ELEVENMILE CREEK SUB-BASIN WORK PLAN

Elevenmile Creek

NORTHWEST FLORIDA WATERSHEDS PARTNERSHIP PROGRAM
PERDIDO RIVER AND BAY WATERSHED
JANUARY 2026

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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EXECUTIVE SUMMARY

The **Northwest Florida Watersheds Partnership Program (Program)** is a collaborative, multi-party initiative to proactively address critical water resource issues within priority sub-basins of the Northwest Florida Water Management District (District). The Program is being implemented in coordination with local and county governments, regional entities, and other interested parties to maximize effectiveness.

The Elevenmile Creek sub-basin was selected as the priority sub-basin within the Perdido Bay watershed. This work plan describes the sub-basin, the critical water resource issues, and strategies and proposed projects that can be implemented to address these issues.

This sub-basin encompasses 30,986-acres in Northwest Pensacola reaching from Cantonment to Perdido Bay in the Beulah area. Elevenmile Creek is approximately 13 miles long and the sub-basin has an elevation ranging from 189 feet above to –1 foot below sea level. The watershed's predominately rural communities are rapidly urbanizing due to commercial developments such as a large Navy Federal complex housing an estimated 10,000 employees, expansion of the roads to accommodate increased traffic, and the numerous commercial and residential developments completed and under construction to meet housing and shopping demands. The population had increased to 39,077 based on the 2020 census and is estimated to grow another 15% by 2045. The latest land use estimates show that 54% of the watershed is now developed with Urban and Built-up making up 46% and Transportation and Utilities at 8%.

Rapid urbanization of the watershed and the resultant loss of floodplains, riparian buffers and upland habitat have impacted the quality of life, ecosystems, and the resilience of the communities within the watershed. Specific issues needing attention include frequent flooding, water quality impairments, impacts to surface waters from industrial sources and development, and increased protection for groundwater. Some of the greatest challenges leading to these issues include the rate of development, insufficient stormwater treatment and storage, loss of open space and the wastewater treatment issues including both onsite septic treatment systems and central wastewater infrastructure. Water quality impairments include Dissolved Oxygen, Biological Oxygen Demand, Nutrients/Unionized Ammonia, and Fecal Coliform in Elevenmile Creek and Fecal Coliform in Tenmile Creek.

Elevenmile Creek with Navy Federal Complex and Residential Developments

Successful restoration and protection of the Elevenmile Creek sub-basin will involve restoring creek channels and floodplains, improving the quality and size of riparian buffers, addressing the sources of water quality impairments, improving the protection and conservation of water supply resources, improving coordination between restoration partners, and increasing monitoring activities to track and evaluate progress.

Addressing critical water resource issues will require a multi-year effort. Future projects, in addition to those identified within this work plan, will likely be needed to fully address water resource issues and challenges within the Elevenmile Creek sub-basin. Currently proposed projects are detailed in the sub-basin work plan. Many projects provide multiple water resource benefits. As of January 2026, nine projects have been proposed, at an estimated total cost of **$23.85 million**. The current funding need is estimated at **$12.8 million**. Project types include:

- Potable water transmission system improvements
- Floodplain expansion and restoration
- Stormwater system expansion and treatment improvements
- Living shoreline assistance and education

The following document provides an introduction to the Northwest Florida Watersheds Partnership Program (Section I), overview of the Perdido Bay Watershed (Section II), details the characteristics of the Elevenmile Creek sub-basin (Section III), discusses the current issues and challenges (Section IV), the proposed management strategies and projects (Section V), and monitoring, metrics and next steps (Section VI).

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1. INTRODUCTION

The **Northwest Florida Watersheds Partnership Program** is a collaborative, multi-party initiative to proactively address critical water resource issues within priority sub-basins within the Northwest Florida Water Management District (District). While shovel-ready projects will be a high priority for implementation, funding is also anticipated to be available for design, feasibility studies, planning, and, where needed, data collection to determine causes of water resource issues or to track improvements. For the first year of the program, efforts will focus on one priority sub-basin within each of the District's seven major watersheds. The program is being implemented in coordination with local and county governments, regional entities, and other interested parties to maximize effectiveness. Partners include the Florida Department of Environmental Protection; Florida Department of Agriculture and Consumer Services; the Florida Fish and Wildlife Conservation Commission; the Choctawhatchee Basin Alliance; and the three Panhandle Estuary Programs: Pensacola and Perdido Bays, Choctawhatchee Bay, and St. Andrew and St. Joseph Bays.

To select priority sub-basins, objective criteria were developed using best-available geographic information system (GIS) datasets and applied to evaluate and rank the 114 sub-basins within the District's seven major watersheds. Evaluation criteria focused on water quality, aquatic habitat restoration, and water supply and considered factors such as water quality impairments, established total maximum daily loads, population growth, and location within a Water Resource Caution Area or Area of Resource Concern. The highest-ranked candidate sub-basins within each watershed were presented at a series of six public workshops held in October 2025. Input received during the workshops and through on-line surveys, together with information regarding proposed projects, was also utilized in the evaluation process to select a single priority sub-basin within each major watershed. Additional details regarding evaluation process can be found in Appendix A.

The Elevenmile Creek sub-basin was selected as the priority sub-basin within the Perdido River and Bay watershed. This sub-basin encompasses a 30,986-acre rapidly urbanizing area consisting of Elevenmile Creek and its tributaries consisting of several smaller creeks and Hurst Branch. This work plan describes the sub-basin's characteristics, critical water resource issues, and strategies and proposed projects that can be implemented to address these issues.

The goal of this work plan is to provide an integrated framework for a multi-year collaborative effort to improve the environmental resources, ecological functions, and public benefits of the Elevenmile Creek sub-basin.

Specific objectives of the program and this work plan include:

- Describe critical water resource issues, with a focus on water quality, aquatic habitat, and water supply needs,
- Determine strategies and projects needed to address the most critical issues including project costs and funding needs,
- Provide an integrated and holistic approach framework that recognizes and incentivizes projects with multiple resource benefits,

- Secure and leverage funding and associated resources needed to implement priority strategies and projects,
- Protect and improve the quality of waters directly influenced by the Elevenmile Creek watershed, as well as within the larger Perdido River and Bay watershed,
- Enhance, protect and sustain aquatic and wetland habitats with the Elevenmile Creek watershed, together with their economic, recreational, and other societal benefits for the community and for natural systems,
- Enhance the resilience and sustainability of aquatic habitats and water supplies,
- Track project implementation metrics and trends in environmental conditions to monitor and evaluate success and inform an adaptive management approach to enhance strategies and maximize the program's effectiveness.

Accomplishing these objectives will require extensive collaboration and coordination among state and local government agencies, federal agencies, nonprofit organizations, and the private sector to maximize synergy between projects and achieve lower overall restoration costs.

2. Overview of Perdido River and Bay watershed

The focus of this work plan, the Elevenmile Creek watershed, is a component drainage basin (sub-basin) within the Perdido River and Bay Watershed. A watershed is a geographic area of land that drains to a common destination, in this case, to Perdido Bay. The Perdido River and Bay watershed covers more than 1,100 square miles, with approximately 70 percent of the watershed in Alabama and 30 percent in Florida. The Perdido River and Bay watershed, including Alabama's portion, lies within the Gulf Coastal Plain physiographic region characterized by gently rolling hills, sharp ridges, prairies, and alluvial floodplains underlain by sediments of sand, gravel, porous limestone, chalk, marl, and clay (Omernik 1995).

The Florida portion of the watershed contains two localized physiographic regions separated by a relict marine escarpment: the Western Highlands to the north and the Gulf Coastal Lowlands to the south (USDA 2004). The Western Highlands encompass most of the watershed, extending from a height of 378 feet in elevation in Alabama down to a relict marine escarpment near Perdido Bay at an elevation of 100 to 120 feet (Rupert 1993). The rolling hills of the Western Highlands have sandy soils and generally dry conditions, with groundwater emerging from lower slopes to create hillside seepage bogs (Wolfe et al. 1988). A series of gently sloping marine terraces make up the coastal lowlands around Perdido Bay and inland from the Gulf of America (Rupert 1993). A series of sand dunes and beach-ridge systems run along the coast, including Perdido Key dunes, which can reach 45 feet in elevation (Rupert 1993).

