

# Hurricane Matthew Resilient Redevelopment Plan

## Pender County



May 2017

Version 1.2



CAUTION CAUTION CAUTION CAUTION CAUTION

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## Change Log

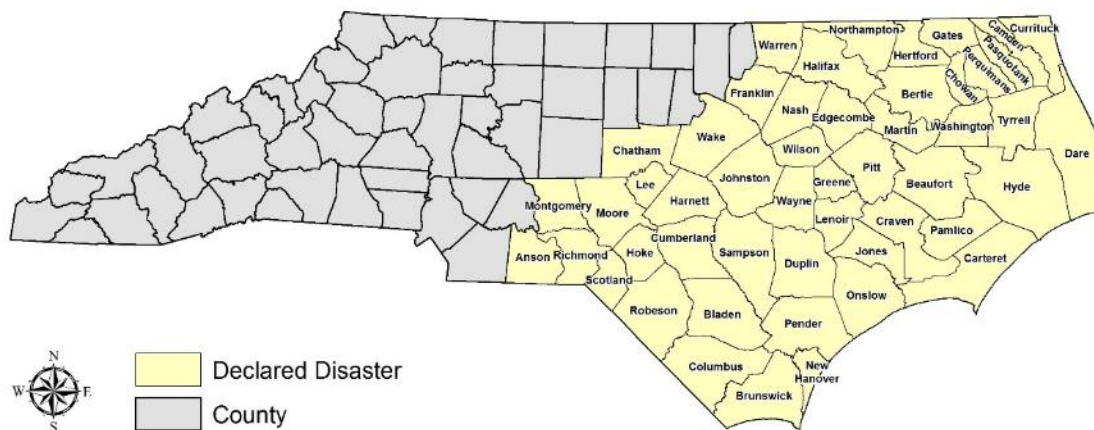
| Version | Date    | Summary of Changes                  |
|---------|---------|-------------------------------------|
| 1.1     | 6/19/17 | Minor Revisions                     |
| 1.2     | 8/25/17 | Labor and unemployment data updated |
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## Executive Summary

In October 2016, Hurricane Matthew caused widespread destruction in the Caribbean and up the Eastern Seaboard of the United States. In North Carolina, at least 26 people lost their lives, and 100,000 homes, businesses, and government buildings sustained damage estimated at \$4.8 billion.<sup>1</sup> At the storm's peak, 3,744 individuals fled to 109 shelters across the region. More than 800,000 households lost power and 635 roads were closed, including the major east-west and north-south corridors.

In December 2016, the North Carolina General Assembly established the North Carolina Resilient Redevelopment Planning (NCRRP) program as part of the 2016 Disaster Recovery Act (*Session Law 2016-124*). The purpose of the program is to provide a roadmap for community rebuilding and revitalization assistance for the communities that were damaged by the hurricane. The program empowers communities to prepare locally driven recovery plans to identify redevelopment strategies, innovative reconstruction projects, and other needed actions to allow each community not only to survive but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP consists of planning and implementation phases and is managed through North Carolina Emergency Management.



**Figure 1. NCRRP Counties**

This document is a snapshot of the current needs of the County regarding holistic recovery and redevelopment. The plan will evolve as the county analyzes the risk to its assets, identifies needs and opportunities, determines the potential costs and benefits of projects, and prioritizes projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Proposed projects or actions may be eligible for state or federal funding, or could be accomplished with municipal, nonprofit, or private investments. However, inclusion of a project or action in this plan does not guarantee that it will be eligible for recovery funding.

<sup>1</sup> State of North Carolina Supplemental Request for Federal Assistance Hurricane Matthew Recovery, <https://governor-new.s3.amazonaws.com/s3fs-public/documents/files/Hurricane%20Matthew%20Relief--2017%20Federal%20Request%20%28002%29.pdf>.

After multiple public meetings, Pender County has identified 17 projects in four pillars: Housing, Infrastructure, Economic Development, and Environmental. Details of these projects can be found in Section IV of this plan.

| Pillar               | Project/Action Count |
|----------------------|----------------------|
| Housing              | 6                    |
| Economic Development | 3                    |
| Infrastructure       | 5                    |
| Environment          | 3                    |
| <b>Grand Total</b>   | <b>17</b>            |

**Table 1. Pender County Summary of Projects by Pillar**



An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky brown color, submerging lawns, streets, and parts of the houses. Numerous trees are isolated in the water, some with only their tops visible. The houses are mostly two-story structures with light-colored siding and dark roofs. The flooding appears to be extensive, covering a large portion of the visible area.

# 1. Background

# 1. Background

## Summary of Hurricane Matthew Storm Damage

Hurricane Matthew was an extraordinarily severe and sustained event that brought record-level flooding to many areas in eastern North Carolina's coastal plain, sound, and coastal communities. Hurricane Matthew hit North Carolina on October 8, 2016, as a Category 1 storm. Communities were devastated by this slow-moving storm primarily by widespread rainfall. During a 36-hour period, up to 18 inches of heavy rainfall inundated areas in central and eastern North Carolina.

Riverine flooding began several days after Hurricane Matthew passed and lasted for more than 2 weeks. New rainfall records were set in 17 counties in the Tar, Cape Fear, Cashie, Lumber, and Neuse River watersheds. Entire towns were flooded as water levels throughout eastern North Carolina crested well beyond previously seen stages.

During the peak of the hurricane, 800,000 households lost power and 635 roads were closed, including a section of I-40 West in Johnston County that was closed for 7 days, and sections of I-95 North and South in Robeson and Cumberland Counties that were closed for 10 days.

Approximately 88,000 homes were damaged and 4,424 were completely destroyed. Losses totaled more than \$967 million, representing an economic loss as high as 68% of the damages, or \$659 million, not expected to be covered by insurance or FEMA assistance.

North Carolina Governor McCrory requested FEMA assistance on October 9, 2016, and FEMA subsequently declared a major disaster (DR-4285) for North Carolina on October 10, 2016, for 48 counties encompassing approximately 325 cities, towns, townships, and villages.

Preliminary estimates indicate more than 30,000 businesses suffered physical or economic damage, and 400,000 employees were affected as a result. Hurricane Matthew also had a significant impact on the agriculture and agribusiness economy in eastern North Carolina. The nearly 33,000 agricultural workers and 5,000 agricultural-support workers hit by the storm account for more than half of the state's agriculture and agriculture-support workforce.

Initial economic analysis of the impacts of crop and livestock losses caused by Hurricane Matthew estimated the loss of more than 1,200 jobs and roughly \$10 million in state and local income and sales tax revenue. <sup>2</sup>

## State / Legislative Response

North Carolina's response to Hurricane Matthew included 2,300 swift-water rescues using 79 boats and more than 90 air rescues. North Carolina also deployed over 1,000 National Guard and State Highway Patrol to assist with rescue and sheltering missions. There were 3,744 individuals transported to 109 shelters across central and eastern North Carolina during the storm's peak.

FEMA's disaster declaration made 50 counties eligible for FEMA assistance, 45 of which are eligible for Individual Assistance and Public Assistance and 5 of which are eligible for Public Assistance only.

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<sup>2</sup> *Governors McCrory's Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016*



- There were 81,832 individuals registered for FEMA/state assistance.
- Federal/state financial assistance in the amount of \$92.5 million was approved to help flood survivors recover.
- Small Business Administration (SBA) loans approved for individuals after Hurricane Matthew totaled \$65.6 million.
- SBA loans approved for businesses after Hurricane Matthew totaled \$23.2 million.

After the immediate response period, North Carolina Governor McCrory and the North Carolina General Assembly took the steps summarized below to obtain and allocate long-term funding for Hurricane Matthew.

**November 1:** The Hurricane Matthew Recovery Committee is established. Preliminary damage assessments are completed, and the State Emergency Response Task Force continues to administer programs and identify needs unmet by existing federal programs.

**November 14:** Governor McCrory formally submits North Carolina’s request for supplemental federal disaster assistance to the delegation as Congress returns to work.

**Late November/Early December:** Congress appropriates supplemental disaster assistance for North Carolina. After the supplemental federal disaster recovery assistance package is received, Governor McCrory submits a supplemental state disaster assistance package (House Bill 2) recommendations to the General Assembly and calls a special session. Governor McCrory then signs the Hurricane Matthew Recovery Act to fund disaster recovery efforts.

This supplemental federal assistance was to focus on housing, infrastructure, economic development, and the environment. These four pillars were to be funded through the following programs and agencies: The U.S. Department of Housing and Urban Development’s Community Development Block Grant–Disaster Recovery (CDBG-DR) program, Army Corps of Engineers Operations and Maintenance, the FEMA National Dam Safety Program, the Federal Highway Administration’s Emergency Highway Funding, and the U.S. Department of Agriculture’s Emergency Conservation and Watershed Protection programs.

### **Resilient Redevelopment Planning**

The purpose of the NCRRP program is to provide a roadmap for communities in eastern North Carolina to rebuild and revitalize after being damaged by Hurricane Matthew. The program empowers communities to prepare locally driven, resilient redevelopment plans to identify redevelopment strategies, innovative reconstruction projects, and other actions to allow each community not only to survive, but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP process employs a holistic approach to planning that includes four pillars: housing, infrastructure, economic development, and the environment. Redevelopment strategies and reconstruction projects for each of the four pillars is included in each plan.

The NCRRP process consists of planning and implementation phases and is managed through North Carolina Emergency Management (NCEM).

## Scope of the Plan

This document is a snapshot of the County's current needs for achieving holistic recovery and redevelopment. The plan will evolve as the County analyzes the risk to its assets, identifies needs and opportunities, determines the potential costs and benefits of projects, and prioritizes the projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

Planning objectives are to (1) develop strategic, resilient redevelopment plans and actions, and (2) to define any unmet funding needed to implement such actions after taking into account other funding sources.

The resulting resilient redevelopment plans will be the foundation for any supplemental funding received through Congress, the North Carolina General Assembly, and other funding sources. These plans will also be the basis for the state's Recovery Action Plan, which is required by the U.S. Department of Housing and Urban Development before the state can expend funds received from the CDBG-DR program.

## Local Participation and Public Engagement

Stakeholder engagement and public involvement was an essential component of the NCRRP initiative. Three robust rounds of discovery, analysis, collaboration, and interaction were held with each affected county. Each meeting had two components: an in-depth working session with county officials, subject matter experts, and planners from the affected counties and municipalities; and a public open house. The purpose of each meeting was as follows:

**Meeting 1** – Initiated the planning process and validated the existing data pertaining to damage and impacts.

**Meeting 2** – NCEM presented draft documentation of resilient redevelopment strategies and received feedback from community leaders and the public.

**Meeting 3** – NCEM presented refined resilient redevelopment strategies based on feedback from Meeting 2 and received additional feedback for finalization of the plan.

Each of the 50 counties that were declared a major disaster by the President of the United States as a result of Hurricane Matthew under the Stafford Act (P.L. 93-288) participated in the resilience redevelopment planning process. Each municipality in those counties, as well as the five economic development regions that sustained damage from Hurricane Matthew, were also invited to participate.

The counties impacted by the storm cover the eastern half of North Carolina and occupy parts of the piedmont, sand hills, and coastal areas of the state. A map depicting Pender County and surrounding counties is shown on the following page.

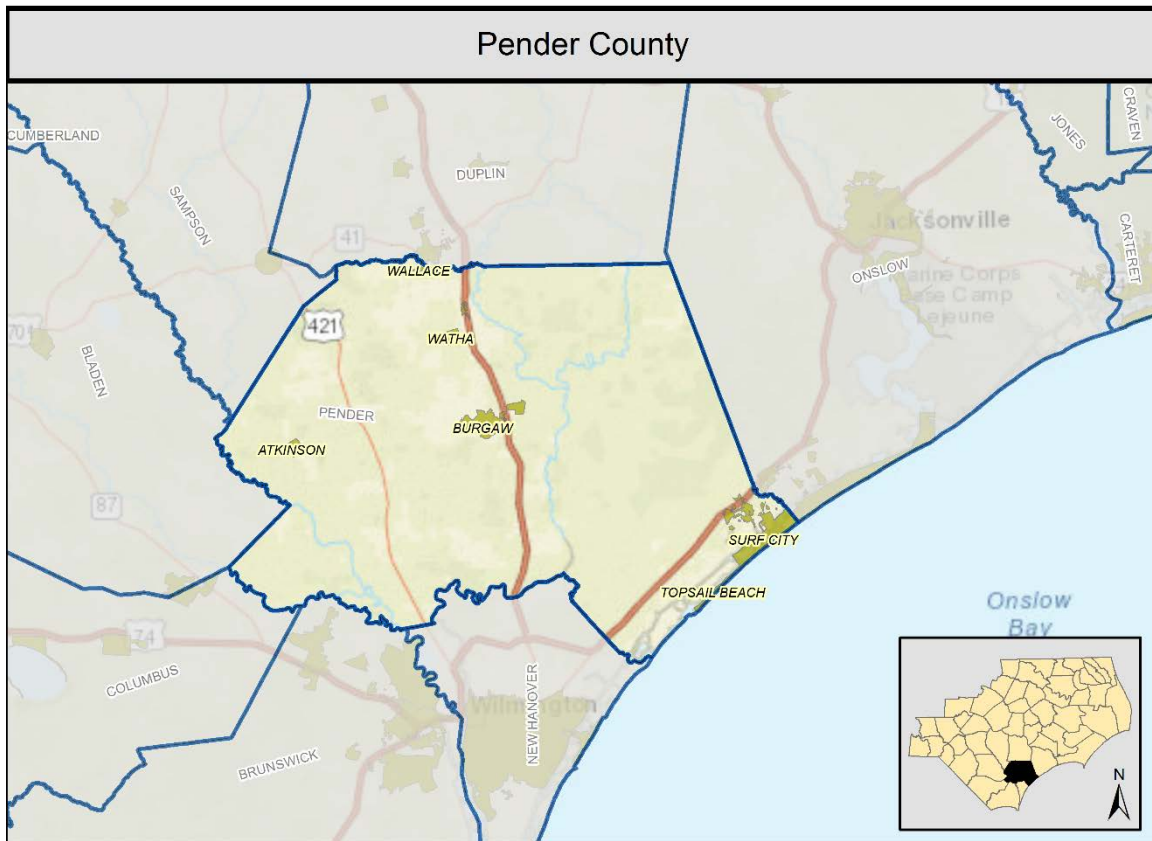


Figure 2. Pender County and Neighboring Counties

### Data, Assumptions, and Methodologies

NCEM has assembled a wealth of data, resources, and technical expertise from state agencies, the private sector, and the University of North Carolina system to support the development of innovative best practice strategies.

Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Inclusion of a project or action in this plan does not guarantee that it will be eligible for recovery funding. However, proposed projects or actions may be eligible for state or federal funding or could be accomplished with municipal, nonprofit, or private investment.



An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky brown color, submerging lawns, streets, and parts of the houses. Numerous trees are isolated in the water, some with only their tops visible. The houses are mostly two-story structures with light-colored siding and dark roofs. The flooding appears to be extensive, covering a large portion of the visible area.

## 2. County Profile



## 2. County Profile

Pender County is located along the coast in southeastern North Carolina, north of Wilmington. It is comprised of eight census-designated places: Hampstead, Atkinson, Burgaw, St. Helena, Surf City, Watha, Rocky Point, and Topsail Beach. Its current population is 55,166. This section provides a profile of housing, economics, infrastructure, environment, and administration within Pender County.

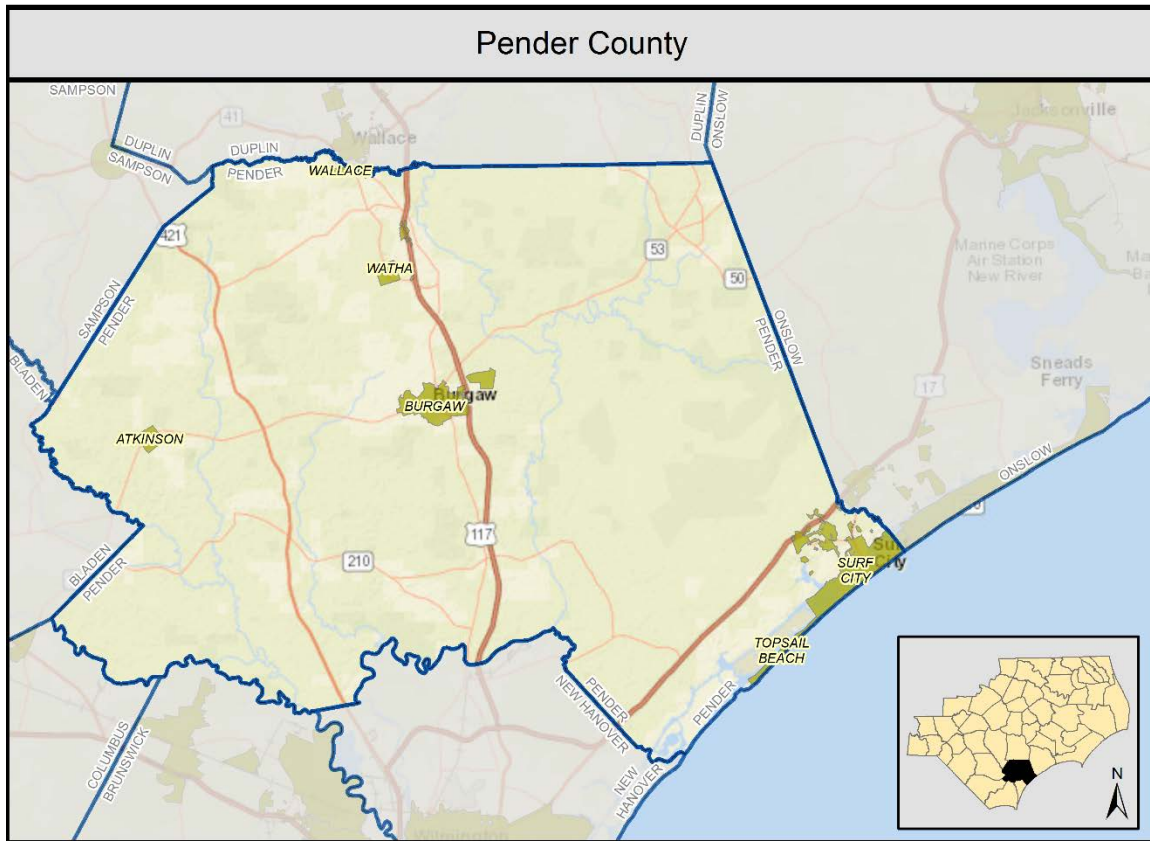


Figure 3. Pender Base Map

### Demographic Profile

Demographics for Pender County and census-designated places within the county are summarized and compared to statewide averages in this profile. The demographic data is from the 2000 Census, 2010 Census, and 2011-2015 American Community Survey five-year estimates.

