

BASIN MANAGEMENT ACTION PLAN

DRAFT PHASE 2

**for the Implementation of Total Daily Maximum Loads
for Fecal Coliforms**

**Developed by the
Florida Department of Environmental Protection
in the Lower St. Johns River Basin Tributaries I**

developed by the
Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection
Tallahassee, FL 32399

in cooperation with the
Lower St. Johns River Tributaries Stakeholders

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TABLE OF CONTENTS

ACKNOWLEDGMENTS	II
LIST OF ACRONYMS AND ABBREVIATIONS	IX
SUMMARY	X
SECTION 1. CONTEXT, PURPOSE, AND SCOPE OF THE PLAN.....	1
1.1 TMDLs in the LSJR Tributaries I Basin.....	1
1.2 Responsible Parties and Key Stakeholders.....	2
1.3 Sufficiency-of-Effort Approach	4
1.4 Fecal Coliform Reductions Since BMAP Adoption.....	4
1.5 Water Quality Trends.....	6
1.5.1 Newcastle Creek.....	7
1.5.2 Hogan Creek	7
1.5.3 Butcher Pen Creek	12
1.5.4 Miller Creek	15
1.5.5 Miramar Creek.....	18
1.5.6 Big Fishweir Creek	21
1.5.7 Deer Creek	24
1.5.8 Terrapin Creek.....	27
1.5.9 Goodbys Creek.....	30
1.5.10 Open Creek	33
SECTION 2. WATER QUALITY MONITORING AND SOURCE ASSESSMENT	36
2.1 Water Quality Monitoring Plan	36
2.1.1 Newcastle Creek Monitoring Network.....	36
2.1.2 Hogan Creek Monitoring Network	36
2.1.3 Butcher Pen Creek Monitoring Network	37
2.1.4 Miller Creek Monitoring Network	37
2.1.5 Miramar Creek Monitoring Network.....	37
2.1.6 Big Fishweir Creek Monitoring Network.....	37
2.1.7 Deer Creek Monitoring Network	38
2.1.8 Terrapin Creek Monitoring Network.....	38
2.1.9 Goodbys Creek Monitoring Network.....	38
2.1.10 Open Creek Monitoring Network.....	38
2.2 Walk the WBID and Source Identification Sampling	39
2.3 WBID Boundary Modifications.....	41
SECTION 3. COUNTYWIDE PROGRAMS IN THE LSJR BASIN	43
3.1 JEA	43
3.1.1 Countywide Programs	43
3.1.2 Walk the WBID Follow-Up	43
3.2 FDOH–Duval County	44
3.2.1 Countywide Programs	44

3.2.2	Walk the WBID Follow-Up	45
3.3	FDOT	45
3.3.1	Countywide Programs	45
3.3.2	Walk the WBID Follow-Up	46
3.4	COJ	47
3.4.1	Countywide Programs	47
3.4.2	Walk the WBID Follow-Up	47
3.5	FDACS	49
3.5.1	Agricultural Best Management Practice (BMP) Implementation.....	49
3.5.2	Agricultural BMPs	50
3.5.3	BMP Enrollment	50
3.5.4	FDACS’ OAWP Role in BMP Implementation and Follow-Up	52
3.5.5	OAWP Implementation Assurance Program	53
3.5.6	Beyond BMPs.....	53
SECTION 4.	NEWCASTLE CREEK (WBID 2235)	55
4.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	55
4.2	JEA Activities in the Newcastle Creek Watershed	55
4.3	FDOH–Duval County Activities in the Newcastle Creek Watershed	55
4.4	COJ Activities in the Newcastle Creek Watershed.....	55
SECTION 5.	HOGAN CREEK (WBID 2252)	57
5.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	57
5.2	JEA Activities in the Hogan Creek Watershed.....	57
5.3	FDOH–Duval County Activities in the Hogan Creek Watershed	57
5.4	FDOT Activities in the Hogan Creek Watershed	58
5.5	COJ Activities in the Hogan Creek Watershed	58
SECTION 6.	BUTCHER PEN CREEK (WBID 2322)	60
6.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	60
6.2	JEA Activities in the Butcher Pen Creek Watershed	60
6.3	FDOH–Duval County Activities in the Butcher Pen Creek Watershed	60
6.4	FDOT Activities in the Butcher Pen Creek Watershed	60
6.5	COJ Activities in the Butcher Pen Creek Watershed.....	60
SECTION 7.	MILLER CREEK (WBID 2287).....	62
7.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	62
7.2	JEA Activities in the Miller Creek Watershed.....	62
7.3	FDOH–Duval County Activities in the Miller Creek Watershed.....	62
7.4	FDOT Activities in the Miller Creek Watershed	62
7.5	COJ Activities in the Miller Creek Watershed	62
SECTION 8.	MIRAMAR CREEK (WBID 2304)	64
8.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	64
8.2	JEA Activities in the Miramar Creek Watershed	64

