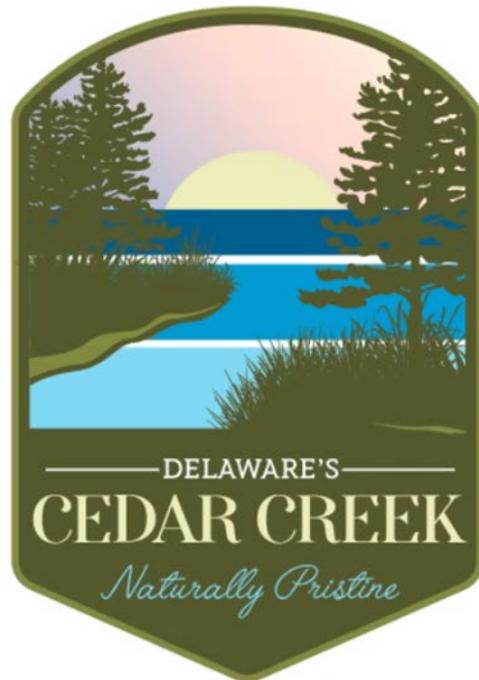
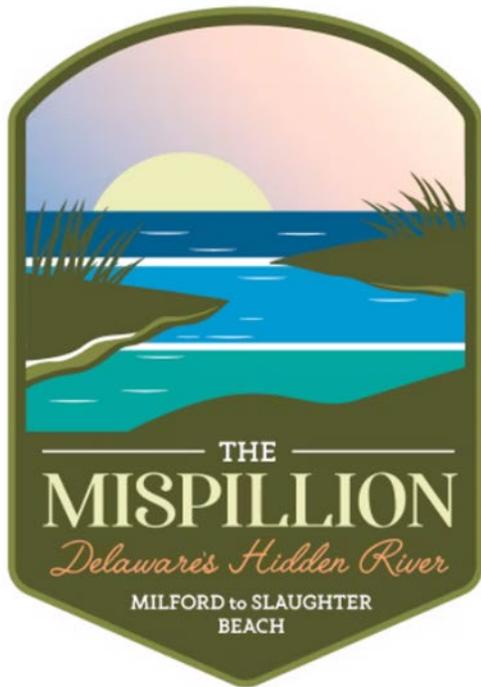


# Ecotourism and Resilience Investment Strategy for the Mispillion and Cedar Creek Watersheds Kent and Sussex Counties, Delaware



**Acknowledgments:** This report was prepared by the University of Maryland Environmental Finance Center with the participation of watershed stakeholders and oversight of the Waterways Infrastructure Investment Network Coalition comprised of members I.G. and Dave Burton and representatives from the following organizations



\*Pew is not responsible for errors within and does not necessarily endorse the opinions and conclusions herein.

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## Executive Summary

The state of Delaware is in the midst of explosive population growth and development at a time when it faces increasing risks of flooding from sea level rise and climate change. A coalition of partner organizations called the Waterways Infrastructure and Investment Network (WIIN) recognized that natural infrastructure (in the form of wetlands, rivers, creeks, open space, and bay beaches) provide a multitude of benefits that can mitigate some of the impacts of climate change while contributing to biodiversity, community way of life, and the economic health of the region. The natural resources within the Mispillion and Cedar Creek watersheds are one of the largest, relatively undisturbed tracts left in Delaware and they are critically important to conservation, climate adaptation, and community resilience. This investment strategy<sup>1</sup> rests on the principle that the natural resources of the Mispillion and Cedar Creek watersheds are so valuable – ecologically, economically, and in a community resilience context – that they require active investment to maintain and enhance their value into the future.

This project was led by members of the Delaware Resilient and Sustainable Communities League (RASCL), including Delaware Sea Grant, the project manager; the University of Maryland Environmental Finance Center, the economic and investment study lead and author; and the Partnership for the Delaware Estuary (PDE), the project's administrative and fiscal agent as well as the vulnerability assessment lead. Together with the City of Milford, the Town of Slaughter Beach, and The Pew Charitable Trusts, they formed WIIN to develop a strategy to incentivize the continued resilience of this region. The natural resources of this region have value far beyond traditional economic terms. This value can be leveraged to support community needs while maintaining the health and character of these resources for future generations. WIIN's project is funded by the National Fish and Wildlife Foundation's National Coastal Resilience Fund, and it involves three components (available at [www.derascl.org/wiin](http://www.derascl.org/wiin)):

- First Report - *Community-Centered Natural Resource Benefits: Mispillion Watershed, Delaware* a natural resource economic valuation study, completed by the University of Maryland Environmental Finance Center in June 2021
- Second Report - A vulnerability assessment, completed in July 2022 by the Partnership for the Delaware Estuary; and,
- Third Report - This *Ecotourism and Resilience Investment Strategy*, which incorporates elements of the first two efforts and contains recommendations to expand conservation and recreation opportunities while building the resiliency of the region's communities and ecosystems to future climate impacts.

This project aligns with multiple local, state, and federal initiatives which are highlighted in the strategy. For example, one of the state efforts is the Delaware Bayshore Initiative, a non-regulatory program launched in 2012 to set habitat conservation and restoration goals while promoting outdoor recreation and local Bayshore economies. The Delaware Byways program, an offshoot of the National Scenic Byways Program, also encourage sustainable recreation and community resilience. Neither program has developed strategies specific to the Mispillion River, Cedar Creek, Milford, and Slaughter Beach,

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<sup>1</sup> Rather than use the term “plan” this document is a strategy. A plan is an arrangement, pattern, program or scheme for a definite purpose. A strategy, on the other hand, is a blueprint, layout, design, or idea used to accomplish a specific goal that is open for adaptation and change when needed. ([Center for Management and Organization Effectiveness](#).)

however. WIIN believes that this region would benefit from a comprehensive approach to resource management that also factors in sustainable forms of economic activity and community resilience to climate change.

As a starting point, the natural resources within the watersheds provide residents and visitors with many opportunities for recreation and enjoyment of nature. Many ideas and opportunities for advancing ecotourism and/or resiliency in the Mispillion and Cedar Creek watershed were identified over the course of this project through stakeholder and partner interviews, focus groups, and a review of existing studies and reports. A number of the ideas serve multiple goals: for example, using ecotourism to incentivize conservation of the natural resources. These ideas were generated by the community and with partners who work within the region to catalyze action. Approximately forty investment opportunities were identified based on broad principles of fostering connectivity and access to natural resources, a sense of place in the communities served by these resources, local capacity to plan and implement the strategy, and overall sustainability and resilience. An investment matrix summarizes and categorizes the different components that characterize the opportunities. A simplified matrix contains information for each opportunity sorted by the Community (Milford, Slaughter Beach, or Watershed-Wide), Primary Community Resilience Theme, Next Steps, and Potential Funding source. A more detailed matrix is housed in a google document for coalition partners with information that includes Status, Project Type, Category, Location, Flood Vulnerability, Tracking Economic Benefit Value or Impact, and Complementary Projects. This google document is intended to be used to track progress and to be adapted as the opportunities evolve. The investment ideas are to be fleshed out in more detail by the coalition and other partners as time goes on, and there are funding opportunities and partnership suggestions that can assist with project exploration and development. Some opportunities are more “watershed-wide” than community-specific and will take county, state, or possibly federal coordination.

To foster local capacity and generate investment interest in the region, WIIN partnered with Ben Muldrow of Arnett and Muldrow Associates on a marketing and branding toolkit. Based on extensive community input, Ben Muldrow crafted a branding vision that markets the Mispillion River as a hidden resource waiting to be discovered and Cedar Creek as a pristine slice of natural Delaware. This vision is incorporated into the Mispillion and Cedar Creek BrandTouch™ Manual that is included as an Appendix to this strategy. It contains style guides, images, fonts, and slogans to enable the towns, tourism offices in Delaware, and the State to promote the Mispillion and Cedar Creek watershed as a destination. The branding and marketing vision is aligned with this strategy to ensure it supports the goals of WIIN. Since the area lacked a clear identity as a destination containing resources that are valuable and worthy of protection, the marketing and branding tools can serve to help generate public and investor interest and future implementation of the investment ideas in the strategy.

Overall, this investment strategy represents a framework to incentivize investment in the resilience of this region, from a climate, economic, and conservation standpoint. It supports the capacity of communities like Milford and Slaughter Beach to undertake a project of this magnitude by surrounding them with a coalition of partners and a branding and marketing vision to help execute the next steps. Further, it creates momentum by bringing new partners to the table and connecting this vision to existing efforts at the federal, state, and local levels. This project has already spurred stronger coordination between Milford, Slaughter Beach, and partners. Several partners from this project have begun an application to DelDOT for funding a safe bike route between the two communities. Moreover, the University of Delaware’s Coastal Resilience Design Studio (an initiative administered by Delaware

Sea Grant and the School of Landscape Architecture) has agreed to partner with Slaughter Beach on a comprehensive planning and design effort that builds off of this work. WIIN believes that this ecotourism and resilience investment strategy provides the partners, background, vision, content, and marketing and branding support to facilitate funding and implementation steps for the array of opportunities identified.

## Introduction

The Mispillion and Cedar Creek watersheds are "hidden gems" of Delaware. These watersheds comprise 128 square miles of land and waters within the Delaware Bayshore. To the north, the Mispillion River flows eastward through the City of Milford and forms the dividing line between Kent and Sussex Counties. To the south, Cedar Creek passes through the towns of Lincoln and Slaughter Beach and meets the Mispillion as both bodies flow into Delaware Bay. Expansive pristine marshland borders the rivers and provides some of the best birdwatching, hunting, and wildlife viewing in the Bayshore region. Agricultural fields dot the landscape and give the "rural" feel that is iconic to southern Delaware. The communities of Milford and Slaughter Beach are linked by the Mispillion River and have some characteristics in common, but they also have some differences. Milford is a larger community with a desire to promote economic development in their community, and it is positioned along a busy transportation corridor that is slated for more development. Slaughter Beach is a small town on the Delaware Bay that wishes to compete more effectively for federal and state coastal resilience funding while still maintaining its small beach town character. In many ways, it is a harbinger of sea level rise's impacts on coastal Delaware and small, rural America. The only two roads in and out of town flood. Saltwater intrusion is putting valuable cropland out of commission and necessitating the town's transition from septic to sewer infrastructure. While slightly less vulnerable, Milford does experience flooding on occasion too, when the tide backs up through the Mispillion River and stormwater has no place to discharge. Understanding their relative vulnerabilities to flood, sea level rise, and development is important to both communities. In addition, both communities wish to express their value to the Delaware economy and deepen their connection to the natural resources of the Delaware Bayshore.

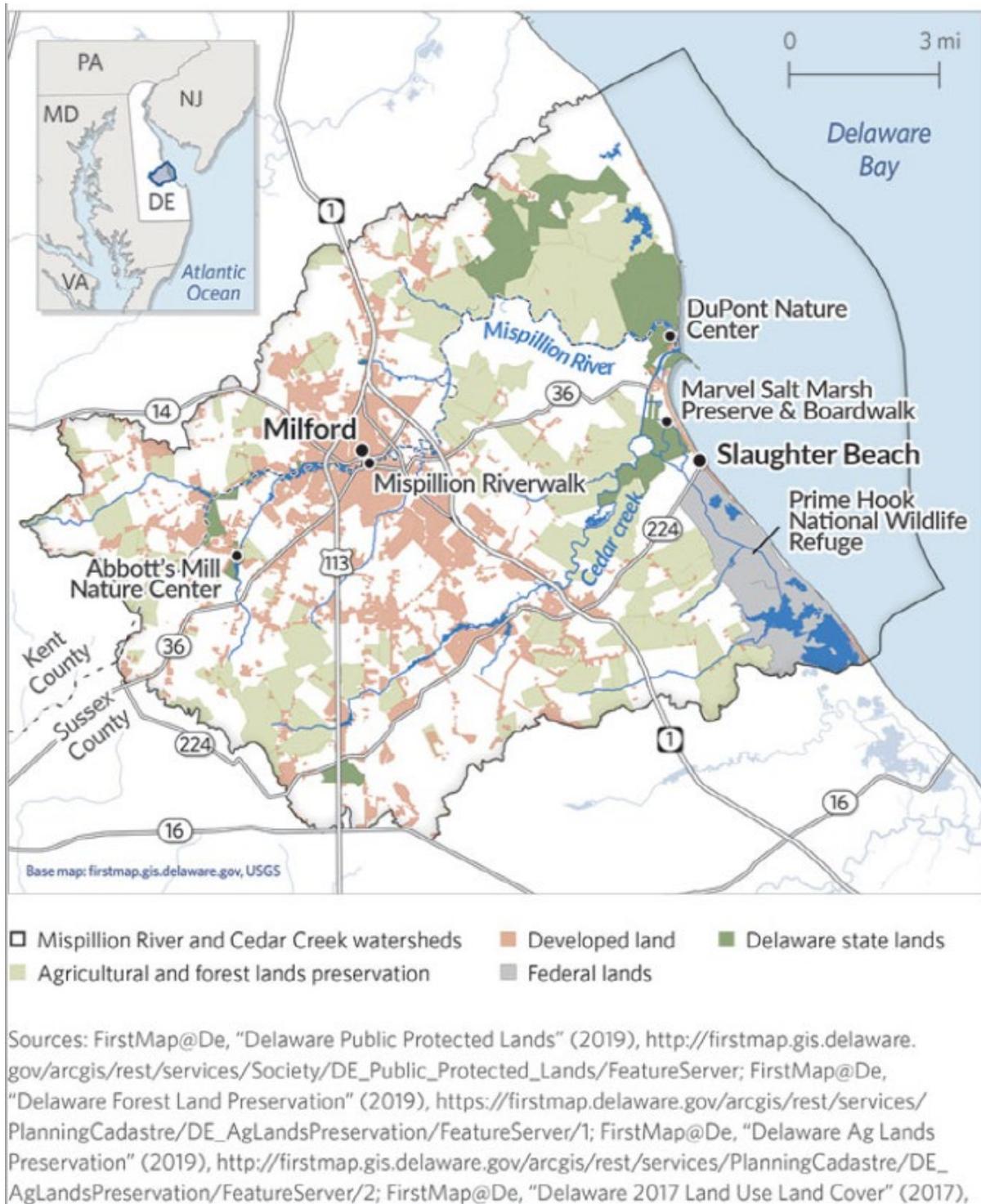
The natural resources within the watersheds provide residents and visitors with recreation and outdoor enjoyment of the natural world. During May and early June, the Delaware Bayshore is home to the red knot, a bird species listed in 2014 as threatened under the Endangered Species Act. The Mispillion Harbor is a vital foraging area for the birds on their epic migratory journey north and is chronicled in the critically acclaimed book, "The Narrow Edge: A Tiny Bird, an Ancient Crab, and an Epic Journey" by Deborah Cramer. The author describes how intertwined humans are with the red knot and the horseshoe crabs they feed upon. The red knots rely on an ecosystem that supports an internationally recognized flyway for migrating birds. Slaughter Beach is within this flyway and is a designated Horseshoe Crab Sanctuary within the Delaware Bay: the latter contains one of the highest concentrations of horseshoe crab spawning areas worldwide. The crabs' eggs are a critical food source for red knots and other migrating birds in spring. The crabs' blood in turn is important to medical sterilization and research, including a COVID-19 vaccine. The healthy balance between red knots, crabs, and humans produces a multitude of benefits, including tourism. This unique wildlife in the Mispillion Watershed draws tens of thousands of visitors every year. In addition, scientists have recently identified Delaware Bay as a "coastal stronghold." These are natural areas that have a special capability to protect people and marine life from rising sea levels. Delaware Bay's beaches and tidal marshes reduce storm

damage and provide critical habitat for nurseries important to the seafood industry.<sup>2</sup> Expanding sustainable ecotourism opportunities so more people can enjoy these unique resources and better appreciate the region while implementing protection and climate adaptation measures - will help support the way of life for the communities of Milford and Slaughter Beach.

