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WORKFORCE NEEDS FOR NATURE-BASED SOLUTIONS

In Wisconsin's Northern Tier

A report prepared for

Wisconsin Sea Grant

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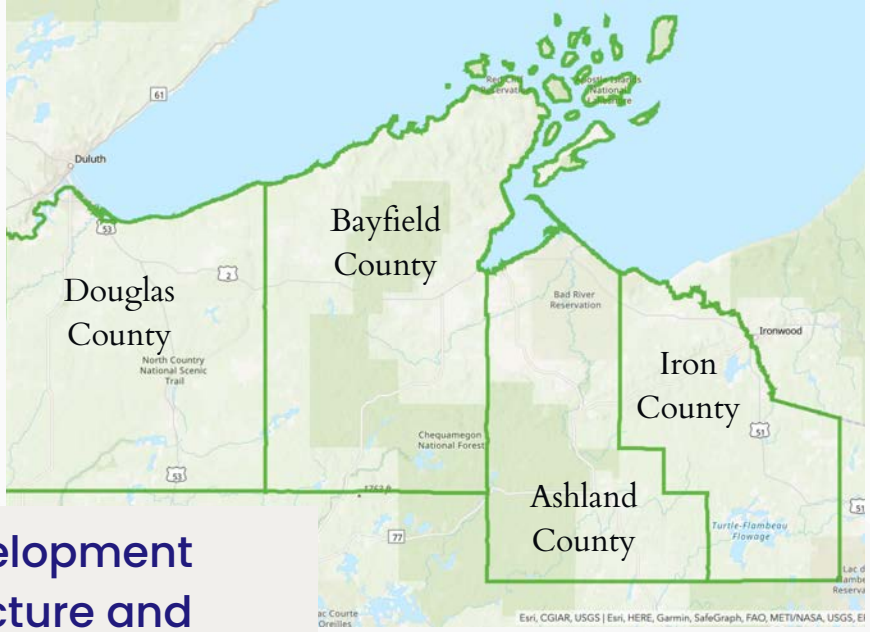
New England
Great Lakes
California + Pacific

WATER 365 LLC

Executive Summary



Assessing Workforce Development Needs for Green Infrastructure and Nature-Based Solutions in Wisconsin's Northern Tier

This report, commissioned by Wisconsin Sea Grant, is an assessment of the broad-based needs to support implementation of green infrastructure stormwater management techniques and a broader suite of nature-based solutions in the four northern Wisconsin counties and Tribal lands along the shoreline of Lake Superior. Initially focused on workforce development and training needs for green infrastructure, the inquiry summarized in this report was expanded to assess the broader context and challenges around implementation of nature-based solutions at many scales.

The investigations immediately found not only strong capacity, interest, and strengths in the region that support use of nature based solutions, but several unexpected limitations relating to a region-wide housing shortage and state-initiated limits on municipal fiscal capacity. Overall, the region's public, private, educational, and non-profit leaders have an exceptional understanding of the range of nature-based solutions and green infrastructure practices that can be deployed to bolster climate resilience, ecological restoration, and infrastructure systems, as well as the importance of these solutions in supporting community, social, and economic health. Active, creative leaders are working on wetland restoration, food systems, coastal engineering, forestry, and stream restoration, bolstered by the expertise and education provided at Northland College in Ashland. New funding opportunities are being explored, including federal sources and non-traditional approaches such as enrolling county forests in carbon credit programs, providing the potential for significant financial inflows into the four counties - Douglas, Bayfield, Ashland, and Iron - that make up the Northern Tier region.

However, the region is held back by the sheer lack of people available to carry out this work. Tribal and local governments, along with local firms providing construction and maintenance services, report persistent and frustrating limits on their ability to hire enough people to fill positions ranging from laborers to advanced professionals. Housing availability, unexpectedly, was cited as perhaps the single most difficult limitation on recruitment. While a variety of new housing has been built in the city of Superior, the Northern Tier region does not have enough housing units available to attract and support the labor force needed to carry out the work. In particular, given the many opportunities for complex, multi-party restoration and infrastructure projects, there is a pressing need for resources and people to serve as conveners, project managers, and fiscal managers – in short, the people who can ensure that resources are harnessed to get work done.

This report provides a more comprehensive look at limitations, strengths, and needs in the Northern Tier region for implementing nature-based solutions, including site-scale green infrastructure. Professionals throughout the Northern Tier generously provided time to share their experience and knowledge, summarized in the report.

As next steps, this report recommends that Wisconsin Sea Grant and its regional partners consider different options to build grant and project management capacity, address the regional housing shortage, work towards legislative reform, and facilitate training that will support specific needs in the Northern Tier around nature-based solutions. Case studies of efforts in other rural regions are provided to illustrate successful strategies from other areas. There are many exciting and potentially transformational opportunities in this region that can be led by the knowledgeable, experienced, and committed individuals who are ready and able to enhance the Northern Tier's economy, community, and environment.

Key Findings & Regional Needs

Build Project Management Capacity

New project management capacity is needed to support implementation throughout the Northern Tier, particularly to convene partnerships, secure grant funding, manage the procurement process, and oversee project implementation. A number of possible structures could carry out this important role, such as a non-profit or inter-governmental organization.

Address the Housing Shortage

Housing shortages -including rental and ownership opportunities - are widely cited as a significant limitation on the region's capacity to implement nature-based solutions and to support business growth. An active effort with regional partners to highlight and address regional housing shortages would have beneficial impacts on the economy and environment in this beautiful and resource-rich area.

New Areas for Training & Support

Support and training in the Northern Tier, a role long filled by Wisconsin Sea Grant, could expand beyond technical elements of green infrastructure to include training for grants management and procurement processes, securing non-traditional revenue (i.e., carbon credit enrollment), earthwork contractor development and training, and nature-based entrepreneurship - all of which would bolster the region's capacity for nature-based solutions.

Address Limits on Municipal Fiscal Capacity

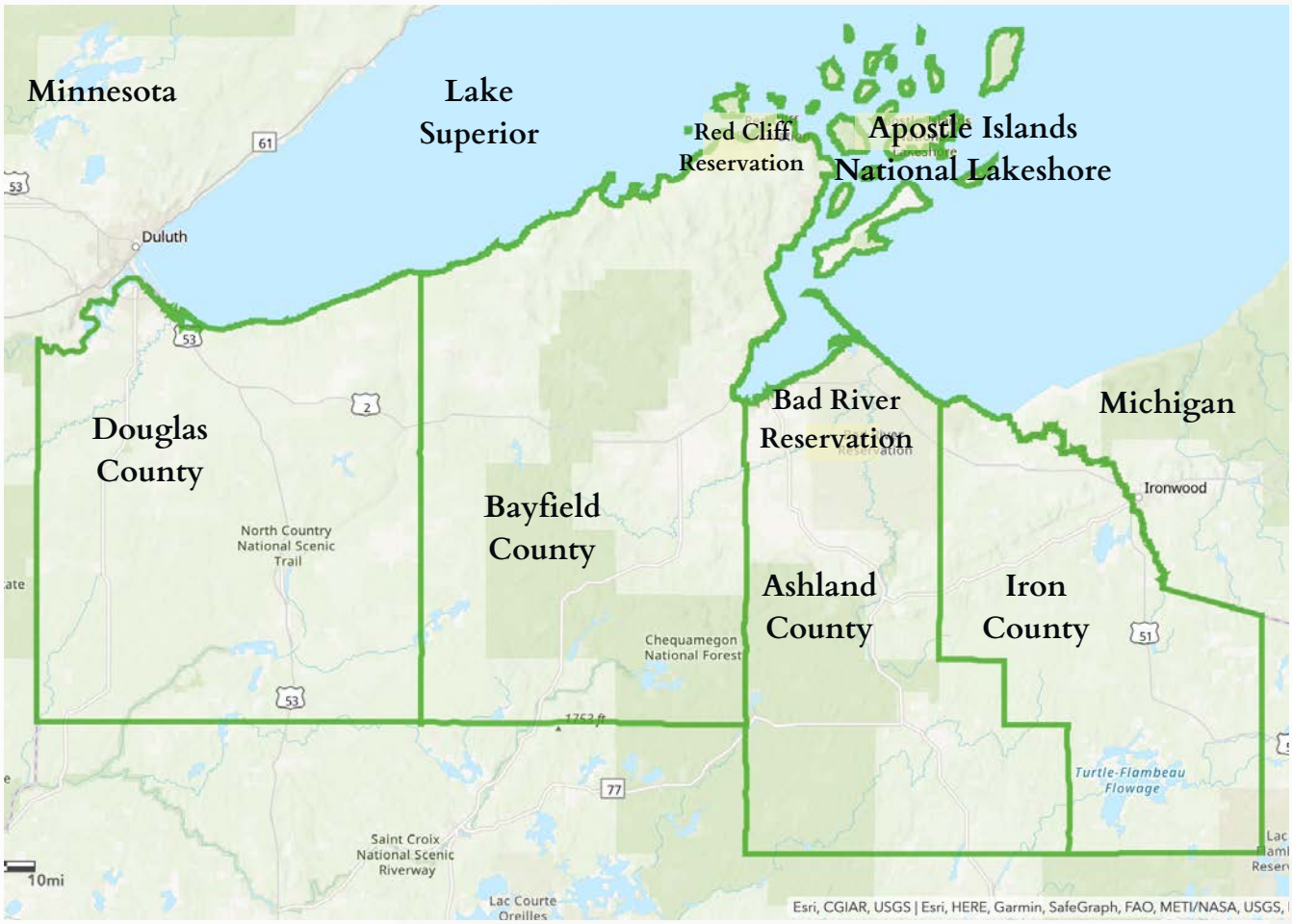
Reform of Wisconsin's state-imposed limitations on local revenue raising would support implementation of desirable nature-based solutions, including and especially complex restoration projects in the Northern Tier's cities that benefit economic development, water quality, and coastline stability. Without the ability to support the cost of expanded staffing, municipalities in particular are losing opportunities to secure funding for beneficial projects - as well as housing and redevelopment opportunities - that would support infrastructure resilience and economic vitality.

