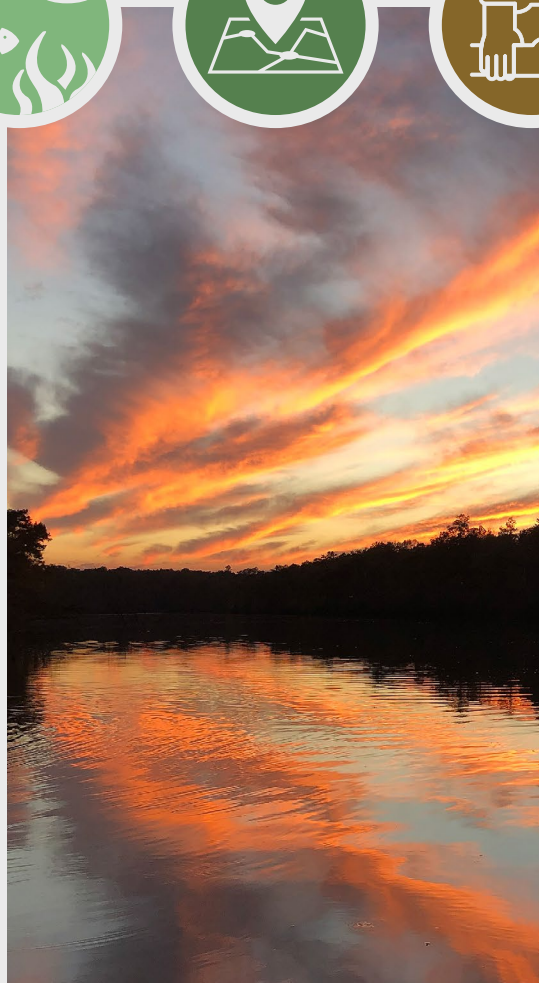
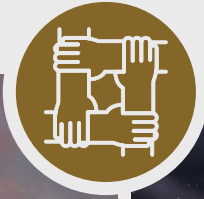
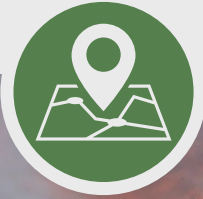




CHOCTAWHATCHEE

ESTUARY **BAY** PROGRAM

Comprehensive Conservation & Management Plan | 2024



ACKNOWLEDGEMENTS

The Choctawhatchee Bay Estuary Program could not have developed the Comprehensive Conservation and Management Plan without the valuable contributions made by the following:

- Alabama Department of Environmental Management
- Choctawhatchee Basin Alliance of Northwest Florida State College
- Choctawhatchee Pea Yellow Watershed Management Authority
- Choctawhatchee Bay Estuary Coalition Technical Advisory Committee
- Choctawhatchee Bay Estuary Coalition Citizens Advisory Committee
- Choctawhatchee Bay Estuary Coalition Education and Outreach Committee
- Eglin Air Force Base/Natural Resources
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Holmes County Board of County Commissioners

- Northwest Florida Water Management District
- Matrix Design Group
- Mattie Kelly Environmental Institute of Northwest Florida State College
- Okaloosa County Board of County Commissioners
- United States Fish and Wildlife Service
- United States Department of Treasury (RESTORE Act)
- University of Florida
- University of Florida IFAS/Extension
- University of West Florida
- Walton County Board of County Commissioners
- Washington County Board of County Commissioners

This project was paid for with federal funding from the Department of the Treasury under the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act).

OVERVIEW

The Choctawhatchee Bay estuary is a spectacular and treasured natural resource that supports the economy, identity, and quality of life of residents and visitors in coastal panhandle Florida and Alabama. The Choctawhatchee River, which feeds the bay, originates approximately 140 miles north in central Alabama. The watershed encompasses 3,339,632 acres with roughly 60% of this area in Alabama and 40% in Florida. It includes abundant forests and wetlands, an extensive network of streams and rivers, Choctawhatchee Bay estuary, and coastal dune lakes along the Gulf coast. These diverse terrestrial and aquatic ecosystems support abundant fish and wildlife species including several endangered and threatened species such as the Gulf Sturgeon, the Okaloosa darter, and the Choctawhatchee beach mouse.

Population centers within the watershed are focused primarily along the coast and perimeter of Choctawhatchee Bay. Population in the Florida portion of the watershed alone has increased significantly with nearly a 40% increase from 1990 to 2010 and a projected increase of approximately 23 percent for 2010-2030 (NFWFMD 2017).

While there are hundreds of thousands of acres of publicly owned conservation lands in the watershed, continued development pressures and increasing recreation uses are expected to exert greater stress on the natural resources of the Choctawhatchee Bay system.

This document is the first Comprehensive Conservation and Management Plan (CCMP) developed for Choctawhatchee Bay and its watershed. While the CCMP builds upon previous environmental assessment and planning efforts by numerous other stakeholders, this document is the first blueprint for restoration and management that has been developed to be compliant with the U.S. Environmental Protection Agency's National Estuary Program guidelines. It is meant to be a living document that is updated as projects are completed, as conditions change, and as new information and data are developed. Numerous partners and community members contributed to the content and vision, and it will take cooperation between business, industry, government, non-profits, and community members to enact these recommendations.

ACRONYM KEY

ACAMP	Alabama Coastal Area Management Program
ADEM	Alabama Department of Environmental Management
AFB	Air Force Base
AGMS	Annual geometric means
ALDCNR	Alabama Department of Conservation and Natural Resources
BIL	Bipartisan Infrastructure Law
BMP	Best Management Practice
BMAP	Basin Management Action Plan
CAC	Citizens Advisory Committee
CBA	Choctawhatchee Bay Alliance
CBEC	Choctawhatchee Bay Estuary Coalition
CBEP	Choctawhatchee Bay Estuary Program
CCMP	Comprehensive Conservation and Management Plan
CDLAB	Coastal Dune Lakes Advisory Board
CHIMMP	Coastal Habitat Integrated Mapping and Monitoring Program
CHL	chlorophyll a
CIGP	County Incentive Grant Program
CPI	Coastal Partnership Initiative
CPYRWMA	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
CRS	Community Rating System
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
DEO	Department of Economic Opportunity
DOD	Department of Defense
E. COLI	Escherichia coli
E&O	Education and Outreach
ECRF	Emergency Coastal Resilience Fund
EOC	Education & Outreach Committee
EFH	Essential fish habitat
EPA	United States Environmental Protection Agency
ERP	Environmental Resource Permit
ESA	Endangered Species Act
FAC	Florida Administrative Code
FAOL	Florida Atlas of Lakes
FC	Florida Code
FCMP	Florida Coastal Management Program
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FDRAP	Florida Recreation Development Assistance Program
FEMA	Federal Emergency Management Administration
FFO	Federal Funding Opportunities

FIM	Fishery Independent Monitoring
FLRACEP	Florida Centers of Excellence Program
FNAI	Florida Natural Areas Inventory
FS	Florida Statutes
FSU	Florida State University
FWB	Fort Walton Beach
FWC	Fish and Wildlife Conservation Commission (Florida)
FWRI	Fish and Wildlife Research Institute
FY	Fiscal Year
GCIWW	Gulf Coast Intracoastal Waterway
GCPEP	Gulf Coastal Plain Ecosystem Partnership
EST	Ecosystem Support Team
GIS	Geographic Information System
GRP	Gulf Research Program
GSA	Geological Survey of Alabama
HAB	Harmful Algal Bloom
HOA	Home-Owners Association
IRA	Inflation Reduction Act
IWR	Impaired Water Rule
MFL	Minimum Flows and Levels
MS4S	Municipal Separate Storm Sewer Systems
MYIP	Multi-Year Implementation Plan
NAWM	National Association of Wetland Managers
NCCOS	National Centers for Coastal Ocean Science
NCDC	National Climate Data Center
NCRF	National Coastal Resilience Fund
NEP	National Estuary Program
NEPA	National Environmental Policy Act
NEXRAD	Next Generation Weather Radar
NFWF	National Fish and Wildlife Foundation
NGO	Non-Governmental Organization
NHD	National Hydrology Database
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Services
NNC	Numeric Nutrient Criteria
NOAA	National Oceanographic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPS	Non-point Source
NRCS	National Resources Conservation Service
NWFWMD	Northwest Florida Water Management District
NWI	National Wetlands Inventory
OPP	Office of Pesticide Programs
OSTDS	Onsite sewage treatment and disposal systems

ACRONYM KEY

PB	Lead
PLACE/SLR	Program for Local Adaptation to Climate Effects/ Sea-Level Rise
PPBEP	Perdido and Pensacola Bays Estuary Program
RAP	Reasonable Assurance Plan
RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States
RWJF	Robert Wood Johnson Foundation
SAV	Submerged aquatic vegetation
SEAHAB	Social, Cultural and Economic Assessment of Harmful Algal Blooms
SEP	State Expenditure Plan
SIMM	Seagrass Integrated Mapping and Monitoring
SRRWRF	Shoal River Ranch Water Reclamation Facility
SRS	Stratified-random sampling
SWIM	Stormwater Improvement and Management
TAC	Technical Advisory Committee
TCPI	Tri-County Community Partnership Initiative
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TNC	The Nature Conservancy
TP	Total Phosphorus
USC	United States Code
UF/IFAS	University of Florida/Institute of Food and Agricultural Sciences
UMAM	Uniform Mitigation Assessment Method
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWF	University of West Florida
WIN	Watershed Information Network
WMA	Water Management Act
WRDA	Water Resources Development Act
WUP	Water Use Permit



On the Bayou by Michael Crane

TABLE OF CONTENTS

4	ACRONYM KEY	88	SECTION 6: MONITORING PROGRAM PLAN
		89	Water Quality Monitoring
8	SECTION 1: INTRODUCTION	90	Water Quantity Monitoring
9	Purpose of the CCMP	90	Habitat Monitoring
10	Overview of the Choctawhatchee Bay Estuary Program (CBEP)	91	Recommendations
12	CBEP Management Conference		
13	CBEP Management Area	92	SECTION 7: FEDERAL CONSISTENCY REVIEW
15	CCMP Focus Areas	93	Water Quality
16	CCMP Content & Organization	95	Fish & Wildlife
		96	Habitat Management
17	SECTION 2: TECHNICAL CHARACTERIZATION SUMMARY	97	Future Review
18	Choctawhatchee Bay Watershed	98	Sources
32	Choctawhatchee Bay Estuary		
		99	SECTION 8: PUBLIC PARTICIPATION SUMMARY
46	SECTION 3: BASE PROGRAM ANALYSIS	100	Technical Advisory Committee
47	Water Quality & Quantity	102	Citizens Advisory Committee
48	Habitat Protection & Management	104	Education & Outreach
51	Fish & Wildlife		
52	Land Use Planning & Management	105	SECTION 9: SUMMARY OF RESPONSE TO PUBLIC COMMENTS
52	Community Resilience		
54	Outreach & Education	107	SECTION 10: REFERENCES
56	SECTION 4: ACTION PLANS	111	SECTION 11: APPENDICES
57	Water Quality & Quantity Action Plan	112	Appendix A—Choctawhatchee Bay Estuary Coalition Board of Directors, Technical Advisory Committee, and Citizens Advisory Committee
63	Habitat Protection & Management Action Plan	114	Appendix B—Summary of Information on Potential Funding Sources for the CCMP Focus Areas
72	Land Use Planning & Management Action Plan	117	Appendix C—Focus Area Projects Supplied by Stakeholders
77	Community Resilience Action Plan	117	Appendix D—List of Outreach Events
80	Education & Outreach Action Plan	129	Appendix E—Public Review Comments and Response Matrix
		133	
85	SECTION 5: FINANCE PLAN & IMPLEMENTATION STRATEGY		
86	Finance Plan		
86	Implementation Strategy		

INTRODUCTION

- Purpose of the Comprehensive Conservation & Management Plan (CCMP)
- Choctawhatchee Bay Estuary Program (CBEP)
- CBEP Management Conference
- CBEP Management Area
- CCMP Focus Areas
- CCMP Content & Organization

PURPOSE OF THE CCMP

Estuaries and other coastal marine waters are national resources increasingly threatened by pollution, habitat loss, coastal development, and resource conflicts. The U.S. Congress established the National Estuary Program (NEP) under the Water Quality Act of 1987 to pioneer a broad, innovative, and locally driven approach to respond to these threats. The NEP, managed by the U.S. Environmental Protection Agency (EPA) identifies nationally significant estuaries and supports the development of CCMPs for those estuaries that identify natural resource status and trends, issues and drivers, and action plans for restoration and management. To achieve the program's goals, a Management Conference of key stakeholders is convened for each NEP to provide a forum for consensus building and problem solving among stakeholder agencies and user groups.

There are currently 28 NEPs in the U.S., including four in Florida: the Tampa Bay Estuary Program, the Sarasota Bay Estuary Program, the Coastal and Heartland (Charlotte Harbor) National Estuary Program, the Indian River Lagoon National Estuary Program. There are many benefits to becoming an NEP including: national recognition, recurring programmatic funding from EPA, improved leveraging of additional grant resources, enduring program staffing and collaborative partnerships,

and best practices sharing with other NEPs. The Choctawhatchee Bay Estuary Program (CBEP) endeavors to become an NEP; the development of this CCMP, and the establishment of the CBEP Management Conference are key steps in the process. Upon completion of these steps, formal designation as an NEP then requires a Congressional nomination and authorization.

Beyond meeting the requirements to become a formal NEP, the purpose of this CCMP is to identify the prominent natural resources, impacts to those resources, and strategies to protect and/or improve their condition for generations to come. These resources include water quality of the bay and freshwater systems, habitats, and fish and wildlife populations. While much of Choctawhatchee Bay watershed is protected as conservation lands, impacts resulting from increasing development pressures around the bay and in the watershed, as well as global impacts from climate change and sea level rise, threaten to degrade the ecological integrity of the Choctawhatchee Bay system over time. Therefore, this CCMP establishes a strategic vision for enhanced public awareness and environmental education, improved environmental monitoring, continued resource protection for resilience and sustainability, and targeted restoration when and where needed.



Pamela Yates, "Breakfast on the Beach" taken at Okaloosa Island

THE CHOCTAWHATCHEE BAY ESTUARY PROGRAM (CBEP)

The Choctawhatchee Bay Estuary Program (CBEP) is a partnership between government, non-profit, and community partners to protect and improve the natural resources, water quality, and economic value of the Choctawhatchee Bay and its watershed. While efforts to protect the waterbody were coordinated at various local and regional levels, the development of a formal program is a critical step in securing the long-term knowledge, resources, and commitments to successfully support the environmental, educational, and economic values of the bay.

HISTORY OF THE CBEP

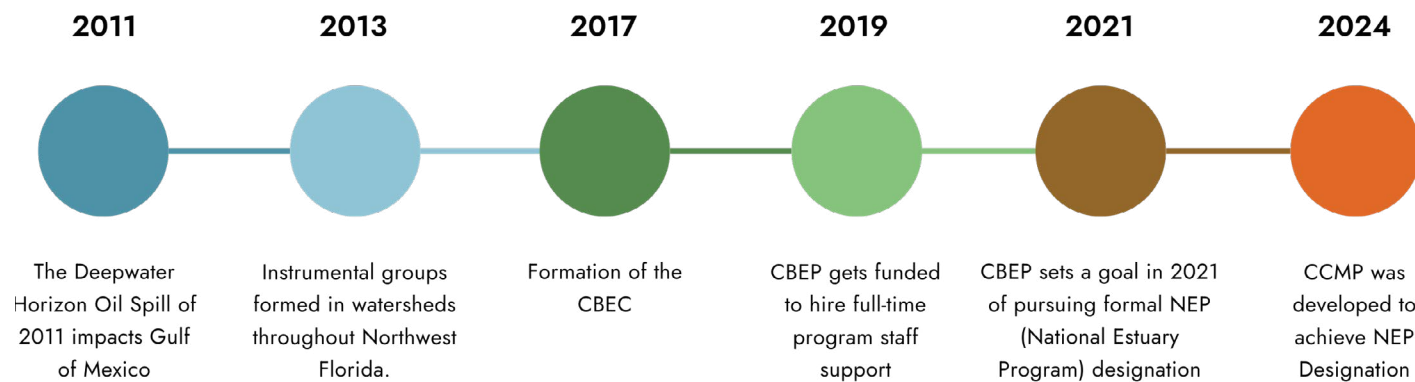
The Deepwater Horizon Oil Spill of 2011 significantly impacted habitats, wildlife, and local economies along the Gulf of Mexico, including the Florida Panhandle. While negative consequences remain, the spill also catalyzed attention in this region and highlighted the need to develop watershed planning and strategic stakeholder engagement. Through initial collaborative efforts driven by The Nature Conservancy (TNC) in 2013, along with other organizations, instrumental groups were formed in watersheds throughout Northwest Florida.

These efforts were led by the counties, local municipalities, and other governmental and Non-Governmental Organizations approving resolutions which led to the formation of the Choctawhatchee Bay Estuary Coalition (CBEC) in June of 2017. The CBEC Board of Directors is represented by County Commissioners from each of Okaloosa, Walton, Holmes, and Washington Counties in

Florida. Additional members include Eglin Air Force Base, the Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority (CPYRWMA) in Alabama, and the Choctawhatchee Basin Alliance (CBA).

The CBEC member counties committed in-kind administrative and technical support to develop the foundation for the Choctawhatchee Bay Estuary Program. Okaloosa County received funding from the TNC and a RESTORE Act grant in June 2019 to stand up the CBEP with full-time program staff support, beginning with the hiring of an Executive Director in November 2019, and then a Public Outreach Specialist. While the CBEC directs and controls the fiduciary oversight of the CBEP, the Executive Director and Public Outreach Specialist were hired as Okaloosa County employees.

The CBEC recognized that formal designation as an NEP would allow the program to leverage federal dollars, enhance grant funding opportunities, and improve coordination with local government and state agency partners. As such, the CBEP set a goal in 2021 of pursuing formal NEP designation. This goal was outlined in the Year One Annual Work Plan under the Community Resiliency Focus Area. The goal also included future collaboration with federal partners to ensure long-term program sustainability. In 2021, Okaloosa County issued a Request for Proposals for a consultant to develop a CCMP to be compliant with EPA requirements for NEP designation, and later that year the consultant team of Janicki Environmental/ESA/Carpe Diem Community Solutions was awarded the contract to prepare this CCMP.



THE CBEP VISION & MISSION

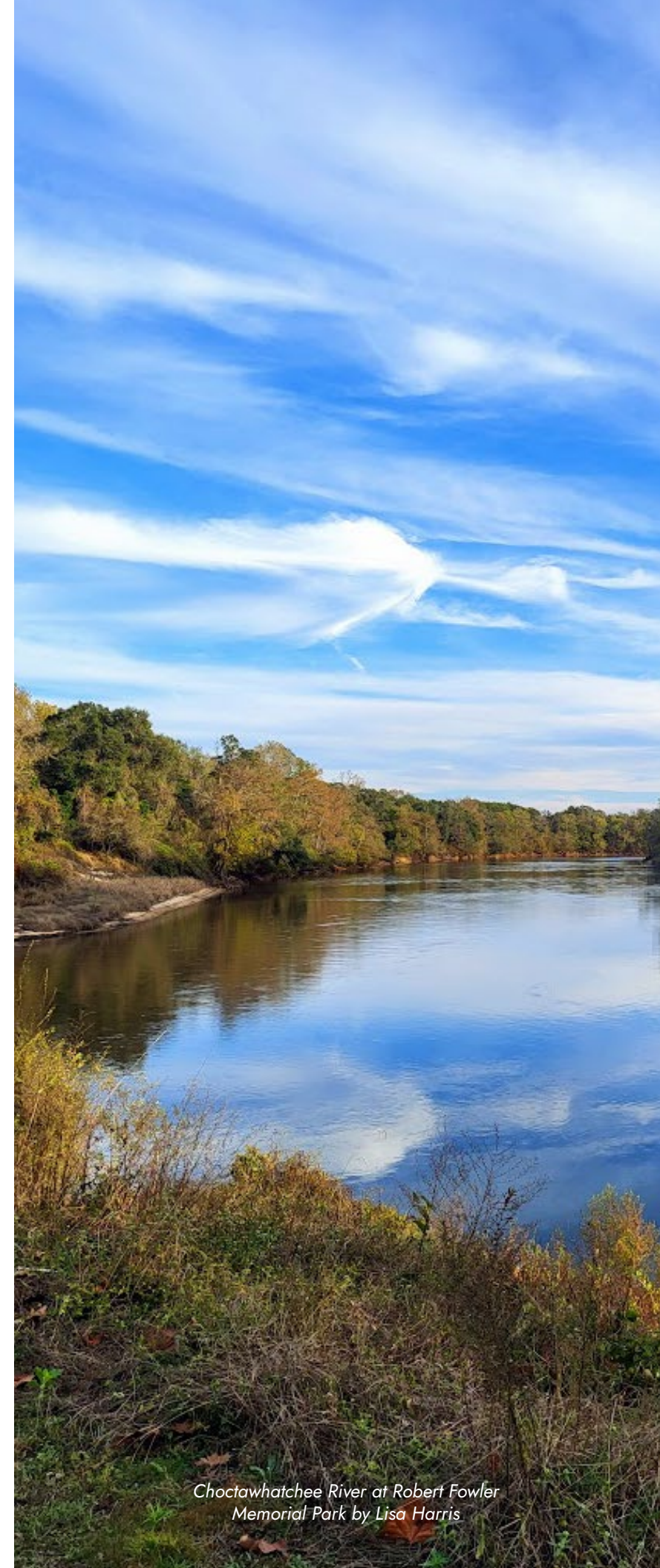
Shortly after its creation, the CBEC developed the following vision and mission statement for the CBEP to establish a foundational basis for the program.

VISION STATEMENT

The Choctawhatchee Bay Estuary Program promotes a **thriving ecology and environment** for the Choctawhatchee Bay, River, and watershed. We aspire to **protect and enhance** these valuable assets for the enjoyment and **benefit** of our **communities**, and to support **diverse economic and recreational interests**.

MISSION STATEMENT

The Choctawhatchee Bay Estuary Program will implement programs and initiatives for the **protection and stewardship of natural resources and water quality** and **strengthen community resiliency** and provide **environmental education** to maintain a **vibrant economy and high quality of life**.



Choctawhatchee River at Robert Fowler Memorial Park by Lisa Harris

INTRODUCTION

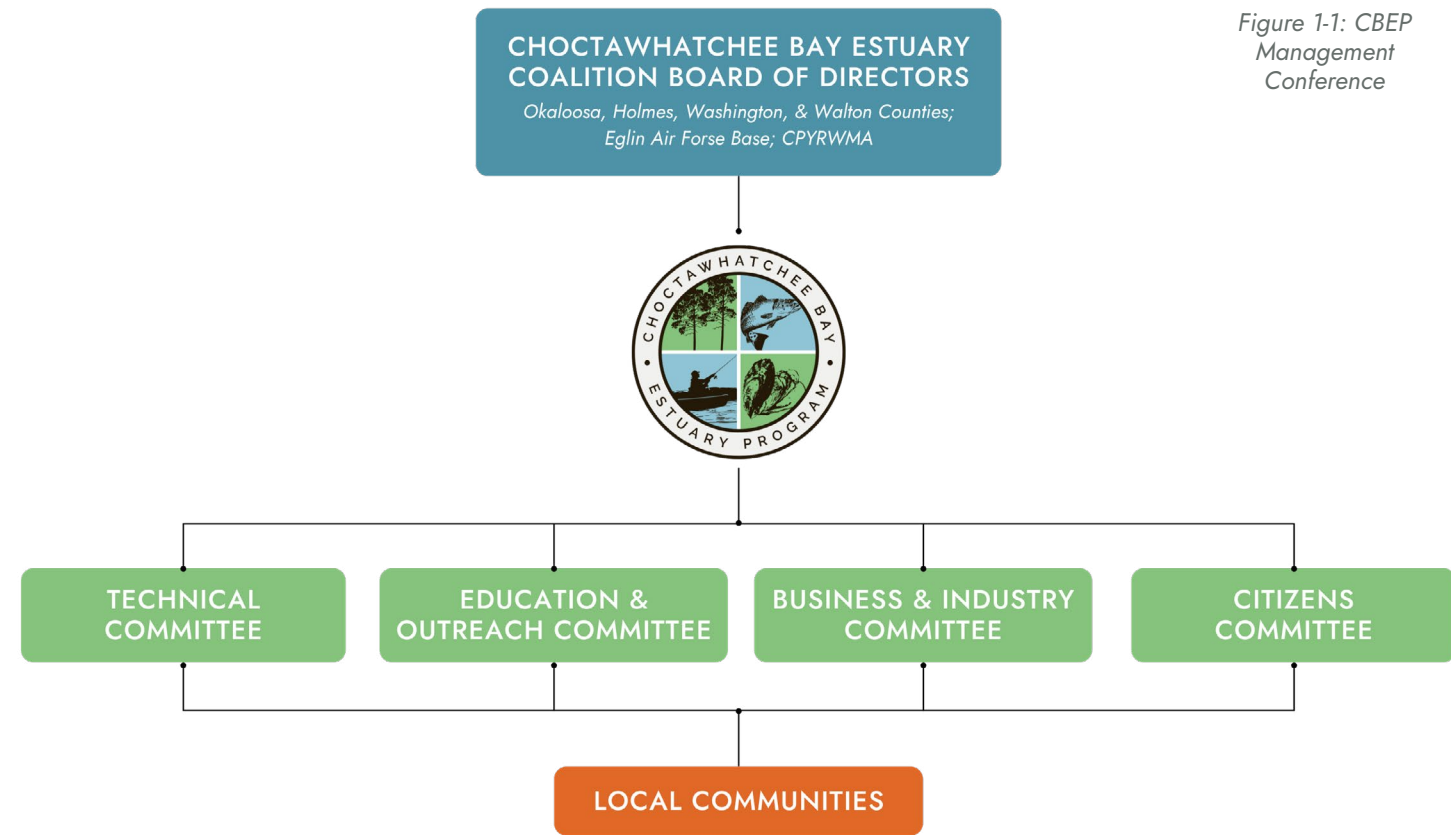


Figure 1-1: CBEP Management Conference

THE CBEP MANAGEMENT CONFERENCE

As recommended by EPA, a Management Conference should contain diverse stakeholders and use a collaborative, consensus-building approach to develop and implement the CCMP. This conference ensures that the CCMP is uniquely tailored to local environmental conditions and is based on local input, thereby supporting local priorities. The Management Conference should include key policy leaders representing local, state, and federal government; as well as representatives from businesses, industries, agricultural interests, public/private institutions, Non-Governmental Organizations (NGOs), and the public. One of the focal goals of a Management Conference is providing a forum for open discussion, cooperation, and compromise that results in consensus. The Management Conference develops and oversees annual work plans and budgets, approves all resource and funding allocations, oversees program implementation, and monitors environmental results.

The CBEP Management Conference Organizational structure is shown in **Figure 1-1** above. The CBEP Management Conference includes the Choctawhatchee Bay Estuary Coalition Board of Directors with representatives from Okaloosa, Walton, Holmes, and Washington Counties, Choctawhatchee Basin Alliance, Eglin Air Force Base, and CPYRWMA. In late 2019, the CBEP Management Conference was expanded by hiring an Executive Director of the Choctawhatchee Bay Estuary Program. The remaining CBEP Management Conference members includes four committees and their respective directors: Technical, Education & Outreach, Business & Industry, and Citizens.

Appendix A provides a list of individuals who have participated in the process including all members of the Choctawhatchee Bay Estuary Coalition Board and the Technical, Citizens, Education & Outreach, and Business & Industry committees.

THE CBEP MANAGEMENT AREA

The management area of the CBEP includes Choctawhatchee Bay and its watershed, as well as the coastal dune lake systems that occur along the Gulf coast in Walton County, and the western portion of the Intracoastal Waterway between Choctawhatchee Bay and West Bay.

The Choctawhatchee Bay watershed includes the drainage area of the Choctawhatchee River and all other tributary rivers and streams flowing thereto. This area encompasses approximately 3,339,632 acres, with roughly 60 percent in Alabama and 40 percent in Florida. **Figure 1-2** shows the boundary of the CBEP management area as well as state, county, and city boundaries. The headwaters of the Choctawhatchee River originate in Bullock County, Alabama, approximately 140 miles north of Choctawhatchee Bay. The other nine Alabama counties in the watershed include Pike, Barbour, Henry, Dale, Coffee, Crenshaw, Covington, Geneva, and Houston. Major municipalities associated with these counties are Dothan, Ozark, Troy, and Enterprise (NFWMD 2017).

The Florida watershed component includes portions of Bay, Jackson, Okaloosa, Walton, and Washington counties, and all of Holmes County. Holmes, Washington, and Walton counties make up the largest portion of the watershed, accounting for 84 percent of the total land area within the Florida portion of the basin; while Bay and Jackson counties make up approximately two percent and five percent of the total Florida watershed area, respectively (NFWMD 2016). Okaloosa County makes up a relatively small percentage of the watershed (nine percent); however, its influence is significant in that it includes developed areas of Fort Walton Beach, Niceville, Destin, and Eglin AFB, which have had historical impacts on water quality, including from point source discharges, untreated stormwater runoff, and outdated infrastructure (NFWMD 2016). Walton County's location and recent increases in urban development also substantially affect the river and bay through residential and commercial land uses, transportation facilities, and associated stormwater and wastewater discharges.

DeFuniak Springs, Chipley, and Bonifay are the major inland Florida municipalities, while smaller communities located along rivers and streams in the watershed include Noma, Esto, City of Graceville, Westville, Caryville, Ebro, Bruce, City of Ponce de Leon, Vernon, and Wausau. Major coastal municipalities include Shalimar, Cinco Bayou, Valparaiso, and Freeport; while smaller coastal communities include Miramar Beach,

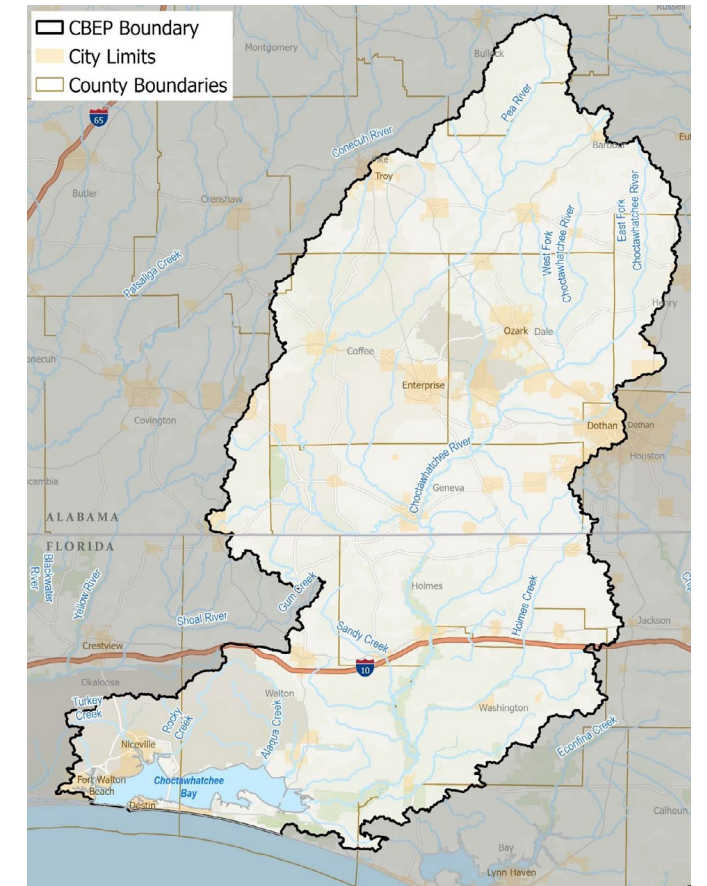


Figure 1-2: CBEP Management Area

Grayton Beach, Point Washington, and Santa Rosa Beach (NFWMD 2017).

The east and west forks of the Choctawhatchee River merge to form the Choctawhatchee River mainstem near Ozark in central Dale County, and then flows southeast for about 48 miles to Geneva (CPYRWMA 2022). The Pea River watershed which contributes to the Choctawhatchee River, drains the area immediately west of the Choctawhatchee River and begins in Bullock County south of Union Springs. The Pea River flows southwestward for approximately 68 miles to Elba (northwest Coffee County) southward for 30 miles into Geneva County then gradually eastward briefly flowing into Florida before joining the Choctawhatchee River south of Geneva. The total length of Pea River is 128 miles and drains an area of 1,452 square miles. (CPYRWMA 2022).

A detailed description of the hydrology, water quality, land uses, native habitats, and other characteristics of Choctawhatchee Bay and its watershed are provided in **Section 2 – Characterization Summary**.

FOCUS AREAS



LAND USE PLANNING & MANAGEMENT

COMMUNITY RESILIENCY



EDUCATION & OUTREACH



WATER QUALITY & QUANTITY



HABITAT PROTECTION & MANAGEMENT

CCMP FOCUS AREAS

Through an initial visioning and goal setting process the CBEP and its stakeholders identified six focus areas as program priorities, with preliminary goals and objectives. These six focus areas included:

- Water Quality
- Resource Protection and Management
- Floodplains and Wetlands
- Land Use Planning and Land Management Focus Area
- Community Resilience
- Education and Outreach.

The CCMP consultant team subsequently worked with stakeholders in a series of Technical Committee meetings and workshops to further refine and define the focus areas. The CCMP Focus Areas and their general descriptions are summarized below and form the framework for the Action Plans (**Section 4**).

BELOW: Educating next generations at the Estuary Festival



1 WATER QUALITY & QUANTITY

Projects, programs, and initiatives to monitor, protect and restore water quality and quantity in freshwater and estuarine systems to meet applicable regulatory criteria and to support living resources requirements and community water supply needs.

2 HABITAT PROTECTION & MANAGEMENT

Projects, programs, and initiatives to monitor, protect, enhance, and restore existing riparian, aquatic, estuarine, and native terrestrial habitats, and associated fish and wildlife populations, in the CCMP management area.

3 LAND USE PLANNING & MANAGEMENT

Projects, programs, and initiatives that support and promote conservation land acquisition and other land use best management practices to protect water quality and habitat in the CCMP management area.

4 COMMUNITY RESILIENCY

Projects, programs, and initiatives that support and promote land use planning, resilient green infrastructure, and nature-based solutions for the protection of communities and natural systems from extreme storm events long-term climate change and sea level rise.

5 EDUCATION & OUTREACH

Projects, programs, and initiatives to support enhanced public education and effective community engagement to promote the Vision and Mission of the CBEP, and implementation of the Actions Plans defined in the CCMP.

CCMP CONTENT & ORGANIZATION

This CCMP has been prepared in a manner that: 1) integrates other completed bay and watershed management plans addressing the Choctawhatchee Bay system; and 2) is compliant with the CCMP requirements articulated by the EPA to be competitive for formal NEP designation.

Key planning documents reviewed as part of the CCMP development process included:

- Choctawhatchee, Pea, and Yellow Rivers Watershed Management Plan (CPYRWMA, 2015)
- Choctawhatchee Bay Community-Based Watershed Plan (TNC, 2014)
- Choctawhatchee River and Bay Surface Water Improvement and Management (SWIM) Plan (NFWFMD, 2017).

In addition, adopted CCMPs from other Florida NEPs as well as numerous other academic and grey literature documents were reviewed and used in the development of this CCMP, as appropriate.

The document titled *National Estuary Program Guidance for Comprehensive Conservation & Management Plans: Content and Approval Requirements* (EPA, 1995) specifies the recommended organization and content requirements for CCMPs, and this CCMP is organized accordingly. The major sections of this document include the following:

- **Section 1 – Introduction**
- **Section 2 – Technical Characterization Summary**
- **Section 3 – Base Program Analysis**
- **Section 4 – Action Plans**
- **Section 5 – Finance Plan and Implementation Strategy**
- **Section 6 – Monitoring Program Plan**
- **Section 7 – Federal Consistency Report**
- **Section 8 – Public Participation Summary**
- **Section 9 – Summary of Response to Public Comments**
- **Section 10 – Appendices**



Beach Walk by Lisa B. Harris at Santa Rosa Beach

TECHNICAL CHARACTERIZATION SUMMARY

- Choctawhatchee Bay Watershed
- Choctawhatchee Bay Estuary



Ekaterina Ilina, "Wave Catcher" taken at Okaloosa Island

TECHNICAL CHARACTERIZATION SUMMARY

This section provides a summary of the technical characterization analysis conducted as part of the CCMP development process. The full technical characterization analysis is provided as a standalone technical supporting document to this CCMP, and is titled *Choctawhatchee Bay and Watershed Technical Characterization Analysis* (ESA, 2024).

This section specifically addresses EPA requirements to characterize the estuary's priority environmental problems and their likely causes based on current conditions, historical trends, and projected future conditions. This characterization summary is broken down into subsections that address the Choctawhatchee Bay watershed and the Choctawhatchee Bay estuary. The focus is on status and trends in land use/population, water quality/quantity, and natural resources, including habitats and associated fish and wildlife populations. This work sets the stage for the development of Action Plans (**Section 4**), as a solid understanding of the priority problems and likely causes will provide technical justification for recommended actions.

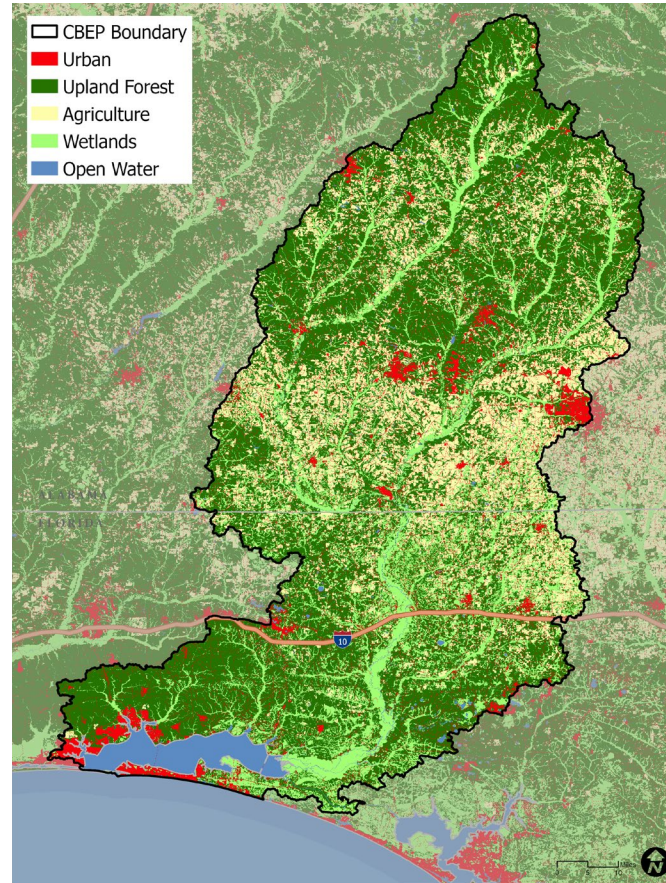


Figure 2-1: Generalized Land Use in the Choctawhatchee Bay Watershed

THE CHOCTAWHATCHEE BAY WATERSHED

LAND USE/POPULATION

The U.S. Geological Survey (USGS), through federal partnerships, developed and maintains a National Land Cover Database (NLCD). This database was used for this CCMP to standardize land use and cover classifications between Alabama and Florida. There are detailed land use/cover data sources in Florida that utilize the Florida Land Use Cover and Forms Classification System (FDOT 1999); however, land use/cover data using the same classification system is not available for Alabama. **Figure 2-1** shows the distribution of generalized land use types in the CBEP watershed, while **Table 2-1** lists the acreages of each land use type in the watershed.

In the Alabama and northern Florida portions of the watershed most of the area is rural, with agriculture, silviculture, farming, livestock, and low-density residential being the predominant land uses. Land cover types

NCLD LAND USE TYPE	ACRES	PERCENT
Agriculture	641,420	19%
Open Water	30,435	<1%
Upland Forest	1,797,460	54%
Urban	261,179	8%
Wetlands	610,829	18%
Total	3,341,323	100%

Table 2-1: Acres of NCLD Land Uses in the Choctawhatchee Bay Watershed

are dominated by upland pine and oak forests. In both Alabama and Florida land cover within the extensive floodplains of the Choctawhatchee River and its tributaries is primarily hardwood wetland forests. Urban land uses are concentrated within the Florida coastal communities and scattered throughout the Alabama portion of the watershed.

The Florida portion of the watershed near Choctawhatchee Bay and along the coast exhibits a much higher concentration of urban and residential land uses due to the attraction of the coastal beaches and recreational resources. This is most evident in Walton County, where population growth, tourism, and hospitality have contributed to a significant increase in urban land use. Military installations (Eglin Air Force Base [AFB] and Hurlburt Field), conservation lands, and other protected areas comprising parks, forests, and preserves and are also a component of the landscape. It should be noted that large portions of Eglin AFB are managed as forestry and conservation lands.

Future population growth in the Alabama portion of the watershed is expected to be modest, with agricultural land uses remaining predominant. Per the Choctawhatchee Bay SWIM Plan (NFWMD 2017), the populations of all counties in the watershed are projected to grow through 2025. The population of Walton County is projected to increase by approximately 21 percent, from 60,687 in 2015 to 77,173 in 2025; and the population of Bay County is projected to increase by almost 11 percent, from 173,310 to 191,876 over the same period. Most of the population growth and associated new urban development in the Florida portion of the watershed is expected to occur along the U.S. Highway 331 corridor, from Freeport to DeFuniak Springs.

CONSERVATION LANDS

Conservation lands in the Alabama portion of the watershed include the Geneva State Forest and portions of the Conecuh National Forest; however, the bulk of conservation lands occur in the Florida portion of the watershed. **Figure 2-2** shows the distribution of existing conservation lands in the Choctawhatchee Bay watershed.

Approximately 26 percent (over 376,000 acres) of the Florida portion of the Choctawhatchee River and Bay watershed is designated conservation lands and protected lands (NFWMD 2017). Conservation lands include the

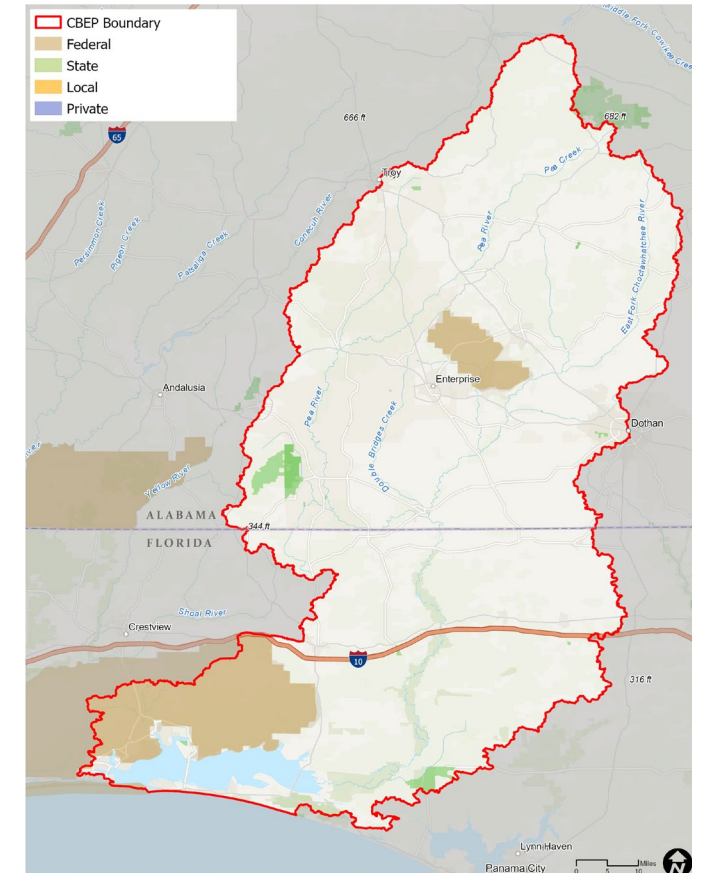


Figure 2-2: Existing Conservation Lands in the Choctawhatchee Bay Watershed

NFWMD Choctawhatchee River and Holmes Creek Water Management Area (WMA), protecting over 60,000 acres along the Choctawhatchee River and Holmes Creek. Other state-owned conservation lands include Live Oak Point, Point Washington State Forest, and Pine Log State Forest. The Florida portion of the watershed supports several state parks, including Grayton Beach, Rocky Bayou, Falling Waters, Topsail Hill Preserve, Deer Lake, and Eden Garden State Parks. The FDEP manages Rocky Bayou Aquatic Preserve in the northwestern portion of the bay.