Major tributaries in the watershed include Brushy Creek, Boggy Creek, McDavid Creek, Jacks Branch, Elevenmile Creek, Tenmile Creek, and Bayou Marcus Creek in Florida, and Dyas Creek, Hollinger Creek, Styx River, and Blackwater River in Alabama. Among the major features of Perdido Bay are Perdido Key, Innerarity Point, Perdido Bay, Big Lagoon, Tarkiln Bayou, and Wolf Bay.

Upland forests, wetlands, water, and agricultural areas make up 80 percent of the watershed, with developed areas, recreational, open land and institutional areas making up the remaining 20 percent. Both commercial and residential development is rapidly expanding in the watershed, particularly within the Elevenmile Creek sub-basin.

Figure 1. Location of Elevenmile Creek Sub-basin

The Perdido River and Perdido Bay encompasses portions of Escambia and Baldwin counties in Alabama and Escambia County, with both serving as the state line. The Perdido River is approximately 65 miles in length, with 58 miles along the Florida-Alabama border (see Figure 2.1 below). There are no major municipalities within Florida's portion of the watershed, although unincorporated portions of Escambia County and the Pensacola metropolitan area are within the watershed. Municipalities in Alabama include Atmore, Bay Minette, Elberta, Foley, Gulf Shores, Loxley, Orange Beach, Perdido Beach, Robertsdale, Silverhill, and Summerdale.

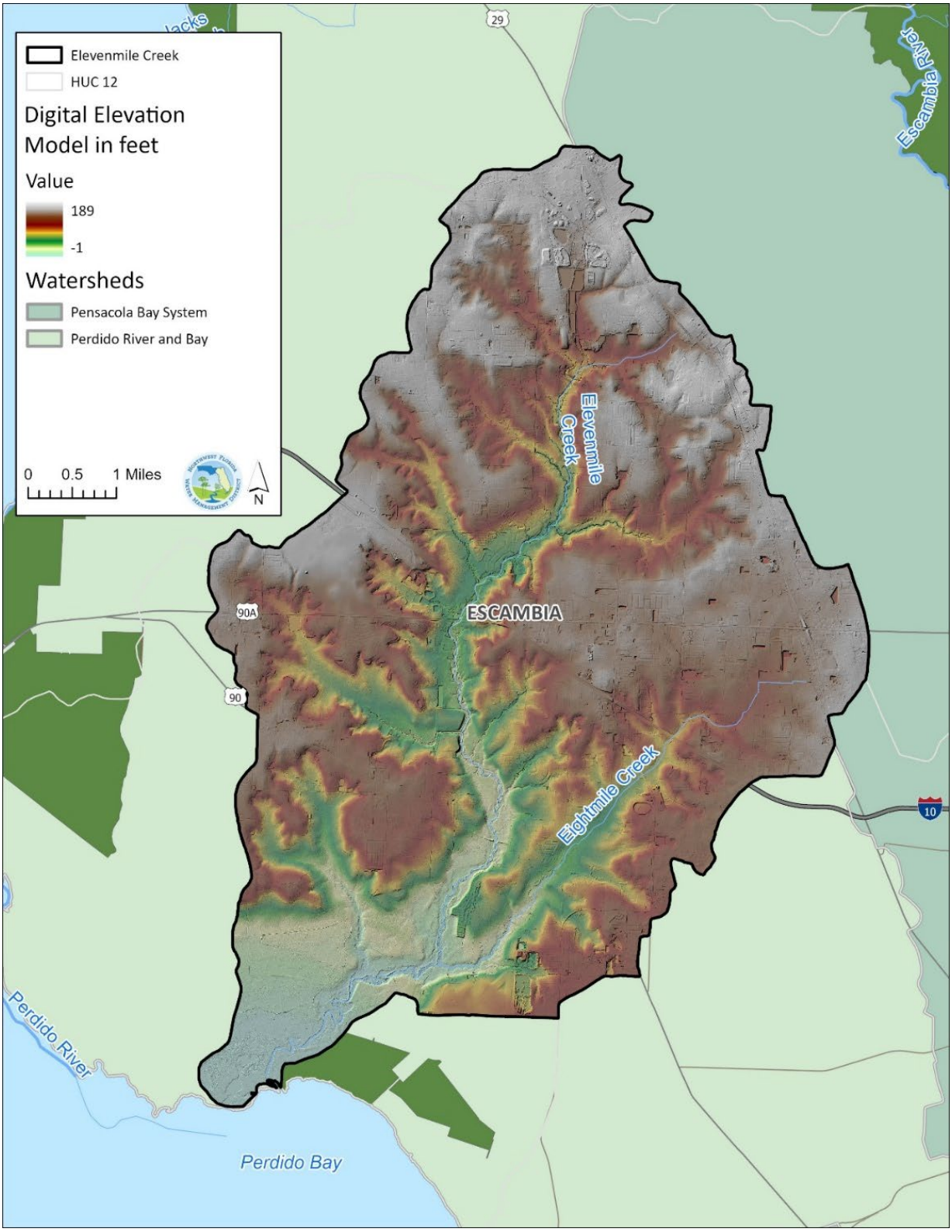

Figure 2. Land Surface Elevations within Elevenmile Creek Sub-basin

3. Perdido River and Bay Sub-basin Characteristics

The Elevenmile Creek watershed sub-basin has a 30,986-acre drainage area that reaches from Cantonment to Perdido Bay **(Figure 3-1)**. Elevenmile Creek is about 13 miles long and the watershed consists of a generally low, flat topography with the highest point at 189 feet above, and the lowest point at -1 foot below sea level.

Hydrology

Elevenmile Creek (WBID 489) is a fourth-order stream 13 miles long and receives water from multiple tributary creeks including Tenmile (WBID 489A), Eightmile (WBID 624) , and Coffee Creek (WBID 489B), as well as Hurst Branch (WBID 681), all of which are designated as Class III fresh waterbodies, and also receives baseflow from the sand-and-gravel aquifer. (FDEP 2008).

Population and Population Growth

There are no incorporated cities within the sub-basin but there are several distinct community areas including Cantonment, Northwest Pensacola, and Beulah. Historically, these communities had rural characteristics such as low population density, strong connections to the natural landscape, and large open areas. With the amount of development occurring within the area, the area is becoming more urbanized along with the accompanying issues of increased flooding, loss of habitat and erosion.

The area is seeing significant growth due to major investments such as the Navy Federal Complex (Figure 3-2), a new Interstate 10 interchange, the proposed former Outlying Field Site 8 (OLF 8) development, and road expansions to address the significant increase in population, commerce and associated traffic.

Figure 3. Aerial Photo of Navy Federal Credit Union, former OLF 8 site, and Surrounding Area

Associated with this development, the population in the watershed increased by 23 percent between 2010 and 2020 and is expected to grow by another 15 percent by 2045 (Table 1). The watershed population increase between 2010 and 2020 is the highest among all sub-basins in the Perdido River and Bay watershed.

Table 1. Population Change within the Elevenmile Creek Area

	Population	Change	Percent Change
2010	**31,660**	**N/A**	**N/A**
2020	**39,077**	**7,417**	**23**
2045	**45,037**	**5,960**	**15**

Land Use

Land use within the basin is largely split between open/natural areas such as upland forest, wetlands, water, rangeland, barren land and agriculture (46.12 percent), and developed areas including urban and build up, and transportation, communication and utilities (53.88 percent) (Table 2 and Figure 4). Within the Urban and Built Up category, much of the area is comprised of residential and commercial properties with some current/former large industrial type facilities such as International Paper, the former Beulah landfill, the former Cantonment Wastewater Treatment Plant (WWTP) and Saufley Field.