1. Introduction

Evaluating GI and Nature-Based Solution Workforce Needs in Wisconsin's Northern Tier

The communities along the Lake Superior coastline in Wisconsin's four Northern Tier counties – Iron, Ashland, Bayfield, and Douglas - are among the state and nation's most beautiful and resource-rich. Encompassing Tribal lands of the Red Cliff Band and Bad River Band of Lake Superior Chippewa, the Northern Tier's land and water resources are the foundation of the region's agriculture, forestry, fishing, and tourism economies. The legacies of historic logging practices, along with increasingly strong coastal storms, have led Northern Tier counties, tribes, and non-governmental organizations to implement restoration and resilience practices ranging from the complete re-construction of harbors and bridges to the incorporation of more site-scaled green infrastructure (GI) practices on individual sites. Nature-based solutions to stormwater and watershed management, particularly stream and wetland restoration, also have been used on sites throughout the region with great success. Given the exceptional visibility and importance of water resources in the Northern Tier, the region has especially high potential for the expanded use of nature-based solutions, including GI, in a wide range of settings.

Figure 1. Project Study Area



1.1 Assessing the Workforce Needs for Nature-Based Solutions

To understand and define the GI-related workforce development and training needs in the region, this study was commissioned by Wisconsin Sea Grant staff at the Lake Superior Field Office. The research team of Birchline Planning LLC and Water365 also was asked to provide recommendations as to how organizations in the region, including Wisconsin Sea Grant, could work together to address those needs. Initially, the team was asked to assess two areas:

1. **The current state of the industry for design, construction, and maintenance of distributed green infrastructure (GI) practices,** including the extent to which underserved and under-represented groups are engaged in GI implementation; and
2. **Northern Wisconsin's workforce development and training needs, relative to broader and more widespread use of GI,** including use in municipal projects, private development, and restoration or resilience practices.

The research plan called for a series of stakeholder interviews and site visits with private and governmental staff in each county and on each Tribal reservation, along with a background look at regional conditions and other GI initiatives in the area. Shortly after beginning the study, and based on initial key stakeholder input, the research team expanded the inquiry to gain an understanding not only of workforce development and training-related limitations to GI implementation, but also **barriers to implementation of nature-based solutions more broadly.** The revised plan included characterizing current and prospective demand for nature-based solutions as a climate resilience tool in the region and then identifying the resources and steps needed to match local firms' and organizations' labor, training, equipment, and related needs to that demand. With clear evidence of the depth of knowledge and commitment in the region around nature-based approaches, the team also expanded the discussion to identify best practices and models for supporting a broader sustainable, people-first, coastal climate resilience strategy.

1.2 Green Infrastructure and Nature-Based Solutions

Depending upon geography, regulatory climates, and local experience, there can be many different working definitions of the various natural resource restoration and stormwater engineering strategies used to protect, restore, and/or manage natural ecosystems in response to climate-related threats and impacts. Nature-based solutions (NBS) are a category of strategies and landscape interventions that utilize constructed natural systems, either instead of or in conjunction with conventional "gray" infrastructure such as culverts and catch basins. NBS offer proven alternatives to traditional hard infrastructure-only approaches and often are more efficient, adaptive, and cost-effective. In addition to environmental benefits, adequate regional investment in NBS helps to reduce the financial consequences of climate change, and contribute to the creation of new jobs, livelihood resilience, and the reduction of poverty. NBS strategies relevant to the Northern Tier are described in more detail in section 2.1.1.

Green infrastructure, city of Bayfield

Bioretention, city of Superior

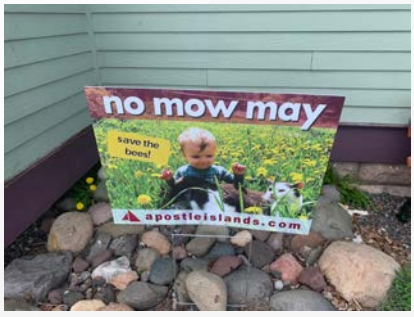
Green Infrastructure (GI), a subcategory of NBS, is defined as site-scaled practices to capture and treat rainwater and stormwater runoff where it falls, whether through infiltration, evapotranspiration, or capture and re-use. For this project, the research team focused on GI solutions commonly used to manage stormwater runoff at the scale of a building or site. GI practices used in the Northern Tier counties, particularly in urbanized parts of the city of Superior (bottom right), city of Bayfield (top right), and city of Ashland include rain gardens or bioretention systems, permeable pavement, dry wells to reduce erosion and increase infiltration, and natural lawns where deep-rooted vegetation substitutes for conventional turf grass. Both the city of Bayfield and city of Superior recently have amended local zoning and municipal codes to facilitate and encourage use of these GI practices.

2. Regional Assessment

2.1 Green Infrastructure and NBS Projects in the Northern Tier

The economic and environmental history of the Northern Tier is a story of natural resources: most notably, forests, fisheries, and mining. Today, as summarized in this section, a knowledgeable, engaged community of natural resource practitioners and educators is working both to adapt forestry and fishing to contemporary economic and community needs, and to restore the wetland, coastal, and riparian ecosystems on which the region's economy - including tourism - depends. With climate change adding increasing dry streaks, strong storms, species migration, and coastal erosion to the local environment, resilience solutions will become ever more important to the region's success.

The sheer amount of GI and NBS activity underway across the Northern Tier counties is truly remarkable in terms of scale, breadth, and pervasiveness. Even if much of the activity, such as culvert reconstruction, is not recognized widely as being part of a nature-based approach, these pieces and projects collectively add up to a remarkable intensity of work and expertise being invested in NBS. A host of completed projects and initiatives are underway at all scales, from "No Mow May" education campaign (bottom left) to the reconstruction of storm-damaged Saxon Harbor (bottom right), which has built a strong working knowledge of project practices and benefits.



(Left) No mow may signs, city of Bayfield

(Right) Reconstruction at Saxon Harbor

A simple regional inventory of GI and NBS projects would highlight their prevalence and benefit in the region

This working knowledge and shared experience is a benefit not to be taken lightly, as other regions across Wisconsin and the nation do not have the benefit of working knowledge and experience. And finally, NBS-based economic strategies, including Tribal efforts to build greater food sovereignty, are another area of practice with which the Northern Tier is well-versed. Creating a regional inventory of NBS projects of all types and scales, even in a manner as simple as a shared document among agencies, would be beneficial in developing further support and understanding among regional and state leaders for this work (and implementing recommendations in this report).

2.1.1 Types of GI and NBS Projects

NBS and GI project types in the Northern Tier region can be categorized in roughly seven types of "buckets." These categories, which are not mutually exclusive nor rigidly defined, are a way of organizing the types of projects underway in the Northern Tier by the types of funding, training, workforce, and project management needs typically associated with each project type.

Downspout redirection, city of Bayfield

1. Site-Scaled Green Infrastructure

Site-scaled GI describes work at the scale of a single property to capture, re-route, or infiltrate stormwater or snow melt to mitigate flooding, prevent erosion, and support better soil capacity and plant growth. These projects generally do not require stormwater or natural resource permitting and thus do not require a licensed professional engineer to design or implement.

2. Site-Scaled Green Infrastructure, Permitted

Parking lot bioretention, city of Superior

Site-scaled GI, permitted describes formally designed stormwater management measures used to satisfy local or Wisconsin Department of Natural Resources permitting requirements for managing post-construction runoff. These projects generally require a licensed professional engineer.

3. Natural Area Restoration and Landscape Maintenance

This refers to work that enhances landscape and coastal ecological function at a scale larger than a single developed site. This category includes work such as removing invasive species, reducing erosion, stabilizing limited areas of slopes or shorelines, planting trees, or restoring native plant species, either as a stand-alone effort or in conjunction with another project such as a recreation trail.

Stream restoration, Iron County

4. Wetland Restoration

Wetland restoration, Ashland County

Photo from WisconsinLandWater.org

Wetland restoration, an active area of NBS practice in the Northern Tier, encompasses projects that restore or enhance the functions and values of natural wetlands, whether riparian, upland, or shoreline. Wetlands can also be engineered and constructed for water quality treatment and wildlife habitat.

5. Urban or Rural Stream and Floodplain Restoration

Reconstructed stream channel and floodplain, Saxon Harbor

This category describes the practice of physical construction to re-establish a naturalized stream channel and/or a riparian floodplain. Some projects involve the restoration of woody debris and other key habitat features; others are more concerned with re-grading and contouring to provide streams with floodplain access, in order to stabilize watershed hydrology. Because of the physical extent of past logging practices as well as urban stream degradation within the Northern Tier's cities, one participant described the region as having "no end" to the number of potential stream restoration projects.