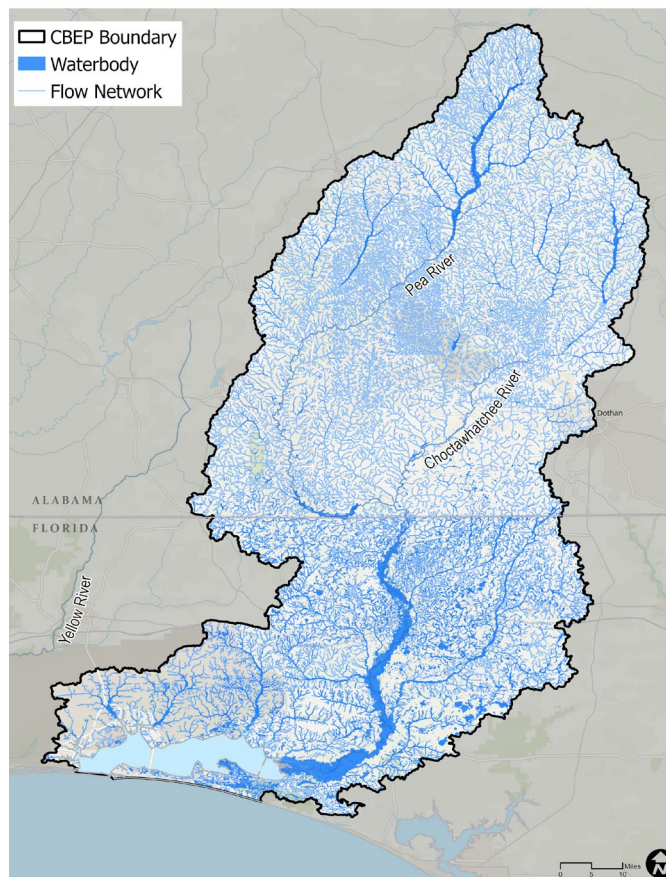
The U.S. Department of Defense owns and manages over 234,000 acres of property across the watershed (NFWMD 2017). Other ongoing land conservation efforts in the watershed are spearheaded by the Gulf Coastal Plain Ecosystem Partnership (GCPEP), a program for restoring and conserving longleaf pine ecosystems, with participants from the Florida State Lands, the NFWMD, Nokuse Plantation, Nature Conservancy (TNC), the Florida Forest Service, the Conecuh National Forest, U.S. Department of Defense, and the Florida Fish and Wildlife Conservation Commission (FWC) contributing.

TECHNICAL CHARACTERIZATION SUMMARY

Regarding Non-Governmental entities, the TNC owns and manages the Choctawhatchee River Delta Preserve at the mouth of the Choctawhatchee River and the Rock Hill Preserve. Devil's Swamp and Nokuse are privately owned mitigation banks that service areas within the watershed.

The Northwest Florida Sentinel Landscape includes rural and agricultural lands, forests, threatened and endangered species habitat and all the military installations in northwest Florida Eglin Air Force Base. The Northwest Florida Sentinel Landscape enables collaborative efforts to facilitate funding assistance from federal, state, and local governments and private programs for restoring and increasing resiliency and sustainability of habitat and water resources while mitigating coastal risks and improving the climate resiliency of military installations. Additional goals include retaining agriculture and forest lands peripheral to military installations. The CBEP is a Northwest Florida Sentinel Landscape partner and collaborates with the partnership to focus on goals related to resiliency, mitigating coastal risks, and climate change adaptation by

Figure 2-3: Stream Network in the Choctawhatchee Bay Watershed



the CBEP focusing on listed species habitat recovery and water quality and quantity improvements. Long-term action plans developed through the CCMP will complement the sentinel landscape conservation approach.

HYDROLOGY

The Choctawhatchee River, the third largest river in the state of Florida in terms of flow (Fernald and Purdum 1998), is the main source of freshwater delivered to Choctawhatchee Bay. The river contributes approximately 90 percent of the freshwater to the system, with an annual discharge of 8,580 cubic feet per second (243 cubic meters per second) (NFWFMD 1996). **Figure 2-3** shows the Choctawhatchee Bay watershed and its stream network as delineated in the National Hydrography Dataset (NHD). Additional information regarding hydrology in Alabama can be found in reports from the CPYRWMA or the Geological Survey of Alabama (GSA). Currently, there are no significant consumptive use withdrawals from the Choctawhatchee River; and no Minimum Flows and Levels (Section 373.042, F.S.) analysis has been conducted for the river.

In addition to the Choctawhatchee River and its upstream tributaries, other sources of freshwater to the bay include several small creeks discharging to the bay's bays, including Turkey Creek, Rocky Creek, Swift Creek, and Alaqua Creek, as well as springs and groundwater from the Floridan aquifer (NFWFMD 1996; Ruth and Handley 2006). Florida Atlas of Lakes (FAOL) along with LakeWatch have identified 276 named lakes/ponds and 129 swamp/marshes within Choctawhatchee Bay watershed. Most of the lakes and swamps are small, with only 39 larger than one square kilometer.



Figure 2-4: Coastal Dune Lakes in the CBEP Management Area

COASTAL DUNE LAKES

While technically not in the Choctawhatchee Bay watershed, coastal dune lakes along the Walton County Gulf coastline are included in the CBEP management area and are addressed in this CCMP. Coastal dune lakes are unique hydrologic features found only in four countries worldwide (U.S., Madagascar, Australia, and New Zealand) and in two U.S. states – Florida and Oregon. There are 10 coastal dune lakes within the CBEP boundary (**Figure 2-4**) and 15 total within Walton County.

Dune lakes are shallow, semi-enclosed brackish lakes that have formed behind the dune line of the Gulf coastline. These lakes intermittently connect to the Gulf when coastal events breach the confining dunes, providing large pulses of salt water, and salinities in these lakes can vary dramatically over the long term (Kalinowski 2018). The lakes can also occasionally discharge freshwater to nearby Gulf waters, especially during periods of high rainfall. Bhadha and Jawitz (2008) found that all the dune lakes were predominantly groundwater-fed with groundwater levels relatively close to the ground surface even during the dry months. Lake water is generally colored with tannins due to dissolved organic matter in shallow groundwater (Bhadha and Jawitz 2008). Accordingly, water quality in dune lakes can be adversely impacted by septic tank leachate and untreated stormwater runoff from residential areas.



DID YOU KNOW?

Coastal dune lakes are found only in four countries worldwide and in two U.S. states— Florida and Oregon. In the CBEP boundary alone, there are ten!

SPRINGS

Springs are found at the locations where groundwater discharges directly to the land surface. The major springs in the Choctawhatchee Bay watershed discharge freshwater from the Floridan aquifer that lies approximately 100 feet above mean sea level and is thinly confined (NFWFMD 2005). The eastern portion of the watershed is a zone of high confining layer permeability and numerous artesian springs have been documented there. Because of the thin confining layer, the NFWFMD has designated a portion of the eastern watershed as a Springs Protection Area.

Springs in the Choctawhatchee River watershed include those with typical fissure-type vents and those that incorporate areas of diffuse, upward percolation of ground water into pools and runs (NFWFMD 2005). Springs that discharge via diffuse percolation are termed seep springs (NFWFMD 2005; Copeland 2003). A swallet is where water disappears underground in a limestone region, and is also called a swallow hole (Copeland 2003). **Figure 2-5** shows the locations of springs and swallets within the Choctawhatchee Bay watershed as well as the Springs Protection Area.

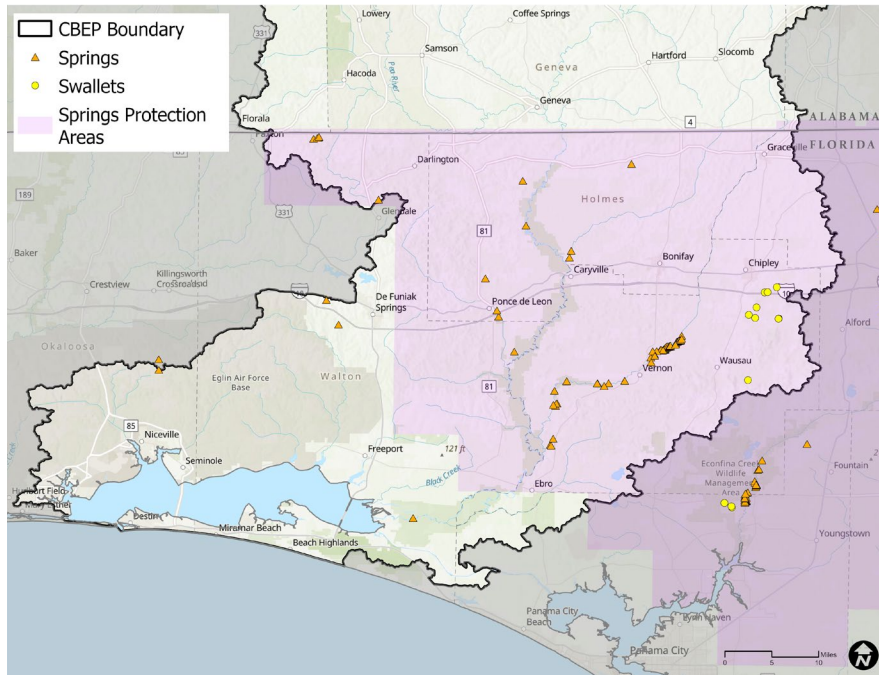


Figure 2-5: Springs and Swallets in the Choctawhatchee Bay Watershed

are available for both Florida and Alabama. The FDEP maintains databases (i.e., the Impaired Water Rule [IWR] and the Watershed Information Network [WIN]), and the primary data sources include the Choctawhatchee Bay Alliance (CBA), Florida Lakewatch, and FDEP. In Alabama, the Alabama Department of Environmental Management (ADEM) houses the surface water quality data in the National Water Quality Monitoring Council Water Quality Data Portal, a cooperative service sponsored by the USGS, EPA and the National Water Quality Monitoring Council. The sources of the data available include ADEM as well as other agencies.

WATER QUALITY IMPAIRMENTS

Section 303(d) of the Federal Clean Water Act (CWA) requires each state to identify waterbodies that do not meet water quality standards every two years. Each state is required to adopt a water quality standards program and to assess their waters. The waters not meeting criteria are placed on the EPA 303(d) list and updated every two years. Once waterbodies are identified as impaired, a Total Maximum Daily Load (TMDL) or an alternative restoration plan is developed to bring the waterbody into compliance. The following provides a summary of the available information regarding water quality impairments in both Florida and Alabama.

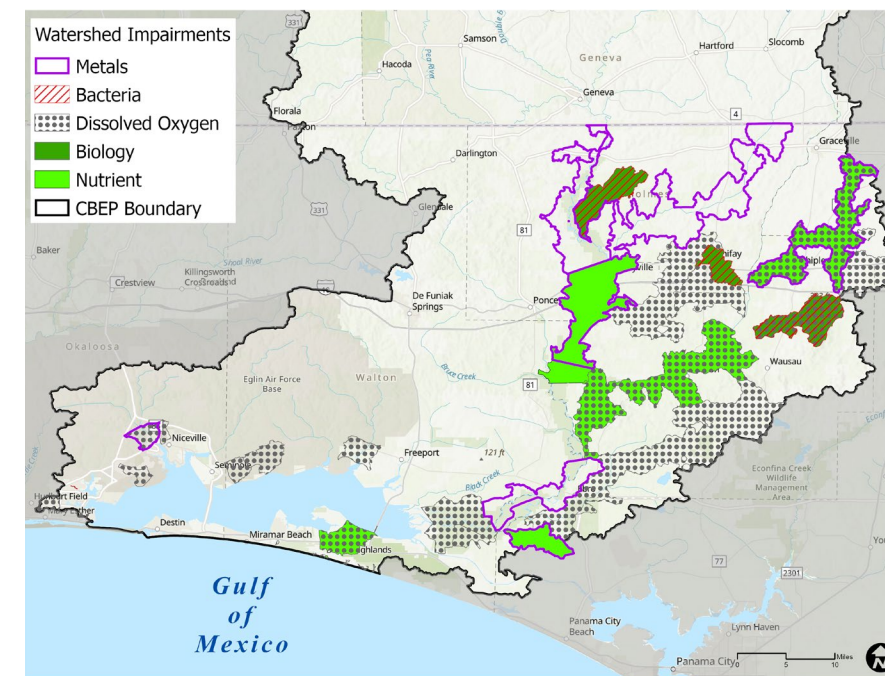
In Florida, the FDEP is tasked with enforcing the CWA and does so through Chapter 62-303 of the Florida Administrative Code (F.A.C) also known as the IWR. The FDEP uses a process called the Watershed Management Approach to implement the IWR. The FDEP houses the water quality data used for

assessments in the IWR database, updated with data from the FDEP’s WIN database, USGS, and EPA. The FDEP employs a rigorous quality control process prior to the use of these data in the impairment assessments.

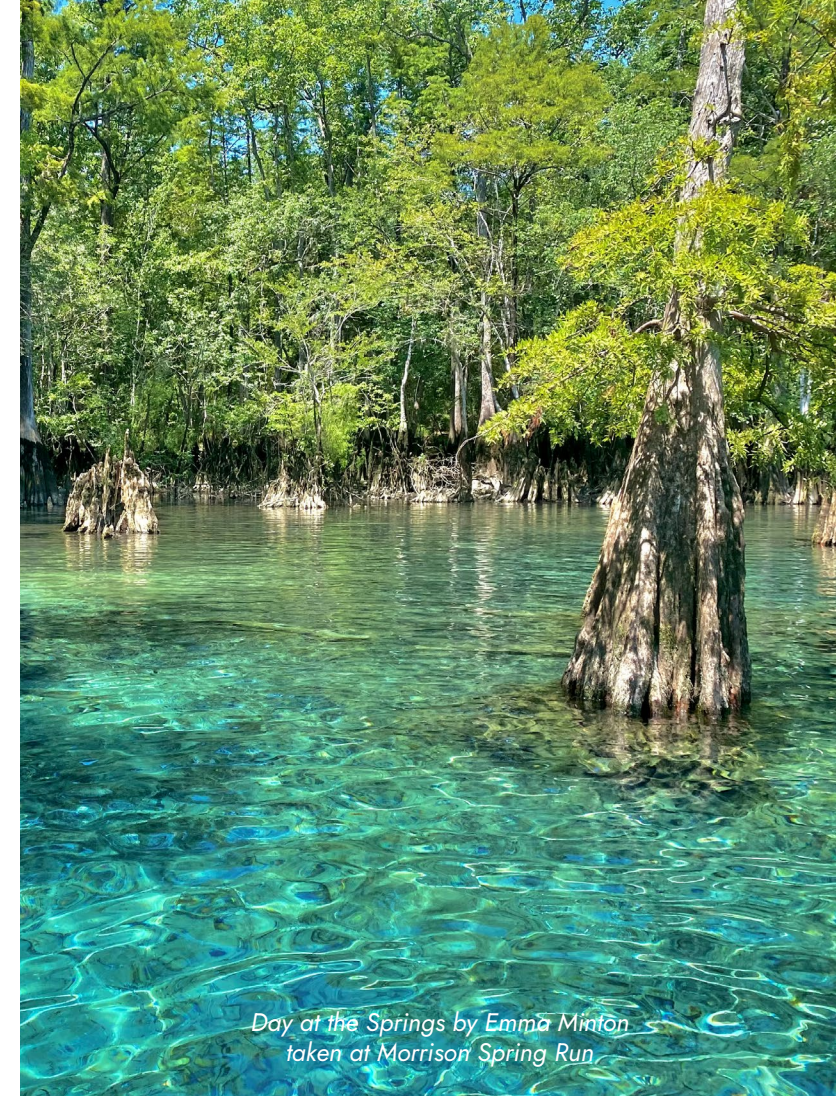
Applicable Florida water quality criteria are dependent on the type and class of the waterbody being assessed. Hoyer et al (2016) concluded that Choctawhatchee Bay is phosphorus limited and thus this is the nutrient most likely to impact trophic water quality (e.g., stimulate harmful algal blooms) in both the freshwater rivers and tributaries, and in the bay. The FDEP has developed numeric nutrient criteria (NNC) to address eutrophication, as well as standards for dissolved oxygen, bacteria, metals, and other contaminants. Water quality criteria and standards are established in Chapter 62-302 of the Florida Administrative Code (FDEP, 2017).

In Florida all waterbodies, or segments thereof, have a water body identifier (WBID). A WBID is deemed impaired due to excessive nutrient concentrations if the numeric nutrient criteria are exceeded in two of any three consecutive years. The process followed by FDEP to list as impaired can be found in FDEP (2013). Several WBID’s in the Choctawhatchee Bay watershed have been identified as not meeting Florida’s water quality criteria (**Figure 2-6**) and are thus classified as “impaired.” TMDLs have been developed for five of the impaired WBIDs in the Florida portion of the watershed to address bacteria, dissolved oxygen, and biology impairments,

Figure 2-6: Florida Waterbodies with Water Quality Impairments



Day at the Springs by Emma Minton taken at Morrison Spring Run



including: Camp Branch (fecal coliform), Minnow Creek (dissolved oxygen, biology, fecal coliform), Sikes Creek (dissolved oxygen, fecal coliform), Turkey Creek (fecal coliform), and Choctawhatchee River (fecal coliform).

In Alabama, the ADEM is tasked with enforcing the CWA and does so through the Water Quality Management Continuous Planning Process authorized by the Alabama Water Pollution Control Act and the Alabama Environmental management Act, both codified in 1975 as Title 22 Section 22-22-1 and Section 22-22A-1, respectively.

Alabama water criteria are intended to protect, restore, and maintain the condition of its waters. They are specific to the waterbody’s designated use, are either numeric or narrative, and include an

TECHNICAL CHARACTERIZATION SUMMARY

antidegradation policy. The criteria are listed in Chapter 335-6-10 ADEM Administrative Code and generally relate to temperature, dissolved oxygen, bacteria, radioactivity, turbidity, and toxic pollutants pursuant to Section 307(a) (1) of the Federal Water Pollution Control Act. With few exceptions, there are no criteria for nutrient or chlorophyll concentrations in Alabama freshwaters.

The assessment process used to determine if a waterbody is meeting its designated use can be found in “Alabama’s Water Quality Assessment and Listing Methodology” (ADEM 2020). Several waterbody segments have been deemed impaired by ADEM within the Choctawhatchee Bay watershed (**Figure 2-7**). The primary cause is bacteria with 31 impaired segments. These are followed by siltation (2), organic enrichment (1) and metals (1). Six of the impaired waterbody segments in the Alabama portion of the watershed have had TMDLs developed to address bacteria and metals impairments, including: Dowling Branch (fecal coliform), Hurricane Creek (fecal coliform), Indian Camp Creek (*E. coli*), Walnut Creek (lead), West Fork Choctawhatchee River (*E. coli*), and Pea River (*E. coli*).

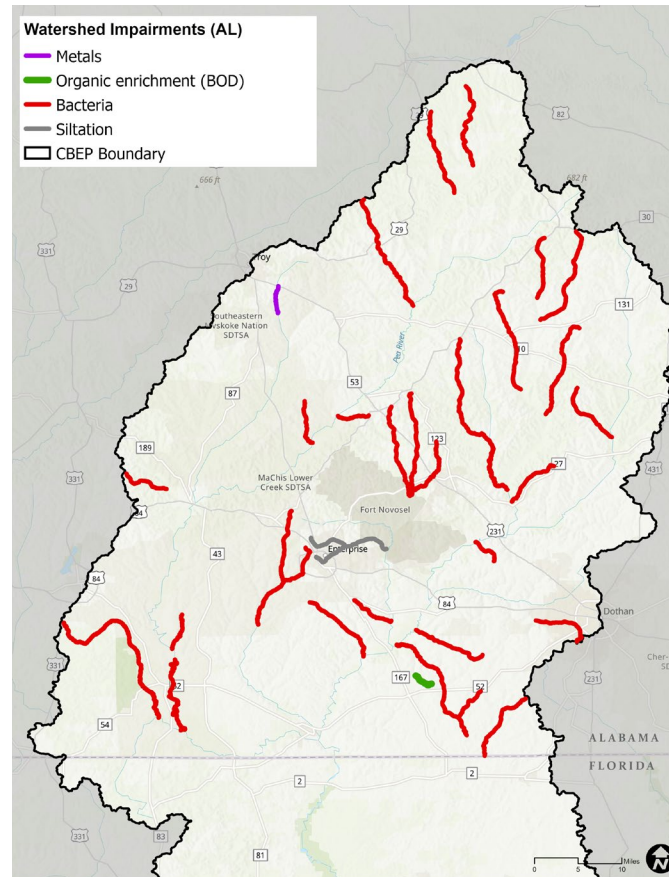


Figure 2-7: Alabama Waterbodies with Water Quality Impairments

POLLUTION SOURCES

Non-point source (NPS) pollution is generated when stormwater runoff collects pollutants from across the landscape (lawns, pavement, highways, dirt roads, buildings, farms, forestry operations, and construction sites, etc.) and carries them into receiving waters. Depending on the type of land use, NPS pollutants typically include nutrients, microbial pathogens, sediment, petroleum products, metals, pesticides, and other contaminants. Typical sources of NPS pollution include stormwater runoff from urban and agricultural lands and erosion and sedimentation from construction sites, unpaved roads, and destabilized stream banks.

Some pollutants, such as nitrogen and mercury, are also deposited on the landscape and waterbodies by atmospheric deposition, which is derived primarily from fossil fuel combustion from vehicular traffic and power plant emissions. Most oxidized-nitrogen emissions are deposited close to the emission source and can especially impact surface water proximate to urban areas (NRC 2000). Airborne pollutants deposited on the landscape surface via atmospheric deposition are subsequently

mobilized and concentrated in stormwater runoff and delivered to surface waters.

Marinas may be a source of NPS pollution from typical activities, such as boat maintenance, fueling, illicit marine sewage discharge, and runoff from parking lots. Pollution from marinas can depend on the availability of pump-out facilities and the level and consistency of marina BMP implementation. Currently, there are nine FDEP-certified Clean Marinas in the Choctawhatchee Bay watershed (NFWMD 2017)

In the Choctawhatchee Bay watershed urban areas are largely concentrated around Choctawhatchee Bay, including the cities of Fort Walton Beach, Destin, Cinco Bayou, Shalimar, Freeport, Valparaiso, Niceville, and adjacent unincorporated areas. In the Florida portion of the watershed eight government entities hold Municipal Separate Storm Sewer System (MS4) NPDES permits for stormwater conveyances that discharge to waters of the State, including Eglin AFB, the City of Niceville, the City of

Destin, the City of Valparaiso, Bay County, the City of Fort Walton Beach, Okaloosa County, and Walton County.

Fertilizer applications, ditching, road construction, and harvesting associated with agriculture and silviculture can also cause NPS pollution, erosion, sedimentation, and physical impacts to streams and lakes (Stanhope et al. 2008). Agricultural lands are most prominent in the northern and eastern portions of the watershed, as well as in Alabama. Agricultural lands are typically exempted from stormwater regulatory requirements but are encouraged to follow Best Management Practices to reduce NPS pollution.

Septic systems, or onsite sewage treatment and disposal systems (OSTDS), are widespread sources of nutrients and other pollutants. High concentrations of OSTDS can degrade the quality of groundwater and proximate surface waters. While conventional OSTDS can control pathogens, surfactants, metals, and phosphorus, mobility in the soil often prevents complete treatment and removal of nitrogen. Dissolved nitrogen is frequently exported from septic drain fields through the groundwater (NRC 2000). Additionally, OSTDS in areas with high water tables or soil limitations may not effectively treat other pollutants which can enter surface waters as seepage into drainage ditches, streams, lakes, and estuaries.

Most of the residential and commercial development in the watershed is served by OSTDS as opposed to central sewer collection and treatment systems, which are limited to the major urban areas listed above. As summarized by the NFWMD (2017) approximately 33,000 known or likely septic systems were documented in the watershed as of 2016, based on permit and inspection records maintained by the Florida Department of Health. With increasing population growth in the watershed, the number of septic systems has likely increased significantly since then.

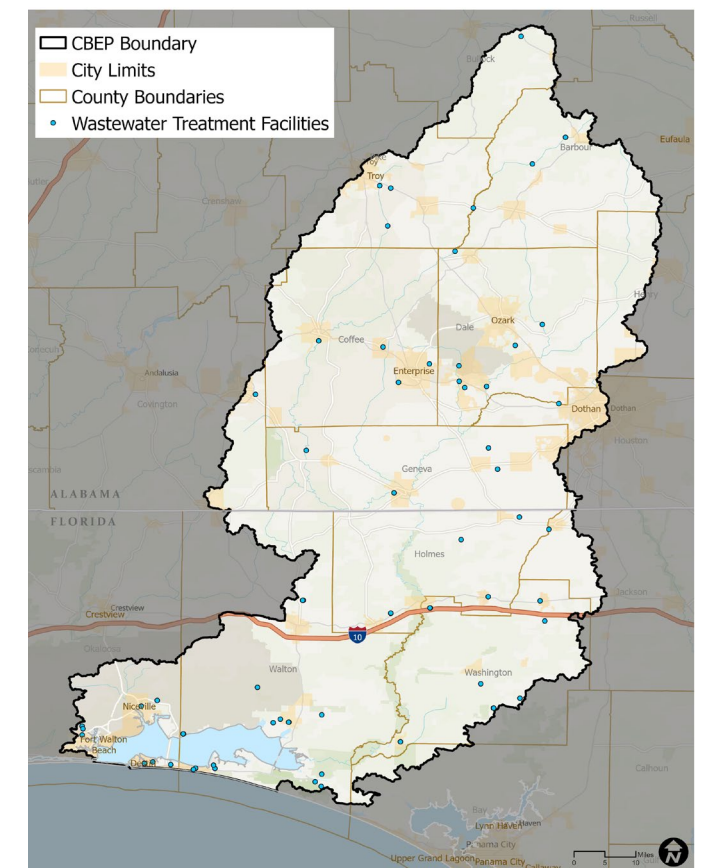
In the Florida portion of the watershed there are 24 permitted wastewater treatment facilities of which 22 are domestic and 2 are industrial. Only four of those facilities discharge treated domestic wastewater to surface waters, and those facilities all have low permitted flows (e.g., <1 million gallons per day). The rest of these facilities discharge treated wastewater via spray irrigation and/or rapid infiltration basins (RIBs). In the Alabama portion of the watershed there are 26 permitted municipal (domestic) wastewater treatment facilities. **Figure 2-8** shows the

location of all permitted wastewater treatment facilities in the watershed.

In summary, pollution sources in the Choctawhatchee Bay management area are generally diffuse, with many septic systems and low flow point source wastewater discharges widely dispersed geographically throughout the watershed. Most treated wastewater is discharged to shallow groundwater via septic drain fields, spray irrigation and RIB’s. Non-point source pollution from urban and agricultural stormwater discharges may be a significant source of nutrients, bacteria, and other contaminants; and atmospheric deposition of nitrogen and mercury may also be important. However, to date, no pollutant loading model has been developed for Choctawhatchee Bay and its watershed, and partitioned pollutant loading estimates from the various sources have not been quantified.

Erosion and sedimentation are natural phenomena that can be accelerated by human activities, with undesirable water quality consequences. Factors such as highly erodible soils, unstable slopes, and high rainfall intensities are important factors in erosion and sedimentation.

Figure 2-8: Location of Permitted Wastewater Treatment Facilities in the Choctawhatchee Bay Watershed





Quiet Reflections by Louis Cerrato taken at Veterans Park Okaloosa Island

Construction activities, unpaved roads, abandoned clay pits, and agricultural and silvicultural practices lacking proper BMPs are common sources of sedimentation. Accelerated stream bank erosion caused by runoff associated with impervious surfaces can also be a significant source of sedimentation into receiving waters.

Erosion from unpaved dirt roads crossing the Choctawhatchee River is a significant source of localized sedimentation; and cumulatively, sedimentation from dirt road erosion probably contributes significantly to sediment loads in the river and loads delivered to the bay. In addition to direct impacts to benthic habitats, sedimentation degrades water quality through increased turbidity and suspended solids. The NFWFMD and the FDOT are currently conducting assessments of dirt road erosion and projects to address this problem in the watershed.

NATURAL SYSTEMS

Natural systems are generally divided into terrestrial and upland communities, and aquatic and wetland communities. The major natural systems of the Choctawhatchee Bay watershed are discussed below.

TERRESTRIAL COMMUNITIES

Terrestrial communities in the watershed are comprised of mesic flatwoods, sandhill, scrub, scrubby flatwoods, upland hardwood forests, wet flatwoods, and xeric hammocks (FNAI 2010; NFWFMD 2017). These communities provide important wildlife habitat, as well as support recreational uses and economic growth (FNAI 2010). Terrestrial communities in the watershed have been used primarily for agriculture and silviculture (forestry). Silviculture activities have significantly altered the landscape and associated hydrology through the construction of dirt roads, overharvest of the native longleaf pine (*Pinus palustris*), and conversion of natural

forests to slash and sand pine plantations. Most of these impacts occurred following the acquisition of land for Eglin Air Force Base in the early 1900s (Ruth and Handley 2006). The restoration of native longleaf pine forests in the watershed is the important objective being led by The Longleaf Alliance and other Non-Governmental Organizations, as well as Florida State Parks. **Figure 2-9** shows the distribution of terrestrial communities in the Choctawhatchee Bay watershed.

AQUATIC COMMUNITIES

Aquatic communities include lakes, rivers, and streams, as well as wetlands and riparian habitats that serve as an interface between terrestrial and open water ecosystems. Together, these aquatic communities provide critically important fish and wildlife habitat that support ecological diversity. Wetlands also provide water quality benefits by filtering stormwater runoff from adjacent uplands and removing excess sediment, nutrients, and contaminants;

TECHNICAL CHARACTERIZATION SUMMARY

and ecological benefits by shading streams to optimize light and temperature conditions for aquatic plants and animals (NFWFMD 2017). Wetlands also provide high primary and secondary productivity which forms the foundation for the aquatic food web.

The wide variety of aquatic habitats in the Choctawhatchee Bay has been defined and described by FNAI (2010) and NFWFMD (2017) and includes: basin marshes, baygalls, bogs, dome swamps, hydric hammocks, floodplain swamps, seepage slopes, wet prairies, blackwater streams, sandhill upland lakes, seepage streams, sinkhole lakes, and spring run streams. Choctawhatchee Bay is an open water estuary and the primary aquatic community of interest as it is the ultimate receiving waterbody in the watershed. **Figure 2-10** shows the distribution of open water (lakes, streams, rivers), wetlands, and estuarine waters, as mapped by the National Wetlands Inventory (NWI) in the Choctawhatchee Bay watershed.

Figure 2-9: Terrestrial Communities in the Choctawhatchee Bay Watershed

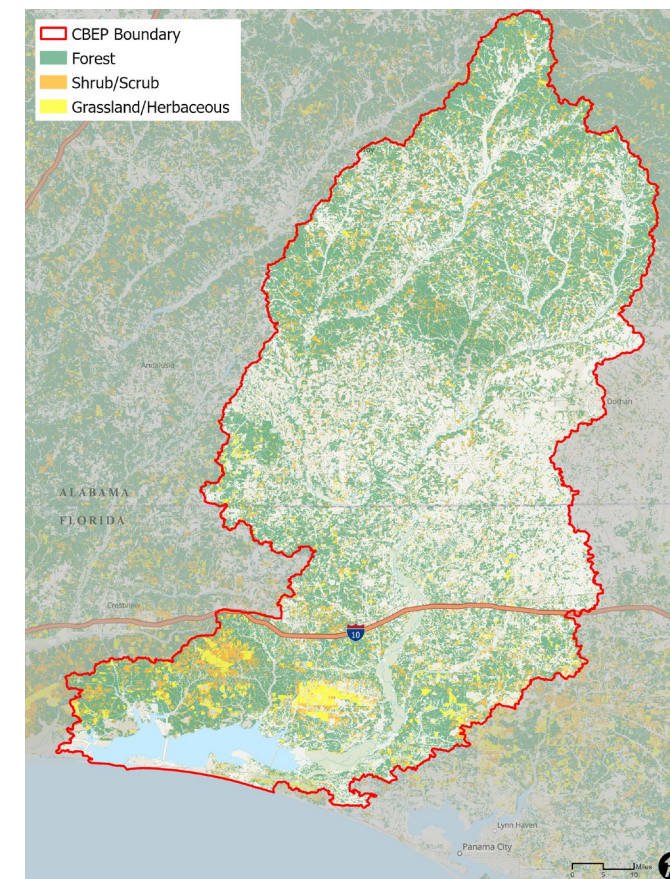
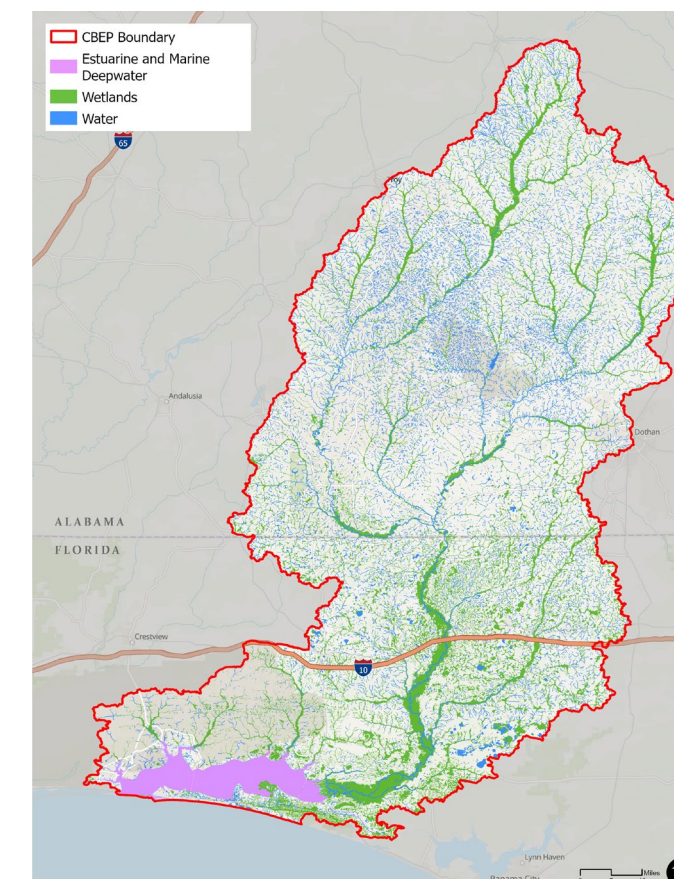


Figure 2-10: Aquatic Communities in the Choctawhatchee Bay Watershed



TECHNICAL CHARACTERIZATION SUMMARY

FISH AND WILDLIFE

The Choctawhatchee Bay and its watershed supports many species of birds, mammals, reptiles, amphibians, and invertebrates including those species generally associated with and tolerant of highly developed, urban areas. Characteristic wildlife that could be expected in the watershed include larger mammals such as white-tailed deer and black bear; small to medium-sized prey mammals, such as rabbits, raccoons, opossum, armadillo, squirrels, native and nonnative anoles, rodents, coyotes, and foxes; and various bird guilds including hawks, doves, crows, sparrows, starlings, finches, swallows, and pigeons.

The CCMP management area was assessed for the presence of suitable habitat for federal-listed and state-listed species and USFWS Critical Habitat in accordance with 50 CFR Part 402 of the Endangered Species Act of 1973, as amended; Chapters 5B-40: Preservation of Native Flora of Florida and 68A-27 FAC: and Rules Relating to Endangered or Threatened Species; the Migratory Bird Treaty Act of 1918. A complete listing of federal and state listed species in the watershed is provided in the CCMP supporting document titled *Choctawhatchee Bay and Watershed Technical Characterization Analysis* (ESA, 2024). The following sections provide a summary of fish and wildlife issues pertinent to the CCMP Action Plans.

FRESHWATER MUSSELS

Freshwater mussels comprise a critical ecological role in the riverine ecosystems of north central Florida and adjacent areas of southern Alabama and Georgia. Hinson et

al (2015) noted that the Alabama portion of the Choctawhatchee River Basin is home to 25 freshwater mussel species, and the aquatic fauna is largely intact due to the absence of large impoundments in the Choctawhatchee, Pea, and Yellow River watersheds. However, interest in the mussel populations has arisen with the conversion of natural areas to more developed land uses. Of particular concern is the potential impact of excessive sedimentation and stream and river blockages that can severely alter natural stream flow patterns. In the Florida portion of the watershed, 6 species of freshwater mussels have been listed as threatened or endangered, and the streams of the Choctawhatchee River basin are Designated Critical Habitat for those species.

FISHES

Fish populations in the watershed are well documented. Simon et al (2015) conducted a comprehensive survey of the diversity and distribution of fish species occurring in the Choctawhatchee River drainage in southeastern Alabama and north central Florida. Over 300 sampling sites were evaluated for species diversity and distribution in the drainage, including compilation of unpublished records from southeastern natural history museums. The freshwater taxa found included 83 native and 10 introduced freshwater taxa, 24 estuarine, and 17 marine taxa. The most frequently encountered species includes Eastern mosquitofish (*Gambusia holbrooki*), Blackbanded darter (*Percina nigrofasciata*), American pickerel (*Esox americanus*), weed shiner (*Notropis texanus*), bluegill (*Lepomis macrochirus*),



Tracie M. Carr, "Can You See Me Now?" taken on Eglin Reservation off Highway 20



L. Andrew Tucker, "After the Rain" taken in Crestview, FL



Osprey with Catch by John Cooper taken in Shalimar



Gulf Sturgeon making a splash

blacktail shiner (*Cyprinella venusta*), longjaw minnow (*Notropis amplamala*), and pirate perch (*Aphredoderus sayanus*).

One fish species of particular concern is the Okaloosa darter (*Etheostoma okaloosae*), which was listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) in 1973. Relatively small (< 2 inches), the Okaloosa darter is endemic to the Florida Panhandle, found in only six coastal watersheds that drain into three Choctawhatchee Bay bayous many (97%) of which can be found on Eglin AFB (Pizzolato 2022). The Okaloosa darter is usually found on the stream bottoms and primarily feeds on mayfly nymphs, caddisfly larvae, and midge larvae (Ogilvie 1980). Sediment loading is one of the major anthropogenic stressors that has impacted this fish.

Eglin AFB has implemented an Integrated Natural Resources Management Plan that includes specific goals and objectives to improve Okaloosa darter habitat. Eglin’s work in improving darter habitat and monitoring populations has been the driving force behind its recovery.

Erosion into streams has been reduced, fish passage barriers have been removed, and over 480 acres of land on the base have been restored, reconnecting stream habitat for the darter. Approximately 90% of the 176 square miles watershed drainage area that historically supported the Okaloosa darter is federal property under the management of Eglin AFB. Due to these conservation efforts, the USFWS removed the Okaloosa darter from the Federal List of Endangered and Threatened Wildlife.

Another fish species of note that occurs in both the freshwater and estuarine waters of Florida (and upper reaches of the watershed in Alabama) is the Gulf sturgeon (*Acipenser oxyrinchus desotoi*). The Gulf Sturgeon is an anadromous species, inhabiting estuaries, bays, and nearshore waters of the Gulf of Mexico during winter and migrating into coastal rivers in early spring (March through May) to spawn. They remain in the river systems the entire summer. Studies conducted from 1999 to 2001 estimated adult and subadult populations in the Choctawhatchee and Yellow Rivers at fewer than 3,000 and 550 individuals, respectively (Hastings and Parauka,

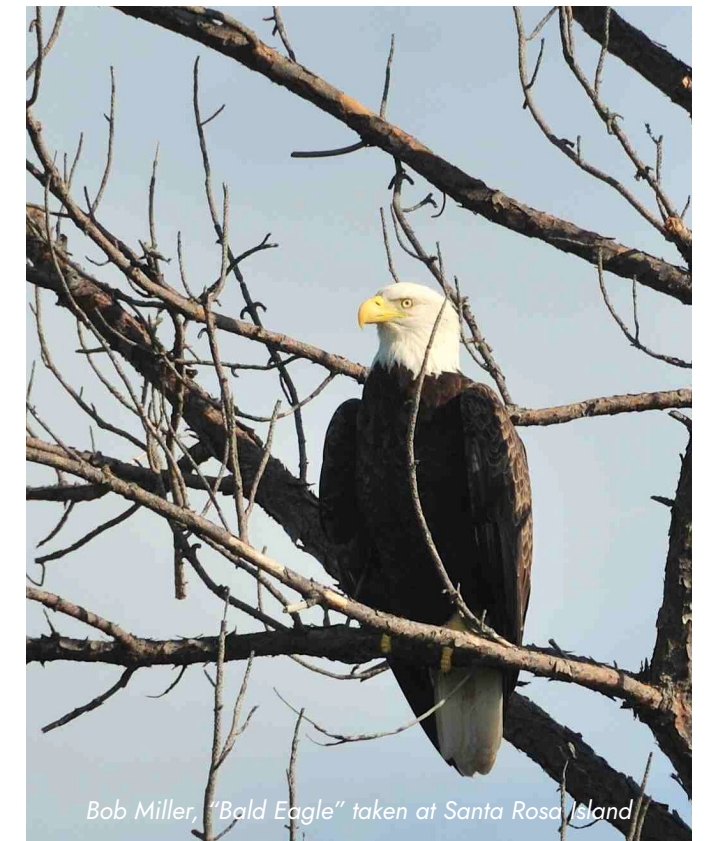
2004). Declining populations have been attributed to a multitude of impacts such as over-fishing, loss of river habitat, modifications to habitat associated with dredged material disposal and sedimentation, de-snagging, and other navigation maintenance activities; incidental take by commercial fishermen; poor water quality associated with contamination by pesticides, heavy metals, and industrial contaminants; and aquaculture and accidental introductions (Hastings and Parauka, 2004). The Gulf Sturgeon is listed as threatened by the USFWS and Designated Critical Habitat occurs in the watershed.

BIRDS

The Florida Panhandle falls within two major migratory bird biological flyways, the Atlantic Flyway and the Mississippi Flyway. The Choctawhatchee Bay watershed is predominantly within the Atlantic biological flyway and millions of individuals representing over 500 bird species use the route, with forty percent of those species being federally recognized species of conservation concern (NFWFMD 2016). Although many of these species are transients, others are accidental visitors far from their native ranges. These species include least terns, piping plovers, and American oystercatchers; and hundreds of other bird species occur throughout the Choctawhatchee River and Bay watershed and across a wide variety of habitats (NFWFMD 2016). In the Florida portion of the watershed 4 species of birds are listed as threatened or endangered including the southeastern American kestrel, bald eagle, wood stork, and red-cockaded woodpecker.

CRITICAL HABITAT

The CBEP management area was assessed for Critical Habitat designated by Congress in the CFA Title 50, Part 17.94 Critical Habitats. Review of the USFWS available GIS data indicates there is Critical Habitat mapped within the watershed for nine (9) species including: Gulf sturgeon (*Acipenser oxyrinchus desotoi*), reticulated flatwoods salamander (RFS) (*Ambystoma bishopi*), Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*), tapered pigtoe (*Fusconaia burkei*), narrow pigtoe (*Fusconaia escambia*), southern sandshell (*Hamiota australis*), Choctaw bean (*Obovaria choctawensis*), fuzzy pigtoe (*Pleurobema strodeanum*), and southern kidneyshell (*Ptychobranthus jonesi*).



