



# NFWF

## Full Proposal Project Narrative

### 1. Coastal Community Context

Coastal communities along the Lake Superior shoreline in the Great Lakes region have been hit particularly hard by more frequent and extreme storm events. In the Upper Peninsula (U.P.) of Michigan specifically, the City of Marquette (largest city in the U.P.; population 21,355) is experiencing unprecedented coastal erosion and infrastructure damage due to high Lake Superior water levels and increased frequency and intensity of storm events. A recent Lake Superior storm (October 24, 2017) documented 28.8-foot waves (historic record) and hurricane-force wind gusts (77 mph; also a historic record), resulting in two drownings and millions of dollars in shoreline damage. The storm broke the all-time record for the largest significant wave height ever measured on the Great Lakes. Water levels on Lake Superior were extremely high during October, with the daily value for October 24 exceeding the record high monthly mean lake level (measured since at least 1918). With return periods of roughly 40 and 100 years for the large wave heights and high lake levels, climatologists estimate that the resulting storm was a 1-in-4000 year event.

Other recent extreme storm events have impacted coastal cities including Houghton, Michigan (June 2018; 7 inches of rain; \$100 million in infrastructure damages; one Michigan death attributed to storm event), Duluth, Minnesota (June 2012; 7.24 inches of rain in 48 hours; \$80 million in damages to infrastructure), and Thunder Bay, Ontario (May 2012; 4.25 inches of rain in 36 hours; causing more than \$58 million in infrastructure damages and overwhelming the city's sewage treatment facility). The impacts of these increasingly frequent events are crippling for the affected communities which often lack sufficient resources (funding, staff, etc.) to recover from the associated damages.

The City of Marquette has over 10 miles of Lake Superior coastline with over 60% in a developed, non-natural state. Pre-settlement maps and natural features inventories confirm that the proposed project site was once natural sand beach with dune and swale complex and intermittent coastal wetlands. This project will restore 4,200 linear feet (approximately 13%) of historically armored shoreline that is most impacted by more frequent and more extreme coastal storm events. The shoreline is located along Lakeshore Boulevard, an important north-south thoroughfare that provides access to the Lake Superior shoreline, homes, and public beaches/parks. This section of shoreline has experienced severe erosion and flooding due to Lake Superior wave action and is heavily armored with a long continuous ridge of stone revetment (3,250 linear feet; project area totals 4,200 linear feet, 38 acres). In some sections, the stone is piled over ten feet high and completely obstructs the lake view for drivers, bikers and pedestrians. The existing revetment, built in 1939, is made up of various materials such as stone and broken concrete and is not considered an "engineered" structure. The City of Marquette maintains the existing structure, which has succumbed to a combination of age and the relentless wave action/storms from Lake Superior, exposing the shoreline to erosion and bluff recession.

The compromised shoreline revetment has resulted in stone debris in the roadway as well as waves overtopping the structure causing flooding during storm events and ice buildup during the winter months. Often, the road is closed during storm events due to fear for public safety and welfare. In addition, the revetment protects a sanitary sewer force main and public bike path that runs along the west side of the road. Starting in 2012, the city, in cooperation with the Superior Watershed Partnership (SWP) undertook a Great Lakes coastal engineering study and alternatives analysis with W. F. Baird & Associates Ltd. for this shoreline with funding from the Michigan Coastal Management Program and conducted public engagement on design alternatives.