### Population

Pender County has a population of 55,166. Hampstead is the most populous place within Pender County with a population of 4,528, and Watha is the least populous place with a population of 216.<sup>3</sup>

<sup>3</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."

## Population Change (2000 to 2010)

The Pender County population increased between the 2000 and 2010 Census. In 2000, the population was 41,082 and in 2010 it was 52,217. The population increased by 11,135 people which is more than 25 percent. In comparison, North Carolina grew by 19 percent from 8,049,313 people in 2000 to 9,535,483 in 2010.<sup>4</sup>

## Age

The median age in Pender County is 42, which is the same for North Carolina. Within Pender County, the Topsail Beach population has the oldest median age, 60, and the Rocky Point population has the youngest median age, 30.<sup>5</sup>

## Race and Ethnicity

Pender County is mostly White (76 percent) and African American (17 percent) with other races constituting the remaining 7 percent. In comparison, North Carolina is 70 percent White, 22 percent African American, 1 percent American Indian and Alaska Native, 3 percent Asian, less than 1 percent Native Hawaiian/Pacific Islander, 3 percent Some Other Race, and 2 percent Two or More Races. Refer to the table below.<sup>6</sup>

Within Pender County, Burgaw has a population that is 45 percent African American. In Rocky Point, 25 percent of the population identifies as Some Other Race.

The Latino population in Pender County is 6 percent compared to 9 percent for North Carolina. Rocky Point has the largest Latino population (37 percent) while St. Helena and Topsail Beach have Latino populations of less than 1 percent according to the census data.

| Geography     | White | Black or African American | American Indian and Alaska Native Alone | Asian | Native Hawaiian/Pacific Islander | Some Other Race | Two or More Races | Total Non-White |
|---------------|-------|---------------------------|---|-------|----------------------------------|-----------------|-------------------|-----------------|
| Hampstead     | 94.1% | 2.9%                      | 0.0%                                    | 0.0%  | 0.0%                             | 0.0%            | 3.0%              | 5.9%            |
| Atkinson      | 90.2% | 6.3%                      | 0.0%                                    | 0.0%  | 0.0%                             | 1.3%            | 2.1%              | 9.8%            |
| Burgaw        | 47.0% | 44.8%                     | 0.4%                                    | 0.0%  | 0.0%                             | 6.2%            | 1.6%              | 53.0%           |
| St. Helena    | 74.6% | 25.4%                     | 0.0%                                    | 0.0%  | 0.0%                             | 0.0%            | 0.0%              | 25.4%           |
| Surf City     | 91.1% | 0.0%                      | 0.6%                                    | 0.4%  | 0.0%                             | 3.1%            | 4.9%              | 8.9%            |
| Watha         | 93.5% | 5.6%                      | 0.0%                                    | 0.0%  | 0.0%                             | 0.0%            | 0.9%              | 6.5%            |
| Rocky Point   | 47.9% | 20.8%                     | 0.0%                                    | 0.0%  | 0.0%                             | 25.5%           | 5.7%              | 52.1%           |
| Topsail Beach | 97.8% | 0.0%                      | 1.4%                                    | 0.0%  | 0.0%                             | 0.8%            | 0.0%              | 2.2%            |

**Table 2. Pender County Race and Ethnicity**

<sup>4</sup> Source: Minnesota Population Center. National Historical Geographic Information System: Version 11.0 [Database]. Minneapolis: University of Minnesota. 2016. <http://doi.org/10.18128/D050.V11.0>. Census 2000/Census 2010 Time Series Tables Geographically Standardized

<sup>5</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."

<sup>6</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B02001, "Race" and Table B03002, "Hispanic or Latino Origin by Race."

### Limited English Proficiency

Limited English Proficiency (LEP) is defined as populations 18 years or older that speak English less than very well. In Pender County, most individuals identified as LEP speak Spanish while others speak Indo-Euro. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within Pender County, Rocky Point has the largest LEP population. The primary language group for LEP populations in Atkinson, Burgaw, Surf City, Rocky Point, and Topsail Beach is Spanish. Hampstead, St. Helena, and Watha do not have LEP populations according to census data.<sup>7</sup>

### Poverty

In Pender County, 18.5 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. In Burgaw, 33 percent of the population is below the poverty level, 17 percent in Surf City and Watha, and 5 percent in Topsail Beach.<sup>8</sup>

### Low and Moderate Income Individuals

In Pender County, 38 percent of the population is classified as low and moderate income (LMI) individuals based on the US Department of Housing and Urban Development's definition. In comparison, 39 percent of the North Carolina population is classified as LMI.<sup>9</sup>

### Median Household Income

The median household income of the population of 25 to 64 year olds is \$50,000 in Pender County and \$53,000 in North Carolina. Hampstead has the highest median household income for this age group, \$71,000, and Burgaw has the lowest: \$27,000. Median household income was not available for St. Helena and Rocky Point.<sup>10</sup>

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<sup>7</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B16004, "Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."

<sup>8</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."

<sup>9</sup> Source: US Department of Housing and Urban Development, Estimate of Low and Moderate Income Individuals, <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/>

<sup>10</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B19094, "Median Household Income in the Past 12 Months."

## Zero Car Households

In Pender County, 6 percent of households do not have a vehicle available compared to 7 percent of North Carolina households. Within Pender County, Burgaw has the highest percentage of households without access to a vehicle, 16 percent, while St. Helena has the lowest percentage: 0 percent.<sup>11</sup>

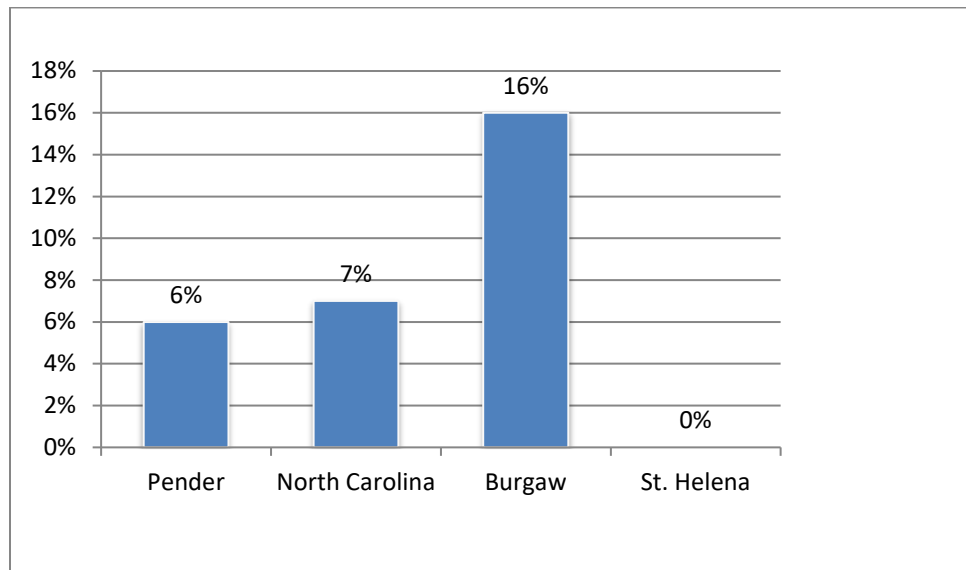


Figure 4. Zero Car Households by Percentage

## Commuting: Travel Time to Work, Means of Transportation

The majority of Pender County residents commute alone to work by vehicle, 78 percent, which is similar to North Carolina average of 81 percent. Within Pender County, Atkinson has the largest percentage of commuters commuting alone, 95.5 percent, and Surf City has the least: 58 percent.

Topsail Beach has the largest percentage of residents commuting by public transportation: 3 percent. In comparison, 1 percent of North Carolina commuters use public transportation. A greater percentage of Hampstead, Burgaw, Surf City, Watha, and Topsail Beach residents commute by walking, bike, or motorcycle than the North Carolina average of 2 percent.

The mean commute time to work for Pender County residents is 28 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes. Within Pender County, Watha has the shortest mean commute time at 16 minutes while Atkinson has the longest at 31.7 minutes.<sup>12</sup>

<sup>11</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25044, "Tenure by Vehicles Available."

<sup>12</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B08301, "Means of Transportation to Work" and Table GCT0801, "Mean Travel Time to Work of Workers 16 Years and Over Who Did Not Work at Home (Minutes)."



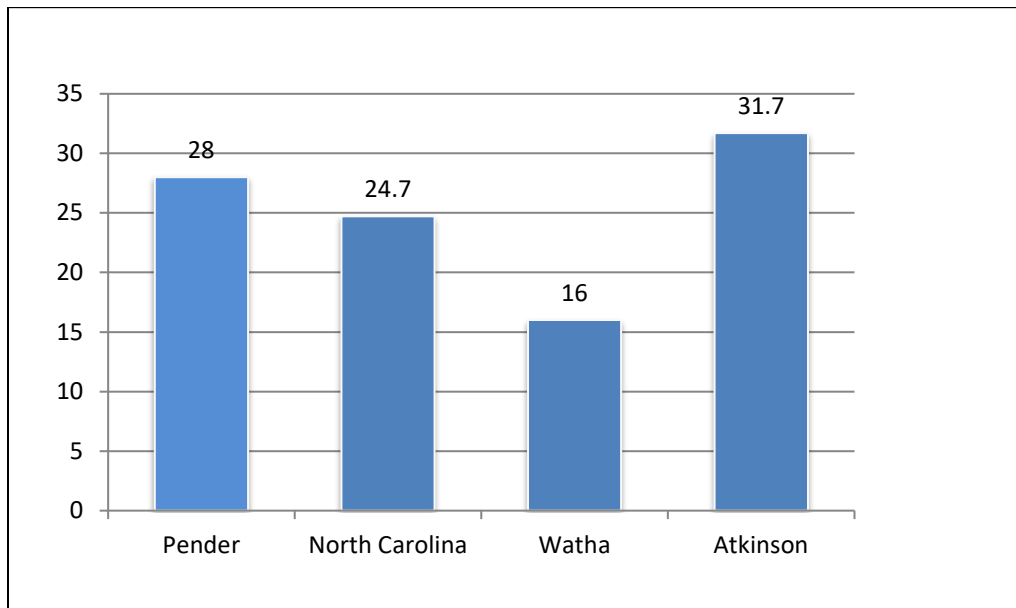


Figure 5. Mean Commute Time to Work in Minutes

### Housing Profile

Pender County has over 27,000 housing units, 65 percent of which are single-family homes, 8 percent multi-family units, and 27 percent manufactured housing.

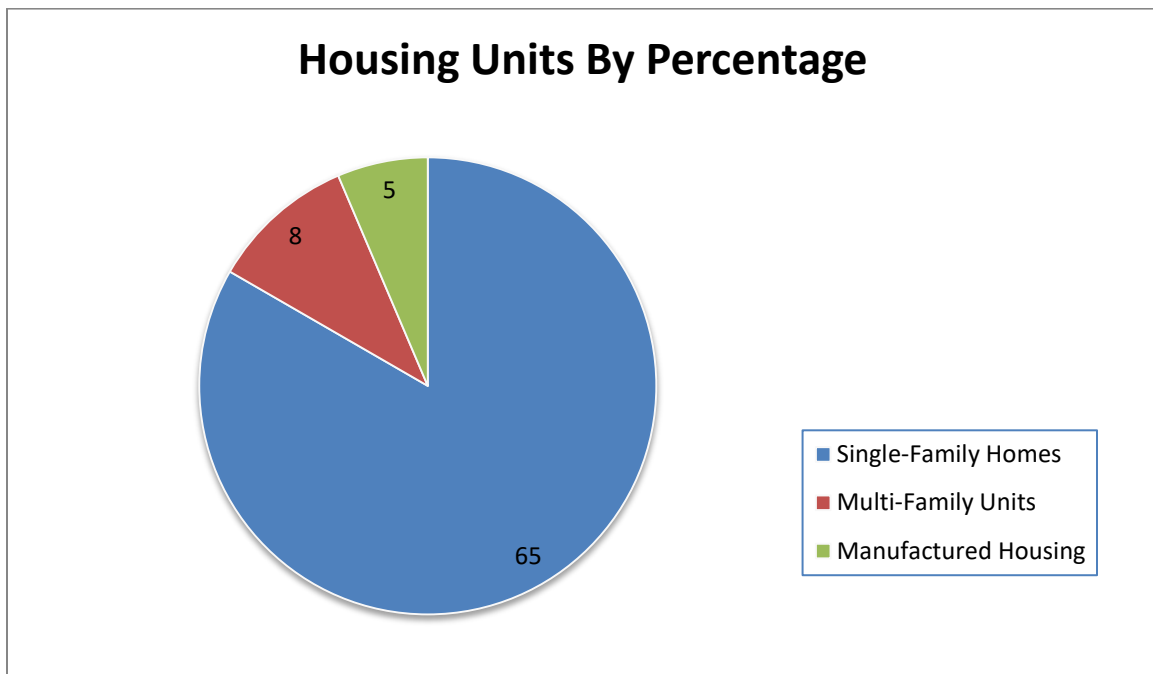


Figure 6. Housing Units By Percentage

In Pender County, 26 percent of housing units are vacant, compared to 15 percent for North Carolina. Within Pender County, Topsail Beach has the largest percentage of vacant housing units, 86 percent, while Rocky Point has the least: 7 percent.

Of the occupied housing units, 77 percent are owner-occupied compared to 65 percent in North Carolina; 23 percent are renter-occupied compared to 35 percent in North Carolina.

The median housing value in Pender County is \$153,000. In comparison, the median housing value in North Carolina is \$140,000. Within Pender County, Topsail Beach has the highest median housing value: \$441,000. Rocky Point has the lowest median housing value: \$79,000.

According to the National Housing Preservation Database, Pender County has 494 affordable housing units. Most of the affordable housing is located within Burgaw.<sup>13</sup>

### **Economic / Business Profile**

Pender County is home to a diverse array of businesses including health services, educational services, retail trade, and accommodation and food services. According to the US Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within Pender County are in downtown Burgaw, and along US-17 near the coast.<sup>14</sup>

### **Labor Force**

According to the local area unemployment statistics (LAUS) from the Labor and Economic Analysis Division (LEAD) for the unadjusted data for all periods in 2016, the civilian labor force population of Pender County is 26,687.<sup>15</sup> Within Pender County, St. Helena has the largest percentage of residents 16 years or over in the labor force, 70 percent, while Burgaw has the smallest: 37 percent.

The civilian unemployment rate in Pender County is 5.3 percent. In comparison, the North Carolina civilian unemployment rate is 5.1 percent.<sup>15</sup> Within Pender County, Rocky Point has the smallest civilian unemployment rate at 4 percent while Burgaw has the largest: 15 percent.<sup>16</sup>

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<sup>13</sup> Sources: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25002, "Occupancy Status"; Table B25003, "Tenure"; Table B25024 "Units in Structure"; Table B25077, "Median Value (Dollars)."

National Housing Preservation Database

<sup>14</sup> Source: US Census Bureau Longitudinal-Employer Household Dynamics Program

<sup>15</sup> Source: Civilian Population and Unemployment Rate - Labor and Economic Analysis Division (LEAD) of North Carolina Department of Commerce – Local Area Unemployment Statistics <http://d4.nccommerce.com/LausSelection.aspx>

<sup>16</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B23025, "Employment Status for the Population 16 Years and Over."

## Major Employers

The top ten employers in Pender County<sup>17</sup> represent the manufacturing, public administration, education, and health service industries, and are listed in order of total employees.