Bob Miller, "Bald Eagle" taken at Santa Rosa Island



Connie Sweetland, "Strategizing"

THE CHOCTAWHATCHEE BAY ESTUARY

Choctawhatchee Bay is an estuary. As defined by EPA, “an estuary is a partially enclosed, coastal water body where freshwater from rivers and streams mixes with salt water from the ocean.” Estuaries, and their surrounding wetlands and uplands, are places of transition from land to sea. Although influenced by the tides, they are protected from the full force of ocean waves, winds, and storms by landforms such as barrier islands (<https://www.epa.gov/nep/basic-information-about-estuaries>).

The critical factors determining hydrodynamic responses in Choctawhatchee Bay include the rainfall to the watershed,

the hydrology of the watershed, the resultant freshwater inflows from the watershed to Choctawhatchee Bay, and exchange with the Gulf of Mexico through East Pass. As described above, the primary source of freshwater to the bay is the Choctawhatchee River, which provides almost all (~90 percent) of the freshwater to the system. In addition to the river, other sources of freshwater to the bay include several small creeks discharging to the bay’s bayous, including Turkey Creek, Rocky Creek, Swift Creek, and Alaqua Creek, as well as springs and groundwater seepage from the Floridan aquifer (NFWFMD 1996; Ruth and Handley 2006).

Figure 2-11: Choctawhatchee Bay Segmentation



BAY SEGMENTATION

Ruth and Handley (2006) divided the bay into three segments for descriptive purposes: the western, middle, and eastern segments (**Figure 2-11**). The western segment is defined as that portion of the bay west of State Road (SR) 293 bridge). The western segment is the most saline portion of the bay and includes the deepest sections (Ruth and Handley 2006), as well as East Pass and the connection to Santa Rosa Sound. The western segment includes, among other waterbodies, Cinco Bayou, Garnier Creek and Bayou, Turkey Creek, Boggy Bayou, Toms Creek and Bayou, and Rocky Creek and Rocky Bayou.

The middle segment is that area between the SR 293 bridge and the US 331 bridge. The Eglin Air Force Base property, including the Elgin Wildlife Management Area, lies along the northern shore of this segment, with several creeks discharging to the bay, including (from west to east) Eagle Creek, Mullet Creek, Trout Creek, Basin Creek (via Basin Bayou), Alaqua Creek (via Alaqua Bayou), and Fourmile Creek and Lafayette Creek (via LaGrange Bayou). Along the southern shore between SR 293 and Fourmile Point just east of Horseshoe Bayou are several golf courses, with Hogtown Bayou east of Fourmile Point.

The eastern segment extends from the US 331 bridge to the eastern boundary of the Bay and includes the Choctawhatchee River delta area. The river provides most of the freshwater to the bay, and as such is one of the two primary influences on salinity within the bay, the other being exchange through East Pass with the Gulf of Mexico. The Gulf Coast Intracoastal Waterway (GCIWW) extends eastward south of the river delta. The river delta also serves as mouth for the Black Creek/Mitchell River flow ways, just north of the mouth of the Choctawhatchee River.

BATHYMETRY AND HYDRODYNAMICS

Choctawhatchee Bay is a shallow stratified system with relatively low tidal energy and relatively limited flushing (Blaylock 1983; Livingston 1986). The system experiences diurnal tides (Seim et al.



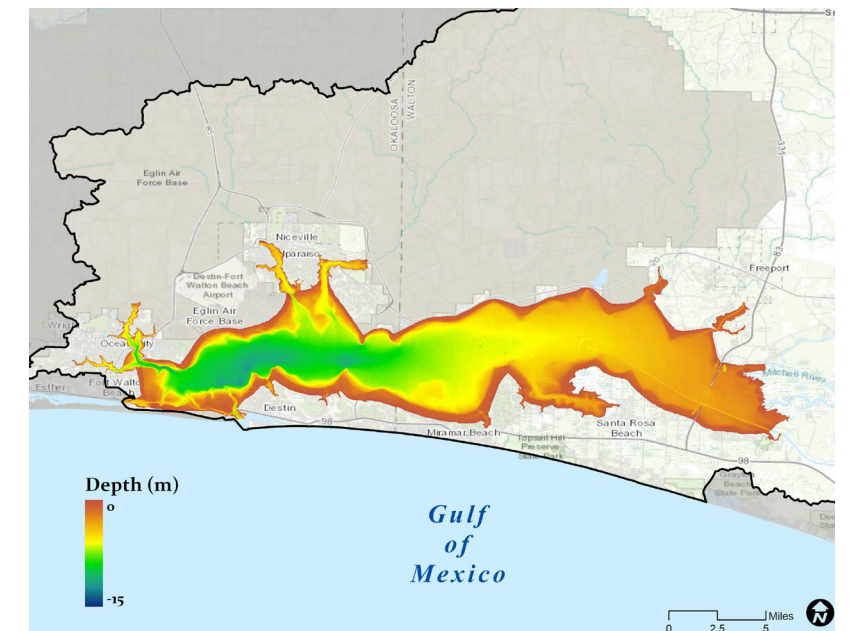
Autumn at Morrison by Lori Ceier taken at Morrison Springs

1987) with relatively small range (0.15 m – 0.5 m for neap and spring tides, respectively).

The bathymetry of Choctawhatchee Bay (**Figure 2-12**) ranges from shallow areas (<3 m deep) near shore and in the eastern portions to deeper areas (>13 m) in the western region of the bay (Ruth and Handley 2006), with a mean depth of 3.8 m. The surface area of Choctawhatchee Bay is approximately 350 km². Ruth and Handley (2006) describe four distinct bottom types within the bay, including shallow slope areas, the deeper basin in the western half of the bay, bayous, and the river delta.

Net water movement within the bay is from the mouth of the Choctawhatchee River at the eastern end of the Bay toward the west, where the bay discharges to the Gulf of Mexico via East Pass. Inflow

Figure 2-12: Choctawhatchee Bay Bathymetry



TECHNICAL CHARACTERIZATION SUMMARY

from the Gulf of Mexico during the incoming portion of the diurnal tidal cycle moves salt water into the system. Choctawhatchee Bay also connects through the GCIWW eastward to West Bay in St. Andrew Bay. This section of the GCIWW was constructed in 1938 and often exhibits bi-directional flow driven by tidal head differences, winds, and spatial and temporal differences in rainfall. Hydrodynamic exchanges with West Bay may play a significant role in water quality conditions in the eastern Choctawhatchee Bay, but such effects have not been well documented.

SALINITY

Extensive salinity and temperature data have been collected at multiple locations in Choctawhatchee Bay for over 40 years and are reported in the FDEP IWR dataset. An analysis of long-term salinity distributions in the three segments was conducted using FDEP data, and the results are shown in **Figure 2-13**. This plot shows that salinity is greatest in the western segment and declines towards the eastern segment where the major freshwater inflow from the Choctawhatchee River is delivered. Overall, salinity in Choctawhatchee Bay is generally brackish or mesohaline, ranging on average between 10-22 ppt.

The combination of a limited direct exchange with the Gulf of Mexico via the shallow and narrow East Pass in the western portion of the bay and the large influx

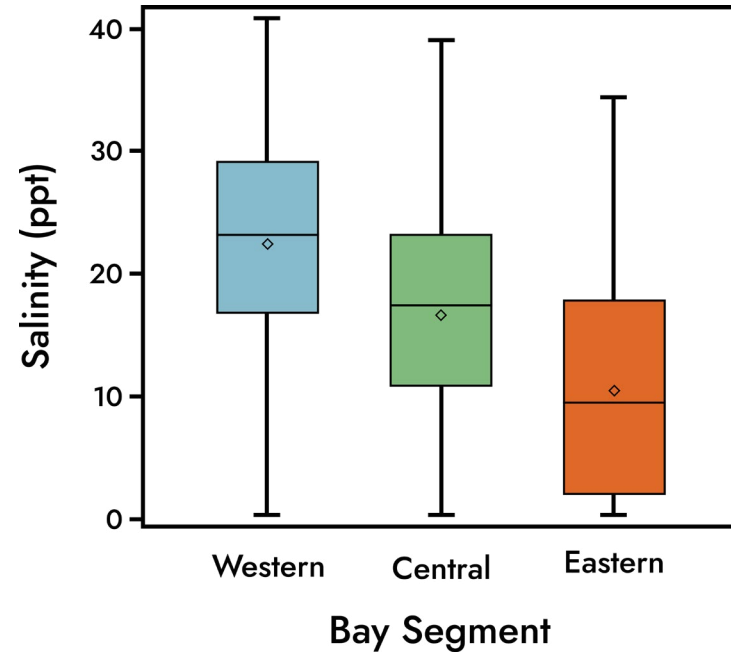


Figure 2-13: Salinity Distributions in the Three Bay Segments

of freshwater from the Choctawhatchee River at the eastern end of the bay result in Choctawhatchee Bay being a relatively stratified system (Blaylock 1983; Livingston 1986). A halocline, or vertical salinity gradient, is evident at most locations in the bay, with denser, high salinity water found in bottom waters. Salinity stratification is weaker in the eastern portions of the bay, especially during periods of high river inflows. **Figure 2-14** shows a schematic of salinity stratification in a typical estuary.

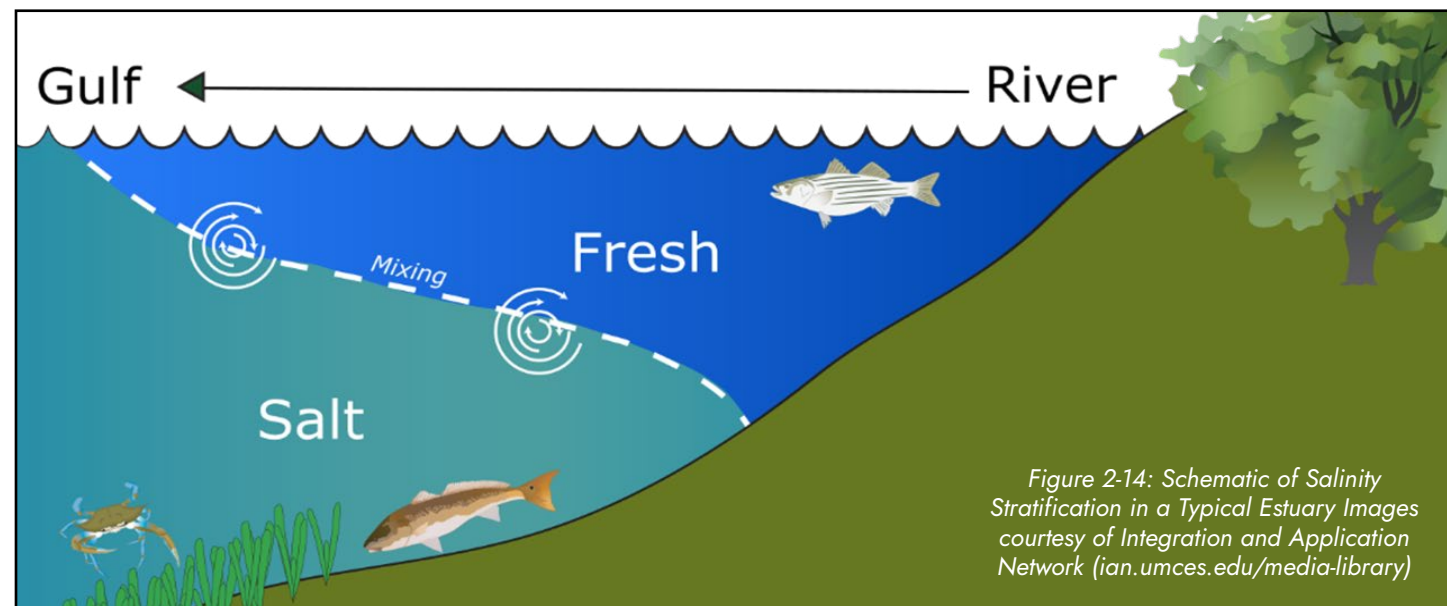


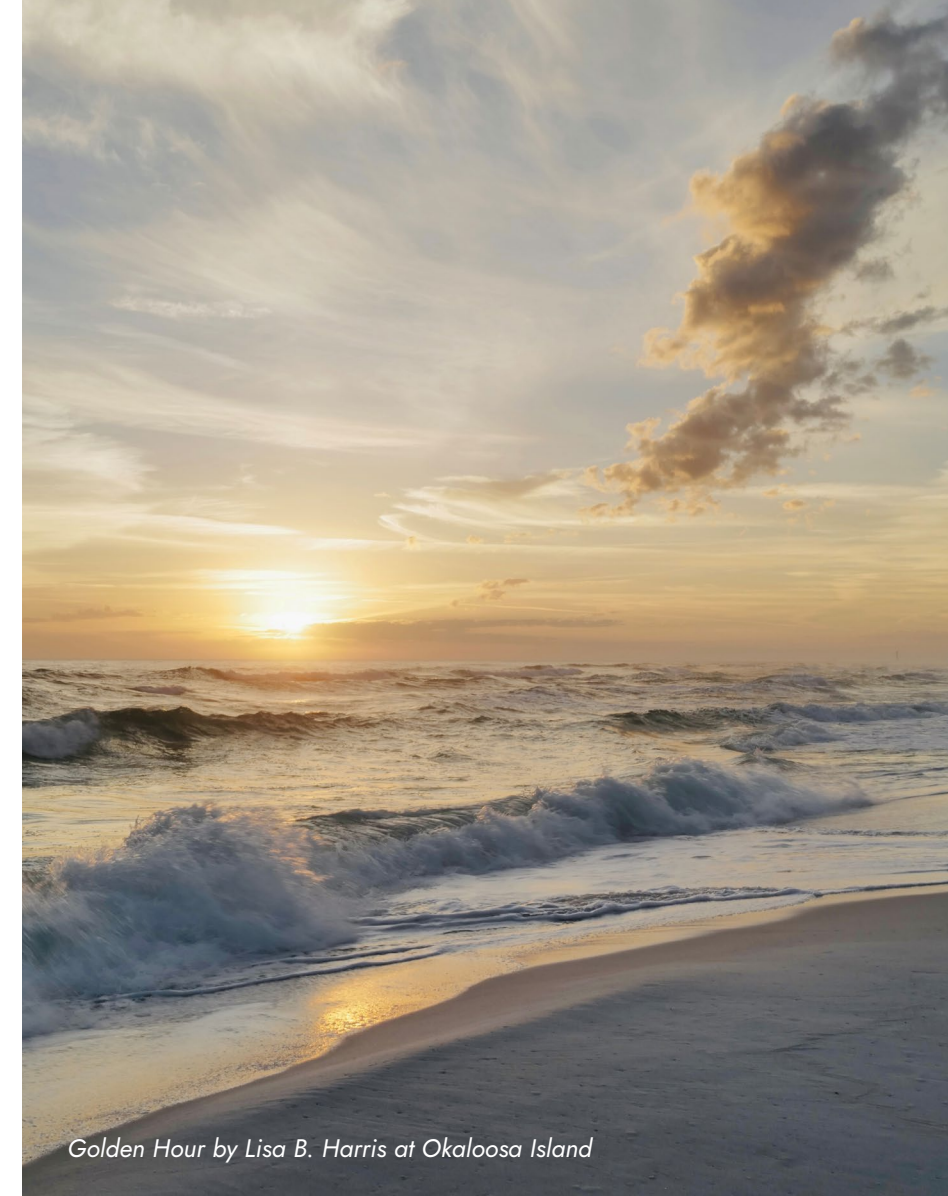
Figure 2-14: Schematic of Salinity Stratification in a Typical Estuary Images courtesy of Integration and Application Network (ian.umces.edu/media-library)

SEA LEVEL RISE

Changes in long-term local seawater surface elevations are important to account for when considering long range planning horizons. The trend in sea level for the Choctawhatchee Bay area has been estimated by NOAA based on water surface elevation data collected at the nearby Panama City Beach tide gauge. These data indicate a sea level increase of 5.10 +/- 0.84 mm/yr over the period 1989 to 2023 (NOAA 2024). **Figure 2-15** shows the increasing trend in sea level at the NOAA Panama City Beach.

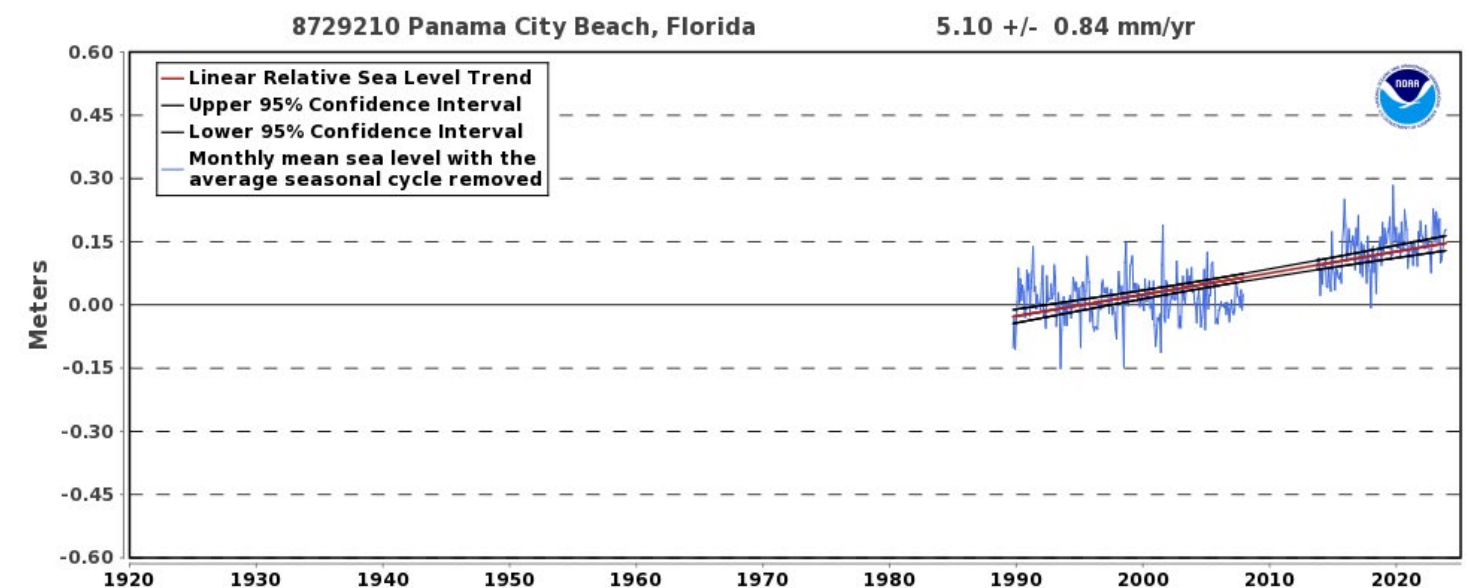
WATER QUALITY

Water quality databases for assessing long-term ambient water quality in the Choctawhatchee Bay are available from the FDEP (i.e., the IWR and WIN databases), and the primary data sources include the CBA, Florida Lakewatch, and FDEP. Continuous data from 1995-2021 was used in various analyses presented herein. A more detailed discussion of water quality is provided in the CCMP technical supporting document titled *Choctawhatchee Bay and Watershed Technical Characterization Analysis* (ESA, 2024).



Golden Hour by Lisa B. Harris at Okaloosa Island

Figure 2-15: Sea Level Trend at the NOAA Panama City Beach Tide Gauge



TECHNICAL CHARACTERIZATION SUMMARY

SAMPLING AREA	CONCENTRATION		
	Chlorophyll <i>a</i> (µg/L)	TN (mg/L)	TP (mg/L)
Alaqua Bayou	6.62	0.36	0.026
Basin Bayou	4.03	0.25	0.014
Boggy Bayou	3.42	0.25	0.013
Choctawhatchee Bay West	4.07	0.28	0.021
Choctawhatchee Bay Middle	3.76	0.30	0.019
Choctawhatchee Bay East	6.20	0.46	0.029
Garnier Bayou	3.50	0.33	0.014
LaGrange Bayou	10.90	0.49	0.028
Rocky Bayou	3.71	0.30	0.016

Table 2-2: Mean CHL, TN and TP Concentrations in Choctawhatchee Bay 1995-2021

SPATIAL AND TEMPORAL VARIABILITY

Using these data, long-term spatial distributions in water quality at various locations in the bay were calculated. **Table 2-2** provides a summary of the mean chlorophyll *a* (CHL), total nitrogen (TN), and total phosphorus (TP) concentrations in each of the three segments of Choctawhatchee Bay and the major bayous. The highest chlorophyll *a* and TN concentrations occur in East Choctawhatchee Bay and several bayous in that segment of the bay, including Alaqua Bayou and Lagrange Bayou. Hoyer et al. (2013) also found strong relationships between CHL, TN and TP and the bay segments, with increasing concentrations for each moving from west to east. This spatial trend is likely caused by large freshwater discharges from the river which carry nutrients delivered from the watershed to the east bay segment.

Using FDEP data, long-term time series plots (1995-2021) were developed to assess temporal variability in water quality (salinity, Secchi disc, chlorophyll *a*, TN, and TP concentrations) in the three major bay segments. Some of the more notable trends include: 1) increases in salinity in both the West and Middle segments; 2) higher nutrient and chlorophyll *a* concentrations in earlier years (pre-2000) in all bay segments; and 3) with the exception of years with tropical storm

events and associated higher rainfall, nutrient concentrations tend to be relatively consistent in later years (post-2005) in all bay segments.

In addition to time series plots, a water quality “report card” approach was applied to Choctawhatchee Bay water quality data to graphically depict temporal variability with respect to compliance with FDEP numeric nutrient criteria for the three primary bay segments. Annual geometric means (AGMs) were calculated by bay segment for each year in the period of record for total phosphorus (TP), total nitrogen (TN), and chlorophyll *a*. These AGMs were compared to the DEP NNC and each bay segment was assigned a “score” as follows:

- Green – in compliance with NNC, i.e., less than the NNC
- Yellow - in compliance with NNC, data reflect an increasing trend over the previous 7.5 years (the period typically used by DEP to identify a trend in water quality)
- Red – not in compliance with NNC, i.e., greater than the NNC.

Figure 2-16 presents the results of the comparison of the bay segment AGMs to the DEP NNC. As shown in this figure, water quality is best in the West Bay segment and worst in the East Bay segment. In addition, TP concentrations appear to have increased since 2018.

WATER QUALITY IMPAIRMENTS

A WBID is deemed impaired due to excessive nutrient concentrations if the numeric nutrient criteria are exceeded in two of any three consecutive years. The FDEP has developed numeric nutrient criteria for various segments in Choctawhatchee Bay and applied those criteria to ambient water quality data collected from the Bay. The process followed by FDEP to list an impaired

West

YEAR	TN	TP	Chla
2000	Green	Green	Yellow
2001	Green	Green	Green
2002	Green	Yellow	Green
2003	Green	Green	Green
2004	Green	Green	Green
2005	Green	Green	Yellow
2006	Green	Green	Yellow
2007	Yellow	Green	Green
2008	Green	Green	Green
2009	Green	Green	Yellow
2010	Green	Green	Yellow
2011	Green	Green	Green
2012	Green	Green	Green
2013	Green	Green	Green
2014	Green	Green	Green
2015	Yellow	Green	Yellow
2016	Green	Green	Green
2017	Green	Green	Yellow
2018	Green	Green	Green
2019	Green	Green	Green
2020	Green	Green	Green
2021	Green	Green	Green
2022	Green	Green	Green

Middle

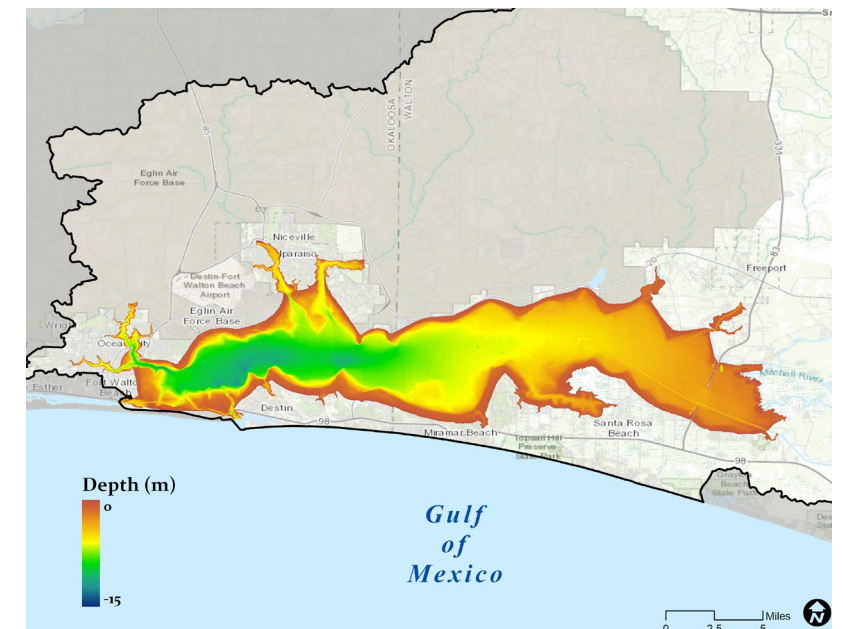
YEAR	TN	TP	Chla
2000	Green	Green	Green
2001	Green	Green	Red
2002	Green	Green	Yellow
2003	Yellow	Green	Red
2004	Green	Green	Red
2005	Yellow	Green	Red
2006	Green	Yellow	Red
2007	Green	Green	Red
2008	Green	Green	Red
2009	Green	Green	Red
2010	Yellow	Green	Red
2011	Green	Green	Red
2012	Green	Green	Red
2013	Green	Green	Red
2014	Green	Green	Red
2015	Yellow	Green	Yellow
2016	Green	Green	Red
2017	Green	Green	Red
2018	Green	Green	Green
2019	Green	Green	Green
2020	Green	Green	Green
2021	Green	Green	Green
2022	Green	Green	Green

East

YEAR	TN	TP	Chla
2000	Yellow	Green	Green
2001	Yellow	Green	Green
2002	Yellow	Green	Red
2003	Green	Green	Yellow
2004	Green	Green	Red
2005	Green	Green	Yellow
2006	Green	Red	Red
2007	Green	Yellow	Red
2008	Green	Green	Red
2009	Red	Green	Red
2010	Yellow	Green	Red
2011	Green	Green	Red
2012	Green	Green	Red
2013	Green	Green	Green
2014	Green	Red	Green
2015	Green	Green	Green
2016	Red	Green	Green
2017	Yellow	Green	Green
2018	Yellow	Red	Green
2019	Green	Red	Red
2020	Green	Red	Green
2021	Red	Green	Green
2022	Green	Yellow	Green

Table 2-16: Choctawhatchee Bay Water Quality Report Card 2000-2022

Figure 2-17: Estuarine WBIDs in Choctawhatchee Bay with Water Quality Impairments



waterbody can be found in FDEP (2013). Several estuarine WBID’s have been identified as not meeting Florida’s water quality criteria (**Figure 2-17**). This figure excludes listings related to the atmospheric deposition of mercury. At this time, there are no TMDLs approved for the listed estuarine waterbodies. A detailed listing of FDEP assessments can be found at <https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists>.

As shown in Figure 2-17, virtually all of Choctawhatchee Bay exhibits impaired water quality. Impairments include exceedances of applicable criteria for nutrients, dissolved oxygen, bacteria, and combinations thereof.

TECHNICAL CHARACTERIZATION SUMMARY

PHOSPHORUS LOADINGS

As discussed above, the Choctawhatchee River contributes approximately 90 percent of freshwater inflow to Choctawhatchee Bay. Therefore, it is likely that the river is the largest contributor of pollutants, such as nitrogen, phosphorus, and sediment to the bay. Hoyer et al. (2016) concluded that the bay is phosphorus limited and thus focused on phosphorus loading dynamics in assessing bay water quality.

Building on the work of Hoyer et al. (2016), annual TP concentration data (FDEP) and river flows (USGS gage near Bruce) were combined to calculate annual TP loads to Choctawhatchee Bay for the years 2004-2020. The results of this analysis are shown in **Figure 2-18**. No trend in flow, and thus TP loading, was determined in this analysis. A longer-term time series of Choctawhatchee River TP concentrations for the years 1999-2021 suggested that there is a slightly decreasing trend; however, the results of a Seasonal Kendall Tau test indicate that this trend were not statistically significant. Therefore, it is concluded that phosphorus loadings to Choctawhatchee Bay are highly variable and are dependent on rainfall and river flows.

COASTAL DUNE LAKE WATER QUALITY

As noted previously, the coastal dune lakes are not hydrologically connected to Choctawhatchee Bay,

Choctawhatchee River

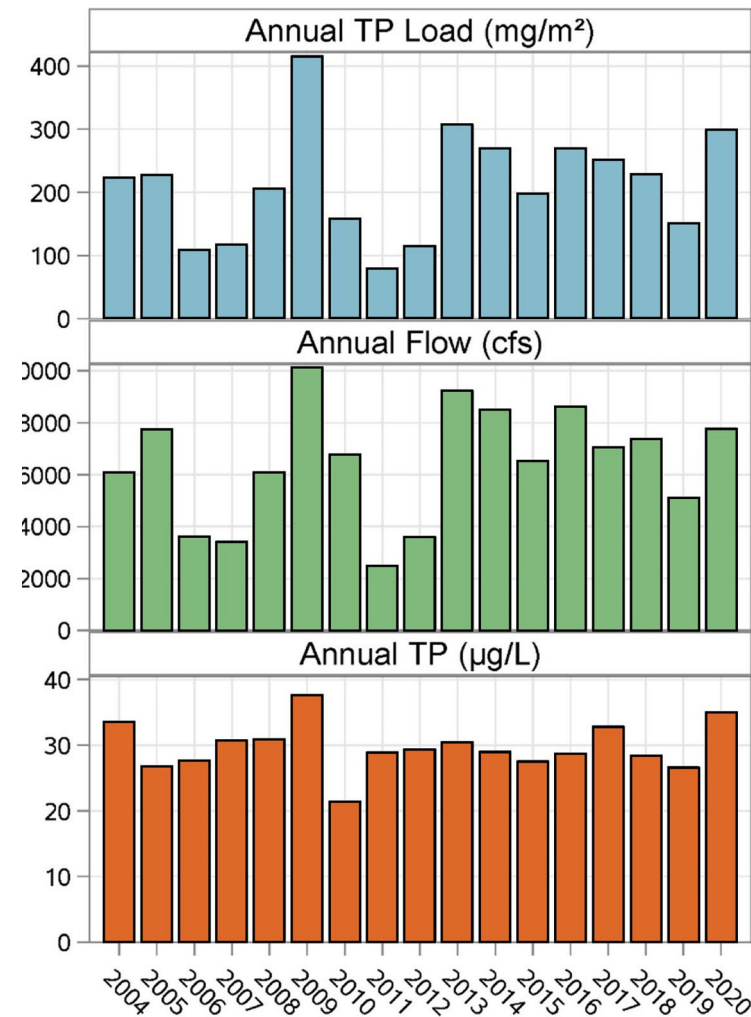


Figure 2-18: Annual TP Concentrations, River Flows, and TP Loads in the Choctawhatchee River



WATERBODY	PARAMETER	CRITERION	ASSESSMENT CATEGORY	ASSESSMENT STATUS
Oyster Lake	Dissolved Oxygen (% Saturation)	≥ 42%	5	Impaired
Oyster Lake	Nutrients (Chlorophyll <i>a</i>)	AGM ≤ 11 µg/L	5	Impaired
Stalworth Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Draper Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Alligator Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Fuller Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Allen Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Big Redfish Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List
Little Redfish Lake	Dissolved Oxygen (% Saturation)	≥ 42%	4d	Study List

Table 2-3: Coastal Dune Lakes Listed as Not Meeting Water Quality Criteria

however, they are unique natural ecosystems within the CBEP management area. As such, an understanding of the water quality of the coastal dune lakes is addressed in this technical characterization. Figure 2-4 above shows the coastal dune lakes in the CBEP management area. Hoyer and Canfield (2008) classified most of the coastal dune lakes as either mesotrophic or oligotrophic, but the FDEP has identified several coastal dune lakes as being impaired or on the TMDL Study List. Oyster Lake is the only lake that is impaired due to exceedances of the dissolved oxygen criterion and the chlorophyll *a* criterion. Each of the other lakes shown in Table 19 do not comply with the dissolved oxygen criterion but since there is no apparent causative agent these lakes have been placed on the Study List. **Table 2-3** shows the current impairment/TMDL status of the coastal dune lakes.

NATURAL SYSTEMS

The following describes the status and trends in the major estuarine habitats within Choctawhatchee Bay. Benthic or subtidal habitats include seagrasses, oyster/mollusk reefs,

and sand/mud flats, while emergent marshes are the most important intertidal habitat.

SEAGRASSES

Submerged aquatic vegetation (SAV), particularly the larger complexes of continuous seagrass beds, is an extremely valuable natural resource that provides shelter, food, and a range of other ecological services important to fish and shellfish species. Seagrass beds are flowering vascular plants that generate high levels of primary and secondary production. They are an important component of estuarine nutrient recycling and carbon sequestration and support high levels of biodiversity. Although seagrasses are protected by both state and federal agencies from direct dredge and fill impacts, they are highly susceptible to anthropogenic impacts such as smothering from sedimentation and algal blooms caused by excessive nutrient loadings.

Choctawhatchee Bay has two predominant species of seagrass. Shoal grass, or *Halodule wrightii*, is the most

TECHNICAL CHARACTERIZATION SUMMARY

common species in the bay and thrives in areas with higher salinity levels in the western portions of the Bay. Widgeon grass, or *Ruppia maritima*, tolerates both freshwater and marine water, and is more common in the eastern portions of the Bay. In addition to these two species, turtle grass (*Thalassia testudinum*) is sparsely present near the Destin Inlet, particularly on Crab Island, where it thrives in higher salinity seawater. The overall extent of seagrass coverage is much greater in the western portions of Choctawhatchee Bay where salinity and water clarity are more conducive to seagrass survival and growth.

Various seagrass monitoring efforts have been conducted in Choctawhatchee Bay to document the distribution and health of seagrass beds. In 2009 the CBA began a long-term monitoring program to analyze coverage and abundance of seagrass in the Choctawhatchee Bay. The program consists of annual surveys of 40 sites throughout the bay where a visual assessment of presence/absence, species composition, and density/condition is conducted.

In 2016 the CBA collaborated with the FWC Fish and Wildlife Research Institute (FWRI) to conduct a more in-depth monitoring protocol involving light attenuation, seagrass growth, abundance, stingray transects, and related water quality variables (FWC 2018). Since 2016 CBA data has been included in the FWRI Reports of the Seagrass Integrated Mapping and Monitoring (SIMM) Program.

The most comprehensive assessment of seagrass status and trends was conducted by the FWC (Carlson et al, 2020; funded by the National Fish and Wildlife Foundation). They acquired the best available historic aerial imagery, digitized GIS layers of seagrass extent for historic benchmark periods, and then compared benchmark coverages to those for more recent and current (2017) time periods. **Table 2-4** presents their summary of seagrass status and trends in Choctawhatchee Bay.

These data indicate that since 1952 the overall coverage of seagrasses in Choctawhatchee Bay has increased by about 86 percent, and this positive trend is in stark contrast with other Florida Panhandle estuaries. For example, Perdido Bay lost 56 percent, and Pensacola Bay lost 60 percent of their benchmark period seagrass coverages over this same general period. The data for Choctawhatchee Bay also indicate that the extent of seagrasses declined significantly in 2003 and 2007, and then rebounded in 2015. The causes of these intra-annual fluctuations are not well documented, but the authors state that continued poor water quality in eastern Choctawhatchee Bay, boat propeller scarring in the west bay, excessive nutrient enrichment from septic tanks, and erosive wave energy from tropical storms and boat traffic are the most significant stressors (FWC 2020).

Table 2-4: Seagrass (Acres) Status and Trends in Choctawhatchee Bay

TYPE	1952	1992	2003	2007	2015	2017
Continuous	1,394	778	557	5	3,450	2,488
Patchy	1,562	3,397	1,980	1,724	1,993	3,017
Total	2,956	4,175	2,537	1,729	5,443	5,505

As part of this study, the authors also conducted a quantitative assessment of boat propeller scarring and the results indicated that 40 percent of the grid cells examined in Choctawhatchee Bay had significant prop scarring damage, which was second only to St. Joseph Sound (43%) among the Panhandle estuaries. The authors also note that with increasing sea levels it will be necessary to improve water clarity in the future just to maintain the existing extent of seagrasses in Choctawhatchee Bay (FWC 2020). **Figure 2-19** shows the current (2017) distribution of seagrass beds in Choctawhatchee Bay.

OYSTER/MOLLUSH REEFS

Oyster/mollusk reefs occur primarily near the southern shore of the central and eastern reaches of Choctawhatchee Bay (Burch 1983; Wiggins 1996). Oyster/mollusk reefs consist of concentrations of sessile mollusks, which settle and develop on consolidated substrates including rock, limestone, wood, and other mollusk shells. This habitat occurs in both the intertidal and subtidal zones. The American oyster (*Crassostrea virginica*) dominates mollusk reef communities, but other organisms include species of sponge, anemones, mussels, the burrowing sponge anemones, mussels, clams, barnacles, crabs, amphipods, and starfish live among or within the reef. Oyster reefs have been widely demonstrated to improve water quality through filter feeding, provide sediment stabilization, and provide habitat for fish, crabs, and other invertebrates. Unfortunately, there are limited data regarding the extent, distribution, and status and trends of oyster/mollusk reefs or other hard bottom habitats in Choctawhatchee Bay. Figure 2-19 also shows the known distribution of oyster/mollusk reefs Choctawhatchee Bay.

SAND/MUD FLATS

The most abundant benthic habitat in Choctawhatchee Bay are sand/mud flats which are deposits of unconsolidated



Oyster Reef

sediments consisting of marl, mud, sand, or shell. Sand/mud flats can support large populations of tube worms, mollusks, isopods, amphipods, and an assortment of crabs; but they lack dense populations of sessile plant and animal species. These areas are important feeding grounds for bottom-feeding fish, shorebirds, and invertebrates. This habitat provides the foundation for the development of other estuarine habitats such as seagrasses and oyster/mollusk reefs. Sand/mud flats and their benthic invertebrate populations can be adversely affected by vessel traffic (prop scarring and erosion), low dissolved oxygen levels, and accumulation of contaminants such as metals, oils, and pesticides. No comprehensive surveys or mapping of sand/mud flats have been conducted in Choctawhatchee Bay.

Figure 2-19: Distribution of Seagrass Beds and Oyster/Mollusk Reefs in Choctawhatchee Bay

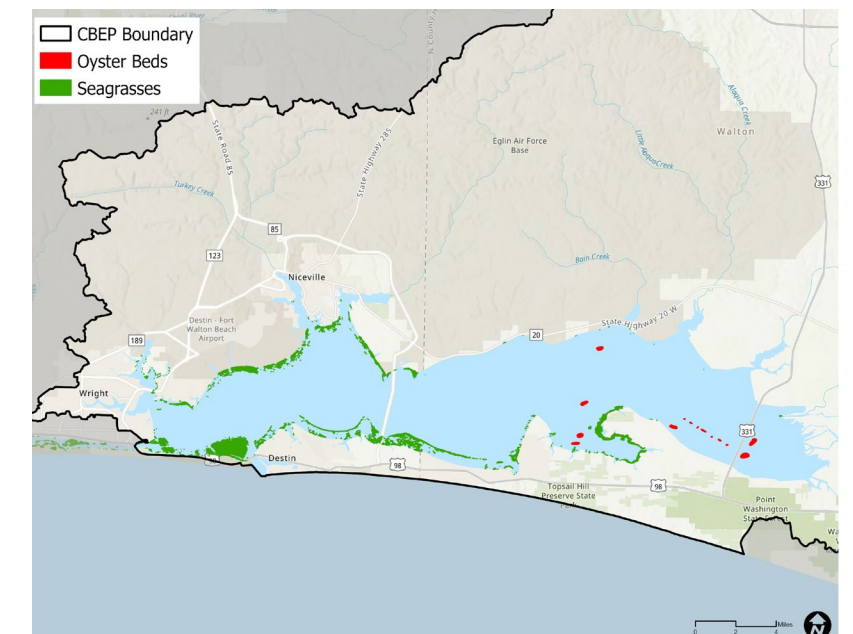




Photo courtesy of Mattie Kelly Environmental Institute

Salt marshes are typically found in intertidal areas, along relatively low energy shorelines, and serve as an important ecotone transition between terrestrial and estuarine systems. Florida Panhandle salt marshes are typically characterized by black needlerush (*Juncus roemerianus*) and smooth cordgrass (*Spartina alterniflora*), with the former being much more common. The two species are separated primarily by intertidal elevation, and salinity to a lesser degree; smooth cordgrass occurs in slightly lower areas with higher salinities, whereas black needlerush is dominant in slightly higher areas with lower salinities (FNAI 2010).

Salt marshes provide high levels of primary and secondary productivity, as well as critical nesting and feeding habitat for migratory and native bird species. In addition, marshes buffer wave energy and protect upland shorelines from excessive erosion by wave energy (FNAI 2010). Salt marshes are adversely impacted primarily by dredge and fill activities associated with shoreline development and hardening. In addition, salt marshes are very sensitive to

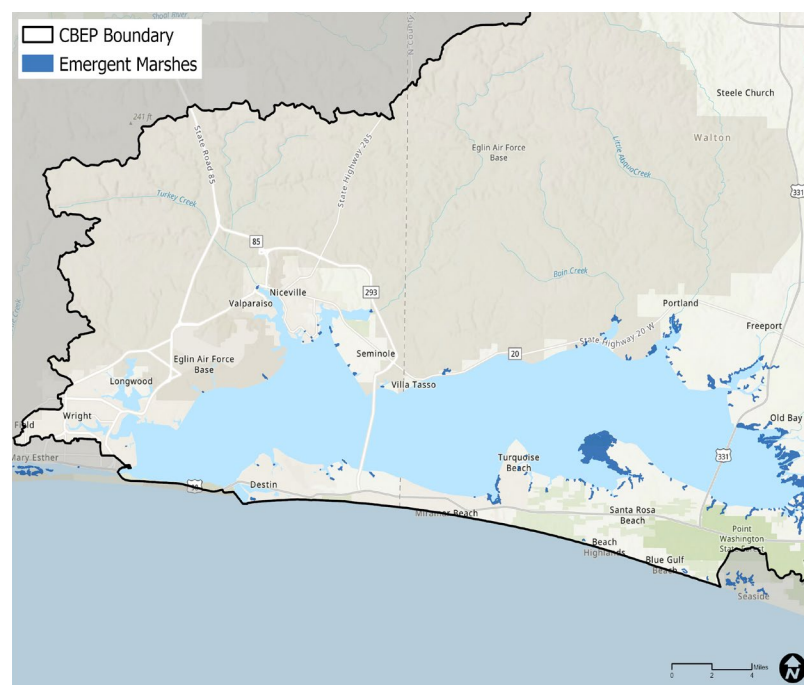
oil spills, although Choctawhatchee Bay salt marshes were not impacted by the Deepwater Horizon Gulf oil spill. Finally, natural stressors, such as tropical storms, climate change, and sea level rise, also impact salt marshes. Over the past two decades salt marshes in the northern Gulf of Mexico have been altered by the invasion of mangroves due to the reduction in freeze events and sea level rise (Comeaux et al. 2012).

FISH AND WILDLIFE

ESSENTIAL FISH HABITAT

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (50 Code of Federal Regulations Section 600.920), as amended through January 12, 2007 and as administered by the NOAA National Marine Fisheries Service (NMFS), federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH). The CBEP management

Figure 2-20: Distribution of Emergent Marshes in Choctawhatchee Bay



EMERGENT MARSHES

Emergent marshes in the Choctawhatchee Bay system include both salt marshes and freshwater marshes. Salt marshes are prevalent along the shallow coastal fringes of Choctawhatchee Bay and the river delta, while freshwater marshes are interspersed among the forested floodplain of the Choctawhatchee River. Overall, emergent marshes are most prevalent in the eastern portion of the Bay. Marsh species are influenced primarily by salinity tolerance, topographic elevation and slope, water levels, soil types, and competitive interactions (FNAI 2010).