The *Lake Superior Coastal Resiliency* project was prioritized over a six year planning process that incorporated input on impacted coastal areas throughout the City of Marquette and involved numerous local, state, Tribal federal and binational partners including but not limited to the National Oceanic and Atmospheric Administration (NOAA) Climate Program Office, Michigan Coastal Zone Program, the Great Lakes and St. Lawrence Cities Initiative (US/Canada) and the US Fish and Wildlife Service (Coastal Program/Migratory Bird Project). During October 2015, the SWP in cooperation with the City of Marquette, the NOAA Climate Program Office, Great Lakes Integrated Sciences and Assessments Center (GLISA), and Marquette County's Climate Adaptation Task Force (CATF) hosted a coastal resiliency planning workshop at Northern Michigan University to train local planners and elected officials on models

and tools for building community resiliency. The workshop introduced attendees to useful planning and risk assessment tools including the U.S. Environmental Protection Agency (EPA) [CREAT risk assessment application](#) and the SWP's [Great Lakes Coastal Shoreviewer](#) risk assessment and community adaptation planning tool that is included in the U.S. Climate Toolkit. Key assets, threats and recent impacts in the City of Marquette including Lake Superior shoreline erosion and flooding were evaluated and used as a model for building coastal resilience. An outline of outcomes from the workshop was provided by NOAA and shared with workshop participants to encourage units of government to consider implementation of the findings and recommendations.

Funding through the National Coastal Resilience Fund will allow for the implementation of the engineered plans along Lakeshore Boulevard, providing a unique opportunity to restore and strengthen natural systems in order to prevent further damage and erosion of the Lake Superior shoreline, protect public infrastructure, restore public access to the shoreline, and create valuable, contiguous coastal habitat for resident and migratory wildlife using green-gray (hybrid) infrastructure. There is substantial evidence that natural infrastructure (i.e., healthy ecosystems) and combinations of natural and built infrastructure ("hybrid" approaches) enhance coastal resilience by providing important storm and coastal flooding protection while also providing other critical benefits for ecosystems and communities.

The project will implement priorities, strategies and goals noted in the [City of Marquette Master Plan](#), the [Marquette County Climate Adaptation Plan](#), the [Lake Superior Climate Adaptation, Mitigation, and Implementation Plan](#) (SWP 2013), as well as the City's [Adapting to Climate Change and Variability](#) report that was developed in 2013 with funding from GLISA, technical assistance from Michigan State University (MSU) Extension, and input from the Superior Watershed Partnership, key stakeholders, and the general public. The report was produced in order to increase community resilience by incorporating community-driven, locally generated adaptation strategies into the City's Master Plan and related documents. The project will also forward the mission of the [Climate Adaptation Task Force](#), which was formed to help engage local leaders and the general public to think proactively about changing conditions (fluctuating lake levels, more frequent/intense storm events, etc.) and to develop strategies that will make the Upper Peninsula more resilient and effective when dealing with the related impacts. Further, the project will benefit from regional partnerships in cooperation with the US Forest Service that include Landscape Conservation initiatives and incorporate related wildlife migration corridor planning aspects.

Additionally, the City participated in an EPA/NOAA Smart Growth Implementation Assistance for Coastal Communities pilot program, which led to the creation of two waterfront form-based code districts designed in part to reduce environmental impacts and promote public access and enjoyment of the waterfront while protecting water resources. The proposed project will support the code district designs as well as program and plan objectives by "protecting and restoring critical habitat, including beach/dune areas" at publically accessible sites throughout the city.

## 2. **Activities**

The project will restore and strengthen natural systems along 4,200 linear feet of Lake Superior shoreline in order to protect critical coastal areas from lake level changes, flooding, storm surge and coastal erosion associated with storm events. Project efforts will create 38 acres of valuable, contiguous terrestrial coastal habitat for resident and migratory species and restore public shoreline access (habitat to include 3 acres sand beach, 16 acres dune/swale, 3 acres coastal wetland, 16 acres upland terrestrial, and 1.6 acres nearshore aquatic connecting with coastal riparian habitat at the mouth of the Dead River). Two Great Lakes coastal engineering firms (Baird, OHM) in cooperation with the City of Marquette Engineering Department have and will continue to provide technical design expertise in cooperation with SWP wildlife biologists and wetland biologists that provide additional expertise regarding habitat restoration design components.