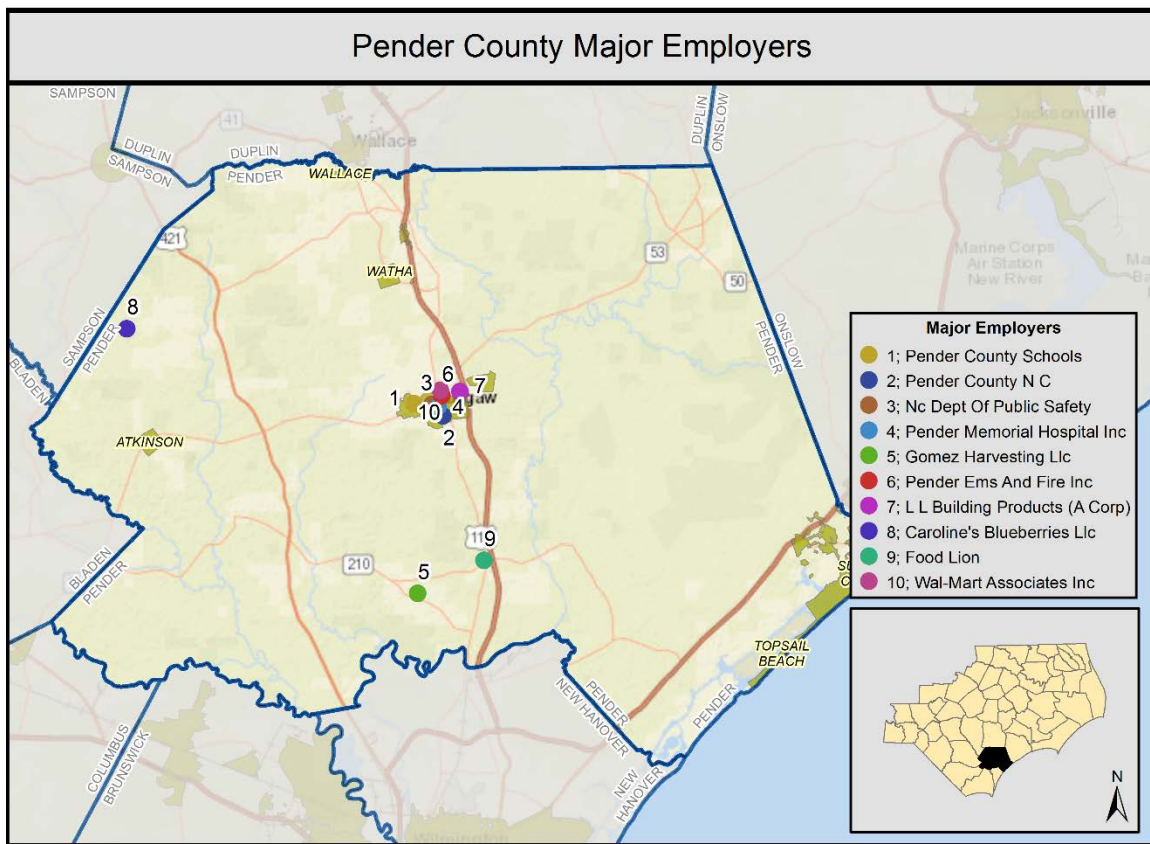


Figure 7. Major Employers by Number of Employees

## Economic Development

Pender County Commerce Park is located at the New Hanover-Pender county line off of US-421. This industrial park is a target for development in Pender County and has two main tenants already with room for future growth.

The Wilmington Business Development organization is responsible for business recruitment to the Greater Wilmington area. Their goals are to “promote, retain, and recruit” businesses in New Hanover and Pender Counties.<sup>18</sup>

<sup>17</sup> Sources: NC Department of Commerce

<sup>18</sup> Sources: Pender County - Economic Development and Wilmington Business Development

## Infrastructure Profile

Transportation, health, education, water, and power infrastructure are summarized for Pender County in the sections that follow.

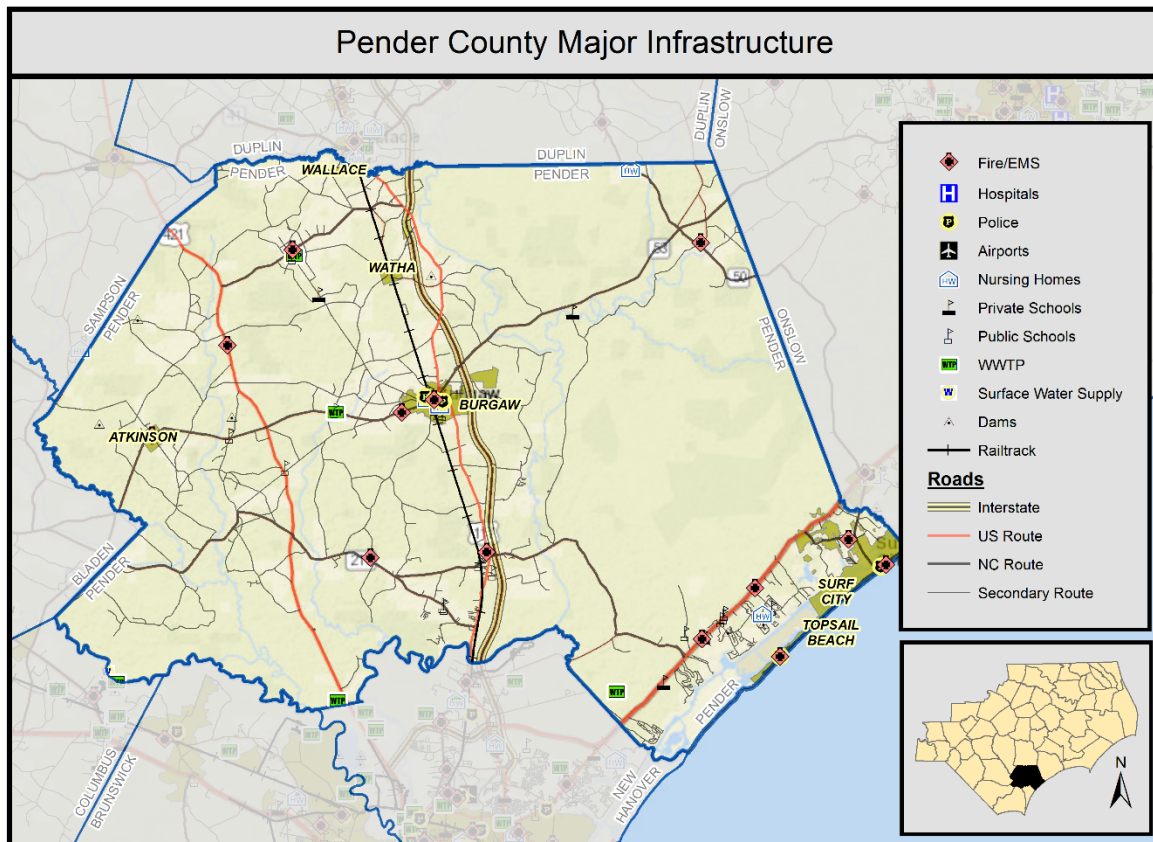


Figure 8. Pender County Major Infrastructure

## Transportation

Pender County is connected to the region by I-40, US-421, and US-17. I-40 is a major east-west interstate that provides Pender County with access to Greensboro and Raleigh to the west and Wilmington and deep water ports to the east. US-421 is a north-south highway connecting the county with Wilmington to the south. US-17 is a north-south highway that runs along the coast connecting the county with New Bern to the north and Wilmington to the south.

Pender County is also served by rail by CSX with a depot in Burgaw, connecting to Port of Wilmington. The Wilmington International Airport is the main airport for the area.<sup>19</sup>

## Health

Pender Memorial Hospital is the only hospital located in Pender County. It is partnered with New Hanover Regional Medical Center and is located in Burgaw.<sup>20</sup>

<sup>19</sup> Sources: Wilmington Business Development

<sup>20</sup> Sources: Pender Memorial Hospital



## Education

Pender County Public Schools administers eight elementary, four middle, and four high schools. Cape fear Community College has two campuses in Pender County, one each in Burgaw and Hampstead.<sup>21</sup>

## Water

The Lower Cape Fear Public Utility manages the water supply, and distributes to Pender County. Pender County Utilities provides drinking water to the county unincorporated areas. Pender County Utilities also manages the wastewater treatment for the county at Pluris Hampstead and other local wastewater treatment plants.<sup>22</sup>

## Power

There is a solar farm in Pender County located in Burgaw. It has a net summer capacity of 4.9 megawatts.<sup>23</sup>

## Environmental Profile

Water resources, natural areas, and managed areas – biodiversity, wildlife habitat, and recreation – are summarized for Pender County in the sections that follow.

### Water Resources

The Northeast Cape Fear River flows north-south through the middle of Pender County. Wetlands are present along the Northeast Cape Fear River and its tributaries. The most common wetland type in Pender County is freshwater forested/shrub wetland.<sup>24</sup>

### Natural and Managed Areas

According to the NC Natural Heritage Program, there are several natural areas of high, very high, or exceptional value in Pender County. These areas in Pender County include: the Holly Shelter Game Land, Angola Bay Game Land, Bellhammon Tract, and areas along the Northeast Cape Fear River.

There are several managed areas under state ownership within Pender County. Managed areas are properties and easements where natural resource conservation is one of the current primary management goals, or are of conservation interest. These areas in Pender County include: along the Black River, the Holly Shelter Game Land, Angola Bay Game Land, Bellhammon Tract, and NC Department of Transportation mitigation sites throughout the county.<sup>25</sup>

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<sup>21</sup> Sources: Pender County Schools and Cape fear Community College

<sup>22</sup> Sources: NC Division of Water Resources, Local Water Supply Plans; and the Neuse Regional Water and Sewer Authority

<sup>23</sup> Source: US Department of Energy, US Energy Mapping System

<sup>24</sup> Source: NC Natural Heritage Program

<sup>25</sup> Source: NC Natural Heritage Program

## Biodiversity and Wildlife Habitat

The NC Natural Heritage Program produces a biodiversity and wildlife habitat assessment for the state. According to this assessment, areas with the highest rating for biodiversity and wildlife habitat are the Holly Shelter and Angola Bay Game Lands, and along the Cape Fear River and its tributaries. These areas rank between a 7 and 10, with 10 being the highest possible score. Other areas of the county rank 5 to 6. Most of the county is unrated.<sup>26</sup>

## Parks and Recreation

The Pender County Parks and Recreation Department maintains three parks in Pender County. The Hampstead Kiwanis Park is located off of US-17 in Hampstead and has a playground and recreation fields. Millers Pond Park is located near the Northeast Cape Fear River in Rocky Point off of US-117 and has walking trails around Miller Pond. Pender Memorial Park is located near downtown Burgaw.<sup>27</sup>

## Administrative Profile

The administrative capabilities of Pender County and the municipalities within the County are discussed in great detail within Section 4 of the Southeast North Carolina Regional Hazard Mitigation Plan (2016). The assessment evaluates the capabilities of the County and municipalities to implement mitigation actions across the areas of planning and regulatory capabilities, administrative and technical capabilities, fiscal capabilities, and political capabilities. Many more details about the capabilities of Pender County and the municipalities can be found in that document.

In terms of administrative capabilities, the County has many of the staff and the necessary plans, policies and procedures in place that are found in communities with “high” capabilities. Pender County has Emergency Management and Planning departments with the capacities to assist in implementing the resilience strategies proposed in this plan. Some of the other indicators of capability for the County include the following: Comprehensive Land Use Plan, a Zoning Ordinance for portions of the County, Subdivision Regulations, and Floodplain Management Ordinance. These plans, policies and procedures help ensure that new development in the County will be managed in a responsible manner and will take place in non-hazardous areas.

Burgaw, Surf City and Topsail Beach also have “high capabilities” as well. They all have administrative resources that would likely be able to assist with implementing the strategies in this plan. In addition, they have the plans, policies and procedures in place that indicate higher capability. The Towns of Atkinson and Watha and the Village of St. Helena would likely need assistance from other agencies in order to implement the strategies in this plan as a result of limited administrative resources.<sup>28</sup>

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<sup>26</sup> Source: NC Natural Heritage Program

<sup>27</sup> Sources: Pender County Parks and Recreation Department

<sup>28</sup> Sources: Pender County, City of Burgaw



An aerial photograph showing a residential neighborhood severely impacted by flooding. The water is a murky, brownish-yellow color, covering large areas of the landscape. Numerous houses with light-colored roofs and walls are visible, some partially submerged. The surrounding area is densely populated with green trees, many of which are also partially underwater. The overall scene depicts significant damage and displacement caused by a storm.

### 3. Storm Impact

### 3. Storm Impact

#### Rainfall Summary

Hurricane Matthew officially made landfall as a Category 1 storm southeast of McClellanville, South Carolina early on October 8, 2016. The track and speed of the storm resulted in nearly two days of heavy precipitation over much of North Carolina that caused major flooding in parts of the eastern Piedmont and Coastal Plain. The storm produced widespread rainfall of 3-8 inches in the central regions of North Carolina and 8 to more than 15 inches in parts of eastern North Carolina. A number of locations received all-time record, one-day rainfall amounts. Many locations in the Coastal Plain of North Carolina had received above normal rainfall in the month of September leading to wet antecedent conditions prior to Hurricane Matthew. Total rainfall depth for Pender County is highlighted graphically in the figure below.

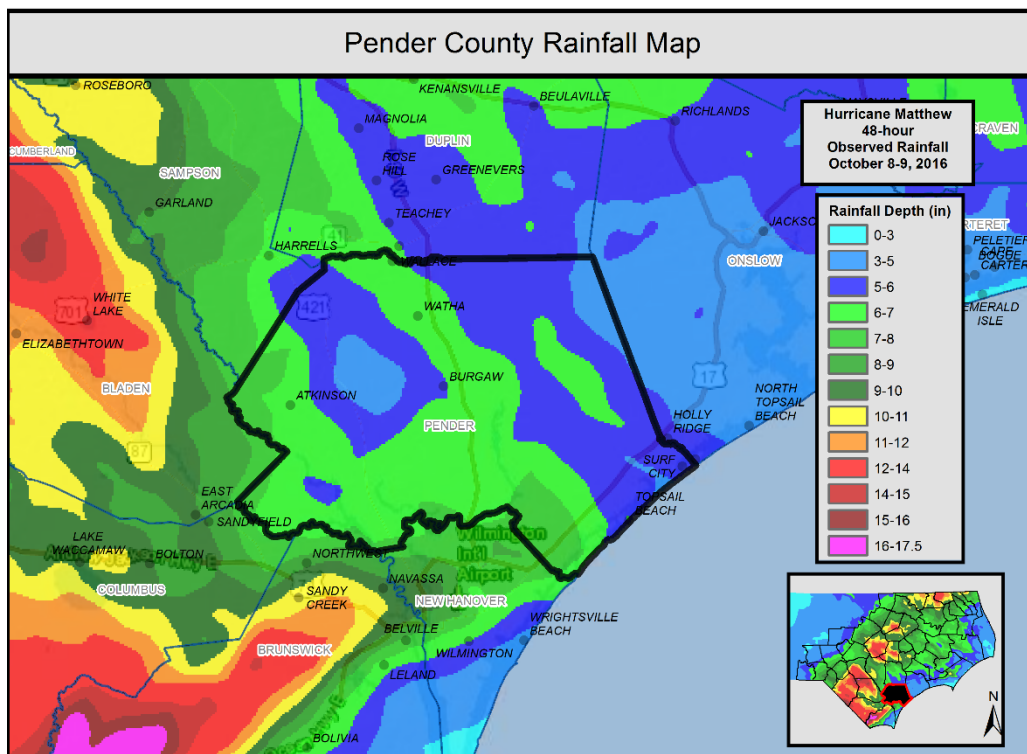


Figure 9. 48-hour Observed Rainfall Depth (October 8-9, 2016)

#### Riverine Flooding Summary

The effects of Hurricane Matthew on Pender County were most pronounced along Black River in southwest Pender County where several major streams converge. USGS documented stream gage data in the report “Preliminary Peak Stage and Streamflow Data at Selected Streamgaging Stations in North Carolina and South Carolina for Flooding Following Hurricane Matthew, October 2016”. Stream gage data from the USGS report for Pender County and nearby gages is summarized on the following page.



| USGS Gage | County  | River Name and Location                 | Drainage Area (sq mi) | Peak Matthew Elevation (ft) | Previous Record (ft) |
|-----------|---------|---|-----------------------|-----------------------------|----------------------|
| 02108566  | Pender  | Northeast Cape Fear near Burgaw, NC     | 920                   | 17.83                       | 22.77                |
| 02106500  | Sampson | Black River near Tomahawk, NC           | 676                   | 27.92                       | 26.83                |
| 02105769  | Bladen  | Cape Fear R at Lock #1 near Kelly, NC   | 5,255                 | 28.62                       | 24.24                |
| 02108000  | Duplin  | Northeast Cape Fear near Chinquapin, NC | 599                   | 19.98                       | 23.31                |

**Table 3. Pender County USGS Stream gage Data**

## Coastal Flooding Summary

Pender County experienced some coastal flooding due to Hurricane Matthew. Peak surge elevations were measured at several USGS and NOAA coastal/tidal gage stations during Hurricane Matthew. Station records were analyzed along the coast of Pender County to compare Hurricane Matthew to the FEMA flood recurrence intervals. Approximate recurrence interval was determined for each site, and this information is summarized for Pender County in the table below.

| Map ID | County | Site Description           | Body of Water | Estimated Peak Surge (ft) | Estimated Recurrence Interval |
|--------|--------|----------------------------|---------------|---------------------------|-------------------------------|
| 17     | Pender | Scotts Hill Marina         | Sound         | 7                         | 25                            |
| 7      | Pender | Harbour Village Yacht Club | Sound         | 6.8                       | 25                            |
| 24     | Pender | Jolly Roger Inn and Pier   | Open Coast    | 6.2                       | 25                            |

**Table 4. Pender County Coastal Flooding**

Based on a review of Small Business Association Business/Housing applications, Individual Assistance claims, and National Flood Insurance Program claims, several residences and businesses in the beach communities along the Pender County coast experienced flooding damage.