8.3	FDOH–Duval County Activities in the Miramar Creek Watershed.....	64
8.4	FDOT Activities in the Miramar Creek Watershed.....	64
8.5	COJ Activities in the Miramar Creek Watershed	65
SECTION 9. BIG FISHWEIR CREEK (WBIDS 2280A AND 2280B).....		66
9.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	66
9.2	JEA Activities in the Big Fishweir Creek Watershed.....	66
9.3	FDOH–Duval County Activities in the Big Fishweir Creek Watershed.....	66
9.4	FDOT Activities in the Big Fishweir creek Watershed	66
9.5	COJ Activities in the Big Fishweir Creek Watershed	66
SECTION 10. DEER CREEK (WBID 2256).....		68
10.1	Projects Added Since the 2009 BMAP and On-Going Efforts	68
10.2	JEA Activities in the Deer Creek Watershed	68
10.3	FDOH–Duval County Activities in the Deer Creek Watershed	68
10.4	FDOT Activities in the Deer Creek Watershed	69
10.5	COJ Activities in the Deer Creek Watershed.....	69
SECTION 11. TERRAPIN CREEK (WBID 2204)		70
11.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	70
11.2	JEA Activities in the Terrapin Creek Watershed.....	70
11.3	FDOH–Duval County Activities in the Terrapin Creek Watershed.....	70
11.4	FDOT Activities in the Terrapin Creek Watershed	70
11.5	COJ Activities in the Terrapin Creek Watershed	70
SECTION 12. GOODBYS CREEK (WBIDS 2326A AND 2326B).....		71
12.1	Projects Added Since the 2009 BMAP and Ongoing Efforts.....	71
12.2	JEA Activities in the Goodbys Creek Watershed	71
12.3	FDOH–Duval County Activities in the Goodbys Creek Watershed	71
12.4	FDOT Activities in the Goodbys Creek Watershed.....	71
12.5	COJ Activities in the Goodbys Creek Watershed.....	71
SECTION 13. OPEN CREEK (WBIDS 2299A AND 2299B)		73
13.1	Projects Added Since the 2009 BMAP and On-Going Efforts	73
13.2	JEA Activities in the Open Creek Watershed.....	73
13.3	FDOH–Duval County Activities in the Open Creek Watershed	73
13.4	FDOT Activities in the Open Creek Watershed	74
13.5	COJ Activities in the Open Creek Watershed	74
APPENDIX A. WBID BOUNDARY MODIFICATIONS		75

LIST OF FIGURES

Figure 1: WBIDs Included in the LSJR Tributaries BMAP I.....	3
Figure 2: Fecal Coliform Trends in Newcastle Creek, 2010–14	8
Figure 3: Cumulative Frequency of Fecal Coliform Results in Newcastle Creek Compared with the Water Quality Standard.....	9
Figure 4: Fecal Coliform Trends in Hogan Creek, 2010-14.....	10
Figure 5: Cumulative Frequency of Fecal Coliform Results in Hogan Creek Compared with the Water Quality Standard.....	11
Figure 6: Fecal Coliform Trends in Butcher Pen Creek, 2010–14	13
Figure 7: Cumulative Frequency of Fecal Coliform Results in Butcher Pen Creek Compared with the Water Quality Standard.....	14
Figure 8: Fecal Coliform Trends in Miller Creek, 2010–14.....	16
Figure 9: Cumulative Frequency of Fecal Coliform Results in Miller Creek Compared with the Water Quality Standard.....	17
Figure 10: Fecal Coliform Trends in Miramar Creek, 2010–14.....	19
Figure 11: Cumulative Frequency of Fecal Coliform Results in Miramar Creek Compared with the Water Quality Standard.....	20
Figure 12: Fecal Coliform Trends in Big Fishweir Creek, 2010–14	22
Figure 13: Cumulative Frequency of Fecal Coliform Results in Big Fishweir Creek Compared with the Water Quality Standard.....	23
Figure 14: Fecal Coliform Trends in Deer Creek, 2010–14	25
Figure 15: Cumulative Frequency of Fecal Coliform Results in Deer Creek Compared with the Water Quality Standard.....	26
Figure 16: Fecal Coliform Trends in Terrapin Creek, 2010–14	28
Figure 17: Cumulative Frequency of Fecal Coliform Results in Terrapin Creek Compared with the Water Quality Standard.....	29
Figure 18: Fecal Coliform Trends in Goodbys Creek, 2010–14	31
Figure 19: Cumulative Frequency of Fecal Coliform Results in Goodbys Creek Compared with the Water Quality Standard.....	32
Figure 20: Fecal Coliform Trends in Open Creek, 2010–14	34
Figure 21: Cumulative Frequency of Fecal Coliform Results in Open Creek Compared with the Water Quality Standard.....	35
Figure 22: OAWP BMP Enrollment in the LSJR Tributaries I Basin as of June 30, 2015	52
Figure A-1: Newcastle Creek WBID Boundary Modifications	76
Figure A-2: Butcher Pen Creek WBID Boundary Modifications	77
Figure A-3: Miller Creek WBID Boundary Modifications	78
Figure A-4: Miramar Creek WBID Boundary Modifications	79
Figure A-5: Big Fishweir Creek (Freshwater and Marine Segments) WBID Boundary Modifications	80
Figure A-6: Goodbys Creek (Freshwater and Marine Segments) WBID Boundary Modifications	81