This investment strategy views the Mispillion and Cedar Creek Watersheds as central to the economic health of each community, their way of life, and their resilience to climate and development pressures. The natural resources within the watersheds produce countless benefits, many of which are captured in the report. There is also an interdependency between humans and the natural environment wherein each relies on the other. For example, the region's natural resources provide climate resilience benefits to the state and local communities but also need to be protected from climate impacts if they are to persist; at the same time, people need to be able to access and benefit from these resources to justify making investments in protection and adaptation. This strategy recognizes and leverages that interdependency to generate future win-win outcomes. A diverse coalition of partners and elected officials consulted with community stakeholders to identify nature-based investments that will protect ecosystem health, strengthen community identity, and boost climate resilience. This included ecotourism opportunities that will enhance sustainable access to the region's unique resources while providing economic benefits. Investment ideas were assessed against potential vulnerability to climate change and land use patterns, and opportunities to leverage complementary initiatives at the regional, state, and national levels were noted, as were potential contributions to adaptation strategies. This strategy focuses on the Town of Slaughter Beach and the City of Milford as being key players in the future of the Mispillion and Cedar Creek Watersheds (see Figure 1).

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<sup>2</sup> Then Nature Conservancy. Must-See Migration. (<https://www.nature.org/en-us/about-us/where-we-work/united-states/new-jersey/stories-in-new-jersey/top-must-see-migrations-in-new-jersey-the-red-knot>)



**Figure 1. Protected lands and outstanding assets of the Mispillion and Cedar Creek Watersheds.**

### Project Components

This project is funded by the National Fish and Wildlife Foundation's National Coastal Resilience Fund, and it involved three components (which can be accessed at [www.derascl.org/wiin](http://www.derascl.org/wiin)):

- A natural resource economic valuation study, completed by the University of Maryland Environmental Finance Center in June 2021 (with funding support by The Pew Charitable Trusts);
- A vulnerability assessment, completed in July 2022 by the Partnership for the Delaware Estuary; and,
- This Ecotourism and Resilience Investment Strategy, which incorporates elements of the first two efforts and contains recommendations to expand conservation and recreation opportunities while building the resiliency of the region's communities and ecosystems to future climate impacts.

This project was led by members of the Resilient and Sustainable Communities League (RASCL). RASCL is a collaborative network of resilience and sustainability practitioners from 22 Delaware state agencies, academic institutions, and nonprofits ([www.derascl.org](http://www.derascl.org)). The member organizations of RASCL provide technical assistance, outreach, and support to Delaware communities to increase their capacity to adapt, mitigate, and respond to environmental changes, especially climate change. Several project partners are RASCL members, including Delaware Sea Grant, the project manager; the University of Maryland Environmental Finance Center, the economic and investment study lead and author; and the Partnership for the Delaware Estuary (PDE), the project's administrative and fiscal agent as well as the vulnerability assessment lead. PDE is the host of the Delaware Estuary Program, which spans Delaware, New Jersey, and Pennsylvania.

This project aligns with multiple local, state, and regional programs. One important state effort is the Delaware Bayshore Initiative, a non-regulatory program launched in 2012 to set habitat conservation and restoration goals while promoting outdoor recreation and local Bayshore economies. The Delaware Byways program, an offshoot of the National Scenic Byways Program, also encourage sustainable recreation and community resilience. Neither program has developed strategies specific to the Mispillion River, Cedar Creek, Milford, and Slaughter Beach. They have limited to no direct funding to complete such a study. This project brings additional momentum and partners to the table and connects these programs and other initiatives under one vision for the Mispillion and Cedar Creek Watersheds.

### Drivers, Concepts, and Framework for this strategy

Two community-based drivers initiated and maintained interest throughout the development of this strategy. First, the mayors of Slaughter Beach and Milford connected with Delaware Sea Grant, which had been helping Pew and RASCL explore project ideas in Delaware. The mayors each had economic goals that could be aided by ecotourism and resiliency investments. Delaware Sea Grant and RASCL saw an opportunity to connect the communities' interests into one project and then apply to the National Coastal Resilience Fund, with investment by Pew and other partners supporting match funding requirements.

The second driver was the creation of a partner coalition to mobilize expertise, resources, and communications to generate momentum and energy for the project as well as engage stakeholder participation throughout the project. Delaware Sea Grant and RASCL formed a new coalition of partners called the Waterways Infrastructure Investment Network (WIIN) to support stakeholder outreach, leverage expertise about the region and related initiatives, and generate media and community support for the project (see Acknowledgments page). The coalition also contributes important capacity to Milford and Slaughter Beach to undertake a project of this scale and eventually, to implement the investment ideas expressed in this strategy.

This investment strategy rests on the principle that the natural resources of the Mispillion and Cedar Creek Watersheds are so valuable – ecologically, economically, and in a community resilience context – that they require active investment to maintain and enhance their value into the future. Several concepts are combined to form a unique investment approach for Milford and Slaughter Beach communities that builds long-term resilience and sustainability while aligning with county and state initiatives. The concepts are: 1) asset-based ecotourism; 2) treating natural resources as assets; 3) ecotourism as an economic development tool; 4) resource conservation as integral to sustainable management of resources; and 5) prioritizing coastal resilience in the overall economic strategy.

Asset-based economic development mobilizes individuals, associations, and institutions to build on the assets already found in the community. This approach is different from an assessment that focuses on the gaps or needs of a community. The intent is to build on what is already working and expand opportunities that align with existing infrastructure. Stakeholder involvement throughout such a process ensures that the community develops ideas that will support their way of life. The involvement of the stakeholders throughout this project enabled the identification of assets and opportunities as well as the protection of resources that can support ecotourism. This strategy's asset-based approach helps set the stage for investment opportunities.

**BOX 1**

Natural assets support the delivery of core local government services while doing so much more. The functions that nature provides to communities beyond core services, such as recreation, climate regulation, clean air, habitat, and biodiversity are invaluable to the overall health and well-being of a community. Including natural assets in asset management processes provides an integrated approach to maintaining or enhancing the natural assets in a community. Integrating Natural Assets into Asset Management:  
<https://www.assetmanagementbc.ca/wp-content/uploads/Integrating-Natural-Assets-into-Asset-Management.pdf>

The second concept treats natural resources as natural assets (see BOX 1). Community assets are not only the built environment (such as buildings and streets) but also people, wildlife, and natural areas such as parks and wetlands.

The third concept uses ecotourism as an economic development framework to develop new opportunities to access nature and to protect and enhance communities' assets. Ecotourism balances the wise management of agricultural and forested lands, wetlands, and waterways with economic and non-economic benefits that support long-term community vitality (Wearing and Schweinsberg 2018). The comparison of mass tourism with ecotourism (Table 1) demonstrates how they are different and how ecotourism, coupled with resource conservation, can be tailored to better fit the local community's needs and character.

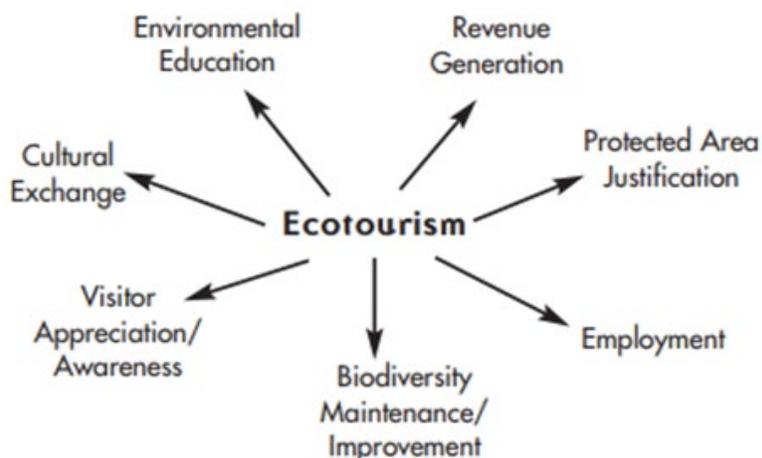
**Table 1 Comparison of tourism with ecotourism with conservation characteristics important for community resilience. Kiper, T. (2013). Role of ecotourism in sustainable development. InTech.**

Characteristics of mass tourism	Characteristics of ecotourism
<ul style="list-style-type: none"> <li>● Large groups of visitors</li> </ul>	<ul style="list-style-type: none"> <li>● Small groups of visitors</li> </ul>

Characteristics of mass tourism	Characteristics of ecotourism
<ul style="list-style-type: none"> <li>● Touristic general marketing activities</li> </ul>	<ul style="list-style-type: none"> <li>● Eco-marketing activities</li> </ul>
<ul style="list-style-type: none"> <li>● Average prices for purposes of market penetration</li> </ul>	<ul style="list-style-type: none"> <li>● High price to filter the market</li> </ul>
<ul style="list-style-type: none"> <li>● Impact on the natural environment</li> </ul>	<ul style="list-style-type: none"> <li>● Little impact on the natural environment</li> </ul>
<ul style="list-style-type: none"> <li>● Management based on macroeconomic principles</li> </ul>	<ul style="list-style-type: none"> <li>● Management based on local development objectives</li> </ul>
<ul style="list-style-type: none"> <li>● Anonymous relationship between visitors and the local community</li> </ul>	<ul style="list-style-type: none"> <li>● Personalized relationships between visitors and the local community</li> </ul>
<ul style="list-style-type: none"> <li>● Behavior-oriented leisure activities/entertainment, opponents to education and training actions</li> </ul>	<ul style="list-style-type: none"> <li>● Loyalty in the process of training and education for appropriate conduct in the natural environment</li> </ul>
<ul style="list-style-type: none"> <li>● Intensive development of tourism facilities</li> </ul>	<ul style="list-style-type: none"> <li>● Reduced development of tourism facilities</li> </ul>
<ul style="list-style-type: none"> <li>● No tie-in with a conservation ethic</li> </ul>	<ul style="list-style-type: none"> <li>● Strong tie with a conservation ethic</li> </ul>

The fourth concept this strategy encourages is resource conservation. Community-based ecotourism (CBET) and community-based tourism enterprises (CBTE) principles, which encourage low-impact, ecologically sound livelihood alternatives and provide business services that connect people to nature, help to incentivize this. (Fennell, 2007; Okazaki, 2008). CBET is like community-based tourism (CBT) but aims to empower the community to preserve its social, cultural, and natural resources. Unlike tourism alone, ecotourism includes conservation and sustainable use of natural resources, which are central to visitors' experiences.

Finally, the last component centers on coastal resilience in the overall investment strategy because this region is under pressures that will eventually compromise the watershed's ability to maintain its value and support its ecological functions and community benefits. Coastal resilience involves anticipating future conditions and proactively planning to reduce risks so that an asset (in this case the watersheds and the communities they support) can rebound or adapt to threats. Coastal resilience is aided by projects that prioritize investments in "green infrastructure." These investments produce multiple benefits that maximize the benefit-costs of projects and can support economic goals.



**Figure 2 Community-based Ecotourism (CBET) encourages the enjoyment and protection of natural resources as well as positive economic impacts. (Drumm, A. and More, A. 2005. Ecotourism Development – A Manual for Conservation Planners and Managers. The Nature Conservancy, Arlington, Virginia, USA. Volume 1: An Introduction to Ecotourism Planning, Second Edition).**

This strategy contains the following chapters: **Chapter 1 Setting** describes the state and federal initiatives and context in which this strategy is written. These initiatives overlap and enhance the potential implementation of actions identified as part of the vision for the State of Delaware and the Delaware Bayshore. **Chapter 2** describes the **Resource Pressures and Vulnerabilities** considered as part of the planning process. **Chapter 3** sets the stage to build ecotourism opportunities based on the **Asset-Based Ecotourism Benefits and Economic Impacts** provided by current recreational and tourism opportunities. **Chapter 4** contains a **Portfolio of Stakeholder and Community-driven Opportunities for Investment**. These opportunities originated from interviews, focus groups, and meetings over two years. Finally, **Chapter 5** provides an overall report summary.

## Chapter 1 Setting

### 1.1 State of Tourism - Beach Focus but The Bay is Beautiful

In 2019, tourism contributed 5% (\$3.5 billion) to the total market value of goods and services produced by the state’s economy (or gross domestic product). Tourism creates jobs and supports local communities through revenue generation. In 2019, the tourism industry was the fourth largest private employer in the state. The state revenue generated from a business, property, income, accommodation, licenses, and other taxes was \$558.2 million.<sup>3</sup> Average visitor spending was estimated at \$315 per trip and \$103 per day with food and transportation accounting for approximately half of the daily expense.<sup>4</sup> The primary activities of tourists include visiting friends and family; visiting a beach is the second most common reason for tourist visits.

<sup>3</sup> D.K.Shifflet & Rockport Analytics. 2019. The Value of Tourism 2019. Delaware Tourism Office. <https://www.visitdelaware.com/industry/tourism-statistics>

<sup>4</sup> D.K.Shifflet & Rockport Analytics. 2019. The Value of Tourism 2019. Delaware Tourism Office. <https://www.visitdelaware.com/industry/tourism-statistics>

Kent County has the smallest share of state tourism expenditures (11.8%) with New Castle (45.7%) and Sussex Counties (42.4%) having a similar share of the majority.<sup>5</sup>

Tourists come to Delaware to not only visit beaches but also to enjoy the natural beauty of the other coastal areas, such as the Delaware Bayshore. Outdoor recreation in general accounts for an important part of Delaware's economy:

“The Bureau of Economic Analysis has found that outdoor recreation generates \$1.1 billion in value added to Delaware's economy, 14,347 homegrown jobs, and accounts for 1.5% of the state's economy. Further, the U.S. Census reports that each year 460,000 people hunt, fish, or enjoy wildlife-watching in Delaware, contributing over \$304 million in wildlife recreation spending to the state economy.”<sup>6</sup>

The Mispillion Watershed and the City of Milford are split between Kent and Sussex counties, with roughly one-third of the area in Kent and two-thirds in Sussex; each County has a tourism-focused organization working to promote the area to visitors. Southern Delaware Tourism (SDT) is the Convention and Visitors Bureau for Sussex County, Delaware. The SDT is a 501(c)6 nonprofit and has a mission to “support and encourage the identification, development, and promotion of sustainable, year-round tourism in Southern Delaware that contributes to economic growth and improves the quality of life.”<sup>7</sup> In 2021, SDT launched the Bike & Stay and Paddle & Stay hotel packages and continued to promote the area as a “foodie” destination through Southern Delaware's Culinary Coast (trademark). According to SDT, the top 10 visitor activities in the County include activities available in the Mispillion Watershed such as dining out, visiting the beach, shopping, visiting breweries and wineries, festivals, visiting museums and historic sites, cycling, antiquing, cultural arts, and fishing. “The Bike & Stay and Paddle & Stay promotions...are working well for us and we are looking to expand on the number of accommodations involved...” (SDT email communication, 2/10/2023).

Kent County Tourism Corporation has developed branding as Delaware's Quaint Villages (DQV). The DQV also operates as a 501(c)6 and has a mission to “...generate incremental economic impact for the community through the attraction of visitors.”<sup>8</sup> The Visitors Guide profiles Milford as a “Quaint Village” and one of the best places to stroll; they highlight the Mispillion Riverwalk, which links the historic elements of downtown (formerly a shipbuilding hub) with parks and cultural facilities.<sup>9</sup>

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<sup>5</sup> D.K.Shifflet & Rockport Analytics. 2019. The Value of Tourism 2019. Delaware Tourism Office. <https://www.visitdelaware.com/industry/tourism-statistics>

<sup>6</sup> Lindholm, A. Land and Water Conservation Fund. Success in Delaware. <https://static1.squarespace.com/static/58a60299ff7c508c3c05f2e1/t/630526e3bda1dc69274b7474/1661282019208/Delaware+fact+sheet+8.10.22.pdf>

<sup>7</sup> Southern Delaware Tourism FY 2021 Annual Report. <https://visitsoutherndelaware.com/tourism-research>

<sup>8</sup> About Kent County Tourism Corporation. <https://www.visitdelawarevillages.com/about/>

<sup>9</sup> Delaware's Quaint Villages Official Visitors Guide. Today Media Custom Communications. <https://digital-editions.todaymediacustom.com/kent-county/2022/#p=5>

## 1.2 Complementary Initiatives

The Mispillion and Cedar Creek Watersheds offer unique opportunities for visitors to Delaware. Although the unique nature of these places has only begun to be fully appreciated, the importance of the Delaware Bay and adjacent lands was recognized several decades ago. Historic legislation (the Coastal Zone Management Act) spurred the protection and preservation of thousands of acres of natural marshes and waterways in and surrounding the Mispillion and Cedar Creek Watersheds. Complementary initiatives and programs are described below to establish the context and regional setting of the Mispillion and Cedar Creek Watersheds. Investments in ecotourism and conservation in the Mispillion should be aligned with these other efforts, particularly the state and federal initiatives.