## Housing Impacts

According to FEMA Individual Assistance claims as of March 20<sup>th</sup>, 2017, there were 957 registrations for Individual Assistance in Pender County as a result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew may still be pending, so this number may not reflect the final claims data from the event. This also does not take into account other historic impacts to the county or other areas of concern for flooding that may not have occurred during this storm. With that in mind, the planning team attempted to take a comprehensive look at both Hurricane Matthew impacts and any historic impacts that local officials felt would validate areas that should be considered at high risk to future flooding.

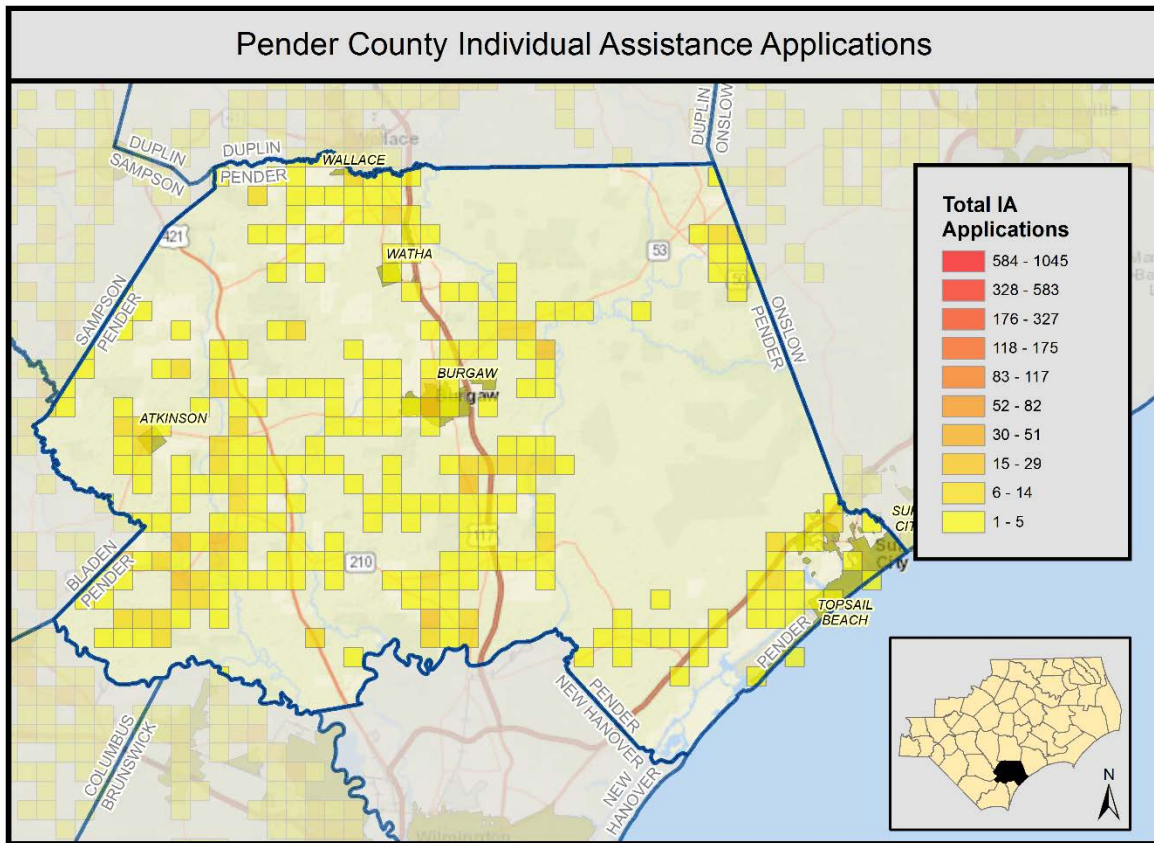


Figure 10. Pender County IA Applications by Area

Housing was certainly impacted in Pender County as a result of Hurricane Matthew as there were several homes damaged, especially in the southwest part of the county. The bullets below summarize some of the major impacts to housing that were identified by local officials from the event.

- Homes Flooded from Hurricane Matthew:** Currie and the southwest portion of Pender County are both in flood-prone areas and both flooded during Hurricane Matthew. Based on historic flooding information, these areas include a significant amount of repetitive loss properties. It should also be noted that it is not uncommon for the bottom floor of these elevated houses to be closed in by homeowners without local government approval and used as living space. This has frequently resulted in a larger flooding impact than would have otherwise been the case.

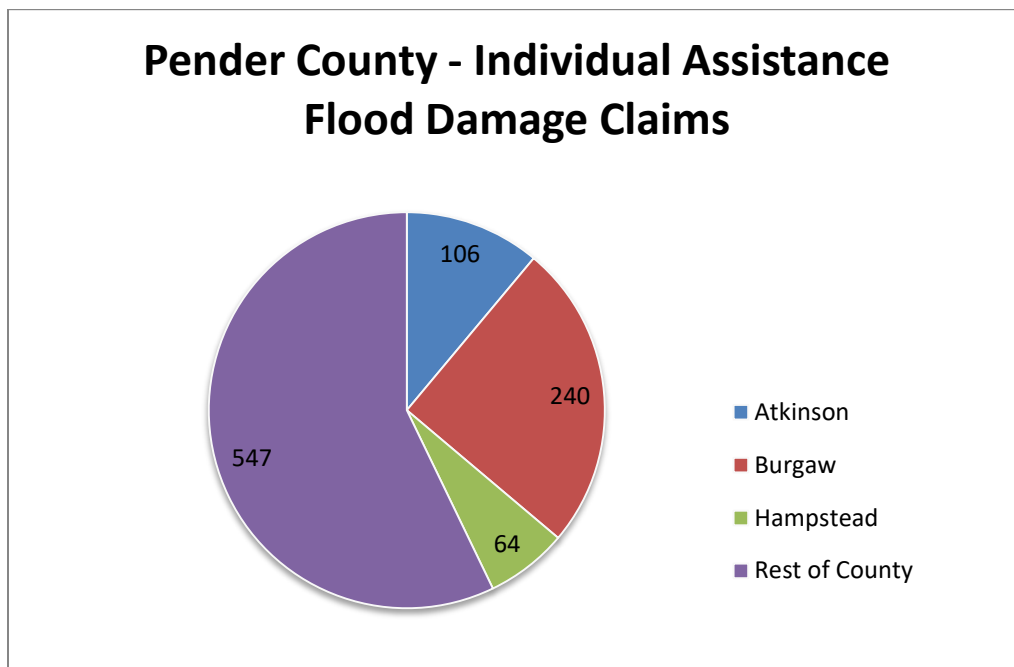


Figure 11: Number of IA Flood Damage Claims by Area

- **Homes At-Risk of Future Flooding:** Pender County is mostly covered with wetlands. The low ground elevations and major river systems entering the county there are areas at high risk for flooding within the County. According to historic flooding information, there are nearly 80 repetitive loss properties in Pender County.

### Economics / Business / Jobs

Although there were some impacts to the economy in Pender County from Hurricane Matthew, these were generally minor compared to other impacts the county experienced. The number of Small Business Administration (SBA) Business claims as of March 20<sup>th</sup>, 2017 was 117. In addition, as of March 15<sup>th</sup>, 2017, there have been 4 claims through USDA. The bullets below summarize some of the impacts to the economy/businesses/jobs that were identified by local officials from the event.

- **Downtown Areas Impacted:** Burgaw and Atkinson contain many structures, including both commercial and residential, located in the flood zone. A few commercial buildings flooded during Hurricane Matthew and frequently flood during other heavy rainfall events, often due to clogged storm drains.
- **Agriculture Impacted:** Currie and Atkinson and areas within the southwestern part of Pender County include many small business farms in the flood zone. Many of the farms across Pender County were flooded during Hurricane Matthew.
- **Identified Economic Development Zones:** There are several communities in the county that may not have had major impacts directly from Hurricane Matthew but which have been impacted economically over the past several years as jobs and businesses have struggled. Particularly in Burgaw, Atkinson, and Watha, there have been difficulties attracting businesses and there has been a desire to improve growth and make these communities attractive to new businesses and commercial development.

- **Employment**

The top ten employers in Pender County are listed in the table below.

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Pender County Schools</li> <li>• Pender County</li> <li>• NC Department of Public Safety</li> <li>• Pender Memorial Hospital, Inc.</li> <li>• LL Building Products</li> </ul> | <ul style="list-style-type: none"> <li>• Pender EMS and Fire, Inc.</li> <li>• Food Lion</li> <li>• Wal-Mart Associates, Inc.</li> <li>• Woodbury Wellness Center, Inc.</li> <li>• RC Creations Llc</li> </ul> |
|--|---|

While no specific employment issues were noted by any of the employers, there was most likely loss of employment from those residents which suffered damage to their homes due to Hurricane Matthew and had to move elsewhere while waiting to rebuild.

### Infrastructure

According to Public Assistance claims, which are often closely tied to infrastructure, as of February 20<sup>th</sup>, 2017 there were \$1,234,186 of claims in Pender County as a result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew may still be pending, so this number may not reflect the final claims data from the event.

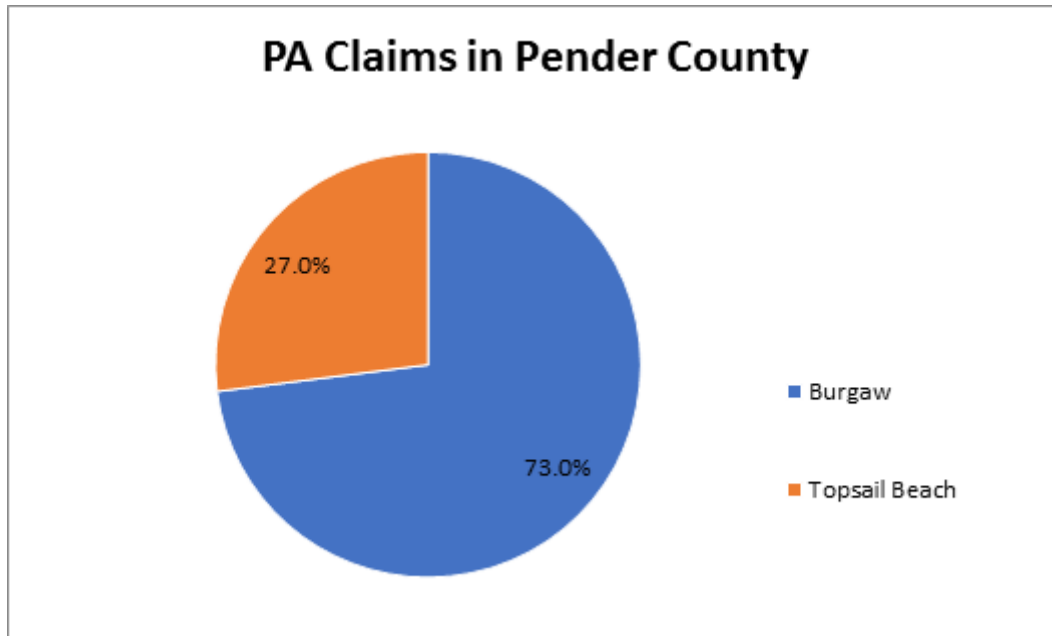


Figure 12: Pender County PA Claims by Area and Percentage



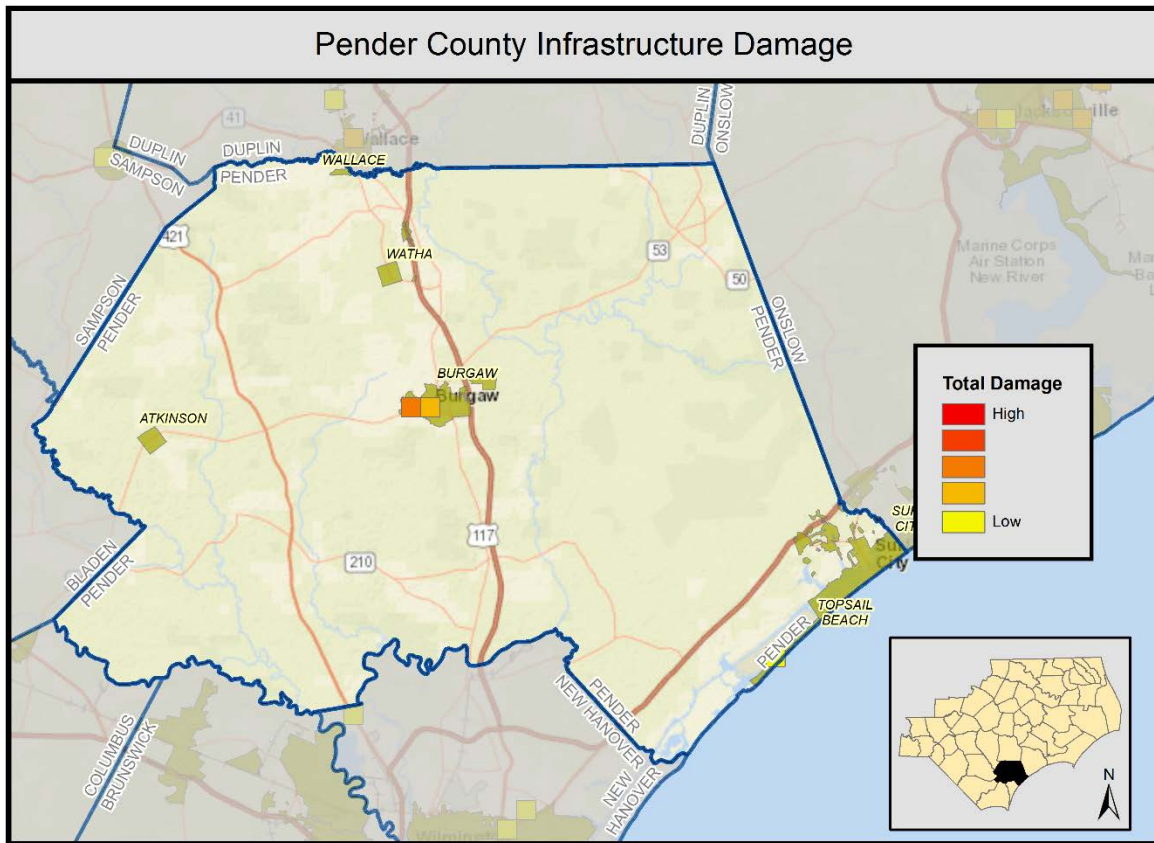


Figure 13. Pender County Infrastructure Damage

County infrastructure was one of the greatest areas of concern in the wake of Hurricane Matthew as there were several types of infrastructure that were damaged in multiple locations. The bullets below summarize some of the major impacts to infrastructure that were identified by local officials from the event.

