DESTIN HABOR - HOGTOWN BAYOU
SUB-BASIN WORK PLAN

Destin Harbor

Hogtown Bayou / Live Oak Point

NORTHWEST FLORIDA WATERSHEDS PARTNERSHIP PROGRAM
CHOCTAWHATCHEE RIVER AND BAY WATERSHED
DECEMBER 2025

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

GOVERNING BOARD

DISTRICT OFFICES

Havana (Headquarters)
DeFuniak Springs
Youngstown
Milton

For additional information, write or call:

Northwest Florida Water Management District
81 Water Management Drive
Havana, Florida 32333-4712
(850) 539-5999
www.nwfwater.com

ACKNOWLEDGEMENTS

The Northwest Florida Water Management District (District) watersheds planning effort relies on a large team of District professionals. Primary authors and contributors are noted below.

The District acknowledges and appreciates the many local government staff, estuary program staff, public supply utilities, the public, and other interested parties who provided valuable review and feedback on the priority sub-basins and proposed projects to address water resource issues.

Primary and Contributing Authors:

Paul Thorpe (Primary), Donnie Hicks, Noel Robinson, Kathleen Coates, Garrett Ifland, Campbell Payne, and Jerrick Saquibal.

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 Destin Harbor-Hogtown Bayou sub-basin was selected as the priority sub-basin within the Choctawhatchee River and Bay watershed. This sub-basin encompasses approximately 36,456 acres in Okaloosa and Walton counties, Florida, including drainages to Old Pass Lagoon; Joes, Indian, Hogtown and other bayous; and multiple coastal dune lakes. 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.

Surface waters within the sub-basin are highly productive and include extensive tidal marshes, seagrass beds, and coastal dune lakes. Within the sub-basin is the city of Destin, as well as unincorporated areas within Okaloosa and Walton counties. The population was 42,528 according to the 2020 census, and it is expected to grow an additional by 44 percent by 2045. Currently, approximately 44 percent of the watershed is developed. Residential and commercial land uses are concentrated in Destin, with suburban and resort development extending eastward in the vicinity of Indian and Jones bayous, the Fourmile Point peninsula, and the coastal reach south of U.S. Highway 98 between Destin and Topsail Hill Preserve State Park. About five percent of the sub-basin consists of public lands.

Current Issues and Challenges

Water quality in the Destin Harbor-Hogtown Bayou sub-basin is affected by nonpoint source pollution generated by stormwater runoff which contains pollutants such as nutrients, sediments, bacteria, fertilizers, herbicides, insecticides, oils and greases. The sub-basin has approximately 4,133 known and likely septic systems which can also be a source of nutrients and bacteria pollution. Water quality impairments include dissolved oxygen, nutrients (chlorophyll-a), fecal coliform bacteria, and E. coli.

Potable water in the region is affected by a long-term drawdown in the coastal Floridan aquifer due to decades of groundwater withdrawals. Due to concerns for saltwater intrusion, the sub-basin is within a delineated Water Resource Caution Area. Alternative water supply sources may be needed meet future demands and ensure sustainable water resource availability. Other challenges affecting the sub-basin include flooding, coastal resilience, and the vulnerability of seagrasses and salt marshes.

Strategies and Solutions

This work plan summarizes management strategies to address the water resource challenges affecting the Destin Harbor-Hogtown Bayou sub-basin. Each approach identified addresses multiple issue areas and objectives, reflecting the interrelated nature of water resource attributes and conditions. Proposed strategies include stormwater retrofits, sanitary sewer system improvements, alternative water supply development, reuse of reclaimed water, green infrastructure, septic tank abatement, ecosystems restoration, and monitoring and assessment.

Proposed projects to address water resource issues within the Destin Harbor-Hogtown Bayou sub-basin are detailed in this work plan. Twenty-six projects have been proposed as of January 2026, at an estimated cost of $45,863,000. The current unmet funding need is $38,963,000. Project types proposed include:

- Water supply and reclaimed water transmission and distribution development and improvements
- Stormwater system improvements
- Living shoreline and saltmarsh restoration
- Seagrass and benthic community assessments
- Water quality monitoring
- Estuary program support
- Managed aquifer recharge feasibility study

For more information please visit: https://nwfwater.com/water-resources/surface-water-improvement-and-management/

Table of Contents

List of Tables

List of Figures

I. Introduction

The **Northwest Florida Watersheds Partnership Program (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 the evaluation process can be found in Appendix A.

The Destin Harbor-Hogtown Bayou sub-basin was selected as the priority sub-basin within the Choctawhatchee River and Bay watershed. This sub-basin encompasses approximately 36,456 acres in Okaloosa and Walton counties, including the city of Destin and unincorporated areas of each county. The sub-basin drains to Choctawhatchee Bay, as well as multiple coastal dune lakes. 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 Destin Harbor-Hogtown Bayou 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 Destin Harbor-Hogtown Bayou sub-basin area, as well as within the larger Choctawhatchee River and Bay watershed,
- Enhance, protect and sustain aquatic and wetland habitats with the Destin Harbor-Hogtown Bayou sub-basin, 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.

II. Overview of the Choctawhatchee River and Bay Watershed

The focus of this work plan is the Destin Harbor-Hogtown Bayou sub-basin, a component drainage basin (sub-basin) of the Choctawhatchee River and Bay watershed. A watershed is a geographic area of land that drains to a common waterbody, in this case the Choctawhatchee River and Choctawhatchee Bay. The Choctawhatchee River and Bay watershed covers over 5,300 square miles of northwest Florida and southeast Alabama (Figure 1). About 60 percent of the watershed (the upstream two-thirds) is within Alabama, with the remainder, including Choctawhatchee Bay, in the Florida Panhandle.

The headwaters of the Choctawhatchee River are in Barbour County, Alabama, about 140 miles north of Choctawhatchee Bay. The river's primary tributary, the Pea River, begins further north, within Bulloch County, Alabama. The Pea River joins the Choctawhatchee River just south of Geneva, Alabama, from where the Choctawhatchee River flows southward into Holmes County. Major tributaries within Florida include Holmes, Wrights, Pine Log, Seven Runs, Sandy, and Bruce creeks, as well as groundwater contributions from Floridan aquifer springs. Direct tributaries of Choctawhatchee Bay include Alaqua, Lafayette, and Magnolia creeks in Walton County; Rocky Creek, which extends from Walton County into Okaloosa County; and Turkey, Lightwood Knot, Garnier, and Gap creeks in Okaloosa County. Within Florida, the Choctawhatchee River and Bay watershed includes portions of Holmes, Jackson, Washington, Okaloosa, Walton, and Bay counties.

The Choctawhatchee River is the third largest river in Florida in terms of flow and by far the major source of freshwater inflow into Choctawhatchee Bay. From 1931 through 2016, the river had an average annual flow of 6,948 cubic feet per second (cfs) near its discharge into the bay (NWFWMD 2017). The watershed supports a wide array of aquatic and wetland resources and provides numerous benefits, including recreation, flood protection and water supply. Among the environmental resources are diverse aquatic and wetland habitats, extensive forests, Upper Floridan aquifer springs, steephead streams, coastal dune lakes, and numerous species of flora and fauna.

Choctawhatchee Bay covers approximately 129 square miles within Okaloosa and Walton counties. The bay has a single direct opening to the Gulf at East Pass near Destin. It connects with the Pensacola Bay System to the west through Santa Rosa Sound and with the St. Andrew Bay estuary to the east through the Gulf Intracoastal Waterway. A notable feature of the bay is the series of large bayous that span much of its extent. Rocky and Boggy bayous are prominent on the northwest shore. To the west are Garnier and Cinco bayous, and to the east are Alaqua, Basin, and LaGrange Bayous. Hogtown Bayou on the south shore of the bay is the largest, with Old Pass Lagoon and Joes, Indian, and Jones bayous extending from Destin to Fourmile Point. Santa Rosa Island forms the bay's southern boundary west of Moreno Point and includes the confluence with Santa Rosa Sound.

The overall watershed, including its features, water and related resources, governmental setting, water resource challenges, and management recommendations, are described in detail by the Choctawhatchee River and Bay Watershed Surface Water Improvement and Management (SWIM) Plan (NWFWMD 2017) and the Comprehensive Conservation and Management Plan (CCMP) developed by the Choctawhatchee Bay Estuary Program (CBEP 2024).

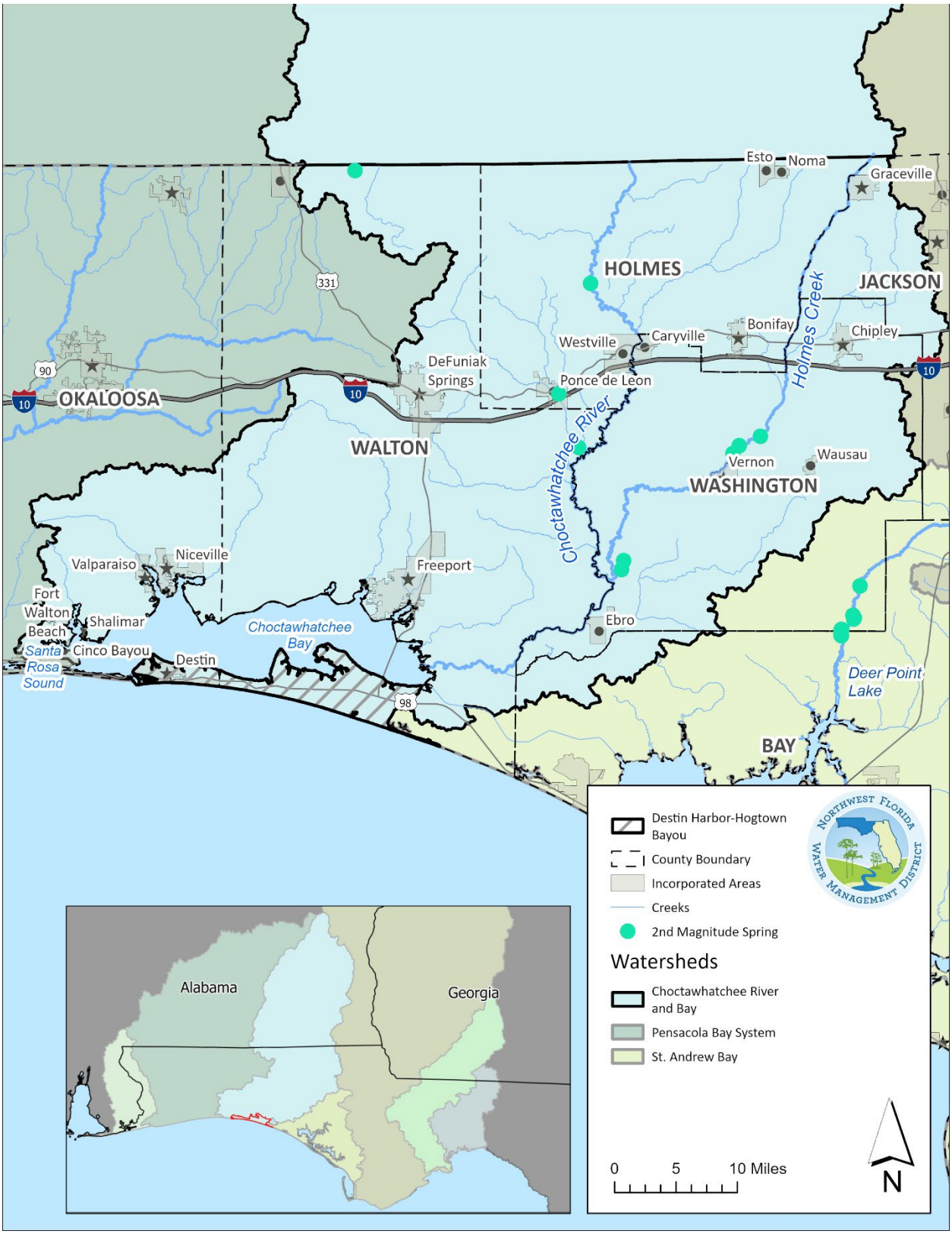

Figure 1. Choctawhatchee River and Bay Watershed

III. Sub-Basin Characteristics

The planning area encompassing the city of Destin, coastal dune lakes, and Hogtown Bayou covers approximately 36,456 acres of the Moreno Point Peninsula, which forms the southern boundary of Choctawhatchee Bay in Okaloosa and Walton counties (Figure 2). For the purposes of this work plan, this area is referred to as the Destin Harbor-Hogtown Bayou sub-basin. The sub-basin includes two separate sub-watersheds (hydrologic units), as defined by the U.S. Geological Survey, listed in Table 1.