Table 2. 2022 Land-Use Estimates for the Elevenmile Creek Sub-basin

Land Use Description	Land Use Code	Total Acreage	Percent
Agriculture	2000	1,011	3.26
Barren Land	7000	218	0.70
Rangeland	3000	376	1.21
Transportation, Communication, and Utilities	8000	2,360	7.62
Upland Forest	4000	7,445	24.03
Urban and Built Up	1000	14,333	46.26
Water	5000	424	1.37
Wetlands	6000	4,818	15.55
Total	N/A	30,986	100.00

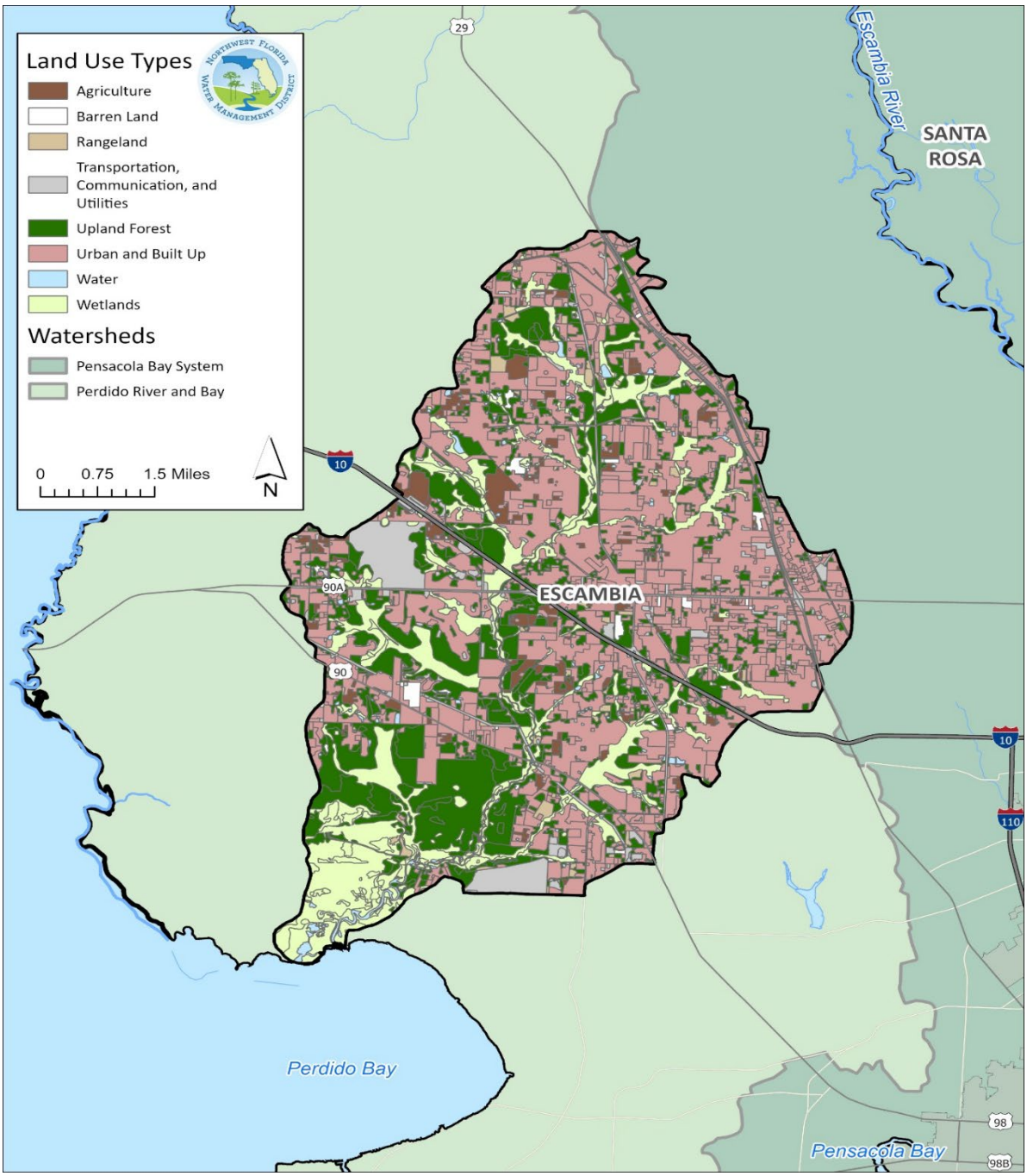

Figure 4. Land Use within the Elevenmile Creek Watershed

Sub-basin Functions, Benefits, and Uses

Elevenmile Creek and its associated natural areas including wetlands, floodplains, and uplands, provide multiple critical benefits for the communities within the area. Some of the most important benefits include flood attenuation; water filtration; habitat for numerous birds, fish and other wildlife; and recreational opportunities such as fishing, kayaking, birdwatching and hiking. In recent years with the

rapid development occurring within the watershed, the importance of these functions, their connection to community resilience, as well as the vulnerability of the system, has become very evident. As more floodplains and natural areas have been developed, increased flooding events, erosion, and decreased water quality have become more commonplace. In response, Escambia County has implemented multiple efforts to try to get in front of the issue. Two of the most important efforts to address these issues are the development of the Elevenmile Creek Stream Restoration Project and the Beulah Master Plan. Both initiatives are described in more detail in the Floodplains and Flood Protection section below.

Floodplains and Flood Protection

Given the growth rate in the area, the Elevenmile Creek sub-basin has seen a significant amount of erosion, loss of floodplains and flooding. Approximately 500 acres of wetland loss occurred between 2010 to 2022. Figure 5 depicts the flood zones within the Elevenmile Creek watershed.

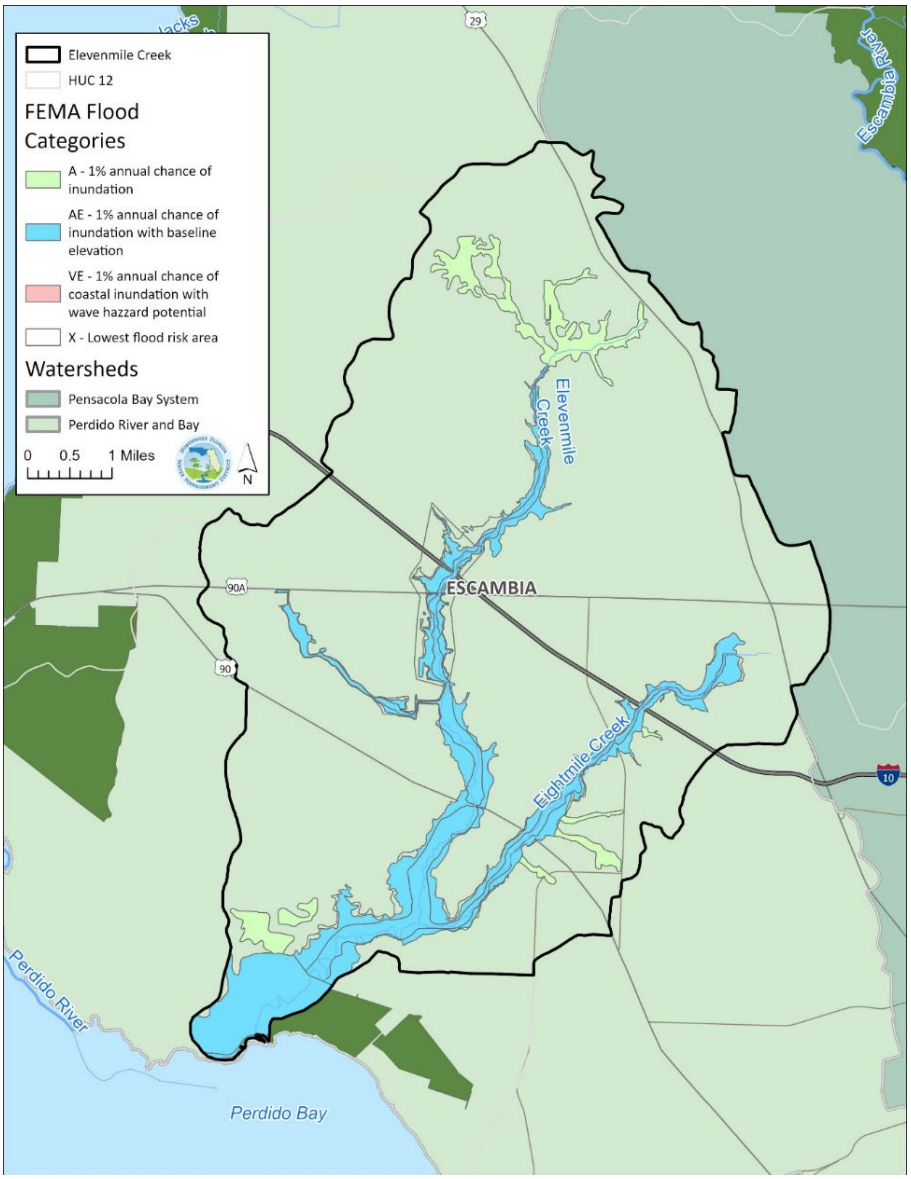

Figure 5. Flood Zones within the Elevenmile Creek Sub-basin

Typical issues associated with urban growth into rural areas are being seen and documented within the Elevenmile Creek basin including habitat loss and fragmentation, floodplain loss, erosion and loss of open space. Escambia County has been working to address these habitat issues through multiple studies, plans and projects. On June 30, 2020, NorthEscambia.com published an article titled, *"U.S. Treasury Approves RESTORE Plan For Beulah Master Plan, Century Wastewater Plant, Eleven Mile Creek Restoration and Other Projects."* The article noted several projects, two of which were focused on the Elevenmile Creek basin:

- **Elevenmile Creek Restoration**
  $1,268,800 was spent to develop designs for improvements along the creek: *The Eleven Mile Creek Stream Restoration project will provide expansion of the creek's buffers, restore natural habitat, and improve water quality in Eleven Mile Creek and Perdido Bay. Additionally, it will mitigate coastal flooding, protect valuable public infrastructure, and repair existing nonfunctional stormwater infrastructure. Restoration and expansion of the floodplain, restoration of wetlands, reduction in invasive species, and re-establishment of riparian buffers will increase wildlife habitats as well as provide flood protection for Bristol Park, Bristol Creek, and Ashbury Hills neighborhoods and surrounding areas. With a 40-acre floodplain expansion, an estimated 160 homes will be protected from flooding.*

  The Elevenmile Creek Restoration project has been 100 percent designed and is currently in the permit application phase with both the FDEP and ACOE permit applications submitted. Noted in Escambia County's Elevenmile Creek Restoration factsheet (*Escambia County Elevenmile Creek Project Page*), the project's expected cost is $11,819,133 (included in project list at end of document) and the expected benefits include:
  - 3,500 linear feet of stream restoration
  - 40 acres of floodplain restoration
  - Protection of 160 homes

- **Beulah *Master Plan***
  $300,000 was spent to develop a master plan for the Beulah area (*Beulah Master Plan Website*): *Escambia County will procure the services of an urban/land-use planning firm to develop a master plan for approximately 30,000 acres in the Beulah community of Escambia County. The master plan will be based on the University of West Florida HAAS Center Citizen Survey, an existing conditions analysis, technical analysis, and on stakeholder engagement and community participation.*

  The Beulah Master Plan will establish a vision for allowing for the continued growth in the area while preserving the quality of life and sense of place enjoyed by the current residents. The final deliverable will be a master plan and/or zoning overlay district and implementation plan, dependent on the technical guidance provided by the procured consultant and concurrence provided by Escambia County Developmental Services staff.

  The Beulah community has experienced extensive growth resulting from improved economic conditions and the expansion of Navy Federal Credit Union's Beulah campus, which is expected to

employ over 10,000 people by 2022. Subdivision development orders in Beulah have increased exponentially, with 7,000 residences permitted for development since 2010. Beulah does not currently have a master plan nor zoning overlay district to effectively plan or manage growth. Development of the Beulah Master Plan will balance the highest and best land uses of the subject area with the needs of the County, region, and the Beulah community in creating a plan for sustaining growth while preserving the character of the community.

Water Quality

Water quality is an important issue in this sub-basin. As Class III waters, the Elevenmile Creek sub-basin's surface waters have a designated use of recreation, propagation, and the maintenance of a healthy, well-balanced population of fish and wildlife. Within this sub-basin, Elevenmile Creek is impaired for total nitrogen (TN), total phosphorous (TP), unionized ammonia (NH3H), bacteria, biological oxygen demand (BOD) and metals, and Tenmile Creek is impaired for bacteria. FDEP has developed a Total Maximum Daily Load (TMDL) to address the fecal coliform (bacteria) impairment (see Figure 6 below).

In addition to the impacts noted above regarding development, there have also been historical water quality impacts from industrial sources such as International Paper in Cantonment. For years, the facility discharged its effluent directly into Elevenmile Creek. However, when the Escambia County Utilities Authority (ECUA) relocated its Mainstreet WWTP to the Cantonment area, ECUA, International Paper, and Gulf Power formed a partnership to utilize reuse water from ECUA. International Paper modified its onsite headworks treatment process and removed the effluent from Elevenmile Creek, piping the effluent south to wetlands further down the system near Tee and Wicker Lakes. International Paper currently uses approximately 5 million gallons per day (MGD) of reclaimed water from ECUA (*December 9, 2025, personal communication, ECUA*), which reduces its dependence on water from the sand-and-gravel aquifer. There is still an overflow structure from the International Paper headworks to Elevenmile Creek which is used when there is excessive water in the system beyond the capacity of the pipeline. International Paper is currently working with FDEP to address this discharge.

The tables summarizing the fecal coliform TMDL reduction goals are included in Appendix B. Significant reductions in fecal coliform levels are necessary throughout the system. Specifically, for Elevenmile Creek at US 90, the goal is a reduction of 62.8%. The reduction at Elevenmile Creek and SR 297A is 65.9%, and the reduction for Tenmile Creek is 42.9%.

In August 2010, the U.S. Environmental Protection Agency (EPA) published a TMDL to address dissolved oxygen (DO), biological oxygen demand (BOD), and nutrients/unionized ammonia for Elevenmile Creek. Based on the TMDL study, EPA believes Elevenmile Creek is naturally below the applicable water quality standard for DO of 5 mg/L. Based on assessment work conducted by HydroQual (2004), Elevenmile Creek's average BOD is 4.2 mg.L. Given this, EPA noted Elevenmile Creek will likely not attain the applicable water quality standard for DO, even if the nutrient and BOD loads established are met. EPA stated the nutrient and BOD targets for its TMDL, which are based on a consideration of natural levels of nutrients and BOD, limits both these constituents so that they do not exert a negative effect on DO, as required by Florida's narrative criterion. (62- 302.530(48)(a) and 2-303.530(12), F.A.C.). According to EPA,

"Limiting nutrients and BOD beyond this point is not expected to have any additional beneficial effect on DO." Therefore, EPA is assigning a load allocation and wasteload allocation equal to the current background condition in Elevenmile Creek (*Total Maximum Daily Load (TMDL) For Dissolved Oxygen, Biological Oxygen Demand and Nutrients/Unionized Ammonia In the Elevenmile Creek (WBID 489), August 2010*). Table 3 summarizes the noted these levels.

Table 3. Total Maximum Daily Load components for WBID 489 (Elevenmile Creek)

Parameter	Wasteload Allocation	Load Allocation
Total Nitrogen	**0.74 mg/l**	**N/A**
Total Phosphorus	**0.06 mg/l**	**7,417**
Biochemical Oxygen Demand (BOD)	**3.5 mg/l**	**5,960**

Some of the most common sources of bacteria and nutrient impacts to a natural system are from stormwater runoff, central wastewater system discharges, and poorly maintained/ failing Onsite Sewage Treatment and Disposal Systems (OSTDS) or more commonly referred to as septic tanks. Figure 6 below illustrates the known septic systems in the Elevenmile Creek sub-basin. Wastewater carries pathogens, nutrients (such as nitrogen and phosphorus), and trace organic chemicals that may be harmful to human health and ecosystem function. While septic systems can be an effective means of wastewater treatment, if they are located in areas close to surface waters and are not operating properly, they can negatively impact the surface waters releasing nutrients and bacteria into the system. Identifying areas where these poorly functioning OSTDS are present and replacing them with more effective systems such as Enhanced Nutrient-Reducting (ENR) systems (e.g., Aerobic Treatment Units and in-ground nitrogen-reducing biofilters), distributed wastewater system, or connecting them to central sewer systems will be an important part of reducing bacteria and nutrient inputs into the system to meet the TMDL requirements.

To help mitigate stormwater impacts, Escambia County developed a prioritized list of stormwater pond expansions and enhancements within the basin that would help reduce flooding and improve water quality. The report, *Elevenmile Creek Pond Expansion and Enhancement Report* (Mott McDonald 2023), identified and ranked 33 pond sites which could be expanded based on complexity of acquisition, constructability, permitting, level of basin development, and infrastructure required. Additionally, the report evaluated 82 stormwater ponds for potential enhancements such as filter systems, skimmers, and outfall structures. These two rankings were then combined to develop a prioritized list of 33 ponds where upgrades were most beneficial.