The project has been designed to provide an ADA accessible shoreline that supports critical coastal habitat and will also better withstand storm surge, coastal flooding, and coastal erosion. Engineered green infrastructure coastal habitat restoration designs will mitigate future coastal storm impacts and flooding by dissipating wave energy, retaining/detaining and infiltrating stormwater runoff, providing floodwater storage capacity, incorporating numerous public safety design features including moving/raising the road elevation, and providing additional root structure/erosion prevention from native plants, shrubs and tree species.

Essential elements of the project include the following:

- Demonstration of coastal resiliency and green-gray infrastructure concepts along 4,200 linear feet of Lake Superior shoreline that will result in improved protection and more natural and resilient conditions.

- Creation/enhancement of 38 acres of valuable, contiguous coastal habitat for resident and migratory species (habitat to include 3 acres sand beach, 16 acres dune/swale, 3 acres coastal wetland, 16 acres upland terrestrial, as well as 1.6 acres nearshore aquatic).
- Improvement of public access including handicap access to the Lake Superior shoreline (4,400 linear feet multi-use pathway).
- Public outreach and engagement via media outlets, presentations, meetings, signage, and press releases.
- Community and K-12 education (including Tribal youth) through volunteer events, the [Upper Great Lakes Stewardship Initiative](#), and Northern Michigan University
- Documentation and sharing of project case study with other coastal communities in the Great Lakes region for possible replication.

System Approach to Geomorphic Engineering (SAGE) guidelines were utilized in the engineered designs in order to provide an integrated approach to risk reduction that incorporates natural and nature-based features as well as non-structural and structural measures that best support improved social, economic, and ecosystem resilience. These guidelines were developed by the U.S. Army Corps of Engineers and NOAA to promote a hybrid engineering approach that integrates soft or “green” natural and nature-based measures with hard or “gray” structural ones. These stabilization solutions include “living shoreline” approaches which integrate living components, such as native plantings that enhance resiliency and help maintain the connections between terrestrial and aquatic ecosystems.

The section of shoreline included in the proposed implementation project currently shows very few signs of life. Additionally, in its current state, the opportunities for human interaction and enjoyment of the coastal area are minimal. The goal of the project is to bring back living components to the shoreline in order to support the ecological and community functionality of the area and to accommodate and better adapt to increased coastal storms, flooding, and related impacts. The project will incorporate several related components in order to revitalize the living aspects to the shoreline. Components include:

- Reclaim Developed Coastal Buffer Zone:** Currently Lakeshore Drive is located directly behind the rock/rubble revetment and is several feet lower than the top of the revetment. This causes several issues, including impacts to public safety from flooding and ice buildup, as well as reduced opportunities for native plantings and natural drainage patterns. The proposed concept will move Lakeshore Drive on average 300 feet away from the shoreline. This will allow for significant lift in the road elevations as well as space to incorporate public shoreline access, native plantings, and dune/swale systems to naturally mitigate flooding from storm induced wave action and ice buildup.
- Integrate Geomorphic Reduction/Softening of Existing Armoring:** With the space gained from the Lakeshore Drive relocation, there will be significant space to add native grasses and other plantings to naturally mitigate both wind and water erosion along the shoreline. This will also bring in the “living” components to the shoreline.
- Restore/Re-Create Natural Beach and Dune/Swale Features:** The space gained will allow for natural land shaping that will provide space to create dune and swale areas to naturalize the area and provide a variety of habitat. This will also allow for natural storage of storm water.
- Incorporate ADA Accessible Public Access and Trail System:** While the project will serve to expand public access to the Lake Superior shoreline within the city, precautions will be included in order to minimize human impacts to critical habitat zones. Defined multi-use trails along the hard armoring and through the native plantings/dune areas are included in the project design (ADA accessible hard surface paved trails and boardwalks where appropriate).
- Local and Great Lakes Public Engagement:** Public engagement to promote replication of these sustainable techniques throughout the Great Lakes region will also be included in project efforts (see above).