Table 1. Destin Harbor-Hogtown Bayou Subwatersheds

Subwatershed (HUC-12)	Receiving Waters	Area (Acres)
Destin Harbor-Alligator Lake Frontal	Old Pass Lagoon, Joes and Indian bayous, coastal dune lakes, Choctawhatchee Bay	17,299
McQuage Bayou-Mack Bayou Frontal	Mack, Hewett, Mussett, Churchill and Hogtown bayous, Choctawhatchee Bay	19,157
	Total Area:	36,456

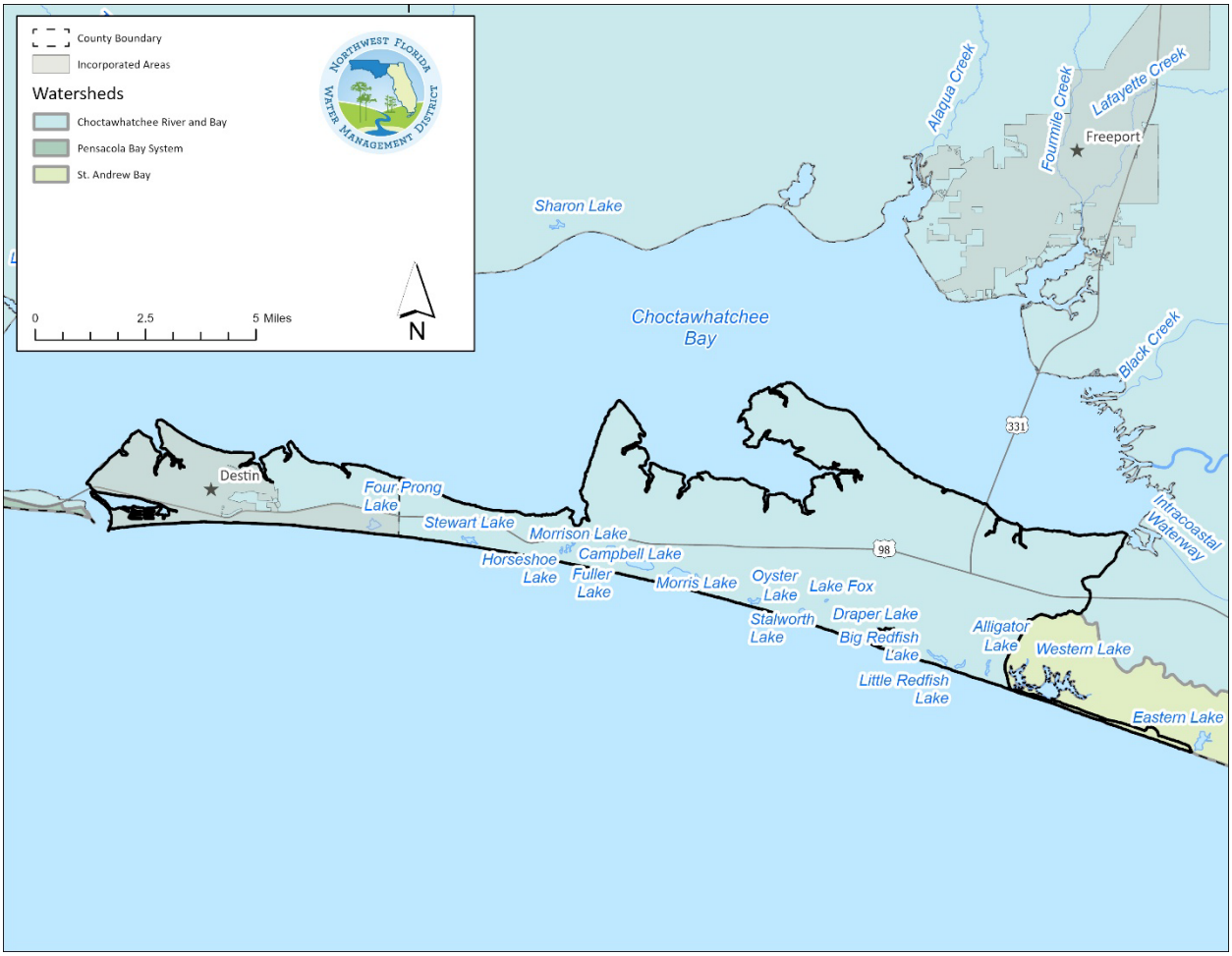

Figure 2. Destin Harbor-Hogtown Bayou Sub-basin

This sub-basin includes the city of Destin and unincorporated portions of each county. Receiving waters in Choctawhatchee Bay include Destin Harbor (Old Pass Lagoon) and Joes, Indian, Jones, Horseshoe, and

Hogtown bayous. A series of coastal dune lakes: Fuller, Morris, Campbell, Stalworth, Oyster, Draper, Big Redfish, Little Redfish, and Alligator lakes, together with their respective catchments, are also in the planning area.

Choctawhatchee Bay and the Moreno Point peninsula are positioned within the Gulf Coastal Lowlands subregion of the Gulf Coastal Plain physiographic region. The Gulf Coastal Lowlands consists regionally of a series of parallel ridges rising from the coast that formed during the Pleistocene Epoch when sea levels fluctuated with melting and expanding ice caps (NWFWMD 2017). Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. The geography of the sub-basin is depicted by Figure 3. Land elevations range from sea level to approximately 74 feet (NAV88).

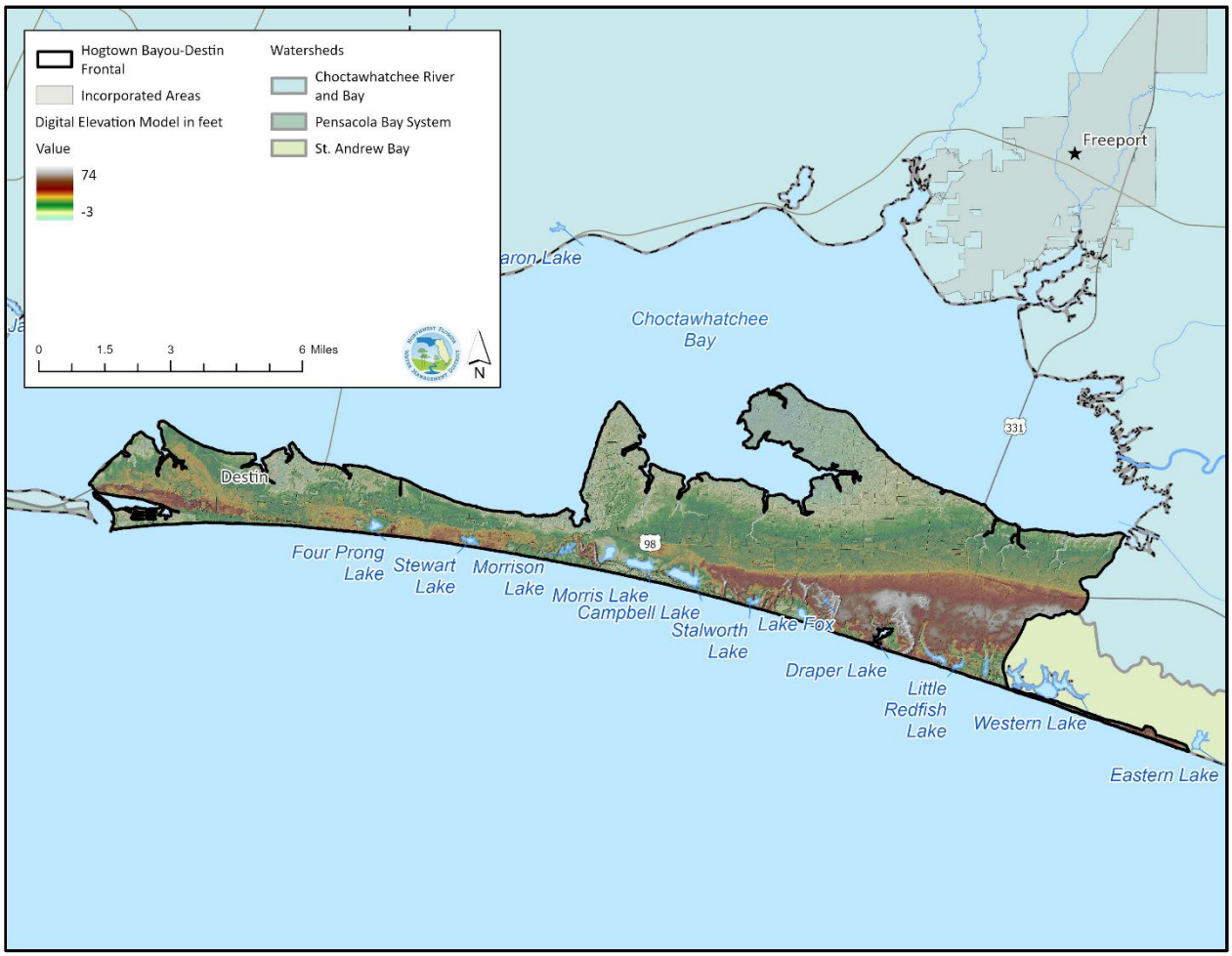

Figure 3. Topography within the Destin Harbor-Hogtown Bayou Sub-basin

Within their respective jurisdictions, Destin, Okaloosa County, and Walton County are responsible for land use and land development regulations within a broad array of other local government responsibilities. The planning area is also within the region served by the Emerald Coast Regional Council, which provides technical assistance and coordinates transportation planning, economic development, emergency and environmental planning, housing, and other services cooperatively with local governments across a seven-county area of northwest Florida.

The Florida Department of Environmental Protection (FDEP) regulates water quality, wastewater, and septic systems, and it owns and manages state parks and coordinates other environmental programs at the state level. The Northwest Florida Water Management District (NWFWMD, or District) is responsible for environmental resource permitting and the regulation of wells and consumptive uses of water, as well as land management, grant programs, and nonregulatory water resource programs. Within the planning area, the District owns and manages the northern extent of the salt marsh on Live Oak Point peninsula. District lands also protect approximately 60,826 acres of floodplain and adjacent buffer area along the Choctawhatchee River and Holmes Creek, protecting water quality in the Choctawhatchee River and Choctawhatchee Bay.

The Florida Fish and Wildlife Conservation Commission (FWC) is responsible for freshwater and marine resource management. The FWC Florida Fish and Wildlife Research Institute conducts seagrass monitoring and management, tracking coastal harmful algal blooms (red tides), and the Oyster Integrated Mapping and Monitoring Program. The Florida Department of Agriculture and Consumer Services, Division of Aquaculture, monitors, evaluates, and classifies shellfish harvesting areas and is responsible for developing and enforcing regulations governing commercial aquaculture.

Among nonprofit organizations, the Choctawhatchee Basin Alliance (CBA) provides a comprehensive program to promote stewardship of Choctawhatchee Bay, the Choctawhatchee River, and coastal dune lakes. Activities in support of this include long-term water quality monitoring, seagrass and oyster monitoring, living shorelines establishment and restoration, invasive species management, extensive classroom and other education programs, and supporting research.

3.1 Sub-basin Functions and Benefits

Ecosystem services and values provided by Choctawhatchee Bay, the coastal dune lakes, and associated water-related resources are essential to the character and quality of the human environment, as well as to regionally significant natural systems. These services and values include fish and wildlife resources, diverse recreational opportunities, noteworthy aesthetic characteristics, surface and groundwater storage and regulation, floodwater storage, and the considerable economic benefits of each of these. Wetlands and floodplains within the drainage area provide important habitat, protect water quality, and provide essential flood protection for the community. The basin's public lands are effective buffers for aquatic habitat and water quality and they provide public access, recreational and educational resources, and shoreline protection and coastal resilience.