- **Dam Issues:** Pender County had no impacted dams due to Hurricane Matthew.
- **Road/Bridge/Culvert Flooding:** Road, bridge and culvert overtopping are common occurrences in Pender County and impacted a number of different locations during Hurricane Matthew. Many of these locations have been historical hotspots in the county and are affected even during rainfall events that are not as extreme as hurricane/tropical storm events. For example:

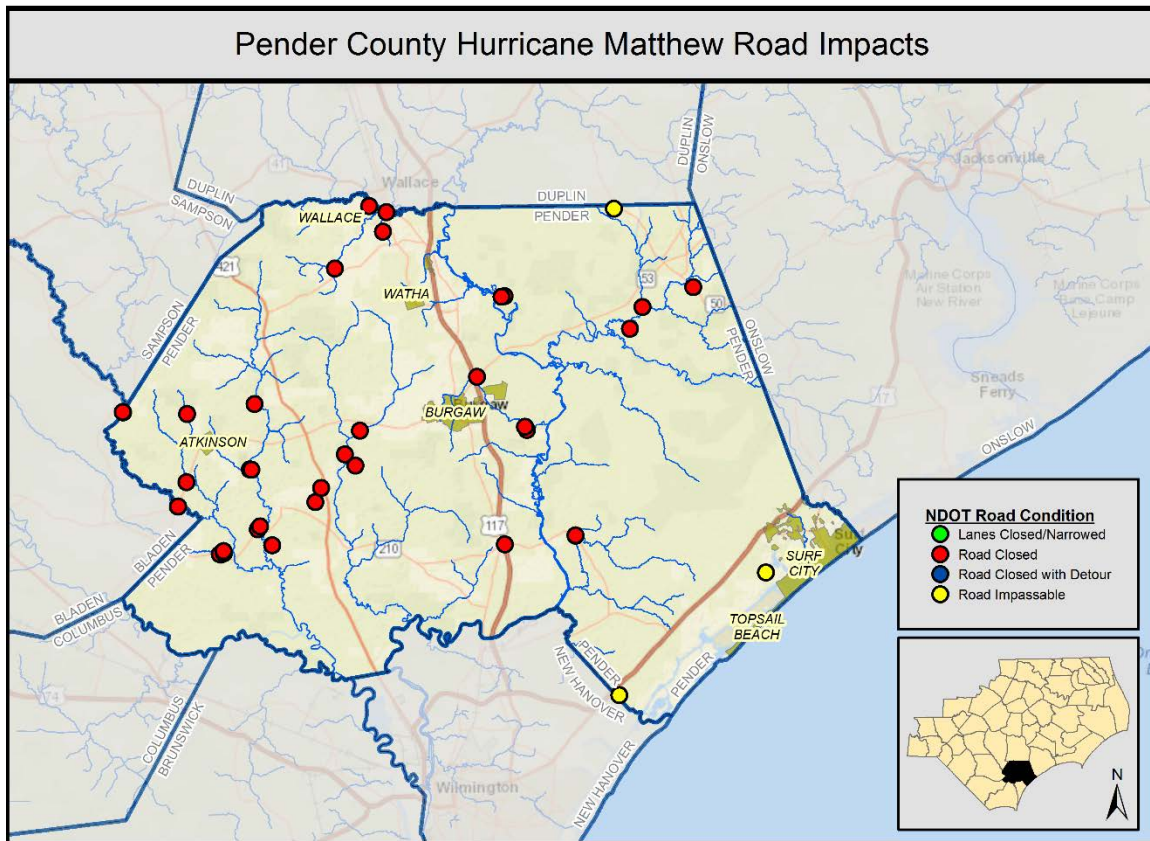


Figure 14. Impacted NCDOT Structure in Pender County

- As mentioned above, the southwestern sector of the county has extensive drainage issues. Water in this area does not drain well enough due to the nature of the area including relatively low elevations and the merging of major riverine systems. Several locations in this area experienced overtopping including NC-210 and several secondary roads.
- NC-53: From Slocum Trail into Bladen County was closed due to flooding from Hurricane Matthew.
- Morgan Road: Closed due to rising waters during Hurricane Matthew.
- Borough Road: From Blueberry Road to Blueberry Road closed due to flooding from Hurricane Matthew.
- Brinson Road: Closed near Currie due to flooding during Hurricane Matthew.
- Beattys Bridge Road: Closed due to flooding during Hurricane Matthew.
- Battleground Road: Closed from NC-210 to Slocum Trail due to flooding from Hurricane Matthew.
- Croomsbridge Road: Closed due to flooding during Hurricane Matthew.
- Stag Park Road: Closed due to flooding during Hurricane Matthew.
- Old Maple Hill Road: Closed due to flooding during Hurricane Matthew.
- Willard Railroad Street: Closed due to flooding during Hurricane Matthew.

- **Water/Wastewater Infrastructure:** Water and wastewater infrastructure is critical to maintaining the health and well-being of the public in the wake of a storm event. Often this infrastructure is threatened due to the necessity of placing it near water bodies, which naturally increases the risk due to flooding. During Hurricane Matthew, a number of water/wastewater facilities were impacted in Pender County.
  - Major damage to a section of 48-inch primary raw water transmission main to Pender county.
  - There was no reported power loss at pump stations and wells during Hurricane Matthew for Pender County.
  - The water treatment plant Issued a water conservation advisory as result of damage to the raw water main supply.
- **Conservation Area Access Roads:** North Carolina Wildlife Resources Commission has reported approximately 18 miles of road closures as of March 20<sup>th</sup>, 2017.

## Ecosystems / Environment

Overall, environmental impacts in Pender County as a result of Hurricane Matthew were relatively minimal. However, there were some noteworthy incidents that may not have explicitly impacted the environment and ecosystems, but which brought to light some underlying issues related to maintenance of environmental features that the county faces recurrently.

- **Southwest Sector/Black River:** In the southwest sector of the county, there is some moderate development that has taken place within designated floodplains which are essentially natural areas created by the river to expand into during heavy rainfall events. In many ways, the best solution for managing these areas is to leave the floodplain undeveloped. This prevents damage to any property that may have otherwise been damaged in a flood event and also reduces the amount of impervious surface area within the floodplain, thereby allowing infiltration into the ground and decreasing runoff.
 

Many of the structures that have been built in the southwest sector are located in flood zones along the Black River and Cape Fear River. The presence of development in identified, natural floodplains has caused not only damage to personal property, but has also caused some harm to the natural functions of the river system. Although this may be said of many areas of the county, it is particularly evident in the southwest sector as the natural beauty and recreational potential of the area is striking and is considered a key environmental resource in the county.
- **Natural Debris Buildup Causing Flooding:** Several low-water culverts and bridges across the county experienced a significant amount of debris buildup in streams. This debris is frequently in the form of downed trees and other buildup of natural remains. Indeed, one of the major causes of debris buildup is from beaver dams that are constructed and then washed out during heavy rainfall/flooding events. This debris is then caught underneath bridges and in culverts, causing a jam which backs up water upstream and results in flooding.



An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky brown color, submerging many houses and large areas of green trees. The houses have grey roofs and are arranged in a grid-like pattern. The trees are mostly deciduous and are partially submerged, with only their tops visible above the water. The overall scene depicts a significant natural disaster impact on a community.

## 4. Strategies for Resilient Redevelopment



## 4. Strategies for Resilient Redevelopment

This section provides details about the resilience and revitalization strategies and actions identified in Pender County. These actions were identified and refined during three public meetings with local officials and county residents held in March and April 2017. The actions are tied to impacts from Hurricane Matthew and organized by the pillars of housing, economic development, infrastructure and environment. In addition to the public meetings, frequent coordination calls with County officials and data gathered from state agencies and organizations were utilized to formulate the actions listed below.

Meeting 1 was designed to introduce the community and County points of contact to the Resilient Redevelopment Planning process and goals. This meeting allowed the planning team to capture areas within the county that were damaged during Hurricane Matthew and to hear what potential mitigation actions had already been considered. Draft resilience actions were then presented at Meeting 2 of the planning process. This was done to garner general buy-in on the draft actions from the County-level planning teams and residents. More details on the actions were collected between Meetings 2 and 3 through research and follow-up phone calls and emails with the primary points of contact. Meeting 3 provided the opportunity to collect and finalize details for the draft actions. Meeting 4, scheduled in early May 2017, allowed the county points of contact to rank the identified actions, group them into High, Medium, and Low Priorities, and to approve their inclusion in the plan.

| Pillar               | Project/Action Count |
|----------------------|----------------------|
| Housing              | 6                    |
| Economic Development | 3                    |
| Infrastructure       | 5                    |
| Environment          | 3                    |
| <b>Grand Total</b>   | <b>17</b>            |

**Table 5. Pender County Summary of Projects by Pillar**

The following table is ordered by the rankings and priorities provided by Pender County during Meeting 3:

| Pillar               | Action Name  | Priority | Overall Ranking |
|----------------------|--|----------|-----------------|
| Housing              | Pender Housing Action 01: Immediate Housing Assistance                           | High     | 1               |
| Housing              | Pender Housing Action 02: Increase Housing Stock                                 | High     | 2               |
| Housing              | Pender Housing Action 03: Address Unmet Needs                                    | High     | 3               |
| Housing              | Pender Housing Action 04: Acquire/Elevate Floodprone Structures/Properties       | High     | 4               |
| Infrastructure       | Pender Infrastructure Action 03: Install/Improve Flood Warning System            | High     | 5               |
| Infrastructure       | Pender Infrastructure Action 01: Implement Drainage Maintenance                  | High     | 6               |
| Infrastructure       | Pender Infrastructure Action 02: Implement Drainage Improvements                 | High     | 7               |
| Environment          | Pender Environment Action 02: Expand Recreational Lands and Preserve Floodplains | Medium   | 8               |
| Economic Development | Pender Economic Development Action 01: Implement Agricultural Recovery           | Medium   | 9               |
| Housing              | Pender Housing Action 05: Enhance Public Outreach Program                        | Medium   | 10              |
| Environment          | Pender Environment Action 01: Implement Stream Restoration Projects              | Medium   | 11              |

| Pillar               | Action Name  | Priority | Overall Ranking |
|----------------------|--|----------|-----------------|
| Housing              | Pender Housing Action 06: Develop Flood Hazard Information for Unmapped Floodprone Areas         | Low      | 12              |
| Infrastructure       | Pender Infrastructure Action 04: Acquire Additional Rescue Equipment                             | Low      | 13              |
| Infrastructure       | Pender Infrastructure Action 05: Acquire Backup Generators                                       | Low      | 14              |
| Environment          | Pender Environment Action 03: Public Outreach on Beaver Management Program                       | Low      | 15              |
| Economic Development | Pender Economic Development Action 03: Implement Downtown Rehabilitation/Revitalization Projects | Low      | 16              |
| Economic Development | Pender Economic Development 02: Enhance Tourism Outreach Program                                 | Low      | 17              |

Table 6. Projects by Rank

On the following pages, we have organized the projects and actions by pillar. Within each pillar, the projects are grouped by county priority. Please note that maps are provided for all projects that have a specific location within the county. Projects without maps are county-wide projects that will benefit citizens throughout the county.

## Housing Strategies

### High Priority Housing Strategies

| Pillar  | Action Name  | Priority | Overall Ranking |
|---------|--|----------|-----------------|
| Housing | Pender Housing Action 01: Immediate Housing Assistance                     | High     | 1               |
| Housing | Pender Housing Action 02: Increase Housing Stock                           | High     | 2               |
| Housing | Pender Housing Action 03: Address Unmet Needs                              | High     | 3               |
| Housing | Pender Housing Action 04: Acquire/Elevate Floodprone Structures/Properties | High     | 4               |

Table 7. Pender High Priority Housing Summary

These four projects represent the housing strategies that Pender County indicated are the highest priority to address. Additional details on the projects can be found below:

- Immediate Housing Assistance:** This project would address immediate housing needs by acquiring trailer homes to provide housing for residents who are still displaced. The County has estimated there are approximately 15 households still in need of housing assistance due to Hurricane Matthew and would like to provide temporary housing to displaced residents.

## Provide Immediate Housing Assistance

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 2-3 months

**Location:** Pender County

**Project Summary:** Provide approx. 15 trailers for immediate housing assistance for those residents still displaced. Trailers will be placed in non-SFHA areas and bring back some of the tax base that's been displaced.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Residents are still displaced and living with relatives some having completely left the county. This will encourage those residents to return while still waiting for their homes to be rebuilt and provide a boost to the local economy. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | This project will encourage residents to return to the county and increase the tax base and those contributing to the local economy.  | N/A         |
| For how long will this solution be effective?   | Less than 10 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | none  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$251K - \$500K   | N/A         |
| What is the level of public support for this project?   | High  | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | County  | N/A         |

- **Increase Housing Stock:** This project would address immediate and future housing needs through the acquisition of additional housing stock. The County would like to be more independent and resourceful in providing temporary housing for future flooding which could come in the form of new hotels, motels, and/or apartments.



## Increase Housing Stock

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 0-3 years

**Location:** Pender County

**Project Summary:** Increase long term housing stock outside of the floodplain with trailers (15 proposed for immediate and long term needs), hotels, motels, and apartments.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | In the aftermath of Hurricane Matthew many residents had to leave the county due to the lack of temporary housing. This will provide rental properties and/or temporary housing in order to keep residents within the County until their homes are rebuilt or repaired. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Additional housing can attract more tourists (more places to rent) and boost the economy.   | N/A         |
| For how long will this solution be effective?   | Between 31 and 50 years   | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | Unknown   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Possibly remove wooded areas in order to build new housing.   | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$1M+   | N/A         |
| What is the level of public support for this project?   | High  | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | Local   | N/A         |

- **Address Unmet Needs:** This project would provide funds to residents who have not received sufficient funds to cover the complete cost of their home repairs. The County has estimated that there are 70 residential properties where the current payout received by the owner was not enough to cover the repair costs.

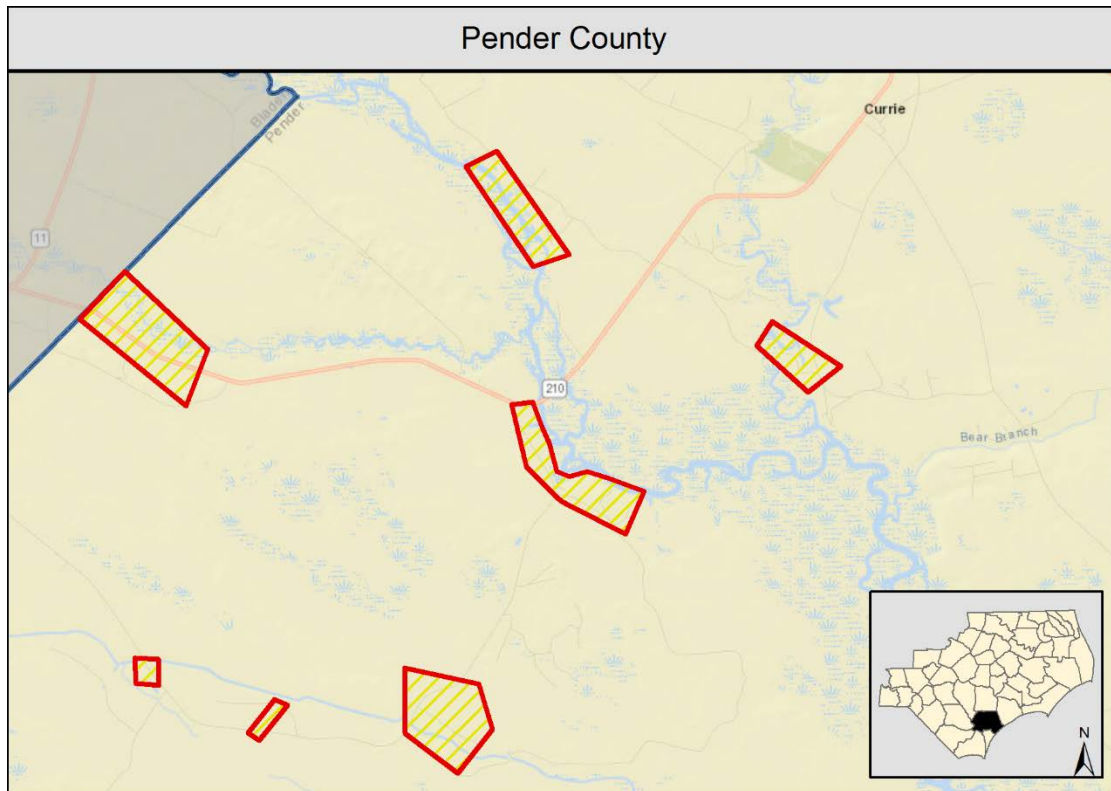


Figure 15. Housing Action 03 - Address Unmet Needs

## Address Unmet Needs

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 2-3 months

**Location:** Pender County

**Project Summary:** Provide additional funds to an estimated 70 residents/properties where the current payouts received do not cover the complete cost to repair/rebuild. Flagged residences/properties have an estimated \$500 or more in unmet needs.

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Several residents are still displaced or unable to fully repair their homes due to lack of funds from original assistance sources. This will provide those additional funds to help residents fully recover from the effects of Hurricane Matthew. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Support of repair cost of unmet needs.   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | This will bring tax payers back to the county and boost the local economy.   | N/A         |
| For how long will this solution be effective?   | Less than 10 years   | N/A         |
| How effective is the risk reduction?  | Unknown  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0  | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown  | N/A         |
| What impact will this action have on the local economy/tax base?  | Less than 25%  | N/A         |
| What impacts to the environment of the county will result from this project?                                  |  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown  | N/A         |
| What is the financial range of this project?  | \$501K - \$1M  | N/A         |
| What is the level of public support for this project?   | High   | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | State  | N/A         |

- Acquire/Elevate Floodprone Structures:** This project would use funding to develop a program to assess and identify the best solution for widespread flooding of homes and continual flood risk in residential communities. The County would like to include the options of elevation, reconstruction, and/or acquisition as a part of this study. The County has estimated 460 non-coastal and 740 coastal buildings with first floor elevations more than half a foot below the base flood elevation.