6. Culvert Replacement

Culvert replacements are underway throughout the region, in part due to the extensive transportation system damage from the 2017 storms. City, county, and Tribal governments, as well as the Wisconsin Department of Transportation, all are actively working to replace under-sized and previously damaged culverts with structures designed to handle larger stormwater volumes.

Culvert damaged in 2016 flood, Ashland County

Photo from Northwest Wisconsin Flood Impact Study

7. Large-Scale Coastal Restoration

Saxon Harbor

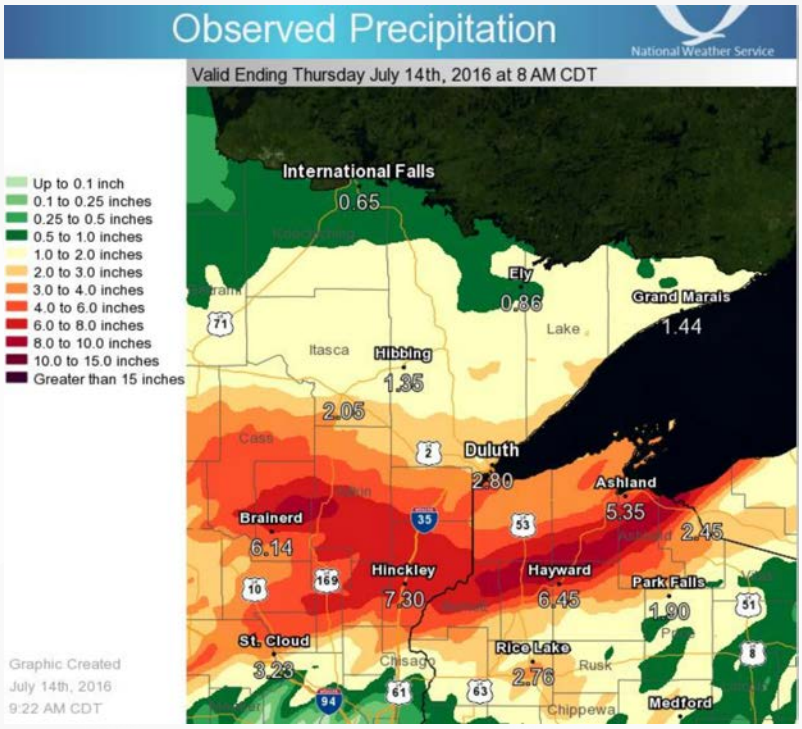
Finally, large-scale coastal restoration, such as the Saxon Harbor reconstruction, generally involves multi-part engineering and construction. These projects generally include a mix of nature-based solutions and physical structures, and use of heavy equipment during construction. Shorelines are eroding throughout the region where not armored, making this ever more important.

2.2 Drivers of GI/NBS Project Need in the Region

Several climate-related factors are driving interest in, and the profound need for, the use of more NBS and GI solutions in the Northern Tier. Because of climate change, many natural hazards are expected to become more frequent and more severe. Reducing the impacts these hazards have on lives, properties, and the economy is a top priority for many of the region's governments, as well as for state and regional agencies such as the Northwest Regional Planning Commission (NRPC), Great Lakes Indian Fish and Wildlife Commission (GLIFWC), U.S. Fish and Wildlife Service (USFWS), and Wisconsin DNR.

1. Stronger Coastal Storms and Intense Rainfall

A major driver for the demand of NBS in the Northern Tier has been in response to increased flooding, high lake levels, and winter storm events. Several participants noted the 2016 storm that damaged much of the region's roadway and culvert infrastructure underscored the need to size culverts and crossings for far larger storms than has been the practice in the past. Coastline cities and counties, particularly the cities of Ashland and Bayfield, also highlighted the need to deal with erosion; in the city of Superior, erosion along the St. Louis River is a significant challenge requiring multiple approaches.



Graphic from National Weather Service showing observed 24-hour precipitation - Thursday, July 14, 2016

Graphic provided by the Northwest Wisconsin Flood Impact Study, prepared by NRPC.

2. Water Quality Protection and Restoration

Despite the perceptions of Lake Superior as a pristine water body, the quality of water in local streams and rivers, and in parts of the nearshore lake, has deteriorated as the result of stormwater runoff from agricultural and developed land. In the absence of a Municipal Separate Storm Sewer System Permit (MS4) outside the city of Superior, there are few controls on urban point and non-point stormwater pollution. Slumping along the lakeshore, observed in the city of Washburn and elsewhere, has localized effects, as does clearing and physical disturbance in the lake's tributary watersheds. Many of the tributaries to Lake Superior are listed as impaired by the Wisconsin DNR, chiefly for nutrient pollution.

Stream erosion in a tributary to Lake Superior, Saxon Harbor

Non-point source stormwater pollution, city of Superior

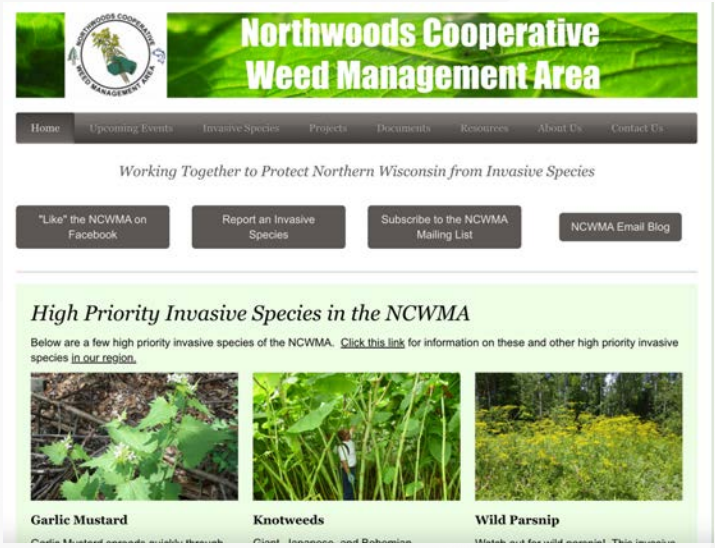
Superior is the sole MS4 permittee in the Northern Tier region, limiting regional action on stormwater runoff from developed land.

3. Invasive Species

The Northern Tier is no stranger to the challenges with invasive species that have affected much of the rest of Wisconsin and the Great Lakes states. The most significant species include Common Buckthorn, a challenge throughout Wisconsin, as well as weeds such as Garlic Mustard and Knotweed. The Northwoods Cooperative Weed Management Area (NCWMA) coordinates with GLIFWIC and a host of other government, Tribal, and non-profit partners in the Northern Tier to provide education, identify sites, and remove invasive species.

Removing buckthorn
Photo from University of Wisconsin - Eau Claire Department of Biology

Removing invasive species is important as a driver of NBS needs both for ecological reasons, and for the fact that invasive plant removal on private and public property is a source of work for youth natural resource crews as well as at least one local NBS-sector business. The NCWMA, moreover, is an excellent model of regional information sharing and collaboration; nearly every participant in this research effort mentioned working with and knowing about NCWMA and its staff.



Website landing page for the Northwoods Cooperative weed management area

4. Addressing Legacy Stream Degradation From Forestry and Agriculture

Finally, the legacy of intensive logging in Wisconsin - which led the nation in timber production in 1915! - provides, in the words of one study participant, "An endless supply of possible restoration projects." Projects in the most rural reaches of the four counties and urban daylighting and restoration such as Bay City Creek in Ashland can support overall flood and drought resilience as well as recreation and stormwater management facilities. The restoration of Fish Creek in Ashland County, as well as wetland restoration on agricultural lands, demonstrates the capacity of the region to accomplish restoration.

Indeed, as an "umbrella" driver encompassing the need to respond to strong storms, water quality challenges, and invasives, stream, floodplain, and wetland restoration emerged as perhaps the type of NBS and GI project that most needs capacity-building and workforce development in the region. Workforce needs for project management, grants writing and management, earth-moving, and physical crews to carry out the work - as well as housing to support hiring and retention - were most pronounced for these projects that can reverse the adverse legacy of forestry and agriculture on Wisconsin rivers, wetlands, and lakes. Staff of the Mary Griggs Burke Center for Freshwater Innovation (Burke Center) at Northland College, and at Wisconsin Wetlands Association, know of additional sites on public and private land suitable for large-scale restoration and enhancement, if and when human and financial resources permit.

Earthwork in 2021 on Fish Creek

Photo by Matt Hudson, Northland College

2.3 The Region's Community of Practice

A strong collaborative spirit, exceptional educational resources, and strong design, construction, and maintenance capacity support GI and NBS planning and implementation in the Northern Tier for coastal and upland projects and issues alike. During the research project, interviewees were asked for their key "go-to" people, agencies, or firms for carrying out GI/NBS project development and construction. Nearly all of these practitioners have communication through, at minimum, the Coastal Hazards of Superior Community of Practice (CHAOS).

Remarkably, for a largely rural area with a small population, relatively few professional and technical skill sets have to be "imported" from outside the region. When those types of services are needed, such as geomorphology or coastline construction, the region's NBS/GI community of practice generally can secure that assistance from service providers in Milwaukee, Madison, or Minneapolis/St. Paul.