### 1.2.1 State Coastal Zone Act

In 1971 the Delaware General Assembly passed the Delaware Coastal Zone Act (CZA). The function of the act was to protect the coast from large-scale industrial use and reserve the land next to the Bay for recreation and tourism. Certain manufacturing uses, other than those classified as heavy industry, are allowed in this area only by permit.<sup>10</sup> Some industrial uses remain in the north toward Wilmington, but in Kent and Sussex Counties, the coastal zone is largely open marsh and natural area. Due in large part to the legacy of this legislation, more than half of the Delaware Bayshore's acreage remains undeveloped. It is today protected as state or federal wildlife lands or by conservation groups.<sup>11</sup> A goal when passing the CZA was to offset the prohibition of industrial operations and associated economic losses for the state through the economic advantages of an improved coastal environment, more attractive beaches, and a cleaner estuary that increases productive shellfishing.<sup>12</sup>

### 1.2.2 National Wildlife Refuges

Two important wildlife refuges, Bombay Hook National Wildlife Refuge (north of the Mispillion Watershed by Dover) and Prime Hook National Wildlife Refuge (directly south of Cedar Creek) protect large salt marsh habitats and have become crucial areas for protecting migratory birds. Bombay Hook was established in 1937 as a link in the chain of refuges extending from Canada to the Gulf of Mexico.<sup>13</sup> Much of the 16,251 acres of the refuge remain pristine. 13,000 acres are tidal salt marshes, considered to be Delaware's most valuable wildlife habitat.<sup>14</sup> More than 150,000 people visit<sup>15</sup> the refuge yearly to "...study and photograph nature, and to view wildlife in unspoiled surroundings. Visitors may drive, bicycle, or walk the public tour route, a 12-mile round-trip traversing the many refuge habitats. Along the route are five nature trails and three observation towers, each overlooking a freshwater impoundment."<sup>16</sup> In 2020 Bombay Hook was

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<sup>10</sup> Coastal Zone Act § 7004(a)

<sup>11</sup> [The Legacy of the Delaware Coastal Zone Act: Conserving the First State](https://exhibitions.lib.udel.edu/coastal-zone-act/84-2/coastal-zone-ecology/) <https://exhibitions.lib.udel.edu/coastal-zone-act/84-2/coastal-zone-ecology/>

<sup>12</sup> Babiarz, F. S. 1972. Land-Use Management in Delaware's Coastal Zone. U. Mich. JL Reform, 6, 251. <https://repository.law.umich.edu/cgi/viewcontent.cgi?article=2291&context=mjlr>

<sup>13</sup> Wurster, F.C. et al. 2013. Water Resources Inventory and Assessment National Wildlife Refuge Smyrna, Delaware <https://ecos.fws.gov/ServCat/DownloadFile/23531?Reference=24828>

<sup>14</sup> Friends of Bombay Hook. Bombay Hook National Wildlife Refuge. <https://www.friendsofbombayhook.org/>

<sup>15</sup> Caudill, James and Erin Carver. 2019. Banking on Nature 2017: The Economic Contributions of National Wildlife Refuge Recreational Visitation to Local Communities. U.S. Fish and Wildlife Service, Falls Church, Virginia

<sup>16</sup> See FN 5

named “The Most Beautiful Place in Delaware” by Conde Nast Traveler.<sup>17</sup> The estimated contributions to the economy of Delaware in a 2017 report were \$5.3 million with \$1.6 million in employment income and 48 jobs.<sup>18</sup>

Prime Hook National Wildlife Refuge (see Figure 1) was established in 1963 and is located south of Slaughter Beach. It contains 10,144 acres of land and visitors can fish, hunt, walk, and observe wildlife. A 2017 study estimated that visitors to Prime Hook generate \$3.4 million in economic output with \$958,000 in employment income and 29 jobs.<sup>19</sup>

Despite the important role that National Wildlife Refuges play in local economies, they have not received regular funding for visitor facilities and infrastructure maintenance, leading to a backlog of repair work nationwide. In August 2020, a bipartisan bill called the Great American Outdoors Act established the Public Lands Restoration Fund to address this backlog. The Act also permanently authorized \$900 million per year for the Land and Water Conservation Fund (LWCF), a major source of funding for refuges nationwide. In Delaware, Bombay Hook and Prime Hook have received \$4.3 million from LWCF over the last five decades to protect more lands and expand recreational access to the refuge system.<sup>20</sup> In 2013, Prime Hook underwent a major tidal marsh restoration project to rebuild dunes, close expansive breaches, and restore tidal flow following Hurricane Sandy. With \$20 million from the National Fish and Wildlife Service, the restored hydrological and salinity regimes support the recolonization of salt marsh grasses and the return of wildlife; however, the longevity of these benefits is directly tied to tidal flows from the Mispillion River and Cedar Creek. More information on the connection with Mispillion hydrology is in the next section.

### 1.2.3 U.S. Army Corp of Engineers (USACE)

Decades ago, the U.S. Army Corps of Engineers (USACE) manipulated the Mispillion River’s entrance to the Delaware Bay for navigation purposes. The river’s entrance to the Bay was combined with Cedar Creek through a single, stabilized inlet. The impacts of this are under active review by the USACE. There is concern that if hydrology changes it will endanger the U.S. Fish and Wildlife Service restoration project at Prime Hook National Wildlife Refuge, located at the southern end of the Mispillion and Cedar Creek project area.

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<sup>17</sup> Magaraci, K. June 03, 2020. Bombay Hook Was Named The Most Beautiful Place in Delaware And We Have To Agree. <https://www.onlyinyourstate.com/delaware/most-beautiful-place-bh-nwr-de/>

<sup>18</sup> Southern Delaware Tourism FY 2021 Annual Report. <https://visitsoutherndelaware.com/tourism-research>

<sup>19</sup> Southern Delaware Tourism FY 2021 Annual Report. <https://visitsoutherndelaware.com/tourism-research>

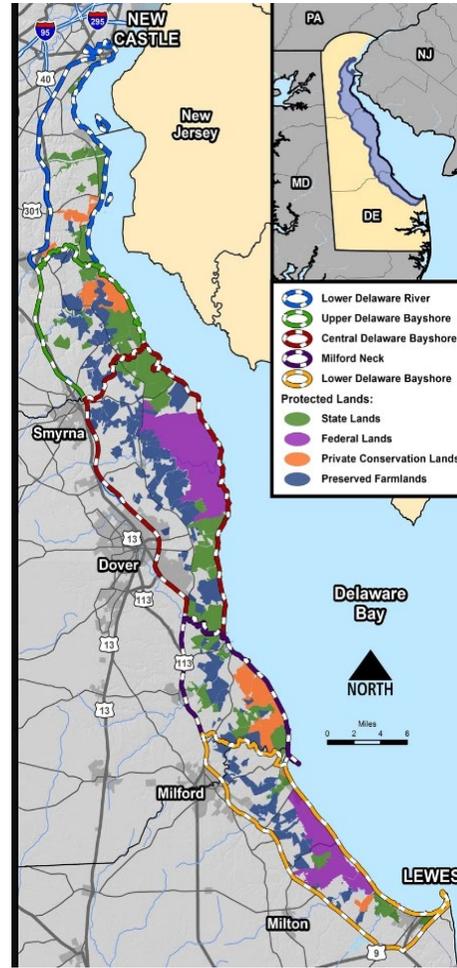
<sup>20</sup> Lindholm, A. Land and Water Conservation Fund. Success in Delaware. <https://static1.squarespace.com/static/58a60299ff7c508c3c05f2e1/t/630526e3bda1dc69274b7474/1661282019208/Delaware+fact+sheet+8.10.22.pdf>

The Delaware Geological Survey recently completed a study for Slaughter Beach of flooding arising from the back bays.<sup>21</sup> Delaware’s back bays are extremely vulnerable to sea-level rise and intensifying storms. The state’s sea-level rise scenarios project up to 1.9 ft (0.58 m) of sea-level rise by the year 2050 and up to 5.02 ft (1.53 m) by 2100.<sup>22</sup> When coastal storms occur over successive tide cycles, the storm tide can build up in the back bays and be slow to ebb. A previous vulnerability assessment limited to roads and residences in Slaughter Beach found that they are more vulnerable to flooding from the tidal marshlands that border the west side of town than flooding from the Delaware Bay on the east side of town. Flooding impacts in the area are described in greater detail in Chapter 2 below.

#### 1.2.4 Bayshore Initiative

Perhaps the initiative with the most direct alignment with the intention of this strategy is the Delaware Bayshore Initiative (DBI, Figure 3). In 2012, the area encompassing 200,000 acres from Delaware City south to Lewes along the shore of the Delaware Bay, was designated as an area of national significance. The DBI aims to “...collaboratively build on the region’s reputation as a unique and beautiful natural resource and help improve the shoreline economy by encouraging more Delawareans and visitors to enjoy it through activities such as recreational fishing, hunting, boating, and ecotourism.”<sup>23</sup> The DBI enhances support of the CZA by solidifying DNREC’s commitment to preserving the state’s coastal zone. The DBI has alignment with the intent of this strategy. The DBI has three areas of focus (from the DBI website)<sup>24</sup>:

Land Conservation



**Figure 3 Delaware Bayshore areas and land ownership.**

<sup>21</sup> Delaware Geological Survey. 2022. Back-barrier flooding in Slaughter Beach, Delaware. <https://slaughterbeach.delaware.gov/files/2022/04/SOFA-Report-reduced.pdf>

<sup>22</sup> Callahan, John A., Benjamin P. Horton, Daria L. Nikitina, Christopher K. Sommerfield, Thomas E. McKenna, and Danielle Swallow, 2017. Recommendation of Sea-Level Rise Planning Scenarios for Delaware: Technical Report, prepared for Delaware Department of Natural Resources and Environmental Control (DNREC) Delaware Coastal Programs. <https://www.dgs.udel.edu/sites/default/files/projects-docs/Delaware%20SLR%20Technical%20Report%202017.pdf>

<sup>23</sup> DNREC. The Delaware Bayshore Initiative. <https://dnrec.alpha.delaware.gov/fish-wildlife/bayshore-initiative/>

<sup>24</sup> see 21

- Protect and connect habitats that support a rich diversity of plants and animals, enhance water quality, and reduce flooding impacts on local communities.
- Support the preservation of private farmlands and the use of conservation best practices.
- Expand habitat restoration efforts that increase resiliency to coastal storms and adapt habitats to sea level rise.

#### Recreation and Education

- Enhance public access to lands and waters for outdoor recreation pursuits compatible with habitat conservation goals.
- Improve amenities to encourage participation in hunting, fishing, birding, photography, hiking, biking, boating, kayaking, and canoeing.
- Increase interpretive signs and other outreach information to raise awareness about wildlife, habitats, farming practices, and cultural and maritime history.

#### Community Engagement

- Invest in historic Bayshore communities by collaborating on projects that enhance visitor experiences and support tourism along the Delaware Bayshore Byway.
- Encourage private-enterprise investments that support local visitation and foster regional and international ecotourism.
- Support local participation in volunteerism to assist with resource stewardship and raising awareness about the connection between community sustainability and habitat conservation.

#### 1.2.5 National Byways

In 2021, the 157-mile route spanning 100 miles of coastline along the Delaware Bayshore was approved as one of the forty-nine new America’s Byways®. The designation came from the Federal Highway Administration, an agency of the U.S. Department of Transportation (DOT). The approval of the Byway centered on the unique and important nature of the Bayshore area providing a connection “...to all that is Delaware: history, wild open space, horseshoe crabs and shorebirds, fresh and saltwater marshes, small communities, fishing villages, and large farms, coastal rivers, the bay, and its beaches, lighthouses and dark skies, historic mansions and migrant shacks, and waterfowl and watermen.”<sup>25</sup> This designation benefits the Mispillion and Cedar Creek Watersheds by elevating the area at the federal and state level to support and provide funds for the restoration and protection of natural resources. In addition, it opens new opportunities for other designations such as the selection of the Mispillion River as a National Blueway. Blueways are designated through a federally supported program that conserves river systems. The rivers are designated by the development of diverse stakeholder partnerships and a strong watershed-based approach to resource stewardship. The Blueway designation

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<sup>25</sup> State of Delaware. April 22, 2021. The Delaware Bayshore Byway National Scenic Byway Designation Sign Unveiling. (<https://news.delaware.gov/2021/04/22/the-delaware-bayshore-byway-national-scenic-byway-designation-sign-unveiling/>)

recognizes the importance of connecting people with the outdoors and unique resources while promoting sustainable economic activities.

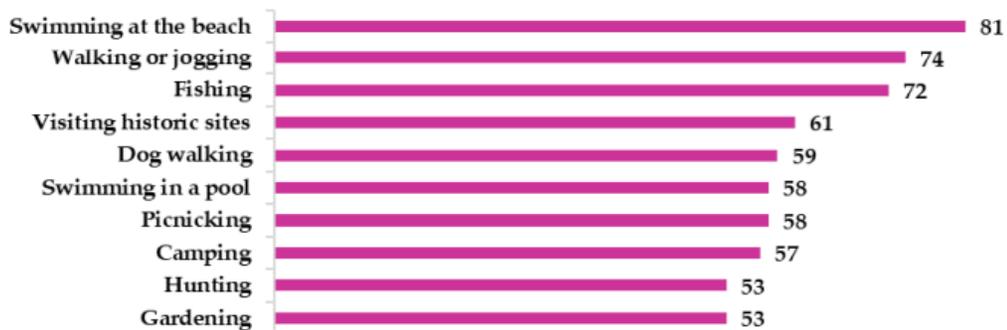
### 1.2.6 State Outdoor Recreation Plan

The State Comprehensive Outdoor Recreation Plan 2018-2023 (SCORP, 2018)<sup>26</sup> is the state-wide strategy for Delaware to determine recreational needs and future investments that will increase outdoor activities. To understand the need for outdoor recreation, a survey asked state residents about:

- The importance of, and participation in, outdoor recreation
- Reasons for participating in outdoor recreation
- Ratings of facilities and opinions on specific aspects of facilities
- Accessing facilities
- Priorities for funding and policy-making decisions

BOX 2 “Investments in outdoor recreation spark a renewed interest and expanded use of outdoor recreation facilities and results in both intrinsic and measurable benefits. Investments that expand and improve public recreation facilities increase recreation and environmental programming, improve our quality of life, and contribute to communities’ vibrancy.” (p.3. SCORP, 2018)

For Milford, the top ten activities in which over fifty percent of Milford households participate are shown in Figure 4. All these activities, as well as bicycling and hiking, are high priorities identified in the SCORP for the region.



**Figure 4 Data from the Delaware SCORP 2018 of the top recreational activities in Milford, Delaware.**

Public and privately owned protected lands in and around the watersheds and publicly available recreation access areas in the watershed are in Tables 2 and 3. The publicly owned land provides both preservation of natural open space and recreational opportunities. The total protected land in the watershed is 81,711 acres, some of which fall outside of the watershed boundaries.