Figure 2-20 shows the current distribution of emergent marshes in Choctawhatchee Bay. There are no consistent historical datasets of marsh distribution in the Bay to quantitatively assess trends.



Connie Sweetland, "Happy Homemaker" taken on Okaloosa Island

TECHNICAL CHARACTERIZATION SUMMARY

area as well as the nearshore Gulf of Mexico was assessed for EFH using the NMFS Southeast Region EFH Mapper Tool. EFH was identified for red drum, shrimp, reef fish, and coastal migratory pelagic fishes. **Figure 2-21** shows the distribution of essential fish habitats in the Choctawhatchee Bay and the nearshore Gulf of Mexico.

FISHERIES INDEPENDENT MONITORING PROGRAM

The Fisheries-Independent Monitoring (FIM) program at FMRI was initially developed to assess the recruitment of resource species that use estuarine and near-coastal waters as nursery areas, and as such, was designed to sample animals during pre-fishery life stages (McDonald 2003). Such an approach allows researchers to avoid many of the problems inherent in fisheries-dependent monitoring and provides stock estimates that are of much greater predictive utility than are estimates determined from fisheries-dependent monitoring. The FIM program's holistic sampling design provides data not only on commercially and recreationally important finfish stocks, but also on select macroinvertebrates and finfish stocks of indirect importance to Florida's fisheries. Furthermore, the program records extensive information on environmental and biological variables at each sampling site which allows researchers to evaluate species interactions, habitat dependencies, and the effects of environmental influences on fishery recruitment processes. The FIM Program publishes annual summary reports for the sampled estuaries.

The FIM program uses a stratified-random sampling (SRS) design, an approach which distributes sampling effort among habitat types and directs greater sampling effort into habitats with higher variability in catches to reduce variability in the data. With the SRS design, FIM divides each estuary to be surveyed into zones based on hydrological and logistical characteristics. The different habitat types (for example: depth, seagrass beds, shore type) available within each zone are then identified as strata. The FIM sampling zones for Choctawhatchee Bay are shown in **Figure 2-22**.

GULF STURGEON

As noted above, Choctawhatchee Bay and the Choctawhatchee River are primary critical habitats for the Gulf sturgeon (*Acipenser oxyrinchus*) population, federally listed as threatened. Fox et al. (2000 and 2002) used ultrasonic telemetry to examine estuarine and marine habitat use of adult Gulf sturgeon in the Choctawhatchee Bay/River System in 1997-1999. Gulf sturgeon were typically found in water of 2–4 m depth and rarely used depths shallower than 1 m and greater than 4 m. The sturgeon appeared to use only the deeper bay waters for movement between shoreline areas. Their results found that areas where Gulf sturgeon remained for prolonged periods were



The endangered Gulf Sturgeon

Figure 2-21: Essential Fish Habitat in the Choctawhatchee Bay and Nearshore Gulf of Mexico

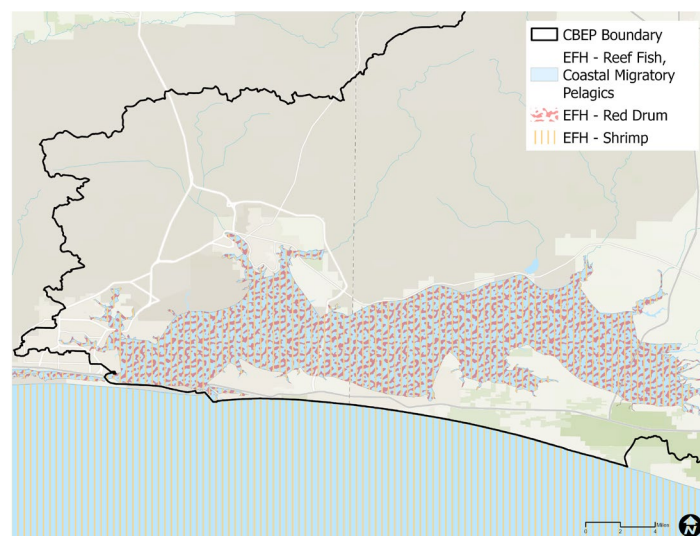
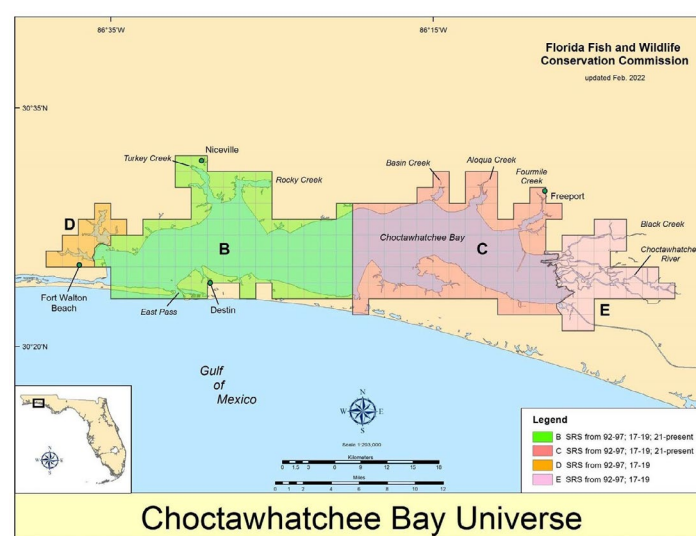


Figure 2-22: Fisheries Independent Monitoring Program Sampling Zones in Choctawhatchee Bay



characterized by sandy substrate harboring a benthic community dominated by crustaceans and annelids. Gulf sturgeon were infrequently found in areas containing seagrass.

CHOCTAWHATCHEE BEACH MOUSE

The Choctawhatchee beach mouse (*Peromyscus polionotus altophrys*) is a federally listed endangered species with a very limited distribution, from Choctawhatchee Bay in Okaloosa County to St. Andrew Bay in Bay County. This species is found in the sand dunes on Shell Island, Grayton Beach, and Topsail Hill. Its diet primarily consists of seeds and fruit of dune plants, and insects. It digs tunnel systems and living chambers within the root network of dune vegetation.

The main threat facing the Choctawhatchee beach mouse is the continued development along beaches which can cause destruction or degradation to sand dunes limiting areas of habitat for the beach mouse, and increasing fragmentation, leading to isolation of populations.

Increased human traffic on sand dunes is also a threat for this species, as the increased traffic damages vegetation on dunes that the beach mice depend on for food and shelter. Hurricanes also pose a risk to the beach mouse as they can cause damage and destruction to their sand dune habitat with the accompanying intense winds and storm surge. Other threats include increased predation from feral and free-ranging cats, foxes, raccoons, and coyotes.

BASE PROGRAM ANALYSIS

- Water Quality & Quantity
- Land Use Planning & Management
- Habitat Protection & Management
- Community Resilience
- Fish & Wildlife
- Outreach & Education



White Pelican, "A Closer Look" by Janet Fikar

Establishment of the CBEP and the development of this CCMP provides a cohesive framework for identifying, prioritizing, and implementing goals related to the protection and restoration of the Choctawhatchee Bay and watershed. This builds on decades of work at various levels of government and from many partners within the community.

Initial efforts to characterize the bay and watershed were led by the counties, local municipalities, and other governmental and non-governmental organizations approving resolutions. This led to the formation of the CBEC in June of 2017. The CBEC Board of Directors is represented by County Commissioners from each of Okaloosa, Walton, Holmes, and Washington Counties in Florida. Additional members include Eglin Air Force Base, the CPYRWMA in Alabama, and the CBA.

Resource management is affected by various regulatory agencies and programs at multiple levels of government. This base program analysis identifies some of the existing programs, including monitoring, regulatory, and public outreach, that are supportive of this CCMP and which can be further leveraged to accelerate progress. The analysis also identifies gaps that may be filled by CBEP or other partners in the future.

Programs are presented within the general areas of water quality, habitat management, fish and wildlife, land use and management, community resilience, and education and outreach.

WATER QUALITY & QUANTITY

Federally, the CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The mission of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Enforcement of the CWA includes both the EPA and U.S. Army Corps of Engineers (USACE); state and municipal governments are also included from a regulatory perspective as those issuing or receiving and complying with permits.

The EPA delegates authority to state environmental agencies to issue permits for the discharge of both

point- and nonpoint source pollution. Point sources of pollution are regulated under the National Pollutant Discharge Elimination System (NPDES). Nonpoint pollution is regulated under Section 319 of the CWA. The EPA requires states to prepare a Nonpoint Management Plan to limit loading to waters of the state. These water quality programs are administered by the FDEP and ADEM, respectively.

A primary component of nonpoint pollution management is the regulation of stormwater, which includes contributions from rural and urban land uses, including industrial and construction activities. The EPA's Stormwater Rules set up the Municipal Separate Storm Sewer Systems (MS4). Phase I regulated medium and large systems generally serving populations of 100,000 or greater; Phase II extended the program to small systems or those not already covered under Phase I. Through this program, permits are issued by the FDEP and ADEM to local cities and counties that operate stormwater systems. These operators are required to obtain an NPDES permit before they can discharge stormwater and are required to periodically monitor and maintain the systems for performance. Operators, ranging from municipalities, industrial facilities, and construction sites, use a variety of stormwater controls known as best management practices (BMPs) to manage their runoff.

Section 303(d) of the CWA requires states to identify waters that are impaired by pollution and to establish total maximum daily loads (TMDLs) of pollutants to ensure that water quality standards can be attained. In Florida, the TMDL program is administered by the FDEP; in Alabama, the administrator is the ADEM. These permits incorporate technology-based and water quality-based requirements.

PROGRAM SUPPORT

Participation, implementation, and compliance with these regulations is supported by multiple programs at state, regional, and local levels.

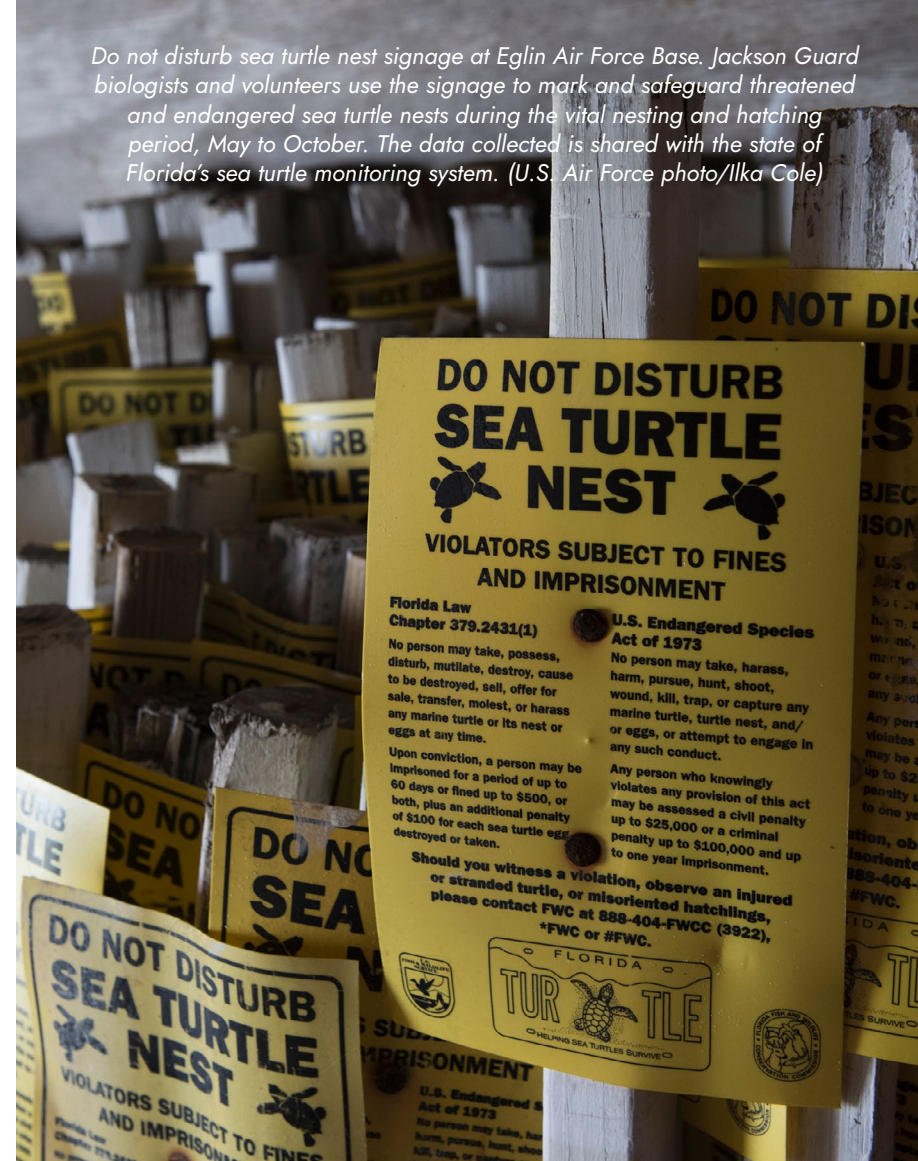
Florida water quality data are compiled by the FDEP to form the IWR database. This database is used to assess waterbodies in Florida, including the waters of Choctawhatchee Bay and its contributing bayous and tributaries, for compliance with state water quality criteria. The compiled data are collected by multiple state and regional agencies including the FDEP, NWFWMMD, CBA, LakeWatch, FDACS, and FDOH. In Alabama, water quality monitoring is conducted by the ADEM and

BASE PROGRAM ANALYSIS

the AGS through several programs. Surface water quality data is housed in the National Water Quality Monitoring Council Water Quality Data Portal, a cooperative service sponsored by the USGS, EPA and the National Water Quality Monitoring Council. Further information on these monitoring efforts can be found in Sections 2 and 6. In Florida, Basin Management Action Plans are the preferred method to engender stakeholder involvement in setting and achieving quantitative pollution reduction goals (as outlined, for example, in TMDLs). More information on the TMDLs in the Choctawhatchee Bay Watershed is provided in Section 2.

Section 404 of the CWA governs discharges of dredge or fill materials into waters of the United States and seeks to avoid adverse impacts and offset unavoidable adverse impacts to aquatic resources. Its application extends to the protection and mitigation of wetlands. Implementation of these regulations, including the issuing of dredge and fill permits, is handled at the federal level by the USACE, with additional oversight by EPA. Environmental Resource Permits (ERPs), administered through FDEP and water management districts are required for any alterations to wetlands or state waters in Florida (373.4131, F.S.) While less common, states are able to apply for state assumption of the 404 program. Florida applied for and was granted this authority in December 2020. Alabama has not sought this assumption. In Alabama, permits are reviewed by USACE and ADEM and, in some cases, the State Oil and Gas Board and/or the Alabama Department of Conservation and Natural Resources (ADCNR) State Lands Division.

Water quantity data is collected primarily by the USGS with some funding provided by the NFWFMD, FDEP, and ADEM. The CPYRWMA collects additional water surface elevation data, as well as a monthly rainfall report. Precipitation data is also available from the National Climate Data Center of the National Weather Service from rain gages throughout the watershed and through NEXRAD precipitation products. Water quantity data play a key role in Water Use Permitting. A Water use Permit (WUP) authorizes the consumptive use of particular quantities of ground or surface water. The Florida Statutes (Chapters 120 and 373) and Florida Administrative Code (Chapters 40D-1 and 40D-2) prescribe rules for applying for a water use permit. Certain projects require both an ERP and a WUP and in some cases, the issuance of the WUP may be dependent upon the ERP being deemed complete.



Do not disturb sea turtle nest signage at Eglin Air Force Base. Jackson Guard biologists and volunteers use the signage to mark and safeguard threatened and endangered sea turtle nests during the vital nesting and hatching period, May to October. The data collected is shared with the state of Florida's sea turtle monitoring system. (U.S. Air Force photo/Ilka Cole)



Each year, Jackson Guard's sea turtle patrol volunteers monitor and survey sea turtle nesting activity to ensure the mission does not impact the endangered species in compliance with the Endangered Species Act. (U.S. Air Force photo/Ilka Cole)

WATER QUALITY/QUANTITY RELATED GAPS

CBEP could serve as a clearinghouse for data and can facilitate discussions with water quality managers to improve water quality conditions. This may include developing specific annual pollutant reduction goals, targeted improvement strategies by industry and land use, or applying for and managing grant-funded water quality improvement projects.

HABITAT PROTECTION & MANAGEMENT

Section 404 of the CWA seeks to achieve no overall net loss of values and functions of wetlands, in recognition of the special significance of the nation's wetlands resources.

To achieve no net loss, those seeking to impact or fill wetlands must follow the general hierarchy of avoidance, minimization, and then compensatory mitigation. Wetland permits are issued by the USACE and FDEP and ADEM. As stated earlier, Florida has received assumption of federal regulation of wetland permitting. While some impacts are mitigated onsite, many permittees purchase credits through a licensed mitigation bank; those banks may include salt and/or freshwater wetland credits. Despite its role in moderating losses of acreage and quality, wetland losses across the US have been extensive. The EPA estimates that, between the 1780s and 1980s, Florida has lost 46% and Alabama has lost 50% of its wetlands.

Section 404 also pertains to saltwater wetlands, including marshes, mangroves, and seagrasses. While nearby panhandle estuaries are protected through aquatic preserve designation (Northwest Florida Aquatic Preserve and the Central Panhandle Aquatic Preserves),

Choctawhatchee Bay does not have this designation. However, statewide regulations through Section 253.04(3) (a), Florida Statutes impose fines on boaters who damage seagrass with boat propellers, a major threat to shallow water seagrass beds. Implementation is led by FWC law enforcement. Also, because seagrasses require adequate light penetration through the water column, attainment of water quality and clarity goals is critical to maintaining healthy and productive seagrass areas.

Significant portions of the watershed, particularly in Florida, are protected by public and private entities. This includes various habitats ranging from coastal and freshwater wetlands to uplands and coastal dune lakes. In Florida there are a total of 376,632 acres of conservation lands within the watershed. Of these, 236,126 acres are federally owned lands (including Eglin Air Force Base), 125,534 acres are state owned lands (wildlife management areas, state forests, state parks, and conservation



(ABOVE) A gopher tortoise crawls out of a volunteer-created starter burrow June 3 at Eglin Air Force Base. (U.S. Air Force photo/Ilka Cole)

easements), and 4,765 acres are privately owned lands (including The Nature Conservancy Choctawhatchee River Delta Preserve). Alabama also has two wildlife management areas.

Section 6 provides information on the current monitoring of habitat being conducted in the CBEP management area (seagrass, oyster reefs, marshes, etc). Historic baselines and periodic monitoring of seagrasses have occurred. No historic benchmark has been conducted for emergent marshes. Similarly, sand and mud flats, the most abundant benthic habitat within the bay, have not been comprehensively monitored. Native uplands, including forests, shrub/scrub, grasslands, while important for wildlife habitat and as natural buffers to floodplain wetlands, have little or no regulatory protection and have not been regularly monitored.

The 10 coastal dune lakes within the watershed have strong local protection via the Walton County Comprehensive Plan and Land Development Regulations. Their management is outlined in the Coastal Dune Lakes Advisory Board management plan.

HABITAT PROTECTION AND MANAGEMENT RELATED GAPS

In many ways, protecting and restoring the Choctawhatchee Bay is focused heavily on preservation and incremental enhancement of key habitats, rather than a need for significant Throughout development of the CCMP, partners raised questions related to habitats of interest:

- Are wetlands adequately protected in the watershed?
- To what extent should the CCMP address native uplands?
- What/where are other priority conservation opportunities in the watershed?
- Is there adequate habitat mapping (seagrasses, oyster reefs, etc.)?
- Are coastal dune lakes receiving adequate protection?
- Are critical habitats for listed species addressed?

To manage the suite of habitats most effectively within the estuary and watershed, CBEP can play an important role in convening stakeholders, particularly scientists, landowners, and resource managers, in developing appropriate habitat protection and restoration goals. While information is available for some habitats, the program would benefit from consistent and comprehensive monitoring of the most critical habitats in the Bay and watershed, particularly those supporting target fish and wildlife species. In addition to the habitat monitoring recommendations made in Section 6, to answer these questions, CBEP and partners could evaluate the merits of a long-term monitoring program, such as the Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP) administered by FWRI to study high-priority coastal habitats. As funding allows additional monitoring within freshwater wetlands and uplands could be conducted, potentially in coordination with land managers at the local, state, and local levels to track trends or degradation in habitat quantity and quality. Within the bay, future research and monitoring could also include emergent salt marshes and sand/mud flats. The use of living shorelines as part of resiliency measures should also be monitored to better inform expansion of these programs. As the program compiles baseline and current data and predictive frameworks, it will allow for the development of protection and restoration goals and a roadmap for strategic conservation and management.

The following management plans should also be considered when developing or expanding monitoring or management initiatives:

- Choctawhatchee River and Bay Surface Water Improvement and Management (SWIM) Plan (NFWFMD, 2017)
- Choctawhatchee Bay Community-Based Watershed Plan (TNC, 2014)
- Choctawhatchee, Pea, and Yellow Rivers Watershed Management Plan (CPYRWMA, 2015)
- RESTORE Act Direct Component Multi-Year Implementation Plan (MYIP) for Okaloosa and Walton Counties
- Florida RESTORE Act Spill Impact Component State Expenditure Plan (SEP)

FISH & WILDLIFE

Protection of imperiled plant and animal species is governed under the federal Endangered Species Act of 1973, as amended, 16 U.S.C. §1531 et seq. Within Florida, Chapter 68A-27 contains rules relating to endangered or threatened species. Included are measures to conserve or improve the status of endangered and threatened species in Florida to effectively reduce the risk of extinction. Numerous amendments have been made to update species lists and ensure consistency with federal guidelines.

This science-informed process is objective and quantifiable, accurately identifies endangered and threatened species that require special actions to prevent further imperilment, and identifies a framework for developing management strategies and interventions to reduce threats causing imperilment. If conducted properly, implementation of the guidelines will prevent species from being threatened to such an extent that they become regulated and managed under state or federal guidelines. The Choctawhatchee Bay and its watershed encompass critical habitat for nine protected species including six species of freshwater mussels, the reticulated flatwoods salamander, the Choctawhatchee beach mouse, and Gulf sturgeon.

Alabama does not have a state law equivalent to the federal Endangered Species Act so species do not have regulatory protection as state endangered or threatened species.



(ABOVE) Endangered Species Biologist, Kathy Gault points out a *cladonia perforata* growing on the Santa Rosa Island Range at Eglin Air Force Base. Also known as a “deer lichen,” this organism is part of the Florida sub-tropical ecosystem and is on the federal list of endangered species of the U.S. (U.S. Air Force photo/Ilka Cole)

FISH AND WILDLIFE RELATED GAPS

In addition to existing monitoring, a comprehensive oyster mapping and monitoring program may assist with the development of an oyster harvest program, which is important to the CBEP. The Central Florida Panhandles Aquatic Preserves oyster restoration program could be used as a model for developing a research and restoration program. Additionally, it is incumbent on all partners to assure that threatened and endangered species are protected adequately, potentially through state recognition in Alabama. Protection and enhancement of habitats, including adequate water quality and quantity, are necessary to the support and long-term survival of listed species.

LAND USE PLANNING & MANAGEMENT

Chapter 163, F.S., requires all Florida counties to develop and adopt by ordinance a Comprehensive Plan addressing elements related to land use including future land use, conservation, transportation, sanitary sewer, stormwater, natural groundwater and aquifer recharge, and coastal management. These plans can address a wide range of issues related to these elements. As discussed in the Land Use Planning & Management Action Plan, a review of the County Comprehensive Plans for those counties within the CBEP was conducted as an inventory of 10 policy plans. Specific issues were reviewed and rated as “Not Addressed”, “Generally Addressed” or “Specifically Addressed.” A review of the comprehensive plans for Okaloosa, Walton, Holmes and Washington counties suggests that there are significant areas for improvement. For the key issues, ranging from local land conservation in the coastal zone and protection of environmentally sensitive areas to improvements to wastewater and stormwater, there is no issue that is adequately addressed in each of the four plans. While some items are not applicable to all counties, the lack of proactive and enforceable policies could lead to stagnation or an inability to achieve CCMP goals.

A stated key land use planning and land management goal is to collaborate with public and private sector stakeholders to plan and implement best practices for land use to protect and restore water quality. Partners have also prioritized policies and land use regulations that recognize and provide adequate protection for major non-riparian wetlands, native upland habitats, and critical groundwater recharge areas in the Choctawhatchee Bay watershed.

LAND USE PLANNING AND MANAGEMENT RELATED GAPS

CBEP can play a critical role in promoting more consistent and protective Comprehensive Plans within the four Florida counties. This includes supporting the development of and ensuring that County Comprehensive Plans are amended by 2030 to adequately and consistently address the CBEP critical planning criteria. Specific recognition of Choctawhatchee Bay as a significant natural resource of control and a recognition of and support for CBEP

should be included, along with conservation, water quality, transportation, pollution reduction, and other measures. This may require dedicated workshops or meetings to prioritize issues and develop regionally appropriate comprehensive language. Following that, CBEP will need to confirm ongoing consistency and compliance through Comprehensive Plan evaluation and appraisal reports. Targeted discussions with Eglin AFB are needed to successfully develop and execute a Memorandum of Agreement between CBEP and Eglin AFB by 2028. This agreement should seek consistency with CBEP critical planning criteria. As progress is made, CBEP could also look to discussions with Alabama jurisdictions to evaluate which issues and policies could be incorporated into their local planning and protection efforts, particularly related to protection of wetlands and riverine buffers.

COMMUNITY RESILIENCE

Community and coastal resilience is an evolving area that incorporates preventative measures, as well as actions to mitigate for unavoidable or worsening impacts from stressors such as sea level rise and storms. As noted earlier, each of the Florida counties is required to adopt comprehensive plans. A clear role for CBEP is to coordinate with the four Florida counties in the Choctawhatchee Bay watershed to develop and implement consistent Comprehensive Plan policies, and associated land development regulations that clearly address coastal resiliency (see Land Use Planning and Management Action Plan). For the portions within Eglin AFB, this will involve an examination of long-term management plans for consistency with CCMP resiliency and land management goals. Those plans may include directed policies and land development regulations to address resiliency. Critical planning criteria specifically related to resiliency could include the following:

- Conservation land acquisition of low-lying coastal areas and floodplains;
- Post-storm acquisition and conservation of frequently flood-damaged properties;
- Increase development setbacks from surface waters, wetlands and floodplains;
- Elevate bridges, pump stations to accommodate local

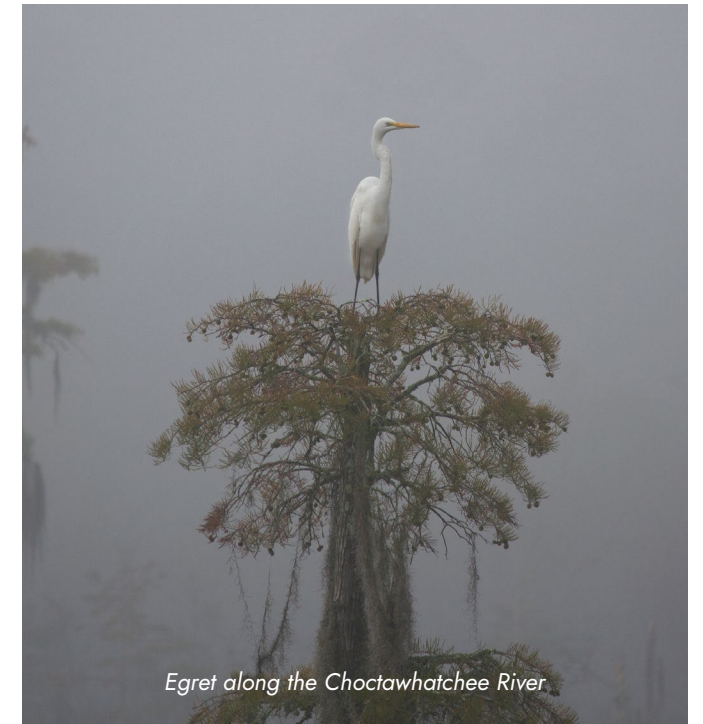
- sea level rise projections;
- Protect critical infrastructure (airports, power plants, sewage/water treatment plants);
- Increase Levels-of-Service for stormwater management systems; and
- Convert existing septic systems to central sewer in low-lying coastal areas.

This CCMP touched on some of the interconnectedness between land management and resiliency efforts, particularly as it relates to the prevention of property and infrastructure damage and economic impacts from major storms and hurricanes. As local governments update their comprehensive plans, they may incorporate tools such as local condemnation or rolling easements to address frequently flood-damaged properties. This, combined with conservation and intentional accommodation of landward migration of intertidal coastal habitats, may result in reduced storm impacts and net gains in salt marshes over time.

Another important aspect of land development regulations is the use of site-specific design standards for county roadways, bridges, and stormwater facilities that take into consideration local sea level rise projections to ensure long-term viability.

The Choctawhatchee Bay Alliance has successfully conducted habitat restoration projects around the bay including living shoreline projects. Green infrastructure, such as living shorelines and marshes can significantly buffer low-lying developed areas from the storm surge and wave damage associated with major storm events. Living shorelines provide intertidal fish and wildlife habitat and protect against coastal erosion. If properly constructed they can also build new land waterward of the existing hardened shorelines through sediment accretion and marsh building processes, thus keeping pace with sea level rise. The construction of living shoreline projects along existing eroded shorelines and other areas vulnerable to coastal erosion within the bay is a proven resiliency strategy. Therefore, a primary recommended action with regards to resiliency is for the CBEP to take the lead in the planning, siting, and implementation of living shoreline projects in coordination with its partners, especially the CBA and FWC.

Developing comprehensive resiliency plans requires an understanding of scientific and atmospheric trends; analyses of risks to infrastructure, ecosystems, and human health from potential or foreseen climatic changes; and



Egret along the Choctawhatchee River

proactive conservations with business and community members. These plans may also be costly and require outside expertise. To address this and other needs, in 2021, the State of Florida developed a Resilient Florida Grant program, housed under the Office of Resilience and Coastal Protection. Funding is granted each fiscal year to counties, municipalities, water management districts, flood control districts and regional resiliency entities to help effectively address the impacts of flooding and sea level rise.

For fiscal year (FY) 2021-22, Walton County received funding for the construction of a regional stormwater management system. For FY22-23, grants were awarded to Holmes County for a comprehensive vulnerability assessment, the City of Ponce De Leon in Holmes County for a vulnerability assessment, Okaloosa County for a vulnerability assessment and adaptation plan, the City of Destin in Okaloosa County for a vulnerability utility assessment, and Walton County for a vulnerability assessment. And in FY 23-24, the City of Freeport in Walton County received funding to conduct a comprehensive vulnerability assessment. Additionally, partners have identified four immediate resiliency projects that are proposed or seeking funding and/or partners, ranging from channel dredging and flood mitigation to vulnerability assessments. CBEP could play a valuable role in reviewing these plans and, through a collaborative stakeholder process, identifying potential comprehensive



Outreach & Education of youth at an Estuary Festival

plan, land use, or policy changes that could be enacted as a region to improve resiliency. Arguably, policies related to setbacks, wetland buffers, living shorelines, or elevating infrastructure will be more effective if done on a regional scale, rather than a piecemeal approach county-by-county. Successful regional efforts have been conducted in southeast Florida and the Tampa Bay region; CBEP could help to facilitate a similar regional strategy and approach within the Choctawhatchee Bay watershed.

COMMUNITY RESILIENCE RELATED GAPS

Overall, CBEP can take a leadership role in aligning resiliency efforts between partners and stakeholders, including Eglin AFB. This may include reviewing county-specific Resilient Florida projects and leading regional discussions about ways to incorporate strategies on a regional or watershed scale. CBEP is also the right organization to take the lead in the planning, siting, and implementation of living shoreline projects in coordination with partners, especially the CBA and FWC.

OUTREACH AND EDUCATION

Successful implementation of the CCMP and long-term support for CBEP hinges on an informed and active community and business sector. Therefore, it is appropriate to put significant efforts into outreach and education. Okaloosa County has played a pivotal role in elevating this by funding the Executive Director and Public Outreach positions; the county has continued to take a leading role in the development of this plan.

CBEP and partners have conducted extensive outreach in the community. A series of virtual stakeholder meetings, made possible through collaboration with RESTORE Act Florida Centers of Excellence Program (FLRACEP) team from the University of Florida and the University of West Florida, led to the development of key program goals related to raising public awareness for the importance of preserving and understanding the Choctawhatchee

Bay watershed. CBEP has continued to attend or lead numerous meetings and events within the community, fostering a sense of open communication and improving community understanding.

Among other goals, CBEP seeks to be a centralized source for information, including a water quality dashboard that will include status and trends information for stakeholders. This type of “living document” will aid in applying for and securing grant funding, another goal. Initial buy-in and progress towards CCMP goals will continue to engender community support and build an active volunteer base.

EDUCATION AND OUTREACH RELATED GAPS

A hallmark of many NEPs is successfully utilizing a voluntary, stakeholder-driven approach bringing together local stakeholders as well as local, state, and federal partners. Like many other actions, CBEP can maintain and accelerate progress on effective outreach and education by bringing a centralized vision and focus to these efforts.

There are nearly 30 projects identified within this area, ranging from boat signage and coastal dune lake education to microplastics sampling and civic engagement related to sea level rise. The table, including project leads, project status and a brief description are included within the Outreach and Education summary in Section 4. While CBEP is the active lead on some projects, others are led by a variety of governmental and NGO partners. Coordinating the progress, completion, review, and next steps for each of these will require dedicated personnel and resources from CBEP and, potentially, outside funding sources.

In addition to serving as a clearinghouse and communicator of scientific data, CBEP must share this information in understandable and meaningful ways with a variety of stakeholders, including K-12 students, the business community, regulatory partners, and the media. Developing a multi-year strategy for research, grant and funding needs, and outreach efforts may provide accountability, and an ability to adaptively manage and track progress.



Annual Estuary Festival



(ABOVE) Robert Billow, a 96th Civil Engineer Group biologist, shows volunteers how to create a gopher tortoise burrow at Eglin Air Force Base. (U.S. Air Force photo/Ilka Cole)

ACTION PLANS

- Water Quality & Quantity Action Plan
- Land Use Planning & Management Action Plan
- Habitat Protection & Management Action Plan
- Community Resilience Action Plan
- Education & Outreach Action Plan



Volunteers during Ocean Conservancy's international clean-up day at Eglin Air Force Base (U.S. Air Force photo/Ilka Cole)

As noted in Section 1, five priority Focus Areas were recommended by the CBEP stakeholders through a series of Technical Committee meetings and workshops conducted as part of the CCMP development process. The priority Focus Areas define the primary problems and issues of concern identified by the stakeholders and form the framework for the Action Plans. The CCMP Focus Areas and their general descriptions are summarized below.

- **Water Quality & Quantity Focus Area**— Projects, programs, and initiatives to monitor, protect and restore water quality and quantity in freshwater and estuarine systems to meet applicable regulatory criteria and to support living resources requirements and community water supply needs
- **Habitat Protection & Management Focus Area**— Projects, programs, and initiatives to monitor, protect, enhance, and restore existing riparian, aquatic, estuarine, and native terrestrial habitats, and associated fish and wildlife populations, in the CCMP management area
- **Land Use Planning & Management Focus Area**— Projects, programs, and initiatives that support and promote conservation land acquisition and other land use best management practices to protect water quality and habitat in the CCMP management area
- **Community Resiliency Focus Area**— Projects, programs, and initiatives that support and promote land use planning, resilient green infrastructure, and nature-based solutions for the protection of communities and natural systems from extreme storm events long-term climate change and sea level rise.
- **Education & Outreach Focus Area**— Projects, programs, and initiatives to support enhanced public education and effective community engagement to promote the Vision and Mission of the CBEP, and implementation of the Actions Plans defined in the CCMP.

As specified by EPA (1995), CCMP Action Plans should address the following:

- State the priority problem/issue including the probable causes and sources.
- State the program goals and objectives related to the priority problem.
- Identify the priority projects, programs and/or activities that should be implemented to address the identified problems/issues.

The following subsections present the Action Plans for each of the priority Focus Areas. The Action Plans are based on problems/issues and information deficiencies identified as part of the Technical Characterization (Section 2), as well as input received from the stakeholders in the Technical Committee workshops and comments received on the draft CCMP. For each Action Plan the following information is presented:

- Background Summary
- Informational Needs
- Goals and Objectives
- Recommended projects, programs, and activities
- Linkages with other Focus Areas
- Action Plan summary

The CBEP invited stakeholders (including members of the TAC) to submit ideas for projects known about, planned, wished for, and/or currently underway/completed relevant to the five Focus Areas. The request included an easy, fillable pdf file to submit one project at a time, an excel spreadsheet to submit multiple projects, and a projects list purpose and instructions. The submitted projects were collated and are provided in tabular form in Appendix C, grouped by Focus Area.

WATER QUALITY & QUANTITY ACTION PLAN

BACKGROUND SUMMARY

WATER QUALITY

Water quality is one of the most critical determinants of estuarine health as documented in other adopted CCMPs, as well as other estuarine management plans and regulatory efforts. The diversity, abundance, and distribution of aquatic biota is largely dependent on water quality. Therefore, tracking the spatial and temporal variability in concentrations of important water quality constituents is a critical element of any watershed management plan. Over the years, knowledge of the linkage between an estuary and its watershed has come to the forefront. Changes in the health of estuaries in response to pollutant loadings, especially sediment and nutrients, have become increasingly apparent. Thus, most CCMPs have focused on the management of pollutant loadings delivered to the estuary.

ACTION PLANS

In Florida, impaired estuarine waters are those that do not fully support their currently designated use or uses, i.e., those waters whose nutrient and chlorophyll-a concentrations exceed the numeric nutrient criteria as defined in 62-302 F.A.C. There are numeric nutrient criteria for TN, TP and chlorophyll-a, and most other constituents have a narrative criterion. Alabama has established an assessment and listing methodology that is consistent with EPA's guidance. Their process entails assessment of the status of surface waters in Alabama relative to the designated uses assigned to each waterbody. Those waters that do not meet their designated uses are placed on the 303(d) list and provided to EPA.

As discussed in Section 2, there are numerous waterbody segments in Choctawhatchee Bay and its watershed that have been determined to be impaired by the FDEP and ADEM. To achieve the CCMP Water Quality goal, i.e., non-impaired status for all bay segments, all such waterbodies that are currently impaired must be addressed by the establishment of their Total Maximum Daily Load (TMDL), or as is the case in Florida, the establishment of an Alternative Restoration Plan (e.g., Reasonable Assurance Plan). Regardless of approach, one of the key data needs to achieve non-impairment status is the estimate of pollutant loadings that can be effectively assimilated by the estuary and are protective of the water's designated uses.

WATER QUANTITY

Water quantity, particularly represented by freshwater flows, is another critical determinant of estuarine health. Variation in freshwater flows can significantly affect the spatial and temporal distributions of critical water quality constituents (e.g., salinity) in the estuary. Freshwater flows also directly affect variation in estuarine hydrodynamics (e.g., residence time) that often influence how estuaries respond to pollutant loads delivered by the watershed. Seasonal variation in freshwater flows is also of importance as the life cycles of many aquatic biota have evolved in response to the timing of freshwater flows to the estuary.

The Choctawhatchee River is by far the most important source of freshwater sources to the bay, providing over 90 percent of the flows. Currently, there are no significant impoundments, diversions, or withdrawals from the Choctawhatchee River for municipal or industrial water supply purposes, and most of the watershed is still

relatively rural. For these reasons, the Northwest Florida Water Management District has not determined the need to develop Minimum Flows and Levels for the river to date. Accordingly, water quantity is currently not considered to be a priority problem/issue.

However, this issue should be revisited if major impoundments, diversions, or withdrawals are proposed in the future, and/or rapid and significant land use changes occur in the watershed. In addition, climate change has, and will continue to, alter the temporal distribution of rainfall in the watershed, which could in turn affect estuarine water quality and hydrodynamics.

INFORMATIONAL NEEDS

The development of meaningful management actions related to water quality is dependent on the quantification of pollutant loadings (e.g., tons per year) of the various constituents of concern, with a breakdown of contributions from various sources, such as stormwater, wastewater, dirt road erosion, etc. A comprehensive pollutant loading model for Choctawhatchee Bay has not been developed to date, and the development of such a model is clear informational need and recommended action. Therefore, the Water Quality Action Plan is primarily focused on diagnostic feasibility studies combined with opportunistic load reduction and water quality improvement projects.

GOALS AND OBJECTIVES

The following goals and objectives have been developed to address the Water Quality/Quantity Focus Area.

- **Goal 1: Attain non-impaired status for all bay segments in Choctawhatchee Bay.**
 - Objective 1-1: Monitor long-term water quality status and trends in Choctawhatchee Bay.
 - Objective 1-2: Quantify pollutant loadings to Choctawhatchee Bay.
 - Objective 1-3: Develop a comprehensive Water Quality Management Plan for Choctawhatchee Bay.
 - Objective 1-4: Implement opportunistic pollutant load reduction and water quality improvement projects where feasible in the Choctawhatchee Bay watershed.

- **Goal 2: Ensure annual and seasonal freshwater inflows to Choctawhatchee Bay that maintain historical salinity gradients and healthy fish and wildlife populations.**
 - Objective 2-1: Monitor long-term changes in freshwater inflows to Choctawhatchee Bay.

RECOMMENDED PROJECTS, PROGRAMS, AND ACTIVITIES

Various projects, programs, and activities addressing the Water Quality/Quantity Focus Area were proposed by stakeholders and/or the consultant team during the CCMP development process, and the key recommended actions are summarized below for each objective.

- **Objective 1-1: Monitor long-term water quality status and trends in Choctawhatchee Bay.**

State agencies currently maintain ambient water quality databases that include data collected from Choctawhatchee Bay and its watershed (e.g., FDEP, ADEM); however, they are focused primarily on meeting federal TMDL program requirements. This objective would centralize the warehousing and regular review of Choctawhatchee Bay data, as well as augment existing monitoring activities to address data gaps and monitoring needs, under the direction of the CBEP and/or partner organizations (e.g., CBA). Meeting this objective would support the ability to regularly assess the long-term status and trends in Choctawhatchee Bay ambient water quality, and to make well informed management decisions. Key actions to meet this objective include the following.

- Develop and maintain a consolidated long-term ambient water quality database specifically for Choctawhatchee Bay.
- Identify data gaps and monitoring needs and implement projects and programs to address the identified deficiencies.
- Prepare periodic (e.g., bi-annual) Water Quality Status and Trends reports to assess short- and long-term changes in water quality conditions Choctawhatchee Bay.

AT A GLANCE

WATER QUALITY & QUANTITY GOALS & OBJECTIVES

- + Attain non-impaired status for all bay segments in Choctawhatchee Bay
- + Ensure annual and seasonal freshwater inflows to Choctawhatchee Bay that maintain historical salinity gradients and healthy fish and wildlife populations.
- + Monitor long-term water quality status and trends in Choctawhatchee Bay.
- + Quantify pollutant loadings to Choctawhatchee Bay.
- + Develop a Comprehensive Water Quality Management Plan for Choctawhatchee Bay.
- + Implement opportunistic pollutant load reduction and water quality improvement projects wherever feasible in the Choctawhatchee Bay watershed.
- + Monitor long-term changes in freshwater inflows to Choctawhatchee Bay.



ACTION PLANS

- **Objective 1-2: Quantify pollutant loadings to Choctawhatchee Bay.**

As discussed in Section 2, pollutant loadings to Choctawhatchee Bay have not been adequately quantified in terms of source allocations (e.g., wastewater discharges; urban stormwater; dirt road runoff, etc.) to support the development of priority water quality improvement projects. There is currently available a long-term record of nutrient loadings from the Choctawhatchee River that is empirically based, i.e., based on measured flow and water quality data. Maintaining this record will prove useful in the future and therefore is a recommended activity. This objective would build on that activity to include the development of a pollutant loading model for Choctawhatchee Bay and its watershed quantifies pollutant loads attributable to each major source. Meeting this objective would support the development of a comprehensive water quality management plan addressing all priority pollutants. The key action addressing this objective includes the following.

