

# **2012 PROGRESS REPORT**

## **for the Bayou Chico Basin Management Action Plan**

*Developed by the  
Watershed Restoration Program  
Division of Environmental Assessment and Restoration  
**Florida Department of Environmental Protection**  
Tallahassee, FL 32399*

*in cooperation with the  
**Stakeholders of the Bayou Chico Basin***

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## LIST OF ACRONYMS AND ABBREVIATIONS

| ACRONYM OR ABBREVIATION | EXPLANATION                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------|
| <b>µmhos/cm</b>         | Micromhos Per Centimeter                                                                   |
| <b>BARC</b>             | Bay Area Resource Council                                                                  |
| <b>BCA</b>              | Bayou Chico Association                                                                    |
| <b>BFA</b>              | Bream Fisherman Association                                                                |
| <b>BMAP</b>             | Basin Management Action Plan                                                               |
| <b>BMP</b>              | Best Management Practice                                                                   |
| <b>CFU</b>              | Colony-Forming Unit                                                                        |
| <b>°C.</b>              | Degrees Centigrade                                                                         |
| <b>Department</b>       | Florida Department of Environmental Protection                                             |
| <b>DO</b>               | Dissolved Oxygen                                                                           |
| <b>ECUA</b>             | Emerald Coast Utility Authority                                                            |
| <b>ECHD</b>             | Escambia County Health Department                                                          |
| <b>F.A.C.</b>           | Florida Administrative Code                                                                |
| <b>FC</b>               | Fecal Coliform                                                                             |
| <b>FDOH</b>             | Florida Department of Health                                                               |
| <b>FDOT</b>             | Florida Department of Transportation                                                       |
| <b>FOG</b>              | Fats, Oils, and Grease                                                                     |
| <b>FQ</b>               | Field Quality                                                                              |
| <b>F.S.</b>             | Florida Statutes                                                                           |
| <b>FWC</b>              | Florida Fish and Wildlife Conservation Commission                                          |
| <b>FWRA</b>             | Florida Watershed Restoration Act                                                          |
| <b>I&amp;I</b>          | Inflow and Infiltration                                                                    |
| <b>MF</b>               | Membrane Filter                                                                            |
| <b>Mg/L</b>             | Milligrams Per Liter                                                                       |
| <b>mL</b>               | Milliliter                                                                                 |
| <b>MPN</b>              | Most Probable Number                                                                       |
| <b>MS4</b>              | Municipal Separate Storm Sewer System                                                      |
| <b>MSWWTP</b>           | Main Street Wastewater Treatment Plant                                                     |
| <b>NPDES</b>            | National Pollutant Discharge Elimination System                                            |
| <b>NWFWMD</b>           | Northwest Florida Water Management District                                                |
| <b>NTU</b>              | Nephelometric Turbidity Units                                                              |
| <b>OSTDS</b>            | Onsite Sewage Treatment and Disposal System                                                |
| <b>ppt</b>              | Parts Per Thousand                                                                         |
| <b>QA</b>               | Quality Assurance                                                                          |
| <b>SSO</b>              | Sanitary Sewer Overflow                                                                    |
| <b>SOP</b>              | Standard Operating Procedure                                                               |
| <b>STORET</b>           | <b>S</b> torage and <b>R</b> etrieval System<br>(operated by USEPA for water quality data) |
| <b>SU</b>               | Standard Unit                                                                              |
| <b>TKN</b>              | Total Kjeldahl Nitrogen                                                                    |
| <b>TMDL</b>             | Total Maximum Daily Load                                                                   |

| ACRONYM OR<br>ABBREVIATION | EXPLANATION                                   |
|----------------------------|-----------------------------------------------|
| <b>TN</b>                  | Total Nitrogen                                |
| <b>TP</b>                  | Total Phosphorus                              |
| <b>USACOE</b>              | United States Army Corps of Engineers         |
| <b>USEPA</b>               | United States Environmental Protection Agency |
| <b>USNAS</b>               | United States Naval Air Station               |
| <b>UWF</b>                 | University of West Florida                    |
| <b>WFRPC</b>               | West Florida Regional Planning Council        |
| <b>WBID</b>                | Waterbody Identification                      |
| <b>WWTP</b>                | Wastewater Treatment Plant                    |

## SUMMARY

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The Bayou Chico Basin Management Action Plan (adopted by Secretarial Order on October 18, 2011) represented current and planned management actions to reduce fecal coliform (FC) pollutant loadings to achieve the Total Maximum Daily Load in the Bayou Chico Basin. Stakeholders included Escambia County, the Escambia County Health Department (ECHD), the city of Pensacola, the Emerald Coast Utility Authority (ECUA), the United States Naval Air Station (USNAS) at Pensacola, the Bayou Chico Association (BCA), and individual businesses, as well as other local and state agencies. All stakeholders have continued or begun to implement projects in the basin to reduce FC loading.

## IMPLEMENTATION OF MANAGEMENT ACTIONS

- *ECUA has made extensive efforts to expand its sanitary sewer system into neighborhoods alongside Bayou Chico that have previously used septic tanks. Escambia County and ECUA have worked together to secure funding for this project from federal, state, and local sources to complete the project (\$7.76 million). Sanitary sewer connections will be available to nearly 1,500 households when the project is complete. Hook-up rates to the ECUA system have averaged greater than 87% across the project phases in both neighborhoods targeted for this effort (with 919 connections made to date and another 449 possible based on recently completed sewer extensions in the Lakewood neighborhood). This effort is supported by a Septic to Sewer Enforcement Program implemented by ECHD. The final phases of these efforts have been completed since BMAP adoption.*
- *The BCA has worked with private marinas, shipyards, and private boat operators to eliminate the discharge of sanitary waste in the basin. Three pump-out facilities have been installed in the basin. Two are at fixed locations and one is a mobile unit. In addition, four marinas have earned a Clean Marina certification (one more is pending), and one shipyard has earned a Clean Boatyard certification.*
- *Escambia County, the city of Pensacola, and the Florida Department of Transportation (FDOT) District 3 have implemented their municipal separate storm sewer system (MS4) programs throughout the basin. The county has also*

*implemented a pet waste ordinance and led many stormwater treatment installation/maintenance projects, as well as stream and wetland restoration projects. These projects will also reduce fecal coliform sources to the basin.*

## **IMPLEMENTATION OF THE BMAP MONITORING PLAN**

The BMAP document outlined a monitoring plan to collect and analyze FC data from across the Bayou Chico Basin. This is a collaborative effort involving Escambia County, ECHD, the University of West Florida (UWF), and the Florida Department of Environmental Protection. The stakeholders initiated the monitoring program in April 2012.