Figure A-7: Open Creek (Freshwater and Marine Segments) WBID Boundary Modifications	82
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LIST OF TABLES

Table 1: Exceedance Medians for TMDL Period of Data and BMAP Period of Data.....	xiii
Table 2: TMDLs for the LSJR Tributaries BMAP I Watersheds	2
Table 3: Exceedance Medians for TMDL Period of Data and BMAP Period of Data.....	6
Table 4: Fecal Coliform Summary of Results for January 1, 2007, through June 30, 2014, Percent Frequency Exceedance in Fecal Coliform for the Recent Verified Period.....	6
Table 5: Summary of Newcastle Creek Fecal Coliform Data by Year, 2010–14.....	9
Table 6: Summary of Hogan Creek Fecal Coliform Data by Year, 2010–14.....	9
Table 7: Summary of Butcher Pen Creek Fecal Coliform Data by Year, 2010–14.....	12
Table 8: Summary of Miller Creek Fecal Coliform Data by Year, 2010–14	15
Table 9: Summary of Miramar Creek Fecal Coliform Data by Year, 2010–14	18
Table 10: Summary of Big Fishweir Creek Fecal Coliform Data by Year, 2010–14	21
Table 11: Summary of Deer Creek Fecal Coliform Data by Year, 2010–14	24
Table 12: Summary of Terrapin Creek Fecal Coliform Data by Year, 2010–14	27
Table 13: Summary of Goodbys Creek Fecal Coliform Data by Year, 2010–14.....	30
Table 14: Summary of Open Creek Fecal Coliform Data by Year, 2010–14.....	33
Table 15: Monitoring Stations in Newcastle Creek.....	36
Table 16: Monitoring Stations in Hogan Creek.....	36
Table 17: Monitoring Stations in Butcher Pen Creek.....	37
Table 18: Monitoring Stations in Miller Creek.....	37
Table 19: Monitoring Stations in Miramar Creek.....	37
Table 20: Monitoring Stations in Big Fishweir Creek.....	37
Table 21: Monitoring Stations in Deer Creek.....	38
Table 22: Monitoring Stations in Terrapin Creek.....	38
Table 23: Monitoring Stations in Goodbys Creek	38
Table 24: Monitoring Stations in Open Creek	38
Table 25: WBID Numbering Changes.....	42
Table 26: JEA Walk the WBID Follow-Up Actions	44
Table 27: FDOH–Duval County Walk the WBID Follow-Up Actions.....	45
Table 28: FDOT Walk the WBID Follow-Up Actions.....	46
Table 29: COJ Walk the WBID Follow-Up Actions	49
Table 30: 2009 Agricultural Land Uses In The LSJR Tributaries I Basin	50
Table 31: Agricultural Acreage and BMP Enrollment for the LSJR Tributaries I Basin.....	51
Table 32: FDOH–Duval County Activities in the Newcastle Creek Watershed	55
Table 33: COJ Activities in the Newcastle Creek Watershed	56
Table 34: JEA Activities in the Hogan Creek Watershed.....	57
Table 35: FDOH–Duval County Activities in the Hogan Creek Watershed	58