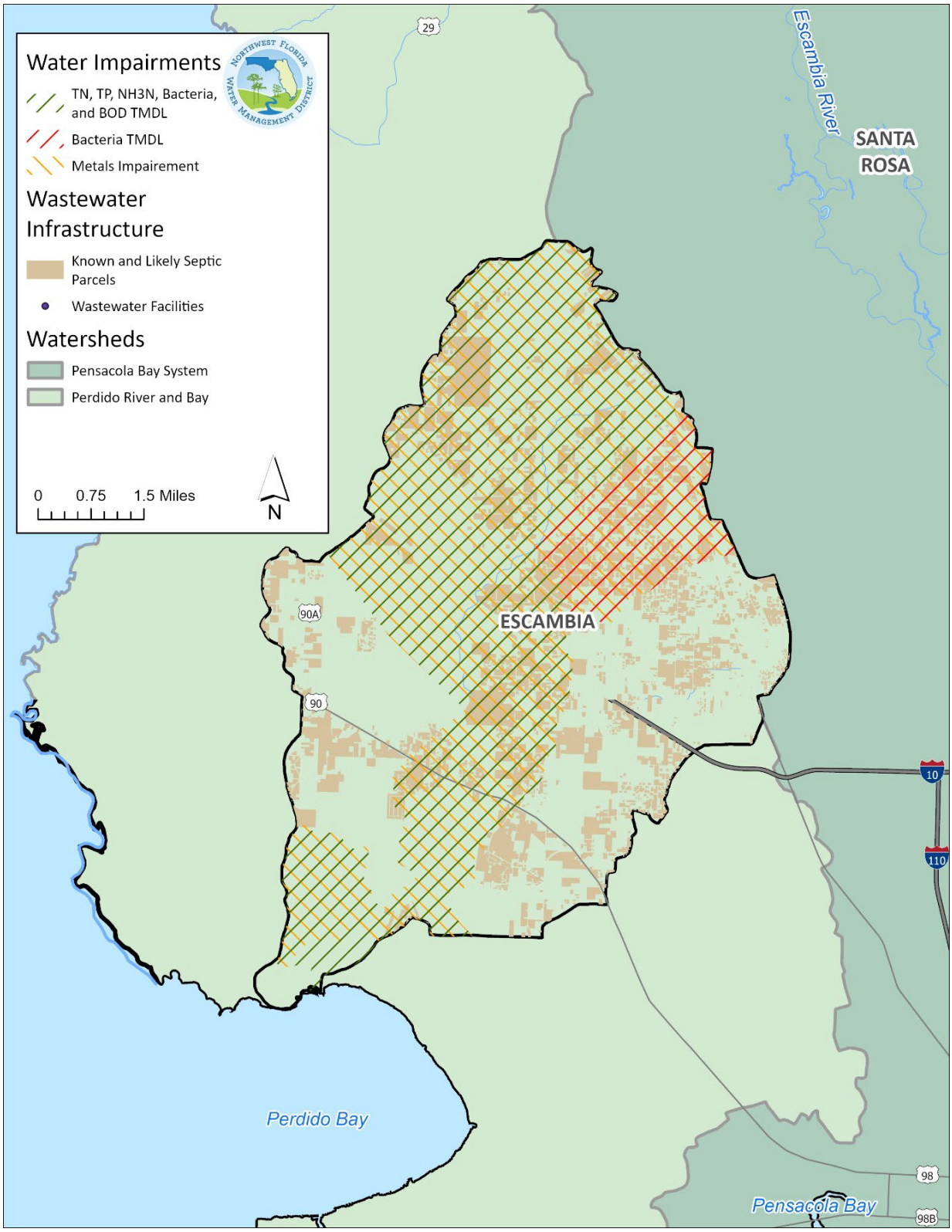

Figure 6. Impaired Waters and Known and Likely Parcels with Septic Systems within the Elevenmile Creek Watershed

Water Supply

Industrial water use is the largest use sector within this sub-basin with International Paper permitted to withdraw an annual average of 25.4 mgd from the sand-and-gravel aquifer. Production wells are concentrated near the headwaters of Elevenmile Creek. During 2024, International Paper pumped 16.28 mgd. International Paper also utilizes reclaimed water provided by Emerald Coast Utilities Authority (ECUA). ECUA provided approximately 10 mgd of reclaimed water for industrial use in 2024, which includes both International Paper and Gulf Power (FDEP 2025). As stated previously, International Paper currently uses approximately 50 percent (5 mgd) of this amount. Public supply is the second largest use sector with customers served primarily by ECUA. Communities within the northwest and northeast portions of this sub-basin are served by Farm Hill Utilities Inc., and Gonzalez Utilities, respectively. The combined water demands for these three utilities are projected to increase from 35.02 mgd in 2020 to 39.47 mgd in 2045, an increase of 4.46 mgd or 12.7 percent.

The sand-and-gravel aquifer is the primary water source within this sub-basin. In this area, it ranges in thickness from approximately 300 to 500 feet (NWFWMD 1996; Figure E-3). It is comprised of three hydrostratigraphic zones (NWFWMD 2023). The uppermost zone, the surficial zone, consists of fine to medium-grained sand, with gravel beds and lenses (Randazzo and Jones, 1997) and varies in thickness from a few feet to tens of feet. The underlying low-permeability zone consists of fine sand to clay, ranging in thickness from 20 feet to 100 feet in (NWFWMD 2023). The leaky nature of the low-permeability zone enables water from the surficial zone to move vertically through this layer and recharge the main-producing zone (NWFWMD 2023). The main-producing zone consists of highly productive sand and gravel layers interbedded with clayey layers and is the primary zone utilized by public water supply and industrial production wells. Groundwater availability is very good due to high local recharge rates and well yields often exceed 1,000 gallons per minute. Groundwater in the sand-and-gravel aquifer moves along flow paths to discharge at supply wells, as baseflow and surficial seepage to Eightmile and Elevenmile creeks, and as groundwater discharge to Perdido River and Bay.

Although groundwater quality is good in most areas, the sand-and-gravel aquifer is highly vulnerable to contamination from land surface activities. Wellhead protection areas (WHPA) have been incorporated into the Escambia County Land Development Code, and prohibits certain land uses, facilities, and activities within 500 feet or within the seven-year travel time, depending on well location (Escambia County, 2025).

4. SUMMARY OF CURRENT ISSUES AND CHALLENGES

Riparian and Wetland Habitats

As described in detail above, rapid urbanization of the watershed and the resultant loss of floodplains, riparian buffers and upland habitat have impacted the quality of life, ecosystems, and the resilience of the communities within the watershed. As a result, Escambia County has invested significant resources to develop the Beulah Master Plan, an Elevenmile Creek Restoration Plan and conduct a study to identify and prioritize opportunities to increase the level of stormwater treatment and abatement. The resulting projects are included in the table at the end of this document and once implemented should help improve the quality of life and resilience for residents and visitors of the watershed.

Water Quality

As detailed previously, there are multiple water quality impairments within the Elevenmile Creek sub-basin. Implementation of stormwater management improvement projects and creek restoration projects will improve water quality in the watershed by improving the amount of stormwater attenuated and the level of treatment provided by the stormwater systems. In addition, restoring floodplains and creek channels will help to reduce the erosion occurring in the system and the amount of excess sediment entering the creek system. Addressing the fecal coliform exceedances will take both wastewater collection system improvements as well as OSTDS abatement. Regarding the DO and nutrient reduction targets, as noted above, EPA believes that Elevenmile Creek is naturally below the applicable water quality standard for DO of 5 mg/L with Elevenmile Creek's average BOD being 4.2 mg.L. Therefore, EPA noted Elevenmile Creek will likely not attain the applicable water quality standard for DO, even if the nutrient and BOD loads established are met. EPA further stated the nutrient and BOD targets for their TMDL, which are based on a consideration of natural levels of nutrients and BOD, limits both these constituents so that they do not exert a negative effect on DO, as required by Florida's narrative criterion. (62- 302.530(48)(a) and 2-303.530(12), F.A.C.). "Limiting nutrients and BOD beyond this point is not expected to have any additional beneficial effect on DO." Therefore, EPA is assigning a load allocation and wasteload allocation equal to the current background condition in Elevenmile Creek. Given this, it will be important appropriate measures are taken to ensure bacteria and nutrient releases do not increase.