**Table 2 Land ownership and acres in the Mispillion and Cedar Creek Watershed**

Ownership	Acres
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<sup>26</sup> DNREC. Delaware State Comprehensive Outdoor Recreation Plan 2018-2023. SCORP 2018. (<https://destateparks.com/wwwroot/downloads/SCORP/SCORP%202018.pdf>)

<b>Local</b>	<b>Total 95</b>
City of Milford	89
Local Government Easement Ft Saulsbury LLC	6
<b>State</b>	<b>Total 18,070</b>
DE Department of Transportation	69
DE Division of Historical and Cultural Affairs (Abbots Mill Nature Center)	14
DE Division of Parks and Recreation (Cedar Creek Nature Preserve)	62
DE Division of Watershed Stewardship (Slaughter Beach)	54
DE Division of Fish and Wildlife	5904
Redden State Forest Service	11967
<b>Federal</b>	<b>Total</b>
Prime Hook National Wildlife Refuge	<b>9238</b>
<b>Non-Profit</b>	<b>Total 6308</b>
Delaware Nature Society (also manages 92 acres of State-owned land)	191
Delaware Wild Lands Inc	3356
The Nature Conservancy	2761
<b>Private Land</b>	<b>Total</b>
Privately Owned Protected Lands	<b>48,000</b>

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**Table 3 Recreational access in the Mispillion and Cedar Creek Watersheds**

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**Recreational Access**

Bike Trails	50 miles
Boat and Fishing Access Points	9
Walking Trails (Abbots Mill and Mispillion Riverwalk)	6 miles
Canoe/kayak launches (Marshalls Pond, Arena’s Deli, across the Mispillion River from Police Station)	3

### 1.3 Nature-based Recreation Benefits in the Watershed

In June of 2021, one of the deliverables of this National Coastal Resilience Fund project, a report titled “Community-Centered Natural Resource Benefits: Mispillion Watershed, Delaware,” was completed for selected natural assets in the Mispillion and Cedar Creek Watersheds. The project aimed to identify ecosystem services cited by key resource experts and local stakeholders knowledgeable about the Mispillion and Cedar Creek Watersheds in Delaware (project area, Figure 1) and assess the benefits associated with these ecosystem services. The estimated benefit values in the project area can inform resource management decision-making for this region as well as enable the communities of Milford and Slaughter Beach to apply for state and federal project funding.

Economic valuation identifies and quantifies the ways humans express the significance of natural resources through observable market transactions (e.g., fisheries market value) or by a survey of what humans spend or say they are willing to spend to access, restore, or preserve natural resources. These values take considerable effort, time, and funding to estimate, and are typically very context specific. That said, federal and scientific agencies have provided essential guidance regarding how to use valuation when funding is not available for a primary study. The report found that natural ecosystems and their services in the Mispillion and Cedar Creek Watersheds are valued at several million dollars per year for leisure and recreation alone.<sup>27</sup> The values estimated are annual unless otherwise noted. The values have a range because data on some of the specific activities visitors engage in was not available; therefore values were assigned a range using comparable information. Instead of deriving a “Total Economic Value”<sup>28</sup> for the watersheds,

Box 3 The benefit value of the river and marsh natural resources and wildlife for residents and visitors is in the millions per year. See the report at: [https://www.derascl.org/\\_files/ugd/a0ae54\\_8744c1f7926d4bdf9d9a0a063611c2dc.pdf](https://www.derascl.org/_files/ugd/a0ae54_8744c1f7926d4bdf9d9a0a063611c2dc.pdf)

#### Community-Centered Natural Resource Benefits: Mispillion Watershed, Delaware



Image from: [https://www.derascl.org/\\_files/ugd/a0ae54\\_8744c1f7926d4bdf9d9a0a063611c2dc.pdf](https://www.derascl.org/_files/ugd/a0ae54_8744c1f7926d4bdf9d9a0a063611c2dc.pdf)



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<sup>27</sup> It should be noted that given limitations in the initial scope, the economic estimates highlighted in this report are derived from previous studies. Please note that the individual values presented below should not be summed to a “Total Economic Value” as this was not the goal of this study, nor should they be considered revenue for the community.

<sup>28</sup> These values are “baseline” values and will need to be adjusted, as needed, for use with resource changes due to policy action.

researchers determined economic contributions and/or values for key components in each of the three broad ecosystem categories described below.

### Urban River Park and Inland

This category includes recreational- and tourist-centered features such as Abbott’s Mill Nature Center, Mispillion Riverwalk Greenway, and the Vinyard Shipyard. Abbott’s Mill visitation data indicates general recreation values between \$323,000 (hiking) and \$6.54 million (general recreation); and for greenway park leisure activities \$480,000 (picnicking) - \$1.23 (sightseeing) million. Vinyard Shipyard activity value was not captured in this analysis.

The economic contributions estimated by day trip expenditures to the Milford Riverwalk Greenway range between \$ 1 million – 2 million dollars a year. The economic impact of expenditure is slightly different from the benefit value and is an estimate of actual dollars spent by individuals visiting the Greenway.

### Marsh, River, and Wetlands

The Marvel Saltmarsh Preserve Boardwalk provides public access for shorebird viewing. The value of annual birding trips to the boardwalk based on a visitor count in 2020 is estimated at \$435,000, which may be on the low side since the visitor count occurred during the pandemic shutdown. The extensive salt marsh in the area absorbs excess stormwater and storm surge from flood events. The overall protection provided by salt marsh/wetlands reduces monetary damage of storms by 10%. Using flood insurance claims, a sensitivity analysis between 10% and 50% marsh storm protection saves between \$7,800 and \$125,200 in insurance claims per event.

### Marine, Harbor, Slaughter Beach.

Mispillion Harbor Reserve, the DuPont Nature Center, and Slaughter Beach support wildlife, shorebird, and horseshoe crab viewing; bay beach recreation; recreational and commercial boating; and commercial shipping. Annual nature center and harbor shorebird viewing values were calculated at \$574,000 (resident) to \$1.15 million (non-resident). The annual Slaughter Beach recreational access value is estimated to be \$458,000.

These resources are directly or indirectly responsible for sustaining 1,251 jobs across eighty-three businesses in the region, dominated by hospitality and recreational services (restaurants, bars, hotels, campgrounds) and other marine and coastal-dependent industries.

The assets and benefit indicators from the UMD EFC report are included in this report (Sections 3.2 and 4) to describe the benefit values of potential ecotourism and conservation investment options.

#### 1.4 Flood Vulnerabilities - Partnership for The Delaware Estuary Mapping Tool

As part of this project, the Partnership for the Delaware Estuary (PDE) developed a geospatial tool that assesses current and future flood risk for different land use types and specific features of interest. The assessment can be used to screen existing and proposed infrastructure, and recreational or ecotourism investments that support the watershed’s ecotourism economy. The report notes that “protected land,

parks, and recreation assets, water access sites, and certain agricultural easements are among the areas of concern with the highest levels of composite vulnerability” (composite being a combination of current and future flood vulnerability). Four broad land categories were used in the assessment: developed, agricultural, recreation, and habitat (which includes forested and sand/shore). The assessment showed that the habitat land use type has the highest composite vulnerability, followed by the recreation land use type. Within the habitat category, sand/shore is the most vulnerable (note that land with this classification is only 1% of the habitat area). As the sand/shore category comprises a significant portion of the Town of Slaughter Beach, shoreline erosion is one of the biggest concerns for this community. Shoreline erosion is also a threat to wildlife habitat in the region, given the importance of sandy beaches for horseshoe crab spawning and shorebird feeding; at the same time, common “hardening” practices that reduce shoreline erosion (such as bulkheads and rip rap) also destroy suitable spawning habitat and result in direct mortality. However, the effects of erosion on wildlife habitat are usually temporary – after an erosion event like a storm, the beach typically returns to its equilibrium state of a gently sloping beach. Wetlands (92% of the habitat land use category) are by far the most vulnerable, as over 77% of wetlands have a high or highest composite flood risk. The mapping tool developed by PDE was used in this strategy to screen any applicable areas or proposed investment opportunities for current and future flood exposure. However, a more detailed risk assessment should be conducted when making decisions about specific assets.

## Chapter 2 Resource Pressures and Vulnerabilities

### 2.1 Pressures: Flooding and Sea Level Rise’s Impact on Existing Assets

Flooding comes from several sources throughout the watershed, including coastal storms, high tides, and heavy rains. Sea level rise (SLR) exacerbates flooding, as does the loss of the development of open space and protective natural features such as tidal marshes, forests, and freshwater wetlands. Today, this watershed region is a hotspot for coastal flooding due to its very low mean elevation, vulnerability to tropical and extratropical storm systems, and a rate of sea level rise that is twice the global average. The State of Delaware projects 1.9 ft (0.58 m) of sea level rise by the year 2050 and up to 5.02 ft (1.53 m) by 2100<sup>29</sup>, which will have major consequences for agriculture, as many farms are in the low-lying coastal plain east of Route 1, as well as tidal wetlands and coastal communities. The impacts of sea level rise in the watershed will include “beach erosion, inundation of low-lying crops, conversion of wetlands into open water, and damage to private property and public infrastructure (septic systems, roads, water supply networks).” In addition, higher rates of high tide flooding (also known as nuisance or sunny day flooding) are expected. Although many of these impacts will occur gradually and are already being felt, flood events can cause significant damage and disruption in the near term; as sea levels continue to rise, each event has more potential to push a location past its flood tolerance threshold (e.g., tidal wetlands

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<sup>29</sup> These sea level rise projections correspond to the state’s high SLR planning scenario (95% probability) based on the IPCC AR5 RCP 8.5 greenhouse gas emission scenario (also known as the “business as usual” scenario). State of Delaware’s 2017 Sea Level Rise scenarios were used in the preparation of this analysis as they represented the best available science for our region at the time. Callahan, John A., Benjamin P. Horton, Daria L. Nikitina, Christopher K. Sommerfield, Thomas E. McKenna, and Danielle Swallow, 2017. Recommendation of Sea-Level Rise Planning Scenarios for Delaware:

Technical Report, prepared for Delaware Department of Natural Resources and Environmental Control (DNREC) Delaware Coastal Programs. <https://www.dgs.udel.edu/sites/default/files/projects-docs/Delaware%20SLR%20Technical%20Report%202017.pdf>

convert to open water or a roadway becomes too expensive to repair), especially if adaptive measures have not been put in place. The federal government projects that, on average, moderate flooding (the threshold set by the National Weather Service at which homes and buildings are more likely to experience damage) will occur more frequently by 2050 than minor flooding (street inundation, nuisance flooding) occurs today.<sup>30</sup>

Flooding can also be caused by heavy precipitation. Heavy downpours can overwhelm existing stormwater systems and cause localized flooding of roads and low-lying areas; when downpours occur during higher high tides, there is less capacity in stormwater systems and marsh areas to receive excess water and drain away. Heavy rainfall is projected to intensify and occur more frequently due to climate change, necessitating stormwater infrastructure upgrades and design standard updates.<sup>31</sup> Areas at risk of flooding due to heavy rain are not always captured on official floodplain maps, so local experience and detailed studies (when available) can provide additional information on an asset's flood vulnerability.

Coastal storms such as nor'easters and tropical depressions can bring excessive rain, wind, storm surge, and erosion over successive high tides. This often results in scarping of the beach and dune system as well as the backing up of the storm tide in the marshes and other tidal waterways, which are slow to drain. Typically, this contributes to a great deal of flood vulnerability for homes, businesses, and community assets that are adjacent to tidal marshes, rivers, and creeks.

In terms of which community assets are vulnerable to flooding, PDE assessed roadways and found that Bayshore byways and evacuation routes both have flooding risks. Most of the vulnerable road segments are to the east of Route 1, crossing through agricultural areas and habitats (primarily wetlands) and ending near the Delaware Bay. There are other vulnerable sections of roads further inland that may flood during storms and may become inundated in future decades without adaptation measures. A network-type spatial analysis could help reveal the scenarios in which certain routes that provide access to communities or ecotourism assets become impassable, as only a small part of a road segment needs to flood to cut off access. This type of analysis should be conducted soon, either after ecotourism investment decisions have been prioritized or after the next update to local sea level rise projections is made; then, corresponding adaptation projects can be planned for transportation infrastructure that is vital to maintaining the region's ecotourism assets.

The time frame or planning horizon is an important factor in determining the vulnerability of an asset or an area. For example, in the near term, many locations will experience occasional flooding from storms or high tides but in the longer term, some locations are at risk of converting to marsh or open water. The planning horizon that the community chooses to use for decision-making will impact both the degree of vulnerability of each asset as well as the appropriate management strategies to implement. Another way to think about this is to consider whether an asset is vulnerable to occasional disasters and events or to lengthy or permanent inundation -- this can impact whether assets are temporarily

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<sup>30</sup> 2022 Sea Level Rise Technical Report from <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html#step1>

<sup>31</sup> 2014 Delaware Climate Change Impact Assessment. [https://documents.dnrec.delaware.gov/energy/Documents/Climate%20Change%202013-2014/DCCIA%20interior\\_full\\_dated.pdf](https://documents.dnrec.delaware.gov/energy/Documents/Climate%20Change%202013-2014/DCCIA%20interior_full_dated.pdf)

inaccessible but can become usable again, or if they will be effectively lost. Some assets may cross a threshold to inundation; this time frame (or triggering event size), if known, should be incorporated into management planning for the asset. Also, some assets may not be directly vulnerable, but reliable access may be an issue during storms and high tides now or in the future. The continuity of access to priority assets should be evaluated under future scenarios, whether that is roadways, trails, or river/trail access points. These temporal factors should be taken into consideration when designing adaptation strategies both for specific assets and for wider areas.

The current and future flood vulnerability of important features in the watershed is summarized below. Features are grouped under municipalities/communities, sectors/types of assets (having multiple locations), and specific/individual assets (within or outside of municipalities).

### 2.1.1 City of Milford

Within Milford, most of the current and future flood vulnerability that impacts assets of interest lies along the Mispillion River, especially on the south side. Several small but high composite vulnerability areas appear along the northern banks. Greater areas of high vulnerability occur from Goat Island east to Route 1. The PDE assessment notes that “water access points, Goat Island, and different portions of the Mispillion Riverwalk have the greatest proportion of area at a high risk of current and future flooding.” Milford also has higher social vulnerability<sup>32</sup> near many of these assets (e.g., greater proportions of minority and/or lower-income populations), which should be factored into the development and prioritization of adaptation and ecotourism strategies. Many historic sites, businesses, and potential ecotourism opportunities are located downtown near the Mispillion River; while most are situated outside of the current “100-year” (1% annual chance) floodplain, they could still be impacted by access issues during a riverine flood or by stormwater flooding during heavy rain events. As vulnerability along the banks of the river is likely to increase due to sea level rise (SLR), future flood/SLR scenarios should be evaluated when planning to improve existing or add new assets here so that they can be designed to either avoid or withstand flood impacts. This will be particularly important for adapting the Riverwalk and for the development of additional river access points.

### 2.1.2 Town of Slaughter Beach

The town, located on a strip of land between vast salt marshes and Delaware Bay, is currently highly vulnerable to flooding and this vulnerability is expected to increase in the future. Currently, sources of flooding include “tidal salt water from Delaware Bay, fresh water from Cedar Creek and Slaughter Creek, and precipitation falling directly on the barrier, tidal channels, and adjacent salt marsh.”<sup>33</sup> The input received during a 2016 community workshop noted that more flooding came from the marsh side of town than the Delaware Bay side. This difference is attributed to the dunes on the Bay side, which provide some protection but are experiencing erosion, especially during coastal storms. The southern part of town is experiencing more shoreline erosion compared to the rest of town. “Without

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<sup>32</sup>

<sup>33</sup> McKenna, T., & Warner, D. (2022). *Back-barrier flooding in Slaughter Beach, Delaware*. Delaware Geological Survey. <https://slaughterbeach.delaware.gov/files/2022/04/SOFA-Report-reduced.pdf>

maintenance and upkeep, Slaughter Beach’s dune system may not provide adequate protection for the Town over the next twenty years.”<sup>34</sup>

At the same time, studies have shown that “the Town’s back-barrier salt marsh should be considered moderately to over-stressed with the large stressor being the manipulation of the hydrology.”<sup>35</sup> The salt marshes can help attenuate storm surges, but the various man-made ditches that remain within the marsh system reduce this helpful effect and provide channels for water to flow inland more easily. Studies have also noted that the area seems highly sensitive to shoreline changes occurring elsewhere, which have caused increased flooding in the town on occasion.

Roadway access to Slaughter Beach is limited to two roads and both are evacuation routes that are particularly vulnerable to flooding currently and in the future. The two access roads, which cross low-lying agricultural lands and salt marshes east of Route 1, are among the first places to flood in the town. Similarly, the only access road to the DuPont Nature Center just north of Slaughter Beach is extremely prone to flooding. Maintaining reliable access to the town will be an important strategy if it is to remain a viable ecotourism destination and residential community.