Table 36: FDOT Activities in the Hogan Creek Watershed	58
Table 37: COJ Activities in the Hogan Creek Watershed	59
Table 38: FDOH–Duval County Activities in the Butcher Pen Creek Watershed	60
Table 39: COJ Activities in the Butcher Pen Creek Watershed	61
Table 40: FDOT Activities in the Miller Creek Watershed.....	62
Table 41: COJ Activities in the Miller Creek Watershed	63
Table 42: JEA Activities in the Miramar Creek Watershed	64
Table 43: FDOT Activities in the Miramar Creek Watershed.....	64
Table 44: COJ Activities in the Miramar Creek Watershed	65
Table 45: JEA Activities in the Big Fishweir Creek Watershed	66
Table 46: COJ Activities in the Big Fishweir Creek Watershed	67
Table 47: JEA Activities in the Deer Creek Watershed	68
Table 48: FDOH–Duval County Activities in the Deer Creek Watershed.....	68
Table 49: FDOT Activities in the Deer Creek Watershed.....	69
Table 50: COJ Activities in the Deer Creek Watershed	69
Table 51: COJ Activities in the Terrapin Creek Watershed	70
Table 52: COJ Activities in the Goodbys Creek Watershed.....	72
Table 53: JEA Activities in the Open Creek Watershed.....	73
Table 54: FDOH–Duval County Activities in the Open Creek Watershed	73
Table 55: COJ Activities in the Open Creek Watershed	74

LIST OF ACRONYMS AND ABBREVIATIONS

ARV	Air Release Valve
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CARE	Citizen Action Response Effort
C.F.R.	Code of Federal Regulations
CFU/100mL	Colony-Forming Units Per 100 Milliliters
CIPP	Cured in Place Pipe
COJ	City of Jacksonville
Department	Florida Department of Environmental Protection
DBPR	Department of Business and Professional Regulation
<i>E. coli</i>	<i>Escherichia coli</i>
EQD	Environmental Quality Division
F.A.C.	Florida Administrative Code
FDACS	Florida Department of Agricultural and Consumer Services
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FOG	Fats, Oils, and Greases Program
F.S.	Florida Statutes
GIS	Geographic Information System
IDDE	Illicit Discharge Detection and Elimination
IMZ	Industrial/Manufacturing Zone
LSJR	Lower St. Johns River
MAPS	Managed Aquatic Plant Systems
MF	Membrane Filter
mL	Milliliter
MPN	Most Probable Number
MS4	Municipal Separate Storm Sewer System
MSMP	Master Stormwater Management Plan
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAWP	Office of Agricultural Water Policy
OSTDS	On-Site Sewage Treatment and Disposal System
PBTS	Performance-Based Treatment and Disposal System
PIC	Potential Illicit Connection
PSA	Public Service Announcement
PVC	Polyvinyl Chloride
qPCR	Quantitative Polymerase Chain Reaction
SJRWMD	St. Johns River Water Management District
SSO	Sanitary Sewer Overflow
TAT	Tributaries Assessment Team
TMDL	Total Maximum Daily Load
WBID	Waterbody Identification

SUMMARY

TOTAL MAXIMUM DAILY LOADS

The Basin Management Action Plan provides for phased implementation under Subparagraph 403.067(7)(a)1, Florida Statutes (F.S.), and this adaptive management process will continue until the TMDLs are met. The phased BMAP approach allows for incrementally reducing loadings through the implementation of projects, while simultaneously monitoring and conducting studies to understand water quality dynamics (*e.g.*, sources and response variables) in each impaired waterbody. Progress will continue to be evaluated and adjustments will be made or new projects added, as needed, to meet the TMDLs.

The Lower St. Johns River (LSJR) Tributaries BMAP Plan I was adopted by Secretarial Order of the Florida Department of Environmental Protection in December 2009. This document describes the management strategies for Phase 2 of the LSJR Tributaries BMAP I. For this second BMAP iteration (a five-year period), additional strategies for continuing water quality improvements and new monitoring to identify additional sources are proposed to help achieve the adopted fecal coliform Total Maximum Daily Loads. The 2009 BMAP and its associated Secretarial Order remain in effect, and so the projects and activities contained in the BMAP are still ongoing unless otherwise stated. Through the original 2009 BMAP and this Phase 2 plan, the department will track the ongoing efforts continuing from Phase 1, as well as the additional efforts identified in this document.

TMDLS, WATER QUALITY MONITORING, AND TRENDS

TMDLs are water quality targets for specific pollutants (such as fecal coliforms) that are established for impaired waterbodies which do not meet their designated uses based on Florida water quality standards. The department verified 75 tributaries in the LSJR Basin as impaired for fecal coliforms. The LSJR Tributaries BMAP I includes 10 of these 75 impaired tributaries. The department adopted TMDLs in 2006 for Miramar Creek, Butcher Pen Creek, Hogan Creek, and Goodbys Creek. It then adopted TMDLs in 2009 for Miller Creek, Big Fishweir Creek, Newcastle Creek, Deer Creek, Terrapin Creek, and Open Creek.