Adjustments were made to the sampling protocols and monitoring stations in spring 2013 following an annual BMAP meeting of stakeholders and other interested parties. Specifically, the following issues were addressed:

- *FC monitoring for all segments with **waterbody identification (WBID)** numbers verified for FC impairments.*
- *Implementation procedures for Tier 2 (source tracking) monitoring.*
- *Field monitoring quality assurance (QA) procedures.*

### ***FC Monitoring***

During 2012, ECHD discontinued monitoring for FC due to the elimination of the FC indicator as a component in the bacterial sampling required by the program; sampling for *Enterococcus* continued as part of its Healthy Beaches Program. As a result, BMAP monitoring for FC was suspended at Sanders Beach during 2012. This elimination of the FC indicator collection at one of the WBIDs identified as impaired in the BMAP (Sanders Beach, WBID 848DA) required the resumption of FC monitoring to determine whether the BMAP restoration strategies were achieving the TMDL target.

As a successful result of the first annual BMAP meeting, the stakeholders and the Department coordinated an effective means by which to reintroduce FC monitoring at the vital Sanders Beach location. Special assistance by the BCA was instrumental in accomplishing this task. FC monitoring resumed in April 2013 as part of sample collection implemented by Escambia County as a component of the BMAP monitoring plan.

### ***Tier 2 (Source Tracking) Monitoring***

Tier 2 monitoring was not implemented during 2012. Procedures for the collection and analysis of Tier 2 samples were refined in spring 2013 for implementation from that point forward.

Escambia County and the Department's Northwest District Office will collect the follow-up sampling and conduct investigation for FC results greater than 5,000 colony-forming units per 100 milliliters (CFU/100mL). ECHD and ECUA will support the investigation when any Tier 2 follow-up samples have an elevated FC count.

### ***Field QA Procedures***

Field QA procedures for sample collection (*i.e.*, the use of sample blanks) were clarified. The Standard Operating Procedure (SOP) for Field Blanks (Field Quality [FQ] 1230 Mandatory Field Quality Controls) will be followed.

The report and its appendices provide additional information on the implementation of management actions and the monitoring plan.

## SECTION 1: INTRODUCTION

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### 1.1 Purpose of the Report

The Bayou Chico Basin Management Action Plan was developed under the requirements of the Florida Watershed Restoration Act (FWRA), Chapter 403.067, Florida Statutes (F.S.). The BMAP outlined a phased implementation approach to implement Total Maximum Daily Loads developed by the Florida Department of Environmental Protection for waterbodies that were verified impaired for fecal coliform (FC).

*Section 8* of the Bayou Chico BMAP, *Assessing Progress and Making Changes* (pages 57–61), identifies the commitment of the Department and stakeholders to organize monitoring data and track project implementation, present the information in an annual report, and meet at least every 12 months. This is the first annual progress report for the Bayou Chico BMAP; it contains information for the period following BMAP adoption (October 18, 2011) through December 31, 2012.

- *Section 2 provides information on the BMAP water quality monitoring plan, data collection throughout the first year, challenges encountered, and adjustments to the monitoring plan for 2013.*
- *Section 3 describes ongoing program and project implementation by the responsible stakeholders in the Bayou Chico Basin, including a status update of management actions.*

The Appendices include additional information on project implementation and monitoring data.

### 1.2 TMDLs in the Bayou Chico Basin

TMDLs established in June 2008 identified the amount of FC that the Bayou Chico Basin waterbodies could receive and still maintain Class III designated uses. Numeric criteria for bacterial quality are expressed in terms of FC bacteria concentrations. The water quality criterion for the protection of Class III waters, as established by Rule 62-302, Florida Administrative Code (F.A.C), states:

***Fecal Coliform Bacteria:***

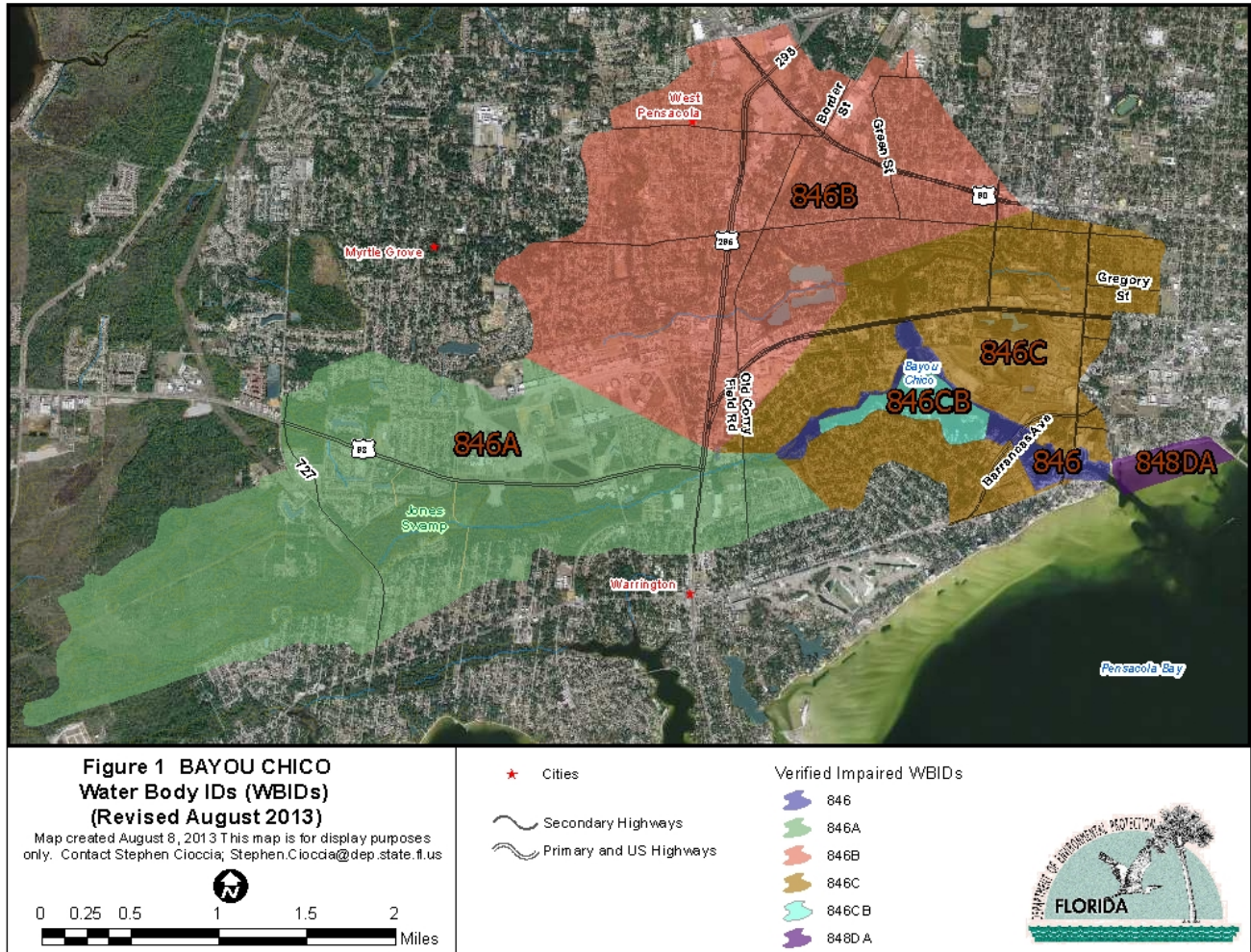
*The most probable number (MPN) of membrane filter (MF) counts (colony forming units – CFU) per 100 milliliter (CFU/100 mL) of FC bacteria shall not exceed a monthly average of 200, nor exceed 400 in 10% of the samples, nor exceed 800 on any one day.*

Section 1.1 of the Bayou Chico BMAP (pages 1–4) discussed water quality standards and TMDLs. In 2008, the Department adopted TMDLs for the following waterbodies (depicted in **Figure 1**), included in the BMAP:

- *Bayou Chico (WBID 846).*
- *Jones Creek (WBID 846A).*
- *Jackson Creek (WBID 846B).*
- *Bayou Chico Beach (WBID 846CB).*
- *Sanders Beach (WBID 848DA).*

The Bayou Chico FC TMDL was calculated using the “not to exceed 400 in 10% of the samples” criterion. The TMDL calculation determined that source loadings (levels) for FC would need to be reduced by 61% to achieve the required TMDL load reduction.

The annual review process documented in this report focuses on evaluating the implementation status of each management action and progress made towards meeting the TMDL load reductions by each of the responsible stakeholders.



**Figure 1. Bayou Chico Segments with Waterbody Identification (WBID) Numbers**

## SECTION 2: WATER QUALITY MONITORING AND TRENDS

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### 2.1 Overview of the BMAP Monitoring Plan

The BMAP monitoring plan included the following objectives:

- **Primary Objective** – *To track implementation efforts and monitor water quality in order to determine additional sources and water quality trends using existing monitoring stations in the basin. There are six monitoring stations with long-term historical data that also coincide with key problem areas, or hot spots, observed in the basin. This Tier 1 monitoring effort will provide critical information to meet the primary objective.*
- **Secondary Objective** – *To conduct more extensive monthly sampling at specific locations where FC counts are historically high and where additional sampling has been proposed. This Tier 2 analysis will target the following areas:*
  - o Probable or suspected loading points previously identified.
  - o Newly suspected spots, especially in the tributaries and creeks, that were not previously sampled. Samples will be taken both during dry and rainy periods to isolate chronic and stormwater influences.

The primary focus of the monitoring plan is to assess the progress towards meeting the TMDL FC targets. Details of the plan, including water quality indicators, are included in *Section 8.2* (page 58) of the Bayou Chico BMAP. **Table 1a** lists the water quality indicators and **Table 1b** lists the field parameters to be sampled as part of the monitoring plan.

**Table 2** lists the six stations monitored as part of the BMAP monitoring plan. Station identification names and numbers in the Bayou Chico Basin have changed since 1996, since the beginning of the period of record for the TMDL through BMAP implementation. **Table 3** lists the current station numbers. **Appendix A** includes an overview of the changes for the six stations included in the BMAP monitoring plan.