The project design includes moving the current lakeshore road inland (this road is often flooded during storm events) to increase the buffer area and allow more natural adaptation and stormwater infiltration in the coastal zone. The coastal area between the roadway and Lake Superior will be restored to natural dune/swale and coastal wetland conditions to buffer wave action and increase the amount of contiguous coastal habitat for resident and migratory wildlife species (38 acres). A mix of native upland and wetland tree species will be incorporated to provide maximum benefits for coastal habitat restoration and enhancement. Species selection will take into account native species present at the sites, Lake Superior shoreline conditions (sandy soils, high winds, etc.), adaptability to regional conditions, and importance to wildlife. Tree planting, species selection, and maintenance for each site will follow guidelines noted in the Guidance

for Landscape Tree Planting in the U.S. Forest Service Northeastern Area. This area will also serve as public waterfront park space with a shoreline bike path, ADA accessible trails, and improved views and access to Lake Superior.

The shoreline revetment will be reconstructed to provide the necessary shoreline protection while allowing for restoration of portions of the shoreline to natural shoreline/beach and providing nearshore aquatic/spawning habitat for native fish (see attached plans). Permits will be required from the Michigan Department of Environmental Quality and U.S. Army Corps of Engineers (MDEQ/USACE Joint Permit Application). The permitting process has been initiated and is expected to be completed by November – December 2018. Construction will be completed by the City of Marquette and qualified contractors and will utilize the SWP's [Great Lakes Conservation Corps](#) (GLCC) field crews to complete hands-on work. The GLCC consists of young adults (18-25) who are trained and supervised by experienced crew leaders with extensive experience and a related college degree (natural resource management, biology, etc.).

The project will include an education and outreach campaign to raise public awareness and provide resiliency leaders with knowledge necessary to effectively enhance coastal resiliency and simultaneously provide critical benefits to ecosystems and communities. Anticipated outreach channels include the city and SWP websites, press releases to media (TV, radio, newspaper), social media, and public meetings/events. The project will also serve as a case study and boilerplate model to be shared with the Great Lakes Beach Association (Marquette hosted the 2016 Annual Conference), the Great Lakes and St. Lawrence Cities Initiative (120 US and Canadian cities; Marquette is a Member City) and the Lake Superior Binational Partnership (US/Canada) for possible replication throughout the region. Additional project education/outreach will include K-12 experiential learning opportunities through the [Upper Great Lakes Stewardship Initiative](#), internship/research opportunities for Northern Michigan University students, and opportunities for the public to be involved via volunteer events (native plantings, etc.).

The project is expected to take three years beginning in November 2018 and concluding in October 2021. A proposed timeline for implementation of the activities described above is provided under the Outcomes section below.

NOTE: This proposed shovel-ready, hybrid design incorporates the best engineered green-gray infrastructure with the best aquatic/terrestrial habitat alternatives. All critical coastal resiliency and habitat restoration components of the design can be fully implemented with the proposed \$5.5 million budget (\$2.5 NFWF grant and \$3,050,000 minimum match). Additional local match will be used to implement adjacent landscaping or future phases of project implementation, expansion, etc. The project planning team is open to NFWF input on the project design and can make adjustments to the design if needed. Project partners can implement a scaled project design with less funding if needed (will accept less than the full funding request from NFWF if necessary).