In addition to tidal and storm-related coastal flooding, heavy rain events also cause issues in Slaughter Beach. Low spots and inadequate drainage lead to precipitation-induced flooding in the northern part of town, and Bay Avenue traps water on lower-lying lands to its east. Some ponded areas may take days to drain due to slow infiltration rates and/or high-water tables.

The vulnerability of Slaughter Beach’s shoreline to erosion is also a major concern due to residential homes landward of the dune line and its high value as a horseshoe crab spawning location. Horseshoe crabs need gently sloped sandy beaches that are protected from wave action for spawning habitat, and these locations serve as critical stopover habitat for shorebirds during migration. In turn, this combination of spawning and shorebird activity is a major draw for seasonal visitors to Slaughter Beach in late spring and summer. Beach loss here due to flooding and storm-generated wave action may have particularly deleterious impacts on both wildlife and the Town.

## 2.2 Development and Land use Change

Stakeholders identified development as a potential threat to the watershed’s unique character that can also impact natural resources and flood risk. Milford is one of Delaware’s fastest-growing towns - growing 60 percent since 2000 - and it has seen more growth attributed to the opening of a new hospital in 2019 and the Delaware Turf Sports Complex (DE Turf) in 2017. DE Turf is owned and operated by a 501c3 non-profit organization. An analysis of the economic impact of DE Turf estimates \$25 million

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<sup>34</sup> Delaware Department of Natural Resources and Environmental Control, Delaware Coastal Programs Office. (2018) *Town of Slaughter Beach Coastal Vulnerability Assessment and Adaptation Options*. <https://documents.dnrec.delaware.gov/coastal/Documents/ResilientCommunityPartnership/Town%20of%20Slaughter%20Beach%20Coastal%20Vulnerability%20Assessment%20and%20Adaptation%20Options.pdf>

<sup>35</sup> McKenna, T., & Warner, D. (2022). Back-barrier flooding in Slaughter Beach, Delaware. Delaware Geological Survey. <https://slaughterbeach.delaware.gov/files/2022/04/SOFA-Report-reduced.pdf>

is contributed to the local economy each year.<sup>36</sup> The hospital complex is driving housing and commercial development, supporting healthcare businesses, hotels, and restaurants.<sup>37</sup> This coupled with Delaware as a desirable retirement location with low property taxes are some of the reasons people choose to move to the state.<sup>38</sup>

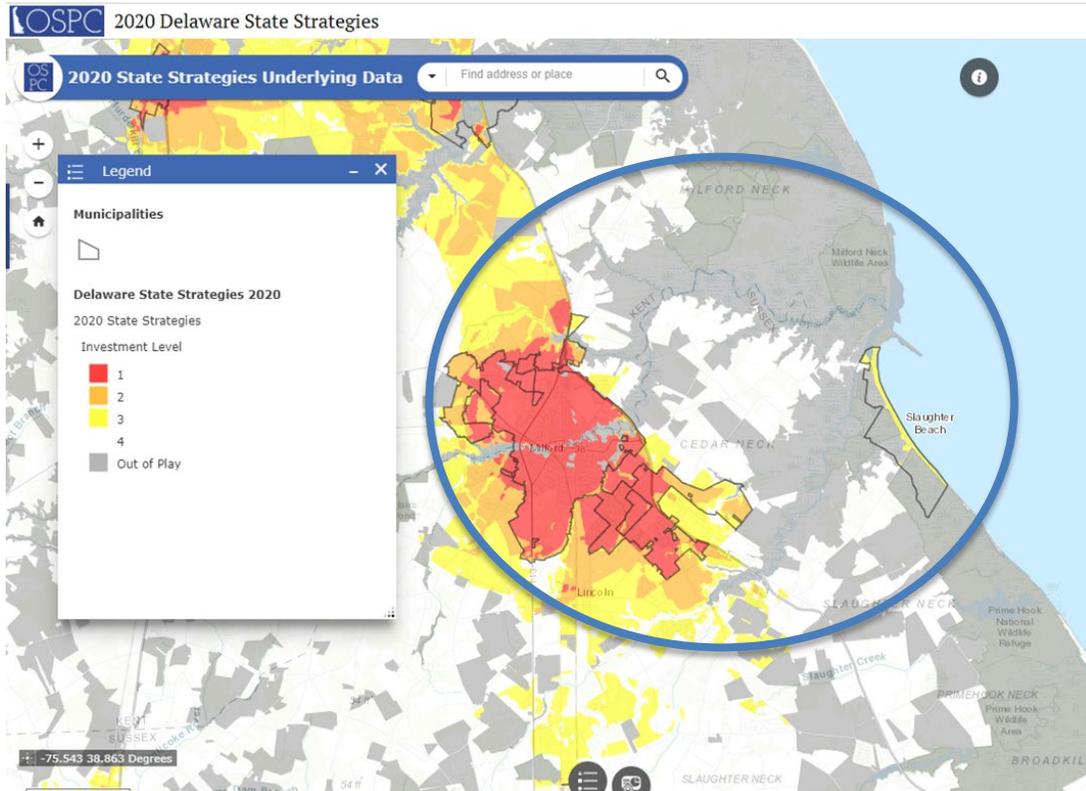
Kent County, Sussex County, and City of Milford Comprehensive plans have addressed approaches to growth. Identified growth zones and state spending plans direct where growth is supported by zoning and funding. The planned county infrastructure (water and sewer) and state funds are concentrated within the growth zones and these do not extend significantly east of Route 1. The State Strategies for State Policies and Spending map classifies land areas into four Investment Levels. Investment levels 1 and 2 are areas where the State intends to use its spending and management tools to promote growth. Level 3 is where growth is not currently planned, and level 4 represents areas where spending will support rural character. Both Kent County and Milford have Transfer of Development Rights to further incentivize the preservation of the remaining privately owned open space and agricultural lands east of Route 1. The Sussex County comprehensive plan supports the purchase of development rights as a strategy to continue open space and agricultural land preservation.

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<sup>36</sup> Smith, J. Oct. 7, 2016. Study: DE Turf Sports Complex will boost Delaware economy  
<https://www.delawareonline.com/story/news/local/2016/10/05/de-turf-sports-complex-impact-local-economy-kent-county/91636672/>

<sup>37</sup> Goss, S. February 11, 2019. Healthcare expansion could remake Milford into Delaware's next boom town. Delaware Online. (<https://www.delawareonline.com/story/money/business/2019/02/08/health-care-expansion-could-remake-milford-into-delawares-next-boom-town/2777910002/>)

<sup>38</sup> ACTS Retirement-Life Communities. (<https://www.actsretirement.org/retirement-resources/resources-advice/tax-benefits-for-retirees/delaware/>)



**Figure 5 2020 State Strategies for State Policies and Spending map. Red and Orange locations indicate areas where state funds will support growth. Yellow areas are not currently anticipated for growth. White areas represent where spending will support rural character. The blue circle is the general area of the watershed from Milford and east to Slaughter Beach.**

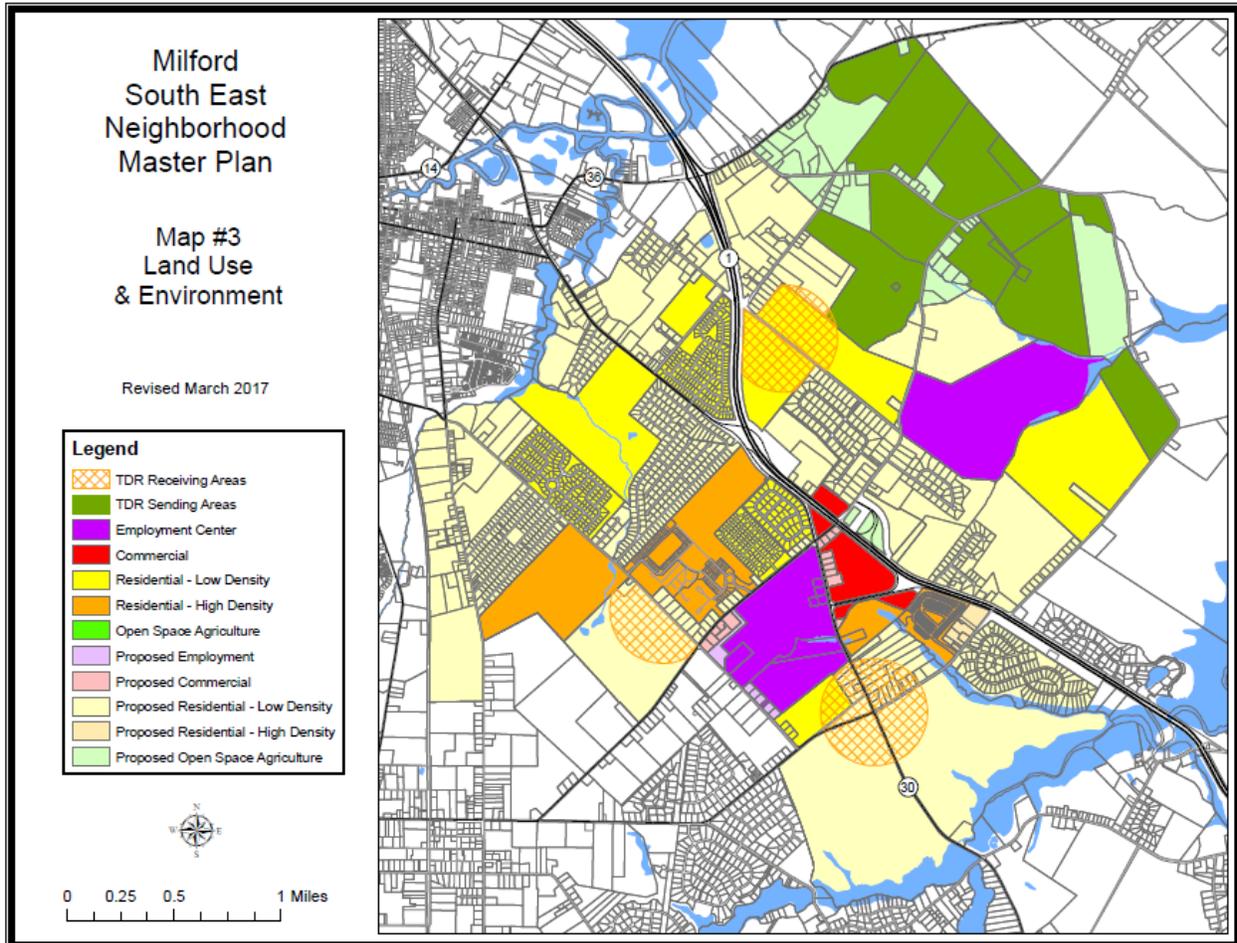
The City of Milford has developed a southeast master plan that factors in open space and agricultural preservation. Milford partners with the Delaware Department of Agriculture and Delaware Agricultural Land Preservation Fund (DALPF) to help assess farms available for preservation. The Transfer of Development Rights (TDR) is available to private landowners east of route 1 particularly in the “TDR Sending Areas” to sell the rights to develop and enter the preservation programs. The rights to develop are dwelling units that can then be used in the orange hatched “TDR Receiving Areas” (Figure 6). This is a way for landowners to preserve their property as well as receive the payment for transferring the development into areas where growth is planned and supported by state, county, and city strategies.

Outside the Growth Zone Overlay, all land has been placed in one of three TDR Sending Area priority categories. These levels (low, medium, and high) are based on five factors (from Kent County Planning):<sup>39</sup>

- 1) A “very high” Land Evaluation and Site Assessment (LESA) score;

<sup>39</sup> Kent County Planning. Exploring Transfer of Development Rights in Kent County, Delaware. <https://kentcountyde.maps.arcgis.com/apps/MapJournal/index.html?appid=2a5bd8b67b35435794705418d73677a4>

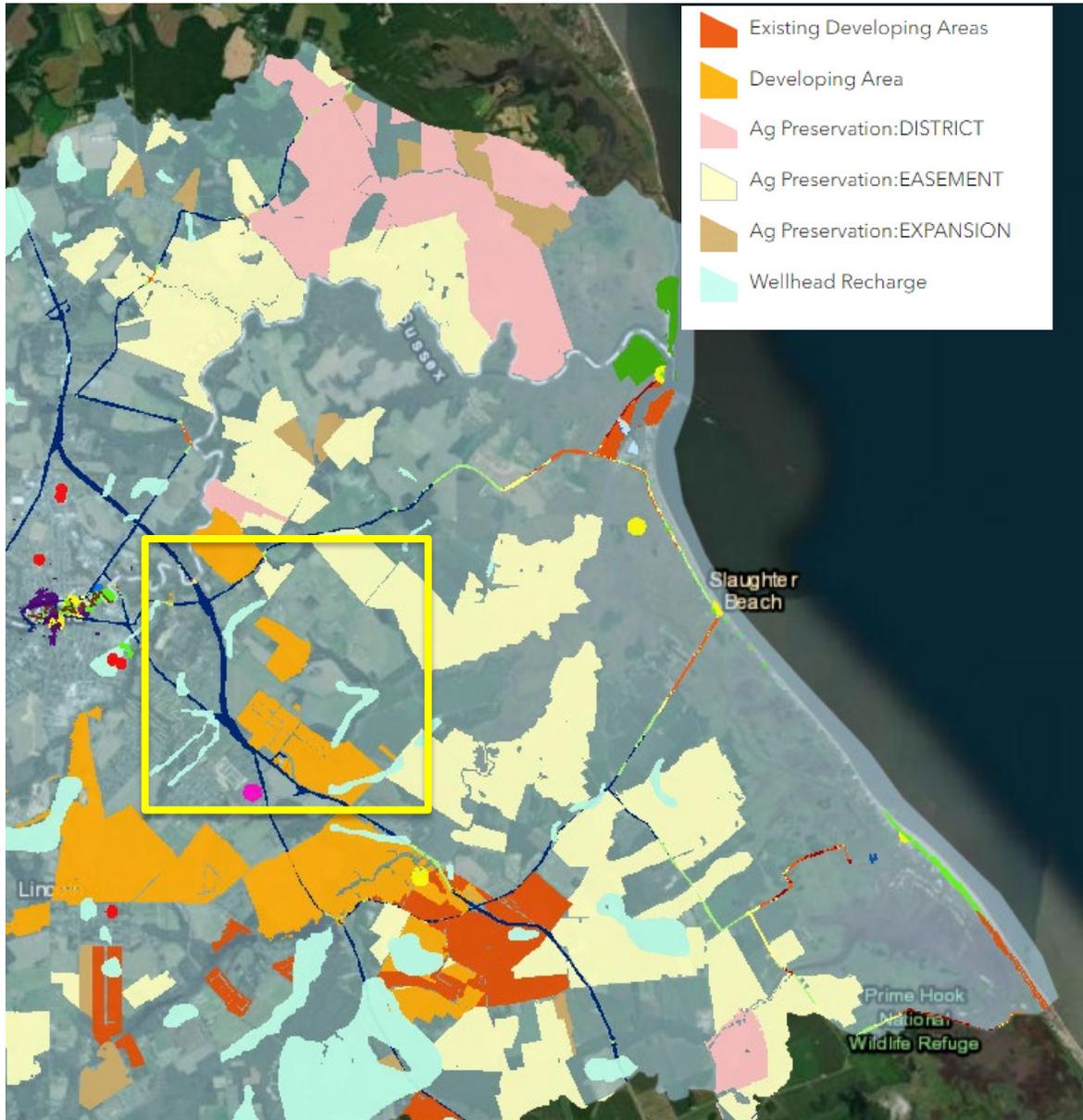
- 2) Proximity to existing preserved lands;
- 3) Historic resources;
- 4) Designation as a State Resource Protection Area;
- 5) Designation as an Excellent Water Recharge Area; and
- 6) Lands adjoining the east side of State Route 1.