**Table 1a. List of Water Quality Indicators**

<sup>1</sup> Nutrients sampled as part of the Department's Strategic Monitoring Plans and municipal separate storm sewer system (MS4) permitting requirements.

| INDICATOR                                       |
|-------------------------------------------------|
| FC (CFU/100mL)                                  |
| <i>Enterococcus</i> (CFU/100mL)                 |
| Total Kjeldahl Nitrogen (TKN) <sup>1</sup>      |
| Total Phosphorus (TP) <sup>1</sup>              |
| Total Nitrogen (TN) <sup>1</sup>                |
| Turbidity (Nephelometric Turbidity Units [NTU]) |

**Table 1b. List of Field Parameters**

| PARAMETER                                           |
|-----------------------------------------------------|
| Air Temperature (°C)                                |
| Cloud Cover                                         |
| Rainfall                                            |
| Wind                                                |
| Tide Stage                                          |
| Canopy Cover                                        |
| Water Flow Condition                                |
| Conductivity (micromhos per centimeter [µmhos/cm])  |
| Dissolved Oxygen (DO) (milligrams per liter [mg/L]) |
| pH (standard units [SU])                            |
| Salinity (parts per thousand [ppt])                 |
| Temperature (°C)                                    |

**Table 2. Stations Included in the Bayou Chico BMAP Monitoring Plan**

| STATION LOCATION                                          | STATION NUMBER | LATITUDE                        | LONGITUDE                        |
|-----------------------------------------------------------|----------------|---------------------------------|----------------------------------|
| Bayou Chico at Navy Boulevard Bridge                      | 3302JE20       | 30° 24' 39.32"<br>(or 30.41092) | 87° 15' 31.74"<br>(or -87.25822) |
| Bayou Chico at "W" Street                                 | 33020JF1       | 30° 24' 54.98"<br>(or 30.41163) | 87° 15' 4.72"<br>(or -87.25147)  |
| Jackson Creek at Old Corry Road                           | 33020221       | 30° 24' 42.8"<br>(or 30.41163)  | 87° 16' 29.85"<br>(or -87.27479) |
| Jones Creek at Old Corry Road                             | 33020118       | 30° 23' 56.84"<br>(or 30.39912) | 87° 16' 24.94"<br>(or -87.27359) |
| Sanders Beach                                             | 33020J10       | 30° 23' 58.04"<br>(or 30.39946) | 87° 14' 15.77"<br>(or -87.23771) |
| Southwest Arm of Bayou Chico –<br>North of Mandalay Drive | 33020JD4       | 30° 24' 15.4"<br>(or 30.4043)   | 87° 15' 31.9"<br>(or -87.2609)   |

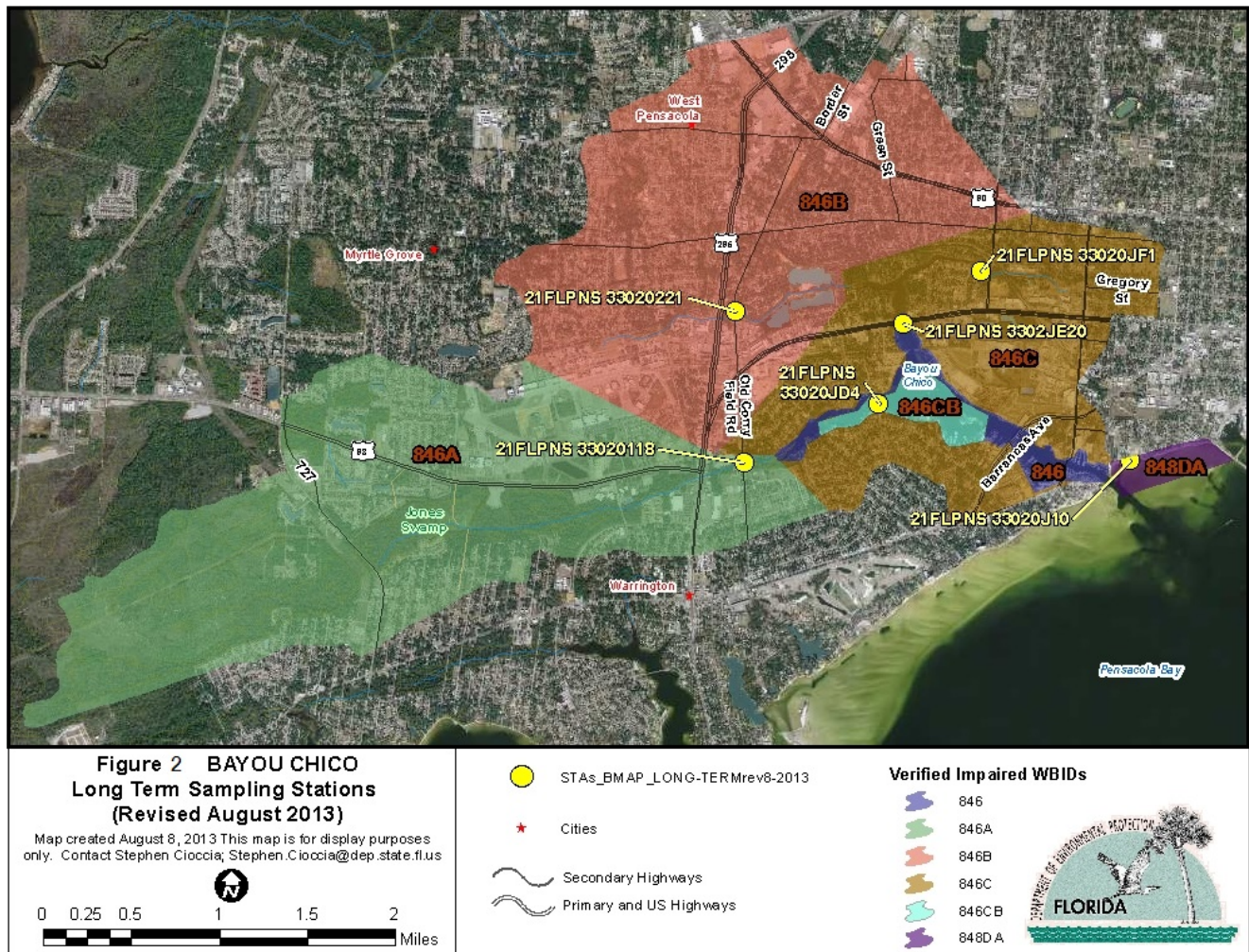
## 2.1 Status of Monitoring Plan Implementation