Other strengths in the region's larger community of practice that project participants pointed out include:

- Landmark Conservancy, Wisconsin Wetlands Association, and County Land and Water Conservation (LWC) staff have excellent track records with **landowner outreach and recruitment**, vital to securing sites for NBS projects.
- **Land conservation is active** throughout the region. Notably, Bayfield County has been purchasing land for protection in Siskiwit, Lost Creek, and Herbster; and both the Bad River and Red Cliff Tribal governments are actively seeking to secure ownership of "checkerboarded" treaty lands currently in other ownership that lie within the boundaries of their respective Tribal areas.
- **Engineering technicians at LWC departments** are tremendous assets. Backed by agricultural engineers within the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), LWC departments' permanently funded staff positions provide the technical capacity to develop projects through the construction documentation stage. This limits the need to hire consultants for project design.

- The **Northwoods Cooperative Weed Management Area** provides well-regarded, energetic, and collaborative leadership on invasive species issues.
- **County foresters** are great assets. Some of them do not think of themselves as working on "nature based solutions," but indeed the foresters' work protects watershed function and overall water quality.
- **Northland College** continues to supply energy and expertise to the region, including graduates who have formed new businesses providing NBS services.
- The **University of Wisconsin-Stevens Point's Wisconsin Lakes Partnership** provides a certification program in shoreland restoration that can train contractors in shoreland restoration with native plans. This program also allows businesses to be listed statewide as certified contractors.
- Strong **natural science programs at UW-Stevens Point and Fox Valley Tech in Appleton**, along with **UW-Platteville's Agricultural Engineering program**, are producing skilled and capable graduates for the region's positions.
- The Northern Institute of Applied Climate Science, of which GLIFWC is a partner, as well as the Wisconsin Initiative on Climate Change Impacts (WICCI), provide the region's community of practice with **future climate models and predictions** that inform design and restoration work.
- Consistent (if small-scale) funding from the **state of Wisconsin supports annual investments in nature-based solutions**. This includes grants through the Wisconsin Coastal Management Program.
- Funding through Wisconsin Act 157 of 2019, the **Flood Risk Reduction Pilot Project**, provided $150,000 to Ashland County for natural flood mitigation.
- **Local excavating and earth-moving contractors** for river restoration and harbor work are reasonably available, as is the expertise required for site-scale GI implementation.
- Following Bayfield County's successful enrollment of its **forests in a carbon credit program**, other counties may be able to follow this example, providing a new source of revenue to regional programs.

However, as discussed and emphasized in Section 3, the workforce challenge today is numbers: an abundance of work to be done; too few people available to carry it out; too little funding to support new positions at municipal, county, and non-profit organizations to lead and manage GI/NBS projects; and too little housing to enable new workers to move in and take the jobs that are funded. Specific challenges, listed roughly in descending order of importance, are:

Limits on staff capacity and hiring, stemming from both levy limits and the lack of available housing, is the greatest challenge for NBS and GI implementation in the Northern Tier.

- **The amount of work desired to be done - and which potentially could be funded through federal and other grants - vastly outstrips the hours available from the region's existing labor force**. Moreover, outsourcing to consultants or remote workers, while possible for jobs that are not locally based or 'hands on,' is only a partial solution as this requires contract management capacity within the region's agencies.
- **Funding for new municipal staff at the local and county level is severely limited by legislatively imposed limits on property tax levies**. This is a substantial challenge, especially in Ashland County and Iron County. Absent new tax base growth, municipal governments cannot hire the staff needed to coordinate the housing development and NBS projects that could bring investment, workers, and value to the region.
- **Few grants for NBS and GI projects provide sufficient funding to hire a project manager or grant administrator.** While overhead and limited administrative costs may be supported, few available grants, if any, support hiring the level of professional labor support required to manage a project – especially with respect to contract or selection, reporting, and project management.
- There are **not enough people in the region to fill the many funded, available, and often well-compensated positions available**, in large part because a **pervasive lack of housing severely limits recruitment.**
- When hiring does occur, new, young, **recent graduates with relatively steep learning curves** often are hired. This has been the case across counties, as well as at regional and federal agencies. While this builds talent, it requires additional hours from more experienced staff than would be the case if more experienced hires were available.
- While there have been many cooperative efforts, and the Northern Tier as a whole benefits from regional collaboration, staff at public agencies **continue to work in "silos"** and do not collaborate with each other to their full potential.
- Finally, **water quality monitoring work and NBS/GI project management work require different skill sets** and focus - but the two responsibilities often are conflated. Ensuring sufficient funding and staffing to carry out both critical responsibilities has been a challenge, especially within non-profit organizations.

2.4 Demand for NBS/GI Projects and Related Workforce and Training Needs

Different actors in the region are making use of different types of green infrastructure and nature-based solutions. This section looks at who is seeking to complete different types of GI and NBS projects outlined in Section 2, and the particular workforce needs for each category.

2.4.1 Site-Scaled Green Infrastructure, Un-permitted or Permitted

Private landowners, developers, and the larger cities constitute the primary market for "regular" green stormwater infrastructure at site scales, whether designed to meet Wisconsin DNR stormwater requirements, or implemented simply to manage water on-site and reduce erosion. Staff at the cities of Superior and Bayfield have been active in pursuing GI installations on public property, such as new permeable pavement at Barker's Island in Superior and rain gardens in Bayfield, supporting regional efforts to "slow the flow" and reduce over-land transport of stormwater from developed lands to streams and Lake Superior. In this context, the ownership team at Bay Area Environmental Consulting (BAEC) reported that private property owners often need practical assistance with flooding and ponding issues on their properties, leading them to seek BAEC's design and construction services to regrade sites or make aesthetic improvements. Finally, private land development within the city of Superior in particular usually includes GI practices that meet local and Wisconsin DNR stormwater requirements.

Green infrastructure for stormwater management at new multi-family complex, city of Superior

Several skill sets are common to all types of GI and NBS project installation and maintenance.

Regional training on native and invasive plant identification, basic soil science, site grading and erosion control, and basics of landscape maintenance, would benefit the region's overall capacity to build and maintain smaller projects.

Relevant training on equipment use (e.g. chain saws, etc.) is provided by the Red Cliff Band of Lake Superior Chippewa as part of its wildland firefighting and fisheries training work.

Workforce Needs for Site-Scaled GI: : There is a relatively limited market for on-site GI installation and maintenance, which represents the major source of demand for conventional green stormwater infrastructure in the Northern Tier. Current demand is able to be absorbed by local providers at the present time.

However, it is important to note that many of the skill sets involved in GI design, implementation, and maintenance – **plant identification, soil science, grading and landscape plan design, erosion control practices, and effective landscape maintenance** - largely carry over from small-scale GI projects to nature-based solutions projects. This argues for identifying the common skill sets and needs among multiple projects and scales, and focusing training and support accordingly. Nonetheless, there is ample opportunity to expand work in this arena – and there is potential for more hiring, once the persistent housing issues (discussed in Section 4) are addressed. BAEC has reported that the firm could hire up to four individuals, if housing were addressed, and that qualified individuals with training in ecology can be attracted to work in the region. With the necessary funding and staff capacity, Bayfield County would do more to deal with coastal erosion issues, including to scale up public education and outreach efforts.

Another skill set required is **basic equipment operation**, e.g., the safe operation of chain saws and power tools needed for grading and clearing. At present, the Red Cliff Band of Lake Superior Chippewa provides this type of training through its wildland firefighting course and in conjunction with its fishing operations, providing at least one regional model to be explored.

2.4.2 Natural Resource/Landscape Restoration, Invasive Species Removal, and Wetland Restoration

The four Northern Tier counties have substantial and ongoing needs for crews to carry out landscape-based work in wetland restoration, upland landscape restoration, and invasive species removal. Project participants across this study reported there is sufficient demand today to support work by more trained crews, in the public and private sectors who can provide these services.

Removing the never-ending supply of invasive Buckthorn - whether at a site scale or as part of other NBS projects - is one area of significant work and energy, with volunteer, youth, and paid professional crews busy throughout the construction season. **Weed management** is another; the NCWMA is running a full seasonal crew, which is shared among the counties. **Summer youth programs** of both the Bad River and Red Cliff Band of Lake Superior Chippewa have been in operation for over 30 years. At Bad River, all children ages 14 to 19 are eligible to participate, and most do. A DNR-funded outdoor program supports up to 20 children; another Tribal group does lawn and grounds care. At Red Cliff, up to 50 Tribal member youth have participated annually, learning about careers with DNR, the USFS, and USFWS. Typically, these youth crews have as much work to do on Tribal lands as can be completed in a summer.

Wetland restoration, including and especially work **restoring former agricultural lands to wetlands**, is a priority for LWC Departments in all four counties. The counties are able to draw on dedicated state funding through DATCP of roughly $40,000 to $60,000 annually for projects restoring farmland to wetlands. Flooding in 2016 brought Wisconsin Wetlands and its team into the Superior Basin, which provides the potential for more **larger-scaled projects that attenuate flooding and reconnect floodplains**, as well as more basic farmland conversion approaches.

Finally, **tree planting, erosion management, and shoreline stabilization** is another area of demand for crews - and also for technical training and guidance. Municipal road crews and contractors with different skill sets often are called on to stabilize banks and plant trees. Often, however, basic rip-rap placement is done without incorporating current best practices; this is also the case for tree planting and protection.