### 3. **Outcome(s)**

The proposed project will result in multiple measurable and observable improvements to critical Lake Superior coastal habitat within the City of Marquette. Primarily, the project will support the implementation of green-gray (hybrid) infrastructure along 4,200 linear feet of Lake Superior shoreline, serving to restore and strengthen natural systems, reduce impacts related to future storm events (erosion, flooding, etc.), protect public infrastructure, restore public access to the shoreline, and create 38 acres of valuable, contiguous habitat for resident and migratory species (habitat to include 3 acres sand beach, 16 acres dune/swale, 3 acres coastal wetland, 16 acres upland terrestrial, as well as 1.6 acres nearshore aquatic). In the Great Lakes region, coastal zones provide critical refuge for populations of native plant and animal species (terrestrial and aquatic) as well as vital stop-over sites for migratory species including birds and the monarch butterfly. By prioritizing Lake Superior coastal habitat restoration and emphasizing contiguous, natural systems including coastal dune/swale, the project will expand upon a critical coastal migration corridor and provide valuable nesting, cover and spawning habitat for resident and migratory species alike. Previous studies conducted by the SWP in nearshore waters of Lake Superior adjacent to the project site identified 33 species of fish including the State threatened cisco/lake herring, an [S3 vulnerable species](#) and spoonhead sculpin, an [S1/S2 critically imperiled to imperiled](#) special concern species. Many of these species are found at shallower depths (9-12 meters) and utilize crevices and rocky shoreline substrates for spawning. In total, the project will benefit species including but not limited to: native fish species, white-tailed deer, moose, black bear, red fox, coyote, small mammals, as well as resident and migratory birds and other pollinator species (monarch butterfly, bees, etc.). All above noted species have been documented within the City limits.

Notably, the project site is directly adjacent to a migratory hotspot within the City of Marquette, where 212 bird species have been observed (data from [eBird](#), obtained July 31, 2018) including 16 species highlighted on the Michigan Natural

Feature's Inventory [Michigan Special Animals](#) list. Of those species, 11 are considered state special concern species (northern goshawk, grasshopper sparrow, eastern whip-poor-will, American bittern, common nighthawk, bald eagle, osprey, black-backed woodpecker, hooded warbler, western meadowlark, and golden-winged warbler), three are state threatened species (merlin, common loon, Caspian tern), one is a state endangered species (peregrine falcon), and one is a state "assumed extirpated" species (lark sparrow).

The project will reduce coastal hazards and increase the community's understanding of the risks resulting from coastal erosion and flooding by providing demonstrations of coastal resiliency concepts using natural systems and planning recommendations that will ensure long-term sustainability of the Lake Superior shoreline. This will help Marquette respond and adapt to coastal storms and Great Lakes water level variabilities and provide a case study for replication within other coastal communities. Project outreach will increase the public's understanding of coastal hazards and natural coastal systems. The project will also result in increased public stewardship through outreach and public engagement, signage, and improved public/handicap access.

The project design will benefit a significant portion of the greater Marquette population along with tourists and residents from outlying areas. The City of Marquette serves a Micropolitan population of 221,249 people (City of Marquette population 21,355; Marquette County population 67,215; Upper Peninsula population 311,361). This project will benefit lower socio-economic/low income residents and those from unique cultural backgrounds (tribal and minority). Additionally, the project will serve as a case study for effective coastal resiliency solutions for possible replication throughout other Great Lakes coastal communities experiencing similar impacts (US/Canada).

The SWP, in cooperation with the City of Marquette, will coordinate and implement the project. The proposed project would begin in November 1, 2018 and conclude on October 31, 2021 (three years). A proposed implementation timeline is provided below:

#### Year One (November 1, 2018 – October 31, 2019)

- Coordinate project partners (City departments, etc.).
- Complete Environmental Clearance (NEPA, etc.) per NFWF guidelines.
- Finalize permits from the U.S. Army Corps of Engineers and Michigan Department of Environmental quality (in progress and anticipated for November-December 2018).
- Conduct public outreach and education.
- Complete Bid documents for construction contractors.
- Establish a schedule for construction.
- Submit progress and financial reports per NFWF guidelines.

#### Year Two (November 1, 2019 – October 31, 2020)

- Coordinate project partners (City departments, etc.).
- Conduct public outreach and education.
- Complete contractor selection and begin construction.
- Submit progress and financial reports per NFWF guidelines.