The monitoring plan is implemented through a partnership of the BMAP stakeholders, as follows:

- *Escambia County conducts monthly ambient sample collection for FC, Enterococcus, and nutrients at five stations. The county laboratory also performs data analysis for nutrients and the follow-up Tier 2 monitoring.*
- *The Escambia County Health Department (ECHD) conducts weekly ambient sample collection for Enterococcus as part of its Healthy Beaches Program at two stations in the Bayou Chico Basin. FC monitoring by ECHD was suspended at these stations during 2012.*
- *The Wetland Research Laboratory at the University of West Florida (UWF) performs the ambient sample analysis for the FC samples collected by Escambia County and the Enterococcus samples collected by ECHD.*
- *The Department's Northwest District (Pensacola) works with Escambia County on sample collection as needed for Tier 2 follow-up sampling and conducts water quality monitoring throughout the district, including quarterly monitoring in Bayou Chico. The Northwest District also processes all samples collected as part of the monitoring plan. The District provides the monitoring containers, ships samples for analysis, enters data into STORET (the **S**torage and **R**etrieval database operated by*

the United States Environmental Protection Agency [USEPA] for water quality data) and conducts quarterly ambient monitoring throughout the Pensacola Basin, including Bayou Chico.

Figure 2 shows the locations of the six stations sampled during 2012. Escambia County sampled five stations monthly by for FC, Enterococcus, nutrients, and field parameters. Weekly samples collected by the ECHD for Enterococcus are collected from two locations in the basin: Bayou Chico (Lakewood Park – near Station 33020JD4 in WBID 846CB) and Sanders Beach (near Station 33020J10 in WBID 848DA). **Figure 2** also shows the location of the Sanders Beach monitoring station. All data are uploaded into STORET.



**Figure 2. Escambia County Monitoring Stations for FC and Nutrients**

During 2013, several changes will be made in coordinating and implementing the monitoring plan for the Bayou Chico Basin, as follows:

– *Sanders Beach FC Monitoring:*

- o Escambia County will add monthly sample collection at Sanders Beach (Station 33020J10 in WBID 848DA) for FC and nutrients.
- o ECHD will continue its weekly monitoring for *Enterococcus* at Sanders Beach and Bayou Chico (near Lakewood Park) as part of its Healthy Beaches Program.
- o This modification was made to include FC sampling for Sanders Beach (one of the WBIDs verified as impaired for FC).
- o Continued FC data collection is necessary to determine if the WBID is still impaired.

– *Tier 2 Monitoring (**Appendix B** includes additional details):*

- o Procedures for implementing Tier 2 (physical source tracking) monitoring were refined for monitoring starting in 2013.
- o Escambia County and the Department's Northwest District Office will collect the follow-up samples and investigate potential sources upon notification by UWF of an FC sample result greater than 5,000 CFU/100mL.
- o The Escambia County laboratory will conduct the sample analysis for the Tier 2 follow-up samples.
- o ECHD and the Emerald Coast Utility Authority (ECUA) will be brought in to support the investigation when any Tier 2 follow-up samples have an elevated FC count.

– *Quality Assurance (QA) Procedures:*

- o QA procedures for sample collection were clarified.
- o Field blanks will be collected quarterly.
- o The Standard Operating Procedure (SOP) for Field Blanks (Field Quality [FQ] 1230 Mandatory Field Quality Controls) will be followed. Details of the

procedure can be found at: <http://www.dep.state.fl.us/water/sas/qa/62-160-drafts.htm>.

### 2.2.1 Progress Towards Implementation Milestones

During 2012, monitoring was conducted from April through December. Escambia County conducted a preliminary data analysis of the 2012 FC data for the 5 stations sampled (**Figure 2**). This information on the monthly ambient FC monitoring was presented during the 2013 Bayou Chico BMAP Annual Meeting. The county also reviewed the data on the percentage of samples at each station that exceeded the 400 CFU/100mL standard (summarized in **Figure 3**, which was prepared by Escambia County and presented at the 2013 Bayou Chico Annual Meeting). The figure illustrates the percentage of samples at each of the 5 FC monitoring sites that exceeded the state standard (not more than a 10% exceedance of 400 CFU/100mL) used for the TMDL. Individual stations varied from nearly 30% to more than a 50% exceedance of that standard. Across all stations, 40% of the 45 samples exceeded the standard.

FC impairments were observed at all stations during 2012, although the severity and the frequency of the exceedances varied from station to station. **Table 3** presents the range of FC counts at each station and the number of times each FC standard was exceeded. Grab samples were taken from April to December at each location (nine samples each). No Tier 2 follow-up sampling was conducted—although had the procedure been in place, Tier 2 monitoring would have been warranted at two stations (Bayou Chico at “W” Street and Jackson Creek at Old Corry Road). Data are not included for Sanders Beach. No FC samples were collected at that station during 2012, although weekly samples were collected for *Enterococcus*.

**Appendix B** includes the full dataset, including nutrient and field parameter data. The appendix also includes the dataset for data collected during 2012 by ECHD at Sanders Beach and in Bayou Chico (near Lakewood Park) for *Enterococcus*.

Monitoring will continue throughout BMAP implementation. Data will be presented annually in future BMAP annual reports. A trend analysis will be conducted in Year 4 of BMAP implementation.

Due to data gaps from 2009 to the resumption of monitoring in 2012, it was not possible to analyze trends for this report. The 2012 annualized data are presented as a snapshot of the current conditions. A further analysis of trends will be possible as part of future annual reports as additional data are collected.

Appendix C summarizes the different monitoring stations (and identification numbers) used in the Bayou Chico Basin since 1995. Several station identification numbers have changed even though the location has remained the same. This cross-walk is provided to facilitate data retrieval from STORET for long-term data trend analysis as part of future annual reports.