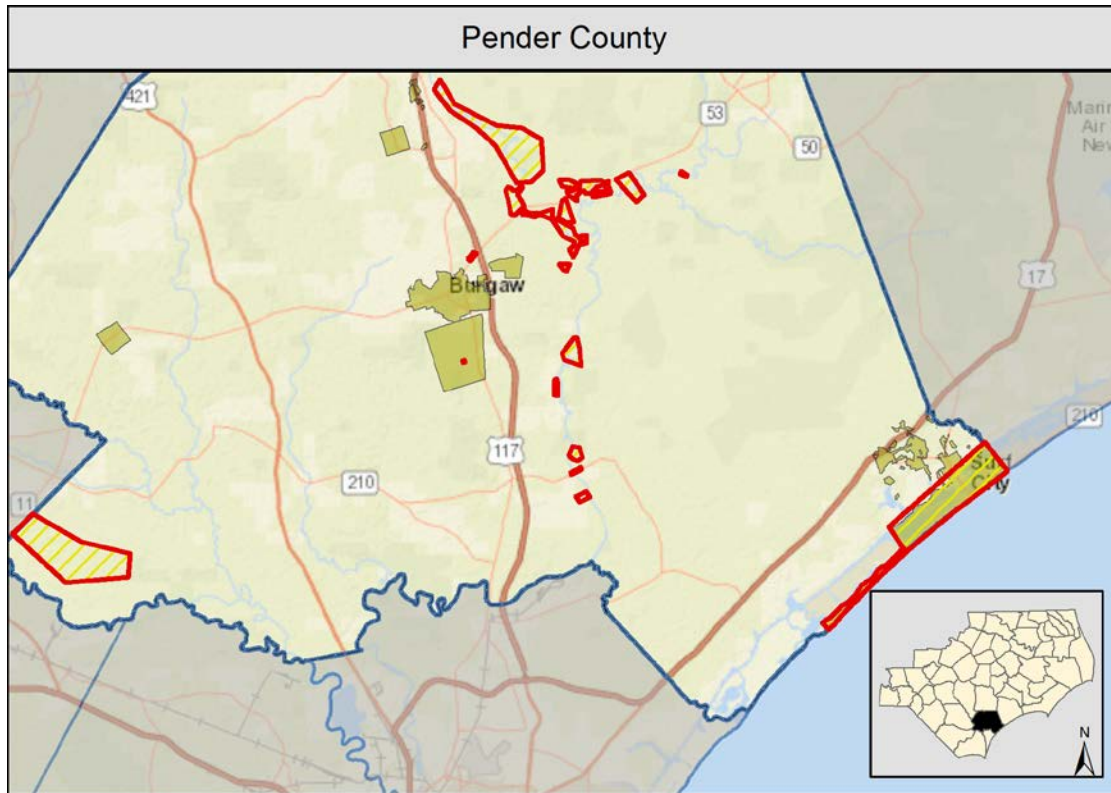


Figure 16. Housing Action 04 - Acquire/Elevate Floodprone Structures



## Acquire/Elevate Floodprone Structures/Properties

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 1-5 years

**Location:** Various locations throughout Pender County

**Project Summary:** Elevate or acquire approximately 1,200 buildings with first floor elevations more than half a foot below the BFE. Of the 1,200 identified buildings, approximately 740 of those are along the coast in Surf City and Topsail Beach.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | This will reduce or remove flood risk for homes that flooded in the hurricane.  | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Reduces flood risk which is consistent with initiatives identified in the Hazard Mitigation Plan  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Acquisition of homes may lead to some loss of the current tax base however if homes can be elevated the county tax base will be retained. | N/A         |
| For how long will this solution be effective?   | More than 50 years  | N/A         |
| How effective is the risk reduction?  | 100-200 year event  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Possibly expand natural floodplain areas if properties are acquired.  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$1M+   | N/A         |
| What is the level of public support for this project?   | High  | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | County  | N/A         |

### Medium Priority Housing Strategies

| Pillar  | Action Name   | Priority | Overall Ranking |
|---------|---|----------|-----------------|
| Housing | Pender Housing Action 05: Enhance Public Outreach Program | Medium   | 10              |

**Table 8. Pender Medium Priority Housing Summary**

This project represents the housing strategy that Pender County indicated is of a medium priority to address. Additional details on the project can be found below:

- Enhance Public Outreach Program:** This project would provide additional outreach to educate the community on the availability of flood insurance as well as the steps to take to receive money to rebuild after a flood event. Funding for this strategy would be applied towards: targeted mailings, multi-media Ad campaigns, and community workshops.

## Enhance Public Outreach Program

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 1 year

**Location:** Pender County

**Project Summary:** Provide additional outreach to educate the community on the availability of flood insurance as well as the steps to take to receive money to rebuild after a flood event. Funding for this strategy would be applied towards: targeted mailings, multi-media Ad campaigns, and community workshops.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Many residents affected by flooding from Hurricane Matthew did not have flood insurance and were not aware of assistance options. This would encourage more residents in high risk areas to obtain flood insurance as well as provide information on assistance options in the case of a future flooding event. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Consistent with initiatives in Hazard Mitigation Plan to inform residents on outreach   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | None  | N/A         |
| For how long will this solution be effective?   | Between 11 and 30 years   | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | None  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$51K - \$100K  | N/A         |
| What is the level of public support for this project?   | Medium  | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | County  | N/A         |

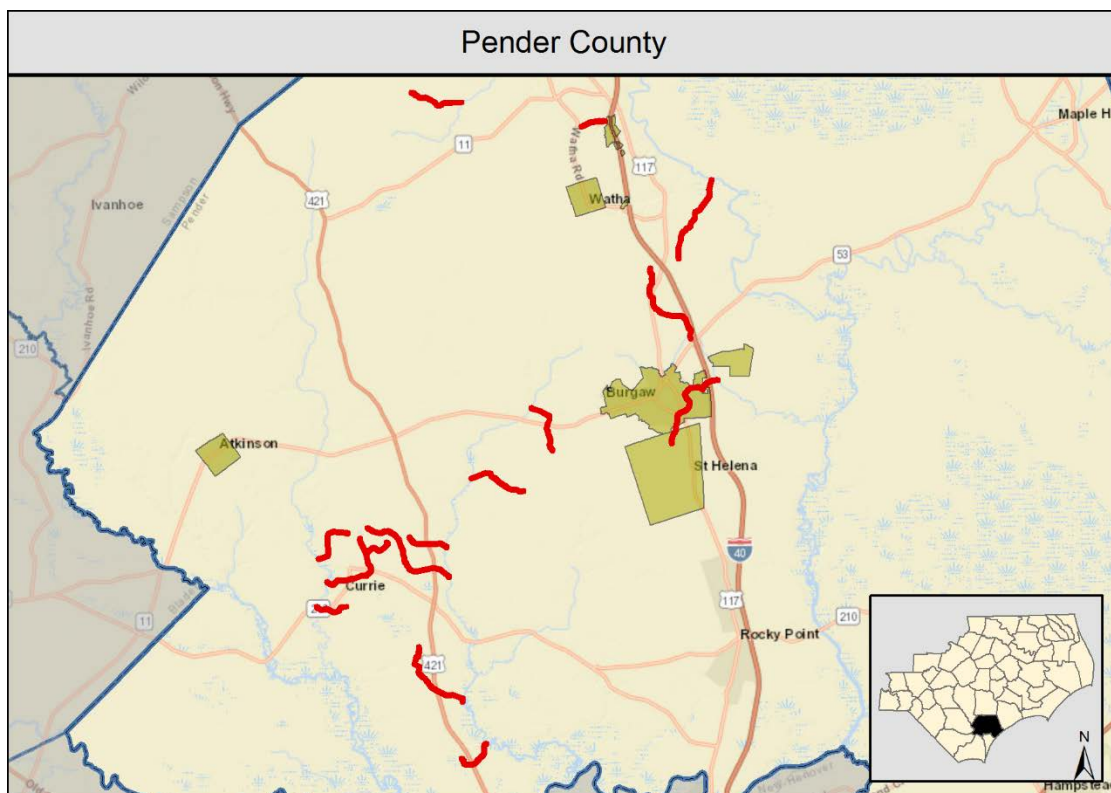
## Low Priority Housing Strategies

| Pillar  | Action Name  | Priority | Overall Ranking |
|---------|--|----------|-----------------|
| Housing | Pender Housing Action 06: Develop Flood Hazard Information for Unmapped Floodprone Areas | Low      | 12              |

**Table 9. Pender Low Priority Housing Summary**

This project represents the housing strategy that Pender County indicated is of a lower priority to address. Additional details on the project can be found below:

- Develop Flood Hazard Information for Unmapped Floodprone Areas:** The project would include performing flood studies for 17 identified streams in order to further pinpoint and map risk areas within the County so that flood regulations can be applied to these areas along with the FEMA mapped streams.



**Figure 17. Housing Action 06 - Develop Flood Hazard Information for Unmapped Floodprone Areas**



## Develop Flood Hazard Information for Unmapped Flood Prone Areas

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 0-4 years

**Location:** Pender County

**Project Summary:** Perform flood studies for 17 streams to further identify and map risk areas within the County so that flood regulations can be applied to these areas along with the FEMA mapped floodplains.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | This would identify additional areas that are at risk of flooding but are not currently shown on FEMA flood maps. It could encourage more residents that are not in the FEMA floodplain to obtain flood insurance and help local governments implement additional building regulations. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Provides additional communication of flood risk consistent with initiatives in Hazard Mitigation Plan   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | None  | N/A         |
| For how long will this solution be effective?   | Between 11 and 30 years   | N/A         |
| How effective is the risk reduction?  | 100-200 year event  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | No Impact   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | None  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$101K - \$250K   | N/A         |
| What is the level of public support for this project?   | Low   | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | County  | N/A         |

## Economic Development Strategies

### High Priority Economic Development Strategies

There are no high priority economic development strategies in Pender County.

### Medium Priority Economic Development Strategies

| Pillar               | Action Name  | Priority | Overall Ranking |
|----------------------|--|----------|-----------------|
| Economic Development | Pender Economic Development Action 01: Implement Agricultural Recovery | Medium   | 9               |

**Table 10. Pender Medium Priority Economic Development Summary**

This project represents the economic development strategy that Pender County indicated is of a medium priority to address. Additional details on the project can be found below:

- **Agricultural Recovery:** This project would provide funding to build a structure (open-aired barn) with box stalls and an arena to help the County prevent livestock loss with future flooding events, similar to what Sampson County has at their Extension Office. The specific location will be determined later. This strategy will also provide cross-training for first responders to help assist with large livestock transport.

## Implement Agricultural Recovery

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 0-3 years

**Location:** Pender County

**Project Summary:** Build a structure (open-aired barn) with box stalls and an arena to help County prevent livestock loss with future flooding events, similar to what Sampson County has at their Extension Office. The specific location will be determined later. Also, provide cross-training for first responders to help assist with large livestock transport.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | During Hurricane Matthew a couple instances were noted where livestock needed to be evacuated. This project would provide a location strictly for the use of livestock evacuation and care during future storms. This will prevent economic loss through the prevention of the loss of livestock. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Not specifically in existing plans  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | This project can reduce the loss of livestock which will lower economic losses from future flooding events.   | N/A         |
| For how long will this solution be effective?   | More than 50 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 1-3   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Reduce potential of livestock death/pollution during flood events   | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$251K - \$500K   | N/A         |
| What is the level of public support for this project?   | Medium  | N/A         |
| What is the technical feasibility of this project?  | Between 51 and 75%  | N/A         |
| Who will administer this project?   | County  | N/A         |

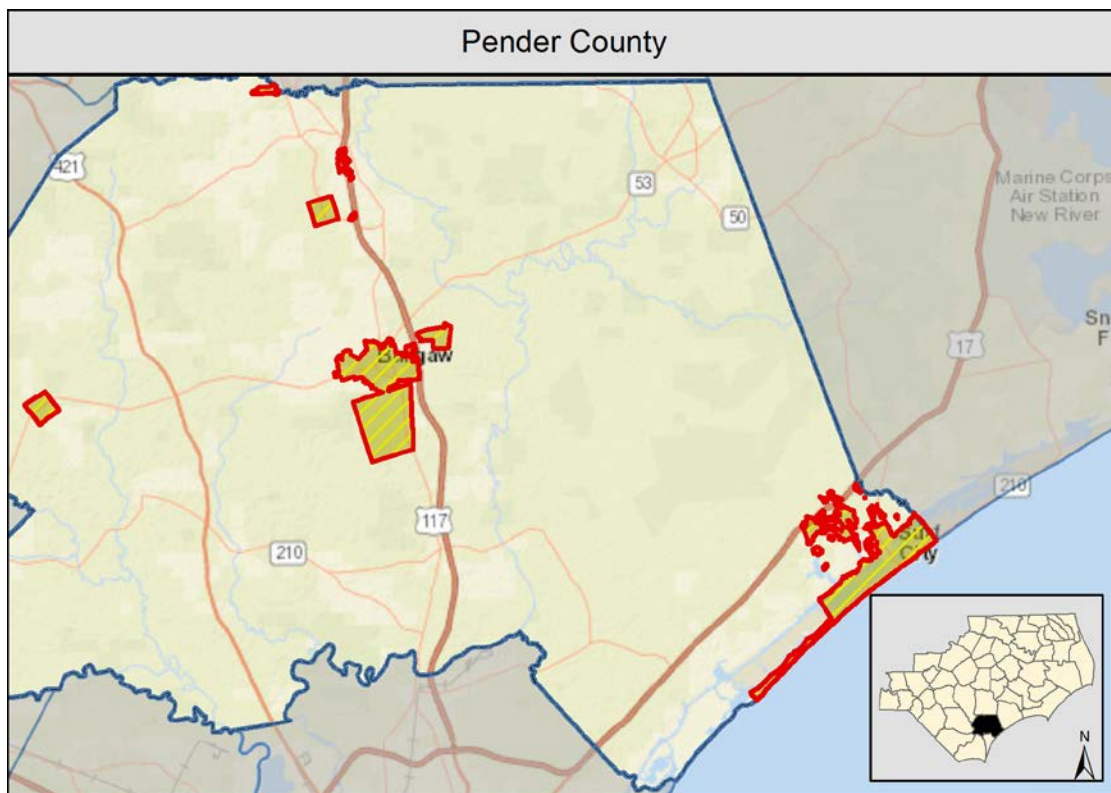
## Low Priority Economic Development Strategies

| Pillar               | Action Name  | Priority | Overall Ranking |
|----------------------|--|----------|-----------------|
| Economic Development | Pender Economic Development Action 03: Implement Downtown Rehabilitation/Revitalization Projects | Low      | 16              |
| Economic Development | Pender Economic Development 02: Enhance Tourism Outreach Program                                 | Low      | 17              |

**Table 11. Pender Low Priority Economic Development Summary**

These two projects represent the economic development strategies that Pender County indicated are of a low priority to address. Additional details on the projects can be found below:

- Downtown Rehabilitation/Revitalization:** This project would provide funding to elevate businesses in downtown areas (Towns of Atkinson, Burgaw, Surf City, Topsail Beach, Wallace, and Watha and the Village of Saint Helena) to reduce loss of inventory, reduce risk from future flooding events, and encourage tourism.



**Figure 18. Economic Development Action 03 - Downtown Rehabilitation/Revitalization**



## Implement Downtown Rehabilitation/Revitalization Projects

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 1-3 years

**Location:** Pender County

**Project Summary:** Revitalize businesses in downtown areas (Towns of Atkinson, Burgaw, Surf City, Topsail Beach, Wallace, and Watha and the Village of Saint Helena) to reduce loss of inventory, reduce risk from future flooding events, and encourage tourism. Revitalization would include improvements to buildings/infrastructure (e.g. elevation, upsize, etc.) to reduce flood potential.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Businesses that were affected by flooding will further be able to recover which will increase the number of jobs in the County. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Consistent with general intent of current economic development plan   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Increase jobs within the county and improve tourism.  | N/A         |
| For how long will this solution be effective?   | More than 50 years  | N/A         |
| How effective is the risk reduction?  | 100-200 year event  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Between 26 and 50%  | N/A         |
| What impacts to the environment of the county will result from this project?                                  | None  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$1M+   | N/A         |
| What is the level of public support for this project?   | Minimum   | N/A         |
| What is the technical feasibility of this project?  | Unknown   | N/A         |
| Who will administer this project?   | Local   | N/A         |

- **Enhance Tourism Outreach Program:** This project will provide funds for tourism related marketing in order to increase local economies. Funds will be applied towards a marketing consultant to develop multi-media Ad campaigns (TV, radio, social media, brochures, etc.) and County branding, increased signage, and/or staff.

## Enhance Tourism Outreach Program

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 0-1 years

**Location:** Pender County

**Project Summary:** Provide funds for tourism related marketing to increase local economies. Funds will be applied towards a marketing consultant to develop multi-media Ad campaigns (TV, radio, social media, brochures, etc.) and County branding, increased signage, and/or staff.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Lack of housing stock was stressed as a significant challenge during flooding events. Increased tourism would increase the housing stock that could then be used as temporary housing for future flooding events. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Would support existing tourism initiatives  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Increased tourism would provide a boost to the local economy and create jobs.   | N/A         |
| For how long will this solution be effective?   | Less than 10 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | None  | N/A         |
| What is the capability of the local government to administer this project?                                    | Medium  | N/A         |
| What is the financial range of this project?  | \$101K - \$250K   | N/A         |
| What is the level of public support for this project?   | Minimum   | N/A         |
| What is the technical feasibility of this project?  | Higher than 75%   | N/A         |
| Who will administer this project?   | County  | N/A         |

## Infrastructure Strategies

### High Priority Infrastructure Strategies

There are no high priority economic development strategies in Pender County.