3.2 Hydrology

Conditions in Choctawhatchee Bay are greatly influenced by discharge from the Choctawhatchee River. From 1931-2016, the river had an average annual discharge of 6,948 cubic feet per second (cfs) near the discharge into bay (NWFWMD 2017). Salinity in the bay is highly variable, depending on river flow. Significant turbidity and sediment can be carried into the bay from the riverine watershed, with sediment transport likely constrained by the U.S. Highway 331 causeway. Water quality in the bay reflects the combined influences of conditions in the larger watershed and runoff and physical conditions in the immediate vicinity of the bay.

The Destin Harbor-Hogtown Bayou sub-basin exhibits varied hydrological characteristics. The westernmost portion, encompassed by the city of Destin, is highly urbanized and drained by ditches and remnant stream segments that discharge into Joes Bayou, Old Pass Lagoon, and Choctawhatchee Bay. To the east, suburban development and golf course land-uses predominate. Within these areas, water

drains to Indian, Jones, and Horseshoe bayous and directly into the bay. East of Fourmile Point, tidal creeks and a large network of mosquito-control ditches discharge into Hogtown Bayou, in some cases through intermediate embayments: Mack, Hewett, Mussett, and Churchill bayous.

The coastal dune lakes receive freshwater inflow from groundwater drainage and inflow from wetlands within their respective basins. The lakes tend to have periodic communication with the Gulf, with discharge streams opening and closing in response to lake levels. When levels reach a critical head, an outlet stream breaches the dune system. When such breaches are sufficiently deep and persistent, a brackish ecosystem develops in the lake. In some cases, lake openings are opened intentionally, particularly when rising lake and adjacent groundwater levels affect nearby drainfields. Coastal storms occasionally bring salt water into the lakes, causing salinity to vary dramatically.

3.3 Aquatic and Terrestrial Habitats

The Destin Harbor-Hogtown Bayou sub-basin hosts diverse ecosystems (Figure 4), including seagrass, salt marsh, oyster reef, and other estuarine habitats, as well as coastal dune lakes, terrestrial uplands, and wetland ecosystems. These resources, described below, are intrinsically important, and they provide habitat for economically significant species of fish and shellfish and enhance other public uses and benefits.

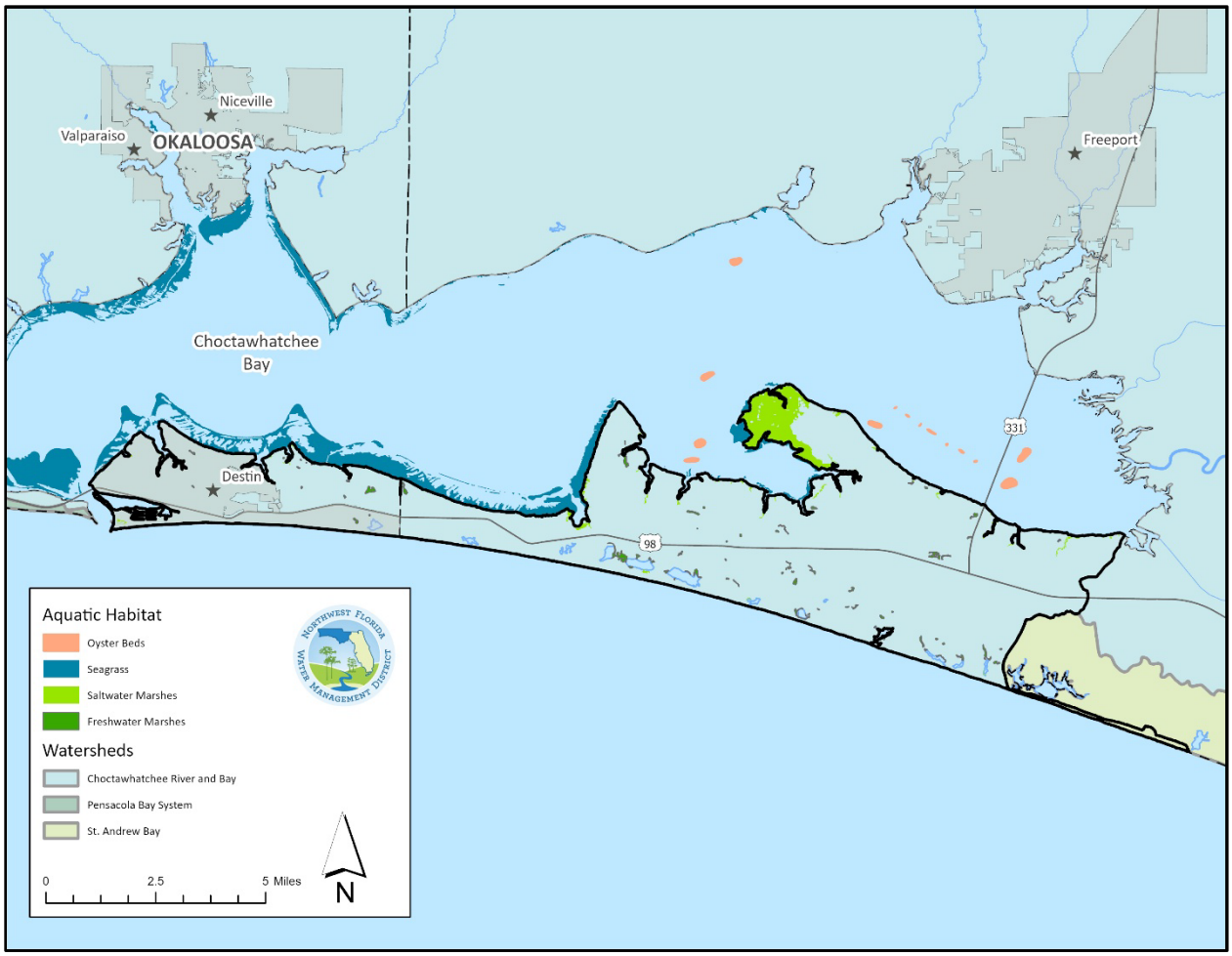

Figure 4. Aquatic Habitats within the Destin Harbor-Hogtown Bayou Sub-basin

Salt Marshes

Salt marshes are intertidal transitional areas between terrestrial and estuarine environments, providing nursery habitat and refuge for a variety of invertebrates and fish, as well as habitat for migratory and other bird species, reptiles, mammals, and other wildlife. Additionally, salt marshes are important for nutrient cycling, water quality protection, shoreline stability, floodwater storage, and coastal resilience.

Live Oak Point Peninsula, extending into Choctawhatchee Bay in the eastern portion of the planning area, contains Choctawhatchee Bay's largest salt marsh (approximately 1,000 acres). Another substantial salt marsh exists on a promontory south of the Live Oak Point peninsula within Hogtown Bayou, and smaller marshes occur within the upper reaches of several bayous to the west.

Salt marshes in the planning area are typically characterized by relatively homogenous expanses of black needlerush (*Juncus roemerianus*), with smooth cordgrass (*Spartina alterniflora*) frequently at deeper elevations along the water's edge. Other prominent species include big cordgrass (*S. cynosuroides*) and bulrush (*Scirpus* spp.). Shrubs, scattered pines, and other transitional species occur on hammocks and spoil piles along mosquito control ditches. The Live Oak Point salt marsh is buffered to the east by hydric pine flatwoods, although single-family housing units are encroaching. A large network of mosquito control ditches, constructed between 1969 and 1972 (as determined from historical aerials), exists throughout much of the northern half of this marsh (NWFWMD 2021).

The northern shore of Live Oak Point is the focus of a major shoreline restoration project, implemented by the Northwest Florida Water Management District. The Choctawhatchee Basin Alliance is providing construction support and technical assistance. North-facing shorelines of the marsh are experiencing significant undercutting and erosion. Analysis of historical aerial photography suggests an average shoreline/salt marsh retreat of approximately 3½ feet per year from 1972-2016 (NWFWMD 2021). Salt marsh habitat loss for the entire peninsula during this period is estimated at 56 acres. To address this and enhance sustainability of the marsh system, the project provides for construction of a limestone breakwater-based living shoreline project along approximately 5,245 feet of littoral marsh. The construction is accompanied by vegetation planting and monitoring.

Oysters

The only reef-building oyster in Choctawhatchee Bay is the Eastern oyster (*Crassostrea virginica*) (Radabaugh *et al*. 2019). Oysters and oyster reefs provide a range of ecosystem services critical to the health and productivity of northwest Florida's estuaries (Radabaugh *et al*. 2019). They improve water quality and clarity through the filter feeding process; improve coastal resiliency by reducing wave energy and erosion; and provide important habitat and food for fish, invertebrates, and birds.

Oysters have historically been commercially harvested within Choctawhatchee Bay, and there have been limited efforts at oyster reef replenishment (Radabaugh *et al*. 2019). While Choctawhatchee Bay, waters north of the planning area are conditionally approved for shellfish harvesting (FDACS 2020), however, harvest yields are considered low (Radabaugh *et al*. 2019).

Two oyster beds are mapped by FWC (2025b) within Hogtown Bayou, and there are a series of small beds extending from north of the Live Oak Point peninsula toward the U.S. Highway 331 causeway. Additionally, the Northwest Florida Water Management District and Choctawhatchee Basin Alliance (CBA) have established a major breakwater-based living shoreline along District lands on Live Oak Point, described above. In addition to protecting against erosion, the breakwater structures have been observed hosting oyster recruitment. The CBA also hosts oyster shell recycling and oyster gardening

programs for Choctawhatchee Bay in addition to enhancing oyster habitats as part of living shoreline projects.

Seagrasses

Seagrasses are a highly productive component of Choctawhatchee Bay's estuarine ecosystem (NWFWMD 2017). They provide important habitat and food for fish, shellfish, manatees, sea turtles, and waterfowl. Many economically significant species of fish and shellfish depend on seagrasses during critical life stages. Additionally, seagrasses help stabilize sediments and thereby protect water quality (Orth *et al*. 2020).

Within the Destin Harbor-Hogtown Bayou sub-basin, a mixture of patchy and continuous seagrass extends along southern Choctawhatchee Bay from the western tip of Destin eastward to Fourmile Point (Yarbro and Carlson 2018; FWC 2025a). In Hogtown Bayou, seagrass coverage becomes more limited, although continuous seagrass beds are present along the southern and eastern shore of the bayou. Substantial beds of continuous seagrass exist along the eastern to northern shorelines of Live Oak Point.

The two species of seagrass most prevalent in Choctawhatchee Bay are shoalgrass (*Halodule wrightii*) and widgeongrass (*Ruppia maritima*), with shoalgrass dominant in higher salinity areas most influenced by exchange with the Gulf. Both species can vary widely in cover over short periods of time, being readily able to expand coverage area under optimal conditions but also vulnerable to adverse effects of turbidity and salinity fluctuations caused by runoff and high river inflow. Tapegrass (*Vallisneria americana*) may be found in freshwater or low-salinity conditions in tidally influenced creeks discharging into the bay.

Coastal Dune Lakes

As described by the NWFWMD (2017), coastal dune lakes are adapted to the region's unique and dynamic coastal environment. They are ecologically distinct, given their position within the watershed and variable interaction with the marine environment. The lakes are an important stopover point for migrating neo-tropical birds and provide unique recreational resources for residents and visitors. The Florida Natural Areas Inventory (FNAI) ranks coastal dune lakes as Globally and State Imperiled (G2/S1) (FNAI 2010).

Terrestrial Habitats

Terrestrial habitats within the Destin Harbor-Hogtown Bayou sub-basin include a varied array of wetland habitats (wet flatwoods, interdunal swales, dome swamps, seepage slopes, wet prairie, and more) and upland communities (beach dune, mesic hammock, scrub, and sandhill, among others). See detailed descriptions by the Florida Forest Service (FFS) (2015) for Point Washington State Forest and the Florida Department of Environmental Protection (FDEP) (2019) for Topsail Hill Preserve State Park.

Freshwater wetlands are a major component of the Destin Harbor-Hogtown Bayou sub-basin. They store floodwaters and provide attenuation and treatment of runoff, thereby protecting water quality in downstream waters, including Choctawhatchee Bay. Additionally, inland wetlands provide critically important flood protection for residential and commercial land uses, as well as habitat for fish and wildlife.