During BMAP I, Phase 1, consisting of the first five years after BMAP adoption, stakeholders developed strong, proactive programs to identify and eliminate sources of fecal coliforms. The Florida Department of Transportation (FDOT) and city of Jacksonville (COJ) trained their field staff to identify illicit

connections to stormwater conveyances. In June 2014, FDOT started the implementation of mandatory illicit discharge detection and elimination (IDDE) training for all staff and contractors working in its rights-of-way. The Florida Department of Health (FDOH)–Duval County inspected all 10 BMAP segments with waterbody identification (WBID) numbers to ensure that on-site sewage and disposal systems (OSTDS) were functioning properly and expanded the program into other high-priority watersheds. JEA has an intensive inspection and remediation program for JEA-owned sanitary sewer conveyances that prioritizes infrastructure near waterbodies for inspections and repairs or replacement as needed.

Although these are model programs, they cannot fully cover the entire county in five years. With more time, these programs will continue to provide additional benefits to the BMAP WBIDs, as well as the other impaired waterbodies in Duval County. Proactive and reactive programs together build better stewardship than reactive programs alone. Examples of proactive programs include JEA's inspections of sanitary sewer conveyances near waterbodies and FDOH–Duval County's septic tank inspection program focused on watersheds with impaired waters.

An example of a reactive program is the monitoring protocol instituted by the Tributaries Assessment Team (TAT) to respond to high hits of fecal coliform by returning to the field as soon as possible to walk and look for sources and take additional samples to help identify source locations. Additionally, the COJ's citizen call line, (904) 630–CITY (2489), enables citizens to report problems, which are then directed to the appropriate department that can address them. Each of these entities is also a participant in the TAT. The collaboration built through the TAT Program has bridged communication gaps and built a stronger infrastructure to address the fecal coliform impairments.

The TAT implemented the BMAP monitoring plan during Phase 1 of the BMAP. Data collected from 2010 through 2014 were assessed to determine water quality trends in the 10 WBIDs in the LSJR Tributaries BMAP I. The contributions made by the TAT during the first five-year iteration were invaluable for communicating about source tracking, locating, and elimination efforts. The TAT met via conference call monthly and discussed recent data results and coordinated follow-up actions. TAT members call one another for help in identifying sources and share staff and equipment to access storm drains and remove problems. Problems that have been identified and eliminated as a result of dedicated TAT efforts include the following:

- COJ and JEA identified a failing, privately owned sanitary sewer infrastructure under a multistory building during a collaborative source tracking effort on Hogan Creek. The leaking infrastructure was repaired.
- The department identified a leaking OSTDS drainfield on Miller Creek, and FDOH–Duval County corrected the problem.
- Department staff removed trash and flow impediments from under a road culvert on Butcher Pen Creek.

The TAT has been unable to identify the remaining sources of fecal coliform in the BMAP streams via the typical method of sampling for fecal coliform and searching the region for signs of a source. In Phase 2 of the BMAP, the department will incorporate additional monitoring for parameters that indicate the presence of human waste. The TAT will then assist the department in locating sources as the sampling leads the team deeper into the upstream reaches of stormwater conveyances. This more intense monitoring will be applied to all 10 BMAP I WBIDs. The first round of sampling indicated varying levels of human wastewater in all 10 streams. The TAT is dedicated to identifying and eliminating sources of human waste.

While fecal coliform reductions have occurred in the tributaries due to the strategies implemented in the first BMAP iteration, these tributaries continue to require improvements to meet state water quality standards. **Table 1** shows the median of exceedances for each WBID using the TMDL data period and the BMAP data period. Using the median of exceedances for the TMDL data period, the reduction needed to bring the exceedance median down to 400 colony-forming units per 100 milliliters (CFU/100 mL) was calculated. The last column shows progress toward meeting the TMDL.

Since the adoption of the BMAP, the greatest improvement in the magnitude of the exceedances occurred in Goodbys Creek (83% reduction) (see **Table 1**). Miramar Creek, Hogan Creek, and Deer Creek improved during Phase 1 by over 50%. Terrapin Creek and Newcastle Creek exceedance medians improved by 46% and 42%, respectively. Big Fishweir Creek and Open Creek exceedance median values remained similar to those in the TMDLs. Butcher Pen Creek and Miller Creek exceedance medians increased since the BMAP implementation began.