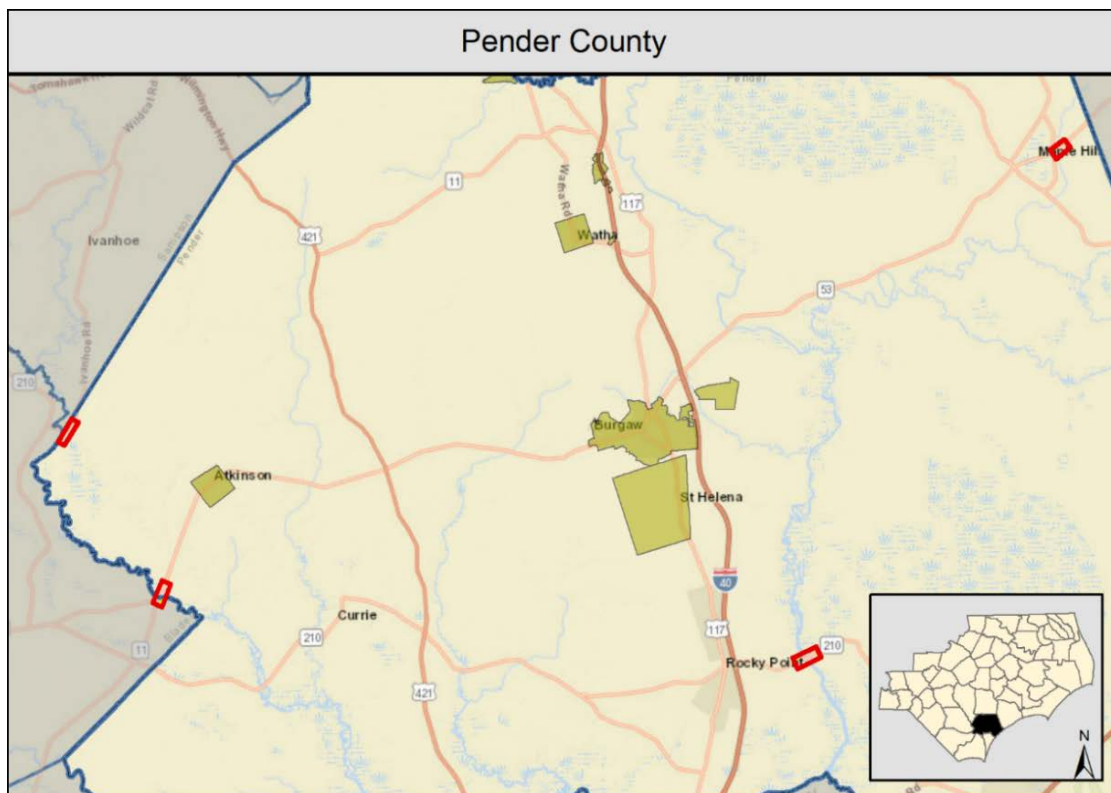
### Medium Priority Environmental Strategies

| Pillar         | Action Name  | Priority | Overall Ranking |
|----------------|--|----------|-----------------|
| Environment    | Pender Environment Action 02: Expand Recreational Lands and Preserve Floodplains | Medium   | 8               |
| Infrastructure | Pender Infrastructure Action 01: Implement Drainage Maintenance                  | High     | 6               |

**Table 12. Pender High Priority Infrastructure Summary**

These three projects represent the infrastructure strategies that Pender County indicated are the highest priority to address. Additional details on the projects can be found below:

- **Install/Improve Flood Warning System:** This project will involve the installation of 4 gages to be a part of the FIMAN gage/warning system (2 along Black River, 1 each along Northeast Cape Fear River and Moores Creek). There is currently only one stream gage located within the County.



**Figure 19. Infrastructure Action 03 - Install/Improve Flood Warning System**



## Install/Improve Flood Warning System

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** Immediately

**Location:** Black River, Northeast Cape Fear River, and Moores Creek

**Project Summary:** Install 4 gages (2 along Black River and 1 each along Northeast Cape Fear River and Moores Creek near Atkinson) as part of the FIMAN network.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | There's currently only one gage within the County as part of the FIMAN network. This will provide early warning of future flooding to a larger portion of the population. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | With advanced flood warnings livestock can be evacuated and prevent economic loss.  | N/A         |
| For how long will this solution be effective?   | More than 50 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 4-6   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown   | N/A         |
| What impacts to the environment of the county will result from this project?                                  |   | N/A         |
| What is the capability of the local government to administer this project?                                    | Minimum   | N/A         |
| What is the financial range of this project?  | \$101K - \$250K   | N/A         |
| What is the level of public support for this project?   | High  | N/A         |
| What is the technical feasibility of this project?  | Higher than 75%   | N/A         |
| Who will administer this project?   | State   | N/A         |

- **Implement Drainage Maintenance:** This project would provide funds to implement ditch maintenance to clear the approximately 950 + miles of ditches along roads within the County. There are also an estimated 160 structure crossings (bridge/culvert) that can be cleared as part of drainage maintenance.

## Implement Drainage Maintenance

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** Immediately

**Location:** Pender County

**Project Summary:** Implement ditch maintenance to clear the approximately 950 + miles of ditches along roads within the County. There are also an estimated 160 structure crossings (bridge/culvert) that can be cleared as part of drainage maintenance.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | This will alleviate flooding along roads in the County that flood easily due to un-maintained drainage structures and ditches which can reduce the risk to buildings due to large and small storm events. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               |   | N/A         |
| For how long will this solution be effective?   | Less than 10 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | No Impact   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Flooding impact mitigation prevents the discharge of potentially toxic material typically found in storm/runoff waters and the destruction of environmental habitats.                                     | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown   | N/A         |
| What is the financial range of this project?  | \$101K - \$250K   | N/A         |
| What is the level of public support for this project?   | High  | N/A         |
| What is the technical feasibility of this project?  | Between 51 and 75%  | N/A         |
| Who will administer this project?   | State   | N/A         |

- **Implement Drainage Improvements:** This project would provide funds to implement drainage improvements (i.e. install ditches, pipes, and other drainage infrastructure) to mitigate/reduce localized flooding in the 18 identified areas. Funding for this strategy would include hiring an engineering consultant to develop a drainage master plan with specific improvements.

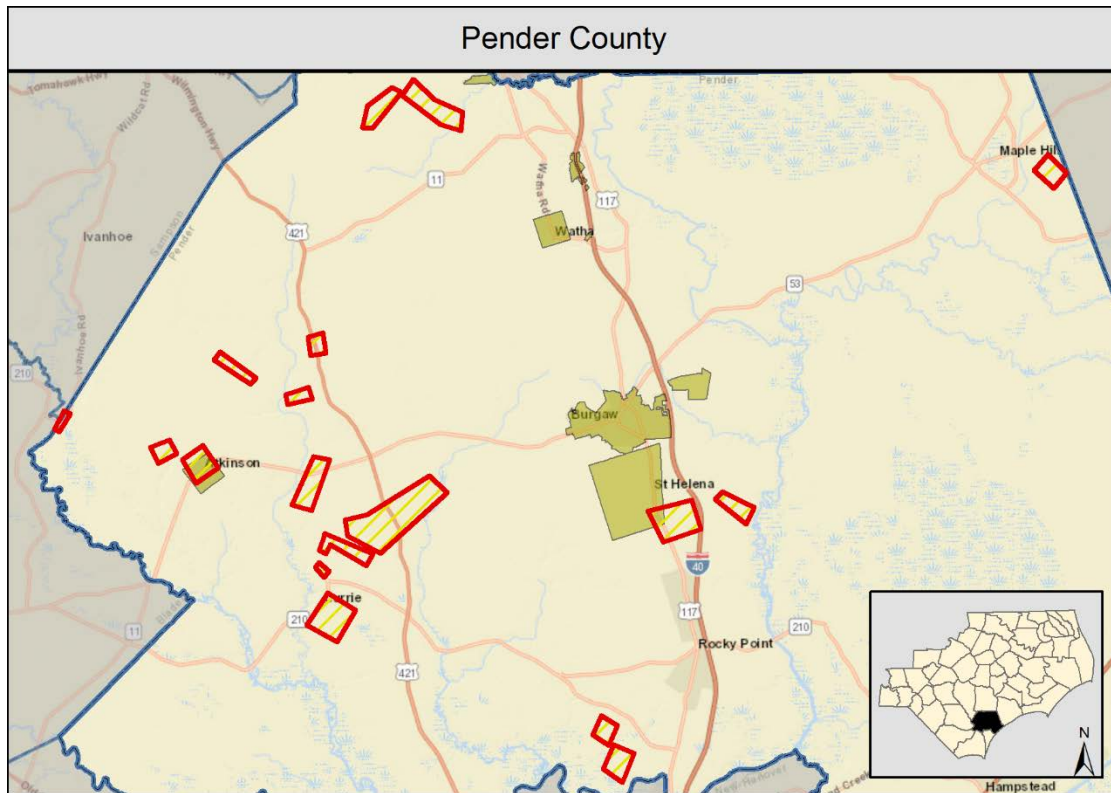


Figure 20. Infrastructure Action 02 - Implement Drainage Improvements



## Implement Drainage Improvements

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 1-2 years

**Location:** Pender County

**Project Summary:** Implement drainage improvements (i.e. install ditches, pipes, and other drainage infrastructure) to mitigate/reduce localized flooding in the 18 identified areas. Funding for this strategy would include hiring an engineering consultant to develop drainage master plan with specific improvements.

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Drainage improvements will help reduce flooding risk from lower frequency events to housing and other critical community facilities .                          | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Improvements to the drainage infrastructure of the county will provide greater resiliency by mitigating impacts to critical facilities businesses and housing. | N/A         |
| For how long will this solution be effective?   | Between 31 and 50 years  | N/A         |
| How effective is the risk reduction?  | Unknown  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | >6   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown  | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown  | N/A         |
| What impacts to the environment of the county will result from this project?                                  |  | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown  | N/A         |
| What is the financial range of this project?  | \$501K - \$1M  | N/A         |
| What is the level of public support for this project?   | High   | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | County   | N/A         |

## Medium Priority Infrastructure Strategies

There are no medium priority infrastructure strategies in Pender County.

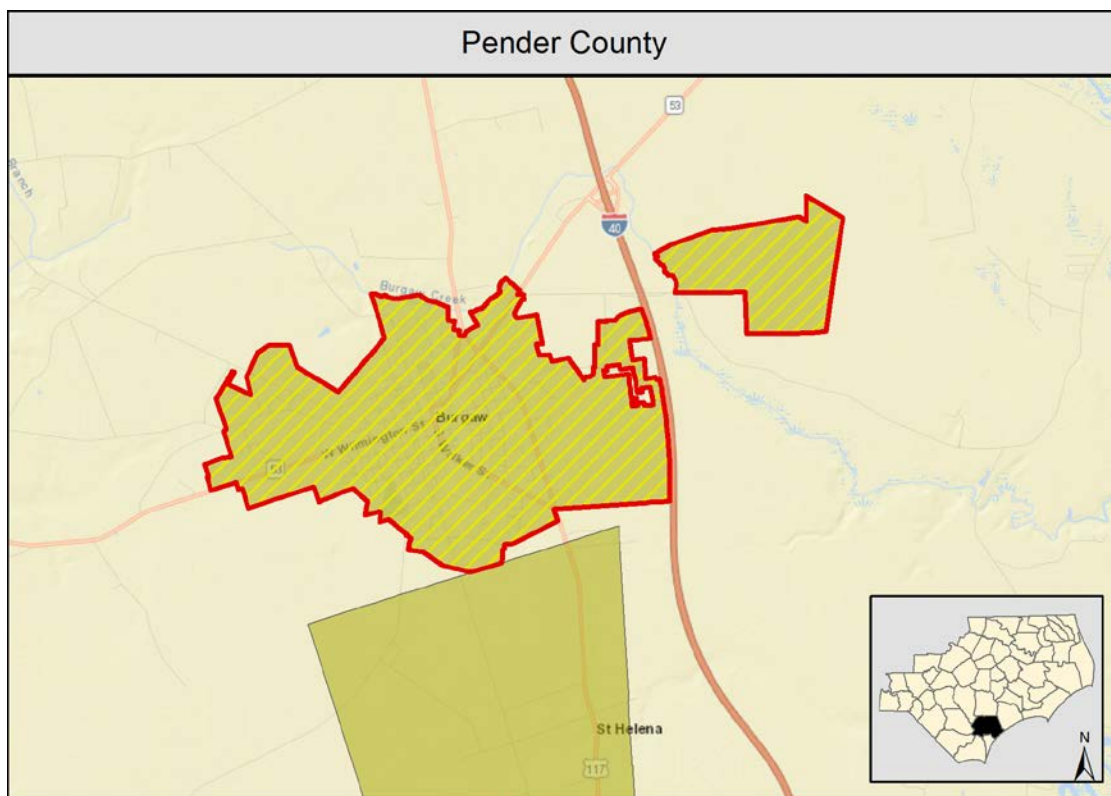
## Low Priority Infrastructure Strategies

| Pillar         | Action Name  | Priority | Overall Ranking |
|----------------|--|----------|-----------------|
| Infrastructure | Pender Infrastructure Action 04: Acquire Additional Rescue Equipment | Low      | 13              |
| Infrastructure | Pender Infrastructure Action 05: Acquire Backup Generators           | Low      | 14              |

**Table 13. Pender Low Priority Infrastructure Summary**

These two projects represent the infrastructure strategies that Pender County indicated are of a lower priority to address. Additional details on the projects can be found below:

- Acquire Additional Rescue Equipment:** This project would provide funds to acquire additional rescue equipment so that the County isn't waiting for State assets in emergency situations. Funding for this strategy would be applied towards equipment such as: boats, search lines, rescue packs, rescue shears, etc.



**Figure 21. Infrastructure Action 04 - Acquire Additional Rescue Equipment**

## Acquire Additional Rescue Equipment

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 1 year

**Location:** Pender County

**Project Summary:** Acquire additional rescue equipment so that the County isn't waiting for State assets in emergency situations. Funding for this strategy would be applied towards equipment such as boats, search lines, rescue packs, rescue shears, etc.

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | While the County has access to state assets (boats) the time to receive these assets is long and reduces the response time of emergency responders trying to reach residents. County assets would provide faster response time for future flooding events. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | None   | N/A         |
| For how long will this solution be effective?   | Between 11 and 30 years  | N/A         |
| How effective is the risk reduction?  | Unknown  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 1-3  | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown  | N/A         |
| What impact will this action have on the local economy/tax base?  | No Impact  | N/A         |
| What impacts to the environment of the county will result from this project?                                  | None   | N/A         |
| What is the capability of the local government to administer this project?                                    | High   | N/A         |
| What is the financial range of this project?  | \$51K - \$100K   | N/A         |
| What is the level of public support for this project?   | Low  | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | County   | N/A         |

- **Acquire Backup Generator:** This project would use funds to acquire backup generators for use at critical care facilities and nursing homes. This will ensure essential facilities and services are available during the next storm event.

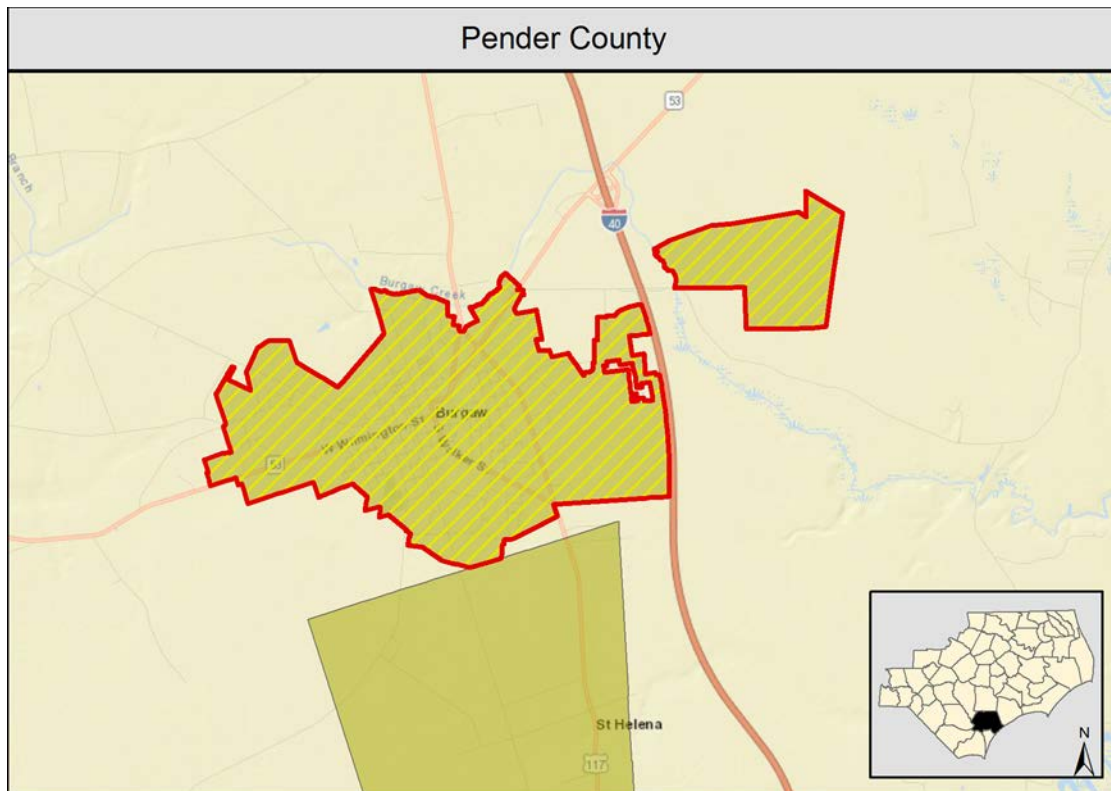


Figure 22. Infrastructure Action 05 - Acquire Backup Generator

## Acquire Backup Generators

**County:** Pender

**Priority Grouping:**

**Priority Ranking:**

**Project Timeframe:** 0-1 year

**Location:** Pender County

**Project Summary:** Acquire backup generators to provide electricity to critical care facilities and nursing homes.

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | This will reduce the number of residents/critical facilities negatively affected by power outages cause by future flooding events. | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    |  | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               |  | N/A         |
| For how long will this solution be effective?   | Less than 10 years   | N/A         |
| How effective is the risk reduction?  | Unknown  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 1-3  | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown  | N/A         |
| What impact will this action have on the local economy/tax base?  | No Impact  | N/A         |
| What impacts to the environment of the county will result from this project?                                  |  | N/A         |
| What is the capability of the local government to administer this project?                                    | High   | N/A         |
| What is the financial range of this project?  | \$51K - \$100K   | N/A         |
| What is the level of public support for this project?   | Low  | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | County   | N/A         |



## Environmental, Ecosystem and Agricultural Strategies

### High Priority Environmental Strategies

There are no high priority environmental strategies in Pender County.