#### Year Three (November 1, 2020- October 31, 2021)

- Coordinate project partners (City departments, etc.).
- Conduct public outreach and education.
- Finalize construction including native plantings.
- Submit progress and financial reports per NFWF guidelines.
- Develop and submit final report per NFWF guidelines.

This project directly furthers the goals of the [City Master Plan](#) and [Climate Adaptation Plan](#) which recommend: "protecting and restoring critical habitat, including beach/dune areas" and "removing structures that harden coastlines, impede natural regeneration of sediments, and prevent natural inland migration of sand and vegetation." The project also forwards the mission of CATF, which was formed to help engage local leaders and the general public to think proactively about changing conditions and to develop strategies that will make the Upper Peninsula more resilient and effective when dealing with the consequences (see attached support letter).

The project also complements numerous local, state, tribal, federal and binational (US and Canada) Great Lakes protection initiatives. At the local level the project furthers the objectives of an annual Great Lakes public beach monitoring program conducted in cooperation with the Michigan Department of Environmental Quality. The project directly supports many of the goals and recommendations of the following plans/initiatives: [GLRI Action Plan II \(2014\)](#), [EPA Strategic Plan \(2018-2022\)](#), [Lake Superior Lakewide Action and Management Plan \(2015-2019\)](#), [Lake Superior Biodiversity Conservation Assessment and Strategy – Volumes I and II \(2015\)](#), and the EPA-nine element [Lower Dead River Watershed Management Plan \(2003\)](#).

#### 4. Tracking Metrics

NFWF tracking metrics that will be used to monitor project success include:

- *Floodplain Restoration – Acres of Floodplain Restored.* The project will serve to restore and strengthen natural systems along 4,200 linear feet of Lake Superior shoreline (38 total acres; habitat to include 3 acres sand beach, 16 acres dune/swale, 3 acres coastal wetland, 16 acres upland terrestrial, as well as 1.6 acres nearshore aquatic) in order to prevent further damage and erosion of the shoreline, protect public infrastructure, restore public access to the shoreline, and create valuable contiguous habitat for resident and migratory wildlife using green-gray infrastructure.
- *Beach and/or Dune Restoration – Miles Restored.* The project design will restore natural systems to incorporate 16 acres of important dune/swale habitat with native plantings and three acres of beach (1,500 linear feet) along approximately 0.3 miles of Lake Superior shoreline.
- *Capacity Building – Number of Organizations Involved.* The proposed project is a collaborative effort between the Superior Watershed Partnership and the City of Marquette in partnership with numerous organizations including municipal, non-profit, community, tribal, regional, state, federal and binational (US/Canada) organizations. Currently the project has 13 committed partners/supporters (see list below and attached letters of support). It is anticipated that, if funded, the project will garner a minimum of 10 additional partner organizations. It should be noted that the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) is a project partner and will disseminate a project case study to over 120 US and Canadian cities for informational purposes and possible replication. Project information will also be shared through numerous public/private outlets in order to gather public input, promote project replication, and maximize project benefits. In addition, the SWP participates in the Upper Midwest and Great Lakes Landscape Conservation Cooperative (LCC) and shares related project information via the [U.S. Geological Survey Science-Base Catalog](#). The project has received overwhelming support from the public and local, state and regional agencies and organizations including Michigan's Congressional representatives. Committed partners/supporters include the following:
  - City of Marquette (Municipal)
  - Marquette County (Municipal)
  - Climate Adaptation Task Force (Community Group)
  - Keweenaw Bay Indian Community (Tribal)
  - American Society of Adaptation Professionals (Non-Profit)
  - Great Lakes and St. Lawrence Cities Initiative (Non-Profit, US/Canada)
  - NOAA Climate Program Office (Federal Agency)
  - Michigan State Extension (State Agency)
  - Michigan Sea Grant Program (State Agency)
  - Michigan DNR Urban Forestry Department (State Agency)
  - Lakehead University (University/Canada)
  - Senator Stabenow (US Senate)
  - Representative Bergman (US House of Representatives, MI-01)
- *Capacity Building – Number of Individuals Reached by Outreach, Training, or Technical Assistance Activities.* It is anticipated that the project will reach a minimum of 300,000 individuals with the potential of reaching up to 30 million (120 US and Canadian Great Lakes Cities through GLSLCI). Project outreach channels include partner websites, press releases to media (TV, radio, newspaper), social media, and public meetings/events. Additionally, project information will be shared with the Great Lakes Beach Association (Marquette hosted the 2016 Annual Conference), Lake Superior Binational Partnership (EPA/Environment Canada) and the Great Lakes and St. Lawrence Cities Initiative (GLSLCI, Marquette is a Member City). It should be noted that the GLSLCI is a project