**Figure 6 The City of Milford Comprehensive Plan Southeast Master Plan (2018). The figure shows the Transfer of Development Rights to sending and Receiving areas that are available in the program. The City of Milford works with the Department of Agriculture and Delaware Agricultural Lands Preservation Fund to purchase rights and preserve areas for agriculture and open space.**

The vulnerability mapper developed by PDE for this strategy identifies lands that are preserved or in easement (Figure 7). The pink, yellow, and brown areas along the Mispillion River show that a good portion of land in Kent County to the east of Route 1, bordering the Mispillion on the north, is either eased or preserved. The southern border is in Sussex County and less land is in preservation compared to Kent County. Cedar Creek also shows most of the land bordering the creek to the east of Rt 1 is in easement (gray areas in Figure 5). The area in the yellow box is roughly the area in Figure 6 which shows where TDR may occur. Nature Preserves (Milford Millponds, Milford Neck) in the watershed are an example of protected lands, some of which double as recreation access. A potential next step for

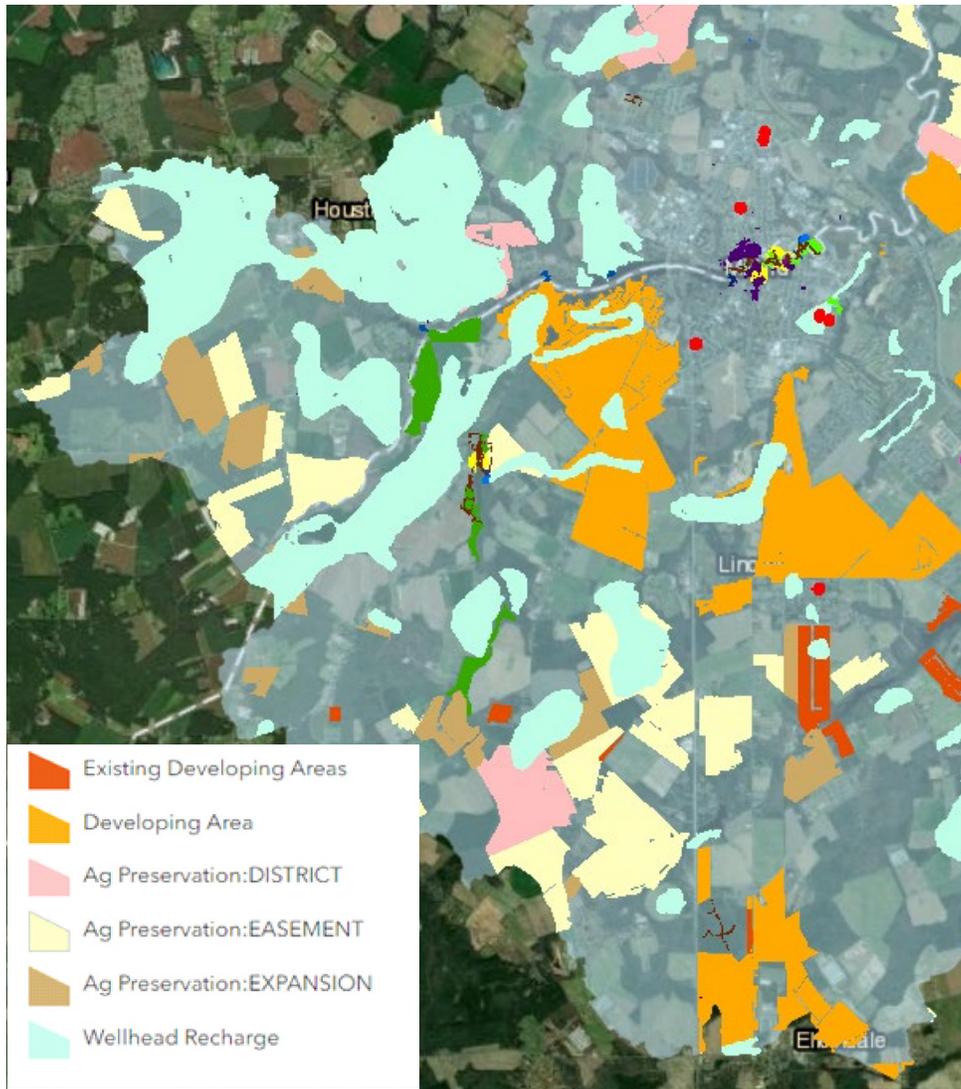
strategy includes building on the preserved lands and further correlating land protection strategies around the high-quality habitat and corridors.



**Figure 7 Partnership for Delaware Estuary prepared maps that show various land uses and resource pressures. The preserved and eased lands as well as the areas being developed outside of the municipal limits of Milford and Slaughter Beach are shown. TDR sending and receiving areas from Figure 6 are roughly within the yellow square. If successful, an additional 11 parcels and 720 acres will be preserved east of Route 1.**

Tightly linked with development is the availability of drinking water to support growth. The state and counties have wellhead recharge areas mapped (Figures 7 and 8 light blue). These areas have been identified as important to protect from development because they provide areas that recharge aquifers that provide drinking water. Most of the wellhead recharge areas are outside of the Milford municipal

boundary. Title 7, Delaware Code, Chapter 60, Subchapter 6, Source Water Protection requires “...the counties to implement measures to protect the quality and quantity of public water supplies within excellent groundwater recharge areas and wellhead protection areas.”<sup>40</sup> Preservation west of Milford (headwaters) is important to water quality, and recreation and provides opportunities for forest protection.



**Figure 8 Wellhead recharge areas and preservation west of Milford.**

### 2.3 Other Watershed Threats that Impact Resources for Ecotourism

In addition to flooding and development pressure, stakeholders in individual interviews and focus groups identified resource concerns with fisheries, beach, and wetland loss as threats that impact ecotourism development.

<sup>40</sup> P. 4-16. Kent County Comprehensive Plan. 2018.

### 2.3.1 Delaware Bay Fisheries

The Delaware Bay serves as a “...spawning and feeding grounds, nursery areas, and migratory routes for many important recreational and commercial fish and invertebrates such as striped bass, weakfish, American shad, and blue crabs.”<sup>41</sup> New Jersey Division of Fish and Wildlife has tracked fish populations and water quality through long-term surveys like a finfish trawl survey (25 years of data) and a seine survey in the Upper Bay and river (41 years of data).<sup>42</sup> The weakfish population decline was cited as a concern for the Delaware Bay in interviews with stakeholders. In 1981 weakfish became Delaware’s state fish because their population was large. A World Championship Weakfish Tournament was held by the Greater Milford Chamber of Commerce – but between 1982 to 1990 the population declined by 84% and between 1998 to 2008 declined another 99%.<sup>43</sup> In 2006 the cause suggested for the decline was natural mortality and predation and not overfishing. Predator populations such as dolphins, striped bass, sharks, rockfish, and flounder, increased during the 2000s. Despite restrictions and harvest limits the population is considered depleted since 2003 and has not rebounded. Only smaller (juvenile) fish have been caught.

Oysters as a resource have a challenging history in the Delaware Bay and various multi-state efforts have addressed population decline. Oysters were once plentiful in the Delaware Bay but over-harvesting and parasites have decimated the populations in the 20th century.<sup>44</sup> The New Jersey (NJ) Legislature established a Task Force by Joint Resolution in 1996. This Task Force looked at oyster challenges and made recommendations in a detailed 1999 report. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Marine Fisheries Administration, and Bureau of Shellfisheries developed a Shellfish Mitigation Account Shellfish Enhancement Program.<sup>45</sup> In 2016 a Memorandum of Understanding established a process to disburse money from the shellfish habitat mitigation fund in New Jersey. Activities that are part of shellfish mitigation were planned for 2017-2022. The NJ Marine Fisheries Administration (MFA) worked with an industry, university, state, and federal group that was formed in 2001 called the Oyster Industry Revitalization Working Group. This group helped direct \$5 million in federal commitments from the Water Resources Reform Development Act. Currently, efforts for restoration are challenging due to concerns about how restored reefs with the non-wild stock impact the natural stock, among other scientific questions that remain about restoration.

### 2.3.2 Beach Condition and Wetland Loss

Beach detritus and erosion negatively impact visitation to Slaughter Beach. Hurricanes and nor’easters erode dunes and dune grasses that Slaughter Beach relies upon for storm protection and public recreational beaches. Once the dunes are breached some houses and roads are more susceptible to flooding. Some residents worry that detritus accumulation could impact HSC populations and beach

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<sup>41</sup> Neilan, B. 2015. Studying the Delaware Bay 2014 Report. (<https://www.nj.gov/dep/fgw/artdelbaystudy14.htm>)

<sup>42</sup> Pyle, J. 2019. Studying the Delaware River - 2018 Report. (<https://nj.gov/dep/fgw/artdelstudy19.htm>)

<sup>43</sup> Delaware Public Media. November 20, 2015. Where did all the weakfish go?

(<https://www.delawarepublic.org/science-health-tech/2015-11-20/where-did-all-the-weakfish-go>)

<sup>44</sup> Morgan, M. Nov 6, 2021. When oyster boats blanketed Delaware Bay: History Special to Salisbury Daily Times. Delmarva now. (<https://www.delmarvanow.com/story/news/local/delaware/2021/11/06/when-oyster-boats-blanketed-delaware-bay-history/6270177001/>)

<sup>45</sup> NJ Department of Environmental Protection. Shellfish Mitigation Account Shellfish Enhancement Program. (<https://www.nj.gov/dep/opi/assets/final-for-web-shellfish-mitigation-account-mou-five-year-plan.pdf>)

visitation. Since 1958 Slaughter Beach has been replenished 11 times with approximately 921,000 cubic yards of sand.<sup>46</sup> With sea level rise and increasing storm frequency, Slaughter Beach will continue to experience changes in beach conditions each year.

Wetlands currently make up 25% of the Mispillion and Cedar Creek Watersheds but they are threatened by sea level rise, climate change, and development. The wetlands east of Route 1 are tidal with the wetlands west of Route 1 non-tidal.<sup>47</sup> All tidal wetlands are protected under Delaware Law and most freshwater wetlands are protected under the federal Clean Water Act. At least 19% of the original wetlands in this watershed have been lost since the 1700s due to development and the conversion of land for agricultural use, and the State of Delaware gives tidal wetland health a “C” grade. The challenges with wetland loss include:

- increased inundation and erosion
- increased tidal surges
- increased severity of flooding from severe weather events
- accelerated saltwater contamination of groundwater and surface water supplies
- elevated water tables
- loss of critical habitats along the shore
- loss of biodiversity

Box 3. Beaches and dunes are naturally occurring land features that require sufficient wave energy to create them and, in turn, provide an extremely effective barrier against destructive wave energy to all that lies landward of them. The vast wetlands of the estuary can endure tidal flooding from coastal storms as they are adapted for that expected elevated level of salt water, but direct wave attack cuts wetlands’ lives very short. The beach/dune/wetland landscape is a system that humans have prospered from for thousands of years and whose values are at the heart of this strategy. Preservation, protection, and restoration of bay-fronting dunes and beaches, that act as shock absorbers from coastal storm tides and waves, is important to the communities that have bay frontage.

A recent study by the U.S. EPA provides projections of marsh loss through modeled simulations of sea level rise.<sup>48</sup> The model showed that the Mispillion region will experience a loss of high marsh acreage by late century.

The high marsh habitats are projected to be lost at a faster rate than low marsh habitats, largely because high marshes are assumed to have lower accretion rates (since they are inundated less and collect less sediment). Additionally, high marsh plants (*Spartina patens*, *Distichlis spicata*) are less tolerant of changes to inundation frequency compared to the low marsh dominant, *Spartina alterniflora* which suggests that high marshes will likely be disproportionately impacted by more frequent inundation compared to low marsh habitats. The Broadkill and Mispillion sites in DE are projected to experience the highest percentage loss of high marsh acreage by 2025 (around 10%), likely due in part to low elevations (on average, the elevation of high marsh habitats at these two sites is lower than at other sites).

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<sup>46</sup> American Shore and Beach Preservation Association. National Beach Nourishment Database. (<https://gim2.aptim.com/ASBPANationwideRenourishment/>)

<sup>47</sup> DNREC 2016 Mispillion Watershed Wetland Health Report Card.

<https://documents.dnrec.delaware.gov/Admin/DelawareWetlands/Documents/MispillionWetlandReportCard.pdf>

<sup>48</sup> U.S. EPA. Application of the Sea-Level Affecting Marshes Model (SLAMM) to the Lower Delaware Bay, with a Focus on Salt Marsh Habitat. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-18/385, 2019.

The report noted that the Mispillion is difficult to accurately model because of the dune replenishment and alterations of the coast along the Bay. The restoration project at Prime Hook National Wildlife Refuge has also altered the hydrology and the marsh areas behind the barrier/dunes have subsided due to the management of the impoundments. Man-made landforms like dikes or ditches are difficult for the mapping to detect and may not be accounted for in GIS layers. The report also noted that the man-made alterations contribute to the loss of wetlands, most prominently the conversion of marsh to agriculture, mosquito control ditching, incremental filling, and, hydrological alteration such as dredging nutrient enrichment and spread of invasive species. In the Delaware Estuary, known sources of disturbance include the conversion of wetlands to agricultural and other land uses, mosquito control ditching, incremental filling, hydrological alterations such as dredging, nutrient enrichment, and the spread of invasive species.<sup>49</sup>

## Chapter 3 Asset-based Ecotourism

### 3.1 Identify Partnerships, Resources, and Assets

Ecotourism assets include built, natural, and human resources. Table 4 shows the partners and resources that have been identified and activated as part of this project. The network built by this project through WIIN is an asset to the community and helps support the future implementation of projects. The partnerships help engage state and federal resources for collaboration and funding

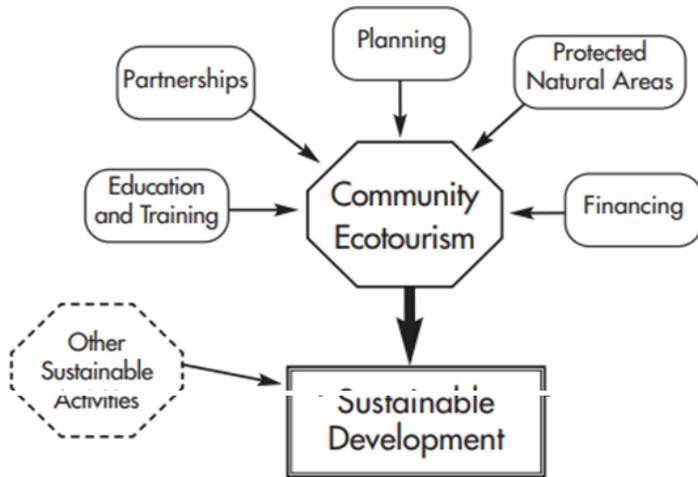
**Table 4 Mispillion and Cedar Creek Watershed Human Assets, Resources, and Potential Funding Partnerships**

<b>Partnerships, Planning, and Protection</b>	<b>Assets and Resources</b>	<b>Funding Partners</b>
Political and Human	WIIN Partners – represent partners in planning, conservation, funding and finance, education, and training	DNS, TNC, Milford Parks
Built infrastructure	Boat and fishing docks, hiking trails, Riverwalk, birding boardwalks	DELDOT, DNREC
Natural infrastructure	Marshes, Mispillion River and Cedar Creek, Slaughter Beach	DNREC, NWF, NFWF, USACE
Cultural or Social Organizations	Milford Historic Society	DELDOT
Local Economy	Downtown Milford, recreational/outdoor business, tour guides, Kent and Sussex Tourism	Offices of Tourism

<sup>49</sup> Haaf, L., Moody, J., Reilly, E., Padeletti, A., Maxwell-Doyle, M., and Kreeger, D. 2015. Factors Governing the Vulnerability of Coastal Marsh Platforms to Sea Level Rise. Partnership for the Delaware Estuary and Barnegat Bay Partnership. PDE Report No. 15-08, 13 p. Haaf, L., Kreeger, D., and Homsey, A. 2017. Chapter 5.2 -Intertidal Wetlands. In: Technical Report for the Delaware Estuary and Basin. Partnership for the Delaware Estuary. PDE Report No. 17-07, pp. 177-193. United States Environmental Protection Agency (USEPA). 2015. Coastal Wetlands Initiative: Mid-Atlantic Review. Available on line <https://www.epa.gov/sites/production/files/2015-04/documents/midatlantic-review.pdf>.

opportunities within their communities. Outdoor activities support local communities through jobs that may also bring new education, programming, and training programs. The tourism industry is integral to supporting outdoor recreation and tourism and in Drumm et al (2005) the essential contributions the tourism industry could provide include:

1. Providing information about the potential market for ecotourism activities.
2. Providing advice concerning visitor preferences in terms of attractions, accommodations, food and transportation services.
3. Marketing an ecotourism activity or program.
4. Providing one or more of the services needed to facilitate visitor access to and appreciation of the ecotourism site.
5. Providing training for local guides and entrepreneurs.
6. Investing in an ecotourism operation. The investment will likely be contingent upon an expectation of a certain level of financial return.
7. Operating an ecotourism operation such as an ecolodge. Within a protected area situation, these operators would be considered concessionaires. As such, they would be subject to strict guidelines covering everything from the energy sources used to the number of guests they may handle at one time to the utilization of local supplies and labor. They would also be required to pay a concession fee to the protected area administration.