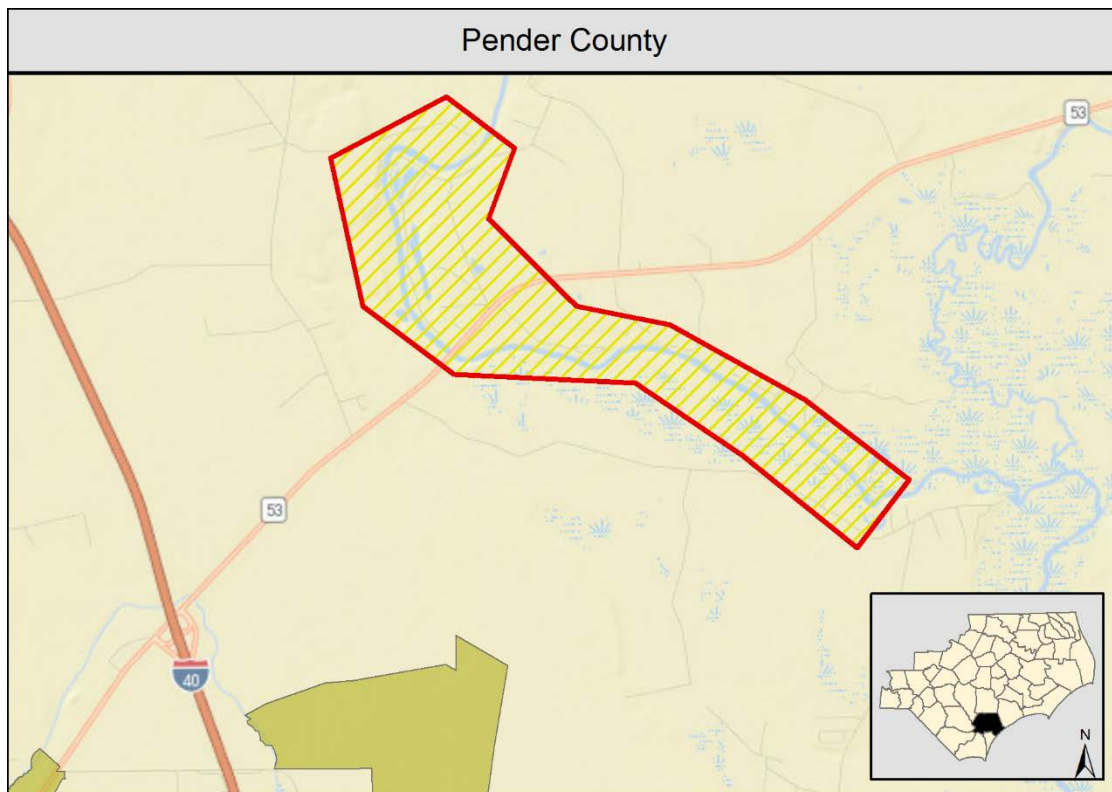
### Medium Priority Environmental Strategies

| Pillar      | Action Name  | Priority | Overall Ranking |
|-------------|--|----------|-----------------|
| Environment | Pender Environment Action 02: Expand Recreational Lands and Preserve Floodplains | Medium   | 8               |
| Environment | Pender Environment Action 01: Implement Stream Restoration Projects              | Medium   | 11              |

**Table 14. Pender Medium Priority Environmental Summary**

These two projects represent the environmental strategies that Pender County indicated are of a medium priority to address. Additional details on the projects can be found below:

- Expand Recreational Lands and Preserve Floodplains:** This project would provide funding to acquire approximately 130 buildings along Northeast Cape Fear River (upstream and downstream of NC Highway 53) that have first floors elevations more than a half foot below the BFE in order to remove homes from flood risk expand the natural floodplain in that area.



**Figure 23. Environment Action 02 - Expand Recreational Lands and Preserve Floodplains**

## Expand Recreational Lands and Preserve Floodplains

**County:** Pender

**Priority Grouping:**

**Priority Ranking:** 0

**Project Timeframe:** 1-3 years

**Location:** Pender County

**Project Summary:** Acquire 130 buildings along Northeast Cape Fear River (upstream and downstream of NC Highway 53) that have first floors elevations more than a half foot below the BFE in order to expand the natural floodplain in that area.

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Removed buildings from floodplain that were affected by Hurricane Matthew and increase natural flooding areas for future storm events.   | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Intend to work in conjunction with acquisition which supports overall hazard mitigation plan of reducing flood risk and preserving/enhancing natural benefits of floodplain areas. | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | Buyouts could remove tax payer from the County if residents do not relocate within the County.   | N/A         |
| For how long will this solution be effective?   | More than 50 years   | N/A         |
| How effective is the risk reduction?  | >200 year event  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0  | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Low to moderate confidence   | N/A         |
| What impact will this action have on the local economy/tax base?  | Less than 25%  | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Natural flooding areas will be expanding and flooding risk to residents will be reduced.   | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown  | N/A         |
| What is the financial range of this project?  | \$1M+  | N/A         |
| What is the level of public support for this project?   | Medium   | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | County   | N/A         |

- **Implement Stream Restoration Projects:** This project would provide funding to implement stream restoration, including but not limited to debris removal, streambank stabilization, and naturalization of channel. Specific locations identified by local County officials include Angola Creek, Northeast Cape Fear River, and Rockfish Creek along the border with Duplin County. In addition, areas along Black River where residential homes experienced backed up water would also benefit from stream restoration.

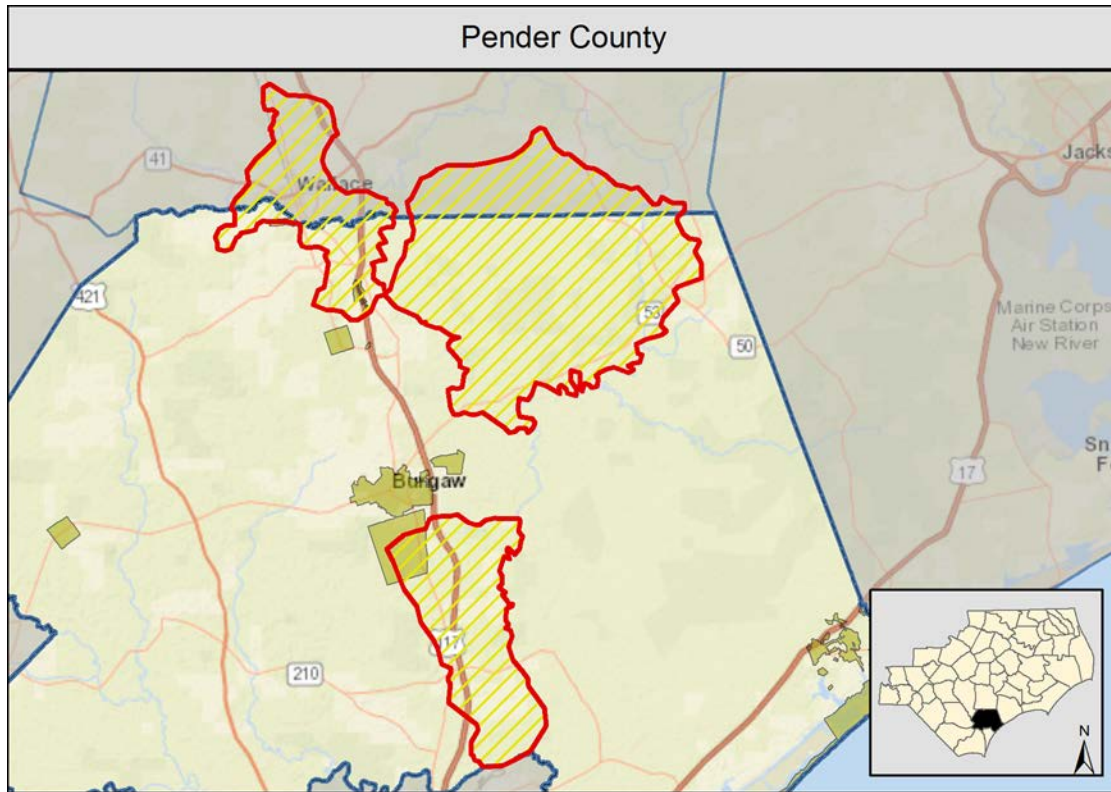


Figure 24. Environment Action 01 - Implement Stream Restoration Projects

## Implement Stream Restoration Projects

**County:** Pender

**Priority Grouping:**

**Priority Ranking:** 0

**Project Timeframe:** 1-3 years

**Location:** Northeast Cape Fear River, Angola Creek, Rock Fish Creek

**Project Summary:** Implement stream restoration projects within Angola Creek, Northeast Cape Fear River, and Rockfish Creek to address issues identified in Cape Fear River Basin Restoration Priorities Report (NCDEQ, 2009).

| Question  | Response   | Disposition |
|---|--|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Potentially reduce future flooding in areas affected by Hurricane Matthew.   | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | Cape Fear River Basin Restoration Priorities Report (NCDEQ 2009)   | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes  | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes  | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               |  | N/A         |
| For how long will this solution be effective?   | Between 31 and 50 years  | N/A         |
| How effective is the risk reduction?  | Unknown  | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0  | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No   | N/A         |
| Is this project consistent with Federal Laws  | Yes  | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | Unknown  | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown  | N/A         |
| What impact will this action have on the local economy/tax base?  | Unknown  | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Stream restoration will improve channel stability address water quality issues and potentially provide flood reduction | N/A         |
| What is the capability of the local government to administer this project?                                    | Unknown  | N/A         |
| What is the financial range of this project?  | \$501K - \$1M  | N/A         |
| What is the level of public support for this project?   | Medium   | N/A         |
| What is the technical feasibility of this project?  | Unknown  | N/A         |
| Who will administer this project?   | County   | N/A         |

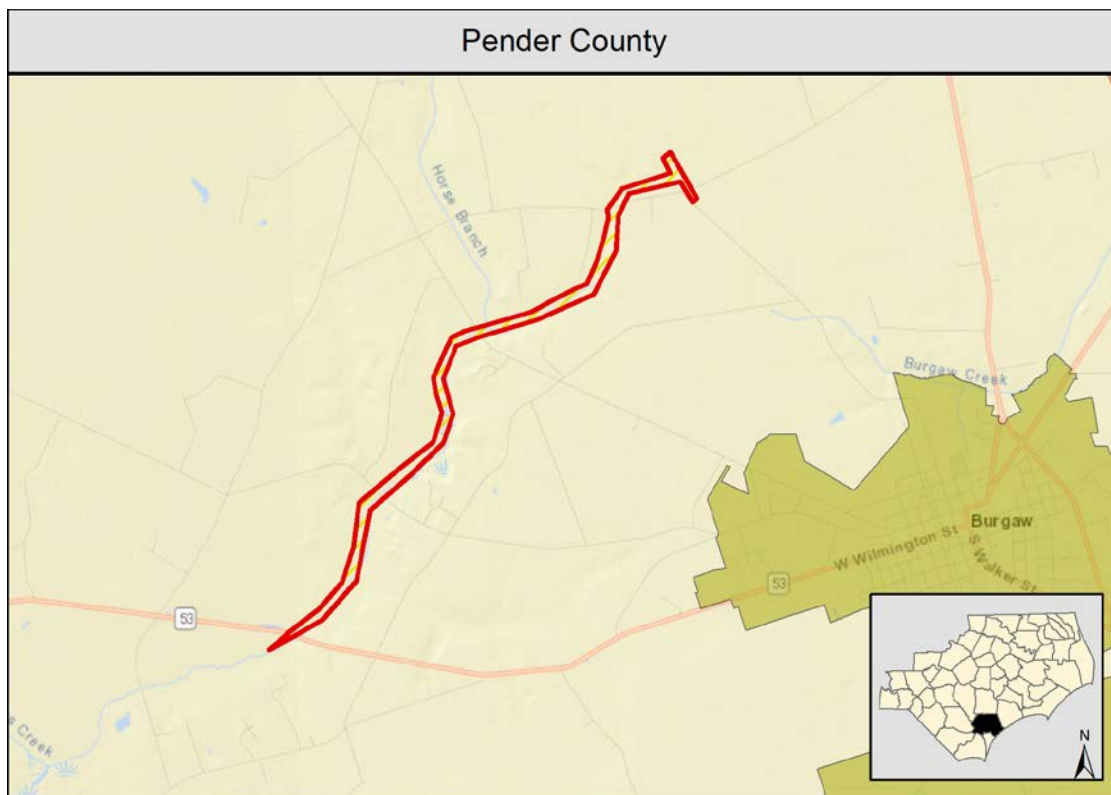
## Low Priority Environmental Strategies

| Pillar      | Action Name  | Priority | Overall Ranking |
|-------------|--|----------|-----------------|
| Environment | Pender Environment Action 03: Public Outreach on Beaver Management Program | Low      | 15              |

**Table 15. Pender Low Priority Environmental Summary**

This project represents the environmental strategy that Pender County indicated is of a lower priority to address. Additional details on the project can be found below:

- **Public Outreach on Beaver Management Program:** This project would provide funding for outreach to educate communities on the availability of the Beaver Management Program as well as the negative impacts of beaver dams.



**Figure 25. Environment Action 03 - Public Outreach on Beaver Management Program**



## Public Outreach on Beaver Management Program

**County:** Pender

**Priority Grouping:**

**Priority Ranking:** 0

**Project Timeframe:** 1 year

**Location:** Pender County

**Project Summary:** Provide outreach to educate communities on the availability of the Beaver Management Program as well as the negative impacts of beaver dams.

| Question  | Response  | Disposition |
|---|---|-------------|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.   | Beaver Management Program Education will help inform residents on the availability of this program as well as the negative impacts beaver dams continue to have during flooding events.   | N/A         |
| Consistent with existing plans (describe points of intersection/departure)                                    | The County already has a Beaver Management Program to help keep channels clear from beaver dams. However they expressed at meetings that many private citizens do not understand potential impacts beaver dams have on flooding so wanted to add education component. | N/A         |
| Does this project comply with existing Local and State authority (codes, plan and ordinance)?                 | Yes   | N/A         |
| Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?                          | Yes   | N/A         |
| Explain any benefits or impacts to the economy of the county from this project.                               | No anticipated economic benefits  | N/A         |
| For how long will this solution be effective?   | Less than 10 years  | N/A         |
| How effective is the risk reduction?  | Unknown   | N/A         |
| How many public facilities are involved in this project (buildings and infrastructure)?                       | 0   | N/A         |
| Is coordination with other communities/counties needed to complete this project?                              | No  | N/A         |
| Is this project consistent with Federal Laws  | Yes   | N/A         |
| To what degree does this project adversely impact local floodplain/coastal zone management?                   | No Impact   | N/A         |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown   | N/A         |
| What impact will this action have on the local economy/tax base?  | No Impact   | N/A         |
| What impacts to the environment of the county will result from this project?                                  | Clear channel to reduce flooding/restore natural flooding areas.  | N/A         |
| What is the capability of the local government to administer this project?                                    | Medium  | N/A         |
| What is the financial range of this project?  | \$0- \$50K  | N/A         |
| What is the level of public support for this project?   | Minimum   | N/A         |
| What is the technical feasibility of this project?  | Higher than 75%   | N/A         |
| Who will administer this project?   | County  | N/A         |

## Summary

Implementation has already begun for some of these actions but for those that have not already been funded, the State of North Carolina will begin a process of prioritizing the actions and seeking to match a funding stream to each action. Those that are not matched with a funding source will be added to the State's Unmet Needs Report. Funding for Unmet Needs will be sought through additional funding from Congress and from the North Carolina General Assembly. Any action that cannot be matched to a funding source should be incorporated into the County's Hazard Mitigation Plan for consideration for future funding. It is important to seek to implement as many of these actions as feasible. Doing so will significantly contribute to helping improve the resiliency of North Carolina's communities.