



**Nature-Based Hazard  
Mitigation Case Study:**  
*Advance Assistance—Data  
Collection and Rebuilding  
Natural Infrastructure in  
Ashland County, Wisconsin*

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## Acknowledgements

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# Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

## Introduction

Funded through FEMA’s Pre-Disaster Mitigation (Advance Assistance) program, Ashland County, Wisconsin, is conducting a study that assesses how the loss of upper watershed flood storage and degraded wetland conditions have led to severe or repetitive damage to roads, culverts, and bridges. The study focuses on data collection and analysis in order to evaluate and prioritize future Natural Flood Management strategies<sup>1</sup>—such as floodplain, stream, and wetland restoration—as cost-effective, long-lasting solutions that address flood hazards and reduce risk from future hazard events.

## Background

Ashland County, a coastal community located in Northern Wisconsin along Lake Superior, is a rural, agricultural county that is rich in aquatic habitats, including wetlands.<sup>2</sup> Historically, the county’s wetland habitats helped to store and slowly release excess rainwater and snowmelt, helping to reduce flooding.<sup>3</sup> However, over the past 150 years, much of the wetland habitat in Ashland County has been lost or degraded due to agricultural development, logging, and extensive gullying that occurred after the forest clearcut and beaver removal. The result is a loss of flood storage and an inability of the floodplain to slow the flow of subsequent flood waters, putting downstream infrastructure at risk. Faster moving flood waters in turn can lead to fluvial erosion hazards (FEH) – incised headwater streams, gullies, and eroding ravines that can result in degradation of wetlands, as they lose their connection to their water sources, and decreased watershed storage.<sup>4</sup>

As a result of the loss of wetland and floodplain storage and resulting watershed degradation, Ashland County has experienced flooding for decades. The County experienced extreme physical and financial damage from the severe storms in 2016 and 2018, with flash flooding causing \$25 million and \$13.1 million in damages to infrastructure, respectively.<sup>5</sup> In response,

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<sup>1</sup> Rebuilding Natural Infrastructure in Ashland County -- First FEMA-Supported Natural Flood Management Project in Wisconsin, Wis. Wetlands Ass’n (Jan. 17, 2020) <https://wisconsinwetlands.org/updates/laying-the-foundation-for-wetlands-as-effective-solutions/>.

<sup>2</sup> Scott Hennelly, *Ashland County is Wetland Country*, Wisconsin Land and Water, <https://wisconsinlandwater.org/programs/cc-stories-detail/ashland-county-is-wetland-country-restorations-of-ashland-countys-wetlands> (last visited Feb. 2, 2020).

<sup>3</sup> Laying the Foundation for Wetlands as Effective Solutions, Wis. Wetlands Ass’n (Jan. 17, 2020) <https://wisconsinwetlands.org/updates/laying-the-foundation-for-wetlands-as-effective-solutions/>.

<sup>4</sup> When Big Storms Inundate Wisconsin, How Could Wetlands ‘Slow The Flow’? <https://www.wiscontext.org/when-big-storms-inundate-wisconsin-how-could-wetlands-slow-flow> Will Cushman WisContext **Oct. 7, 2019**

<sup>5</sup> Scope of Work, *Advance Assistance—Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin*.

the County has contributed to the development and implementation of the regional “slow the flow” strategy focused on increasing infiltration and reducing runoff.<sup>6</sup>

In 2018, the Wisconsin Wetlands Association (WWA) conducted a study in three Northern Wisconsin counties, including Ashland, in an effort to understand how wetland loss, disrupted wetland hydrology, and other degraded watershed conditions, contributed to damages from the 2016 storm.<sup>7</sup> The study, “Exploring the Relationship between Wetlands and Flood Hazards in the Lake Superior Basin,” found that healthy wetlands contribute to resilience, and that channel and incision, gully formation, and headcutting exacerbate downstream flood risks and damages.

The study also found that there are numerous wetland restoration opportunities in the region, but these kinds of projects are not widely used. More demonstration projects are needed to show the benefit of wetland restoration practices and to encourage implementation of these practices. More assessments and better hydrologic data are also needed to help identify areas where restoration projects would be most beneficial.

The study provided the background information and basis for the County to apply for and receive funding from FEMA’s Pre-Disaster Mitigation Program for the Advance Assistance project in 2019. The project aims to address the information gaps identified in the WWA 2018 report.<sup>8</sup>

## The Project

### *The Proposal*

The purpose of the County’s Advance Assistance project is to generate data and analytic tools to help stakeholders develop and implement Natural Flood Management strategies to increase the resilience of public infrastructure to flooding. It focuses on evaluating opportunities to restore stream, floodplain, and wetland conditions upstream of vulnerable road-stream crossings.<sup>9</sup> Based on the goal of restoring watershed hydrology, the Advance Assistance project will:

1. Identify and characterize vulnerable infrastructure and FEH features.

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<sup>6</sup> Wisconsin Land+Water News, Ashland County is Wetland Country: Restorations of Ashland County’s Wetlands Continue to Expand, Available at <https://wisconsinlandwater.org/programs/cc-stories-detail/ashland-county-is-wetland-country-restorations-of-ashland-countys-wetlands>

<sup>7</sup> Wisconsin Wetlands Association. 2018. Exploring the Relationship between Wetlands and Flood Hazards in the Lake Superior Basin. Available at [https://wisconsinwetlands.org/wp-content/uploads/2018/06/WetlandsFloodHazards\\_WWA\\_web.pdf](https://wisconsinwetlands.org/wp-content/uploads/2018/06/WetlandsFloodHazards_WWA_web.pdf)

<sup>8</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin, \*9.