partner and will disseminate a project case study to over 120 US and Canadian cities for informational purposes and possible replication. The project will also enable current and future resiliency leaders by involving the Keweenaw Bay Indian Community (KBIC) Tribal Youth Conservation Corps, Great Lakes Conservation Corps and the Great Lakes Stewardship Initiative which engages regional K-12 schools on Great Lakes resiliency/restoration/protection projects.

Additional metrics to be tracked during project implementation include the total number and type of native species planted, the number of volunteer events hosted, and the number of volunteers participating in project implementation. Before/after photo documentation, GPS, and GIS mapping will be used to track progress. The majority of project partners are committed to staying engaged during the implementation process (3 years minimum) and to assuring the long term sustainability and maintenance (City of Marquette) of the project.

## 5. **Project Team**

The proposed project is a collaborative effort between the Superior Watershed Partnership and the City of Marquette in partnership with support for implementation from numerous organizations including municipal, non-profit, community, tribal, regional, state, federal and binational (US/Canada) organizations. The SWP will administer the project and partner with the City and committed partners/supporters to implement the proposed project.

The SWP has a long history of working with the City of Marquette to provide programs for city residents and implement large-scale projects that help protect Lake Superior, improve quality of life and promote sustainable land use practices. In support of this important project, partners will provide a minimum of \$3,050,000 in non-federal in-kind and cash match over the three year project timeline including a minimum of \$3,000,000 match from the City of Marquette and \$50,000 in-kind match from SWP (see attached commitment letters). The project also leverages an additional \$500,000 in Great Lakes Restoration Initiative Funding awarded to the SWP in cooperation with the City to restore ecological function in over 15 acres of coastal wetlands immediately adjacent to the proposed project site, and incorporate natural systems to reduce stormwater impacts to Lake Superior and public beaches by capturing and infiltrating 7.5 to 9.1 million gallons of untreated stormwater per year and reducing bacterial levels at public beaches by 70%.

The SWP and partner City of Marquette have successfully implemented or assisted in implementing state and federal grant-funded projects. For these awards, the City and SWP met or exceeded all compliance requirements regarding project reporting, financial reporting, and project implementation. Specific qualifications for the Superior Watershed Partnership, the City of Marquette, and key individuals are noted below.

### *Superior Watershed Partnership*

The Superior Watershed Partnership and Land Trust is a nationally recognized 501 c 3 non-profit organization and a regional leader in Great Lakes protection and restoration. Superior Watershed Partnership staff possess expertise in watershed and conservation planning, environmental restoration, pollution prevention, field inventory, water quality monitoring, site design, project administration, and coordinating project partners and contractors. SWP has successfully implemented state, federal, and local grants, and has a long history of successfully implementing long-term objectives after a funding period has ceased. The SWP's Great Lakes Conservation Corps (GLCC) will assist with hands-on work including site preparation and native plantings.

Key SWP staff who will be involved in the project include:

Carl Lindquist, Executive Director: Mr. Lindquist holds a degree in Environmental Management from the University of Wisconsin and has 30 years of experience implementing and supervising large scale environmental restoration projects (Wisconsin, Vermont, and Michigan). Mr. Lindquist will be responsible for overall project administration/oversight as well as partner coordination.