- Develop a quantitative pollutant loading model Choctawhatchee Bay and its watershed.

- **Objective 1-3: Develop a Comprehensive Water Quality Management Plan for Choctawhatchee Bay.**

While several local governments in the Choctawhatchee Bay watershed have prepared stormwater master plans in association with their Municipal Separate Storm Sewer System (MS4) NPDES permits, there is currently no comprehensive water quality management plan for Choctawhatchee Bay that addresses pollutant loads from all potential sources. This objective would build on Objective 1-2 and would include the development of a waterbody response model for Choctawhatchee Bay, and the use of the model to assess the primary limiting nutrients and assimilative capacity of the estuary. Previous research has suggested that phosphorous is the nutrient limiting algal growth in Choctawhatchee Bay; however, more definitive diagnostics to determine limiting nutrient (s) could be provided by proven bioassays approaches that have successfully applied in other estuary programs. The model would also be used to develop water quality targets, and pollutant load reduction goals to meet the water quality targets, augmenting state Numeric Nutrient Criteria with sit-specific data. From this diagnostic feasibility work,

it would then be possible to develop a Comprehensive Water Quality Management Plan that identifies scientifically defensible water improvement projects addressing the various pollutant sources (e.g., septic to sewer conversions; urban stormwater retrofits, etc.), prioritized to optimize cost-effectiveness. Key actions to meet this objective include the following.

- Develop a waterbody response model for Choctawhatchee Bay.
- Use the model to develop water quality targets and pollutant load reduction goals.
- Identify priority water quality improvement projects that meet the pollutant load reduction goals.

- **Objective 1-4: Implement opportunistic pollutant load reduction and water quality improvement projects wherever feasible in the Choctawhatchee Bay watershed.**

In the absence of the diagnostic feasibility studies summarized under Objectives 1-2 and 1-3, this objective would support the opportunistic implementation of currently planned and funded water quality improvement projects by stakeholders in the watershed. Such projects include septic to sewer conversions in coastal and riparian areas, urban stormwater treatment retrofit projects, dirt road paving, and a range of best management practices. As part of the CCMP development process, several planned and/or ongoing projects were identified, and these projects are listed in Table 4-2 below. This objective would also include documentation of the estimated pollutant load reductions attributable to planned and completed projects (e.g., tons of sediment removed/year). Key actions to meet this objective include the following.

- Support the implementation of water quality improvement projects identified by watershed stakeholders.
- Document the estimated pollutant load reductions attributable with planned and completed water quality improvement projects.

- **Objective 2-1: Monitor long-term changes in freshwater inflows to Choctawhatchee Bay.**

As summarized in Section 2, several long-term flow monitoring gages have been established on Choctawhatchee River and other tributaries by the U.S. Geological Survey (USGS), and flow data is managed by



Photo courtesy of Okaloosa County Public Information

USGS as well as the NFWFMD. Like Objective 1-1, this objective would centralize the warehousing and regular review of Choctawhatchee River flow data, as well as augment existing monitoring activities to address data gaps and flow monitoring needs, under the direction of the CBEP and/or partner organizations (e.g., NFWFMD). Using the hydrologic and waterbody receiving models developed under Objective 1-3, this objective would also involve the development of freshwater inflow targets that maintain historical salinity gradients and healthy fish and wildlife populations. Meeting this objective would support the ability to regularly assess the long-term status and trends in Choctawhatchee Bay freshwater inflows, and to make informed management decisions related to proposed consumptive uses (e.g., impoundments, diversions, withdrawals) of Choctawhatchee River flows. Key actions to meet this objective include the following.

- Development and maintenance of a consolidated long-term freshwater inflow database specifically for Choctawhatchee Bay.
- Identify data gaps and flow monitoring needs and implement projects and programs to address the identified deficiencies.

- Develop annual and seasonal freshwater inflow targets.
- Prepare periodic (e.g., every 5 years) Hydrologic Status and Trends reports to assess short- and long-term changes in freshwater inflows to Choctawhatchee Bay.

LINKAGES WITH OTHER FOCUS AREAS

HABITAT PROTECTION AND MANAGEMENT

Water quality and quantity are key components controlling the health of aquatic and estuarine ecosystems. Maintaining good water quality in compliance with adopted criteria and standards is critically important for the continued support of aquatic and estuarine habitats and associated fish and shellfish populations. For example, excessive nutrient and/or sediment loads to the bay can result in algal blooms and siltation that increase turbidity and reduce the water clarity needed to support seagrasses. Excessive siltation can also smother oyster beds and other benthic habitats. The assumption is that if the water quality conditions are suitable and the full mosaic and

Table 4-1: Water Quality & Quantity Action Plan Summary

Goals	Objectives	Priority Activities	Responsible Entity(s) and Partners
Goal 1: Attain non-impaired status for all bay segments in Choctawhatchee Bay.	Objective 1-1: Monitor long-term water quality status and trends in Choctawhatchee Bay.	Develop and maintain a consolidated long-term ambient water quality database specifically for Choctawhatchee Bay.	CBEP, CBA, FDEP.
		Identify data gaps and monitoring needs and implement projects and programs to address the identified deficiencies.	CBEP, CBA, FDEP.
		Prepare periodic (e.g., bi-annual) Water Quality Status and Trends reports to assess short- and long-term changes in water quality conditions Choctawhatchee Bay.	CBEP, CBA, FDEP.
	Objective 1-2: Quantify pollutant loadings to Choctawhatchee Bay.	Develop a quantitative pollutant loading model Choctawhatchee Bay and its watershed.	CBEP, FDEP, Contractor.
		Objective 1-3: Develop a comprehensive Water Quality Management Plan for Choctawhatchee Bay.	Develop a waterbody response model for Choctawhatchee Bay.
	Use the model to develop water quality targets and pollutant load reduction goals.		CBEP, FDEP; Contractor.
	Identify priority water quality improvement projects that meet the pollutant load reduction goals.		CBEP, FDEP; Contractor.
	Objective 1-4: Implement opportunistic pollutant load reduction and water quality improvement projects where feasible in the Choctawhatchee Bay watershed.	Support the implementation of water quality improvement projects identified by watershed stakeholders.	CBEP, CBA, Counties, FDEP.
		Document the estimated pollutant load reductions attributable with planned and completed water quality improvement projects.	CBEP, FDEP, Contractor.
	Goal 2: Ensure annual and seasonal freshwater inflows to Choctawhatchee Bay that maintain historical salinity gradients and healthy fish and wildlife populations.	Objective 2-1: Monitor long-term changes in freshwater inflows to Choctawhatchee Bay.	Develop and maintain a consolidated long-term freshwater inflow database specifically for Choctawhatchee Bay.
Identify data gaps and flow monitoring needs and implement projects and programs to address the identified deficiencies.			CBEP, NFWFMD, USGS.
Develop annual and seasonal freshwater inflow targets.			CBEP, NFWFMD, Contractor.
Prepare periodic (e.g., every 5 years) Hydrologic Status and Trends reports to assess short- and long-term changes in freshwater inflows to Choctawhatchee Bay.			CBEP, NFWFMD, Contractor.

connectivity of habitats in the watershed are adequately protected, then the needs of all species will be met. In addition, maintaining optimal annual and seasonal patterns of freshwater flows to the bay is critical for the delivery of organic matter that supports the food web, and for establishing salinity patterns and habitat suitability of most aquatic and estuarine biota.

ACTION PLAN SUMMARY

Table 4-1 provides a summary of the Action Plan for the Water Quality & Quantity focus area.

HABITAT PROTECTION & MANAGEMENT ACTION PLAN

BACKGROUND SUMMARY

Choctawhatchee Bay and its watershed includes a rich array of estuarine, riverine, aquatic, wetland, and upland habitats that support abundant fish and wildlife populations, including several listed species. Critical watershed and bay habitats in the Choctawhatchee Bay system include:

- Watershed habitats
 - Forested floodplain wetlands
 - Non-riparian wetlands
 - Native upland habitats
- Bay habitats
 - Seagrasses
 - Oyster beds
 - Salt marshes
 - Coastal dune lakes

The status and trends of these various habitats are addressed in Section 2 of the CCMP. The primary issue for both watershed and bay habitats is their degradation or physical destruction caused by various stressors. For all three types of watershed habitats the primary stressors are silviculture, agriculture, and urban land development. The forested floodplain wetlands of the Choctawhatchee River and its primary tributaries, the Pea and Yellow Rivers, provide an extensive buffer between the river system and land development activities on adjacent uplands, protecting against impacts to river hydrology and water quality. In addition, forested floodplain wetlands provide

extensive fish and wildlife habitat as well as in-river water quality treatment from nutrient uptake and carbon sequestration. Forested floodplain wetlands in the Florida portion of the Choctawhatchee River corridor are very well protected, with most of these wetlands currently under state ownership as dedicated conservation lands. However, a similar level of protection in the Alabama portion of the Choctawhatchee River floodplain corridor is lacking. Efforts to extend conservation lands into the Alabama portion of the river floodplain are highly recommended.

Non-riparian wetlands are wetland systems that are hydrologically isolated, or only intermittently flow to the river system. These wetlands also provide important fish and wildlife habitat as well as hydrologic storage in the watershed. Native uplands, such as longleaf pine communities, are typically areas of hydrologic recharge to groundwater that also provide critical wildlife habitat for a range of species. Together, the three watershed habitats comprise an ecologically interconnected mosaic that protects the river system from the anthropogenic impacts of various land alteration and land development activities. Most wetlands are protected at the federal level, and state level in Florida.

Longleaf pine forests once encompassed more than 90 million acres across the Southeast, stretching from eastern Texas to southern Virginia. These forests represent some of the world's most biologically diverse ecosystems and are home to nearly 600 plant and animal species, including 29 threatened and endangered species. But over the past two centuries, development, timbering and fire suppression reduced the ecosystem's range by almost 97 percent. Remnant stands of longleaf pine still exist in the Choctawhatchee Bay watershed, however, upland habitats such as longleaf pine communities do not have regulatory protection and are dependent on cooperative public and private conservation programs to ensure protection. For the bay habitats the stressors are more complex. Seagrasses and oyster beds are submerged habitats and are thus potentially impacted by water quality degradation (e.g., excessive eutrophication and siltation) as well as direct physical impacts from propeller scarring and/or dredge and fill activities, respectively. Therefore, there are clear linkages between the Habitat and Water Quality Action Plans for the submerged habitats. Salt marshes are intertidal wetlands that are also threatened by dredge and fill activities but are now facing ecological stressors related to climate change and sea level rise. Where salt marshes butt up against filled/hardened

ACTION PLANS

shorelines, they cannot migrate landward with sea level rise and thus could be “pinched out” over time, resulting in potentially significant net losses. In addition, with warming temperatures, the range of mangroves has expanded into the northern Gulf, and mangrove encroachment into salt marshes threatens to alter the species composition and ecological functions of the native salt marshes.

The coastal dune lakes are rare and highly sensitive ecosystems that in Florida are unique to the panhandle region. They are threatened by both physical and water quality impacts associated with adjacent land development activities, as well as potentially by sea level rise. Coastal dune lakes in Choctawhatchee Bay watershed fall almost entirely within Walton County, where stringent local Comprehensive Plan policies and regulations have been specifically developed to protect these habitats.

While the CCMP recognizes protected species that occur in the Choctawhatchee Bay watershed, the primary focus is on the natural habitats that support listed species and all other fish and wildlife resources. The assumption is that if the full mosaic and connectivity of habitats in the watershed are adequately protected then the needs of all species will be met. This paradigm has been applied successfully by other gulf-coast NEPs that have focused on restoring historic ratios and/or a mosaic of habitats, rather than on a single habitat type. Maintaining good water quality in compliance with applicable standards is also critically important to the continued support of marine, estuarine, and freshwater fish and shellfish populations. The consumptive harvest of fish and shellfish resources in Choctawhatchee Bay and adjacent marine waters is regulated by both federal and state agencies (e.g., NOAA, FWC) based on fishery statistics and management principles, and is outside the purview of the CCMP. However, given the multiple ecological, sociological, and economic benefits provided by oysters, the development and promotion of an economically viable oyster industry in Choctawhatchee Bay, both natural and via aquaculture, is a focus of the CCMP.

INFORMATIONAL NEEDS

Tracking the status and trends of the various habitat types in the Choctawhatchee Bay watershed is limited by the available information derived from existing monitoring

programs and periodic special studies. Currently, the assessment of changes in the areal extent of watershed and non-submerged bay habitats is dependent upon periodic updates to GIS land use data layers developed by both federal and state agencies. The frequency, methods, and classification schemes used in these land use data layer updates can differ substantially, resulting in a patchwork of incomplete and inconsistent information. Regular, more frequent updates of GIS land use data layers, using consistent methods and classification schemes, are needed to track changes in both developed and natural land use/cover types over time.

The National Land Cover Database (NLCD) maintained by the USGS is generally adequate for assessing changes in broad land cover classifications (e.g., developed, cultivated crops, evergreen forest, etc.), and is comparable between the Florida and Alabama portions of the watershed. The NLCD has consistently developed datasets for the watershed for the period 2001-2021 and is updated roughly every 2-3 years. However, for more assessing changes in detailed land cover classifications, including specific habitat types, the Cooperative Land Cover (CLC) database maintained by the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida National Areas Inventory (FNAI) is only available for the Florida portion of the watershed.

The Choctawhatchee Bay Alliance (CBA) currently conducts regular monitoring of the condition of the primary submerged habitats - seagrasses and oyster beds; however, these monitoring programs are not adequate to assess temporal changes in the larger scale areal extent of these habitats. The FWC periodically conducts seagrass surveys using the interpretation and digitizing of aerial photographic images. The methods used in these assessments are state-of-the-art and combined with the “on the ground” monitoring conducted by the CBA provide excellent information. However, the implementation of a regular (e.g., biennial) and more comprehensive benthic habitat monitoring program to assess temporal changes in the areal extent of all important benthic habitats, including seagrasses, oyster beds and tidal flats is needed to better track status and trends in these critical bay habitats. It is recommended that the FWC or the NFWFMD develop and implement such a program for both Choctawhatchee Bay and the other major estuarine systems in the Florida panhandle.

Finally, data on the status and trends in estuarine fish populations in Choctawhatchee Bay is lacking. The FWC manages a Fishery Independent Monitoring (FIM) Program which is regularly implemented in some parts of Florida, but not in the panhandle estuaries. Given the recent and projected human population growth in the Florida panhandle, and associated increases in recreational fishing pressure, it is recommended that the FWC expand the FIM program to cover Choctawhatchee Bay and the other major panhandle estuarine systems.

GOALS AND OBJECTIVES

The following goals and objectives have been developed to address the Habitat Protection and Management Focus Area.

- **Goal 1: Maximize the conservation of forested floodplain wetlands throughout the watershed.**
 - Objective 1-1: Maintain the current area of conserved forested floodplain wetlands in the Florida portion of the watershed and increase where feasible.
 - Objective 1-2: Increase the area of conserved forested floodplain wetlands in the Alabama portion of the watershed.
- **Goal 2: Conserve and restore native upland habitats throughout the watershed.**
 - Objective 2-1: Increase the area of conserved and restored longleaf pine communities.
- **Goal 3: Protect existing seagrasses and increase seagrass coverage where feasible.**
 - Objective 3-1: Maintain a baseline seagrass coverage of 5,500 acres and increase seagrass coverage where feasible.
 - Objective 3-2: Design and implement a comprehensive and routine seagrass monitoring program in Choctawhatchee Bay.
- **Goal 4: Protect existing oyster beds and increase oyster bed coverage where feasible.**
 - Objective 4-1: Maintain a baseline oyster bed coverage of 225 acres and increase oyster bed coverage where feasible.

AT A GLANCE

HABITAT PROTECTION & MANAGEMENT GOALS & OBJECTIVES

- + Maximize the conservation of forested floodplain wetlands throughout the watershed
- + Conserve and restore native upland habitats throughout the watershed
- + Protect existing seagrasses and increase seagrass coverage where feasible
- + Protect existing oyster beds and increase oyster bed coverage where feasible
- + Promote oyster bed restoration/creation and oyster aquaculture where feasible
- + Preserve existing salt marshes and increase salt marsh coverage where feasible
- + Maintain balanced and healthy fish populations in Choctawhatchee Bay
- + Preserve and enhance the habitat integrity of the coastal dune lake ecosystems

(Continued on following spread)





Cessna Park by Sean Murph

- **Goal 5: Promote oyster bed restoration/creation and oyster aquaculture where feasible.**
 - Objective 5-1: Increase the acreage Conditionally Approved shellfish harvesting areas.
- **Goal 6: Preserve existing salt marshes and increase salt marsh coverage where feasible.**
 - Objective 6-1: Maintain a baseline salt marsh coverage of 2,500 acres and increase salt marsh coverage where feasible.
- **Goal 7: Maintain balanced and healthy fish populations in Choctawhatchee Bay.**
 - Objective 7.1: Periodically assess the status and trends in fish populations in Choctawhatchee Bay.
- **Goal 8: Preserve and enhance the habitat integrity of the coastal dune lake ecosystems.**
 - Objective 8-1: Support the Walton County Comprehensive Plan policies and regulations to protect the coastal dune lake ecosystems.

RECOMMENDED PROJECTS, PROGRAMS, AND ACTIVITIES

Various projects, programs, and activities addressing the Habitat Protection and Management Focus Area were proposed by stakeholders and/or the consultant team during the CCMP development process, and the key recommended actions are summarized below for each objective.

- **Objective 1-1: Maintain the current area of conserved forested floodplain wetlands in the Florida portion of the watershed and increase where feasible.**

Approximately 26 percent (over 376,000 acres) of the Florida portion of the Choctawhatchee River and Bay watershed is designated conservation lands and protected lands (NFWFMD 2017). Conservation lands include the NFWFMD Choctawhatchee River and Holmes Creek Water Management Area (WMA), protecting over 60,000 acres along the Choctawhatchee River and Holmes Creek. Meeting this objective would opportunistically increase the extensive conservation lands in the Florida portion

of the watershed. The key action addressing this objective includes the following.

- Identify critical gaps in the protection of the Florida portion of the Choctawhatchee River floodplain and place these areas under conservation easements where feasible.

- **Objective 1-2: Increase the area of conserved forested floodplain wetlands in the Alabama portion of the watershed.**

Unlike the Florida portion of the watershed, very little of the Choctawhatchee River floodplain in Alabama is currently protected under public or private conservation easements. Meeting this objective would increase the area of forested floodplain wetlands under conservation easements in the Alabama portion of the river corridor. The primary focus of this objective should be to publicly acquire conservation lands in Alabama that are contiguous to conservation lands in Florida so that the river corridor is continuously protected from the Florida border northward. In addition, other conservation lands should be acquired opportunistically throughout the watershed, where feasible.

Publicly acquire forested floodplain conservation lands in Alabama that are contiguous to forested floodplain conservation lands in Florida to extend continuous river corridor protection from the Florida border northward.

- **Objective 2-1: Increase the area of conserved and restored longleaf pine communities.**

Longleaf pine forests in the watershed have been substantially impacted by development timbering. Meeting this objective would include recognizing and informing the public on the ecological significance of this native upland habitat, mapping remaining stands, ensuring adequate protection, and promoting restoration efforts. The key action addressing this objective includes the following. Support the efforts of the Longleaf Pine Alliance (LPA) and the NRCS Longleaf Pine Initiative (LLPI) to protect and restore longleaf pine ecosystems throughout the watershed.

AT A GLANCE

HABITAT PROTECTION & MANAGEMENT GOALS & OBJECTIVES

(Continued)

- + Maintain the current area of conserved forested floodplain wetlands in the Florida portion of the watershed and increase where feasible
- + Increase the area of conserved forested floodplain wetlands in the Alabama portion of the watershed
- + Increase the area of conserved and restored longleaf pine communities
- + Maintain a baseline seagrass coverage of 5,500 acres and increase seagrass coverage where feasible
- + Design and implement a comprehensive and routine seagrass monitoring program in Choctawhatchee Bay
- + Maintain a baseline oyster bed coverage of 225 acres and increase oyster bed coverage where feasible

(Continued on following spread)



ACTION PLANS

- **Objective 3-1: Maintain a baseline seagrass coverage of 5,500 acres and increase seagrass coverage where feasible.**

The best available data indicates that Choctawhatchee Bay currently supports about 5,500 acres of seagrasses; however, this estimate is from 2017 and needs to be updated. Data from the 1950's indicates that a historical baseline was closer to 3,000 acres, so conditions for seagrass growth and expansion may have improved since then. Meeting this objective would involve better protection of existing seagrass beds from propeller scarring (e.g., Crab Island) as well as water quality improvements to ensure optimal water clarity to support seagrass growth and reproduction. Key actions to meet this objective include the following.

- Develop local ordinances and/or state protections to implement Seagrass Protection Zones in the bay that minimize boating impacts to existing seagrass beds.
 - Reduce nutrient and sediment loadings to Choctawhatchee Bay from all sources to ensure optimal water clarity for seagrass growth and reproduction (see Water Quality Action Plan).
- **Objective 3-2: Design and implement a comprehensive and routine seagrass monitoring program in Choctawhatchee Bay.**

Seagrasses perform a wide range of ecosystem services and are a key indicator of estuarine health. The monitoring of seagrass status and trends in Choctawhatchee Bay could be improved through the design of a comprehensive program that is implemented on a regular time interval (e.g., every two years). Such a program would involve standard methods for the acquisition of aerial photography, ground truthing, and GIS mapping of the areal extent and species coverage of seagrasses. The Southwest Florida Water Management District has been successfully implementing such a program in Tampa Bay, Sarasota Bay, and Charlotte Harbor for over 30 years, so the methods are proven (see Section 6 for more details). The key action addressing this objective includes the following.

- Coordinate with FWC, NFWFMD and other state agencies as appropriate to design, fund, and implement an ongoing comprehensive seagrass monitoring program.

- **Objective 4-1: Maintain a baseline oyster bed coverage of 225 acres and increase oyster bed coverage where feasible.**

The best available data indicates that Choctawhatchee Bay currently supports about 225 acres of oyster beds; however, this is a rough estimate that could be improved through the design and implementation of a comprehensive oyster bed survey throughout the bed, including an assessment of historical oyster bed abundance and distribution. Meeting this objective would involve mapping and protecting existing oyster beds from dredge and fill activities, as well as the design and implementation of oyster restoration projects on suitable bay bottom types (e.g., historical oyster beds). The methodologies for oyster bed restoration and creation using cleaned oyster shell from restaurants is well-established, and the CBA has a strong record in implementing such projects. Key actions to meet this objective include the following.

- Design and implement a comprehensive oyster bed and benthic mapping survey including an assessment of historical oyster bed distributions.
 - Design and implement opportunistic oyster bed restoration and creation projects where feasible.
- **Objective 5-1: Increase the acreage Conditionally Approved shellfish harvesting areas.**

Currently, only the central portion of Choctawhatchee Bay is conditionally approved for shellfish harvesting. The entire eastern segment of the bay, east of the U.S. Highway 331 bridge, and western portions of the bay around the urban areas of Fort Walton Beach and Destin, are prohibited for shellfish harvesting. The classification of shellfishing areas is conducted by the Florida Department of Agriculture and Consumer Affairs (FDACS) and is based on actual or predicted water quality conditions related to bacteria and other contaminants that could constitute a public health hazard. Meeting this objective would involve improvements to water quality as well as coordination with FDACS regarding the expansion of approved and conditionally approved shellfishing areas in the bay. In addition, this objective includes the promotion of oyster aquaculture, and the harvesting of natural oysters, where feasible in the bay – both for ecological and economic purposes. Key actions to meet this objective include the following.

- Coordinate with FDACS to conduct more frequent shellfish assessments and updates to the shellfish harvesting area and aquaculture lease maps.
- Promote the oyster industry in Choctawhatchee Bay including both oyster aquaculture and the harvesting of natural oysters.

- **Objective 6-1: Maintain a baseline salt marsh coverage of 2,500 acres and increase salt marsh coverage where feasible.**

The best available data indicate that Choctawhatchee Bay currently supports about 2,500 acres of salt marshes; however, this estimate is dated and needs to be updated. Data from the early 2000's indicate that the coverage of salt marshes has not declined significantly, and that existing federal and state wetlands regulations are generally effective in protecting these intertidal habitats. Meeting this objective would involve recognition of salt marshes as critical habitats in Choctawhatchee Bay, and ongoing coordination with federal and state wetland regulators to ensure that salt marshes are adequately protected from dredge and fill activities. In addition, this objective includes the design and implementation of marsh creation and living shoreline projects that promote the natural expansion of salt marshes in response to sea level rise. Key actions to meet this objective include the following.

- Coordinate with federal and state wetland regulators to ensure adequate protection of salt marshes from dredge and fill activities.
 - Design and implement opportunistic salt marsh restoration and creation as well as living shoreline projects where feasible.
- **Objective 7.1: Periodically assess the status and trends in fish populations in Choctawhatchee Bay.**

The FWC Fisheries Independent Monitoring Program (FIM) is responsible for assessing the status and trends in fish populations in Florida coastal waters. Due to budget limitations FIM has

AT A GLANCE

HABITAT PROTECTION & MANAGEMENT GOALS & OBJECTIVES

(Continued)

- + Increase the acreage Conditionally Approved shellfish harvesting areas
- + Maintain a baseline salt marsh coverage of 2,500 acres and increase salt marsh coverage where feasible
- + Periodically assess the status and trends in fish populations in Choctawhatchee Bay
- + Support the Walton County Comprehensive Plan policies and regulations to protect the coastal dune lake ecosystems



ACTION PLANS

infrequently conducted fish population assessments in Choctawhatchee Bay, and adequate data is not available to analyze status and trends or develop management recommendations. Meeting this objective would involve active coordination with the FWC/FIM to prioritize regular (e.g., every five years) fish population assessments in Choctawhatchee Bay. The key action addressing this objective includes the following.

- Coordinate with FWC/FIM to conduct regular fish population assessments in Choctawhatchee Bay.
- **Objective 8-1: Support the Walton County Comprehensive Plan policies and regulations to protect the coastal dune lake ecosystems.**

As noted above, coastal dune lakes are rare and highly sensitive ecosystems that are threatened by both physical and water quality impacts associated with adjacent land development activities, as well as potentially by sea level rise. Coastal dune lakes in Choctawhatchee Bay watershed fall almost entirely within Walton County, where stringent local Comprehensive Plan policies and regulations have been specifically developed to protect these habitats. The key action addressing this objective includes the following.

- Coordinate with Walton County to improve public recognition of coastal dune lakes as unique and rare habitats, and to ensure adequate protection of coastal dune lake ecosystems.

LINKAGES WITH OTHER FOCUS AREAS

LAND USE PLANNING & MANAGEMENT

Threats to the various habitats in the Choctawhatchee Bay watershed are clearly linked to land use planning and management. The dichotomy in the level of protection of a critical habitat resource between Alabama and Florida is an issue that can and should be addressed as part of the CCMP through improved cooperation between stakeholders in both states. The same focus on protection should extend to the conservation of forested floodplain wetlands such that adjacent habitats from the state line northward into Alabama that are contiguous with Florida conservation lands are protected, particularly those that are proximal to the receiving waters of Choctawhatchee Bay.

While riparian wetlands are generally considered to be

adequately protected by federal and state regulations, the regulatory protection of non-riparian wetlands at the federal level is now less certain; and the protection of native upland habitats is almost entirely dependent on local land use controls or public/private acquisition for conservation purposes. Therefore, there is a need for more consistent and protective comprehensive plan policies and land use regulations by the four Florida counties that recognize and provide adequate protection for major non-riparian wetlands and native upland habitats in the Choctawhatchee Bay watershed.

COMMUNITY RESILIENCY

A primary focus of resiliency is the prevention of substantial property and infrastructure damage, and associated economic impacts, resulting from hurricanes and other major storm events. Resiliency and habitat management intersect in several ways. The public acquisition and conservation of frequently flood-damaged properties, combined with the preparation of those properties to accommodate the landward migration of intertidal coastal habitats with sea level rise (e.g., grading and contouring), is a strategy that could result in net gains in salt marshes over time, while also minimizing storm impacts. In addition, the construction of living shorelines, like constructed marshes or oyster reefs, along developed areas with hardened shorelines can result in accretion and marsh building over time. In addition to providing excellent fish and wildlife habitat, living shorelines can also significantly buffer low-lying developed areas from the storm surge and wave damage associated with major storm events.

ACTION PLAN SUMMARY

Table 4-2 provides a summary of the Action Plan for the Habitat Protection & Management focus area.

Table 4-2: Habitat Protection & Management Action Plan Summary

Goals	Objectives	Priority Activities	Responsible Entity(s) and Partners
Goal 1: Maximize the conservation of forested floodplain wetlands throughout the watershed.	Objective 1-1: Maintain the current area of conserved forested floodplain wetlands in the Florida portion of the watershed and increase where feasible.	Identify critical gaps in the protection of the Florida portion of the Choctawhatchee River floodplain and place these areas under conservation easements where feasible.	CBEP, FDEP, NFWFMD, TNC, Counties.
	Objective 1.2: Increase the area of conserved forested floodplain wetlands in the Alabama portion of the watershed.	Publicly acquire forested floodplain conservation lands in Alabama that are contiguous to forested floodplain conservation lands in Florida to extend continuous river corridor protection from the Florida border northward.	CBEP, FDEP, NFWFMD, TNC, Counties.
Goal 2: Conserve and restore native upland habitats throughout the watershed.	Objective 2-1: Increase the area of conserved and restored longleaf pine communities.	Support the efforts of the Longleaf Pine Alliance (LPA) and the NRCS Longleaf Pine Initiative (LLPI) to protect and restore longleaf pine ecosystems throughout the watershed.	CBEP, Counties.
Goal 3: Protect existing seagrasses and increase seagrass coverage where feasible.	Objective 3-1: Maintain a baseline seagrass coverage of 5,500 acres and increase seagrass coverage where feasible.	Develop local ordinances and/or state protections to implement Seagrass Protection Zones in the bay that minimize boating impacts to existing seagrass beds.	Counties, Cities, FWC.
		Reduce nutrient and sediment loadings to Choctawhatchee Bay from all sources to ensure optimal water clarity for seagrass growth and reproduction.	Counties, Cities.
	Objective 3-2: Design and implement a comprehensive and routine seagrass monitoring program in Choctawhatchee Bay.	Coordinate with FWC, NFWFMD and other state agencies as appropriate to design, fund, and implement an ongoing comprehensive seagrass monitoring program.	CBEP, CBA, FWC, NFWFMD.
Goal 4: Protect existing oyster beds and increase oyster bed coverage where feasible.	Objective 4-1: Maintain a baseline oyster bed coverage of 225 acres and increase oyster bed coverage where feasible.	Design and implement a comprehensive oyster bed and benthic mapping survey including an assessment of historical oyster bed distributions.	CBEP, CBA, FWC, Contractor.
		Design and implement opportunistic oyster bed restoration and creation projects where feasible.	CBEP, CBA, FWC, Contractor.
Goal 5: Promote oyster bed restoration/creation and oyster aquaculture where feasible.	Objective 5-1: Increase the acreage Conditionally Approved shellfish harvesting areas.	Coordinate with FDACS to conduct more frequent shellfish assessments and updates to the shellfish harvesting area and aquaculture lease maps.	CBEP, FDACS.
		Promote the oyster industry in Choctawhatchee Bay including both oyster aquaculture and the harvesting of natural oysters.	CBEP, FDACS.
Goal 6: Preserve existing salt marshes and increase salt marsh coverage where feasible.	Objective 6-1: Maintain a baseline salt marsh coverage of 2,500 acres and increase salt marsh coverage where feasible.	Coordinate with federal and state wetland regulators to ensure adequate protection of salt marshes from dredge and fill activities.	CBEP, FDEP, NFWFMD, USACE.
		Design and implement opportunistic salt marsh restoration and creation as well as living shoreline projects where feasible.	CBEP, CBA, FWC, Contractor.
Goal 7: Maintain balanced and healthy fish populations in Choctawhatchee Bay.	Objective 7.1: Periodically assess the status and trends in fish populations in Choctawhatchee Bay.	Coordinate with FWC/FIM to conduct regular fish population assessments in Choctawhatchee Bay.	CBEP, CBA, FWC/FIM.
Goal 8: Preserve and enhance the habitat integrity of the coastal dune lake ecosystems.	Objective 8-1: Support the Walton County Comprehensive Plan policies and regulations to protect the coastal dune lake ecosystems.	Coordinate with Walton County to improve public recognition of coastal dune lakes as unique and rare habitats, and to ensure adequate protection of coastal dune lake ecosystems.	CBEP, Walton County.

LAND USE PLANNING & MANAGEMENT ACTION PLAN

BACKGROUND SUMMARY

Land use planning is generally described as the process of regulating the uses of land by governmental authorities with the goal of balancing private property rights with the promotion of desirable social and environmental outcomes and the efficient use of public resources. The objectives of modern land use planning include minimization of land use conflicts, reduction of urban sprawl, optimization of infrastructure costs, promotion of economic growth, and protection of environmental resources.

During CCMP development workshops the CBEP stakeholders identified the following issues of concern regarding land use planning and management:

- Rapid population growth and excessive seasonal tourism,
- Increasing development densities in the lower watershed (Florida),
- New development pressures in the upper watershed (Alabama),
- Inconsistent and/or weak comprehensive plan policies and land development regulations,
- Long-term conservation land and water management on Eglin AFB, and
- Need for additional conservation lands primarily in the upper watershed.

In Florida, land use planning is primarily the purview of local governments. Counties and cities use land use planning and related ordinances to manage land development within their jurisdictions, and in so doing these governmental units can plan for the needs of their communities while safeguarding natural resources. Pursuant to Chapter 163, Florida Statutes, all counties are required to develop and adopt by ordinance a Comprehensive Plan which includes numerous elements relevant to the mission of the CBEP. These elements include Future Land Use; Conservation, Transportation; Sanitary Sewer, Stormwater Management, Aquifer Recharge, and Coastal Management. County Comprehensive Plans and associated land development regulations and ordinances can address a wide range

of issues relevant to the CCMP including future land use and development patterns, transfer of density rights, conservation land acquisition, buffers and setbacks from wetlands/critical habitats, wastewater and stormwater treatment, local fertilizer ordinances, and paving of dirt roads.

As part of the CCMP development, a review of the adopted Comprehensive Plans for each of the four Florida counties in the CBEP management area was conducted to assess applicable goals, objectives, and policies. Prior to conducting this review, the following “critical planning criteria” were developed to assess and compare the respective county Comprehensive Plans.

- Specific recognition of Choctawhatchee Bay as a significant natural resource of concern through recognition of and support for the CBEP.
- Commitment to local coastal conservation through land acquisition in the coastal zone, protection of coastal resources, and habitat restoration (e.g., living shorelines).
- Protection of environmentally sensitive lands through wetland buffers and setbacks and protection of critical habitats for listed fish and wildlife.
- Discourage urban sprawl in environmentally sensitive areas through zoning controls, transfer of density rights, and other mechanisms.
- Improve quality of wastewater through extension central sewer service to priority coastal and watershed areas now served by septic systems and improvement of treatment level for nutrient removal at wastewater treatment plants.
- Reduce stormwater pollution through enhanced water quality treatment, treatment retrofit in older basins, and use and protection of natural wetlands and floodplains for stormwater management.
- Improved transportation design through the promotion of greenways; paving and stormwater retrofit of unpaved dirt roads to reduce sediment and pollutant runoff.
- Enhanced nutrient controls through adoption of local urban/residential fertilizer ordinances and promotion of urban and/or agricultural BMPs for nutrient management.
- Reduced boater impacts and marina pollution through recreational boater seagrass protection zones and marina siting and operational criteria (e.g., provision of sewage pump out facilities).

- Special recognition of dune lakes as a significant natural resource through protective setbacks and buffers and basin-specific stormwater requirements.

For each of these criteria the respective plans were evaluated pursuant to the following attributes: Specifically Addressed; Generally Addressed; Not Addressed; and Not Applicable. The results of this review are summarized in **Table 4-3** below. Coastal issues are obviously relevant to Okaloosa and Walton counties, but not to Holmes and Washington counties as they are not located in the coastal zone. Based on this review, Walton County currently has the strongest Comprehensive Plan with respect to the criteria applicable to the CBEP.

The primary land use planning and management issue in the Florida portion of the watershed is inadequate and/or

inconsistent County Comprehensive Plan policies and land development regulations regarding the identified CBEP critical planning criteria. At a minimum, all four county Comprehensive Plans should include the recognition of Choctawhatchee Bay as a regionally significant environmental resource worthy of special protection. In the Alabama portion of the watershed, more information is needed on existing state and local governmental land use planning and management regulations, as well as the key stakeholders to coordinate with to improve consistency.

In addition, there is a potential lack of consistency between CBEP goals and long-term management of Eglin AFB lands that should be addressed through improved and ongoing coordination and communication between CBEP and Eglin AFB. Long-term progress towards the protection

Table 4-3: Comparison of County Comprehensive Plans Regarding CBEP Critical Planning Criteria

Critical Planning Criteria	Okaloosa	Walton	Holmes	Washington
Specific recognition of Choctawhatchee Bay as a significant natural resource of concern; recognition of and support for the CBEP	Not Addressed	Specifically Addressed	Not Addressed	Not Addressed
Commitment to local conservation land acquisition in coastal zone; protection of coastal resources; commitment to coastal habitat protection and restoration (e.g., living shorelines)	Generally Addressed	Specifically Addressed	Not Applicable	Not Applicable
Protection of environmentally sensitive lands; protective buffers and setbacks from wetlands; protection of critical habitats for listed fish and wildlife	Specifically Addressed	Specifically Addressed	Not Addressed	Generally Addressed
Discourage urban sprawl in environmentally sensitive areas through transfer of density rights and other mechanisms	Specifically Addressed	Specifically Addressed	Not Addressed	Not Addressed
Wastewater: extend central sewer service to priority coastal and watershed areas now served by septic systems; improve WWTP level of treatment for nutrient control	Generally Addressed	Specifically Addressed	Not Addressed	Generally Addressed
Stormwater: enhanced water quality treatment; treatment retrofit in older basins; use and protection of natural wetlands and floodplains for stormwater management	Generally Addressed	Specifically Addressed	Not Addressed	Generally Addressed
Transportation: promotion of greenways; paving and stormwater retrofit of unpaved dirt roads to reduce sediment and pollutant runoff	Not Addressed	Specifically Addressed	Not Addressed	Specifically Addressed
Urban/residential fertilizer ordinances; promotion of agricultural BMPs for pollution controls; local nutrient controls	Not Addressed	Generally Addressed	Not Addressed	Not Addressed
Reduce pollution from marinas and boaters; recreational boater seagrass protection zones; marina siting criteria	Generally Addressed	Generally Addressed	Not Applicable	Not Applicable
Special recognition of dune lakes as significant natural resources; protective setbacks and buffer; basin-specific stormwater requirements	Not Applicable	Specifically Addressed	Not Applicable	Not Applicable

ACTION PLANS

and restoration of the Choctawhatchee Bay is reliant on strong support from partners, in particular the four Florida counties in the Choctawhatchee Bay watershed and Eglin Air Force Base (AFB), a major landowner in the watershed. This can be aided through formal recognition of the Choctawhatchee Bay as a significant natural resource of concern. Partners should work to ensure consistency between management documents and the goals and objectives of the CCMP.

INFORMATIONAL NEEDS

More information is needed on existing state and local governmental land use planning and management regulations in the Alabama portion of the watershed, as well as the key stakeholders to coordinate with to improve consistency.

GOALS AND OBJECTIVES

The following goals and objectives have been developed to address the Land Use Planning and Management Focus Area.

- **Goal 1: Ensure that all four Florida County Comprehensive Plans effectively address the CBEP critical planning criteria.**
 - Objective 1-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria.
- **Goal 2: Ensure consistency between CBEP goals and the long-term management of Eglin AFB lands in the watershed.**
 - Objective 2-1: Develop and execute a Memorandum of Agreement between CBEP and Eglin AFB.
- **Goal 3: Coordinate with key Alabama stakeholders to ensure consistency between the CBEP critical planning criteria and Alabama state and local land use regulations.**
 - Objective 3-1: Identify and coordinate with key stakeholders in Alabama to improve consistency between the CBEP critical planning criteria and Alabama land use regulations.
 -

RECOMMENDED PROJECTS, PROGRAMS, AND ACTIVITIES

Various projects, programs, and activities addressing the Land Use Planning and Management Focus Area were proposed by stakeholders and/or the consultant team during the CCMP development process, and the key recommended actions are summarized below for each objective.

- **Objective 1-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria.**

As summarized in Table 4-1, the four County Comprehensive Plans address the CBEP critical planning criteria inconsistently. Meeting this objective would involve the coordinated amendment of the four County Comprehensive Plans address the critical planning criteria more effectively and consistently. Ongoing consistency and compliance would be addressed through the ongoing Comprehensive Plan Evaluation and Appraisal Report process. The key action addressing this objective includes the following.

- Coordinate the amendment of County Comprehensive Plans to more consistently address the CBEP critical planning criteria.

- **Objective 2-1: Develop and execute a Memorandum of Agreement between CBEP and Eglin AFB.**

As part of the CCMP development process, stakeholders expressed concerns that there may be inconsistencies between the goals of the CBEP and long-term management of the extensive Eglin AFB lands in the watershed, especially lands directly adjacent to the bay. Meeting this objective would involve the development and execution of a Memorandum of Agreement (MOA) between CBEP and Eglin AFB that establishes commitments regarding the long-term conservation, management, and restoration of applicable AFB lands, general consistency with CBEP critical planning criteria, and ongoing communication and coordination protocols. The key action addressing this objective includes the following.

- Develop and execute an MOA between CBEP and Eglin AFB that ensures consistency with CBEP goals and general compliance with the CBEP critical planning criteria.

- **Objective 3-1: Identify and coordinate with key stakeholders in Alabama to improve consistency between the CBEP critical planning criteria Alabama land use regulations.**

Meeting this objective would involve additional coordination with Alabama stakeholders in the watershed to better understand the existing land use planning and management regulatory framework at the state and local levels. In addition, an improved understanding of anticipated future development patterns and potential land use changes in the watershed (e.g., conversion of agricultural lands to urban or industrial uses), and the key local government units involved in rapidly changing areas, would be important for priority coordination activities. The key action addressing this objective includes the following.

- Identify key Alabama local government units to coordinate with regarding the improvement of consistency with the CBEP critical planning criteria.

LINKAGES WITH OTHER FOCUS AREAS

HABITAT PROTECTION & MANAGEMENT

In the Florida portion of the Choctawhatchee Bay watershed there are currently about 376,632 acres of conservation lands, making the Choctawhatchee Bay watershed one of the most protected estuarine watersheds in the state. Nonetheless, local government Comprehensive Plan policies and associated land development regulations play a critical role in controlling environmental impacts on privately-owned non-conservation lands and can contribute additional conservation measures at the local level. While riparian wetlands are generally considered to be adequately protected by federal and state regulations, the regulatory protection of non-riparian wetlands at the federal level is now less certain given recent regulatory changes; and the protection of native upland habitats and groundwater recharge areas is almost entirely dependent on local land use controls or public/private acquisition for conservation purposes. Therefore, there is a need for more consistent and protective Comprehensive Plan policies and land

AT A GLANCE

LAND USE PLANNING & MANAGEMENT GOALS & OBJECTIVES

- + Ensure that all four Florida County Comprehensive Plans effectively address the CBEP critical planning criteria
- + Ensure consistency between CBEP goals and the long-term management of Eglin AFB lands in the watershed
- + Coordinate with key Alabama stakeholders to ensure consistency between the CBEP critical planning criteria and Alabama state and local land use regulations
- + Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria
- + Develop and execute a Memorandum of Agreement between CBEP and Eglin AFB
- + Identify and coordinate with key stakeholders in Alabama to improve consistency between the CBEP critical planning criteria Alabama land use regulations



ACTION PLANS

use regulations by the four Florida counties that recognize and provide adequate protection for major non-riparian wetlands, native upland habitats, and critical groundwater recharge areas in the Choctawhatchee Bay watershed.