Managed lands within Point Washington State Forest and state parks protect the headwaters and immediate landscape of multiple coastal dune lakes as well as drainages to Choctawhatchee Bay. The District's Live Oak Point property protects the bay's major salt marsh, as described above, as well as water quality within the bay.

Listed Species

Aquatic habitats, estuarine and freshwater wetlands, and terrestrial habitats within the planning area are important for sustaining biological diversity within the region, including a number of species federally listed under the Endangered Species Act (Table 2).

Table 2. Listed Species Potentially Occurring within the Destin Harbor- Hogtown Bayou Sub-basin

Common Name	Scientific Name	Federal Status
Perforate reindeer lichen	*Cladonia perforata*	Endangered
Reticulated Flatwoods Salamander	*Ambystoma bishop*	Threatened
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Green Sea Turtle	*Chelonia mydas*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Eastern Indigo Snake	*Drymarchon couperi*	Threatened
Piping Plover	*Charadrius melodus*	Threatened
Red-cockaded Woodpecker	*Dryobates borealis*	Threatened
Red knot	*Calidris canutus rufa*	Threatened
West Indian Manatee	*Trichechus manatus*	Threatened
Choctawhatchee Beach Mouse	*Peromyscus polionotus allophrys*	Endangered
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	Threatened
Sources: Florida Forest Service (2015); Florida DEP (2018); FNAI (2025)		

3.4 Land Use and Land Cover

Land use and land cover from 2022 (FDEP 2022) is listed in Table 3 and depicted in Figure 5. The Urban and Built-Up category, including residential, commercial, and industrial land uses, comprises approximately 40 percent of the sub-basin area. Upland forest and wetlands encompass about 23 percent and 25 percent, respectively, and the Transportation, Communication, and Utilities category accounts for about 4 percent of the sub-basin.

Table 3. 2022 Land Use and Land Cover within the Destin Harbor – Hogtown Bayou Sub-basin

Land Use/Cover	Area (acres)	Percent
Urban and Built-Up	14,400	39.50
Upland Forest	8,293	22.75
Wetlands	8,928	24.49
Water	1,767	4.85
Transportation, Communication, Utilities	1,435	3.94
Rangeland	1,034	2.84
Barren Land	547	1.50
Agriculture	53	0.14
Total	36,457	100

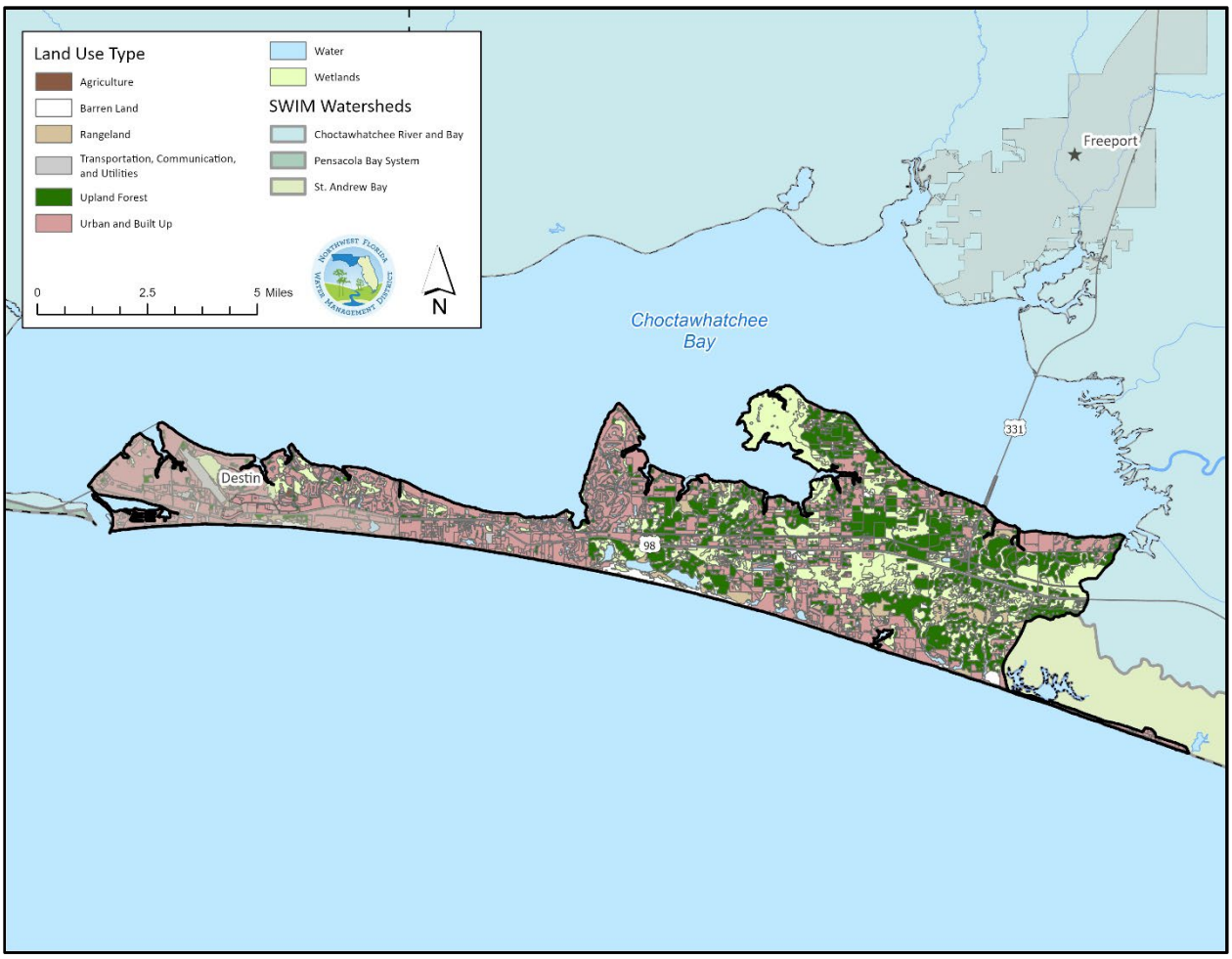

Figure 5. 2022 Land Use and Land Cover within the Destin Harbor – Hogtown Bayou Sub-basin

Residential and commercial land uses are concentrated in Destin, with suburban and resort development extending eastward in the vicinity of Indian and Jones bayous, the Fourmile Point peninsula, and the coastal reach south of U.S. Highway 98 between Destin and Topsail Hill Preserve State Park.

About 5.2 percent of the sub-basin consists of public lands (Figure 5). These include Topsail Hill Preserve State Park, Point Washington State Forest, the District's Live Oak Point property in Walton County, and Henderson Beach State Park in Okaloosa County. In addition to providing for public use and recreation and protecting ecosystems, these lands serve as a buffer to protect water quality and aquatic habitats. Coastal resilience benefits include floodwater storage, hurricane storm surge protection, and protection of communities from coastal erosion.

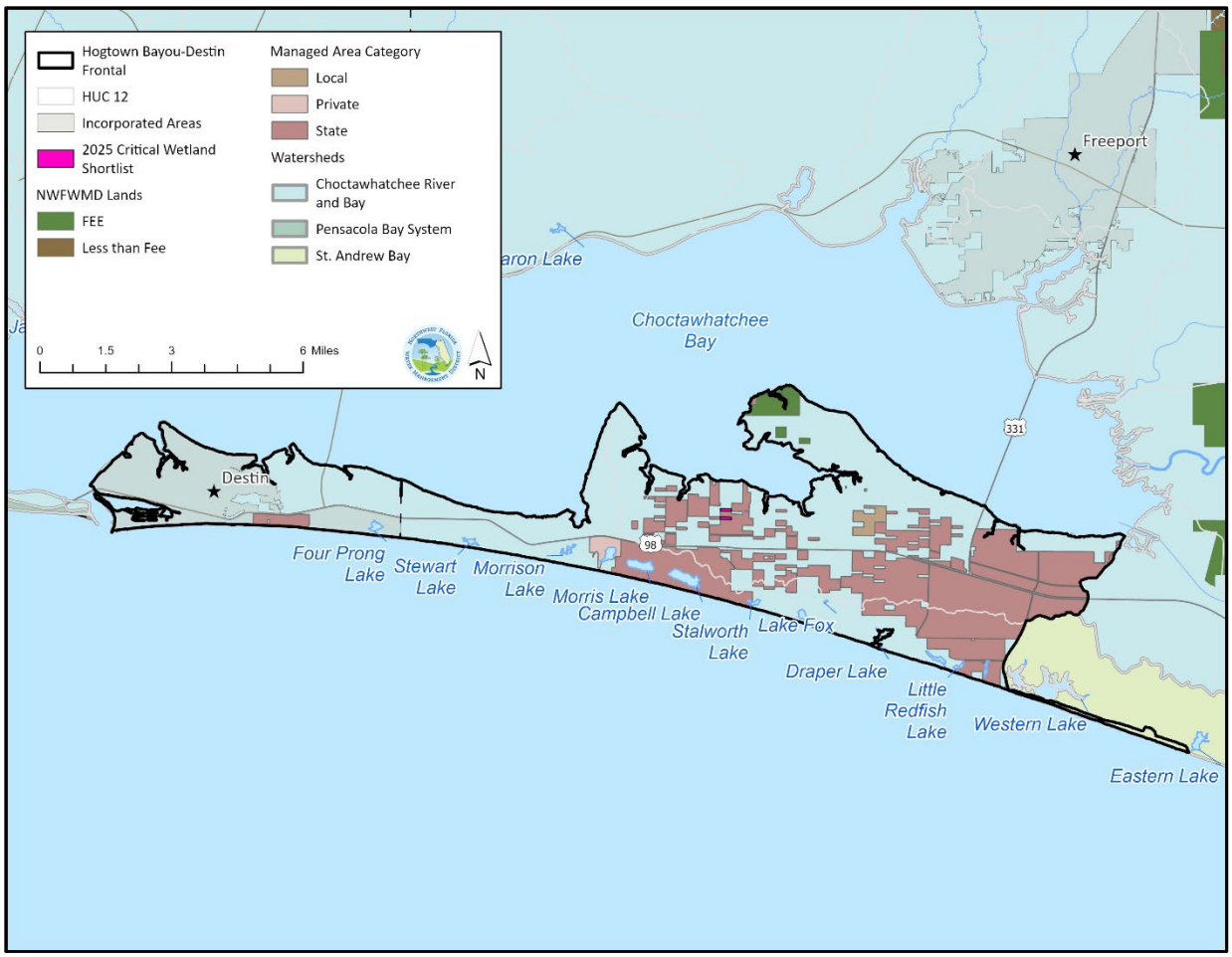

Figure 6. Managed Lands in the Destin Harbor – Hogtown Bayou Sub-basin

3.5 Population and Growth

The University of Florida Bureau of Economic and Business Research (BEBR) (2024) estimated the 2024 populations of Okaloosa and Walton counties at 221,806 and 87,728, respectively. The 2020-2024 population growth rate for Okaloosa County was 4.8 percent, and the growth rate for Walton County was 16.5 percent.

Analysis of the 2020 U.S. Census point data indicates a planning area population of 42,528. By 2045, the area is projected to grow an additional 44 percent, to reach 61,287. These numbers indicate permanent resident populations only and do not include the significant numbers of tourists and seasonal residents.

3.6 Water Supply

Public supply is the largest water use sector in the sub-basin, followed by landscape irrigation. Destin Water Users serves the city of Destin and an unincorporated area to the east within Okaloosa County. South Walton Utility Company provides water service to the easternmost portion of the sub-basin area within Okaloosa County, as well as the western portion of the sub-basin within Walton County, including the Fourmile Point peninsula. Regional Utilities serves the remainder of the sub-basin's area within Walton County.

Destin Water Users has coastal production wells located within this sub-basin and purchases a portion of its supply from South Walton Utility Company, which obtains water from an inland wellfield in central Walton County. South Walton Utility Company also operates coastal production wells located within this sub-basin to meet a portion of the demand in its inland Okaloosa County service area. Regional Utilities obtains water from an inland wellfield in central Walton County. The District (NWFWMD 2023) estimates water demands for the Destin Water Uses will increase by approximately 28 percent between 2020 and 2045. Demands for South Walton Utility and Regional Utilities are projected to grow about 69 percent and 105 percent, respectively, between 2020 and 2045, underscoring the level of growth and watershed change facing the region.