Water Supply

Water supply from the sand-and-gravel aquifer is generally of good quality and sufficient quantities are available to meet projected future water demands. There are, however, opportunities for water conservation measures to reduce future water demands on the sand-and-gravel aquifer. Measures could include plumbing retrofits, appliance rebates, and measures that enhance the efficiency of landscape irrigation use.

The sand-and-gravel aquifer is highly vulnerable to impacts from land use activities. Areas of groundwater contamination exist within the sub-basin. Wellhead protection ordinances are in place; however, in some areas, on-site treatment may be needed. Continued coordination and planning among the Escambia County, ECUA, Gonzalez Utilities, and Farm Hill Utilities can ensure that existing and future well sites are protected.

Changes in regulated contaminants are a continuing concern for many local governments and utilities. Water utilities must track and plan for potential changes in drinking water regulations. For example, ECUA is implementing a project to verify lead pipes are not present within its service area in response to EPA's Lead and Copper Rule Improvements (ECUA 2025). Most of the water service lines have been surveyed and no evidence of lead pipelines has been found (ECUA 2025). An area of ongoing concern for some utilities is changes in regulations regarding per- and polyfluoroalkyl substances (PFAS). PFAS is a category of human-made chemicals that have been widely used in a variety of products and industries, such as firefighting foams, protective coatings, and surfactant applications among many other uses and products (National Groundwater Association, 2025).

Additionally, aging water system pipes can be subject to leakage and infiltration, necessitating repair or replacement. Population growth and new development may also require increased pipe diameters or water line extensions. Associated improvements may include booster pumps, modernized metering and data systems, and looping and sectionalization of water distribution systems. In some portions of the ECUA system, water treatment improvements, such as granular activated carbon filter replacements, may be needed at specific well sites.

Data and Knowledge Gaps

Escambia County, FDEP, and others have conducted several studies in the Elevenmile Creek basin as noted above. These include the 2023 Eleven Mile Creek Pond Expansion and Enhancement Report, the Beulah 2045 A Community Vision for the Future, FDEP's fecal coliform TMDL and EPA's TMDL for dissolved oxygen, biological oxygen demand and nutrients/unionized ammonia. Due to these studies, much of the basin is well understood along with the general types of projects needed to address water quality and habitat improvement needs.

Risks and Vulnerabilities

Two of the greatest risks and vulnerabilities facing the basin is the rapid development and its impact on the floodplain and other habitats, and reducing the impact from IP effluent discharge on Elevenmile Creek and the wetlands and Tee and Wicker lakes. Loss of the floodplain and other habitats has greatly increased flooding in the basin which impacts the community and its citizens. While Escambia County has allocated significant funds to restore Elevenmile Creek, its tributaries and associated floodplains, there is still more that needs to be accomplished. Augmenting the county and other partners' efforts will help bridge that gap. Work at the private level is ongoing such as IP working to address the overflows into Elevenmile Creek and commercial and residential land-development companies improving the use of Best Management Practices (BMPs) to reduce soil erosion during construction and the protection of floodplains and other critical habitat in the basin.

5. MANAGEMENT STRATEGIES AND PROJECTS

Table 4 summarizes management strategies recommended to address the water resource challenges described above. Each approach identified addresses multiple issue areas and objectives, reflecting the interrelatedness of water resource attributes and conditions and the fact that most projects can be designed to achieve multiple complementary outcomes.

Consistent with the SWIM plan (2017) and the P&PBEP's CCMP (2022), the management strategies and projects presented within this work plan are based on a watershed approach to protecting and restoring water resources. A watershed approach is predicated on recognition that the character and quality of a waterbody are defined by conditions across the contributing drainage basin. Managing pollutant sources and protecting the extent and functions of floodplains, wetlands, upland forests, and tributary stream systems across a watershed are essential for protecting a given waterbody downstream.

Table 4. Recommended Management Strategies for the Elevenmile Creek Sub-basin

Management Strategy	Issue Areas Addressed	Objectives	Description
Ecosystem(s) Restoration	• Stream and Wetland Habitats	• Sustained aquatic and wetland ecosystems	Stream restoration Wetland restoration
Stormwater Retrofits	• Water quality • Aquatic and Wetland Habitats • Flooding and Coastal Resilience	• Improved water quality • Improved flood protection and resilience • Sustained aquatic and wetland ecosystems	Retrofit stormwater systems to incorporate BMPs to improve flood protection and downstream water quality. Identify and implement specific BMPs effective for treating bacteria, suspended solids, and nutrients
Septic Tank Abatement	• Water Quality • Aquatic and Wetland Habitats	• Improved water quality • Sustained aquatic and wetland ecosystems	Connect structures served by OSTDS to central sewer systems, where feasible. Alternatively, modern nutrient reducing septic systems can be installed. Either approach would require funding to incentivize connections or conversions.
Sanitary Sewer System Improvements	• Water Quality • Aquatic and Wetland Habitats	• Improved water quality • Sustained aquatic and wetland ecosystems	Design, permitting, and construction of retrofits to existing sanitary sewer systems to reduce inflow and infiltration of stormwater.
Green Infrastructure	• Water quality • Aquatic and Wetland Habitats	• Improved water quality • Improved flood protection and resilience	Apply "nature-based," green infrastructure methods for multipurpose projects. Projects frequently involve integrating stormwater BMPs, buffer zones,

Management Strategy	Issue Areas Addressed	Objectives	Description
	• Flooding and Coastal Resilience	• Sustained aquatic and wetland ecosystems • Improved public access	greenways, and living shorelines into public parks and transportation systems.

Proposed Activities and Projects

Proposed projects known at the time of this publication are listed in 5. Projects listed, details, and cost estimates will be updated in cooperation with local governments and other cooperators within the planning area.

One of the key activities of the District's Watersheds Partnership Program is to help coordinate restoration activities among key partners and stakeholders to help maximize efficiency and synergy between projects, shift to a more proactive approach to restoring and protecting the District's watersheds, and help increase funding for project implementation. This work plan will have a coordinator assigned who will serve as this "traffic control" function to ensure effective implementation of this plan and identify necessary changes to adaptively manage as progress is made and conditions change.

Table 5. Proposed Projects and Funding Needs Identified for the Elevenmile Creek Sub-basin

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
Beulah Area Potable Water Transmission Main	Emerald Coast Utilities Authority	• Provide fire flow and potable water per master plan demands • Improve distribution system resiliency	Construction of approximately 15,500 feet of 16-inch diam. water main. This main will provide water for fire flow and potable water per demands derived using ECUA's Water System Master Plan. This main will transmit potable water to ECUA's water distribution system from a new well currently in construction. The 16-inch main also forms a backbone east-west line in our system in the Beulah area and thereby improves the resiliency of the distribution system.	$7,000,000	$7,000,000
Elevenmile Creek Restoration	Escambia County	• Reduce flood risk • Improve water quality • Restore floodplain habitat	Currently waiting to receive permits, 100% design plans complete. Escambia County Board of County Commissioners will construct the Eleven Mile Creek Restoration and Stormwater Enhancement project (Project) to expand the floodplain of Eleven Mile Creek between Highway 297A and Interstate I-10, reduce flood risk for adjacent flood prone neighborhoods, implement natural channel design methods to enhance fish and wildlife habitat and improve water quality, and reestablish stormwater facilities along the creek to meet or exceed current state and local design standards. Construction will consist of 2 phases of stream restoration and create 3 new stormwater ponds along the creek.	$13,000,000	$11,819,133
Highway 297A Stormwater Pond	Escambia County	• Stormwater Improvements	Construct the Hwy 297A stormwater pond retrofit in accordance with the design plans and specifications. Expansion and retrofit of the current stormwater pond.	$1,500,000	$1,500,000
Hed Par Stormwater Retrofit	Escambia County	• Improve water quality • Improve stormwater retention • Improve wetlands • Increase community resilience	The Project's goal is to plan, design, permit, and retrofit four (4) stormwater ponds in the Eleven Mile Creek Watershed which covers approximately 22,000 acres in west central Escambia County. Each pond retrofit provides incremental water quality and attenuation improvements. Environmental benefits of the future pond retrofits include water quality improvements, downstream flow rate reduction, wetlands improvement,	$500,000	$500,000