COMMUNITY RESILIENCY

A primary focus of resiliency is the prevention of substantial property and infrastructure damage, and associated economic impacts, resulting from hurricanes and other major storm events. Resiliency and land use planning and management intersect in several ways. Local government condemnation and acquisition of frequently flood-damaged properties, combined with the conservation and preparation of those properties to accommodate the landward migration of intertidal coastal habitats with sea level rise (e.g., grading and contouring), is a strategy that could result in net gains in salt marshes over time, while also minimizing storm impacts. Additionally, the

construction of living shorelines along developed areas with hardened shorelines can result in sediment accretion and marsh building over time. In addition to providing excellent fish and wildlife habitat, living shorelines and marshes can also significantly buffer low-lying developed areas from the storm surge and wave damage associated with major storm events. Another important aspect of land development regulations is the development of site-specific design standards for county roadways, bridges, and stormwater facilities that take into consideration local sea level rise projections to ensure long-term viability.

ACTION PLAN SUMMARY

Table 4-4 provides a summary of the Action Plan for the Land Use Planning & Management focus area.

Table 4-4: Land Use Planning & Management Action Plan Summary

Goals	Objectives	Priority Activities	Responsible Entity(s) and Partners
<p>Goal 1: Ensure that all four Florida County Comprehensive Plans effectively address the CBEP critical planning criteria.</p>	<p>Objective 1-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria.</p>	<p>Coordinate the amendment of County Comprehensive Plans to more consistently address the CBEP critical planning criteria.</p>	<p>CBEP, Counties.</p>
<p>Goal 2: Ensure consistency between CBEP goals and the long-term management of Eglin AFB lands in the watershed.</p>	<p>Objective 2-1: Develop and execute a Memorandum of Agreement between CBEP and Eglin AFB.</p>	<p>Develop and execute an MOA between CBEP and Eglin AFB that ensures consistency with CBEP goals and general compliance with the CBEP critical planning criteria.</p>	<p>CBEP, Eglin AFB.</p>
<p>Goal 3: Coordinate with key Alabama stakeholders to ensure consistency between the CBEP critical planning criteria and Alabama state and local land use regulations.</p>	<p>Objective 3-1: Identify and coordinate with key stakeholders in Alabama to improve consistency between the CBEP critical planning criteria and Alabama land use regulations.</p>	<p>Identify key Alabama local government units to coordinate with regarding the improvement of consistency with the CBEP critical planning criteria.</p>	<p>CBEP, Alabama stakeholders.</p>

COMMUNITY RESILIENCE ACTION PLAN

BACKGROUND SUMMARY

Resiliency is generally defined as the ability to adapt to changing conditions, and to withstand and rapidly recover from disruptions caused by acute and chronic stressors. Like other Gulf coast estuaries, Choctawhatchee Bay and its surrounding urban communities are increasingly vulnerable to natural disasters as well as powerful long-term environmental changes, including:

- Rising sea levels,
- Increasing air and water temperatures,
- Greater intensity of storm events,
- Amplified storm surges,
- More frequent nuisance and catastrophic flooding, and
- Increasing human population and development pressures.

These stressors affect both the natural and built environments. Coastal wetlands are being impacted by increased shoreline erosion, landward migration, and species shifts (e.g., mangrove encroachment into salt marshes). Water quality is being affected by increased sedimentation, algal blooms, and ocean acidification. Low-lying coastal infrastructure, including roads, bridges, airports, sewage/water treatment plants, power plants, and commercial/residential developments, is increasingly vulnerable to storm surge and flooding.

It is beyond the scope of this CCMP to address the full range of resiliency issues related to the built environment; however, improving the resiliency of the natural environment is within the purview of the CBEP. The primary issue regarding natural system resiliency in Choctawhatchee Bay is the inadequate protection of vulnerable coastal and bay shorelines, and the inability of hardened shorelines to accommodate sea level rise.

Living shorelines provide intertidal fish and wildlife habitat and protect against coastal erosion. If properly designed and constructed, they can also build new coastal wetlands waterward of existing hardened shorelines through sediment accretion and marsh building processes, thus keeping pace with sea level rise. The construction of living shoreline projects along existing eroded shorelines as well

as hardened shorelines in the bay is a proven resilience strategy.

In addition to the construction of living shorelines, there are other land use policies and regulations that could be implemented to improve the resiliency of both the natural and built environment. As discussed in the Land Use Planning and Management Action Plan, the four Florida counties in the Choctawhatchee Bay watershed could improve their Comprehensive Plans to more effectively and consistently address CBEP critical planning criteria related to coastal resiliency, including:

- Conservation land acquisition of low-lying coastal areas and floodplains;
- Post-storm acquisition and conservation of frequently flood-damaged properties;
- Increase development setbacks from surface waters, wetlands and floodplains;
- Elevate bridges, pump stations to accommodate local sea level rise projections, and
- Protect critical infrastructure (airports, power plants, sewage/water treatment plants)
- Increase Levels-of-Service for stormwater management systems.
- Convert existing septic systems to central sewer in low-lying coastal areas.

INFORMATIONAL NEEDS

A living shoreline suitability assessment is needed to identify eroding and hardened shorelines in Choctawhatchee Bay that could benefit from the construction of living shorelines. In addition, a performance evaluation of existing shoreline projects in the Florida panhandle (e.g., Project Green Shores) should be conducted to assess the success or failure of methods and materials used on completed projects.

GOALS AND OBJECTIVES

The following goals and objectives have been developed to address the Resiliency Focus Area.

- **Goal 1: Improve the protection of vulnerable bay shorelines from erosion and enhance natural processes to build intertidal habitats that keep pace with sea level rise.**
 - Objective 1-1: Conduct a living shoreline suitability assessment and develop a living

AT A GLANCE

COMMUNITY RESILIENCE GOALS & OBJECTIVES

- + Improve the protection of vulnerable bay shorelines from erosion and enhance natural processes to build intertidal habitats that keep pace with sea level rise
- + Ensure that applicable County Comprehensive Plans adequately and consistently address the CBEP critical planning criteria related to coastal resiliency
- + Conduct a living shoreline suitability assessment and develop a living shoreline master plan for Choctawhatchee Bay
- + Opportunistically implement the construction of priority living shoreline projects pursuant to the master plan
- + Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria related to coastal resiliency



shoreline master plan for Choctawhatchee Bay.

- Objective 1-2: Opportunistically implement the design, permitting, and construction of priority living shoreline projects where feasible, pursuant to the master plan.
- **Goal 2: Ensure that applicable County Comprehensive Plans adequately and consistently address the CBEP critical planning criteria related to coastal resiliency.**
 - Objective 2-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria related to coastal resiliency.

RECOMMENDED PROJECTS, PROGRAMS, AND ACTIVITIES

Various projects, programs, and activities addressing the Resiliency Focus Area were proposed by stakeholders and/or the consultant team during the CCMP development process, and the key recommended actions are summarized below for each objective.

- **Objective 1-1: Conduct a living shoreline suitability assessment and develop a living shoreline master plan for Choctawhatchee Bay.**

Meeting this objective would involve the completion of a living shoreline suitability assessment and the development of living shoreline master plan for Choctawhatchee Bay. The suitability assessment would identify existing problem areas with excessive shoreline erosion as well as hardened shorelines, for potential living shoreline project construction. The master plan would include the development of standard methods and materials and a priority list of living shoreline projects. Both the living shoreline suitability assessment and master plan would need to be updated periodically (e.g., every five years). The key action addressing this objective includes the following.

- Complete and periodically update a living shoreline suitability assessment and master plan.



Living Shoreline photo at Live Oak Point by Rachel Gwin

- **Objective 1-2: Opportunistically implement the construction of priority living shoreline projects pursuant to the master plan.**

The Choctawhatchee Bay Alliance (CBA) and other entities have successfully constructed numerous habitat restoration projects around the bay including living shoreline projects. Meeting this objective would involve the continued opportunistic implementation of priority living shoreline projects pursuant to the master plan, as funding is available. The key action addressing this objective includes the following.

- Opportunistically implement priority living shoreline projects identified in the master plan.

- **Objective 2-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria related to coastal resiliency.**

As summarized in Table 4-1, the four County Comprehensive Plans address the CBEP critical planning criteria inconsistently. Meeting this objective would

involve the coordinated amendment of the four County Comprehensive Plans address the critical planning criteria more effectively and consistently. Ongoing consistency and compliance would be addressed through the ongoing Comprehensive Plan Evaluation and Appraisal Report process. The key action addressing this objective includes the following.

- Coordinate the amendment of County Comprehensive Plans to more consistently address the CBEP critical planning criteria related to coastal resiliency.

LINKAGES WITH OTHER FOCUS AREAS

LAND USE PLANNING & MANAGEMENT

As discussed above, the prevention of substantial property and infrastructure damage, and associated economic impacts, resulting from hurricanes and other major storm events is beyond the scope of this CCMP. However, resiliency and land use planning and management intersect in several ways (see Land Use Planning and Management Action Plan). Local government

ACTION PLANS

condemnation and acquisition of frequently flood-damaged properties, combined with the conservation and preparation of those properties to accommodate the landward migration of intertidal coastal habitats with sea level rise (e.g., grading and contouring), is a strategy that could result in net gains in salt marshes over time, while also minimizing storm impacts. Another important aspect of land development regulations is the development of site-specific design elevation standards for county roadways, bridges, and stormwater facilities that take into consideration local sea level rise projections to ensure long-term viability.

ACTION PLAN SUMMARY

Table 4-5 provides a summary of the Action Plan for the Community Resiliency focus area.

EDUCATION & OUTREACH ACTION PLAN

BACKGROUND SUMMARY

The CBEP is committed to environmental stewardship leading to the protection and restoration of Choctawhatchee Bay and its watershed. By embracing the model of the National Estuary Program, CBEP strives to engage diverse stakeholders, incorporate science-based practices, and foster a collaborative, community-driven efforts within the Choctawhatchee Bay watershed, which spans portions of four counties in Northwest Florida (Okaloosa, Walton, Washington, and Holmes) and portions of ten counties in Southeast Alabama.

Educating the public about Choctawhatchee Bay and its watershed, and the ecosystem services and economic benefits derived from these natural resources, is critical to garnering stakeholder support for the protection and restoration activities proposed in the CCMP. In addition,

effective public education, outreach, and engagement activities can lead to a broad, multi-generational consensus and commitment to the vision and mission of the CBEP.

The Education & Outreach focus area is best addressed through the development of an Education and Outreach Plan (EOP) that will serve as a vital component of CBEP's comprehensive approach to achieving its mission. In alignment with its overarching goals and in coordination with government agencies, natural resource trustee organizations, and various partners, including the Gulf Coast Ecosystem Restoration Council, the CBEP is dedicated to defining stewardship strategies for the Choctawhatchee Bay estuary through the Comprehensive Conservation and Management Plan (CCMP) and the EOP. The EOP will outline the necessary tools and practices to support CBEP staff and stakeholders, thereby achieving a comprehensive and collaborative protection, management, and restoration focus for Choctawhatchee Bay and its watershed.

Through stakeholder input the framework of the EOP was developed to ensure programs and initiatives that rely on community engagement promote the Mission, Vision, and Core Values of the CBEP. The primary goal of an effective Estuary Program is to enhance community engagement as a vital component within the watershed, thereby raising public awareness for the importance of understanding, protecting, and restoring Choctawhatchee Bay and its watershed. The EOP will ensure the development of the tools and resources needed to advance and support regional objectives and build organizational capacity to expand the stakeholder base.

INFORMATIONAL NEEDS

Adequate information and guidance materials are available and have been used to support the development of the EOP framework. The objectives and elements of the EOP described below were developed through collaboration with the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies (RESTORE Act) Florida Centers of Excellence Program (FLRACEP) team from the University of Florida and the University of West Florida. A series of virtual stakeholder workshops held in July and August 2021 enabled the gathering of valuable input and strategic guidance. Six strategic objectives have been defined, each with prescribed target activities and engagement strategies. The following sections outline the EOP objectives and activities to achieve the education and outreach goals by the CBEP.

GOALS AND OBJECTIVES

The following goals and objectives have been developed to address the Education & Outreach Focus Area.

- **Goal 1: Develop and implement a comprehensive Education and Outreach Plan (EOP) to communicate and promote the goals of the CBEP.**
 - Objective 1: Provide for open communication and relationship building with the community.
 - Objective 2: Secure and utilize grant funding.
 - Objective 3: Establish a working relationship with the media.
 - Objective 4: Improve community understanding.
 - Objective 5: Develop an active volunteer base.
 - Objective 6: Become a centralized source for information.

RECOMMENDED PROJECTS, PROGRAMS, AND ACTIVITIES

Various projects, programs, and activities addressing the Education & Outreach Focus Area were proposed by CBEP public outreach staff, stakeholders, and the consultant team during the CCMP development process, and the key recommended actions are summarized below for each objective.

- **Objective 1: Provide for open communication and relationship building with the community.**

This objective involves the identification and characterization of the various types of stakeholder groups and target audiences in the watershed, and then developing appropriate messaging and outreach materials specifically tailored to each group. Key actions to meet this objective include the following.

- Create a stakeholder engagement plan that outlines how to identify, connect with, and maintain relationships with key stakeholders.
- Set specific targets for the number of stakeholders engaged, surveys collected, and feedback implemented.
- Develop a timeline for hosting events and administering surveys to gather community values and concerns; and evaluate effectiveness of community events through web-based comment portals, townhall workshops, social media analytics, and program evaluation.
- Develop a budget range for outreach activities, including surveys and event hosting.

Table 4-5: Community Resiliency Action Plan Summary

Goals	Objectives	Priority Activities	Responsible Entity(s) and Partners
Goal 1: Improve the protection of vulnerable bay shorelines from erosion and enhance natural processes to build intertidal habitats that keep pace with sea level rise.	Objective 1-1: Conduct and a living shoreline suitability assessment and develop a living shoreline master plan for Choctawhatchee Bay.	Complete and periodically update a living shoreline suitability assessment and master plan.	CBEP, CBA, FWC.
	Objective 1-2: Opportunistically implement the design, permitting, and construction of priority living shoreline projects where feasible, pursuant to the master plan.	Opportunistically implement priority living shoreline projects identified in the master plan.	CBEP, CBA, FDEP.
Goal 2: Ensure that applicable County Comprehensive Plans adequately and consistently address the CBEP critical planning criteria related to coastal resiliency.	Objective 2-1: Amend County Comprehensive Plans as appropriate to adequately and consistently address the CBEP critical planning criteria related to coastal resiliency.	Coordinate the amendment of County Comprehensive Plans to more consistently address the CBEP critical planning criteria related to coastal resiliency.	CBEP, Counties.

ACTION PLANS

• **Objective 2: Secure and utilize grant funding.**

This objective involves securing funding through a range of grants and county administrative support. Secure and reliable sources of funding are critical to the long-term viability of the CBEP. As such, the CBEP must define guiding principles for its education and outreach role to ensure consistency and alignment with its mission and values. Key actions to meet this objective include the following.

- Identify all grant programs that are applicable for supporting the CBEP.
- Develop a schedule for identifying and applying for grants.
- Track the number of grants applied for, awarded, and the amount secured and include a budget for grant application expenses.
- Measure the impact of grants by tracking the progress of partner-directed research, restoration projects, and community-based initiatives funded through grants.

• **Objective 3: Establish a working relationship with the media.**

This objective involves identifying key media outlets and organizations (e.g., TV and radio stations, newspapers, social media, stakeholder websites, chambers of commerce; etc.) in the Choctawhatchee Bay watershed followed by the development and execution of a media outreach plan. Through positive promotion and awareness of CBEP to various media outlets, public visibility will be enhanced. The development of a media plan is necessary, thereby increasing the knowledge of the Choctawhatchee Bay watershed and the importance of its protection to target audience groups.

- Inventory and identify key media outlets and organizations in the watershed.
- Create a media outreach plan with a detailed timeline for engaging with media outlets.
- Track the number of media outlets engaged, the frequency of coverage, and the reach of media coverage.
- Monitor media coverage's impact on community awareness and participation.
- Develop a budget for media engagement efforts.

• **Objective 4: Improve community understanding.**

This objective involves increasing community engagement to include adults, educators, businesses, and tourists visiting the area while supporting other partner programs that educate school aged children. The CBEP is working with partners to develop appropriate messaging, associated education and outreach materials, and implementation strategies to effectively engage and inform our defined target audiences. Key actions to meet this objective include the following.

- Develop a schedule for implementing adult, businesses, and tourist education curricula to include hands-on field experiences.
- Track the number of people educated and assess their understanding of watershed-related topics.
- Administer pre- and post-participation surveys to measure changes in knowledge and awareness.
- Develop a budget for education program development and implementation.

• **Objective 5: Develop an active volunteer base.**

Volunteer engagement can significantly enhance the effectiveness of the EOP and encourage long-term buy-in and support by all stakeholders. This objective involves the identification of the pool of dedicated stakeholders who are willing and able to voluntarily promote EOP, and then developing and implementing a volunteer program. Key actions to meet this objective include the following.

- Identify a pool of dedicated stakeholders who are willing and able to voluntarily promote EOP.
- Create a detailed volunteer engagement plan with a schedule for promoting community-led events and citizen science opportunities.
- Track the number of volunteers engaged and their contributions to outreach, restoration, and preservation activities.
- Evaluate the impact of volunteers on achieving outreach and conservation goals.
- Creating a calendar to show events happening all over the watershed.
- Create budget for volunteer engagement activities.

• **Objective 6: Become a centralized source for information.**

Many of the established Estuary Programs around the U.S. provide local information warehousing functions,

serving as a centralized source of data and other information relevant to management of their respective estuaries and watersheds. This objective involves the development of those capacities within the CBEP so that it can begin to oversee the collection, evaluation, and housing of relevant scientific and public outreach information. As more projects are implemented and milestones achieved, the role of the CBEP as a central hub of CCMP projects, programs, and activities will grow. Key actions to meet this objective include the following.

- Collaborate with the Choctawhatchee Basin Alliance to promote and utilize the interactive water quality GIS map and dashboard.
- Collaborate with the Choctawhatchee Basin Alliance to prepare an annual Water Quality Report Card.
- Measure the increase in website traffic, dashboard usage, and engagement with partner organizations.
- Monitor the program's presence in local government and chamber of commerce meetings and its response to impact events.
- Develop a budget for maintaining and promoting the dashboard and for preparing the annual Water Quality Report Card.

LINKAGES WITH OTHER FOCUS AREAS

Stakeholder education and outreach is tightly linked with, and overlaps, all the focus areas. Educating the public about Choctawhatchee Bay and its watershed, and the ecosystem services and economic benefits derived from these natural resources, is critical to garnering stakeholder support for the protection and restoration activities proposed in the CCMP.

ACTION PLAN SUMMARY

Table 4-6 provide a summary of the Action Plan for the Education & Outreach focus area.

ATA GLANCE

EDUCATION & OUTREACH GOALS & OBJECTIVES

- + Develop and implement a comprehensive Education and Outreach Plan (EOP) to communicate and promote the goals of the CBEP.
- + Provide for open communication and relationship building with the community.
- + Secure and utilize grant funding.
- + Establish a working relationship with the media.
- + Improve community understanding.
- + Develop an active volunteer base.
- + Become a centralized source for information.



Table 4-6: Education and Outreach Action Plan Summary

Goals	Objectives	Priority Activities	Responsible Entity(s) and Partners
Goal 1: Develop and implement a comprehensive Education and Outreach Plan (EOP) to communicate and promote the goals of the CBEP.	Objective 1: Provide for open communication and relationship building with the community.	Create a stakeholder engagement plan that outlines how to identify, connect with, and maintain relationships with key stakeholders.	CBEP.
		Set specific targets for the number of stakeholders engaged, surveys collected, and feedback implemented.	CBEP.
		Develop a timeline for hosting events and administering surveys to gather community values and concerns; and evaluate effectiveness of community events through web-based comment portals, townhall workshops, social media analytics, and program evaluation.	CBEP.
		Develop a budget range for outreach activities, including surveys and event hosting.	CBEP.
	Objective 2: Secure and utilize grant funding.	Identify all grant programs that are applicable for supporting the CBEP.	CBEP.
		Develop a schedule for identifying and applying for grants.	CBEP.
		Track the number of grants applied for, awarded, and the amount secured and include a budget for grant application expenses.	CBEP.
		Measure the impact of grants by tracking the progress of partner-directed research, restoration projects, and community-based initiatives funded through grants.	CBEP.
	Objective 3: Establish a working relationship with the media.	Inventory and identify key media outlets and organizations in the watershed.	CBEP.
		Create a media outreach plan with a detailed timeline for engaging with media outlets.	CBEP.
		Track the number of media outlets engaged, the frequency of coverage, and the reach of media coverage.	CBEP.
		Monitor media coverage's impact on community awareness and participation.	CBEP.
		Develop a budget for media engagement efforts.	CBEP.
	Objective 4: Improve community understanding.	Develop a schedule for implementing adult, businesses, and tourist education curricula to include hands-on field experiences.	CBEP.
		Track the number of people educated and assess their understanding of watershed-related topics.	CBEP.
		Administer pre- and post-participation surveys to measure changes in knowledge and awareness.	CBEP.
		Develop a budget for education program development and implementation.	CBEP.
	Objective 5: Develop an active volunteer base.	Identify a pool of dedicated stakeholders who are willing and able to voluntarily promote EOP.	CBEP.
		Create a detailed volunteer engagement plan with a schedule for promoting community-led events and citizen science opportunities.	CBEP.
		Track the number of volunteers engaged and their contributions to outreach, restoration, and preservation activities.	CBEP.
		Evaluate the impact of volunteers on achieving outreach and conservation goals.	CBEP.
		Creating a calendar to show events happening all over the watershed.	CBEP.
		Create budget for volunteer engagement activities.	CBEP.
	Objective 6: Become a centralized source for information.	Collaborate with the Choctawhatchee Basin Alliance to promote and utilize the interactive water quality GIS map and dashboard.	CBEP, CBA.
Collaborate with the Choctawhatchee Basin Alliance to prepare an annual Water Quality Report Card.		CBEP, CBA.	
Measure the increase in website traffic, dashboard usage, and engagement with partner organizations.		CBEP.	
Monitor the program's presence in local government and chamber of commerce meetings and its response to impact events.		CBEP.	
Develop a budget for maintaining and promoting the dashboard and for preparing the annual Water Quality Report Card.		CBEP.	

FINANCE PLAN AND IMPLEMENTATION STRATEGY

- Finance Plan
- Implementation Strategy



Photo courtesy of Mattie Kelly Environmental Institute

FINANCE PLAN AND IMPLEMENTATION STRATEGY

Section 320 of the Clean Water Act establishes several purposes for NEP Management Conferences. In addition to technical assessments of an estuary, the Management Conference is tasked with developing plans to coordinate implementation of the CCMP by federal, state, and local agencies. In combination, the EPA has determined that the development of a CCP and the above stated purpose of the Management Conference include a review of how implementation of the CCMP will be funded.

FINANCE PLAN

This Finance Plan is intended to be used in planning to assist CBEP and its partners in effectively implementing the Action Plans (Section 4). While EPA funding is a primary source of revenue for formally-established NEPs, an NEP can also apply for sources of revenue from other federal, state, regional, local, and private organizations. This Finance Plan identifies potential sources of revenue for the CBEP to implement the identified Action Plans. The CCMP provides five Focus Areas for these Action Plans. Table 5-1 lists these Focus Areas, as well as potential funding sources applicable to each Focus Area. This list is not exhaustive, and some Actions may not have a currently identified funding source or exact cost estimate. Summary information for each of these identified potential funding sources is provided in Appendix B.

IMPLEMENTATION STRATEGY

The goal of the implementation strategy is to “institutionalize” the recommendations, particularly with regard to projects identified in the CCMP. As this CCMP was being developed, the original Executive Director of the Choctawhatchee Bay Estuary Program resigned. Following that resignation, an interim Executive Director was appointed, and consideration has been given to reorganizing the program. A specific implementation strategy can only be developed after such re-organization has occurred.

One of the critical steps in developing an implementation strategy is the definition of the process to be used in prioritizing potential projects identified in this CCMP.

Successful prioritization of the proposed projects can be built with the application of appropriate criteria to be applied in the prioritization process. The following identifies a number of criteria that could be considered once the program reorganization is completed.

POTENTIAL PRIORITIZATION CRITERIA

The initial criterion or question to be addressed is “What focus area does this project address?”. Prioritization will likely be developed for those projects addressing a specific focus. This is particularly important if the goal is to address each of the CCMP focus areas. It may also be desired that the focus areas be prioritized.

The following measures of major benefits that a project provides could be considered:

- **Natural Systems**—for example, the gain in wetland function using a mitigation assessment methodology such as UMAM.
- **Water Quality**— for example, the reduction in pollutant loading provided by the project.
- **Water Supply**—potential for alternative water supply sources supplied by a project.
- **Flood Control**—for example, number of homes with improved flood protection level of service.

Criteria that address regulatory issues:

- Compliance with comprehensive plans and local ordinances
- Address water quality impairments
- Address water supply needs, and/or
- Address habitats for protected species

Important cost criteria that could be used to prioritize projects include:

- Estimated project costs
- Average annual operation & maintenance costs
- Present value of operations & management
- Probable project lifespan
- Present value of costs, and
- Benefits/Costs ratio

There are also some intangible benefits that can be used to prioritize projects, such as those that:

- Improve/restore natural systems
- Address climate change impacts
- Restore historical drainage patterns, or
- Improve water quality

Table 5-1: Potential funding sources for each of the CCMP Focus Areas.

FUNDING SOURCE	WATER QUALITY & QUANTITY	HABITAT PROTECTION & MANAGEMENT	LAND USE PLANING & LAND MANAGEMENT	COMMUNITY RESILIENCE	EDUCATION & OUTREACH
FDEP Online Grant Portal	×		×	×	
FDEP Division of Water Restoration Assistance	×	×			
Florida Coastal Management Program (FCMP)		×		×	
Gulf Research Program Fellowship and Grants				×	×
Restoring Tribal Priority Fish Passage through Barrier Removal Grants		×		×	
Transformational Habitat Restoration and Coastal Resilience	×	×		×	
Coastal Habitat Restoration and Resilience Grants for Tribes and Underserved Communities Under the BIL and IRA	×	×	×	×	
Social, Cultural and Economic Assessment of Harmful Algal Blooms (SEAHAB) Program				×	×
Restore Act Pot 1 - Treasury	×	×	×	×	×
Restore Act Pot 3 with Gulf Consortium	×	×	×	×	×
NFWF Emergency Coastal Resilience Fund			×	×	
USACE 165a Pilot Program	×	×	×	×	
Florida Recreation Development Assistance Program			×		×
EPA Trash-Free Waters Projects		×			×
NOAA Climate Resilience Regional Challenge				×	
NOAA RESTORE Science Program	×	×	×		
Clean Water State Revolving Fund (CWSRF): Estuary Protection and Restoration	×	×	×		
FDOT – County Incentive Grant Program				×	
FFWCC Derelict Vessel Removal Funding	×	×			×

Summary information for each of these identified potential funding sources is provided in Appendix B.

MONITORING PROGRAM PLAN

- Water Quality Monitoring
- Water Quantity Monitoring
- Habitat Monitoring
- Recommendations



Seagrass photo courtesy of Benjamin Jones

There are several existing environmental monitoring programs including water quality, water quantity, and habitat elements for the Choctawhatchee Bay watershed. This section summarizes those programs and provides recommendations for potential enhancements of these programs that can be used to track progress in achieving the CCMP goals.

WATER QUALITY MONITORING

A compilation of all available water quality data was completed for both Florida and Alabama (Figure 6-1). The resulting database allowed the identification of several agencies and volunteer programs responsible for the collection of water quality data within Choctawhatchee Bay and its watershed and tributaries.

Since 1996, CBA has collected data from the watershed, bays and bayous, and Walton County's coastal dune lakes. Through a partnership with the University of Florida's LakeWatch program, CBA had their samples analyzed for nutrients and chlorophyll a. This program continues today, and results are shared on the CBA dashboard and via the FDEP Watershed Information Network (WIN) database.

The Okaloosa County Environmental Council sponsored a volunteer water quality monitoring program with sampling sites throughout the bay and several adjacent bayous. Laboratory analyses were provided by FDEP, and those data were imported into the WIN database. Their analytes included nutrients, total suspended solids, and specific conductance. This program was discontinued in 2017.

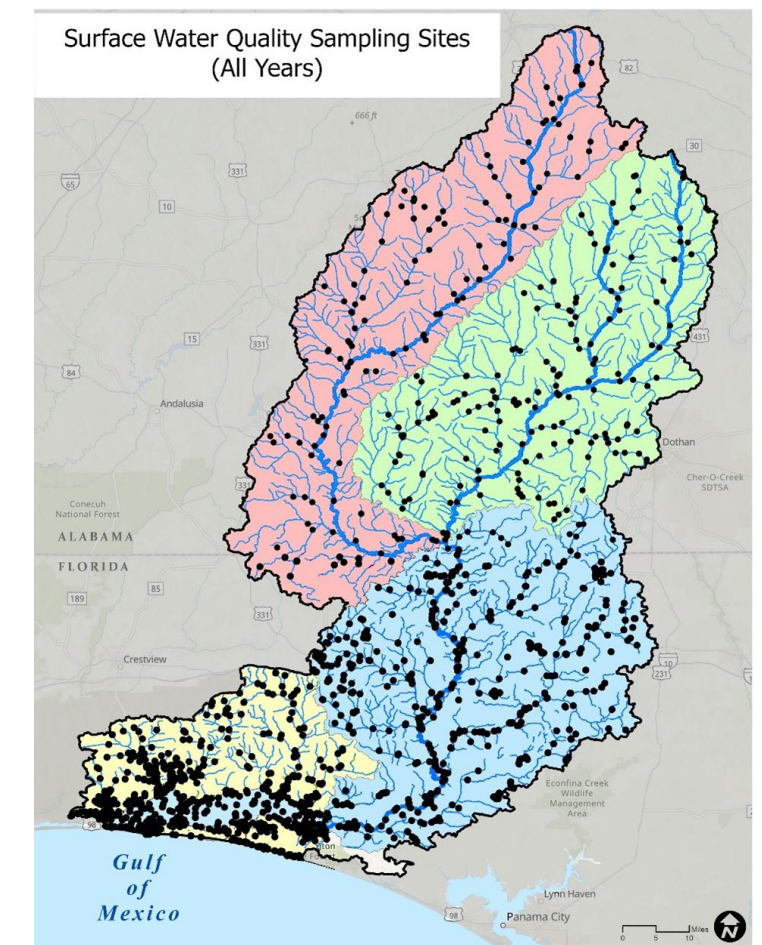
Additional agencies in Florida that monitor ambient water quality are the FDEP, NFWFMD, FDACS, and FDOH. Each agency has its own role in monitoring. FDEP and the NFWFMD monitor surface water quality in Choctawhatchee Bay and its tributaries to assess compliance with the Federal Clean Water Act and the Florida Watershed Restoration Act. Waters deemed suitable for shellfish harvesting are monitored by FDACS to minimize the risk from shellfish-borne illnesses. The agency has the authority to open/close shellfish harvesting areas based on environmental

conditions. Through a partnership with FDEP, FDACS also collected nutrients samples for analysis, though that partnership recently ended in 2021. FDOH is responsible for monitoring designated recreational beaches for the presence of fecal indicator bacteria. If appropriate criteria are not met, those waters are resampled to verify the exceedance. If verified, an advisory is posted.

Florida water quality data are compiled by FDEP to form the Impaired Water Rule (IWR) database. This includes data runs used to assess the waters of Choctawhatchee Bay and its contributing bayous and tributaries for compliance with State water quality criteria.

In Alabama, water quality monitoring is conducted by the ADEM and the Alabama Geological Survey AGS. These efforts are managed through several programs. The Rivers and Reservoirs Monitoring Program samples stations on a 5-year rotating basis monthly from April to October, the primary algal growing cycle. The Rivers and Streams Monitoring Program is a watershed-based monitoring program whose primary goal

Figure 6-1: Surface water quality sampling sites located within the Choctawhatchee Bay Watershed.



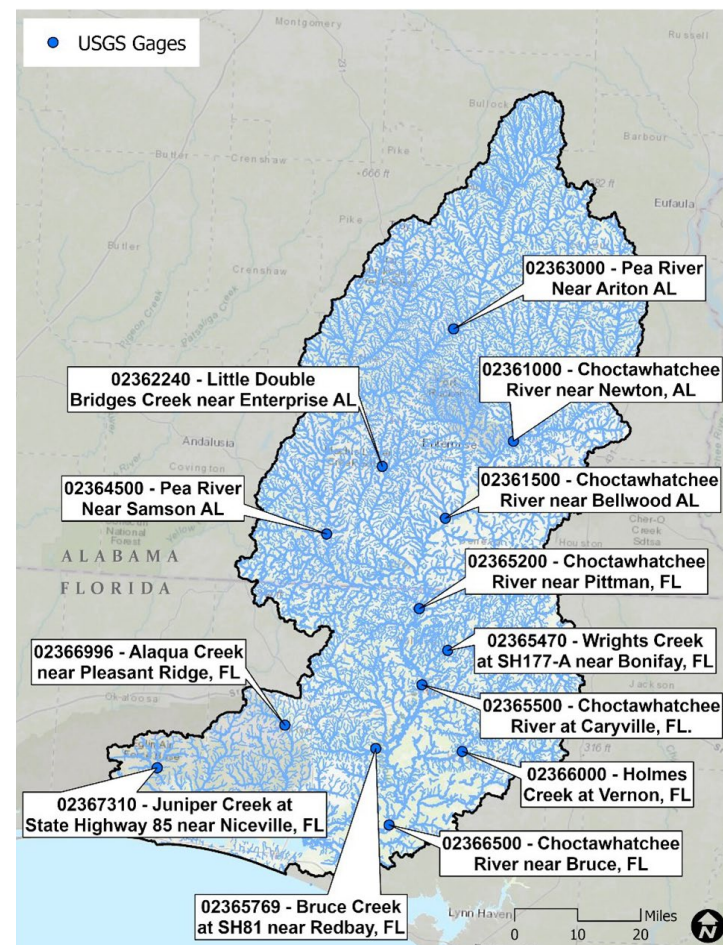
MONITORING PROGRAM PLAN

is to provide stressor-response data for the development of criteria and indicators. In addition, the Alabama Water Watch is a citizen scientist, volunteer-based program operated by the Alabama Extension Service located at Auburn University. Data from this program includes in situ water quality and bacteriological samples. These data are available from the Alabama Water Watch website.

WATER QUANTITY MONITORING

A compilation of the available hydrologic data was completed for both Florida and Alabama. The USGS is the primary hydrologic data provider within the watershed (**Figure 6-2**). Many of those sites are funded by other agencies including the NFWFMD, FDEP, and ADEM. Additional water surface elevation data are being collected by the CPYRWMA. Spring

Figure 6-2: USGS discharge monitoring stations



discharge should also be monitored to identify trends in discharges over time.

Precipitation data is widely available from rain gages throughout the watershed with data available from the National Climate Data Center of the National Weather Service. Continuous coverages derived from NEXRAD precipitation products are also available. These provide estimates within a 2kmx2km grid which captures the rainfall between gages. The CPYRWMA also produces a monthly rainfall report.

HABITAT MONITORING

In 2009 the CBA began a long-term monitoring program to analyze coverage and abundance of seagrass and other benthic communities, primarily oysters, in Choctawhatchee Bay. The program consists of annual diver surveys of 40 sites (both fixed and random) throughout the bay where a visual assessment of presence/absence, species composition, and density/condition is conducted.

In addition to being an economically important species, oyster reefs provide critical habitat for other fish and shellfish, as well as cumulative water quality benefits via filter feeding. The CBA seagrass and benthic monitoring program is currently the only regular monitoring program assessing the extent, distribution, and health of oyster reefs in Choctawhatchee Bay.

The FWC's FWRI periodically conducts a more in-depth monitoring protocol involving light attenuation, seagrass growth, abundance, stingray transects, and related water quality variables. Since 2016 the CBA seagrass data has been included in the FWRI Reports of the Seagrass Integrated Mapping and Monitoring Program.

The most comprehensive assessment of seagrass status and trends was conducted in 2020 by the FWC in collaboration with NFWF (Carlson et al 2020). They acquired best available historic aerial imagery, digitized GIS layers of seagrass extent for historic

benchmark periods, and then compared benchmark coverages to those for more recent and current (2017) time periods. The FWC SIMM Program does not monitor seagrass coverage on a regular basis, but rather rotates their sampling efforts across the other Florida panhandle estuaries based on available funding and staff resources.

The extent and distribution of marshes (e.g., salt marshes, brackish marshes, and freshwater marshes) in Choctawhatchee Bay are periodically mapped as part of ongoing land use/cover mapping programs conducted by the FDEP and NFWFMD.

RECOMMENDATIONS

The following recommendations for future monitoring efforts to track progress in achieving the CCMP action plans.

WATER QUALITY/QUANTITY MONITORING

- Continue the current monitoring effort at the same funding level.
- Additional spring discharge sites could be added to ensure changes in spring discharges are captured as development continues.
- Add monitoring in Holmes Creek and Juniper Creek to improve knowledge regarding water quality inputs to the bay.
- Add a permanent sampling site in Florida at USGS gage 02365200, Choctawhatchee River NR Pittman, FLA. This station is located approximately 3 miles downstream of the Alabama border and has been monitored intermittently by various entities. This site could be used to characterize the water quality from waters in the Pea River and Alabama portion of the Choctawhatchee River.
- Extend monitoring at Alabama's Pea River (PEAG-2) and Choctawhatchee River (CHO-9) stations to monthly data collection throughout the year. Both stations are collocated with USGS sites which will allow for estimating annual pollutant loading.
- Increase water quality sampling from seasonal to monthly frequency at two additional sites – Pea River (PEAG-1) Choctawhatchee River (CTWG-1).



Bay Scallop

There are several Action Plan projects discussed in Section 4 that provide justification for water quality monitoring efforts that will further the understanding of water quality in the bay and its watershed.

HABITAT MONITORING

- Encourage FWRI to conduct regular seagrass surveys and mapping every two (2) years, highlighting the ecological importance of seagrass, and the strong relationship between water clarity and seagrass coverage.
- These surveys should utilize aerial photographic imagery acquired specifically for subaqueous assessments and should include photointerpretation and the development of digitized GIS layers of seagrass and oyster polygons to support areal trend analysis.
- Data from the ongoing CBA annual seagrass/benthic assessments should also be utilized to groundtruth and supplement the aerial photographic mapping.
- Encourage NFWFMD and/or FDEP to monitor the extent and distribution of marshes in Choctawhatchee Bay and its watershed as part of the periodic development of land use/cover GIS datasets. Mapping frequencies should be every five (5) years at a minimum to assess marsh losses and conversions over time.

FEDERAL CONSISTENCY REVIEW

- Water Quality
- Fish & Wildlife
- Habitat Management
- Future Review
- Sources

Federal Consistency Review is the process by which the Management Board of a National Estuary Program determines whether federal assistance and development programs are aligned with and supportive of the proposed actions within the CCMP. This is outlined in the Clean Water Act (CWA) Section 320 (b) (7) (Purpose 7). As a rule of thumb, federal policies set the baseline level of protection for federal resources, including waters of the United States, habitats, and fish and wildlife. State and local entities are generally able to enact their own policies if they are more protective or stringent than the federal ones, and so long as this power has not been legally pre-empted or prevented. This CCMP strives to integrate federal programs and opportunities relevant to the Choctawhatchee Bay watershed. Because this CCMP seeks to preserve and enhance the ecological value of the Choctawhatchee Bay and watershed, it is anticipated that the action plan and specific goals will meet or exceed federal requirements.

Importantly, this review highlights specific federal assistance and development programs that will catalyze implementation and success of the CCMP. If there are conflicts between federal programs and CCMP goals, it is incumbent on the Management Board to mitigate these inconsistencies. This section provides an initial review of potential alignment or inconsistencies, **as well as the process that the Management Board** should follow to ensure that updates to the CCMP are consistent with local, state, and federal policies and programs. Regional planning councils and local governments also may participate in the federal consistency review process by advising the Department of Economic Opportunity (DEO) on the local and regional impact of proposed federal actions. Similarly, this Management Board could raise concerns with the DEO if future federal actions may impact or lead to inconsistencies with an adopted CCMP.

Federal partners directly involved in the CCMP process thus far include the Eglin Air Force Base, the USFWS, and the NRCS. Additional collaboration should be developed with EPA, NOAA, National Marine Fisheries Service (NMFS), US Army Corps of Engineers (USACE), and the Federal Emergency Management Agency (FEMA). As this process continues, CBEP will actively engage these and other federal partners during the implementation.

The review is broken into general focus areas: water quality and quantity, fish and wildlife, and habitat. However, due to the interconnected nature of ecosystems, some federal programs may have applicability in more than one area. Sources consulted in this analysis are listed at the end of this section.

WATER QUALITY

The Clean Water Act contains two sections that require federal consistency reviews: Section 319 and Section 401.

Section 319 is the Nonpoint Management Plan and requires states to prepare a nonpoint pollution control plan to limit loading to waters of the state. These water quality programs are administered by FDEP and ADEM, respectively.

Authority to administer and oversee a Municipal Separate Storm Sewer Systems (MS4) program comes from EPA's Stormwater Rule, Phase I for medium and large systems generally serving populations of 100,000 or greater, and Phase II for small systems or those not already covered under Phase I. In Florida, the program is administered by the FDEP under 62-624 F.A.C.; in Alabama it is pursuant to ADEM Admin. Code r. 335-6-1-.04. Through this program, permits are issued to local cities and counties. The state of Florida is updating its stormwater rule, subject to ratification by the 2024 Legislature. Implementation may lead to modified or additional requirements of permittees with the goal of improved pollution reduction. However, changes to land use, planning, and/or permitting may be necessary to ensure consistency and compliance with new rules.

Components of the MS4 program include: Public Education and Outreach, Public Participation/ Involvement, Illicit Discharge Detection and Elimination, Construction Site Runoff Control, Post-Construction Runoff Control, and Pollution Prevention/ Good Housekeeping. Proper management of MS4 systems will positively impact water quality goals and fish and wildlife habitat. Additionally, public education and participation can be fostered through the engagement with business, industry, and public partners – key stakeholders in the CCMP.

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant allowed to enter a waterbody that will still allow that waterbody to meet water quality standards for that pollutant. If a waterbody contains more of a specified pollutant, it is considered to be impaired and compensatory action is required.

FEDERAL CONSISTENCY REVIEW

In Florida, the TMDL program requires an adoption for each impaired water for the pollutants of concern. Following adoption, stakeholders are required to develop a Basin Management Action Plan (BMAP). Participation in the BMAP process dovetails well with implementation of the CCMP due to the emphasis on stakeholder input. This can be a tool to leverage greater cooperation from partners throughout the watershed. While not required in Alabama, this same stakeholder-focused approach can be implemented as the community advances water quality goals in the CCMP. Within Alabama, TMDLs are implemented through a combination of regulatory actions and non-regulatory, or incentive-based actions, including Best Management Practices (BMPs), pollution prevention activities, habitat preservation, or restoration.

Currently, there are approved TMDLs for waterbodies within the Choctawhatchee Basin in Florida and Alabama but none within Choctawhatchee Bay. Within Florida, state- and EPA-approved TMDLs include Sikes Creek (TN and dissolved oxygen), Alligator Creek

(fecal coliform), Minnow Creek (fecal coliform), Camp Branch Stream (fecal coliform), Choctawhatchee River (fecal coliform), and Turkey Creek (fecal coliform). Within Alabama, state- and EPA-approved TMDLs include the Pea River, West Fork Choctawhatchee River, Flat Creek, Wrights Creek (pathogens/E. coli); Indian Camp Creek (pathogens); Walnut Creek (metals, Pb); Hurricane Creek (pathogens); and Dowling Branch (pathogens).