In order of depth, the major hydrostratigraphic units that comprise the groundwater flow system within this sub-basin are the surficial/sand-and-gravel aquifer, the intermediate system, and the upper Floridan aquifer. The upper Floridan aquifer is the primary source of potable water, with the surficial/sand-and-gravel aquifer providing water for landscape irrigation needs. The surficial aquifer thickens to the west and is referred to as the sand-and-gravel aquifer in Okaloosa and Santa Rosa counties. In this sub-basin, the intermediate system also serves as a supply source for some landscape irrigation wells. The upper Floridan aquifer system is comprised of carbonate and dolomitic rocks that are more than 400 feet thick in southern Okaloosa County (NWFWMD 2023). Well yields are generally low in the coastal areas relative to areas further north.

IV. Current Issues and Challenges

The Destin Harbor-Hogtown Bayou sub-basin faces distinct challenges affecting water quality, aquatic and wetland habitats, water supply, and flooding and coastal resilience. These issue areas and responsive management strategies are closely interrelated. Water quality, for example, directly influences habitat quality and sustainability. Similarly, healthy aquatic, wetland, and upland ecosystems directly support water quality. Functional floodplains and wetland systems each provide flood protection for surrounding communities, provide fish and wildlife habitat, and protect and improve water quality.

4.1 Monitoring and Trends

The Choctawhatchee Basin Alliance (CBA) of Northwest Florida State College monitors more than 130 water-quality stations in Choctawhatchee Bay, the Choctawhatchee River, and Walton County's coastal dune lakes (CBA 2025). Field parameters monitored include temperature, dissolved oxygen, pH, salinity, specific conductivity, oxygen saturation, and water clarity (Secchi depth). Samples are analyzed by the Florida LAKEWATCH Program for total nitrogen, total phosphorus, and chlorophyll-a. Within the Destin Harbor-Hogtown Bayou sub-basin, 26 CBA estuarine sampling sites are documented by Florida LAKEWATCH (Florida LAKEWATCH 2025). LAKEWATCH also documents multiple monitoring stations in all of the coastal dune lakes.

Florida's Seagrass Integrated Mapping and Monitoring (SIMM) Program conducts periodic assessments of seagrasses in Florida's estuarine waters, including Choctawhatchee Bay (Yarbro and Carlson 2018). Seagrass area is mapped, and water-quality data are collected as part of the assessments, including salinity, temperature, depth, Secchi depth, pH, and dissolved oxygen concentration, together with optical water quality parameters—light attenuation, chlorophyll-a concentration, turbidity, total suspended solids, and color.

The Florida Healthy Beaches Program of the Florida Department of Health monitors one site within the planning area, Clement Taylor Park in Destin, as well as several Gulf beach sites in the vicinity. Samples at public beaches are analyzed for *Enterococcus*, as an indicator fecal contamination. Advisories are issued when data exceed established criteria. Sites are sampled weekly to biweekly (FDOH 2025).

The Florida Department of Agriculture and Consumer Services, Division of Aquaculture monitors shellfish harvesting areas for the presence of fecal coliform bacteria as an indicator of the possible presence of other pathogens.

4.2 Water Quality

Estuarine and lake waters in the Destin Harbor-Hogtown Bayou sub-basin are affected by threats to water quality common to Florida waters, including stormwater runoff and nonpoint source pollution and challenges associated with wastewater management and treatment. Nonpoint source pollution is generated by stormwater runoff across the landscape carrying pollutants from diffuse sources to receiving waters. Common pollutants include nutrients, sediments, bacteria, pet and wildlife waste, fertilizers, herbicides, insecticides, oils and greases, effluent from onsite sewage treatment and disposal systems (OSTDS), and litter. Sources may include residential yards, commercial and industrial sites, streets and parking lots, agricultural areas, construction sites, atmospheric deposition, and erosion sites. The highest rates of pollutant loading, including for nutrients, suspended solids, and biochemical oxygen demand, are typically associated with residential, commercial, industrial, and agricultural land uses (Harper 1999).

Impairments listed by the state of Florida within the planning area include fecal coliform bacteria and dissolved oxygen in multiple waterbody segments, *E. coli* bacteria in the Dune Lake Drain segment, and nutrients (chlorophyll-a) in a middle segment of Choctawhatchee Bay. Waterbodies listed as not attaining standards at the time of this writing are listed in Table 4. Bacterial parameters are the most commonly identified impairments. Sources of bacteria and other pathogens may include seepage of groundwater affected by leaking sanitary sewers and septic tanks, animal wastes, sanitary sewer overflows and leaks, and urban stormwater runoff.

In 2006, the U.S. Environmental Protection Agency established a TMDL establishing a target for a 15-percent reduction in fecal coliform counts in the middle segment of Choctawhatchee Bay between Destin and Eglin AFB (EPA 2006).

The network of mosquito control ditches east of Fourmile Point carries large volumes of untreated stormwater runoff from residential subdivisions, the U.S. Highway 98 corridor, and developing areas into Hogtown, Mack, Hewett, Mussett, and Churchill bayous and Choctawhatchee Bay. During major storm events, these ditches can bring large sediment and turbidity into estuarine waters, as well as nutrients, oils and greases, and other nonpoint source pollutants. They can also deliver pulses of fresh water into the estuary much more rapidly than would occur under natural watershed processes.

Table 4. Waters Not Attaining Standards in the Destin Harbor – Hogtown Bayou Sub-basin

Waterbody	WBID*	Parameters Not Attaining Standards
Choctawhatchee Bay Lower Segment	778A	Dissolved Oxygen (Percent Saturation) Fecal Coliform (Shellfish harvesting area classified Prohibited)
Clement E. Taylor Park	778AD	Bacteria (beach advisories) Dissolved Oxygen (Percent Saturation) Fecal Coliform (Shellfish harvesting area classified Prohibited)
Destin Harbor	917A	Fecal Coliform (Shellfish harvesting area classified Prohibited)
Dune Lake Drain	959F	Dissolved Oxygen (Percent Saturation) Escherichia coli
Choctawhatchee Bay (Middle Segment1)	778B	Dissolved Oxygen (Percent Saturation) Fecal Coliform (Shellfish harvesting area classified Prohibited and Conditionally Approved)
Choctawhatchee Bay (Middle Segment2)	778C	Nutrients (Chlorophyll-a) Dissolved Oxygen (Percent Saturation) Fecal Coliform (Shellfish harvesting area classified Conditionally Approved)
Hogtown Bayou East	881A	Fecal Coliform (Shellfish harvesting area classified Prohibited) Fecal Coliform
Mack Bayou	937	Fecal Coliform Fecal Coliform (Shellfish harvesting area classified Prohibited)
East Pass	778AB	Bacteria (beach advisories)
* Waterbody Identification Number Sources: Florida Department of Environmental Protection (2025a) Florida Department of Agriculture and Consumer Services (2020)		

Hyman (2025a) summarizes annual and 10-year spatial patterns for Choctawhatchee Bay. In general, total nitrogen values are found to have a decreasing trend across much of the bay, and total phosphorus values were found to have no trend or to be increasing. During 2024, average total phosphorus and chlorophyll-a values exceeded state numeric nutrient criteria (NNC) at several stations within the Hogtown Bayou area, including within mosquito control ditch influenced discharges into the bayou. Average values at one station also exceeded the NNC for total nitrogen. One station in upper Indian Bayou on average exceeded the NNC for chlorophyll-a.

The planning area includes approximately 4,133 OSTDS. These are concentrated primarily in the Walton County portion of the planning area, with clusters within mosquito control ditch drainages to Hogtown Bayou, in the drainages and proximity of several coastal dune lakes, and along the south shore of Choctawhatchee Bay (Figure 7).

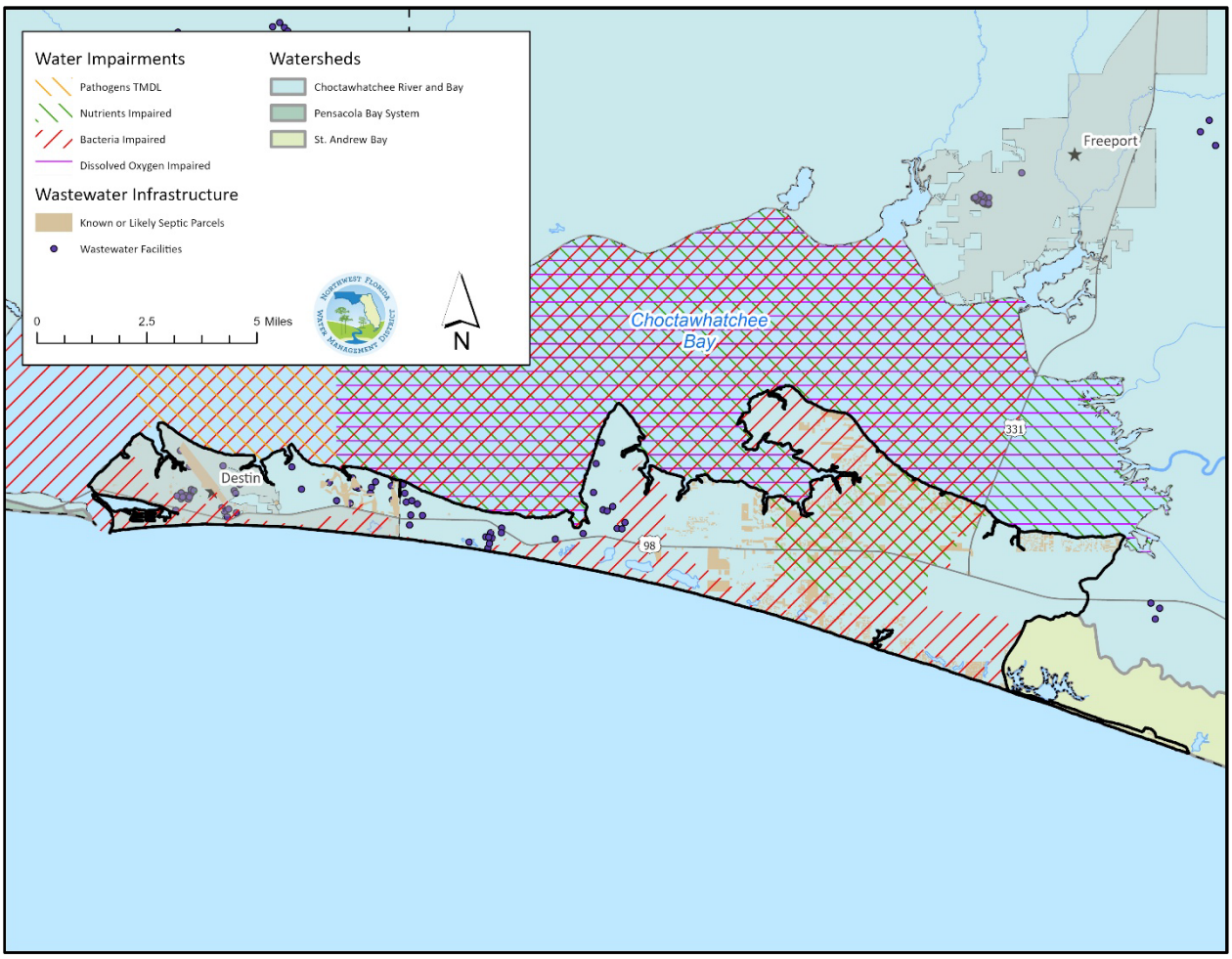

Figure 7. Water Quality Conditions and Wastewater Infrastructure in Hogtown Bayou Sub-basin

Florida's Algal Bloom Sampling Status dashboard (FDEP 2025b) identified several recently reported harmful algal blooms within the sub-basin, including both cyanobacteria and green algae. These were on the shoreline of Choctawhatchee Bay west of Fourmile Point, within the upper reaches of Joes Bayou (City of Destin), and upper Mack Bayou, which drains into Hogtown Bayou.