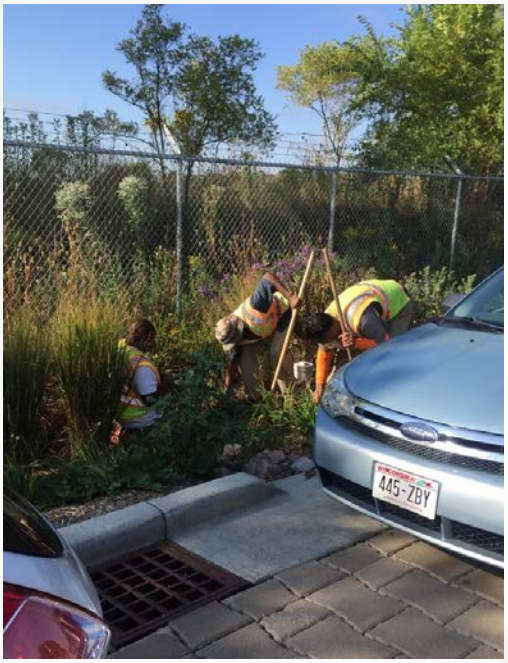
Workforce Needs: As noted under the discussion of site-scaled green infrastructure, BAEC and others report that while they are able to meet most of these landscape-related needs, **more crew capacity is needed** to take advantage of the abundant opportunities and funding for restoration. Additional crews could be hired at current levels of demand if people - and housing - were available.

Training on plant identification and removal techniques (including equipment use), as noted for site-scaled GI, would expand and improve the pool of potential crew members. **Training for construction-phase tree protection and erosion prevention**, as well as **training on proper rip-rap use and basic shoreline stabilization**, also is badly needed and would support better ecological function.

Avenues for using landscape restoration as a means to support and uplift people and economies is a goal many study participants held up for the Northern Tier. The region's relatively strong demand for GI and landscape restoration services could support a social enterprise similar to Milwaukee's Blue Skies Landscaping, an arm of the non-profit Walnut Way Conservation Corps.

Blue Skies Landscaping provides green infrastructure maintenance in Milwaukee area

www.walnutway.org/programs/blue-skies-landscaping-program



Blue Skies Landscaping trains people who have faced employment barriers as landscape and horticulture and GI maintenance technicians, improving GI function and providing social and equity benefits to greater Milwaukee.

Finally, while building crew capacity within the region would be very beneficial, it is worth noting that with the region's small population, for some larger-scaled projects, outside labor is and will continue to be necessary. As one example, crews from Canada were brought in recently for forest planting in Bayfield County; as another, crews from WisCORPs have been used to help fill this need for outside labor.

2.4.3 Stream Restoration and Floodplain Reconnection

Throughout the Northern Tier, medium- and large-scale projects are underway to restore streams, remove dams, and reconnect lands to floodplains. The plethora of opportunities in urban and rural settings, and tremendous technical knowledge within the region of restoration techniques, makes this a critical area for addressing workforce challenges. Among the opportunities and focus areas:

The **Marengo River Watershed Partnership Project-Watershed Action Plan** (illustration below) exemplifies the types and scales of stream restoration and floodplain reconnection projects that could be accomplished with more staff and project management capacity in the region. The plan was prepared by what is now the Superior Rivers Watershed Association with the Burke Center at Northland College. With the detail and level of project identification included, this plan provides the basis to leverage FEMA and U.S. Environmental Protection Agency funding for restoration, including wetland creation as a stream restoration and flood resilience measure.

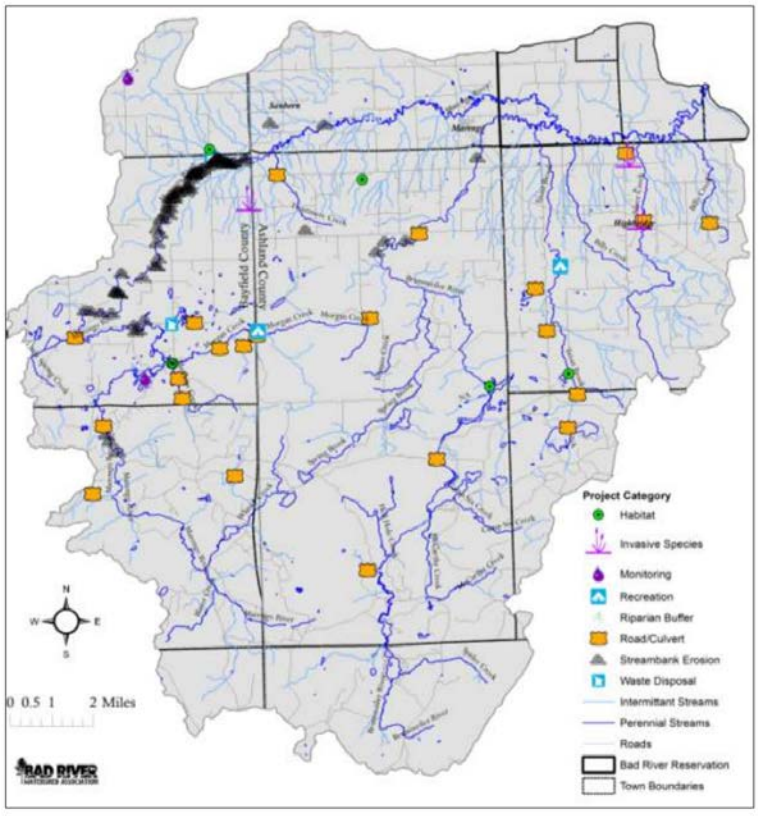


Figure 5.45. "Make Your Mark on the Marengo" Watershed Map with project ideas gathered via citizen input. Project ideas are incorporated within the actions of the Action Plan table.

Within the Watershed Action Plan is an extensive, multi-faceted list of potential projects and related actions for the Marengo watershed, illustrating the sheer volume of resilience-enhancing work from culvert replacement to large scale stream restoration that can be accomplished - along with the many funding sources potentially available.

superiorrivers.org/wp-content/uploads/2021/03/Marengo_Watershed-Plan.pdf

Urban restoration, while less extensive in the Northern Tier, is another opportunity in need of grants and project management support. A sub-watershed of Fish Creek, Bay City Creek in Ashland is impaired for *E. coli* and phosphorus, suffers from erosion of old fill soils, and has been damaged by dumping of everything from old cars to snow. The city owns 30 acres of land along the creek and has an ambitious project underway to pursue restoration in phases. Also in Ashland County, funding is being sought for restoration in North Fish Creek, and upland wetland attenuation is being designed in-house by Ashland County staff. The ability to use DATCP-funded engineering technicians is noted as an especially valuable asset for advancing stream and floodplain projects.

Finally, in Douglas County, where improving dissolved oxygen levels through dam removal is a significant concern, is the site of ongoing restoration efforts for Whittlesey Creek. This effort was pursued cooperatively between the county and the USFWS.

Workforce Needs: The abundance of stream and floodplain restoration projects points to the three main workforce and training needs for NBS in the Northern Tier:

1. Supporting a Larger and Better-Trained Pool of Earthwork Contractors is a key workforce and training need. Nearly all participants noted the need for more skilled earthwork contractors. Securing any level, up to and including heavy construction for in-lake work, can be challenging. Contractors are noted as needing more education about standards and rules including permitting, DNR regulations for rip-rap, and rock sizing.

It was noted that some contractors prefer and even specialize in restoration projects on private land, rather than engaging in government contracting. Government contracting involves greater complexity with respect to bid requirements and compliance, which is an additional cost and challenge.

Bay City creek, Ashland

Photo by Friends of Bay Creek, 2014

2. Linking to Engineering Services for Complex Floodplain and Riparian Design Work - While the Griggs Center and DATCP-funded county engineering technicians provide much of the engineering expertise needed for GI and NBS, there are no engineers locally who provide complex floodplain restoration engineering services. Bringing in engineers from Milwaukee or Madison, while entirely feasible, makes projects more costly because of travel.

3. Project Management Capacity - The most essential need is for project management services. Projects to restore streams and/or reconstruct or reconnect floodplains are most in need of staff to provide grants writing, project management, and contract administration capacity to fulfill the region's exceptional potential for these practices.

2.4.4 Culvert Replacement

Awareness of the critical role of properly sized, designed, and installed culverts has been raised throughout the region among private landowners, contractors, and public agencies. This is an area where education and outreach plus continuous public investment can yield immediate improvements for water quality and resilience.

A limitation for municipal government in the wake of the 2015 and 2017 floods is FEMA's policy of funding culvert replacement in-kind only. To up-size or enhance culvert design for larger flows, municipalities must pay the additional costs from local funds or state grants. In spite of this unhelpful federal policy, there has been substantial progress in some parts of the Northern Tier. Bayfield County has used Wisconsin DOT grants to improve culverts; the Red Cliff Tribal roads department has improved several locations to support better fish passage. However, construction and materials costs have been very high (especially since COVID-19), and a more resilience-focused federal funding policy would be beneficial.