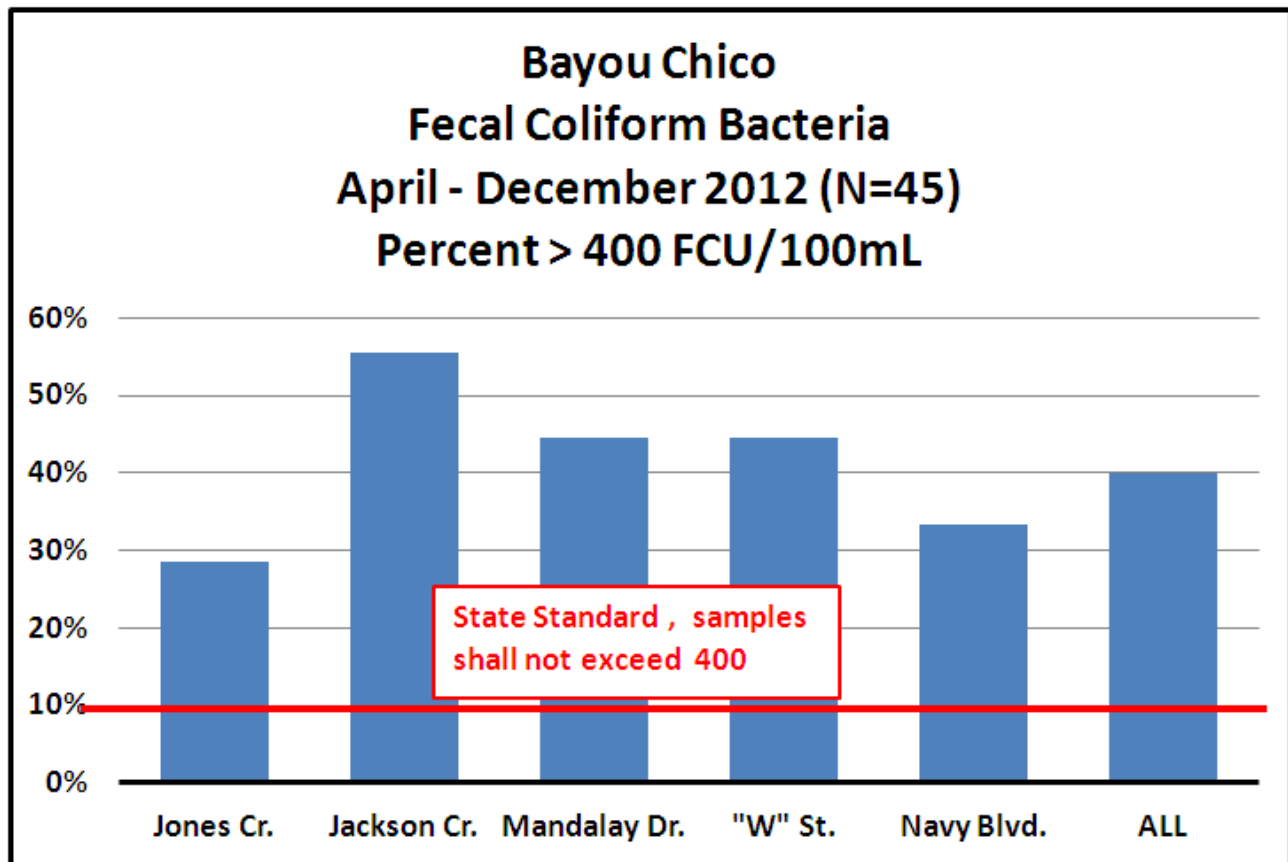


Figure 3. Escambia County FC Monitoring Data – Bayou Chico 2012

**Table 3: 2012 FC Monitoring Results in the Bayou Chico Basin**

<sup>1</sup> Monthly grab samples taken from April to December 2012.

<sup>2</sup> No FC samples were collected at Sanders Beach during 2012.

- = Empty cell/no data

| STATION LOCATION                                     | ANNUAL RANGE OF FC (CFU/100mL) <sup>1</sup> | ANNUAL AVERAGE FC (CFU/100mL) <sup>1</sup> | % OF FC SAMPLES EXCEEDING 400 CFU 100/mL <sup>1</sup> | NUMBER OF SAMPLES EXCEEDING 800 CFU/100mL |
|------------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|-------------------------------------------|
| Bayou Chico at Navy Blvd. Bridge                     | 46 – 2,000                                  | 414                                        | 33%                                                   | 0 of 9                                    |
| Bayou Chico at “W” St.                               | 18 – 10,800                                 | 1,577                                      | 44%                                                   | 1 of 9 (December)                         |
| Jackson Creek at Old Corry Rd.                       | 208 – 6,000                                 | 1,580                                      | 56%                                                   | 1 of 9 (December)                         |
| Jones Creek at Old Corry Rd.                         | 60 – 600                                    | 283                                        | 22%                                                   | 0 of 9                                    |
| Sanders Beach <sup>2</sup>                           | -                                           | -                                          | -                                                     | -                                         |
| Southwest Arm of Bayou Chico – North of Mandalay Dr. | 1 – 780                                     | 322                                        | 44%                                                   | 0 of 9                                    |

### SECTION 3: BMAP PROJECT IMPLEMENTATION STATUS

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The Bayou Chico BMAP is implemented by individual organizations as well as partnerships between those organizations. The level of cooperation and collaboration across the stakeholders in the basin is one of the distinguishing characteristics of this BMAP and the stakeholders. For many years, these stakeholders have worked to improve water quality in Bayou Chico. Specifically relevant to the Bayou Chico BMAP, since 2006 the stakeholders have implemented programs and projects to reduce FC loading to the bayou and address the impairments.

BMAP project stakeholders include the entities listed in **Table 4**. Partnerships responsible for projects included in the BMAP are indicated.