**Figure 9 shows the essential elements of community-based ecotourism. The development of this ecotourism and resilience investment strategy involved interviewing many partners to identify options.**

Existing guided birding tours such as the Delmarva Birding Weekends (<https://delmarvabirding.com/>) are an example of ecotourism in southern Delaware. The tours incorporate local businesses and brands to bring birders to the Delmarva peninsula. Several times a year, planned trips are marketed and participants register to visit birding hotspots. For example, the Winter Delmarva Dogfish BirdINNG Weekend in March includes the opportunity to stay at the locally owned Dogfish Inn in downtown Lewes, within walking distance from downtown shops and restaurants. The trips are sponsored by local businesses such as hotels, county tourism offices, bird supply stores, nonprofits, and real-estate services.

A marketing and branding component of this project was prepared separately by Ben Muldrow of Arnett and Muldrow Associates. This effort provides the towns and tourism offices in Delaware and other states with the tools to promote the Mispillion and Cedar Creek Watershed as a destination and it has been aligned with this strategy to ensure it supports the goals of WIIN. The “Branding Toolkit” (BrandTouch Manual) contains a style guide, all logo resources, 167 different logo files saved in 5

different file formats, fonts and implementation guides. The toolkit provides the communities with a way to attract future investors and resources to the area. The area lacked a clear identity as a destination with resources that are valuable to protect and discover. The marketing and branding tools can help generate public interest too, which helps support investor interest. The BrandTouch Manual is provided as an Appendix to this report.

### 3.2 Economic Benefit Indicators to Track and Capitalize with Investments

The University of Maryland Environmental Finance Center report titled, “Community-Centered Natural Resource Benefits: Mispillion Watershed, Delaware” (2022) identified specific benefit indicators to help guide investments. These indicators can be tracked to document the economic impacts that ecotourism and conservation investments may provide.

#### Economic Benefit Indicators

- Recreation Value (hiking, biking, kayaking) - Tracking number of visitors
- Expansion or enhancement of park space and programs for outdoor leisure activity – Number of activities and participants (picnicking/sightseeing)
- Number of cultural programs and opportunities to experience the shipping history
- Flood cost reduction of wetland preservation or restoration
- Shorebird viewing access points and car or visitor counts

#### Outdoor, Coastal, and Marine economic impact

- Number of businesses
- Number of employees
- Estimated expenditures

#### **Example and Brief Look at Economic Impact vs. Benefit Values of Ecotourism**

The indicators above are used to track and quantify economic values. To show the benefits of an investment in ecotourism or the preservation of resources for ecotourism, these and other indicators should be tracked. Economic Impact includes tracking the last three bullets and potentially conducting an economic impact analysis of ecotourism. Data on recreation, entertainment, and retail businesses as well as accommodations and food services that support the tourism industry are available through certain companies such as ESRI Business Analyst. To produce all the elements of Economic Impact analysis, the direct, indirect, and induced impacts should be reported. One example of an ecotourism impact analysis is in the Middle Peninsula Region of Virginia; Figure 10 shows the types of businesses

associated with the study.<sup>50</sup> Over five years, ecotourism business sales grew 13.5% and provided \$33.1 million in annual impact, 442 jobs, 50 + businesses, and \$1.6 million in state and local tax revenues.

Benefit values are obtained by tracking the number of visitors to a resource or asset and their purpose



for visiting. Benefits transfer can then be used to determine the value of this visitation. Delaware Nature Society has set up ways to track visitors to Abbott’s Mill Nature Center (car counter in the parking area), and Marvel Saltmarsh Boardwalk (foot counter). The DuPont Nature Center tracks visitors (national and international) in a visitor’s log. The City of Milford tracks attendance at specific events held in the City and along the Riverwalk. Ways to track the benefits of

investments made under this strategy are suggested in the next chapter.

## Chapter 4 Portfolio of Ideas and Opportunities for Investment

These watersheds are so critical to the ecology, economy, and way of life that we must conserve and maintain them into the future. Threats are emerging - like flooding - that require resilience to be at the center of an investment strategy. Ecotourism is one set of investments that promote resilience and conservation along with other goals. And other investments besides ecotourism are also needed. Ecotourism has become an important economic activity in natural areas around the world. It provides opportunities for visitors to experience powerful manifestations of nature and culture and to learn about the importance of biodiversity conservation and local cultures. At the same time, ecotourism generates income for conservation and economic benefits for communities living in rural and remote areas. The attributes of ecotourism make it a valuable tool for conservation. Its implementation can:

- give economic value to ecosystem services that protected areas provide;
- generate direct income for the conservation of protected areas;
- generate direct and indirect income for local stakeholders, creating incentives for conservation in local communities;
- build constituencies for conservation locally, nationally, and internationally;
- promote sustainable use of natural resources; and
- reduce threats to biodiversity and community resilience.

Some areas have greater potential for realizing the benefits of ecotourism than others. In areas with low visitation, the potential is not usually clear. In others, tourism may already be an important factor. In both cases, the ecotourism planning process is critical to achieving ecotourism’s potential as a powerful conservation strategy.

Many ideas and opportunities for advancing ecotourism and/or resiliency in the Mispillion and Cedar Creek Watershed have been identified over the course of this project through interviews, focus groups,

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<sup>50</sup> VA DEQ Economic Impact of Ecotourism, Middle Peninsula Region, Virginia.  
(<https://www.deq.virginia.gov/home/showpublisheddocument/9751/637599636517470000>)

and existing studies and reports. These ideas can be evaluated for investment purposes according to how well they support key themes that stakeholders have identified as important to the region, described below.

#### 4.1 Community-identified Themes

Five themes that emerged as part of the project's extensive stakeholder outreach efforts include: 1) connectivity; 2) access and safety of access; 3) sense of place; 4) capacity; and 5) resilience and sustainability. These themes are expanded upon in this report with suggestions on specific types of projects for the communities to consider. These opportunities were identified in interviews, stakeholder and partner meetings, and focus groups.

- 1) Connectivity – expanding and linking community assets such as existing greenways and bike paths, as well as helping people go from one place to another. In Slaughter Beach, this was also expressed through a desire to encourage linkages between Milford and Slaughter Beach and to foster an understanding of the value of the natural environment.
  - Extend the Riverwalk through the Shipyard
  - Expand bike loops around Milford that connect to natural amenities, Riverwalk
  - Install signage that supports wayfinding
  - Improve integration with the Byways
  - Promote interdependence between Slaughter and Milford – beach and commerce
- 2) Access and Safety of Access – promoting ways that people can safely access and enjoy natural amenities such as the Mispillion River and in Slaughter Beach.
  - Expand bike paths between Slaughter Beach and Milford
  - Create access for a kayak/non-motorized boat launch midway along the Mispillion River
  - Install more public restrooms along the Riverwalk and at the north end of Slaughter Beach
  - Include information/signage about tides and currents
  - Install more platforms for birding, fishing, watching sunsets
  - Open a four-season rest stop for bikers and tourists passing through Slaughter Beach (potentially tie to a bait shop, little market, or café)
- 3) Sense of Place – fostering the identity of the community through its “brand” and attractions as a way to promote investment in the community
  - Invest in the arts, such as a sculpture garden on the Riverwalk
  - Bolster the city's connection to its shipbuilding and maritime heritage
  - Install signage and visual markers that draw people to the area and explain the history and natural resources
  - Promote the beautification of Milford
  - Tell the story of the marsh as nature's nursery with 4 distinct seasons
  - Represent Cedar Creek as one of the last pristine saltwater marshes in the country
- 4) Capacity – bolstering the number and breadth of civic resources that could support the investments identified in this report.
  - Reimage the old police station into a resource center/home for civic groups
  - Cover the amphitheater at the library to expand outdoor programming
  - Encourage more volunteerism in Milford (build on citizen science and HSC survey work)

- Promote more collaboration at the civic level – such as through the creation of a Milford arts council, tourism office, or cultural council that blends heritage and the arts
  - Develop marketing, and discovery tours
  - Attract more state and federal resources to the area
- 5) Resilience and Sustainability – improve the community’s ability to adapt to climate change and land use development by reducing exposure and vulnerability to flooding and sea level rise as well as maintaining the health and quality of the natural environment for future generations.
- Invest in resilient design practices that integrate green infrastructure such as living shorelines, rain gardens, wildflower gardens, and other measures into the urban setting
  - Adopt higher standards for floodplain management
  - Promote conservation and preservation projects and land use tools (buffers and easements) that reduce pollution, improve water quality, and protect habitats and biodiversity
  - Invest in ongoing shoreline management strategies including beach nourishment
  - Participate in dialogue with state and federal officials about the deteriorating condition of the jetty where the Mispillion River meets the Bay and the erosion just north of it – to examine impacts to the future resilience of the watershed and what to do about it
  - Identify segments of roadways to elevate, such as Rt 36 east of Milford

#### 4.2 Community-identified Opportunities

The tables below identify opportunities discussed in multiple WIIN meetings, focus groups with stakeholders, or individual interviews with resource managers at DNREC. The tables below are categorized by jurisdiction – Milford, Slaughter Beach, or watershed-wide. Watershed-wide opportunities may necessitate coordination among the towns, counties, and state. The resilience theme, specific opportunities, next steps, and funding opportunities are listed.

##### City of Milford

Table 5 City of Milford Opportunities for Potential Ecotourism and Resilience Investment.

Primary Community Resilience Theme	Opportunity and Site Location(s) if Known	Contact(s)/Next Steps	Funding Opportunities
Connectivity	Expand the Milford Riverwalk greenway to the south bank of the Mispillion River	Michael Tholstrup Outdoor Recreation Planner DNREC, Division of Parks & Recreation Phone: (302) 739-9215 Email: Michael.Tholstrup@delaware.gov	<a href="#">Outdoor Recreation, Parks &amp; Trails Program</a>

Connectivity	Establish a downtown Milford kayak and bike rental startup for outdoor recreation gear	Ben Muldrow	<a href="#">Encouraging Development, Growth &amp; Expansion</a>
Access and Safety of Access	Evaluate access to boat/fishing pier access - near Goat Island	Coordination with Milford and DNREC	
Sense of Place	Repurpose the Shipyard to honor the historical and cultural legacy of Milford while promoting redevelopment	Mayor Campbell, Brad Dennehy, Sara Bluhm, Nicole Rogers, State Historic Preservation	<a href="#">Preservation Delaware</a>
Resilience and Sustainability	Explore the installation of Living Shorelines at the mouth of Cedar Creek	Living Shoreline Committee Danielle Kreeger at 302-655-4990 or Alison Rogerson at 302-739-9939 <a href="http://de.gov/livingshorelines">http://de.gov/livingshorelines</a> ites	<a href="#">Living Shoreline Resources</a>
Resilience and Sustainability	Consider installation of a Living Shoreline along Bicentennial Park	Living Shoreline Committee Danielle Kreeger at 302-655-4990 or Alison Rogerson at 302-739-9939 <a href="http://de.gov/livingshorelines">http://de.gov/livingshorelines</a> ites	<a href="#">Living Shoreline Resources</a>
Sense of Place	Add a cover to the Amphitheater at Bicentennial Park to encourage year-round events	Sara Bluhm	Milford City Budget

Capacity	Repurpose the old Police Station as a hub for recreation and ecotourism	Jen Adkins, Brad Dennehy, Sara Bluhm and other partners. Potential funding sources can fund capacity.	<a href="#">Resilient Communities Program</a>
Resilience and Sustainability	Install a Living Shoreline behind Goat Island	Living Shoreline Committee Danielle Kreeger at 302-655-4990 or Alison Rogerson at 302-739-9939	<a href="#">Living Shoreline Resources</a>
Capacity	Increase support for Abbott's Mill's educational programming and outreach	Jen Adkins, Brad Dennehy, Sara Bluhm and other partners. Potential funding sources can fund capacity.	<a href="#">Resilient Communities Program</a>
Connectivity	Support Abbott's Mill - Property Master Plan	Jen Adkins, Brad Dennehy, Sara Bluhm and other partners. Potential funding sources can fund capacity.	<a href="#">Resilient Communities Program</a>
Resilience and Sustainability	Promote flood risk education, integration of climate change into planning, and business continuity planning to the Milford and Slaughter Beach business community to support flood readiness and recovery	Delaware Tourism Resilience; FEMA, Sea Grant	FEMA's hazard mitigation
Access and Safety of Access	Improve running and bike safety in towns	John T. Fiori - Bicycle Coordinator (302)760-2260 John.Fiori@delaware.gov	<a href="#">DelDOT Transportation Alternatives Program - TAP</a>

Connectivity	Expand Milford Wellness Village’s nature programming to connect clients to nature and the Mispillion River	Lon Kieffer, Executive Director Milford Wellness Village lkieffer@milfordwellnessvillage.com (302) 462-6748	<a href="#">Robert Wood Johnson Foundation</a>
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Town of Slaughter Beach  
Table 6 Town of Slaughter Beach Opportunities for Potential Ecotourism and Resilience Investment

Primary Community Resilience Theme	Opportunity and Site Location(s) if Known	Contact(s)/Next Steps	Funding Opportunities
Capacity	Establish a Seasonal Market with limited goods (refreshments, sunblock, hats, bait) for day travelers visiting Slaughter Beach	Julia Geha and Ben Muldrow	<a href="#">Encouraging Development, Growth &amp; Expansion</a>
Access and Safety of Access	Expand Beach access points	Jesse Hayden DNREC Shoreline Management Jesse.Hayden@delaware.gov	
Access and Safety of Access	Evaluate the addition of bathrooms and parking in a location near the north side of town	Bob Wood and Julia Geha to assess the needs	<a href="#">Outdoor Recreation, Parks &amp; Trails Program</a>

Connectivity	Establish dedicated bike path - Slaughter Beach Road (currently one stretch by the town is missing a dedicated bike path)	John T. Fiori - Bicycle Coordinator (302)760-2260 John.Fiori@delaware.gov	<a href="#">DeIDOT Transportation Alternatives Program - TAP</a>
Resilience and Sustainability	Evaluate Jetty repair - Slaughter Beach Jetty – to address a potential breach	Tony Pratt – Town of Slaughter Consultant	USACE
Capacity	Increase support (staff) for DuPont Nature Center and evaluate ways to improve safety of access road	DNREC Division of Fish and Wildlife / DeIDOT	<a href="#">Resilient Communities Program</a>
Resilience and Sustainability	Improve drainage/raise roads to reduce flooding on roads going into Slaughter Beach	DeIDOT	Hazard Mitigation Grant
Resilience and Sustainability	Remove detritus - Slaughter Beach, north end	Tom Barry Management and Program Analyst Phone: (240) 533-0425 Email: tom.barry@noaa.gov	<a href="#">Community-Based Marine Debris Removal Grant Program</a>
Access and Safety of Access	Maintain the Marvel Saltmarsh Preserve Boardwalk and track visitation	DNS	
Resilience and Sustainability	Promote flood preparedness education to residents and visitors	Julia Geha Slaughter Beach Manager and Bob Wood Mayor of Slaughter Beach	<a href="#">Delaware Flood Ready Communities Plan and Policy Checklist</a>
Access and Safety of Access	Dredge the Mispillion River	Bob Wood – Mayor of Slaughter Beach	USACE