Data management is another notable problem for culvert replacement, though there are efforts underway to address it. Participants across this project stated that there are multiple different inventories, but none is centralized, none relates to geomorphic process or identifies under-sizing, and none identifies repetitive damage information. Notably, the

Wider stream passage at reconstructed bridge providing resilience against future strong storms, Saxon Harbor

2012 regional culvert inventory is badly out of date in the wake of the 2015 and 2017 storms. This is now being addressed by the Wisconsin Coastal Infrastructure Data Initiative (WI CIDI), which is creating a **standardized regional culvert inventory**. It is important to note that this important effort will need to be communicated more effectively, as addressed in Section 3: It took the project research team well over two months to track down who was responsible and report that information. Many parties outside road crews and the Wisconsin Coastal Management Program are not aware of who is in charge and where to find this critical data.

Workforce Needs: Two specific workforce needs emerged on the culvert replacement front. First, and critically, the Northern Tier is struggling with the lack of a central repository for culvert data. Once culvert data are standardized and consolidated through WI CIDI, the region needs to work to secure supplemental funds to "up-size" culverts, in order to prevent the region's small municipalities, in particular, from using FEMA funds to replace culverts that have been washed out or damaged with the same size and type. The DNR has provided funding and support for resilient culverts through the Wisconsin DOT, but this is not enough to overcome FEMA's reimbursement rules. Cities or counties either must pay for the increased cost of better and more resilient infrastructure, or find supplemental grant funding, in order to add resilience to their systems.

An accurate, up-to-date culvert inventory, including identification of under-sized and deficient culverts, is needed and underway for the region.

2.4.5 Large-Scale Coastal Restoration

The largest scale projects in the region are major coastal restoration projects involving heavy equipment, coastal engineering, and significant, multi-million dollar budgets. As noted above regarding stream and floodplain restoration projects, contractors for in-lake work are challenging to secure, which increases costs - as well as arguing for bundling efforts to create larger and more costly projects with contract values attractive to this type of firm.

2.5 Structural Barriers to GI and NBS Implementation

Participants in this study were very clear-sighted about the presence of structural challenges that limit the implementation of NBS and other potentially beneficial resilience strategies. As is the case in many communities, there remains a need to train municipal staff, contractors, and landowners on some elements of the "why" and "how" of nature-based solutions to ensure that these practices can become more widespread.

However, it became clear from the outset that one of the most crucial challenges for nature-based solutions - a region-wide housing shortage that limits workforce expansion - requires a completely different set of strategies. Another critical limitation, Wisconsin's levy limits on municipal tax, limits the ability of cities to make investments in the staff, projects, and grants management capacity that could leverage additional funds.

2.5.1 Housing Availability, Conditions, and Costs

To a person, the participants in this study said the first challenge for GI and NBS implementation is the lack of decent quality, affordable housing in the region. The extraordinary shortage of housing to rent or purchase, and the poor condition of much of the housing that is available, is noted as a primary contributor to a regional "brain drain" of individuals who are or would be part of the local community of practice, thus reducing local capacity for NBS projects.

Ironically, wages offered for NBS/GI-related positions, for roles from marina attendants and laborers to engineers and scientists, appear to be competitive, and positions in government include excellent benefits. But the shortage of housing at all but the highest end of the market can lead to a sense of defeat: Why post positions at all, if there are not people in the region, or able to move to the region, who will accept the positions and take on the work? The Bad River Tribal government related that a highly qualified attorney eager to work with the community recently was offered a position, but gave up the position because she could not find housing. Only staff located within the city of Superior report having sufficient housing options for their current and prospective employees; the 2020 Northwest Wisconsin Comprehensive Economic Development Strategy (CEDS) notes that Superior has seen substantial new housing construction since the 1990s and enjoys the "youngest" housing stock in the region.

> "Housing has become a critical and ongoing issue in the region and is currently one of the top priorities to address in this five-year CEDS. One of the major challenges in the region includes a lack of inventory of affordable, workforce housing. This can be attributed to the region's lower wages, the lack of density typically attractive to developers, and the high cost of building a new home. Regulatory costs and an increase in lumber prices both result in a higher price of a new home. Another factor is rising labor costs due to a shortage of workers in the skilled trades in the region. According to the American Community Survey, 2018 Estimates, over 40% of the housing stock in the region was built before 1960."
>
> *2020 Northwest Wisconsin Comprehensive Economic Development Strategy, p. 21*

While a full housing market analysis is beyond the scope of this study, the market conditions affecting the Northern Tier and northwest Wisconsin more generally are broadly recognized as a significant limitation on the region's economy, and a contributor to population loss, especially among working-age people. Within the four Northern Tier counties, four factors exacerbate the situation:

1. The **rise of online vacation and short-term rental platforms** has resulted in many housing units being removed from the market, particularly in the parts of Bayfield and Ashland counties where rentals command high prices during peak tourist seasons. While short-term rentals require licensing in Ashland County and the city and town of Bayfield, there are no numeric limits on the number of units that may be offered for rent, nor is owner occupancy required.
2. Multiple **cost pressures accelerated during the COVID-19 pandemic, raising rents and construction costs**. The impact of the COVID-19 pandemic and, ironically, the region's strong broadband internet capacity, resulted in a surge of interest in housing in the region, overwhelming planning and zoning offices with permit processing needs. Excellent broadband availability, as well as the region's natural resources and amenities, also led to an influx of second home owners who became permanent residents during pandemic. Bayfield County interviewees described their HR group as being "overwhelmed" with open positions needed simply to process an inflow of construction permits related to home improvement.
3. While census data from 2020 for the four counties indicate rents generally are within range of the median income, several participants working in each of the four counties reported that **rents have been increasing sharply in 2022** – a trend noted in many other parts of the US that is not yet reflected in government data, but is creating further challenges in an already-challenged housing market. Some noted that rents have increased substantially. This seems to some counterintuitive in light of a long-term trend of population loss in more rural areas, especially in the younger age cohorts; however, the attractions of the region with its general affordability, resilience, and amenities, along with the COVID-19 remote work influx, could counter this trend in the future.

4. The **age and poor quality of the region's housing stock** also contributes to the challenges. Purchase of an under-market house in Ashland, for example, would rate as "affordable"; however, the cost to renovate a property to basic contemporary standards would require more of a financial investment than can be re-captured with a sale, given the region's prevailing housing values and incomes. With so much of the housing stock in relative disrepair, any housing units in good condition are expensive and difficult to find. In a further negative cycle, **construction contractors are not able to hire because they cannot get prospective new employees housed**.

There is modest positive news. In 2022, Commonwealth Development Companies constructed the "Timeless Timber" project in Ashland with 50 multi-family workforce housing units for low- and moderate-income households. The cottage-style units, built on land near the Wal-Mart, will rent for $350 to $1,000 per month, well within the affordability ranges for the region. The city of Ashland's active efforts to secure a developer for the site were instrumental in advancing this project, providing a model for other cities in the Northern Tier.

(Left) Site plan for Timeless Timber residential project.


Ashland Daily Press News Sports Obituaries Opinion A&E Classifieds Calendar E-Editions Contests

Applications soon to open for new Ashland complex

By Tom Stankard, tstankard@ashlanddailypress.net Jun 15, 2022 Updated Jun 16, 2022

(Right) Ashland Daily Press announced upcoming opening of applications for income-restricted housing units - June, 2022.

2.5.2 The Impact of Wisconsin's Municipal Levy Limits

Workforce development issues and needs for GI and NBS projects in the Northern Tier are inseparable from the need of cities and counties to raise and expend funds to hire permanent public staff. For some projects and roles, there simply is no way to carry out desirable NBS and GI projects without municipal employees acting in their public roles. Wisconsin's statewide limitations on local government levies, which tether municipal tax revenue to growth or decline in the tax base, significantly limits the ability of cities and counties to have sufficient staff and general government capacity - even when that capacity is exactly what is needed to enable growth and development.

The "anti-growth" impact of municipal levy limits came into high relief during the COVID-19 pandemic. Participants in this study reported there has been an influx into the area and pressure for housing development, in part because of the relatively good availability of broadband. However, to achieve the very growth that would provide more taxable base, building permits must be processed - an authority Wisconsin law assigns to municipal zoning and building officials. In Ashland County, participants noted that three recently hired staff in permit review and processing were overwhelmed with work. Another staffing area in significant need, with the same potentially positive implications for property tax base growth, is staff to recruit and coordinate with housing developers.

2.5.3 Limitations of Other State and Federal Laws

In addition to municipal planning decisions and levy limits, certain other laws, regulations, and policies (or the lack thereof) hinder the implementation of NBS and GI in the Northern Tier. Unlike the city of Superior, smaller municipalities in the region lack a Municipal Separate Storm Sewer System (MS4) permit that would require them to reduce polluted stormwater runoff and implement stormwater management programs using best management practices (BMPs). MS4 permit requirements would provide a much stronger impetus for management measures such as a culvert inventory, public education, and investments in the storm sewer system in Ashland and Bayfield.

Laws, regulations and policy decisions relating to alcohol and drug use also impact workforce availability for NBS projects. For example, drug-free workplace laws have not been modernized to reflect changes in marijuana legality at state levels, limiting applicant pools, especially for value-added food processing and NBS project labor roles.

Further, re-entry services for residents who have been incarcerated or receiving in-patient treatment for alcohol or drug dependency are insufficient. The region lacks Medication Assisted Treatment (MAT) for substance use disorder, limiting the potential for residents who are returning home from incarceration and/or in-patient treatment to seek and retain work. Supportive work options for people challenged with alcohol or drug use disorders or past incarceration would be welcome ways to address the regional labor shortage.