Section 401 requires states to certify that federal activities comply with the state's water quality requirements. It requires that applicants for federal licenses or permits obtain a certificate from the state if a proposed activity may result in any discharge to navigable waters. Actions covered include filling wetlands (Section 404 of the CWA); activities in navigable waters (Sections 9 and 10, Rivers and Harbors Act of 1899); and point source discharge permits (Section 402 of the CWA).

Section 404 of the CWA, Title 33 of the U.S. Code (U.S.C.) §1251, *et seq.*, governs discharges of dredge

or fill materials into waters of the United States. The EPA allows for state assumption of the 404 program. Florida began the process at the request of the Legislature in 2018 and EPA published its approval of Florida's State 404 Program in the Federal Register on December 22, 2020. While permittees may still be required to go through the National Environmental Policy Act (NEPA) process or conform to other requirements through the Endangered Species Act (ESA), state assumption seeks to reduce redundancies for permittees. Alabama has not sought this assumption of the 404 program. In both states, entities are required to reduce impacts to wetlands to the extent possible; unavoidable impacts are required to be mitigated through on- or off-site mechanisms. As development increases, particularly within the coastal areas, partners, particularly local municipalities, must be cognizant of the wetland habitat preservation and enhancement goals within the CCMP. Extra effort may be required to protect valuable salt and freshwater wetlands through public ownership or conservation easements.

FISH & WILDLIFE

THE ENDANGERED SPECIES ACT

The Endangered Species Act: 16 U.S.C. §1531 establishes protections for fish, wildlife, and plants that are listed as threatened or endangered. Compliance with the ESA may limit and/or restrict activities that may directly or indirectly impact listed species and their unique and shrinking habitats. The federal agencies tasked with implementation include the USFWS, NOAA, NMFS, and the EPA Office of Pesticide Programs (OPP). These agencies, particularly USFWS and NMFS, must ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

Listed species within the Choctawhatchee Bay watershed include the Gulf Sturgeon, the Okaloosa darter, and the Choctawhatchee beach mouse. Since the primary goal related to fish and wildlife habitat is preservation or enhancement of critical coastal and upland habitats, any progress in maintaining or enhancing these habitats may lessen pressure on these listed species. However, continued development pressure, particularly within the coastal zone, will necessarily lead to a decrease in natural habitats.

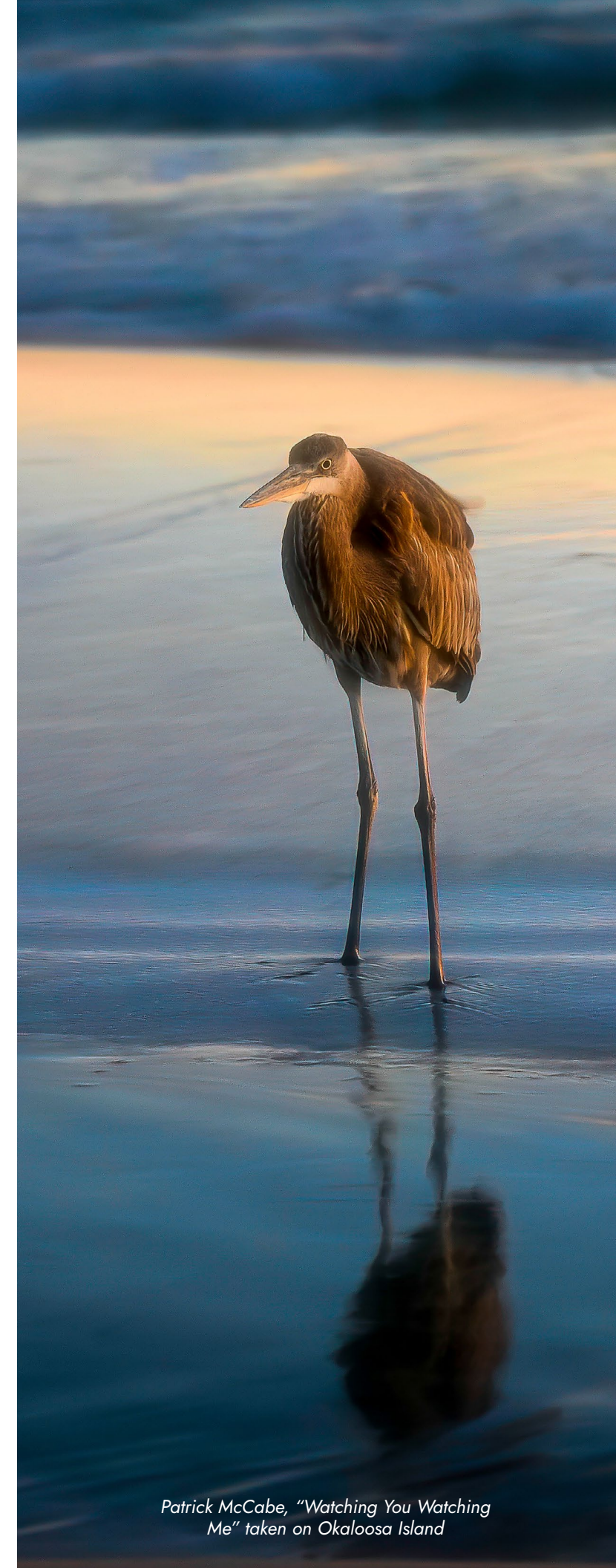
(BELOW) Choctawhatchee Beach Mouse
(photo credit: www.myfwc.com)



"Breakfast With a Twist" by Michelle Funderburk



"Misty Morning Along Western Lake" by Lori Ceier



Patrick McCabe, "Watching You Watching Me" taken on Okaloosa Island



Snowy Plover in the Snow (Sand)" taken at Santa Rosa Island, Eglin AFB

HABITAT MANAGEMENT

THE COASTAL ZONE MANAGEMENT ACT (CZMA)

The Coastal Zone Management Act (CZMA): seeks to “protect, preserve, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone.” Although a voluntary program, the CZMA encourages states to utilize coastal land and water use programs to conserve coastal areas and provides technical and funding assistance. The CZMA requires federal agency activities (i.e., “direct” agency activities) to be fully consistent with a state’s approved coastal management program unless full consistency is prohibited by federal law. Federal permit and funding decisions (i.e., “indirect” activities) must be fully consistent with the state’s approved coastal management program.

The Florida Coastal Management Program (FCMP) was approved by NOAA in 1981 and is codified at Chapter 380, Part II, F.S. It includes 24 Florida Statutes administered by nine state agencies and five water management districts. The FCMP, housed under the FDEP, coordinates coastal management activities within FDEP programs, state agencies, water management districts and local governments that have responsibilities for managing coastal resources. The FCMP seeks to protect coastal resources and help Floridians maintain vital communities. Activities are implemented through program support projects, special initiatives, grant programs, and coordinated reviews of federal activities for consistency with the statutory authorities in the FCMP. Annually, federal CZMA is made available through the Coastal Partnership Initiative (CPI), a competitive grant program to eligible local governments for projects that promote the conservation, restoration, and sustainable management of Florida’s invaluable

coastal resources. Grant focus areas include resilient communities, public access, working waterfronts, and coastal stewardship. This could be an appropriate funding source for actions related to habitat protection and coastal planning.

Alabama enacted its Alabama Coastal Area Management Program (ACAMP) in 1979, however, since there are no coastal components of the watershed within Alabama, this CCMP does not further explore consistency with the ACAMP.

Section 307 (c)(3) of the CZMA requires that activities conducted inside or outside of the coastal zone that affect land or water uses or natural resources of the coastal zone are consistent with federally-approved CZM plans. Future land use changes and developments should be vetted to ensure adherence to these guidelines. Additionally, section 6217 of the Coastal Zone Reauthorization Act of 1990 requires states to develop and enforce nonpoint pollution control programs. This further reinforces the importance of advancing water quality actions that will address impaired waterbodies through the TMDL process and implementation of the MS4 program.

THE RESOURCES AND ECOSYSTEMS SUSTAINABILITY, TOURIST OPPORTUNITIES, AND REVIVED ECONOMIES OF THE GULF COAST STATES (RESTORE) ACT

The Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act was signed into law on July 6, 2012. The Act established the Gulf Coast Restoration Trust Fund in the U.S. Treasury Department to distribute administrative and civil penalties by responsible parties involved in the 2010 Deepwater Horizon Oil Spill. The spill resulted in millions of gallons of crude oil being released into the Gulf of Mexico, resulting in significant loss to fish and wildlife habitats and economic impacts to local communities. Portions of the Trust Fund have been set aside for programs, projects, and activities that restore and protect the environment and economy of the Gulf Coast region. Oversight for allocation of funding includes the Gulf Coast Ecosystem Restoration Council, NOAA, the NOAA RESTORE Act Science program, and the Centers for Excellence Research Grants Program administered by Treasury. Additionally, penalties were administered directly to Alabama, Mississippi, Texas, Louisiana, twenty Louisiana parishes, and twenty-three Florida counties.

Significant funding for habitat restoration and fish and wildlife protection has been made available to Gulf coast communities for habitat protection and restoration, support of fish and wildlife species, and local communities through the RESTORE Act. The CBEP should proactively evaluate funding opportunities and partnerships with other government, NGOs, and academic partners to advance CCMP goals that align with RESTORE Act priorities.

FUTURE REVIEW

It is recommended that a more comprehensive federal consistency review be conducted upon approval of this CCMP. There are numerous federal statutes and agencies that have not been detailed in this initial review; however, it is incumbent on the Management Board to perform this exercise throughout the ongoing development, implementation, and review of the

CCMP. It is advisable to designate a specific meeting of the Management Board on an annual basis to proactively review new federal assistance and development programs, identify potential inconsistencies, and present recommendations to mitigate challenges. Regular coordination between local, state, and federal partners will help to accelerate progress on goals and objectives within the CCMP in a manner that minimizes unintentional conflicts or redundancies, further improving efficiency at all levels of government.

(BELOW) Photo courtesy of the Mattie M. Kelly Environmental Institute



SOURCES

<https://adem.alabama.gov/DeptForms/Form503.pdf>

<https://www.adem.alabama.gov/programs/water/tmdl.cnt>

<https://www3.epa.gov/npdes/pubs/fact2-0.pdf>

https://floridadep.gov/sites/default/files/choctawhatchee_river_fctc_tmdl.pdf

<https://www.arcgis.com/home/webmap/viewer.html?webmap=7b18b183feb14e658635275952800988&extent=-87.484,26.2887,-78.4587,30.9448>

<https://adem.alabama.gov/programs/water/approvedtmdls.htm>

<https://floridadep.gov/rcp/fcmp/content/24-florida-statutes-florida-coastal-management-program>

PUBLIC PARTICIPATION SUMMARY

- Technical Advisory Committee
- Citizens Advisory Committee
- Education & Outreach



Afterglow at Choctawhatchee Bay by Sue Townsend taken on the North Shore of Choctawhatchee Bay



Convergence of Choctawhatchee and Pea rivers in Alabama by Lisa Harris



Ekaterina Odinkova, "Social Distancing" taken at Miramar Beach, Legion Park



Photo courtesy of Mattie Kelly Environmental Institute

PUBLIC PARTICIPATION SUMMARY

audience to add or amend the ideas. All meeting notes were distributed to the CCMP Project Team members following the workshops. Online meetings were recorded, and the recordings were distributed to the TAC members and Project Team.

The purpose of the initial two workshops was to discuss the broad outlines and purpose of the CCMP and to identify stakeholder priorities within the watershed. Questions posed to the groups included, "what are the strengths and weaknesses of watershed?" and "what do you think the CBEP and CCMP needs to do, should do, and must do?" The workshops were held in Alabama and Florida on back-to-back days. The Alabama stakeholders brought up several local organizations and agencies that could provide additional feedback and guidance for the CCMP and stressed local partnerships and the need for additional conservation measures. The major river systems feeding the estuary were discussed, including the Choctawhatchee and Pea Rivers in Alabama. The priority focus areas among the attendees were Land Use and Planning and Community Outreach. Attendees at the Florida workshop included representatives for the CBA, Walton County, Okaloosa County, FWC, and USFWS. The Florida attendees stressed the need to preserve and enhance resources within the bay and the watershed including seagrass beds, wetlands, and fisheries. The group listed increased development and runoff as well as aging and insufficient stormwater and wastewater infrastructure as threats. The priority focus area for the group was Habitat Protection and Management.

Following the initial public engagement meetings, a series of four workshops were held between April and July 2023 to further evaluate the CCMP focus areas and to identify problems, goals, and action plans for each focus area: Water Quality, Water Quantity, Habitat Protection and Management, Land Use Planning and Land Management, Education and Outreach, and Community Resilience.

At the first workshop addressing the Water Quality and Water Quantity focus areas, participants were asked what the water quality and water quantity sections "should" and "must" include. Discussion focused on ways to address water quality through improved wastewater treatment and infrastructure, improvements to stormwater management, and pro-active land use planning. Existing water quality data and ongoing monitoring were discussed as well as ways to expand water quality monitoring within the watershed.

Development of a CCMP is subject to the public participation requirements of the Clean Water Act. The EPA's policy is that public support for the CCMP is critical to the long-term success of the plan and that each Management Conference must conduct a public participation program as part of the development and implementation of its CCMP.

From the outset, the CBEP has been a stakeholder-driven program. Following the establishment of the CBEP, three committees were established: the Citizens Advisory Committee (CAC), the Technical Advisory Committee (TAC), and the Education and Outreach Committee (EOC). Committees consist of local citizens from within the watershed as well as surrounding areas with representation by local government, non-profit organizations, universities, as well as state and federal agencies. Key members of the committees included representatives from: Walton County, Okaloosa County, NFWFMD, FDEP, ADEM, FWC, CPYRWMA, FWS, TNC, UWF, FSU, and CBA. Committee meetings were held both in person and virtually.

TECHNICAL ADVISORY COMMITTEE

The Project Team engaged the TAC and the public several times over the course of approximately two years for input in the development of the CCMP. Initial meetings were held virtually over Zoom in April, June, and August of 2022. The general approach for the CCMP and timeline were discussed as were the initial focus areas for the CCMP. Following the TAC meetings in 2022, individual interviews with key members of the TAC were completed to gain feedback for the direction of the CCMP and TAC process. From these interviews it was suggested that the goals and objectives of the CCMP should be better defined, the CBEP should forge a closer working relationship with the CBA, and meetings should be held in person with more opportunities for the committee members and public to interact and provide direct feedback to the Project Team.

Beginning in January 2023, a series of six in-person TAC workshops were held to better facilitate discussion with stakeholders for the development of the CCMP. These meetings were held in two locations in Florida and two locations in Alabama to allow for TAC members and interested parties across the watershed to attend. Meetings were held in Freeport, FL (Walton County), Okaloosa Island, FL (Okaloosa County), Florala, AL (Covington County), and Enterprise, AL (Coffee County). Four of the six meetings were also presented live online using Zoom to allow for online participation. Where online meetings were provided, screens were set up inside the room to allow in-person attendees to see and hear from the online participants. Meetings were planned and coordinated by the Janicki Environmental CCMP Project Team in coordination with the CBEP. Group discussions were facilitated by Carpe Diem Community Solutions. All meetings were designed to allow for participation from the attendees to provide feedback on the CCMP. Ideas presented inside the meetings were written down on easel pad sheets and hung in the room to engage the

PUBLIC PARTICIPATION SUMMARY

The second workshop focused on the Habitat Protection and Management and the Land Use Planning and Land Management focus areas. The meeting began with an overview of the CBEP and CCMP and an introduction to the proposed focus areas. After an initial group discussion, break-out sessions were held for each focus area, and problems, goals, and action plans were proposed for both focus areas. Ideas discussed in the Land Use break-out session included the need to identify future land use needs and development trends, and the need to prioritize conservation areas for water quality and wildlife habitat corridors. The Habitat Protection and Management break-out session discussed various habitats including oyster reef, salt marsh, forested floodplains, and seagrass beds and discussed the future threats and proposals for protection and enhancements of these areas.

A third workshop concentrated on the Education and Outreach and Community Resilience focus areas. For this workshop, members of both the TAC and EOC were invited to participate. The opening discussion provided an overview of the purpose and benefits of an estuary program and CCMP and key points from the previous meetings' focus areas for those that had not attended the previous meetings. An Education and Outreach discussion focused on ways for local collaboration and synergy with ongoing efforts, particularly with CBA, collaboration with groups in Alabama, a need for a unifying message or branding, and ideas for reaching out to visitors to the area. The Community Resilience discussion included the need to support government resilience projects, the need for the CCMP to address climate change, potential impacts to the natural communities by invasive species due to climate change, and the need for the CCMP to address promoting and enhancing a variety of natural areas and resources to better cope with environmental stressors.

The purpose of the final workshop was to provide updates for each of the five focus areas to the Alabama stakeholders who were not able to attend the previous meetings and receive Alabama-specific feedback for inclusion in the CCMP. Questions posed to the group included "Why should someone in Alabama be involved in the CBEP?" and "What Alabama-specific data should be included in the CCMP?" Attendees were asked to weigh in on each of the focus areas and provide suggestions for issues that were not addressed in previous meetings. The group identified areas of interest within the watershed,

high growth areas within the Alabama portion of the watershed, and education and outreach opportunities with Alabama partners.

In addition to the in-person workshops, TAC members were asked to provide projects for inclusion in the CCMP. A project form was produced and sent to the members of the TAC. Provided projects have been included in the Action Plans of Section 4.

CITIZENS ADVISORY COMMITTEE

The CBEP's focus on a diverse range of stakeholders was essential to safeguard a comprehensive and inclusive approach in developing the CCMP and ensuring waterway improvement projects are representative of the community - these ensure effective solutions and greater community support for sustainable initiatives. Various target groups were invited to become CAC stakeholders, as each group represents specific ideas on how best to improve waterways within their communities. These target groups included: local communities, environmental organizations, government agencies, fisheries and aquaculture, tourism industry, farmers and agriculture, industries and businesses, educational institutions, civil society and advocacy groups, water utilities, emergency services, and native and indigenous communities.

Starting in early 2022, various target groups were identified, and, with organizational recommendations and stakeholder discussions, 25 citizens were invited to form the CAC. The CAC's first meeting was held virtually in June 2022 where CBEP staff described the purpose of the Choctawhatchee Bay Estuary Program, what is an estuary, defined the Choctawhatchee watershed and highlighted the importance of public participation and citizen involvement for an Estuary Program. This presentation can be viewed on this link, <https://www.youtube.com/watch?v=POVTTfFYcBE>. Attendees shared specific water quality topics that were important to them and wanted to learn more about impacts to their communities.

The August 2022 CAC meeting, held virtually, included a presentation explaining what a CCMP was and how it

serves as a roadmap for the Estuary Program, highlighting the five focus areas and the process involved in public participation and engagement by many stakeholders. Additionally, during that meeting, Eglin AFB presented the example of the Okaloosa Darter fish and how through systematic efforts by various groups, it went from being on the Endangered Species list since 1972 to being downgraded to the Threatened Species list because of environmental restoration projects.

During the October 2022 virtual CAC meeting, a presentation was made on the benefits of installing a living shoreline to a waterfront property on the Choctawhatchee Bay. The living shoreline was installed by the CBA who is an active stakeholder with CBEP. The presentation highlighted to the attendees what a living shoreline is, shared the process for a homeowner, and the long-term benefits for the community, the waterways, and the ecosystem as a whole. Connecting citizens to restoration projects and monitoring efforts empowers citizens and links the public to the importance of the CCMP.

The December 2022 meeting was an in-person demonstration about the benefits of rain barrels and how installing a rain garden can help property owners deal with areas prone to excessive water during storms.

The February 2023 virtual CAC meeting had guest speaker, the Coastal Sustainability Agent for UF IFAS Escambia Extension Office, presenting on "Managing Stormwater in a Changing Florida Panhandle." This meeting had extensive discussion by attendees wanting to learn more about stormwater impacts to a community. This topic is a key area in the development of the CCMP.

The April 2023 in-person CAC meeting discussed the five CCMP focus areas and how citizen involvement can benefit implementation of CCMP outlined projects. The meeting included information about the benefits of oyster reefs in an estuary and how public participation and best management practices are incorporated into the CCMP development.

The June 2023 in-person meeting was a joint meeting held with the TAC, EOC, and the CAC. The CCMP was presented, and the focus areas Education & Outreach and Community Resilience were presented. This meeting was attended by several CAC members, and many other stakeholders, and contributed greatly to the CCMP development.

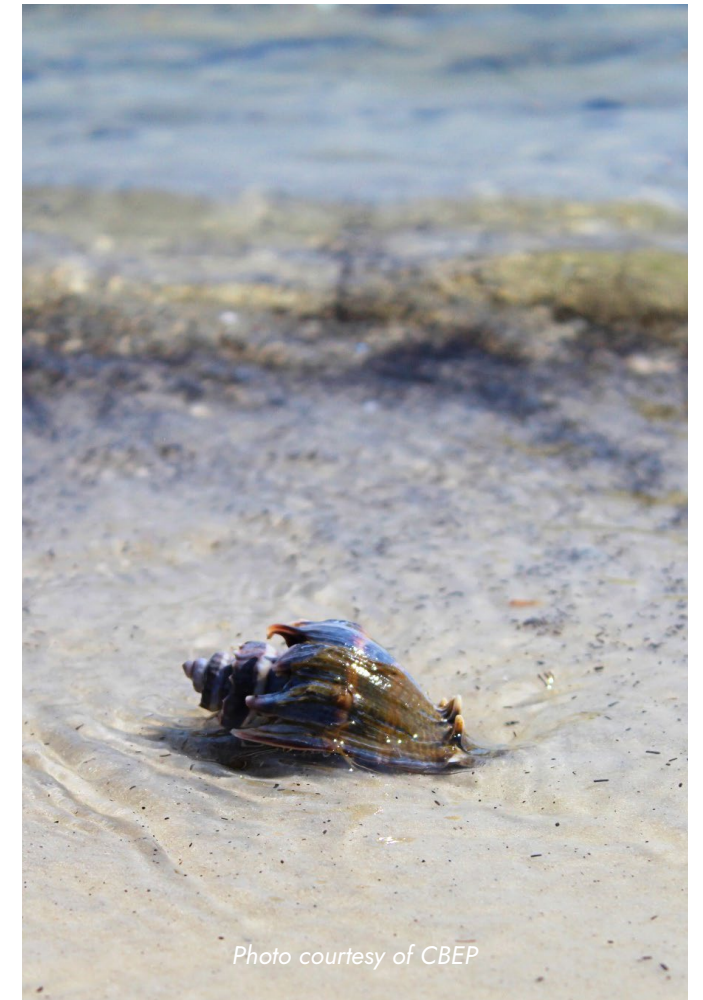


Photo courtesy of CBEP

The September 2023 CAC meeting was part of a community clean-up event held at Florida Park in Valparaiso, Florida. This event by CBEP staff included a presentation using a coastal Enviroscape to demonstrate how rainwater impacts the land and waterways. The meeting included a clean-up of the park with several attendees kayaking along the bayou to collect trash in honor of National Estuaries Week activities. Organized volunteer events like clean-up drives help to maintain active participation by the public and interested citizens. This participation is a critical component of the goals within the CCMP.

The February 2024 meeting was a joint meeting held with the TAC, EOC and the CAC to discuss the Estuary Program's next steps for the CCMP and to receive input from attendees on the new CBEP logo design. This meeting helped the attendees acknowledge the progress of the CCMP and celebrate planned activities for future waterway improvement, thereby boosting morale and encouraging continued participation.



SUMMARY OF RESPONSE TO PUBLIC COMMENTS

EDUCATION & OUTREACH

CBEP's focus has been on collaboration and partnerships with citizens, local organizations, environmental groups, schools, businesses, and government bodies - helping to leverage resources and increase outreach. These collaborative efforts demonstrate to communities that they can have a bigger impact to reaching the goals within a CCMP.

Through public participation activities by CBEP, citizens have learned what types of responsible behaviors can improve the waterways, and developed various watershed topics that are included in the CCMP. Knowledgeable citizens are key to increasing CBEP's program participation and creating a better understanding of the importance of the CCMP action items.

Public events and educational activities were held including teaching at local marine camps, presentations to community stakeholders, schools, scouting groups and

attending or organizing community events with the goal of increasing the reach to additional target groups. These types of public activities have helped CBEP understand that citizens may be unaware of important topics like waste disposal, proper use of fertilizers, and the impacts of stormwater systems to a community, topics which were added as action items for the CCMP.

A variety of outreach activities were conducted by CBEP representatives during 2022 and 2023. The events include outreach activities with multiple stakeholder groups including schools, marinas, advisory meetings, management groups, counties, and others, as well as meetings of the Management Conference Advisory Committees. A full list of these outreach events occurring between April 2022 and October 2023, as well as TAC/CAC meeting dates during this period, is provided in Appendix C.



Swept Away by L. Andrew Tucker taken at Princess Beach Okaloosa Island

Section 320 of the Clean Water Act establishes several purposes for NEP Management Conferences. In addition to technical assessments of an estuary, the Management Conference is tasked with developing plans to coordinate implementation of the CCMP by federal, state, and local agencies. In combination, the EPA has determined that the development of a CCP and the above stated purpose of the Management Conference include a review of how implementation of the CCMP will be funded.

Comments were received from a total of 26 individual reviewers. Reviewers were associated with multiple organizations and CBEP Committees, including:

- CBEP Technical Advisory Committee
- CBEP Citizens Advisory Committee

- CBEP Education and Outreach Committee
- Alabama Department of Environmental Management
- University of Florida Institute of Food and Agriculture Sciences
- Florida Fish and Wildlife Conservation Commission
- Education and Outreach Committee
- Eglin Air Force Base
- Northwest Florida Water Management District
- Choctawhatchee Basin Alliance
- Florida Department of Environmental Protection
- Destin-Fort Walton Beach
- United States Fish and Wildlife Service

All submitted public comments were reviewed during the finalization of the CCMP. Comments, and the responsive action taken, are provided in matrix form in Appendix E.

Figure 9-1. Image of CCMP posted to Choctawbay.org website for public review and comment.

The screenshot shows the website for the Choctawhatchee Bay Estuary Program. At the top left is the logo "CHOCTAWHATCHEE BAY Estuary Program". At the top right are links for "Home" and "Contact". The main heading is "COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN (CCMP)". Below this is a section titled "Why is a CCMP important to the Choctawhatchee Bay and watershed?" with a paragraph explaining its role as a blueprint for environmental protection. A green box contains a link: "CLICK on the green box below to download this CCMP document. Once downloaded you will be able to make comments directly to the CCMP document file. Then save your edits and send your edited document to Spennington@myokaloosa.com". At the bottom, there are two buttons: "INSTRUCTIONAL VIDEO LINK - HOW TO REVIEW & MAKE COMMENTS FOR CCMP" and "COMPREHENSIVE CONSERVATION MANAGEMENT PLAN". A central graphic shows the CCMP logo surrounded by logos of partner organizations: Washington County, Florida; Okaloosa County; River Preservation Commission; Choctawhatchee Basin Alliance; Florida Department of Environmental Protection; and the Florida Fish and Wildlife Conservation Commission.

REFERENCES



Twenty-three Loggerhead baby sea turtles were released into the wild off Eglin's beaches. (U.S. Air Force photo/ Airman Anthony Jennings)

REFERENCES

Alabama Department of Environmental Management (ADEM). 2020. Alabama's Water Quality Assessment and Listing Methodology.

Blaylock, D.A. 1983. Choctawhatchee Bay: Analysis and Interpretation of Baseline Environmental Data. Florida Sea Grant College. Technical paper #29.

Bhadha J.H. and J.W. Jawitz. 2008. The Coastal Dune Lakes of Florida: Trends in Water Quality and Changing Land-Use Practices. AWRA Water Resources Impact. 10:17-20.

Burch, T. A. 1983. Inventory of Submerged Vegetation in Choctawhatchee Bay, Florida. Northwest Florida Water Management District. Water Resources Special Report 83-4.

Choctawhatchee Bay Alliance. 2017. Walton County Coastal Dune Lakes Water Chemistry Summary 2017.

Carlson, P., L. Yarbrow, L. Johnsey, A. Patranella, C. York, S. Scolaro, M. Poniatowski, M. Mosser, and S. Nappier. 2020. Roadblocks to Seagrass Recovery – Final Report. Submitted January 31, 2019. Updated June 30, 2020.

Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority (CPYRWMA). 2015. Choctawhatchee, Pea and Yellow Rivers Comprehensive Watershed Management Plan Information Series 82.

Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority (CPYRWMA). 2022. Watershed Information. Accessed August 25, 2022 <https://cpyrwma.alabama.gov/about-watersheds/about-the-watersheds-choctawhatchee-river/>;

Comeaux, R.S., M.A. Allison, and T.S. Bianchi. 2012. Mangrove expansion in the Gulf of Mexico with climate change: Implications for wetland health and resistance to rising sea levels. *Estuarine, Coastal and Shelf Science*; Volume 96. Pgs. 81-95.

Copeland, R., "Florida Spring Classification System and Spring Glossary", Florida Geological Survey, Special Publication No. 52, 2003.

Environmental Science Associates (ESA). 2024. Choctawhatchee Bay and Watershed Technical Characterization Analysis. Prepared for the Choctawhatchee Bay Estuary Program.

Fernald, E. A., and E. D. Purdum. 1998. "Water Resources Atlas of Florida." Florida State University, Institute of Science and Public Affairs. Tallahassee, Florida. 312 p.

Florida Department of Environmental Protection (FDEP), 2013. Chapter 62-303, Identification of Impaired Surface Waters, Florida Administrative Code, 2013.

Florida Department of Environmental Protection (FDEP), 2017. Chapter 62-302 Surface Water Quality Standards Florida Administrative Code, 2017.

Florida Department of Transportation (FDOT). 1999. Florida Land Use Cover and Classification System Handbook. Department of Transportation Surveying and Mapping Geographic Mapping Section; Tallahassee, FL.

Florida Natural Areas Inventory (FNAI). 2010. Guide to the Natural Communities of Florida: 2010 Edition.

Florida Atlas of Lakes. 2022. <https://wateratlas.usf.edu/atlasoflakes/florida>

Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute. 2018. Summary Report for Choctawhatchee Bay. In Seagrass Integrated Mapping and Monitoring Program Mapping and Monitoring Report No. 3.

Fox, D. A., J. E. Hightower, and F. M. Parauka. 2000. Gulf sturgeon spawning migration, and habitat in the Choctawhatchee River System, Alabama/Florida. *Transactions of the American Fisheries Society* 129:811–826.

Fox, D. A.; Hightower, J. E.; Parauka, F. M., 2002: Estuarine and nearshore marine habitat use by Gulf sturgeon from the Choctawhatchee River system, Florida. In: *Biology, management and protection of North American sturgeon*, Vol. 28. W. Van Winkle, P. J. Anders, D. H. Secor and D. A. Dixon (Eds.) American Fisheries Society Symposium, Bethesda, pp. 111– 126, June 2002, 274 pp.

Hastings, R. W., and F.M. Parauka. 2004, Gulf Sturgeon *Acipenser oxyrinchus desotoi*, in Mirarchi, R.E., J.T. Garner, M.F. Mettee, and P.E. O'Neil, (eds.). *Alabama Wildlife: Volume 2: Imperiled aquatic mollusks and fishes: Tuscaloosa*, University of Alabama Press, p. 204-205.

Hinson, A. S., A. L. Rogers, and M. R. Cook. 2015. Choctawhatchee, Pea and Yellow Rivers Comprehensive Watershed Management Plan. Geological Survey of Alabama; Tuscaloosa, AL.

Hoyer, M.V. and D.E. Canfield. 2008. Pros and Cons of Issues Identified by Stakeholders Regarding the Future Management of Walton County Dune Lakes. Prepared for Choctawhatchee Basin Alliance.

Hoyer, M.V, J.B. Terrell, and D.E. Canfield DE Jr. 2013. Water Chemistry in Choctawhatchee Bay, Florida USA: Spatial and Temporal Considerations Based on Volunteer Collected Data. *Florida Scientist* 76: 453–466.

Hoyer, M.V., J.B. Terrell, and D.E. Canfield, Jr. 2016. Chain of eutrophication models for assessing the potential impact of nutrient enrichment on Choctawhatchee Bay, FL, USA. *Florida Scientist* 78(1), 20-36.

Kalinowski, S. 2018. Coastal Dune Lakes: Walton County FL. <http://basinalliance.org/wp-content/uploads/2018/09/BiophiliaCDL.pdf>

Livingston, R.J. 1986. Choctawhatchee River and Bay System, Final Report. Florida State University Center for Aquatic Research and Resource Management, v. 1-4. Tallahassee, Florida.

McDonald, T. 2003. Chapter 15 in the Baywide Environmental Monitoring Report, 1998-2001. 2003. TBEP Technical Publication #06-02 (Eds. J.R. Pribble, A.J. Janicki, H. Greening).

National Research Council (NRC). 2000. *Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution*. National Academy Press, Washington DC.

National Oceanic and Atmospheric Administration (NOAA). 2022. Sea Level Trends at Panama City Beach, FL. Access date 7/20/22. https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8729210.

Northwest Florida Water Management District (NFWFMD). 1996. The Choctawhatchee River and Bay System Surface Water Improvement and Management Plan: Havana, Florida, Program Development Series 96-4, 69 p., 8 appendices.

Northwest Florida Water Management District (NFWFMD). 2005. Choctawhatchee River Springs Inventory Holmes, Walton, and Washington Counties, Florida, Water Resources Special Report 05-02. <https://www.nfwfwater.com/Data-Publications/Reports-Plans/Springs-Inventories>.

Northwest Florida Water Management District (NFWFMD). 2016. Choctawhatchee River and Bay System Watershed Characterization. Draft Working Document.

Northwest Florida Water Management District (NFWFMD). 2017. Choctawhatchee River and Bay Surface Water Improvement and Management Plan. Program Development Series 17-05.

Ogilvie, V.E. 1980. Unpublished Florida Game and Freshwater Fish Commission Endangered Wildlife Project E-1. Annual Progress Report. Tallahassee, Florida. 19 p.

Pizzolato, W. (2022). From Tate, B., W. Pizzolato, and S. Estenoz. Delisting the Okaloosa Darter: A Generation of Improvements.

Ruth, B. and L.R. Handley. 2006. "Choctawhatchee Bay, Seagrass Status and Trends in the Northern Gulf of Mexico: 1940–2002." U.S. Geological Survey Scientific Investigations Report 2006–5287, 267 p.142-152. <http://pubs.usgs.gov/sir/2006/5287/>

Seim, H. E., B. Kjerfve, and J. E. Sneed. 1987. Tides of Mississippi Sound and the adjacent continental shelf, Estuarine Coastal Shelf Sci., 25, 143– 156.

Simon, T.P., C.C. Morris, B.R. Kuhajda, C.R. Gilbert, R. Carter R. H. Bart, Jr., N. Rios, Stewart, T.P. Simon, IV, and M. Denney, Mit. 2015. "Fishes of the Choctawhatchee River System in Southeastern Alabama and Northcentral Florida," Southeastern Fishes Council Proceedings: No. 55. Available at: <http://trace.tennessee.edu/sfcproceedings/vol1/iss55/1Simpson>, R. H., and Riehl, H. 1981. The Hurricane and Its Impact, Louisiana State University Press, Baton Rouge, LA.

Stanhope, Andrine, Larry Robinson, and Cassel Gardner. 2008. Characteristics of Nutrient Transport from Tate's Hell State Forest into East Bay Florida. Journal of Coastal Research. Special Issue 52: 263 – 272. ISSN 0749-0208.

The Nature Conservancy (TNC). 2014. Choctawhatchee Bay Community-Based Watershed Plan.

U.S. Environmental Protection Agency (EPA). 1995. National Estuary Program Guidance for Comprehensive Conservation & Management Plans: Content and Approval Requirements.

Wiggins, D.R. 1996. Annual and Triennial Reevaluation of the Choctawhatchee Bay Shellfish Harvesting Area (#06), Okaloosa and Walton Counties for the 1995 Calendar Year. Florida Department of Environmental Protection.

APPENDICES

- *Appendix A—Choctawhatchee Bay Estuary Coalition Board of Directors, Technical Advisory Committee, and Citizens Advisory Committee*
- *Appendix B—Summary of Information on Potential Funding Sources for the CCMP Focus Areas*
- *Appendix C—Focus Area Projects Supplied by Stakeholders*
- *Appendix D—List of Outreach Events*
- *Appendix E— Public Review Comments and Response Matrix*

APPENDIX A

Choctawhatchee Bay Estuary Coalition Board of Directors, Technical Advisory Committee, and Citizens Advisory Committee

INTRODUCTION

This appendix provides a listing of the Board and Advisory Committees in the management conference.

COALITION BOARD MEMBERS

Mel Ponder, *Okaloosa County Commissioner*
Boots McCormick, *Walton County Commissioner*
Alan Bush, *Washington County Commissioner*
Phillip Music, *Holmes County Commissioner*
Alison McDowell, *CBA Director*
Lisa Harris, *CPYRWMA Director*
Randall Rowland, *Eglin Airforce Base*

PAST COALITION BOARD MEMBERS

Kelly Windes, *Okaloosa County Commissioner*
Trey Goodwin, *Okaloosa County Commissioner*
Bill Chapman, *Walton County Commissioner*
Brandon Newsome, *Holmes County Commissioners*
Clint Erickson, *Holmes County Commissioner*
Barbara Gibson, *CPYRWMA*

TECHNICAL ADVISORY COMMITTEE MEMBERS

Heather Griffin Chair Person of Coalition, ADEM
Rob Holbrook Co- Chair Person, USFWS

Ada Clark, *ECRC*
Alex Fogg, *Okaloosa County*
Alex Vaughan, *USDA*
Alicia Ketter, *SW UCI*
Alison McDowell, *CBA*
Allie Logan, *Alabama Extension*
Amanda Croteau, *University of West Florida*
Ammy Hanson, *City of Niceville*
Andrea Ward, *Walton County*
Andrea Albertin, *Northwest Extension District*
Anjala Chandrasoma, *ADEM*
Anna Cornelius, *Wiregrass Resource Conservation & Development*
Anne Birch, *TNC*
Ariel Blanton, *IFAS- Camp Timpooshee*
Becca Hatchell, *FWC*
Beth Lewis, *TNC*
Beth Robertson, *FDEP*

Benjamin Ralys, *FDEP*
Bill Pine, *University of Florida*
Bradley Bohn, *Walton County*
Brian Walker, *McKim and Creed*
Bryan Helms, *Troy University*
Caroline Stahala, *National Audubon Society*
Carolynn Zonia, *Citizen Advocate Walton County*
Carisse Lejeune, *Okaloosa County*
Charlie Kuhl, *Martix*
Chelsea Conley, *Okaloosa County Marketing Assoc for TDC*
Chelsey Sharon, *Legislative Aide to Trey Goodwin*
Chris Boyd, *Troy University*
Chris Metcalf, *USFWS*
Christopher Slade, *FDEP*
Cody Watson, *ADEM*
Craig Coffee, *Okaloosa County*
Daniel Butler, *City of Destin*
Darryl Boudreau, *NFWFMD*
Darryl Williams, *USDA*
David Corbin, *Holmes County*
David Murzin, *850 Consulting Group*
David Smith, *FDEP*
DeAsia Armster, *FDEP*
Diane Alix, *TNC*
Diane Fraser, *Emerald Coast Science Center*
Eric Christianson, *ECRC - Emerald Coast Regional Council*
Eric Schneider, *ESA*
Erika Burkett, *FDACS*
Faye Douglas, *Okaloosa County*
Garrett Wallace, *TNC*
Gina Alvarez, *FWC*
Greg Stewart, *Okaloosa County Attorney*
Haley Gancel, *PPBEP*
Harley Peters, *Emerald Coast Science Center*
Holly Greening, *CoastWise Partners*
Jane Caffrey, *University of West Florida*
Jane Evans, *Okaloosa County Grants*
Jared Cobb, *City of Mary Ester*
Jason Catalano, *Walton County*
Jeff Powell, *FWS*
Jenna Testa Kilpatrick, *CBA*
Jennifer Hathaway, *Mattie Kelly Environmental Institute*
Jeremy Preston, *Eglin 96th CEG/CEIEA*
Jessica Graham, *St Andrews St Joe Bay Estuary Program*
Jessica Valek, *Coastal Resources*

Jim Miller, *Troy University*
Jim Muller, *Bay County*
Joe Bodi, *City of Destin*
John Iten, *ECRC*
John Hueste, *City of Fort Walton Beach*
John Yost, *Okaloosa/Okaloosa Dem Env Caucus*
Kaitlyn Sutton, *FDEP*
Katrina Yancey, *FDEP*
Keith Williams, *Town Manager of Cinco Bayou*
Kenneth Weaver, *FDEP*
Kent Smith, *FWC*
Kent Wimmer, *NW Sentinel Landscape & Defenders of Wildlife*
Kevin O'Donnell, *FDEP*
Kristal Walsh, *FWC*
Kristin Bennett, *Tetra Tech*
Latilda Hughes-Neel, *City of Freeport*
Laura Bell, *Alabama Watershed Stewards Workshops*
Laura Tiu, *IFAS, SeaGrant*
Lauren Day, *The Conservation Fund*
Laurie Murphy, *Emerald Coast Keeper*
Lesley Bertolotti, *TNC*
Lisa Harris, *CPYRWMA*
Lisa Lord, *The Longleaf Alliance*
Logan McDonald, *PPBEP*
Mac Carpenter, *Walton County*
Marcy Frick, *Tetra Tech*
Matt Kenworthy, *FWC*
Matt Love, *RESTORE Council*
Mark Mauldin, *UF/IFAS Extension Washington County*
Matt Deitch, *UF IFAS*
Matt Posner, *PPBEP*
Melinda Gates, *Walton County*
Melody Ray-Culp, *USFWS*
Michael King, *FDEP*
Michael (Mike) Mullen, *AL Riverkeepers*
Mike Norberg, *Okaloosa County*
Michelle Smith, *FDACS*
Mona Dominguez, *Alabama Water Watch*
Monica Wallis, *Destin Water Users*
Nathan Kelly, *Town of Valparaiso*
Rachel Bearden, *AL GSA*
Rachel Gwin, *CBA*
Rachel Hoag, *City of Destin*
Randy Morris, *City of Dothan*
Rebecca Perry, *The Conservation Fund*
Rebecca Prado, *WSP*
Renee Collini, *MS State EDU*
Rickey Mitchell, *City of Dothan*
Rob Holbrook, *USFWS*
Robert Jenkins, *City of Niceville - Planner*
Ryann Rossi, *St. Andrew & St. Joseph Bays Estuary Program*
Ryan Scott, *City of Destin*
Sabina Pennington, *CBEP*

Samantha Hanson, *City of Niceville*
Mr. Sandy Pizzolato, *Eglin Air Force*
Scott Bitterman, *Okaloosa County*
Scott Carraway, *Walton County*
Steve O'Connor, *City of Destin*
Sydney Armstrong Bunch, *NFWFMD*
Sydney Smith, *Auburn University/ACES/AWW*
Ted Corcoran, *FWB Chamber*
Ted Reese, *ESA*
Tom Littlepage, *ADECA*
Traci Goodhart, *Walton County*
Tucker Reynolds, *CBA*
Vernon Comptom, *Long Leaf Alliance*
Walter Bowers, *FDACS*
Wesley Henriquez, *ESA*
Whitney Scheffel, *PPBEP Scientist*
William Puckett, *SWCC*
Zack Whalen, *FWC*
Zbigniew (Zbig) Resiak, *American States Utility Services, Inc.*
Johnathan Laird, *City of Niceville*

EDUCATION AND OUTREACH COMMITTEE

Alex Fogg, *Okaloosa County*
Amanda Briant, *CBA*
Ariel Blanton, *IFAS- Camp Timpooshee*
Amanda Croteau, *University of West Florida*
Brenda Powell, *WSP*
Chelsea Conley, *CBEP (former)*
Christina Meyer, *Eglin Air Force Base*
Clair Norden, *IFAS- Camp Timpooshee*
Cody (Thomas) Watson, *ADEM*
Darryl Boudreau, *NFWFMD*
Diane Fraser, *Emerald Coast Science Center*
Eric Schneider, *ESA*
Haley Gancel, *UF & PPBEP*
Ms. Harley Peters, *Emerald Coast Science Center*
Heather Griffin, *ADEM*
Jenna Kilpatrick, *CBA*
Jessica Valek, *Okaloosa County*
John Woodward, *Coastal Conservation Association Florida*
Katia Hajduk, *CBA*
Kayla Wingard, *CBA*
Kathy Blue, *Destin History and Fishing Museum*
Kristin Bennett, *Tetra Tech, Inc.*
Laura Bell, *Auburn University/ACES*
Laura Tiu, *UF/IFAS-SeaGrant*
Mark Mauldin, *UF/IFAS*
Mary Gutierrez, *Earth Ethics*
Melinda Gates, *Walton County*
Matt Love, *RESTORE Council*
Mike Norberg, *Okaloosa County*
Sabina Pennington, *CBEP*

CITIZENS ADVISORY COUNCIL

Andrea Hartt, *Walton County- Santa Rosa Beach*
 Barry Barnes, *Okaloosa - Destin*
 Barry Gray, *Okaloosa - Ft Walton Beach/Gap Creek*
 Candice Blackmon, *Washington County*
 Carol Porch, *Choctawhatchee Bay Audubon Society*
 Carolynn Zonia, *Walton County Environmental group*
 Cody Wells, *Panhandle Fly-fishers group*
 Crystal Gainey, *Washington County business owner*
 Dalila Deiters, *Former Chair Environmental Focus Group ISP*
 Dave Engbrecht, *Okaloosa - Destin*
 Daquiri Champion, *Walton County*
 Debi Riley-Broadnax, *Okaloosa - Gap Creek FWB Area*
 Gary Shipman, *Walton County*
 Greg Graham, *Walton County*
 Janet Hays, *Master Gardener & Destin Garden Club*
 Jason Marquardt, *Okaloosa – Niceville – Charter Boat Captain*
 Jason Stafford, *Holmes County*

Jeff Talbert, *Walton County*
 Jill Hoglund, *Chair of ISP*
 John Yost, *Okaloosa/Okaloosa Dem Env Caucus*
 John Burns, *Retired Biologist and Fly Tide 30A*
 Joseph (Joe) Testa, *Bluewater Bay Unified Foundation*
 Kim Gasaway, *Okaloosa - Niceville/ STEM teacher*
 Lori Ceier, *Walton County - Publisher Walton Outdoors*
 Margaret Landry, *Walton- Santa Rosa Beach*
 Mary Gutierrez, *Okaloosa/ Earth Ethics Action*
 Mathilda Ravine, *Okaloosa - Santa Rosa Sound*
 Michael Mullen, *Troy, Alabama*
 Monica Douglas, *Walton- Santa Rosa Beach*
 Patrick Pilcher, *Walton County*
 Ryan Hinley, *Bluewater Bay Marina*
 Sharlene Cox, *Okaloosa - Crestview*
 Steve Duresky, *Okaloosa - Blue Water Bay Community*
 Tim Wedemyer, *Okaloosa - Ft Walton Beach*
 Will Rogers, *Friends Guild of the Destin Library*

- Watershed Restoration Program.
- Manage Alternative Water Supply projects and legislative appropriated water-related projects through the Water Quality and Supply Program.

