadunce Camp...	Campsite	0	0	278	3	Latrine Q=4, Benches=...
1742	1261.8	Boardwalk x2	Boardwalk	16	4	1742	0	x
1741	1267.6	Reeves Road crossing	Road Crossing	0	0	1741	0	x
1744	1263.4	Reeves Road crossing	Road Crossing	0	0	1744	0	x
1743	1260.1	Boardwalk	Boardwalk	16	4	1743	0	x
1738	1317.0	Power Line Corridor	Corridor	0	0	1738	0	With vista
1737	1301.8	Trail Junction	Trail Junction	0	0	1737	0	x
1740	1320.5	Pipeline Corridor	Corridor	0	0	1740	0	x
1739	1339.6	Vista	Vista	0	4	1739	0	x
1734	1250.5	Reeves Road Mileage	Sign	0	4	1733	0	x
1733	1250.4	Reeves Road Parking Lot	Parking	0	0	1732	0	x
1736	1302.7	Reeves Road Gate	Gate	0	4	1736	0	x
1735	1252.9	Reeves Road confusion	Fix	0	1	1735	0	Lack of blazes along th...
251	847.2	Bridge over Kimball Creek	Bridge	25	5	297	0	x
249								
253	868.0	Kimball Creek Campsite 1...	Trail Junction	0	0	299	0	x
252	864.0	Kimball Creek Trail Junction	Trail Junction	0	0	298	0	x
246	817.9	Stairway	Stairway	0	0	291	0	New, soon to be

## Database Curation

## Certifications



## Collaborators



We are passionate naturalists with hundreds of miles of experience mapping waypoints in extreme conditions. Our mapping efforts will serve to educate the public and inspire Minnesotans to safely explore trails and waterways across the state.

**We have the skills, knowledge, and dedication to carry this project from conception to completion!**



## **Project Lead**

Andrew Gustin is the Chair and functioning director of Outdoor Explorer. He is also the owner of GeoPOI LLC, a digital cartography business based out of St. Paul, Minnesota that specializes in producing interactive and uniquely informative point-of-interest maps and applications. He holds a Masters of Science in Geological Sciences from Indiana University and focused on mapping glacial deposits for his thesis research. Andrew has previously worked on multiple geothermal energy projects, including one through the University of Minnesota that was funded by the LCCMR. He is certified as a Minnesota Master Naturalist with an extensive background in backpacking and camping. These combined attributes and experiences make Andrew a qualified candidate for identifying and mapping a wide variety of natural features.

Andrew has worked on contracted projects with the Saint Paul District 10 Community Council aimed at improving the environmental conditions of Como Park since moving to St. Paul in 2015. These include reducing the amount of phosphorus in stormwater that enters Como Lake, mapping the features along park pathways, and enhancing the informational signage within the park. He was recently contracted by the Superior Hiking Trail Association (SHTA) to update and expand their spatial database. This required hiking over 300 miles and documenting man-made and natural features encountered. The resultant database greatly assists the SHTA in maintaining the quality of the route and highlighting features and amenities that can be enjoyed along the trail.

For this project, Andrew will be taking the lead on identifying geological, biological, cultural, and other noteworthy waypoints in the field. He will use his experience hiking, teaching, and mapping to create a custom database of spatial information to encourage people to explore public lands and educate the public on a variety of subjects. After data collection is completed, Andrew will use GIS software to process the collected waypoints and finalize the database. He will also facilitate displaying this information on a series of digital and paper publications by programming interactive web applications and drafting printable maps.

## **Organization Details**

Outdoor Explorer (OE) is a newly-formed Minnesota nonprofit with a fresh take on digital mapping. The mission of OE is to support and conduct non-partisan research, education, and scientific data collection in Minnesota and beyond. This is accomplished in part by identifying, documenting, and compiling a public database of natural features and man-made and generating informative maps to display this data. OE also aims to promote the sustainable enjoyment of the wide variety of ecosystems, habitats, and features in our natural world while protecting and enhancing these sacred spaces for future generations by encouraging responsible public land, trail, and waterway use.

If funded, this project would be an incredible opportunity for OE to demonstrate their relevance through mapping this beautiful and underused trail corridor in northern Minnesota. The detailed and insightful spatial databases that OE specializes in producing have the potential to revolutionize how people experience the outdoors and learn about natural resources, conservation, and wildlife.