4.3 Aquatic and Wetland Habitats

Seagrasses

Seagrasses have proven vulnerable worldwide to water quality impairments, changing climatic conditions, and physical impacts. Orth *et al*. (2006) describes a number of causative stressors, including nutrient enrichment, sediment runoff, invasive species, hydrological alterations, coastal armoring, and sea level rise. Climatological risks include increases in sea surface temperature, sea level, and frequency and intensity of storms, and associated water-quality effects. Shoreline armoring can prevent shoreward migration of seagrasses in response to sea-level rise, leading to losses of habitat at the deeper edges of the grass beds. In addition to their intrinsic importance, seagrass communities are an effective indicator of broader environmental conditions and changes (Orth *et al*. 2006). In addition to their intrinsic importance, seagrass communities are an effective indicator of broader environmental conditions and

changes (Orth *et al*. 2006). Seagrass beds integrate environmental effects over time. Changes can therefore signal broader effects on estuarine resources and conditions.

Yarbro and Carlson (2018) noted seagrass acreage in Choctawhatchee Bay has varied widely across mapping efforts conducted in 1992, 2007, and 2015, likely due to responses of the dominant seagrass species, shoalgrass and widgeongrass, to changing environmental conditions. Losses in coverage were observed between 1992 and 2007, but substantial increases in seagrass area were evident between 2007 and 2015. Stressors to seagrasses within Choctawhatchee Bay include turbidity and salinity fluctuations associated with riverine inflow and heavy rainfall events and increased color due to greater colored dissolved organic matter (CDOM) in stream runoff (Yarbro and Carlson 2018). Imagery from 2013 indicated that propeller scarring affected approximately 40 percent of the bay's seagrass beds, but that most affected beds were only lightly damaged (Yarbro and Carlson 2018).

Oysters

Oyster reefs encompass a limited area within Choctawhatchee Bay. Portions of the bay are conditionally approved for shellfish harvesting (FDACS 2020), but, as noted above, yields are generally low (Radabaugh *et al*. 2019). There have been some efforts by the state to enhance oyster reefs in the bay, with the total enhancement area being approximately 30 acres between 1987 and 2009 (Radabaugh *et al*. 2019). More recently, the CBA has initiated oyster shell recycling and oyster gardening programs, and the CBA and NWFWMD have established shoreline restoration projects that expand oyster habitat within the bay, with the major project being that described above on Live Oak Point.

Radabaugh *et al*. (2019) discuss factors essential to the sustainability of oyster populations, including with respect to salinity, runoff and sedimentation, and the rate of shell deposition from new growth relative to the rate of shell loss (the "shell budget"). Oyster populations were noted as having suffered major declines statewide. Principle contributors to this loss and continuing threats include:

- Hydrologic alterations causing unsuitable salinity conditions, both in pulses and in long-term trends.
- Sedimentation, burying oysters and impacting filter feeding and respiration.
- Coastal development and shoreline armoring, increasing sedimentation and runoff, diminishing water quality, reducing available habitat area, and constraining the ability of oysters to migrate shoreward in response to sea level rise.
- Predation and disease, particularly at higher salinity levels.
- Effects of changing climate conditions, including sea-level rise, warming, low oxygen levels, and acidification.

Salt Marshes

The bay's largest marsh, on Live Oak Point, is substantially protected by public land ownership, with the northern portion of the marsh owned and managed by the District, and the southern portion owned by the state of Florida. As described above, however, the marsh at Live Oak Point has experienced rapid erosion of its northern shoreline. Approximately 56 acres were lost between 1972 and 2016, with erosion continuing (NWFWMD 2021). The Live Oak Point shoreline restoration project has been implemented to prevent continued erosion and to enhance and restore littoral habitat.

Sea-level rise places at risk the long-term sustainability of salt marshes in Choctawhatchee Bay through submergence and drowning (Rolando *et al*. 2023), as well as erosion and increasing salinity. Emergent vegetation along bay shorelines and within bayous can be particularly vulnerable where coastal

construction and shoreline armoring prevent migration of marshes inland along an elevation gradient in response to sea level rise.

Palustrine Wetlands

Freshwater wetlands within the contributing watershed area are important for protecting water quality in downstream waters, as well as providing flood protection and fish and wildlife habitat. Palustrine wetlands within the Destin Harbor-Hogtown Bayou sub-basin have been subject to significant loss and fragmentation due to extensive development over the past several decades. Additionally, wetland areas have been hydrologically disrupted through construction of mosquito control ditches. Fortunately, substantial wetland habitat areas have been protected and remain relatively intact within public conservation lands within the sub-basin. The District has identified two parcels adjacent to Point Washington State Forest and within the Hogtown Bayou drainage as being critical wetlands for acquisition consideration should funding become available. Additional information is found in the District's 2024 Critical Wetlands Update (NWFWMD 2024b).

4.4 Flooding and Coastal Resilience

The Destin Harbor-Hogtown Bayou sub-basin is highly susceptible to coastal storm impacts (Okaloosa County 2021; Walton County 2020). Recent major storms impacting the area have included hurricanes Opal (1995), Dennis (2005), Ivan (2004), and Michael (2018).

Portions of Destin in the vicinity of Joes Bayou and Old Pass Lagoon and unincorporated development within the Fourmile Point peninsula and the entirety of the Live Oak Point peninsula are all within flood-prone areas (Figure 8). Approximately 38 percent of the planning area is within the Special Flood Hazard Area (one percent annual chance of flooding). Much of that area is within conservation lands and wetlands, underscoring their protective function for the community. Some residential areas are within the flood-prone areas, however. These are within Destin near Marler and Joes bayous and Old Pass Lagoon, as well to the east in the vicinity of Jones Bayou, near Santa Rosa Beach, and within waterfront areas bordering the bay. Storm surge from a Category Three hurricane would impact residential areas bordering Hogtown Bayou, within the Fourmile Point peninsula, and just east of Destin, as well as residential and tourist development bordering Old Pass Lagoon and the entirety of the Live Oak Point peninsula (NOAA 2025). About 3.3 percent of the planning area is within the VE zone, with potential impacts from waves and high velocity waters during hurricanes and tropical storms.

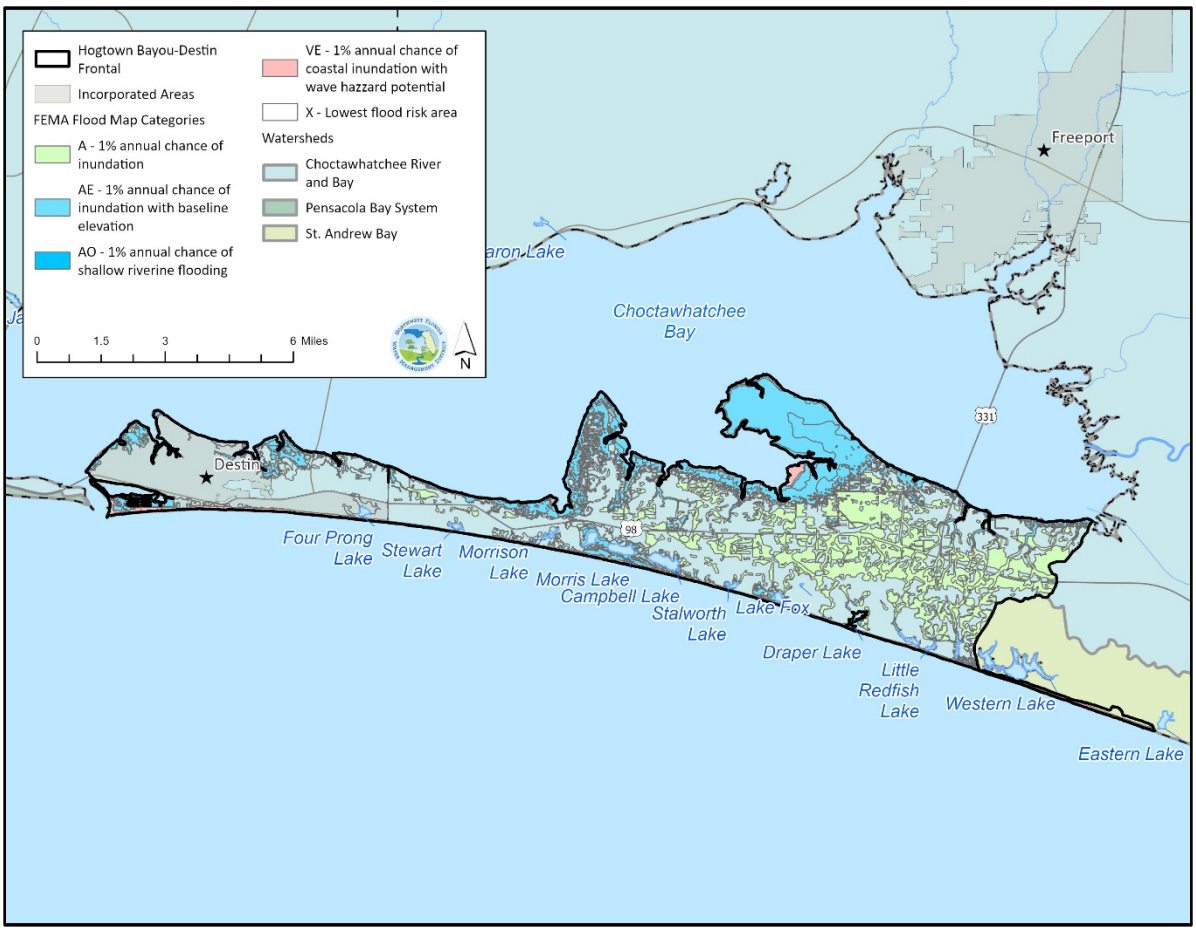

Figure 8. Flood Zones within the Destin Harbor- Hogtown Bayou Sub-basin

4.5 Water Supply

Due to decades of population growth and historical water production concentrated along the coast, the potentiometric surface of the upper Floridan aquifer in this region has declined to below sea level causing saltwater intrusion to become a significant concern. Due to this resource concern and projected future growth in water demands, the District's Governing Board delineated a Water Resource Caution Area for the coastal and southern portions of Walton, Okaloosa, and Santa Rosa counties in 1989. This designation specifies more restrictive thresholds for water use permitting, prohibits new and expanded uses of the upper Floridan aquifer for non-potable purposes, and requires utilities to implement water conservation measures and evaluate the feasibility of water reuse. Additionally, a Regional Water Supply Plan (RWSP) has been in place in these three counties since 2000 due to concerns about the ability of existing and future water sources to meet projected demands. The RWSP was updated in 2024 for the 2020-2045 planning horizon (NWFWMD 2024a). Collaborative efforts among the utilities, local governments, and the District to develop inland wellfields and shift withdrawals away from the coast during the past few decades have achieved a partial recovery of upper Floridan aquifer levels. Aquifer levels in the center of the cone of depression located near Fort Walton Beach are 65 to 70 feet below sea level (NWFMWD 2024). However, aquifer levels are projected to further decline to nearly 150 feet below sea level by 2045 unless alternative water supplies are developed to reduce reliance on the upper Floridan aquifer (NWFWMD 2024a).

Within this sub-basin, the potentiometric surface of the upper Floridan aquifer is approximately 40 to 50 feet below sea level below the city of Destin, and 0 to 20 feet below sea level in the eastern portion of the sub-basin (NWFWMD 2023, Figure 2-18). Aquifer drawdowns are less pronounced toward the east, partly due to the thinner and leakier nature of the intermediate system on the eastern edge of Choctawhatchee Bay (NWFWMD 2023). Despite lower well yields, aquifer drawdown, and proximity to the Gulf and Choctawhatchee Bay, groundwater quality near Destin and just to the east within this sub-basin is generally good (NWFWMD 2023).

The District's most recent assessment of saltwater intrusion risk for Region II was completed in 2024 (NWFWMD 2024a). The District is working to collect additional data, refine the groundwater flow and solute transport models, and assess the need to adopt minimum aquifer levels to protect the upper Floridan aquifer. The District has performed planning-level evaluations of the potential for the Shoal River and Choctawhatchee River to serve as future surface water sources, with additional analyses planned during 2026 and 2027. District staff are also evaluating benefits that could be achieved by modifying the spatial distribution and magnitude of groundwater pumpage.