Geri Grant, Senior Planner: Ms. Grant holds a M.S. degree in Biology and has over 27 years of experience in the field of natural resources including 13 years as a Fisheries Biologist with the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers. Ms. Grant will be responsible for project related technical support, partner and contractor coordination, and project related reporting.

Barb Trombley, Office Manager/Accountant: Ms. Trombley possesses 20+ years of experience in business administration, accounting, and grant writing and administration. Ms. Trombley will be responsible for financial management, recordkeeping, and financial reporting.

Abbie Debiak, Biologist/Project Planner: Ms. Debiak holds a B.S. and M.S. in Biology from Northern Michigan University. Ms. Debiak will assist with coordination of project implementation and monitoring as well as project reporting.

Emily Leach, GLCC Coordinator: Ms. Leach holds a degree in Environmental Studies and Sustainability from Northern Michigan University. Ms. Leach will be responsible for GLCC training and coordination.

Great Lakes Conservation Corps Crew: The SWP will utilize its Great Lakes Conservation Corps (GLCC) field crews to complete hands-on work including site preparation, native plantings, and project monitoring. The GLCC provides jobs for young adults (18-25 years old) with a related college degree (natural resource management, biology, etc.). GLCC crews are trained and supervised by experienced crew leaders with relevant experience.

#### *City of Marquette*

Each year the City of Marquette administers numerous local, state and federal grants including state-funded block grants for housing and public works projects. The City of Marquette has been recognized with a Certificate of Achievement for Excellence in Financial Reporting by the Government Finance Officers Association. The City of Marquette and project partner SWP have successfully implemented or assisted in implementing state and federal grant-funded projects. For these awards, the City and SWP met or exceeded all compliance requirements regarding project reporting, financial reporting, and project implementation. Key City staff who will lead implementation of the project include, L. Michael Angeli, City Manager, who will serve as the liaison between City Department staff and the City Commission, Dennis Stachewicz, Director of Community Development, who will oversee project implementation including related public outreach through supervision of Planning, Utilities, and Engineering departments; and Keith Whittington, the City Engineer who will be directly involved in on-the-ground implementation and construction (see attached resumes).

#### 6. **Other (Optional)**

As the largest population center in the Upper Peninsula located directly adjacent to Lake Superior, the City of Marquette has observed significant increases in recreational tourism in recent years. It is estimated that there has been up to a 300% increase in nature related tourism over the last decade. This is especially true for coastal areas and public beaches, as residents and tourists alike are drawn to the shores of Lake Superior. With less than 10% of the Lake Superior shoreline comprised of sand beach, increased tourism has led to an increase in related impacts to sensitive coastal areas and coastal habitats. This project will restore additional sand beach/dune areas and provide more controlled public access and ADA accessibility to these sites with the intent of reducing traffic pressures and related impacts.

NOTE: Pre-settlement maps and natural features inventories confirm that the proposed project site was once natural sand beach with dune and swale complex and intermittent coastal wetlands. This project would restore much of these natural habitat conditions.

#### 7. **Representative Project Photos**

Lakeshore Storm Damage 1: Geraldine Grant, Superior Watershed Partnership. Flooding of Lakeshore Boulevard during a recent storm event.

Lakeshore Storm Damage 2: Geraldine Grant, Superior Watershed Partnership. Debris on Lakeshore Boulevard resulting from large waves crashing over the revetment during a recent storm event.

Lakeshore Shoreline Revetment: Geraldine Grant, Superior Watershed Partnership. Photo depicts the current revetment along Lakeshore Boulevard. The existing revetment, built in 1939, is made up of various materials such as stone and broken concrete and is not considered an “engineered” structure.

#### 8. **Designs, Site Maps and Letters of Support**

See attached





47,479 sf

1,007,405 sf

198,754 sf

825'-0"

435'-6"

1,799'-5"

185'-10"

3,652'-6"

407'-1"