			coastal flood protection, and protection of public infrastructure. Implementation of the Project is anticipated to reduce annual pollutant load contributions from the Eleven Mile Creek Basin.		
Witt Lane Pond Retrofit	Escambia County	• Alleviate Flooding	Pond retrofit to reduce residential flooding, reduce pollutant load contributions for water quality. Currently under design, in the Hed Par Stormwater Retrofit.	$750,000	$750,000
Millet Circle Pond Retrofit	Escambia County	• Alleviate Flooding • Water Quality	Pond retrofit to improve attenuation, reduce downstream flow rate, and reduce annual pollutant load. Currently under design, in the Hed Par Stormwater Retrofit.	$800,000	$800,000
Quail Ridge Pond Retrofit	Escambia County	• Alleviate Flooding • Water Quality	Pond retrofit to reduce pollutant load contributions and reduce residential flooding risks. Currently under design, in the Hed Par Stormwater Retrofit.	$750,000	$750,000
PPBEP CCMP Update and Project Development	PPBEP	• Identify project needs aligning with CCMP and SWIM Plan goals	Project would support PPBEP in the update to their CCMP which would specifically identify project needs within priority basins that align with CCMP and SWIM Plan goals.	$100,000	$100,000
Living Shoreline Assistance Program	Pensacola and Perdido Bays Estuary Program	• Promote nature-based shoreline stabilization • Address erosion in Pensacola and Perdido Bay watersheds	PPBEP offers the Living Shoreline Assistance Program to help waterfront property owners and community groups address shoreline erosion in the Pensacola and Perdido Bay watersheds. This program aims to promote nature-based solutions for shoreline stabilization. Financial and technical support is provided to selected applicants, making it easier for landowners to create a living shoreline on their waterfront property. The program is designed to simplify the process of creating a living shoreline for landowners by providing guidance on benefits, suitability, design, and navigating the permitting process, as well as offering financial assistance to chosen applicants.	$200,000	$200,000
				$23,850,000	**$ 22,669,883**

6. MONITORING, METRICS AND NEXT STEPS

Setting clear resource protection and restoration goals with associated metrics and monitoring to evaluate progress are essential for achieving the stated objectives. Metrics will be developed cooperatively with local governments and other cooperators to track completion and quantify the benefits of funded projects and monitor trends in environmental indicators. This sub-basin work plan will be updated periodically using adaptive management principles to ensure continued effectiveness.

Examples of metrics for the Elevenmile Creek sub-basin may include:

- Sub-basin-level:
    - Water quality data and trends
    - Aquatic habitat area and trends
- Project level:
    - Project status (percent complete)
    - Quantifiable project benefits achieved
    - Project targets/objectives met
- Funding and expenditures:
    - Percent of current budget allocated
    - Percent of budget remaining
    - Total estimated project funding cost
    - Total estimated remaining project funding needs

Maintaining a publicly accessible website for the program will facilitate effective monitoring of work plan implementation, project status and metrics, funding needs, and water quality and habitat trends. Additionally, the website will enhance public awareness regarding water resources within the Elevenmile Creek sub-basin. The website will include information regarding:

- Project status
- Funding and expenditures
- Water quality trends

During 2026, the District, local governments, and state and regional agencies will work collaboratively to refine and prioritize critical water resource issues, as well as the strategies and projects to address the identified issues within the Elevenmile Creek sub-basin. This work plan is anticipated to be finalized by the summer of 2026. As program funding is obtained, the District and project partners will implement the prioritized projects approved by the District's Governing Board.

Work plans will be updated periodically to reflect progress achieved, new information, or additional proposed projects and remaining funding needs. A program website will be created to track project progress, metrics, and expenditures and to share information regarding trends in water quality and aquatic habitat and water supply improvements achieved by program implementation.

REFERENCES AND RESOURCES

Beulah Master Plan website:
https://storymaps.arcgis.com/stories/ed026cd6c59b42c985be1bdff9ee9952

Eleven Mile Creek Pond Expansion and Enhancement Report. 2023. Mott Macdonald.

HydroQual. 2004. Technical Memorandum: Water Quality Modeling of Perdido Bay and Elevenmile Creek.

Escambia County Elevenmile Creek Project Page. https://myescambia.com/docs/default-source/restore/myip-pdfs/elevenmilecreekstreamrestorationmyippdf.pdf?sfvrsn=93ec436d_2

U.S. Environmental Protection Agency, Region IV. 2010. Total Maximum Daily Load (TMDL) For Dissolved Oxygen, Biological Oxygen Demand and Nutrients/Unionized Ammonia In the Elevenmile Creek (WBID 489).

Florida Department of Environmental Protection. 2008. TMDL Report Fecal Coliform TMDL for Elevenmile Creek, WBID 489, and Tenmile Creek, WBID 489A.

U.S. Treasury Approves RESTORE Plan For Beulah Master Plan, Century Wastewater Plant, Eleven Mile Creek Restoration And Other Projects. https://www.northescambia.com/2020/06/u-s-treasury-approves-restore-plan-for-beulah-master-plan-century-wastewater-plant-eleven-mile-creek-and-other-projects#:~:text=Eleven%20Mile%20Creek%20Restoration,-$1%2C268%2C800%20to%20for&text=The%20Eleven%20Mile%20Creek%20Stream,will%20be%20protected%20from%20flooding

Southwest Florida Water Management District. 2025. Watershed Management: A Comprehensive Approach to Managing Water Resources in the Southwest Florida Water Management District. https://www.swfwmd.state.fl.us/sites/default/files/medias/documents/watershed_management.pdf

Emerald Coast Utilities Authority. 2025a. 2025 Approved CIP Budget. 235 pp.

Emerald Coast Utilities Authority (ECUA), 2025b. ECUA website, accessed 12/15/25. Newsroom Page

Escambia County Land Development Code. Sec. 4-5.9 - Wellhead protection. Mini TOC: PART III - LAND DEVELOPMENT CODE | Code of Ordinances | Escambia County, FL | Municode Library. Accessed 12/16/25

Florida Department of Environmental Protection. 2025. 2024 Reuse Inventory.

National Groundwater Association. 2024. Groundwater and PFAS. Accessed 12/9/25.

Northwest Florida Water Management District. 1996. Hydrogeology of the Northwest Florida Water Management District. Water Resources Special Report 96-4.

Northwest Florida Water Management District. 2023. 2023 Water Supply Assessment Update. Publication Number WRA 23-01.

University of Florida, Bureau of Economic and Business Research (BEBR, website). https://www.bebr.ufl.edu/data/localities/616/county

APPENDIX A. SUB-BASIN PRIORITIZATION METHODOLOGY

Overview of Prioritization Process

The District's 114 HUC-10 sub-basins were analyzed for water quality, water supply, and natural areas criteria using multiple different GIS layers. From this initial analysis, the top-ranked basins from each watershed were selected based on a natural break in scores within each watershed. In total, 34 HUC-10 candidate basins were selected from the seven watersheds. The District then hosted public workshops for each watershed to discuss the candidate sub-basins with the public. Online surveys were also created to expand the opportunity for public input on the sub-basins. The District also reviewed planned projects within the 34 candidate sub-basins based on available information from local governments and utilities. The public feedback from the workshops, online surveys, and project information were then scored and added to each sub-basin's GIS analysis scores to create the final overall scores. The top-ranked candidate sub-basin per watershed was then recommended for the development of a sub-basin workplan. The recommended priority sub-basins were presented to and approved by the District Governing Board on December 10, 2025. Additional details regarding the prioritization process are provided below.

Public Input

During October 2025, the District hosted public workshops for each of the seven watersheds to share information about the program and obtain input regarding the prioritization of sub-basins for work plan development. In addition to the public meetings, the District solicited public input regarding the selection of priority sub-basins within each watershed including water resource areas of concern via online surveys. This public input was a major component in the prioritization process. Scoring was based on survey priority rank responses where basins receiving the highest priority votes for their watershed were awarded the highest points.

Consideration of Proposed Projects

The availability of proposed projects within sub-basins was also considered in the prioritization process. The District requested and reviewed information on current and future projects related to water quality improvement, habitat restoration, and water supply from the public, local governments, and utility companies. Scoring was based on project status where basins including shovel-ready projects received the highest points.