FLORIDA COASTAL MANAGEMENT PROGRAM (FCMP)

[\(27381177 - Florida Administrative Rules, Law, Code, Register - FAC, FAR, eRulemaking \(flrules.org\)\)](#)

- 4 priority areas:
 - Resilient communities
 - Coastal resource stewardship
 - Access to coastal resources
 - Working waterfronts
- Max \$30k for planning, design and coordination activities, and up to \$60k for construction projects, habitat restoration, invasive exotic plant removal and land acquisition. Recipients to provide 100% matching contributions in the form of goods and services that directly benefit the specific grant project.

GULF RESEARCH PROGRAM FELLOWSHIP AND GRANTS

[\(Gulf Research Program Fellowships and Grants | National Academies\)](#)

- Seeking proposals for sustainable, data-driven, industry-engaged projects that will provide education and training opportunities to students ages 16-25 and ready participants to become part of the future energy workforce.
- The Gulf Research Program (GRP) is seeking proposals for youth leadership training programs that equip youth (ages 15-24) with the knowledge, skills, and expertise necessary to build resilience to climate hazards and associated disasters.
- The Gulf Research Program (GRP) and Robert Wood Johnson Foundation (RWJF) are partnering to advance health equity in at-risk communities located in the coastal region of the US Gulf of Mexico.

RESTORING TRIBAL PRIORITY FISH PASSAGE THROUGH BARRIER REMOVAL GRANTS

[\(Restoring Tribal Priority Fish Passage through Barrier Removal Grants | NOAA Fisheries\)](#)

- In collaboration with NOAA, selected partners will use these funds to build tribal organizational capacity and implement projects that reopen migratory pathways and restore access to healthy habitat for tribally-important species. Selected projects may also provide community and economic benefits, such as enhancing

climate resilience by removing or improving aging infrastructure.

TRANSFORMATIONAL HABITAT RESTORATION AND COASTAL RESILIENCE

[\(Transformational Habitat Restoration and Coastal Resilience Grants | NOAA Fisheries\)](#)

- Projects selected through this funding opportunity will have a transformative impact for coastal communities and tribes across the country. They will help sustain our nation's fisheries, make significant strides in the recovery of threatened and endangered species, and help protect coastal communities and ecosystems from the impacts of climate change. They will support efforts such as reconnecting rivers to their historic floodplains, outplanting corals to rebuild reefs, building living shorelines that protect coasts from erosion and sea level rise, and more.

COASTAL HABITAT RESTORATION AND RESILIENCE GRANTS FOR TRIBES AND UNDERSERVED COMMUNITIES UNDER THE BIL AND IRA

[\(View Opportunity | GRANTS.GOV\)](#)

- The principal objective of this funding opportunity is to support opportunities for tribes, and/or tribal entities, and underserved communities to meaningfully engage in coastal habitat restoration activities

SOCIAL, CULTURAL AND ECONOMIC ASSESSMENT OF HARMFUL ALGAL BLOOMS (SEAHAB) PROGRAM

[\(NOAA Announces Funding Opportunity to Advance Understanding of Social, Cultural and Economic Impacts of Harmful Algal Blooms - NCCOS Coastal Science Website\)](#)

- The NCCOS Competitive Research Program is pleased to announce a Fiscal Year 2024 Notice of Funding Opportunity (NOFO) for its Social, Cultural and Economic Assessment of Harmful Algal Blooms (SEAHAB) Program. This funding opportunity seeks to support research and to provide more accurate assessments of the social, cultural and economic impacts of harmful algal bloom (HAB) events at local, state, regional and national scales. This research will better inform the selection of management strategies and methods most appropriate to a specific HAB event and ongoing HAB issues.

APPENDIX B

Summary Of Information on Potential Funding Sources for the CCMP Focus Areas

INTRODUCTION

Potential funding sources were identified in Section 7 of the CCMP. This appendix provides summary information from the websites for each of the sources identified in Section 7.

FDEP ONLINE GRANT PORTAL

[\(Grants | Water Quality Dashboard \(protectingfloridatogether.gov\)\)](#)

- Resilient Florida Grant Programs
- Water Quality Protection Grant Program
- Water Quality Improvement Grants
- Alternative Water Supply Grants
- Nonpoint Source Management Grants
- Innovative Technology for Harmful Algal Blooms Grant

FDEP DIVISION OF WATER RESTORATION ASSISTANCE

[\(Water Restoration Assistance | Florida Department of Environmental Protection\)](#)

- Provides loans and grants to local governments, utilities and sometimes other agencies for projects that improve the quality and quantity of the state's water resources and provide a significant benefit to the environment and local communities.
- These projects improve stormwater quality, reduce pollutants entering surface water and ground water, conserve energy or water, protect springs, collect and treat wastewater, produce and distribute drinking water, provide alternative water supply, restore potable water for homeowners in areas affected by declining source water quality, and restore habitat/enhance recreation through the Deepwater Horizon program.
- Manage springs projects through the Springs and

RESTORE ACT – POT 1 US TREASURY

[\(RESTORE Act | U.S. Department of the Treasury; Final-Rule-Federal-Register-2015-31431.pdf \(treasury.gov\)\)](#)

- Thirty-five percent of the penalties paid into the Gulf Coast Restoration Trust Fund are set aside for the Direct Component, which is administered by Treasury for eligible activities proposed by the States of Alabama, Mississippi, Texas, Louisiana, twenty Louisiana parishes, and twenty-three Florida counties.
- Ecosystem restoration, economic development, and tourism promotion

RESTORE ACT – POT 3 GULF CONSORTIUM

[\(Spill Impact Component | Restore The Gulf\)](#)

- Under the Spill Impact Component, the Gulf Coast States can use thirty percent of the penalties in the Trust Fund for eligible activities pursuant to state expenditure plans approved by the Council.
- To access Bucket 3 funds, each state must first have an approved State Expenditure Plan (SEP). The RESTORE Act lists the types of activities that can be contained in a SEP, including but not limited to planning, ecosystem restoration, tourism promotion, and to a limited extent, infrastructure projects such as flood protection.

NFWF – EMERGENCY COASTAL RESILIENCE FUND

[\(Emergency Coastal Resilience Fund | NFWF\)](#)

- The Emergency Coastal Resilience Fund (ECRF) is a partnership between the National Fish and Wildlife Foundation and the National Oceanic and Atmospheric Administration with additional support from the Bezos Earth Fund that supports projects that build resilience for coastal communities impacted by natural disasters.
- The ECRF seeks to fund shovel-ready projects to improve wildlife habitat that also improves community resilience and recovery both in and around impacted areas. Program goals include:
 - Help recover from 2020 and 2021 disasters, as well as reduce the impact of future disasters and associated natural hazards to coastal communities; and
 - Improve the ecological integrity and functionality of coastal ecosystems to enhance fish and wildlife and their habitats.
- Eligible projects must be located within the National Coastal Resilience Fund (NCRF) Coastal Areas and be within counties that received a federal Major Disaster

Declaration with a Public Assistance designation as a result of hurricanes or wildfires in 2020 and 2021.

USACE 165A PILOT PROGRAM

[\(WRDA 2020 \(army.mil\)\)](#)

- The U.S. Army Corps of Engineers (Corps) is launching a pilot program to fully fund small water resources projects for economically disadvantaged communities.

FLORIDA RECREATION DEVELOPMENT ASSISTANCE PROGRAM

[\(FRDAP Home \(site.com\)\)](#)

- The Florida Recreation Development Assistance Program (FRDAP) is a competitive program which provides grants, subject to legislative appropriation, to local governmental entities for acquisition and development of land for public outdoor recreation use or to construct recreational trails. Section 375.075, Florida Statutes and Rule Chapter 62D-5, Florida Administrative Code govern the FRDAP program.

EPA TRASH-FREE WATERS PROJECTS

[\(Trash-Free Waters Projects | US EPA\)](#)

- EPA has provided technical and financial support for a number of projects designed to prevent trash from entering waterways.

NOAA CLIMATE RESILIENCE REGIONAL CHALLENGE

[\(NOAA Climate Resilience Regional Challenge\)](#)

- The focus of this grant program is on collaborative approaches to achieving resilience in coastal regions. Proposed projects should address risk reduction, regional collaboration, and equity, and build enduring capacity for adaptation.
- NOAA technical assistance is available for organizations applying for and receiving a grant. Many technical assistance options are available, including data, tools, training, and access to NOAA expertise.

NOAA RESTORE SCIENCE PROGRAM

[\(Funding Opportunities - NOAA RESTORE Science Program\)](#)

- The NOAA RESTORE Science Program supports research, observation, and monitoring in the Gulf of Mexico to address regional science and management needs. The Science Program will periodically

announce federal funding opportunities (FFOs) to which eligible applicants can apply and compete for funding.

CLEAN WATER STATE REVOLVING FUND (CWSRF): ESTUARY PROTECTION AND RESTORATION

[\(Clean Water State Revolving Fund \(CWSRF\): Estuary Protection and Restoration | US EPA\)](#)

- The CWSRF is a source of funding for water quality improvement projects that implement Section 320 National Estuary Program (NEP) Comprehensive Conservation and Management Plans (CCMP). The CWSRF offers a broad range of eligibilities and flexible, affordable financing options.
- Can provide funding to:
 - Develop or revise an NEP CCMP;
 - Implement projects located within an NEP study area that implement a CCMP;
 - Implement projects located within the greater watershed of an NEP that implement a CCMP;
 - Match grants that support eligible projects for the protection or restoration of estuaries (including Section 319 Nonpoint Source Management Program and Section 320 National Estuary Program grants); and
 - Fund any estuary project that meets the criteria of one of the eleven CWSRF eligibilities in Section 603(c) of the Clean Water Act.

FDOT – COUNTY INCENTIVE GRANT PROGRAM

[\(County Incentive Grant Program \(fdot.gov\)\)](#)

- The County Incentive Grant Program (CIGP) was created for the purpose of providing grants to counties, to improve a transportation facility including transit which is located on the State Highway System (SHS) or which relieves traffic congestion on the SHS, per Section 339.2817, Florida Statutes. Such projects may include resurfacing and paving dirt local roads as long as the statutory requirement is clearly met. For example, if an application is received for CIGP funds to pave a dirt road, the justification must indicate how paving the dirt road would relieve congestion on the SHS.

FFWCC DERELICT VESSEL REMOVAL FUNDING

[\(FWC Derelict Vessel Removal Grant Program Guidelines \(myfwc.com\)\)](#)

- The Florida Fish and Wildlife Conservation Commission (FWC), pursuant to sections 206.606 and 823.11, F.S., hereby establishes the Derelict Vessel and At-Risk/Public Nuisance Vessel Removal Grant Program to provide grants to local governments and other political subdivisions of the State for the costs of removal from the waters of this State, storage, destruction, and disposal of derelict vessels and at-risk vessels that have become public nuisances in accordance with paragraph 327.73(1)(aa), Florida Statutes.

APPENDIX C**Focus Area Projects Supplied By Stakeholders**

The Choctawhatchee Bay Estuary Program (CBEP) invited its stakeholders (including members of the Technical Advisory Committee) to submit ideas for projects known about, planned, wished for, and/or currently underway/completed relevant to the five Focus Areas detailed in the Comprehensive Conservation and Management Plan

(CCMP). The request provided an easy, fillable pdf file to submit one project at a time, an excel spreadsheet to submit multiple projects, and a projects list purpose and instructions. The submitted projects were collated and are provided on the following pages, in tabular form, grouped by Focus Area.

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Focus Area: Water Quality and Quantity			
Al Power	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS
Choctawhatchee River - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Dirt to Pave	Improve water quality	Planning	Geneva Road & Bridge Dept
Dowling Branch - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Duke Field South of Range Road 213 Gully Repair	Improve water quality by addressing stormwater runoff	Bid Award Construction December 2023; Completion April 2024	US Air Force; Three Rivers RC&D Council, Inc.
Flat Creek - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Holley Mill Creek - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Hurricane Creek - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Mattie Kelly Drainage Outfall	Decrease flood risk; Decrease sedimentation; Improve drainage flows; Improves wetland water quality and habitat via more stable and predictable environment.	Seeking Funding	City of Destin
Monthly Water Quality Monitoring	Ongoing assessment of baseline physical and chemical water quality parameters (20+ year dataset)	Ongoing	CBA

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Pates Creek - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Pea River - Geneva County 319 Project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Pine Log Branch - Geneva County 319 project	Restoration to improve water quality	Planning	Choctawhatchee, Pea, and Yellow Rivers Watershed Management Authority
Project 2	Improve water quality by addressing stormwater runoff	Design	FDEP
Quick Response Red Tide Monitoring	Provides rapid results on the presence of Red Tide in areas of reported concern	Ongoing	CBA/FWC
Range Road 420 Bridge Replacement	Improve water quality by addressing stormwater runoff	Ongoing; Construction Completion December 2023	US Air Force; Three Rivers RC&D Council, Inc.
Real-time Data Logging Network	Real-time water quality information to inform more robust analysis of water quality characteristics	Proposed	CBA
Simmons Property	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS
Stormwater Outfall WQ Improvement through Introduction of Seagrass	Stormwater runoff treatment, stormwater outfall improvement	August 2023-December 2027	CBA
Thompson Farm	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS
Tucker Property	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Water Quality Portal/Dashboard	Provides interactive data visualization and water quality information	Ongoing	CBA
White Point Recreation Area, Choctawhatchee Bay	Improve water quality by addressing stormwater runoff	Ongoing; Construction Completion November 2023	US Air Force
Williams Property CR 71	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS
Williams Property CR 31	Streambank restoration to improve water quality	Planning	Geneva Co Engineers Office, Geneva NRCS
Focus Area: Habitat Protection and Management			
Name	Objective/Benefit	Project Status	Project Lead
Apalachicola Regional Stewardship Alliance and Ecosystem Restoration Team	Ecosystem restoration and maintenance across the eastern Florida panhandle	Ongoing	The Nature Conservancy
Blue Springs Tributary Steephead Stabilization	Upland Erosion Control, Sediment Reduction	Survey/Design/Permit Application Fall 2024	US Air Force; Three Rivers RC&D Council, Inc.
Choctawhatchee Bay Estuary Program Landscape Land Protection	Protection of important natural resources and natural areas, especially those that are part of the Florida Wildlife Corridor and those that provide other key ecological and wildlife habitat connections.	Ongoing	Florida Forever (FDEP) and Alabama Forever Wild (ALDCNR)
CR107 Culvert Replacement	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
CR16 Culvert Replacement	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
CR21. Culvert Replacement	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
CR55 Culvert Replacement	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
CR81 Culvert Replacement	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
Davis Branch (Tributary to Alaqua Creek) Stream Restoration	Upland Erosion Control, Floodplain Reconnection, Fish & Aquatic Passage	Survey/Design/Permit Application Summer 2024	US Air Force; Three Rivers RC&D Council, Inc.
Dune Lake Invasive Plant Removal	Restore native plant habitat and ecosystem functions	Ongoing	CBA, Walton Co.
Eglin Living Shorelines	Habitat Restoration, Erosion Control, Water Filtration	Planning and Design	CBA
Eldredge Park Living Shorelines	Habitat Restoration, Erosion Control, Water Filtration	Planning	CBA
Forest and Lakes Ecosystem Florida Forever Project	The property provides important surface water protection and a high volume of aquifer recharge. The wetlands resources are in near-pristine conditions, and include rare sandhill lakes, blackwater streams, seepage springs, seepage slopes, springs, and spring runs. Many species of animals – invertebrates and vertebrates- have been reported and are known to occur on the project. More than 40 imperiled species of plants were identified by FNAI.	Ongoing	Florida Department of Environmental Protection – Division of State Lands
Grassy Cove Living Shoreline	Habitat Restoration, Oyster Recruitment, Coastal Resilience	Application Spring 2024; Award Fall 2024; Planting Spring 2025	US Air Force; Three Rivers RC&D Council, Inc.
Gulf Coastal Plain Ecosystem Partnership (GCPEP) Ecosystem Support Team (EST) Invasive Species Control	Provide support for control of invasive species on partner lands and with other landowners and local governments within the Choctawhatchee Bay Watershed. Problematic species include cogon grass, Chinese tallow tree, Japanese climbing fern, mimosa, Chinese privet, and calorie pear.	Ongoing	The Longleaf Alliance
Gulf Coastal Plain Ecosystem Partnership (GCPEP) Ecosystem Support Team (EST) Prescribed Fire Implementation	Provide support for implementation of prescribed fire which is a driver of longleaf ecosystem health. Prescribed fire is used for both habitat management and restoration.	Ongoing	The Longleaf Alliance

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Highway 98 Living Shoreline	Habitat Restoration, Erosion Control, Water Filtration	Planning	Okaloosa Co., CBA
Homeowner Living Shorelines	Habitat Restoration, Erosion Control, Water Filtration	Completed 2009-2023	CBA
Live Oak Point Living Shoreline	Habitat Restoration, Erosion Control, Water Filtration	Estimated Completion Date: September 2024	CBA
Living Shoreline Suitability Model	Inform decision-making and prioritization of living shoreline projects	Completed 2023	CBA
Oyster Gardening	Outreach, involvement, water filtration	Ongoing	CBA
Oyster Habitat Suitability Model for All Tidal Shorelines in Choctawhatchee Bay	The "Choctawhatchee Bay Oyster Habitat Suitability Model" and associated web-viewer was created to provide state, federal, and non-governmental natural resource managers, with a readily available online source to assist the user to successfully evaluate oyster (<i>Crassostrea virginica</i>) site suitability for specific locations in Choctawhatchee Bay, Florida	Completed June 2023	Troy University
Oyster Shell Recycling	Reduce oyster shells in landfills and source materials for restoration	Completed 2023	Walton County
Project 2	Wetland Restoration	Design	FDEP/Walton County
Public Living Shorelines	Habitat Restoration, Erosion Control, Water Filtration	Completed 2009-2023	CBA
RC Collins Rd	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Recovery of Rare Species	Provide support for recovery of rare species and their habitats through habitat restoration and/or captive rearing, including red-cockaded woodpecker, gopher tortoise, reticulated flatwoods salamander, northern bobwhite quail, Bachman's sparrow, and eastern indigo snake	Ongoing	USFWS, FWC, Alabama Department of Conservation and Natural Resources
Recovery Plan Delisting Okaloosa Darter from Endangered Species List	Restoration of a floodplains & wetland provided a net conservation benefit to water quality and wildlife habitat	Delisting Effective June 2023	US Air Force, US Fish & Wildlife Service, Three Rivers RC&D Council, Inc.
Seagrass Monitoring	Annual assessment of seagrass diversity and abundance	Ongoing	CBA
Stephenson Rd	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
Stormwater Outfall WQ Improvement through Introduction of Seagrass	Stormwater runoff treatment, stormwater outfall improvement	August 2023 - December 2027	CBA
Sub-Tidal Reefs	Restoration of Habitat and Ecosystem Services	Planning	CBA, Walton Co.
Tillman Rd	Restore passage for the anadromous Gulf sturgeon	Design	Geneva Co Road & Bridge Dept
Turkey Creek Range Road 639 Decommission Range Road 637 Improvements	Upland Erosion Control, Sediment Reduction, Stormwater Improvements	Survey/Design/Permit Application Spring 2025	US Air Force; Three Rivers RC&D Council, Inc.
Middle Rocky Creek Bridge Replacement (NPS 130X) Eglin AFB Range Road 420	Habitat improvement for the federal-listed Okaloosa darter (<i>Etheostoma okaloosae</i>) by removing 67 foot creosote timber bridge	Completion November 2023	US Air Force
Focus Area: Land Use Planning and Management			
Project 2	Setback from key resource	Expected Completion 2025	CBEP

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Focus Area: Resiliency			
City of Destin Vulnerability Study	Vulnerability Study for the City of Destin to assess existing deficiencies and identify projects to decrease identified community risks.	Seeking Funding and Partners	City of Destin
Destin Harbor USACE Channel Dredging	Improve navigability of channel.	Seeking Funding	City of Destin, USACE
Four Prong Lake Outfall Improvement/Extension	Reduce flood risk to homeowners abutting Four Prong Lake	Seeking Funding	City of Destin
Nature-based Infrastructure Materials Center	Increase local capacity by building a central staging and production location for oyster shell, limestone, and plants to be used in nature-based infrastructure projects in the watershed	Proposed	CBA
Project 2	Vulnerability assessment	Expected Completion 2025	Okaloosa County
Sylvania Heights Stormwater Flooding Mitigation	Alleviate 40+ years of residential flooding, which has been repeatedly studied but never addressed. During heavy rainstorms, many one-way streets are impassible, blocking both residential and emergency vehicle ingress or egress.	Proposed	Okaloosa County Public Works
Focus Area: Outreach and Education			
All In Pollution Prevention Campaign	Monofilament recycling, cigarette-butt removal, and beach clean-ups to prevent pollution from entering our waterways	Ongoing	CBA
Boats Signage Program	Reduce scarring to seagrasses	Design	CBA and others
Business/Citizen Styrofoam Education	Reduction of litter (Styrofoam) in the watershed	Suggested by Citizens Advisory	CBEP
City of Destin Stormwater/Floodplain Education & Outreach Program	Provide the community with a better understanding of current and future flood plain maps, and the associated construction regulations.	Seeking Funding	City of Destin
Community Engagement and Recreational Opportunities	Facilitates awareness, understanding, connection, and ultimately stewardship of our natural resources - citizens have a vested interest when they are involved	Ongoing	CBEP

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Community Outreach for Water Based Behavioral Changes	Educational materials and campaigns with local communities raise awareness about the significance of water conservation and encouraging individuals to adopt more sustainable water-related behaviors.	Ongoing	CBEP
Condominium / Rental Unit Educational Signage	Educational conservation signage for beach rental units can play a crucial role in raising awareness about environmental issues and promoting responsible beachgoer behavior.	Design	CBEP
Connecting our Waters to People	Slogan explains the connection of our waterways to the people. Need E&O to continue this connection. Primarily it is through events and opportunities to teach the public of all ages the importance of access to fresh water.	Design	CBEP
Dune Lake Education	Annual educational tours to share information on the importance of Dune Lakes in our watershed	Ongoing/ Annual	UF/IFAS Florida Sea Grant
Dunes in Schools Middle School Education Program	Increase environmental literacy about dune lake and barrier island habitats in grades 6-8 and foster the next generation of water stewards through hands-on activities and science lessons	Transitioning Delivery Model	CBA
Education & Outreach Regarding Living Shoreline	Increase interest/involvement in living shorelines which counter shoreline erosion	Ongoing	CBEP
Education of the planned Shoal River Ranch Water Reclamation Facility" (SRRWRF)	Protecting local waterways and natural resources from nutrient loading in our waterbodies. Citizens can learn about the benefits of public sewer treatment plants vs. septic tank	Ongoing	Okaloosa County
Entering the Choctawhatchee Bay Waterway Signage	Encouragement to public to enjoy the waterway responsibly	Design	CBEP
Fill Your Holes Stickers on Shovels	Program would provide stores with stickers to attach on their products (shovels, beach sand toys, etc.) that educates people on the need to protect beach animals (primarily sea turtles, but benefits others as well).	Design	CBEP

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Florida Master Naturalist Program Training	Annual training on freshwater, uplands, and coastal ecosystems to prepare attendees to better understand, appreciate and advocate for the environment.	Ongoing/ Annual	UF/IFAS Florida Sea Grant
Florida Oyster Breeding and Germplasm Cryopreservation	Collection of native Choctawhatchee Bay oysters to preserve germplasm for potential restoration work	Collection Fall 2023	UF/IFAS Florida Sea Grant
Freshwater Frenzy	Increase environmental literacy about freshwater ecosystems (e.g., springs, rivers, wetlands) and water quality in fifth grade and foster the next generation of water stewards through hands-on activities and science lessons	In Development	CBA
Grasses in Classes Elementary Education Program	Increase environmental literacy about the Choctawhatchee Bay in 3rd and 5th grades and foster the next generation of water stewards through hands-on activities and science lessons	Ongoing (reaching approximately 2000 students annually)	CBA
Green School Program	Certifying Green sustainable schools through student participation, including giving them the criteria to do the assessments by K-12 curriculum	Design	CBEP
Green Hotel Lodging Certification Program	Designates and recognizes lodging facilities that make a commitment to conserve and protect Florida's natural resources through the Florida Green Lodging Program. Environmental guidelines allow the hospitality industry to evaluate its operations, set goals and take specific actions to continuously improve environmental performance.	Design	CBEP
Informal Education Programs	Increase environmental literacy about waterways and foster the next generation of water stewards through hands-on activities and science lessons	Ongoing	CBA
Microplastics Sampling	Citizen Science project documenting the presence of microplastics in local waters	Ongoing	Florida Sea Grant
Nitrogen Fertilizer Education	Know your nutrients: Fertilize responsibly and know how to protect our Bay, springs, lakes and rivers	Suggested by Citizens Advisory	CBEP
Oyster/Living Shoreline Suitability Project	Evaluation of current and potential locations for oyster reefs or living shoreline deployment.	2023	Walton County

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Place Sea Level Rise (SLR)	Civic engagement to discuss local SLR issues	45527	Walton County
Planting One Tree at a Time	The intent of this project is to get the community and/or school aged children engaged in the planting of native trees in community areas while teaching them about the importance of trees to our environment, other species, water quality, water quantity, and weather.	Anticipated Fall 2024	Earth Ethics
Private Lands Outreach, Education and Technical Assistance	Provide outreach, education and technical support to private landowners in support of establishment and management of longleaf pine and recovery of the longleaf ecosystem.	Ongoing	The Longleaf Alliance
Project 2	K-12 WQ curriculum	2024 School Year	CBEP
Restaurant Waterways Friendly Certification Program	Encouraging restaurants to green their operations through science-based certification standards. Through E&O to restaurants they can certify their establishment to become more environmentally sustainable in Energy, Water, Waste, Food, Chemicals, Disposables, & Building design.	Design	CBEP
Scars Hurt Seagrass Awareness Campaign	Promote seagrass-aware boating	Launching 2023	CBA, Okaloosa Co., Walton Co., UFIFAS, CBEP
SeaCoast Collegiate High School Estuary Curriculum.	Develop curriculum for grades 9 -12 similar to CBA's "Grasses in Classes" to foster awareness of the threats surrounding our natural resources.	Proposed	CBEP
SECOORA Water Level Monitoring	Installation of water level (and other parameters) monitoring in flood prone areas to provide data for local use.	Ongoing (May 2023-July 2024)	Florida Sea Grant
SHOALS Highschool Education Program	Increase environmental literacy about seagrass and oyster habitats in grades 9-12 and foster the next generation of water stewards through hands-on activities and science lessons	Ongoing	CBA

Stakeholder identified potential projects by Focus Area.			
Name	Objective/Benefit	Project Status	Project Lead
Stormwater Management in a Changing Florida Panhandle Workshop	Bring the latest research based information on stormwater management from the University to the counties/region	Ongoing/ Annual	UF/IFAS Florida Sea Grant
TEACH - Teen Environmental Action & Community Heroes	Development of environmental action for young adults through the school districts or towns primarily for 8th - 12th grades & college	Ongoing	CBEP
Unified Messaging Campaign	Unified messaging about the importance of the watershed to increase public awareness and stewardship	Proposed	CBEP/CBA
Water Education to Okaloosa Youth Leadership Council	Raising awareness about water conservation, environmental stewardship, and sustainable practices among young people. Such a council can play a pivotal role in educating and inspiring the youth to take an active role in addressing water-related challenges.	Design	CBEP
Water Quality Portal/Dashboard	Provides interactive data visualization and water quality information	Ongoing	CBA
Watershed Game Training	Training for educators to utilize the Watershed Game developed at Minnesota Sea Grant to educate the public and decision makers about multiple aspects of the watershed.	Fall 2023	Florida Sea Grant

APPENDIX D

List of Outreach Events

Section 8 of the CCMP provided a summary of public participation in the CCMP development process. This appendix provides a list of education and outreach events, as well as meeting dates for various committees, for the period April 2022 through October 2023.

APRIL 2022

- Event – “Earth Day Fort Walton Beach” at The Landing April 23, 2022 (exhibit table)
- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting

MAY 2022

- Meeting – Alabama’s Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority
- Meeting – Technical Advisory Meeting (TAC)
- Stakeholder outreach & engagement
 - Okaloosa STEM Academy
 - Doolittle Institute
 - NaGISA Foundation at Niceville High School
 - Okaloosa County Schools Science teacher director
 - Okaloosa County Recycling Advisory Committee

JUNE 2022

- Meeting – Citizens Advisory Meeting (CAC)
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Explore Northwest Florida and stakeholder connection outreach
 - VISIT Florida
 - Leave No Trace
- Meeting & Collaboration – Choctawhatchee Basin Alliance (CBA)
 - Planning for 12-month strategic plan for unique partnership
- Event – Emerald Coast Science Center and stakeholder connection outreach
 - Florida Trail Association
 - Doolittle Institute
- Event – BSA Summer Camp Education & Outreach
 - Big Lagoon State Park
 - Escambia County Environmental Dept
- Event – Camp Timpooshee Marine Science Camp education & outreach

- Stakeholder outreach & partnership – Destin-Fort Walton Beach Convention Center

JULY 2022

- Meeting – Education & Outreach Committee (EOC)
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – CBEC Board meeting in Bonifay
- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Event - Emerald Coast Science Center and stakeholder connection outreach
 - Florida Trail Association
 - BitWizards
- Outreach – Social Media campaign started
 - Facebook
 - Instagram
 - You Tube channel created

AUG 2022

- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Citizens Advisory Meeting (CAC)
- Development of Education & Outreach Plan (deliverable for RESTORE Grant)
- Event – Emerald Coast Science Center and stakeholder connection outreach
 - Florida Trail Association
- Stakeholder outreach & engagement (and raffle prizes)
 - SharkQuest Dive shop
 - Saltwater Restaurants
 - kROCK Radio station
 - Nonies Ark Animals
 - Ft Walton Beach Chamber of Commerce

SEPT 2022

- Meeting – Greater Sylvania Heights Community Stakeholders
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Tri-County Community Partnership Initiative (TCPI)
- Event – Alabama Watershed Stewards Workshop Presentation in, Enterprise, Alabama
- Event – NWFL Communications Summit conference and stakeholder outreach

- Event – Choctawhatchee Bay Family-FUN-Fest – “Your Passport to the Bay”
 - Outreach to 159 people
 - 10 Community Partners participation in event
 - Family & children Activities provided and raffle prizes from area business
 - Ocean Strike Team Lionfish Hunters
 - Florida Greenways & Trails Council appointment requested from State Representative Pat Maney (FL)
- Public Education – development of infographics to highlight Choctawhatchee Bay Estuary Program

OCT 2022

- Meeting – NOAA Grant for Sylvania Heights/ Gap Creek residents
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Citizens Advisory Meeting (CAC)
- Meeting – Ft Walton Beach Chamber of Commerce director, Ted Corcoran
- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Meeting – Escambia County IFAS – Green Stormwater infrastructure Design and Outreach course
- Event – FWB Sailing Club Presentation & Outreach Presentation
- Stakeholder outreach & collaboration
 - Pensacola & Perdido Bays Estuary Program (PPBEP)
 - St Andrews/St Joe EP
 - Okaloosa Academy school
 - Okaloosa County Coastal Resources
 - Audubon Society
 - Oyster Farmers Co-op & restoration
 - FWB Sailing Club
 - Muscogee Tribe

NOV 2022

- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Education & Outreach Committee (EOC)
- Event – Okaloosa County Environmental Council stakeholder outreach Presentation
- Event – Ft Walton Beach Homeschooling presentation & outreach
- Event – Emerald Coast Big Game Fisherman’s Club Presentation
- Event – Half Shells on the Harbor hosted by Harbor Walk in Destin
 - Survey done with public on 4 questions (see attached)
- Public Education – Deer Lake State Park wetlands

- restoration tour in Walton County
- Stakeholder outreach & collaboration
 - Destin Library Guild
 - Saneka’s Legacy – planting the seeds of change through native plants
 - Niceville Chamber of Commerce
 - S.E.A. (Safety, Environment, Activities) nonprofit
 - Collegiate High School
 - NW Florida State College

DEC 2022

- Meeting – Citizens Advisory Meeting (CAC)
- Meeting – Topsail State Park
- Meeting – Keep America Beautiful
- Meeting – UF/IFAS Marine Science Advisory Committee
- Meeting – Destin City Mayor – Bobby Wagner
- Meeting – University of Florida - Optimizing approaches to seagrass scar restoration and prevention
- Event – School Outreach & education with partner - Choctawhatchee Basin Alliance (CBA)
- Event – “Trash Free Waters” boom cleanup event with partner – Pensacola & Perdido Bay
- Event – Freeport Farmers Market
- Stakeholder outreach & collaboration
 - Destin Middle School
 - Pryor Middle School
 - Niceville High School Earth Club
 - Okaloosa STEM Academy Earth Club
 - Keep Okaloosa Beautiful
 - City of Destin
 - Okaloosa Public Works & Recycling department

JAN 2023

- Meeting – Okaloosa Water & Sewer Dept Director
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Education & Outreach Committee (EOC)
- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Meeting – Alabama Water Management Nature-Based Solutions Workshop
- Event – Niceville Kiwanis Club Presentation
 - Rotary Club
- Stakeholder outreach & collaboration
 - Mattie Kelly Environmental Institute
 - Emerald Coast Fishing Club
 - Destin Library
 - Elliott Point Elementary

FEB 2023

- Meeting – IFAS, Walton County Gardening in the Panhandle
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Citizens Advisory Meeting (CAC)
- Meeting – UF/IFAS Bay County Septic 101
- Meeting – UF/IFAS Bay County Septic System Care before & After Storms
- Event – NWFL Assoc of Environ Professionals Presentation
- Stakeholder outreach & collaboration
 - Cox
 - Live Oak Fiber
 - Gulfarium Marine Adventure Park
 - Destin Commons – City Hall
 - Eglin AFB – Jackson Guard
 - Mary Ester Elementary
 - Baker elementary

MAR 2023

- Meeting – Education & Outreach Committee (EOC)
- Meeting – Tier One Media group
- Meeting – UF Barriers and Enablers of Living Shorelines in Florida
- Event – Economic Valuation Study
- Event – Panhandle Estuarine Restoration Team Presentation
- Stakeholder outreach & collaboration
 - Crane Associates
 - Freeport Elementary
 - Choctawhatchee Audubon Society
 - West Defuniak School

APRIL 2023

- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Meeting – Citizens Advisory Meeting (CAC)
- Meeting – 2023 Florida Legislative Update
- Meeting – NAWM Tribal Wetlands, Monitoring and Data Collection for Tribal Lands
- Meeting – Military and Community Partnership Program
- Meeting – National Academies Climate Conversations: Nature-Based Solutions
- Event – Mattie Kelly Estuary Festival
- Event – Walton County Earth Day Townhall
- Event – Destin High School What’s an Estuary Presentation
- Event – Earth Day Clean-up with Okaloosa Island
- Stakeholder outreach & collaboration
 - Kenwood Elementary
 - Emerald Coast Wildlife Refuge
 - Eco-Clean Marine

MAY 2023

- Meeting – American Wetlands Community Outreach Lessons learned
- Meeting – Education & Outreach Committee (EOC)
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – RESTORE Act: Science-Based Solutions for a Changing Gulf
- Event – Lionfish Emerald Coast Open Tournament
 - Lionfish International Divers
 - Bluewater Marina
- Event – Walton County Flood Resilience by PLACE/SLR (Program for Local Adaptation to Climate Effects: Sea-Level Rise)
- Event – Bluewater United Foundation Presentation
- Stakeholder outreach & collaboration
 - Edge Elementary
 - Laurel Hill
 - Eglin Military Spouses Group
 - Hurlburt Military Spouses Group

JUNE 2023

- Meeting – EPA’s Water Infrastructure Planning Tool Can Help Utilities Engage Community & Make Cost-Effective Multi-Benefit Investments
- Meeting – NW Florida Sentinel Landscape 2-day conference
- Meeting – Joint meeting with all the committees (Technical Advisory Meeting (TAC), Education & Outreach Committee (EOC), Citizens Advisory Committee (CAC)
- Meeting – DEP Hurricane Recovery & Preparedness with lessons learned from Hurricane Ivan
- Event – Watershed education & outreach Scouting USA summer camp
- Event – Homeschooling group watershed education Holmes County
- Event – Cinco Bayou Property Shoreline project with Rep. Patt Maney, CBA, and partnerships
- Event – Community Resilience working group focus areas
- Stakeholder outreach & collaboration
 - Dauphin Island Sea Lab
 - Manatee Sightings Network
 - Okaloosa County IFAS

JULY 2023

- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Meeting – Alabama Technical Advisory Meeting (TAC)
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Education & Outreach Committee (EOC)
- Meeting – RESTORE Addressing Research Gaps for Sustainable Oyster Reef Restoration and Recovery

- Meeting – RAE Introducing the Gulf Region Oyster Network
- Meeting – Tracking Nutrient Trends to Emerging HAB Issues via Estuary Data Mapper
- Meeting – EPA Modeling Resilience in Coastal Wetlands
- Meeting – EPA Helping Communities Solve Water Challenges
- Event – Destin Library Garden Club
- Event – Gulf of Mexico Division, Environmental Justice Discussion Group
- Stakeholder outreach & collaboration
 - Innisfree Hotel chain partnership
 - Okaloosa County Schools Advisory Council
 - AJ’s Restaurant on the bayou
 - Brotula’s
 - Paradise Native Plant

AUG 2023

- Meeting – Technical Advisory Meeting (TAC)
- Meeting – Wastewater Pollution Challenges & Nature based solutions
- Meeting – Univ. of Florida Water Ambassador, Working with HOAs on Stormwater Management through the Healthy Ponds Program
- Meeting – Military Installation Resilience Review
- Event – Beach clean-up with Keep Okaloosa Beautiful
- Event – Destin Forward Leadership training
- Event – EPA WaterTA - Helping Communities Solve Water Challenges
- Event – DOD & Eglin AFB Okaloosa Darter Fish delisting
 - Florida Fish & Wildlife
- Stakeholder outreach & collaboration
 - Ocean Hour Okaloosa
 - United Federal Bank
 - Destin Chamber of Commerce
 - Wakulla Environmental Institute
 - Atlanta Botanical Gardens
 - Conexion Media Group
 - Trust for Public Land
 - Flood Defenders Panhandle

SEPT 2023

- Meeting – Authentic Exploration Matters (E&O nonprofit)
- Meeting – Education & Outreach Committee (EOC)
- Meeting – National Academies Climate Conversations for Schools - How to Help K-12 schools Reduce Their Carbon Emissions
- Event – Innisfree Hotel Beach cleanup
- Event – Coca-Cola Innisfree Hotel Beach cleanup
- Event – Native Plants Expo in Paradise
- Event – Women in Science Presentation
- Event – Schools Across the Panhandle Campus Clean-up
- Event – Bay Life Media article published
- Event – South Walton Life Media article published
- Event – Florida Resilience Conference in Ft Lauderdale
- Stakeholder outreach & collaboration
 - Harbor Docks Charities
 - Regions Bank
 - Eglin Federal Credit Union
 - ACE50 media
 - Lulu’s Restaurants
 - Waste Management
 - Heritage Museum
 - City of Valparaiso

OCT 2023

- Meeting – Choctawhatchee Bay Estuary Coalition Board Meeting
- Meeting – Technical Advisory Meeting (TAC)
- Meeting – SeaGrant Climate Smart Floridians Managing Water and Yards
- Event – Destin Seafood Festival
- Event – Walton County Fair (6-days long)
- Event – Choctawhatchee Audubon Veterans Rookery tour
- Stakeholder outreach & collaboration
 - Riverside Elementary
 - Destin Fishing & Heritage Museum
 - Fudpuckers Restaurant
 - Southern Star
 - Destin Parks & Recreation
 - Emerald Coast Fishing Fleet Group
 - Legendary Marina

APPENDIX E

Public Review Comments and Response Matrix

INTRODUCTION

This appendix provides, in tabular form, the list of substantive comments received during the public review period for the Choctawhatchee Bay Estuary Program (CBEP) Comprehensive Conservation and Management Plan (CCMP). In addition to these listed comments, multiple reviewers suggested punctuation, spelling, and other related suggestions. Such comments have been addressed in the revision of the Draft CCMP. The list also includes if/how the comment was addressed during the revision process. You can review this list at www.websiteurlhere.com.