2.5.4 Clarifying Regional Roles and Building Project Management Capacity

As noted earlier in this report, strong capacity, interest, and strengths in the region support the use and scale-up of nature-based solutions. However, study participants across organizations (tribes, cities, counties, and nonprofit groups) noted that one of the region's greatest needs was for cross-organizational project management capability and human capacity.

Study participants noted that, generally, NBS project design and implementation funding is generally available from state and federal sources. The obstacle is the lack of funding to hire people for grant procurement, grant management, and project administration roles. While federal and state monies have been reasonably available to fund the cost of NBS project engineering and construction, funding for hiring the staff to manage the funding (from application to final reporting), as well as coordinate and manage the implementation of funded projects is lacking.

During each interview the research team asked study participants, "Where would you house project management capacity if it were available?" Several organizations were mentioned as potential "homes," including the Superior Rivers Watershed Association (SRWA), Wisconsin Sea Grant, the Burke Center at Northland College, University of Wisconsin Extension, or the Northwest Regional Planning Commission.

However, study participants agreed that no single organization currently is equipped to take on the role of a what might be best described as a regional NBS projects coordinator. Study participants also identified that there may be within-region capacity, depending on whether financial resources can be directed from one entity to another – for example, from a city or county to a Tribal government. But this often is more "easier said than done."

Thus, there is a pressing need to **establish and memorialize a regional consensus on "who can do what," to discuss and clarify existing organizations' roles and capacities**, and to develop and implement a roadmap and framework for moving forward. Perhaps the most important recommended steps, as outlined in Section 3, are to develop a **comprehensive inventory of the region's NBS and GI projects**, and then to **convene a working session** to hash out potential locations and resources for adding project management capacity.

3. Moving Forward

Regional Cooperation to Leverage the Northern Tier's Many Assets

The research team has identified four primary focus areas for regional collaboration to scale up NBS and drive environmental, social, and economic prosperity in the Northern Tier. These are, in no particular order:

- Building coordination and project management capacity
- Supporting workforce development pathways for contractors and laborers
- Attacking affordable housing obstacles and opportunities
- Promoting and supporting nature-based economic development

Relevant to those focus areas, we offer the following recommendations and identify key players for the work in the following sections of this report.

3.1 Exploring Structures for Building Project Management Capacity

Recommended Actions:

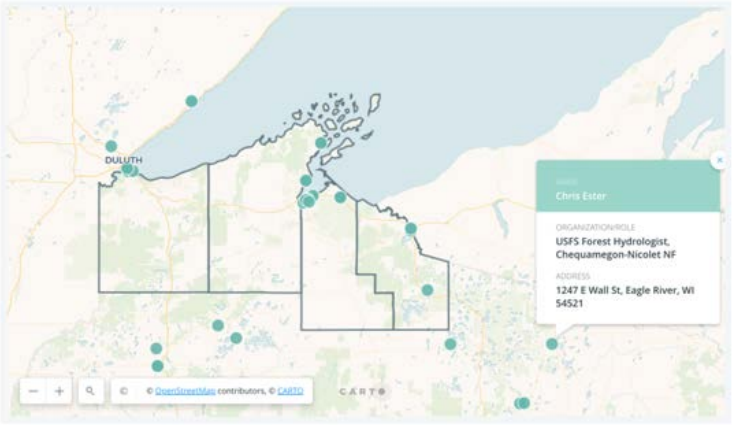
- Convene to inventory existing projects and clarify roles
- Determine staffing gaps
- Explore organizational frameworks and options
- Procure NBS project management training for project management staff

Coordinated correctly, regional project management collaboration can lead to economies of scale, more effective leveraging of resources, and – ideally – more projects accomplished with less frustration and stress on the part of the exceptional, dedicated members of the region's community of practice.

A first step would be to **inventory NBS and GI projects in the Northern Tier, both constructed and in the planning stages**. Having a catalog of planned and already implemented NBS and GI projects would serve as a resource for organizations of all types for future planning and training needs. Such a catalog would also serve to answer the questions of potential grant funders who want to understand how proposed projects relate to and leverage existing projects and funding. This can be as simple as a shared drive document, updated as often as participants contribute new projects; a standing agenda item at CHAOS meetings asking for updates of regional projects could be a simple way to ensure that at least some updates are made regularly.

The research team recommends that Wisconsin Sea Grant lead an inventory of organizations and their roles in the NBS-space and **convene a facilitated brainstorming session on organizational options and structures for leading future NBS funding and project management efforts** for the region. WI CDI offers a potential model for creating a central database and a self-sustaining system for project and system updates. WI CDI has now established the framework for a comprehensive, four-county, online inventory of culverts, an essential component of NBS projects and solutions. It is recommended that any convening presentation begin with an overview of how the WI CDI system was launched, its functions, and its synergies with required information for grants and with other data platforms (notably other GIS resources for the region).

Community of Practice



The Wisconsin Coastal Data Infrastructure Management (WI CDI) community of practice (left, map of current culvert inventory) provides one model for coordinated information-sharing

While there is not an easy or immediately apparent solution for quickly building the staffing capability and capacity necessary for NBS grant procurement, grant management, and project administration, project participants noted that the **regional organizations and community of practice members below all bring significant, relevant expertise to the table and would need to be involved in brainstorming options:**

- Bad River Band of Lake Superior Chippewa
- CHAOS
- County Land and Water Management staff
- WI CDIdData partners in the Wisconsin Coastal Data Inventory (WICDI)
- Griggs Burke Center at Northland College
- Landmark Conservancy
- Northwoods Technical College
- Public works or management staff of the incorporated coastal cities (Ashland, Bayfield, Cornucopia, Herbster, and Superior)
- Red Cliff Band of Lake Superior Chippewa
- Regional engineering and construction firms, including Bay Area Environmental Consulting and K&D Excavating, who were cited region-wide as outstanding and knowledgeable partners
- Superior Rivers Watershed Association
- UW Extension's Lake Superior Collaborative
- UW Wisconsin Sea Grant
- Wisconsin Coastal Management Program
- Wisconsin DATCP managers
- Wisconsin Wetlands Association, as part of the Wisconsin DNR

Questions to consider are:

- Is there an existing, regional organization available to support this project management work? If not, how might one be created/reorganized?
- Could this type of group be a clearinghouse for available funding, coordinating applications, and allocating responsibility effectively? What would be required to make that possible?
- Would it make sense to hire an existing, outside firm to do any or all of this work? How could funding be secured (e.g., memorandum of understanding, inter-local agreement, state-managed working group, etc.)
- If a regional group is created or reorganized to serve this role, who might be available to offer project management training the organizational staff and what types of training might be required?
- Most times, contracts and procurement must be arranged with the project financial agent (e.g., Tribal, city, county, etc.) so that the independent agent can act on behalf of or gain appropriate clearances from the project "owner." How might a regional collaboration be impacted by these requirements?

An important perspective on regional capacity needs generally is outlined in the Marengo Watershed Action Plan prepared by the Superior Rivers Watershed Association (attached as Appendix B to this report). The plan identifies the need for project management, as well as other areas of skills identified specifically for implementation of the Marengo watershed plan; these skills and needs are strongly consistent with the types of project management and strategic positions other participants outlined. Some of those positions are discussed further in section 3.2 of this report, and can serve as a working outline for discussions. However, SRWA staff also noted that the sheer volume of work, money, and scope of Northern Tier projects is beyond the capacity of a small volunteer-based organization to handle. This study has shown that a stronger and higher-level approach clearly would be most appropriate to maximize the potential for implementation.

3.2 Support Workforce Development Pathways and Provide Training for NBS/GI Construction and Resource Restoration Projects

To attain social and environmental justice and equity, as well as long-term economic prosperity, underserved communities must be able to participate equally, both benefiting from and contributing to a thriving economy. Green infrastructure workforce development is one potential approach to improve social, economic, and environmental resilience through green jobs that have a low barrier to entry and can provide steady, long-term work.

An initial, important question for regional policy makers and potential NBS employers is "what are the opportunities for our organizations to intersect with justice, equity, diversity, and inclusion?" One such approach would engage **formerly incarcerated residents** who are returning to their communities, as well as those who are succeeding in outpatient drug and alcohol recovery programs. However, as noted in section 2.5.3, there are social justice barriers to this approach to workforce development that would have to be addressed.

Another possible labor source is **area youth** (high school age to young adults). A workforce development pathway offered by one study participant for consideration was that young people who may have grown up on a farm or large property in the region might start their career in a municipal highway department or work for Northern Clearing – an Ashland-based right-of-way clearing company with a national practice. Invasive species identification and removal work could also serve as a *de facto* training pathway to support firms like Bay Area Environmental Consulting, city and county public works or parks departments, and nature-based enterprises, whether crafts or food processing.

One idea floated was to have another entity, whether a conservancy or special purpose association, have an on-call crew for non-permitted restoration work. This could dovetail with deliberate attention to offering youth opportunities, training, and financing to explore and build businesses in these areas.

Hand-built projects that are especially suitable to entry-level laborers continue to be part of the region's portfolio; however, the greatest current need is earthwork contractors. More local, trained earthwork and bioengineering construction contractors along with more competitive pricing would be a boon to the region's NBS programs.