Local efforts to address water quality issues in Bayou Chico have been under way for many years. The Bayou Chico BMAP identified 74 projects to be implemented by the BMAP partners. Financial data for the projects is incomplete because many were implemented by private entities or were funded as part of larger efforts. However, an investment of \$19.69 million was projected for 34% of the projects. Of that, \$15.75 million is associated with projects completed as of December 31, 2012.

As of that date, 41 of the 74 projects had been completed, with 33 in some phase of implementation. Many are ongoing programs such as the MS4 Program implemented by Escambia County, the city of Pensacola, and FDOT District 3 in the basin. The MS4 program is implemented under the National Pollutant Discharge Elimination System (NPDES) permit program administered by the Department's NPDES Stormwater Program.

The following tables highlight the completed and ongoing projects that are likely to have the greatest impact on reducing or eliminating FC sources in the basin:

- **Table 5a:** *Marine waste handling improvements/Clean Marina and Boatyard Programs.*
- **Table 5b:** *Sanitary sewer extension and system upgrades or repairs.*
- **Table 5c:** *Stormwater-related projects, including source control programs, and MS4 program implementation.*

- **Table 5d:** Other projects (including stream and wetland restoration or sampling efforts).

**Table 4. Bayou Chico BMAP Lead Project Stakeholders and Partners**

- = Empty cell/no data

| ORGANIZATION                                            | PRIMARY PROJECT TYPES                                                                                                                                                                                                                          | PARTNERS                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bay Area Resource Council (BARC)                        | Public outreach                                                                                                                                                                                                                                | Bayou Chico Association (BCA)                                                                                                                                                                                                                                                           |
| BCA                                                     | Barge clean-up efforts<br>Clean Marina and Boatyard Programs<br>Oyster reef establishment<br>Public outreach                                                                                                                                   | Private Marinas<br>BARC                                                                                                                                                                                                                                                                 |
| City of Pensacola                                       | Stormwater program implementation<br>Stormwater system upgrades/repairs<br>Stormwater treatment installation<br>Pet waste reduction                                                                                                            | Escambia County<br>USEPA                                                                                                                                                                                                                                                                |
| ECUA                                                    | Sanitary sewer system expansion<br>Sewer system upgrades/repairs                                                                                                                                                                               | Department<br>Escambia County<br>Florida Department of Health (FDOH)                                                                                                                                                                                                                    |
| Escambia County                                         | Bayou Chico dredging<br>Sanitary sewer system upgrades/repairs<br>Stormwater program implementation<br>Stormwater system upgrades/repairs<br>Stormwater treatment installation<br>Pet waste reduction<br>Public outreach<br>Stream restoration | BARC<br>City of Pensacola<br>ECUA<br>Florida Department of Transportation (FDOT)<br>District 3<br>Gulf Plain Ecosystem Partnership<br>Northwest Florida Water Management District (NFWFMD)<br>United States Army Corps of Engineers (USACOE)<br>United States Naval Air Station (USNAS) |
| ECHD                                                    | Septic tank inspection/testing<br>Septic tank permitting and regulation                                                                                                                                                                        | -                                                                                                                                                                                                                                                                                       |
| FDOT – District 3                                       | Stormwater program implementation<br>Roadway projects with structural stormwater best management practices (BMPs)                                                                                                                              | City of Pensacola<br>Escambia County                                                                                                                                                                                                                                                    |
| Florida Fish and Wildlife Conservation Commission (FWC) | Live-aboard vessel compliance                                                                                                                                                                                                                  | -                                                                                                                                                                                                                                                                                       |

All of the projects are listed in the appendices: **Appendix D** provides a list of *completed* projects and **Appendix E** provides a list of *ongoing* projects. The estimated cost of the 74 projects included in the Bayou Chico BMAP is more than \$19,685,981. This investment represents the cost estimates provided by the BMAP partners for 34% of the projects included in the BMAP. As of December 31, 2012, the BMAP partners had completed 41 projects with a value of \$15,746,846. The remaining 33 projects are in some phase of implementation ranging from planning to construction;

some are ongoing programs such as the local MS4 and Sanitary Sewer Overflow (SSO) Overflow Response Programs.

**Table 5a** demonstrates the commitment of the boating community to eliminate sewage discharges in the Bayou Chico basin through the development of a network of pump-out facilities and implementation of clean boatyard practices.

**Table 5a. Marine Waste Handling Improvements/Clean Marina and Boatyard Programs**

- = Empty cell/no data

| PROJECT NAME/DESCRIPTION                                            | RESPONSIBLE ENTITY               | WBID | STATUS<br>12/31/12 | PROJECT<br>COST |
|---------------------------------------------------------------------|----------------------------------|------|--------------------|-----------------|
| Clean Marina Certification                                          | Harbor View Marina<br>with BCA   | 846C | Completed          | -               |
| Clean Marina Certification                                          | Island Cove Marina<br>with BCA   | 846C | Completed          | -               |
| Clean Marina Certification                                          | Palm Harbor Marina<br>with BCA   | 846C | Completed          | -               |
| Clean Marina Certification                                          | Bahia Mar Marina<br>with BCA     | 846C | Completed          | -               |
| Clean Marina Certification                                          | Pensacola Yacht Club<br>with BCA | 846C | In process         | -               |
| Clean Boatyard Certification                                        | Pensacola Ship Yard<br>with BCA  | 846C | Completed          | -               |
| Pump-out Facilities (two fixed and one<br>mobile unit in the bayou) | BCA                              | 846  | Completed          | -               |

**Table 5b** highlights the sanitary sewer extensions and system upgrades or repairs implemented in the Bayou Chico basin. ECUA, FDOH, ECHD, and Escambia County have invested considerable resources and efforts to convert 2 neighborhoods on the shores of the bayou from septic tanks to centralized sanitary sewer. As of December 31, 2012, more than 1,300 septic tanks connections had been made available in the Edgewater and Lakewood neighborhoods. As of August 2013, more than 919 connections had been made, with 449 possible in the recently completed final phases (IV, V, and VI) of the Lakewood project.