Resilience and Sustainability	Establish/expand waterways buffers and efforts to preserve marshes given sea level rise and saltwater intrusion	DNREC, The Nature Conservancy	Open space Preservation Funds, Delaware Guidelines to Evaluate Land for Preservation
Resilience and Sustainability	Install Oyster set tank on private land	Town of Slaughter and private land owner	NOAA, Sea Grant

Watershed-Wide

Table 7 Watershed-Wide Opportunities for Potential Ecotourism and Resilience Investment

Primary Community Resilience Theme	Opportunity and Site Location(s) if Known	Contact(s)/Next Steps	Funding Opportunities
Access and Safety of Access	Establish kayak access point on Mispillion River outside of Milford on the way to Slaughter Beach	DNREC Division of Fish and Wildlife	<a href="#">The Delaware Bayshore Initiative</a>
Connectivity	Form committee to explore Blueway/National Water Trail designation for the Mispillion River	DelDOT Kelly Valencik DelDOT Byway Program Coordinator 302.760.2254 kelly.valencik@delaware.gov	<a href="#">National Water Trail application</a>
Access and Safety of Access	Evaluate formal camping (potentially private) incentives, to alleviate informal camping pressure during high season	Julia Geha and Bob Wood	

Access and Safety of Access	Explore non-motorized boat access points along the Mispillion east of Milford	DNREC Division of Fish and Wildlife	
Access and Safety of Access	Improve bike safety - various locations	John T. Fiori - Bicycle Coordinator (302)760-2260 John.Fiori@delaware.gov	<a href="#">DelDOT Transportation Alternatives Program - TAP</a>
Connectivity	Install wayfinding signage - various locations	Ben Muldrow	<a href="#">DelDOT Transportation Alternatives Program - TAP</a>
Resilience and Sustainability	Develop a <a href="#">Special Area Management Plan for the Mispillion and Cedar Creek watersheds</a>	State Lands & Wetland Migration Planning (DNREC), The Nature Conservancy	Open space Preservation Funds, Delaware Guidelines to Evaluate Land for Preservation
Sense of Place	Encourage cultural and ecological Bus Tours - Milford to Slaughter Beach and vice versa	<a href="#">Coordination and marketing with Delmarva Discovery Tours</a> <a href="https://www.delmarvadiscoverytours.com/">https://www.delmarvadiscoverytours.com/</a>	

4.3 Investment Matrix

An [investment matrix was developed to summarize and categorize the different components that characterize the opportunities](#). The matrix contains the information within the tables in section 4.2 Community-identified Opportunities and contains additional information explained below.

The Community, Primary Community Resilience Theme, Opportunity, Next Steps, and Potential Funding source are within the matrix. The additional information in the matrix includes Status, Project Type, Category, Location, Flood Vulnerability, Tracking Economic Benefit Value or Impact, and Complementary Projects. Each is described below.

**Status**

The opportunity is classified as either *existing* or *new*. This is to identify opportunities that build on the existing assets or infrastructure currently in place.

**Project Type**

*Open Space Preservation and Enhancement*

Delaware guidelines to evaluate land for preservation and protection shows how parcels are selected for state funds. Open space preservation in this strategy protects assets and improves resilience by allowing wetlands room to naturally migrate with the advent of sea level rise and provide additional buffering between the natural and built environment. Opportunities identified are wetlands and marsh migration strategies in coordination with DNREC. Dune replenishment is another opportunity to provide storm protection for marsh and open lands in specific areas.

#### *Recreational Access*

Recreational access projects may be new or recommended to build on existing assets that need *improvement or expansion to provide public recreation opportunities.*

#### *Resource Restoration and Protection*

The natural resources of this watershed contribute many benefits to Milford, Slaughter Beach, and the state. Protecting these resources is vital not only for the benefit of future generations and biodiversity but for community resilience and economic objectives. Therefore, it is central to this investment strategy. Projects in this category particularly focus on living resources (like oysters) or habitats that may be in non-profit or public *ownership.*

#### *Cultural Tourism*

Cultural tourism presents win-win opportunities to generate new forms of visitation and spending within the region but also reinforces the identity and branding of the towns and watershed. Connecting Milford's shipbuilding history with the Delaware Bay resources (oysters) through educational tours and cultural events is one example of increasing visitation and interest in Milford's downtown area.

#### *Educational Programming*

Delaware Nature Society (DNS) provides robust programs for its members and communities throughout Delaware. They are a leader in connecting humans with nature. Data DNS supplied was used to value several of the natural assets and that data is vital to track the benefits of investments like wildlife viewing boardwalks and recreational uses. Educational programming can stem from many opportunities. For example, they could be a strong partner to repurpose the police station to make it an eco-tourism hub, or educational center with information about nature in Milford and the watershed. Continued support for their existing operations is vital and building membership, outreach, and increasing funding for programs and capacity. This is necessary for DNS to continue to provide services including trail and boardwalk maintenance and habitat management.

#### *Infrastructure Support and Upgrades*

Infrastructure support or upgrades refer to opportunities that support visitor experience or improve safety and access to experiences. Examples include a market with limited goods for day travelers in Slaughter Beach, improving increasing, or stabilizing beach access points, adding drainage and/or raising roads/berms to reduce flooding on roads into Slaughter Beach, and dredging the Mispillion for boat safety and access.

#### *Policy Updates*

Policy updates are specific to flood readiness and opportunities to help businesses and Milford thrive while acknowledging that the resource that makes the town special presents challenges. Flood readiness and ordinance review can help proactively plan for flooding. Slaughter Beach has a Coastal Vulnerability Assessment (2019) which detailed the steps the community can take to address flood hazards.

## **Category**

### *Capitalizing on an opportunity*

Capitalizing on an opportunity are projects that build on existing assets such as an amphitheater cover installation in Bicentennial Park to repurposing the police station to serve ecotourism and community development. The opportunities also include strengthening and supporting vital partners like DNS with Abbott's Mill – through additional educational programming and membership building and helping to develop an Abbott's Mill master plan that addresses capital needs and land management of the different properties by the mill.

In Slaughter Beach, there is an opportunity to support visitors and sustainably promote small businesses. For example, a seasonal small market or food truck with limited goods for day travelers could support visitation without creating a heavy footprint on the resources in town. Ensuring that current beach access points are adequate and well-maintained to serve residents and the public is also important to support visitation and ensure that foot traffic does not trample the dunes. Beach replenishment maintains the structure of dunes and the integrity of the beach so that it is not eroded, allowing continued use of the beach by the public and also protecting property from storm damage.

There are new opportunities to promote sustainable economic ventures that connect the communities through aquaculture and local food supply by installing oyster set tanks (remote setting) either on publicly accessible land or private land.<sup>51</sup> Oyster set tanks are used to grow spat on shells that can be used to restore the oyster beds in the Delaware Bay. Locating the tanks on public land offers a potential for educational programming that ties environmental education to heritage and culture, such as what is being done in the Chesapeake Bay.<sup>52</sup> Increasing oysters in the Delaware Bay through aquaculture also helps promote local economies and locally sourced food. Research in Delaware has shown that people are willing to pay more for oysters that are locally sourced.<sup>53</sup>

Delaware has various opportunities for aquaculture that differ by water body. The lease beds in the Delaware Bay are limited to on-bottom culture and harvest. The majority of Delaware Bay lessees mostly rely on natural production and recruitment, although a few of the lessees have augmented

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<sup>51</sup> Commercial oyster fishing dates back to the nineteenth century and helped form an important economic and social component to the fabric of Delaware. Today, commercial quotas represent small fractions of historical catches, demonstrating a unique opportunity to use innovative, applied technology (hatchery, remote setting) to enhance economic and learning opportunities, improving sustainability in coastal communities for all. Oysters can be grown using either cage culture for individual oysters or bottom culture creating large concentrations—or reefs—of harvestable oysters. Remote setting uses oyster larvae to jump start the creation of an oyster reef in a relatively short time frame (about two weeks).

<sup>52</sup> NOAA Oysters in the Chesapeake Bay K-12 Science Module Development (<https://oceanservice.noaa.gov/education/oysters-in-the-chesapeake-bay/welcome.html>)

<sup>53</sup> Thomas, A. March 7, 2018. Marketing Oysters <https://projectwicced.org/2018/03/07/marketing-oysters/>

natural recruitment with planted shells and spat on the shell (DNREC Division of Fish and Wildlife, comment 2.14.23). Restaurants in Delaware have reported a lack of supply of locally grown oysters. Improvements in supply can enhance economic growth and provide new training for jobs (via increased aquaculture opportunities) in Delaware's coastal towns.

Although there are still scientific concerns about how to restore oyster reefs, they were once an important part Bay habitat and good water quality. Currently, there are areas where oyster harvesting is restricted due to water quality impairments. One of the opportunities for expanding oyster restoration and commercial aquaculture in Delaware may be in Slaughter Beach, oyster set tanks are necessary to grow supply for placement in the Delaware Bay, for both lease beds and restoration of reefs.

In the future, as Delaware-grown oysters see progress, there is an opportunity to develop an "Oyster Trail" that connects restaurants and the local community to their source of food and its importance to the area. For example, the North Carolina Oyster Trail offers visitors and residents the opportunity to discover and eat local oysters or tour operations at a shellfish farm. There are also associated educational programs and volunteer opportunities to learn about how to protect and support oysters and the industry.<sup>54</sup>

An opportunity to explore designating the Mispillion River as a Blueway or National Water Trail could increase potential funding and recognition for recreational uses. A new designation would take the work of a committee to gather information to support an application. Protecting the Horseshoe Crab Sanctuary in Slaughter Beach could be a major focus of such an initiative.

A National Blueway includes the entire river from "source to sea" as well as the river's watershed.

A National Blueway designation doesn't establish any new protections for the watersheds in question, but it does open the door to some federal support for existing and/or new local and regional conservation, recreation, and restoration projects. ...and also helps with improving coordination between local/regional planning entities and federal agencies such as the U.S. Army Corps of Engineers. The designation should also mean more funding for trail building and forest restoration projects.<sup>55</sup>

Visitors have come to camp in Slaughter Beach during times when there are events such as the shorebird migration season in May. Increasing opportunities to camp or a partnership with existing camping businesses could fill this need and help alleviate any concerns of campers on private land.

#### *Addressing a threat*

Areas that are prone to flooding or erosion can be protected by natural infrastructure such as living shorelines, riparian buffers, or open spaces. Living shorelines can be constructed in certain areas along the banks of the Mispillion to stabilize the shoreline and build habitat. Protecting the hydrodynamic and ecological function of the watershed is paramount as well as protecting the Mispillion Harbor. The jetty supports the harbor where shorebirds and other wildlife live, where HSC spawn and visitors view the

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<sup>54</sup> Virginia Oyster Trail. (<https://virginiaoystertrail.com/>)

<sup>55</sup> Scheer, R and Moss, D. 2012. What is a national Blueway? The Environmental Magazine. (<https://emagazine.com/what-is-a-national-blueway/>)

shorebird migration each year. Other hazards identified as part of the community focus groups included road safety for cyclists and improving drainage in and around Slaughter Beach.

### *Infrastructure need*

The infrastructure opportunities for ecotourism can be policy-oriented like helping businesses with flood protection or providing structures like new or expanded bathroom facilities as needed. The infrastructure needs listed in the strategy describe the physical construction or maintenance needs of existing structures like the Marvel Boardwalk, dredging the Mispillion for boat safety, providing new access to the Mispillion, and installing new wayfinding signs as recommended by the marketing plan developed by Arnett Muldrow.

### *Programming*

Linking adults and children with outdoor activity and nature usually are enhanced by having structured programming. Delaware Nature Society and the Town of Milford Parks and Recreation both provide these types of activities. As DNS develops new plans for outreach, membership building comes from offering community events and programs. Partnerships with the Town have occurred in the past, and new staff at Abbots Mill will help facilitate future opportunities.

### **Location**

Potential location for the project based on preliminary evaluation by PDE for living shorelines. Other locations are based on interviews and focus group discussions about potential locations for projects.

### **Flood Vulnerability**

Flood vulnerability is based on the PDE assessment. The vulnerability is related to flood hazard and inundation potential of areas currently and in the future. The project locations can be assessed based on the potential for flooding.

### **Tracking Economic Benefit Value or Impact**

The economic benefit values and impact of projects are important to identify, describe and report as part of the implementation and applying for funding. The second tab in the Investment Strategy Matrix includes benefit and cost tracking examples from the report prepared by UMD Environmental Finance Center (2021) titled Community-centered Natural Resource Benefits: Mispillion Watershed, Delaware. These categories of Benefit Values, Assets, Benefit Indicators, Benefit Metrics, Cost Estimates, Estimated Benefit Values, and Per unit benefit estimates can be used to describe the different investment opportunities and track their impact on the community over time. These types of narratives help funders understand what the project intends to provide for the community.

### **Contacts, Next Steps, and Funding Opportunities**

The contacts and next steps identify potential next points of contact for exploring the feasibility and gathering additional information for the implementation of the opportunity. These contacts are mostly partners that have been engaged in the project throughout the development of the investment strategy. Other points of contact were identified by interviewing DNREC or DeIDOT contacts and inquiring about the next steps (e.g., bikeways).

Many funding opportunities can be found on the searchable database provided by the University of [Delaware Database For Funding Resilient Communities](#). This searchable database helps find potential funding for multiple types of projects from disaster preparedness to wetland protection. Users can also look at funding by match the required, funding amount, or program type (grant, loan, or Technical Assistance). There are funding options listed in the matrix however there may be other funding that is more applicable as the opportunity is further developed.

### **Complementary Projects**

These projects are either in the planning stage or are occurring and are complementary to the vision and intent of this investment strategy.

## **Chapter 5 Summary**

The communities of Milford and Slaughter Beach are linked by the Mispillion River and share vulnerabilities to challenges like flooding and sea level rise. They also recognize the need to attract more economic investment to maintain thriving communities and to strengthen the resilience of the region's natural resources and communities to climate change. This strategy helps to identify opportunities to improve regional ecotourism while investing in the long-term resilience of natural resources. By providing new options to access nature, this strategy will enable more people to enjoy these unique resources and to better appreciate the region. It can also help support investment interest and the way of life for the communities of Milford and Slaughter Beach.

Classic economic development is traditionally a large-scale, "top-down" approach, endeavoring to recruit employers in industries such as manufacturing and technology, to relocate their businesses (and jobs) to a new state or community. Asset-based economic development is a "bottom-up", community-driven approach that focuses on utilizing existing assets in a community to positively impact its economy. This Ecotourism and Resilience Investment Strategy for the Mispillion and Cedar Creek Watersheds recognizes that the future resilience of the natural resources within the watersheds is critical to the overall ability of local communities to thrive, and vice versa. Our goal is to provide community-identified opportunities that build on the interdependency of existing human and natural resources. These human and natural resources, framed as "assets," help position the investments as integral to building the economic drivers around resilience and visitation that celebrates what makes the Mispillion and Cedar Creek Watersheds unique not only in Delaware but also in the region.

This strategy aims to catalyze action. Although some of the investment ideas do not have specifics yet, there are funding opportunities and partnerships outlined that can be explored as a next step for Milford and Slaughter Beach. Some opportunities are more "watershed-wide" and will take county, state, or possibly federal coordination. It is important to highlight the need for sustained capacity to manage existing natural and recreational assets (land management, trail maintenance) in light of increased use and climate change. Climate change stresses associated with temperature, invasives, and disease require more management of resources. Increased flooding and recreation use creates more stress on trail systems, boardwalks, and boat launches requiring greater investment.

This project has already spurred stronger coordination between Milford, Slaughter Beach, and partners. Several partners from this project have begun an application to DelDOT for funding a safe bike path between the communities. Slaughter Beach and the University of Delaware's Coastal Resilience Design

Studio are also partnering on a comprehensive resilience planning project. Altogether, this strategy provides the partners, background, vision, content, and marketing and branding support that is intended to quickly facilitate funding and the next steps for the opportunities identified.

To access the marketing and branding toolkit, click on this link:

**Mispillion and Cedar Creek BrandTouch™ Manual LINK**

<https://www.dropbox.com/s/npxjnk01znwe5d7/BrandTouch-Mispillion%20%26%20Cedar.pdf?dl=0>