The lack of relevant training and funding for necessary tools and equipment also get in the way of workforce development, professional development, and small business expansion. Continued attention to contractor development and recruitment at all scales, from green infrastructure inspection and maintenance, to mid-scale construction, to large shoreline and harbor projects is required. Another study participant suggested working with the Wisconsin Department of Workforce Development to help people gain access to construction equipment and start a business.

In research for this project the team noted that Northwoods Technical College's campuses in Superior and Ashland do not offer the variety of construction and contractor-related training options that are available at the principal campus in Rice Lake, nearly 2 ½ hours away. Nonetheless, engaging Northwoods Technical College staff – admissions and program development in particular – is strongly encouraged since there is, at least, an infrastructure for learning and certification in place in the broader region and a knowledge base about students, needs, and opportunities.

To that end, there are basic GI-related training courses that area organizations do and can provide, and that could be expanded. **Study participants identified the following training needs**:

- Plant identification, including invasive species
- GI inspection and long-term maintenance
- Tree protection during construction
- Erosion prevention and sediment control
- Proper culvert sizing
- GIS/remote sensing
- Earthwork services and
- Climate resilience planning.

The National Green Infrastructure Certification Program (NGICP) provides the base-level skill set needed for entry-level workers to properly construct, inspect and maintain green stormwater infrastructure. Designed to meet international best practice standards, NGICP is a tool that can be used to meet a wide range of needs, including professional development for existing GI professionals and as part of larger workforce development to provide candidates with the technical skills necessary to enter the green workforce and earn a livable wage. NGICP could serve as a tool to jump-start NBS workforce development in the Northern Tier.

Study participants also noted that the many site-scale demonstrations of green infrastructure are useful as examples of BMPs and training sites – but in the words of one participant, "more are always better." Projects at Northland College, in Bayfield, Superior, and Ashland, and any new projects developed and supported through Wisconsin Sea Grant could all be advertised and emphasized even more for those purposes.

3.3 Address Regional Housing Needs, Gaps, and Potential Solutions to the Affordable Housing Crisis

As noted in Section 2.5.1. of this report, the extraordinary shortage of housing for long-term rent or purchase has been noted by project participants a primary contributor to a regional "brain drain" of individuals who are or would otherwise be part of the local NBS community of practice. Even where funding for positions has been available, potential employees have not been able to find adequate housing and positions have remained unfilled. The housing shortage is having a detrimental effect on the economic, social, and environmental prosperity of Northern Tier communities.

Housing supply represents a critical limitation on workforce development and NBS implementation.

We recommend that a study be undertaken, potentially by the Northwest Regional Planning Commission, to track building permit activity, housing starts, and second-home rentals (via Air BNB/VRBO) to ensure that the impact is documented and publicized in the context of regional economic development, tax base development, and workforce needs. In doing so, a focus on housing; impacts of short- term rentals; and both the age of existing housing and the lack of supply of quality units are especially important to highlight, as these specific factors are most affecting availability of labor and the vitality of the economy. There is growth potential in this region, but it is limited by the lack of housing and by levy limits making it impossible for the municipal governments to support proactive planning. **Above all, supporting housing – including the funds needed for municipal staff who enable its development - must be emphasized as a key part of implementing nature- based solutions and sustainability!**

3.4 Promote and Support Nature-Based Economic Development

Finally, one Northern Tier asset not to be ignored is nature-based entrepreneurship. In the private sector and communities, where the Bad River and Red Cliff Bands are active in training youth in conservation practices and are pursuing natural systems-based food and craft enterprises.

Economic diversification for the Bad River Band of Lake Superior Chippewa Indians will include developing a food hub for meat and fish processing. Creative production is another focus, formalizing undercapitalized small home-based businesses. The Red Cliff Fish Company is working to expand, drawing on its Tribal rights to the Lake Superior fishery and demand for sustainably harvested food in

the region and nation. A successful local business, Bay Area Environmental Consulting (BAEC), is providing NBS and GI services from design through implementation and has the potential to expand.

1. **Food Production:** Agricultural production and local value-added processing is growing. Food sovereignty is an important focus of both Tribal governments; the Red Cliff Tribe's distillery and fish company are examples of the types of business enterprises in development.
2. **"Bike and Brew" Tourism**: Trail networks in the NorthernTier are drawing more mountain- and road-biking-focused tourists, as well as tourists attracted to the region's breweries - whether traveling by bicycle or car. This is an outstanding opportunity for the Northern Tier and can support greater engagement and interest in the other recommended actions.
3. **Ecological restoration and cultural immersion options:** Finally, while this must be approached with great care, the Northern Tier's wealth of natural resource restoration opportunities and its remarkable cultural heritage holds the potential for the region to create opportunities for cultural immersion and restoration as part of the visitor experience. From Mexico to Hawaii, local communities are benefiting from offering thoughtful, high-quality cultural/linguistic immersion travel experiences coupled with hands-on resource restoration opportunities, whether supporting release of wildlife or stream restoration planting. This is a genuine opportunity for the Northern Tier's community of practice to discuss in conjunction with the other opportunities and needs outlined in this report.

Appendix A. Stakeholders Interviewed

The project team gratefully acknowledges the time and expertise provided by the individuals and organizations who were interviewed for this effort.

Project Sponsor

Wisconsin Sea Grant

Natalie Chin, Climate and Tourism Outreach Specialist

Karina Heim, Coastal Program Training Coordinator

Lake Superior National Estuarine Research Reserve

Ashland County

Mary Jo Gingras, County Conservationist

Bayfield County

Travis Tulowitzky, Conservation Technician

Douglas County

Ashley Vande Voort, Land Conservationist

Iron County

Eric Peterson, County Forestry & Parks

City of Ashland

Sarah Hudson, City Parks + Recreation

City of Bayfield

Billie Hoopman, City Clerk

Kate Kitchell, Sustainability Commission

Wisconsin Department of Administration - State Geographic Information Office

Jim Giglierano, State Geographic Information Officer

Bad River Band of Lake Superior Chippewa

Philomena Kebec, Policy Analyst and Attorney

Red Cliff Band of Lake Superior Chippewa

Chase Meierotto, Tribal Natural Resources Division Administrator

Bay Area Environmental Consulting

Nile Merton, Founder

Michael Sinclair, Co-Owner

Superior Rivers Watershed Association

Alex Faber, Executive Director

Landmark Conservancy, Bayfield

Erika Lang , Conservation Manager

Northland College Center for Freshwater Innovation

Matthew Hudson, Associate Director

Tom Fitz, Professor of Geoscience

Wisconsin Wetlands Association

Kyle Magyera, Local Government Outreach Specialist

InterFluve

Marty Melchior, Principal

Appendix B.
Marengo Watershed Action Plan List of Priority Staff Positions

As noted in Section 3.1, the Marengo Watershed Watershed Action Plan included a description of staffing positions needed within the region to implement recommended actions for this watershed alone. This text is repeated here as a reference for the types of specific roles and capacities needed to expand NBS and GI implementation in the region.

At minimum, continue current staffing levels devoted to implementing natural resources programs at the federal, Tribal, state, and county agencies and at institutions and non-profit organizations. In order to achieve the Marengo River Watershed Action Plan implementation strategy (described in Chapter 7), the following positions are needed:

- **Watershed Action Director, Bad River Watershed Association** [now Superior Rivers Watershed Association]: Coordination of plan implementation, project scoping and connection to local governments and local and regional agencies and partnerships, grant writing support, assist with Marengo River Watershed Partnership events, plan updating and reporting.

- **Citizen Involvement Coordinator, Bad River Watershed Association**: Coordination of outreach and education component of plan, connecting citizen interests to agency programs through Watershed Action Director, coordinating Marengo River Watershed Partnership events.

- **Lake Superior Basin Educator, University of Wisconsin-Extension**: Technical expertise related to outreach and education component, Connection to Lake Superior Basin Partner Team, grant writing support.

Additional support needed to ensure plan implementation:

- **Chequamegon Bay Area Partnership Coordinato**r: Coordinate regional partnership projects, Connect watershed planning efforts (including Marengo River Watershed Action Plan) to larger, regional efforts, define partnership roles, support for planning and grant writing, connection to statewide and Great Lakes regional programs and funding opportunities.

- **Watershed Scientists**: Provide technical expertise for landscape-level precision conservation analysis, coordination of monitoring strategy, conducting various monitoring, analysis of monitoring data, etc.

- **Watershed Restoration Engineers**: Provide technical engineering assistance and project oversight for stream, lake and wetland restoration projects. Often project implementation needs exceed local capacity to implement them. Engineering expertise specific to the restoration needs in the Chequamegon Bay area would expand project implementation capabilities.

- **Conservation First Responder Specialist**: (http://www.huronpines.org/project/75). One-on-one visits to landowners to match their natural resource interests to available programs (such as CREP, Partners for Fish and Wildlife, forest management planning, etc.) Could be tied in with BRWA Citizen Involvement Coordinator. This type of position was seen as a need because often citizens are not aware of available technical and financial assistance available to them to help meet their conservation goals along with broader agency goals.

- **Invasive Species SWAT Teams**: These teams would be deployed to treat and/or remove priority invasive species at locations identified by the Northwoods Cooperative Weed Management Area. Summer internship opportunity for Northland College or other interested students/citizens.

- **Invasive Species Coordinators for Ashland and Bayfield County and Bad River Natural Resources Department**: Coordinate trainings, inventory, control, education/outreach with landowners and community groups.

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