The effort has had an exceptional connection rate (greater than 87%) for Edgewater Phases I and II and Lakewood Phases I, II, and III due to ECUA's efforts and the support of ECHD's enforcement program. Lakewood Phases V and VI have a connection rate of 40% to date. Lakewood Phase IV has only recently become available for connection.

ECHD's enforcement program had sent 1,488 notices to connect as of December 31, 2012. After the connection time frame passes, ECHD will escalate the effort and identify septic tank owners who are in noncompliance. As of December 31, 2012, 694 households were still within the connection time frame and 55 were noncompliant. Households still within the connection timeframe include Lakewood Phases V, and VI (connection available as of October 2012) and additional 165 connections that became available in August 2013 in Lakewood Phase IV .

Also of note is the effort by ECUA to relocate its Main Street Wastewater Treatment Plant (MSWWTP) to higher ground in Cantonment and its SSO Response Plan, which is a key component of the Tier 2 (source tracking) monitoring plan to investigate instances of high FC counts for follow-up sample events. The project cost for the MSWWTP relocation has not been included in the total for Bayou Chico BMAP project costs. The relocation benefitted the bayou with collection system infrastructure improvements, but the costs associated with the bayou-specific improvements cannot be separated out of the total cost for the project.

**Table 5c** highlights some of the stormwater program efforts implemented in the basin as part of the MS4 permit held by Escambia County, the city of Pensacola, and FDOT. **Appendices D and E** include additional stormwater treatment installation and maintenance or repair projects. Many public education efforts have also been implemented throughout the basin to educate residents and other members of the public living near or using the recreational facilities on, or near, the bayou.

**Table 5d** highlights some of the wetland and stream restoration projects implemented in the basin that are designed to restore a natural flow regime.

In addition, numerous projects have improved flushing in the basin (*e.g.*, dredging at the mouth of the bayou by Escambia County with the USACOE and the NFWMD, and the FDOT District 3 bridge replacement at U.S. Highway 98 Navy Boulevard, which added stormwater treatment and widened the span across the bayou).

**Appendix D** presents a complete list of *completed* projects. **Appendix E** lists *ongoing* projects. The ongoing projects will be tracked and reported on as part of future annual reports.

**Table 5b. Sanitary Sewer Extensions and System Upgrades or Repairs**

<sup>1</sup> Cost of relocating the MSWWTP is not included in total project costs for the Bayou Chico BMAP. The project benefits the bayou but also the entire area served by ECUA.

- = Empty cell/no data

| PROJECT NAME/DESCRIPTION                                                        | RESPONSIBLE ENTITY                 | WBID | STATUS 12/31/12    | PROJECT COST                     |
|---------------------------------------------------------------------------------|------------------------------------|------|--------------------|----------------------------------|
| Edgewater Phase I Sewer Extension (62 connections made of 74 available)         | ECUA with FDOH                     | 846C | Completed          | \$1,467,661 (including Phase II) |
| Edgewater Phase II Sewer Extension (264 connections made of 295 available)      | ECUA with FDOH                     | 846C | Completed          | Costs are included in Phase I    |
| Lakewood Phase I Sewer Extension (172 connections made of 183 available)        | ECUA with FDOH                     | 846C | Completed          | \$1,431,866                      |
| Lakewood Phase II Sewer Extension (77 connections made of 85 available)         | ECUA with FODH                     | 846C | Completed          | \$747,263                        |
| Lakewood Phase II Sewer Extension (82 connections made of 112 available)        | ECUA with FDOH                     | 846C | Completed          | \$723,964                        |
| Lakewood Phase IV Sewer Extension (165 connections available as of August 2013) | ECUA with Escambia County and FDOH | 846C | Under construction | \$128,845                        |
| Lakewood Phase V and VI Sewer Extension (262 connections made of 651 available) | ECUA with Escambia County and FDOH | 846C | Completed          | \$3,390,897                      |
| Septic to Sewer Enforcement                                                     | ECHD                               | 846C | Completed          | -                                |
| MSWWTP relocation from Main Street to Cantonment                                | ECUA                               | All  | Completed          | \$316,000,000 <sup>1</sup>       |
| SSO Response Plan                                                               | ECUA                               | All  | Ongoing            | -                                |

**Table 5c. Stormwater-Related Projects**

- = Empty cell/no data

| PROJECT NAME/DESCRIPTION                                                                              | RESPONSIBLE ENTITY                                  | WBID  | STATUS 12/31/12 | PROJECT COST |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|-----------------|--------------|
| Adopted a Pet Waste Ordinance (Part 1, Article 1, Section 10-11f)                                     | Escambia County                                     | All   | Completed       | -            |
| Pensacola Yacht Club Ditch Replacement Storm Sewer Reconstruction to Reroute Flow from Superfund Site | City of Pensacola with USEPA                        | 848DA | Completed       | \$1,250,000  |
| MS4 Implementation                                                                                    | City of Pensacola, Escambia County, FDOT District 3 | All   | Ongoing         | -            |
| MS4 Implementation – Stormwater Outfall Monitoring                                                    | Escambia County                                     | All   | Ongoing         | -            |

**Table 5d. Stormwater-Related Projects**

| PROJECT NAME/DESCRIPTION                                                                                     | RESPONSIBLE ENTITY | WBID | STATUS 12/31/12 | PROJECT COST |
|--------------------------------------------------------------------------------------------------------------|--------------------|------|-----------------|--------------|
| East Jones Creek Stream Restoration (construct a natural stream channel; restore the floodplain and wetland) | Escambia County    | 846A | Completed       | \$250,000    |
| Purchase and Preserve 4 Parcels of Wetlands                                                                  | Escambia County    | 846A | Completed       | \$300,000    |