Water Quality Criteria

GIS Layers Assessed: FDEP Statewide Basin Management Action Plan (BMAP) General Areas, FDEP Waters Not Attaining Standards (WNAS), FDEP Alternative Restoration Plans, FDEP Total Maximum Daily Load (TMDL), EPA Established Total Maximum Daily Load (TMDL), NWFWMD Drinking Water Facilities, NWFWD Locally Provided Water Infrastructure, NWFWMD Treatment and Pump Stations, FDEM Storm Surge Zones Tiled, FEMA Flood Special Hazard Area

Analysis Process:

GIS layers depicting the features BMAP area, WNAS, Alternative Restoration Plans, FL TMDL, EPA TMDL, and Storm Surge Zones were overlayed on the District HUC-10 layer and inspected to verify what basins contain each target feature. All basins containing the targeted feature were then awarded points for that parameter.

The FEMA Flood Special Hazard layer was queried to isolate areas susceptible to a 1% chance of annual flooding. The new layer was then spatially isolated to the District HUC-10 basin layer. The sub-basins

were then evaluated for total acreage and percent of the sub-basin represented by floodplain and scored using a four-quartile system.

The NWFWMD Drinking Water Facilities, Locally Provided Water Infrastructure, and Treatment and Pump Stations (critical assets) were spatially isolated to the FEMA Flood Special Hazard layer then spatially joined to the District HUC 10 layer. The count of each identified critical asset in the FEMA Flood Special Hazard Layer was then summed per sub-basin and scored using a using a four-quartile system.
Scores for all water quality fields were then summed to create the sub-basins overall water quality score.

Water Supply Criteria

GIS Layers Assessed: NWFWMD Planning Region 2, NWFWMD Water Resource Caution Areas, NWFWMD Areas of Resource Concern, FGS Potentiometric Surface Map, Census Bureau 2010 and 2020 Census Block Points

Analysis Process:

GIS layers depicting the features NWFWMD Planning Region 2, Water Resource Caution Areas, Areas of Resource Concern, and FGS Potentiometric Surface Map were overlayed on the District HUC-10 layer and inspected to verify what basins contain the target feature. The FGS Potentiometric Surface Map was analyzed by identifying all sub-basins intersecting and located south of the zero-contour line. All basins containing the targeted feature were then awarded points for that parameter.

The 2010 and 2020 Census Block points were both joined to the District HUC-10 layer and exported to excel. The difference in population and the percent change from 2010 to 2020 was then calculated and sorted from largest to smallest. Each sub-basin was then scored individually for both parameters where 1 equals the smallest amount of population or percent of population change. The two scores were then averaged together and re-scored using a 1-to-10-point scale where 1 represents the lowest 10% of the averaged population score. Additionally, an estimated future population change was also conducted by analyzing BEBR data. The 2020 Census Block Points were joined with the District counties layer and exported. All exported points were then sorted by county and summed. The percent of the county population was calculated for each point's unique ID number. The determined percentage was then multiplied by the estimated 2045 BEBR County Population Estimate to give each point its estimated 2045 estimated population. Using the points' unique ID number, each point was matched to its sub-basin using the previous join to the District HUC-10 layer. The populations for each sub-basin were then summed. The future estimated population was then assessed using the same process as the one described above for the other population analyses. The sum of both scores was then averaged.
Scores for all water supply fields were then summed to create the sub-basins overall water supply score.

Natural Areas Criteria

GIS Layers Assessed: NWFWMD 2010 Land Use, NWFWMD 2022 Land Use

Analysis Process:

All 6000 level Florida Land Cover Classification System (FLUCCS) codes were isolated for the 2010 and 2022 layers. Both revised layers were then isolated to the District HUC-10 basins. The natural areas exported were then summed by sub-basin. The total acreage difference and percent acreage change was then calculated for each sub-basin and scored on a 1 to point 10 scale where 1 represents the least amount of natural area change. The two scores for each sub-basin were then added together.

Table A.1 GIS Layers Assessed Reference Table

Layer Name	Year Data Updated	Location
FDEP Statewide Basin Management Action Plan (BMAP) General Areas	2025	Statewide Basin Management Action Plan (BMAP) General Areas | Florida Department of Environmental Protection Geospatial Open Data
FDEP Waters Not Attaining Standards (WNAS)	2025	Waters Not Attaining Standards (WNAS) | Florida Department of Environmental Protection Geospatial Open Data
FDEP Alternative Restoration Plans	2025	Alternative Restoration Plans | Florida Department of Environmental Protection Geospatial Open Data
FDEP Total Maximum Daily Load (TMDL)	2025	Florida Total Maximum Daily Load (TMDL) | Florida Department of Environmental Protection Geospatial Open Data
EPA Established Total Maximum Daily Load (TMDL)	2025	EPA Established Total Maximum Daily Loads (TMDLs) | Florida Department of Environmental Protection Geospatial Open Data
NWFWMD Drinking Water Facilities (Isolated from parent data set by District)	2024	Critical Infrastructure | Florida Department of Environmental Protection Geospatial Open Data
NWFWD Locally Provided Water Infrastructure (Isolated from parent data set by District))	2024	Critical Infrastructure | Florida Department of Environmental Protection Geospatial Open Data
NWFWMD Treatment and Pump Stations (Isolated from parent data set by District)	2024	Critical Infrastructure | Florida Department of Environmental Protection Geospatial Open Data
FDEM Storm Surge Zones Tiled	2022	Storm Surge Zones | Florida State Emergency Response Team
FEMA Flood Special Hazard Area	2024	FEMA Flood Zones | Florida Department of Environmental Protection - MapDirect
NWFWMD Planning Regions	2023	Water Supply Planning Regions | NWFWMD - Open Data

NWFWMD Water Resource Caution Areas	2023	Water Resource Caution Area | NWFWMD - Open Data
NWFWMD Areas of Resource Concern	2023	Resource Concern Area | NWFWMD - Open Data
FGS Potentiometric Surface Map (Isolated from parent data set by District)	2025	Upper Floridan Aquifer Potentiometric Surface | Florida Department of Environmental Protection Geospatial Open Data
US Census Bureau 2010 Block Points	2025	USA Census BlockGroup Points - Overview
US Census Bureau 2022 Block Points	2025	USA Census Block Points - Overview
NWFWMD 2010 Land Use	2024	District Land Use 2010 | NWFWMD - Open Data
NWFWMD 2022 Land Use	2024	NWFWMD 2022 Land Use | Florida Department of Environmental Protection Geospatial Open Data

APPENDIX B. FDEP TMDL REPORT ON FECAL COLIFORM TMDL FOR ELEVENMILE CREEK, WBID 489, AND TENMILE CREEK, WBID 489A. OCTOBER 22, 2008. TABLES 6.1A, 6.1B AND 6.1C

Table 6.1a. TMDL Components for the Elevenmile Creek Watershed at U.S. 90

WBID	Parameter	TMDL (% Reduction)*	WLA		LA (% Reduction)*	MOS
			Wastewater (cfu/100mL)	NPDES Stormwater		
Elevenmile Creek at U.S. 90	Fecal Coliform	62.8%	Point sources must meet permit limits	62.8%	62.8%	Implicit

* The percent reduction is based on the 10th to 90th percentile of recurrence intervals minus the WLA; see **Table 5.4a**.

Table 6.1b. TMDL Components for the Elevenmile Creek Watershed at S.R. 297A

WBID	Parameter	TMDL (% Reduction)*	WLA		LA (% Reduction)*	MOS
			Wastewater (cfu/100mL)	NPDES Stormwater		
Elevenmile Creek at S.R. 297A	Fecal Coliform	65.9%	Point sources must meet permit limits	65.9%	65.9%	Implicit

* The percent reduction is based on the 10th to 90th percentile of recurrence intervals minus the WLA; see **Table 5.4b**.

Table 6.1c. TMDL Components for the Tenmile Creek Watershed, WBID 489A

WBID	Parameter	TMDL (% Reduction)	WLA		LA (% Reduction)	MOS
			Wastewater (cfu/100mL)	NPDES Stormwater		
Tenmile Creek	Fecal Coliform	42.90%	Point sources must meet permit limits	42.90%	42.9%	Implicit