TABLE 1: EXCEEDANCE MEDIANS FOR TMDL PERIOD OF DATA AND BMAP PERIOD OF DATA

WBID	WATERBODY NAME	TMDL DATA (1996–2003) EXCEEDANCES MEDIAN	BMAP DATA (2010–14) EXCEEDANCES MEDIAN	PHASE I PROGRESS TOWARD TMDL (%)
2204	Terrapin Creek	1,367	920	46%
2235	Newcastle Creek	2,500	1,622	42%
2252	Hogan Creek	5,000	1,622	73%
2256	Deer Creek	2,765	1,376	59%
2280	Big Fishweir Creek	3,000	2,900	4%
2287	Miller Creek	5,000	5,100	-2.2%
2299	Open Creek	1,000	920	13%
2304	Miramar Creek	5,000	2,100	63%
2322	Butcher Pen Creek	2,400	2,850	-22.5%
2326	Goodbys Creek	3,000	840	83%

BMAP IMPLEMENTATION AND TRACKING

In this second phase, the department and stakeholders will continue to track implementation efforts, as well as monitor water quality in the TMDL waterbodies, to ensure that the BMAP is carried out and to measure its effectiveness. The stakeholders will meet approximately annually to discuss implementation issues, consider new information, and determine other management strategies needed for waterbodies that are not projected to meet their TMDLs.

MANAGEMENT STRATEGIES

Each entity responsible for implementing management strategies as part of the BMAP will complete an annual report for submittal to the department. The report will track the implementation status of the management strategies listed in the BMAP and document additional management strategies undertaken to further water quality improvements in the basin. Water quality data will also be included in the BMAP annual report to help assess strategies and identify the need for new actions.

SECTION 1. CONTEXT, PURPOSE, AND SCOPE OF THE PLAN

For Phase 2 of the Basin Management Action Plan, new strategies are proposed for continuing water quality improvements in the impaired waters to help achieve the fecal coliform Total Maximum Daily Loads in the Lower St. Johns River (LSJR) Tributaries I Basin. The 2009 LSJR Tributaries BMAP I remains in effect, and strategies adopted through it are still being implemented by [Secretarial Order](#) of the Florida Department of Environmental Protection.

This second phase of the BMAP identifies additional management strategies to continue fecal coliform reductions in 10 of the most impaired tributaries in the LSJR Tributaries Basin and identifies additional monitoring to determine sources that could be addressed to further reduce fecal coliforms. Paragraph 403.067(7)(a)1, Florida Statutes (F.S.), allows for the phased implementation of management strategies designed to achieve incremental reductions, while simultaneously monitoring and conducting studies to better understand water quality dynamics in each impaired waterbody. This BMAP continues the phased implementation to achieve the fecal coliform TMDLs in these tributaries.

1.1 TMDLs in the LSJR Tributaries I Basin

The LSJR Tributaries BMAP I update includes the 10 tributaries with adopted TMDLs identified as the waterbodies with the worst fecal coliform impairments (**Figure 1**). This determination was made using a ranking method that establishes the severity of water quality impairment based on the number of exceedances of fecal coliform colony counts. The water quality ranking method uses the total number of fecal coliform samples in the waterbody during the period of record to categorize how many samples are over 800, 5,000, and 10,000 colony-forming units per 100 milliliters (CFU/100mL). These criteria were developed by the Tributaries Assessment Team (TAT). A combined rank is created based on the number of exceedances in each category. The WBIDs are sorted from worst to best to provide a guideline for assessment priorities, with the worst-case WBID ranked as number one.

The water quality criterion for fecal coliform bacteria is detailed in Chapter 62-302, Florida Administrative Code (F.A.C.). The requirements for exceeding maximum fecal coliform concentrations in a Class III waterbody are stated as follows: *The most probable number (MPN) or membrane filter (MF) counts per 100 milliliters (mL) of fecal coliform bacteria shall not exceed a monthly average of 200, nor exceed 400 in 10% of samples, nor exceed 800 on any one day.* The criterion states that monthly averages shall be expressed as geometric means based on a minimum of 10 samples taken over

a 30-day period. However, there were insufficient data (fewer than 10 samples in a given month) available to evaluate the geometric mean criterion for fecal coliform bacteria. Therefore, the criterion selected for the TMDLs was not to exceed 400 CFU/100mL.

The department adopted fecal coliform TMDLs for Hogan Creek, Butcher Pen Creek, Miramar Creek, and Goodbys Creek in 2006. In July 2009, the department adopted TMDLs for Newcastle Creek, Miller Creek, Big Fishweir Creek, Deer Creek, Terrapin Creek, and Open Creek. **Table 2** lists the TMDLs adopted by rule and the pollutant load allocations for the 10 LSJR Tributaries BMAP I watersheds.