<sup>9</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin, at 4.

2. Synthesize assessment data to describe and scope Natural Flood Management practices and identify potential target areas for implementation.
3. Engage stakeholders to solicit input on project activities, finalize recommendations, and append the Ashland County Hazard Mitigation Plan.<sup>10</sup>

The project will quantify and help the County evaluate the potential hydrologic and economic benefits and costs of installing Natural Flood Management projects. Natural Flood Management strategies focus on preventing additional erosion and restoring watershed hydrology in areas damaged by FEHs.<sup>11</sup> Some examples of techniques or conservation practices that the project will explore to restore healthy hydrology and reduce flooding include:

- In-channel grade control to reconnect streams to floodplains or adjacent wetlands;
- Reversal of erosion-induced drainage to increase flood storage in upper catchment wetlands;
- On-farm erosion control and water management practices.<sup>12</sup>

This project will provide the first steps in proactively creating and restoring natural defenses to flooding events in Ashland County.

### *Integration with Ashland County's Hazard Mitigation Plan*

Two goals from Ashland County's Hazard Mitigation Plan encompass the Advance Assistance project:

**Goal 2:** To preserve and enhance the quality of life throughout Ashland County by identifying potential property damage risks and recommending appropriate mitigation strategies to minimize potential property damage during/due to flooding.

**Goal 5:** To identify potential funding sources for mitigation projects and form the basis for project grant applications through *FEMA's Pre-Disaster Mitigation (PDM)* and/or Flood Mitigation Assistance (FMA) programs.<sup>13</sup>

The plan also recognizes the importance of “good data” to ensure that “decision-makers can create and enforce appropriate zoning and/or building regulations to make any new structures disaster resistant.”<sup>14</sup>

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<sup>10</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin, at 3

<sup>11</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin, at 4

<sup>12</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin, at 4

<sup>13</sup> Ashland County's Hazard Mitigation Plan, at 103.

<sup>14</sup> Ashland County's Hazard Mitigation Plan, 104.

## *Partners*

Ashland County will lead the project. Other partners include: United States Geological Survey (USGS), Northwest Regional Planning Commission (NWRPC), Wisconsin Wetlands Association, Wisconsin Department of Natural Resources, Ashland County Land and Water Conservation Department, the Ashland County Highway Commissioner, Ashland County Zoning, Wisconsin Emergency Management, and the Wisconsin Silver Jackets Hazard Mitigation Team.<sup>15</sup>

## *Funding*

The total cost for this project is estimated to be \$266,666.50. Ashland County applied for and received \$199,999.86 in Pre-Disaster Mitigation funds through FEMA.<sup>16,17</sup> USGS contributed approximately \$66,000 in cooperative matching funds.

## *Wisconsin Act 157*

Wisconsin Act 157 allocates \$150,000 to Ashland County to be used on up to three demonstration projects that “test natural flood risk reduction practices in the county.”<sup>18</sup>

## *Benefits*

Ashland County and communities downstream from the study area will benefit from “access to better data and decision support tools to plan and implement nature-based flood defenses such as FEH mitigation practices to build community flood resilience.”<sup>19</sup> The project will lead to the reduction of safety hazards during and after storms, minimizing damages and the cost of response, repair, and recovery.<sup>20</sup> Private landowners, particularly those with agricultural land, will also benefit from a reduction in erosion and soil loss and an improvement in water management. Further, the involvement of statewide partners provides an opportunity for these methodologies to be implemented in other flood-prone communities.<sup>21</sup> The results of the project will also help to inform state and local land use and zoning policies.

Additionally, the reconnection of floodplains and the restoration of wetlands will improve fish and wildlife habitat. This is ecologically beneficial as well as economically and socially beneficial and will provide more recreational opportunities for the local community.<sup>22</sup>

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<sup>15</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

<sup>16</sup> <https://www.fema.gov/pre-disaster-mitigation-program-fy-2018-subapplication-status>

<sup>17</sup> Interview with Kyle Magyera. Local Government Outreach Specialist. Wisconsin Wetlands Association

<sup>18</sup> 2019 WISCONSIN ACT 157 at <https://docs.legis.wisconsin.gov/2019/related/acts/157>

<sup>19</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

<sup>20</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

<sup>21</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

<sup>22</sup> Scope of Work, Advance Assistance – Data Collection and Rebuilding Natural Infrastructure in Ashland County, Wisconsin

Further, this project (along with others supported by Wisconsin Act 157) will provide on-the-ground examples and data for other communities looking to restore hydrology and reduce flood risk and damages. The methodologies, partnerships, strategies, and results from this project will be valuable references for future Natural Flood Management projects.<sup>23</sup>

### *Timeline and Current Status*

The project began in the winter of 2020 and is expected to run through the spring of 2022. The three primary goals of the project (see above) will be carried out simultaneously, with data synthesis and the recommendation of FEH mitigation practices and project locations slated to begin in early 2021.

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<sup>23</sup> [Wisconsin Wetlands Association: Applauds passage of Flood Demonstration Projects Bill | WisPolitics.com](https://www.wispolitics.com/news/wisconsin-wetlands-association-applauds-passage-of-flood-demonstration-projects-bill)