During 2026, the District will be administering a new water conservation grants program to implement projects that result in quantifiable reductions in water use. The District continues to work with local governments and utilities to expand water conservation and water reuse. Within the sub-basin, Destin Water Users, South Walton Utility Company, and Regional Utilities all operate reclaimed water systems to meet a portion of the landscape irrigation needs within the sub-basin. Destin Water Users also operates an aquifer storage and recovery system (ASR), which helps to optimize reclaimed water utilization.

Water supply challenges in the sub-basin include:

- Coastal well sustainability – Coastal wells are highly susceptible to coastal flooding and storm surge and, in some areas, are subject to the long-term saltwater intrusion risks. There is limited availability of groundwater from the coastal areas, with inland wellfields providing much of the water utilized in coastal areas.
- Alternative Water Supply Development – Alternative water supplies are needed to meet future demands within Planning Region II, including coastal Okaloosa and Walton counties. There are significant challenges in identifying the most cost-effective alternative water supplies, developing the regional partnerships and framework needed for project implementation, and securing funding for design and construction.
- Infrastructure retrofit and maintenance – As water system infrastructure ages, pipes can be subject to leakage and infiltration, necessitating repair or replacement. Population growth and new development also require increased pipe diameters and water line extensions. Associated improvements may include booster pumps, modernized metering and data systems, and looping and sectionalization of water distribution systems.
- Changes in Regulated Contaminants – Water utilities must track and plan for potential changes in drinking water regulations. An area of ongoing concern for most 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 2024).

4.6 Data and Knowledge Gaps

- Water Quality – Water quality can be highly variable, depending on precipitation, freshwater inflow, and seasonal conditions. Sampling frequency may be inadequate for capturing effects of individual events or evaluating trends over periods of months or years. Substantially increasing the temporal and spatial density of water quality monitoring, with an expanded set of parameters at least for 1-2 years, would provide a more accurate assessment of water quality in the sub-basin. Additional parameters for such an assessment may include nitrite + nitrate (NO_{2+3}) ammonium (NH_4), orthophosphate (PO_4), total suspended solids, and others as may be agreed upon by participants.
- Sediment Quality – Sediment data are indicative of the quality of benthic habitats, as well as potential effects from sedimentation, nutrient enrichment, or contaminants. Sediments integrate processes over time and can therefore be useful in assessing long-term impacts. Legacy sediment quality data published by the Florida Department of Environmental Protection (DEP) (Seal et al. 1994) indicates stations within Old Pass Lagoon and east of Live Oak Point.
- Biological Data – Continued updates to evaluations and maps of seagrass and oyster reef distributions and conditions would facilitate identifying trends and risks for water quality, habitat quality, and coastal resilience.

4.7 Risks and Vulnerabilities

Future risks and ongoing vulnerabilities affecting the planning area and Choctawhatchee Bay as a whole are centered on effects related to growth and development and sea level rise. These are summarized as follows:

- Water Quality – Continued population growth and development will bring additional stormwater and wastewater management challenges. It is important to effectively prevent pollutant loading from point and nonpoint sources within a changing landscape. Coastal waters are otherwise vulnerable to eutrophication and harmful algal blooms.
- Seagrass Communities – The health and extent of Choctawhatchee Bay's important seagrass communities can be impacted by poor water quality conditions and physical impacts. Seagrass-bed area at the deeper edges can also be lost due to sea level rise.
- Oysters – Oysters are similarly susceptible to being impacted by pollutant loading and sedimentation. Additionally, oysters can be vulnerable to changing climatic conditions, including warming, low oxygen levels, and acidification.
- Coastal Habitats – Salt marshes and littoral habitats are likely to continue to be lost due to sea-level rise (both submergence and erosion). Salt marsh is also vulnerable to loss where coastal development and shoreline armoring precludes shoreward migration as sea levels rise.
- Fragmentation – Loss or fragmentation of wetland area within the sub-basin will dimmish beneficial functions of wetlands, including floodwater storage, water quality improvement, and fish and wildlife habitat.
- Water Supply Sustainability – This sub-basin is located within a delineated Water Resource Caution area and within Planning Region II, where there are concerns regarding the ability of the upper Floridan aquifer to meet projected future demands. Continued implementation of water reuse and conservation programs, as well as alternative water supply development are

anticipated to be needed to meet future needs and reduce reliance on the upper Floridan aquifer.

V. Management Strategies and Projects

Table 5 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 CCMP (2024), 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 5. Recommended Management Strategies for the Destin Harbor – Hogtown Bayou Sub-basin

Management Strategy	Issue Areas Addressed	Objectives	Description
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 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. 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 • Flooding and Coastal Resilience	Improved water quality Improved flood protection and resilience Sustained aquatic and wetland ecosystems Improved public access	Apply “nature-based,” green infrastructure methods for multipurpose projects. Projects frequently involve integrating stormwater BMPs, buffer zones, greenways, and living shorelines into public parks and transportation systems.

Management Strategy	Issue Areas Addressed	Objectives	Description
Reuse of Reclaimed Water	• Water Quality • Water Supply Sustainability	Improved coastal water quality. Enhanced sustainability of water resources	Construct reclaimed water treatment, storage, transmission, and distribution systems to reduce potable water demand and to reduce wastewater discharges.
Alternative Water Supply Development	• Water Supply Sustainability	Enhanced sustainability of water resources	Additional studies are needed to identify alternative water supplies, such as surface water or managed aquifer recharge, that can be implemented to enhance the sustainability of the upper Florida aquifer.
Monitoring and Assessment	• Water Quality • Aquatic and Wetland Habitats • Flooding and Coastal Resilience	Improved understanding of current conditions and trends	Intensive water quality monitoring over the course of one-two years will provide a reliable assessment of current conditions and trends. Periodic updates to assessments and maps of seagrasses and oysters will identify trends and risks for water quality, habitat quality, and coastal resilience.
Ecosystem(s) Restoration	• Aquatic and Wetland Habitats	Sustained aquatic and wetland ecosystems	Oyster ecosystem restoration Living shorelines restoration Seagrass restoration Wetland restoration

Proposed projects known at the time of this publication are listed in Table 6. Listed are a wide array of water supply, water quality, and restoration projects. Projects currently proposed include a mixture of water supply, restoration, and water quality projects, as well as estuary program support Projects listed, details, and cost estimates will be updated in cooperation with local governments and other cooperators within the planning area.

Table 6. Proposed Projects and Funding Needs Identified for the Destin Harbor - Hogtown Bayou Sub-basin

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
New Interconnection with SWUCI	Destin Water Users	Water system capacity and reliability improvement.	This project would create another interconnect with SWUCI to ensure supply of water from WRP wellfield and help maintain pressure in service area.	$150,000	$150,000
Upgrade Inland Wellfield Capacity Service Area	Destin Water Users	Water system capacity and reliability improvement.	This project is to upgrade pumping capacity at booster stations from the WRP wellfield to meet expected demand increases with future growth in the area.	$1,150,000	$1,150,000
Reuse piping- North	Destin Water Users	Water resource sustainability. Reduced wastewater discharge.	This project would extend the North Zone of the reuse system to Indian Trail adding multiple reuse customers.	$4,100,000	$2,000,000
Reuse piping- East	Destin Water Users	Water resource sustainability. Reduced wastewater discharge.	This project would replace existing reuse main on South zone of the reuse system and increase capacity to the zone while increasing pressure for customers at the end of the line.	$5,200,000	$2,500,000
SWU Reuse Storage	South Walton Utility, Inc.	Water resource sustainability. Reduced wastewater discharge.	TBD	TBD	TBD
Destin Mattie Kelly Outfall	City of Destin	Improve stormwater management and prevent inland flooding during high bay water levels	This is a stormwater outfall that serves the wetland area adjacent to Joe's Bayou Recreation Area and a significant area of the surrounding residential neighborhood. The outfall is undersized and during storm events with high water levels in the bay, the bay water will run inland through the outfall. Currently, a new outfall is being designed.	$5,000,000	$3,000,000
South Walton Utility Reuse Expansion	South Walton Utility Co., Inc.	Provide reclaimed water to reduce demand on Floridan Aquifer	This project is to build reclaimed water storage tanks, piping infrastructure, and pumping stations to provide water to the members to lessen their demand on the Floridan Aquifer.	TBD	TBD
12" Line Chat Holly at Nellie Dr. to Blue Mountain Road	Regional Utilities	Additional Flow and Capacity	Install a new 12-inch water main on Old Blue Mountain Road from Chat Holly to Hwy 98.	$500,000	$500,000

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
24" Source Pipeline, US 331 Plant to US 98	Regional Utilities	Additional Flow and Capacity	Project increases size of existing line and adds redundancy for isolation/looping.	$1,150,000	$1,150,000
24" Source Water Transmission Line Replacement US 98	Regional Utilities	Improved Pipeline Reliability	Replacing existing PVC pipeline with Ductile Iron pipeline.	$3,200,000	$3,200,000
Water Main upgrades to allow fire hydrants	Regional Utilities	Additional Flow and Capacity	Project upgrades or extends larger diameter water mains throughout service area (Yearly Cost)	$500,000	$500,000
18" Line upgrade from WM CR 30A west to Rosemary Beach	Regional Utilities	Additional Flow and Capacity	Replaces existing smaller water mains along CR30A	$20,000,000	$20,000,000
SWU Water booster station	South Walton Utility Co., Inc.	Water system capacity and reliability improvement.	TBD	TBD	TBD
RPA Reuse Water Tank at 331	Regional Utilities	Water resource sustainability. Reduced wastewater discharge.	Project will construct an additional 4MG ground storage tank at the existing site.	$2,500,000	$2,500,000
5 MG Ground Storage Water Tank (West)	Regional Utilities	Water system capacity and reliability improvement.	Pipeline connecting the additional wellfield expansion to the existing wellfield network. Cost at $1,725,000 per mile.	TBD	TBD
Live Oak Point Shoreline Restoration II	District	Shoreline protection; habitat improvement	Living shoreline to protect District property recently acquired at Live Oak Point.	$200,000	$100,000
Choctawhatchee Basin Environmental History - Benthic Communities	Choctawhatchee Basin Alliance	Document past and present benthic ecosystems for management and restoration context	Sediment Study to document Choctawhatchee Bay benthic ecosystems past and present - part of larger Environmental History proposal designed to provide context for present-day management and restoration.	$100,000	$100,000

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
Million Oyster Project - Destin Harbor	Choctawhatchee Basin Alliance	Provide water filtration, habitat, and shoreline stabilization Improve water clarity and ecological health Support nutrient reduction and enhance fisheries habitat	Oyster gardening program for Destin Harbor aims for comprehensive participation from harbor front business and residents, who will grow oysters from their docks using Vertical Oyster Gardens (VOGs) made of oyster shell sourced from an oyster shell recycling program collected from local restaurants. As VOGs mature, oysters will be transferred to permitted Bottom Oyster Gardens that will be constructed from a combination of recycled oyster shell and robust molded concrete modules. This project will provide water filtration, habitat, and shoreline stabilization benefits, improving water clarity and ecological health throughout the Harbor. The number of reef units can expand over time based on resources and community participation. The project supports nutrient reduction, enhances fisheries habitat, and engages local businesses in long-term harbor restoration.	$265,000	$265,000
Seagrass Monitoring and Restoration	Choctawhatchee Basin Alliance	Increase aquatic habitat and nutrient uptake Provide current data on seagrass distribution and extent	Seagrass surveys at established stations in the bay are conducted on a biannual basis. Surveys include species present, percent cover, water quality parameters, PAR measurements, and sting ray pit counts. Additional surveying will be conducted to locate potential sites for seagrass restoration with the freshwater tolerant Widgeon Grass, Ruppia maritima. Historical water quality data and presence of storm water outfalls will be considered in choosing locations for planting for the purpose of increasing aquatic habitat and nutrient uptake. Finally, updated seagrass mapping using remote sensing and ground-truthing is needed to provide current data on seagrass distribution and extent.	$168,000	$168,000