TABLE 2: TMDLS FOR THE LSJR TRIBUTARIES BMAP I WATERSHEDS

WBID NUMBER	WBID NAME	WASTELOAD ALLOCATION WASTEWATER (COLONIES/DAY)	WASTELOAD ALLOCATION STORMWATER (%)	LOAD ALLOCATION (%)
2235	Newcastle Creek	Not applicable	84%	84%
2252	Hogan Creek	Meet permit limits	92%	92%
2322	Butcher Pen Creek	Meet permit limits	83%	83%
2287	Miller Creek	Not applicable	92%	92%
2304	Miramar Creek	Not applicable	92%	92%
2280	Big Fishweir Creek	Not applicable	87%	87%
2256	Deer Creek	Not applicable	86%	86%
2204	Terrapin Creek	Not applicable	71%	71%
2326	Goodbys Creek	Not applicable	87%	87%
2299	Open Creek	Not applicable	60%	60%

1.2 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

Sources of anthropogenic fecal coliform loading in the 10 tributaries include wastewater and on-site sewage treatment and disposal systems (OSTDS). In addition, stormwater runoff conveys bacteria from pet and livestock waste and, in some areas, homeless person encampments. The entities responsible for addressing these sources in the BMAP tributaries include the city of Jacksonville (COJ), Florida Department of Health (FDOH)–Duval County, Florida Department of Transportation (FDOT), JEA, and Florida Department of Agriculture and Consumer Services (FDACS). The department is also essential to the implementation of BMAP activities.