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
Continuous Water Quality Monitoring	Choctawhatchee Basin Alliance	Provide consistent, frequent water quality data publicly available	Two continuous water quality monitoring systems to provide consistent frequent water quality data to be publicly available online. Sensors will include temperature, conductivity, dissolved oxygen, pH, turbidity, chlorophyll-a, and fluorescent dissolved organic matter (FDOM). Potential locations include Destin and Mid-Bay bridges.	$80,000	$80,000
Living Shoreline Cost Share Program	Choctawhatchee Basin Alliance	Provide water filtration, habitat, and shoreline stabilization Improve water clarity and ecological health Support nutrient reduction and enhance fisheries habitat	Funding to expand CBA's living shoreline cost-share program to assist more private property owners. There has been an increase in property owners requesting living shorelines and this funding would support CBA's ability to navigate the permitting process for them and implement the living shoreline projects. This project will provide water filtration, habitat, shoreline stabilization benefits, and improve water clarity and ecological health throughout Choctawhatchee Bay. The project supports nutrient reduction, enhances fisheries habitat, and engages the local community to help support a healthy bay.	$200,000	$200,000
Subtidal Oyster Reef Restoration	Choctawhatchee Basin Alliance	Provide water filtration, habitat, and possible shoreline stabilization Improve water clarity and ecological health Support nutrient reduction and enhance fisheries habitat	This project will identify suitable locations for subtidal oyster reef restoration and implement on the ground restoration and enhancement of oyster reef habitat. Choctawhatchee Bay has healthy oyster populations for oyster recruitment, but with the heavy sediment load from the river it can be substrate limited. This project will add beneficial oyster substrate including recycled oyster shells from CBA's oyster shell recycling program, modular reef units, and possibly limestone. This project will provide water filtration, habitat, possible shoreline stabilization benefits, and improve water clarity and ecological health throughout the southern portion of the Choctawhatchee Bay in Walton County. The project supports nutrient reduction and enhances fisheries habitat.	$400,000	$400,000

Project Name	Lead and Project Partners	Water Resource Benefits	Description	Estimated Total Cost	Funding Need
Choctawhatchee Bay Estuary Program Support	NWFWMD Choctawhatchee Bay Estuary Program	Water quality improvements Habitat Enhancement	The Choctawhatchee Bay Estuary Program is a critical partner who effectively facilitates intergovernmental collaboration and supports watershed planning, data collection and monitoring, water quality improvement, and habitat enhancement efforts. The project would provide annual operational support for the Choctawhatchee Bay Estuary Program, for a two-year period.	$400,000	$400,000
Land Acquisition	NWFWMD	Water quality protection Flood protection Public access and recreation Fish and wildlife habitat	Additional public land acquisition may be considered to achieve additional and compounded functional benefits for water quality, flood protection, habitat, and public use. Acquisition may help accomplish objectives of the District's Critical Wetland evaluation (NWFWMD 2024b).	TBD	TBD
Managed Aquifer Recharge Feasibility Study	NWFWMD	Water supply sustainability	Managed aquifer recharge may provide a feasibility option to offset groundwater withdrawals, reduce the risk of upconing of poor quality water, and improve the reliability of the upper Floridan aquifer to meet future demands in Okaloosa and Walton counties, including the Destin Harbor – Hogtown Bayou sub-basin.	$300,000	$300,000
Mosquito Control Ditch Stormwater Retrofit Assessment	NWFWMD Walton County South Walton Mosquito Control District	Develop engineering plans that would lead to improved water and aquatic habitat quality in Hogtown Bayou and Choctawhatchee Bay	Conduct an engineering assessment to identify feasible site-specific stormwater retrofit projects and best management practices that will better regulate stormwater runoff, improve water quality treatment, and reestablish floodplain functions within the current mosquito control ditch network and drainages. Develop preliminary engineering plans for feasible projects.	$300,000	$300,000
Total				$45,863,000	$38,963,000

VI. 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 Destin Harbor-Hogtown Bayou 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 (e.g., lbs of nutrient reduction)
  - 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 Destin Harbor-Hogtown Bayou 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 Destin Harbor-Hogtown Bayou 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.

VII. References and Resources

Choctawhatchee Basin Alliance. 2025. https://basinalliance.org/on-the-water/. Accessed 12/8/2025.

Choctawhatchee Bay Estuary Program. 2024. Comprehensive Conservation and Management Plan. https://choctawbay.org/plan

Florida Department of Agriculture and Consumer Services, Division of Aquaculture. 2020. Shellfish Harvesting Area Classification Map #06. https://www.fdacs.gov/Agriculture-Industry/Aquaculture/Shellfish-Harvesting-Area-Classification/Shellfish-Harvesting-Area-Information

Florida Department of Environmental Protection. 2017. St. Andrews Aquatic Preserve Management Plan. Tallahassee: Florida Coastal Office. https://floridadep.gov/rcp/aquatic-preserve/documents/st-andrews-aquatic-preserve-management-plan

Florida Department of Environmental Protection. 2019. Topsail Hill State Park Approved Unit Management Plan. Florida Department of Environmental Protection, Division of Recreation and Parks. https://floridadep.gov/sites/default/files/08.2019%20THPSP_AGDraftUMP.pdf

Florida Department of Environmental Protection. 2022. NWFWMD 2022 Land Use. https://geodata.dep.state.fl.us/datasets/nwfwmd-2022-land-use/about

Florida Department of Environmental Protection. 2025a. Impaired Waters, TMDLs, and Basin Management Action Plans Interactive Map. Accessed 12/5/2025. https://floridadep.gov/dear/water-quality-restoration/content/impaired-waters-tmdls-and-basin-management-action-plans

Florida Department of Environmental Protection. 2025b. Harmful Algal Bloom Dashboard. Accessed 12/7/2025. https://floridadep.gov/AlgalBloom

Florida Department of Health. 2025. Florida Healthy Beaches. Accessed 12/8/2025. https://www.floridahealth.gov/environmental-health/beach-water-quality/index.html

Florida Fish and Wildlife Conservation Commission (FWC). 2025a. Seagrass Habitat in Florida, accessed 12/7/2025. https://geodata.myfwc.com/datasets/myfwc::seagrass-habitat-in-florida/

Florida Fish and Wildlife Conservation Commission (FWC). 2025b. Oyster Beds in Florida, accessed 12/5/2025. https://geodata.myfwc.com/datasets/oyster-beds-in-florida/

Florida Forest Service. 2015. Ten Year Land Management Plan for the Point Washington State Forest. Florida Department of Agriculture and Consumer Services, Florida Forest Service. https://www.fdacs.gov/forest-wildfire/our-forests/state-forests/point-washington-state-forest

Florida LAKEWATCH. 2025. Florida LAKEWATCH Data Dashboard. Accessed 12/8/2025. https://lakewatch.ifas.ufl.edu/data--reports/data-dashboard/

Florida Natural Areas Inventory. 2010. Guide to the Natural Communities of Florida: 2010 Edition. https://www.fnai.org/PDFs/Full_FNAI-Natural-Community-Classification-Guide-2010_20150218.pdf

Florida Natural Areas Inventory. 2025. Rare Species and Communities We Track, Searchable Field Guides and Tracking List. Accessed 12/7/2025. https://www.fnai.org/species-communities/tracking-main

Harper, H.H. 1999. Stormwater Chemistry and Water Quality: Estimating Pollutant Loadings and Evaluation of Best Management Practices for Water Quality Improvement. Environmental Research and Design, Inc. http://www.erd.org/ERD%20Publications/STORMWATER%20CHEMISTRY%20AND%20WATER%20QUALITY---1999.pdf

Hyman, A.C. 2025a. Choctawhatchee Bay 2024 Water Chemistry Report. Choctawhatchee Basin Alliance. https://basinalliance.org/water-quality-portal/

Hyman, A.C. 2025b. Coastal Dune Lake 2024 Water Chemistry Report. Choctawhatchee Basin Alliance. https://basinalliance.org/water-quality-portal/

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

National Oceanic and Atmospheric Administration (NOAA). 2025. Coastal Flood Exposure Mapper, accessed 12/7/2025. https://coast.noaa.gov/floodexposure/#-10575352,4439107,5z

Northwest Florida Water Management District. 2017. Choctawhatchee River and Bay Watershed Surface Water Improvement and Management Plan. Program Development Series 17-05. Havana: Northwest Florida Water Management District. https://nwfwater.com/water-resources/surface-water-improvement-and-management/

Northwest Florida Water Management District. 2021. Live Oak Point Living Shorelines, Walton County, Florida. NWFWMD In-Lieu Fee Program (SAJ-2011-00287 TMF), February 2021.

Northwest Florida Water Management District, 2023. 2023 Water Supply Assessment Update. Publication Number WRA 23-01. https://nwfwater.com/Water-Resources/Water-Supply-Planning/Water-Supply-Assessments/

Northwest Florida Water Management District, 2024a. 2024 Region II Regional Water Supply Plan Publication Number PDS-02. 144 pp. https://nwfwater.com/Water-Resources/Water-Supply-Planning/Regional-Water-Supply-Planning/

Northwest Florida Water Management District, 2024b. Critical Wetlands Assessment Update. https://nwfwater.com/critical-wetlands-report/

Okaloosa County. 2021. Okaloosa County Local Mitigation Strategy. https://alertokaloosa.com/LMS

Orth, R. J., T.J.B. Carruthers, W.C. Dennison, C.M. Duarte, J.W. Fourqurean, K.L. Heck JR., A.R. Hughes, G.A. Kendrick, W.J. Kenworthy, S. Olyarnik, F.T. Short, M. Waycott, and S.L. Williams. 2006. A Global Crisis for Seagrass Ecosystems. BioScience 56: 987–996.

Orth, R.J., J.S. Lefcheck, K.S. McGlathery, L. Aoki, M.W., Luckenback, K.A. Moore, M.P.J. Oreska, R. Snyder, D.J. Wilcox, and B. Lusk. 2020. Restoration of seagrass habitat Leads to Rapid Recovery of Coastal Ecosystem Services. Science Advances (7 Oct 2020), Vol 6, Issue 41. https://www.science.org/doi/10.1126/sciadv.abc6434

Radabaugh KR, Moyer RP, Geiger SP, editors. 2019. Oyster integrated mapping and monitoring program report for the state of Florida. St. Petersburg, FL: Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission. FWRI Technical Report 22. https://myfwc.com/research/habitat/coastal-wetlands/oimmp/

Ranasinghe, P.N., J.P. Donnelly b, R.L. Evans , J.R. Rodysill, N.U. Nanayakkara, P.J. van Hengstum, A.D. Hawkes, R.M. Sullivan, M.R. Toomey. 2021. Complex sedimentary processes in large coastal embayments and their potential for coastal morphological and paleo tropical cyclone studies: A case study from Choctawhatchee Bay Western Florida, U.S.A. Marine Geology, Volume 437, July 2021.

Rolando, J. L., M. Hodges, K. D. Garcia, G. Krueger, N. Williams, J. Carr Jr., J. Robinson, A. George, J. Morris, and J. E. Kostka. 2023. "Restoration and Resilience to Sea Level Rise of a Salt Marsh Affected by Dieback Events." Ecosphere 14(4): e4467. https://doi.org/10.1002/ecs2.4467

Seal, T.L., F.S. Calder, G.M. Sloan, S.J. Schropp, and H.L. Windom. 1994. Florida Coastal Sediments Contaminant Atlas. Florida Department of Environmental Protection. https://publicfiles.dep.state.fl.us/DEAR/DEARweb/WMS/Sediment/FloridaCoastalSedimentContaminantsAtlas.pdf

University of Florida Bureau of Economic and Business Research (BEBR). 2024. Florida Estimates of Population 2024: April 1, 2024. Gainesville: Bureau of Economic and Business Research.

U.S. Environmental Protection Agency. 2006. Total Maximum Daily Load for Fecal Coliform in Choctawhatchee Bay. Atlanta: U.S. EPA Region IV. https://attains.epa.gov/attains-public/api/documents/actions/21FL303D/32223/107899

Walton County. 2020. Local Mitigation Strategy. https://www.mywaltonfl.gov/569/Local-Mitigation-Strategy-LMS

Yarbro, L.A., and P.R. Carlson, ed. 2018. "Summary Report for Choctawhatchee Bay," in Seagrass Integrated Mapping and Monitoring Program, Mapping and Monitoring Report No. 3. Technical Report 17, Version 3. St. Petersburg: Florida Fish and Wildlife Conservation commission, Fish and Wildlife Research Unit. https://myfwc.com/research/habitat/seagrasses/simm/simm-reports/

Appendix A. Sub-basin Prioritization Process

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