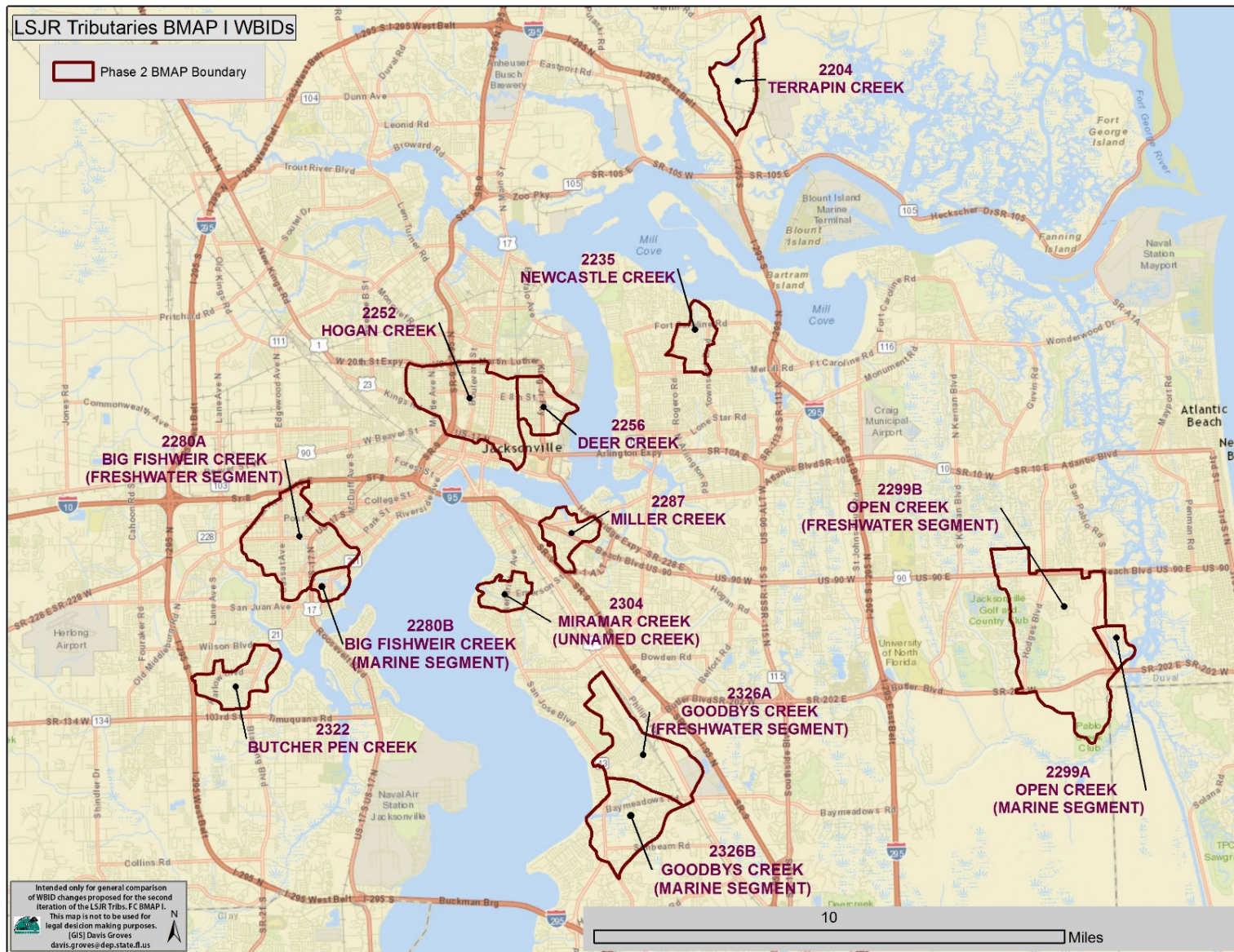


FIGURE 1: WBIDS INCLUDED IN THE LSJR TRIBUTARIES BMAP I

1.3 SUFFICIENCY-OF-EFFORT APPROACH

Fecal coliforms can be highly variable and easily transported, making it difficult in many cases to identify the source of the bacteria. For this reason, detailed allocations were not made to each of the BMAP stakeholders. In Phase 1 of the BMAP, the stakeholders were asked to identify their strategies to reduce or remove bacteria sources that have been implemented since 1996 (the start of the TMDL verified period) and additional efforts that were under way or planned in five years from BMAP adoption. The sufficiency-of-effort evaluation was not an assessment of each agency's individual activities; instead, it focused on whether the activities submitted by all the entities corresponded to the potential sources identified in the watershed and whether the total efforts were adequate to eliminate the known sources, assess unknown sources, and prevent the development of new sources.

For Phase 2, the stakeholders submitted additional activities that were implemented since the first BMAP iteration was adopted, as well as activities that are planned in the future. These activities are targeted in areas of the basin where additional efforts are needed to further reduce fecal coliform bacteria in the tributaries.

1.4 FECAL COLIFORM REDUCTIONS SINCE BMAP ADOPTION

To determine the progress made during the first BMAP iteration (as reflected in Phase 1 annual reports), medians were calculated using both nonexceedance data (≤ 400 CFU/100 mL) and exceedance data (> 400 CFU/100mL) for the BMAP data period (2010–14). These “all-data medians” were compared for progress by dividing the BMAP data period median by the TMDL data period exceedance (> 400 CFU/100mL) median. In the TMDLs for this BMAP, the required percent reduction was calculated by taking the median of a subset of data, only the exceedances, during the TMDL data period and determining the percent reduction needed to reduce the median of exceedances to 400 CFU/100mL. The methodology for Phase 2 of the BMAP will use exceedance median data for the BMAP and TMDL data periods. This method is more accurate and will better show the progress made towards meeting the TMDL percent reductions.

Table 3 shows the results of the more accurate methodology using the formula shown below. Based on this revised method to calculate progress during the BMAP period, the department compared the TMDL data period monitoring results with the BMAP data period monitoring results. Using the median of exceedances for the TMDL data period, the reduction needed to bring the exceedance median down to 400 CFU/100mL was calculated. The reduction achieved for each WBID was then calculated by

subtracting the TMDL required reduction from the BMAP exceedance median data. The medians of exceedances for each WBID using the TMDL data period and the BMAP data period are shown in **Table 3**. The last column shows progress toward meeting the TMDL.

$$\frac{(TMDL\ Exceedance\ Median - BMAP\ Exceedance\ Median)}{(TMDL\ Exceedance\ Median - 400)} \times 100$$

Since the adoption of the BMAP, the greatest improvement in the magnitude of the exceedances occurred in Goodbys Creek (83% reduction) (see **Table 3**). Miramar Creek, Hogan Creek, and Deer Creek improved during Phase 1 by over 50%. Terrapin Creek and Newcastle Creek exceedance medians improved by 46% and 42%, respectively. Big Fishweir Creek and Open Creek exceedance median values remained similar to those in the TMDLs. Butcher Pen Creek and Miller Creek exceedance medians increased since the BMAP implementation began.

However, **Table 3** does not reflect the frequency of exceedances, which is a key component in meeting water quality standards. For this second BMAP iteration (and subsequent annual reports), the department will focus on an approach that mirrors the Impaired Surface Waters Rule (IWR) methodology Chapter 62-303, F.A.C., for assessing the impairment status of a waterbody. The criterion is set so that no more than 10% of the data can exceed the water quality standard of 400 CFU/100mL during each verified period (see **Table 4**).

Table 4 shows the minimum number of samples needed to place a waterbody on the Verified List with at least a 90% confidence level for the applicable verified period (January 1, 2007–June 30, 2014). The fifth column (*Minimum number of exceedances to be considered impaired*) shows the minimum number of exceedances for a waterbody to be considered impaired for fecal coliform for the verified period (found in Rule 62-303.420, F.A.C., Table 3).

The restoration goal of the BMAP is to meet water quality standards that will be determined by the number of exceedances during an IWR verified period, compared with the number of allowable exceedances based on the number of samples. The far-right column (*Percent exceedance*) shows the percentage of exceedances, which is calculated by dividing the number of exceedances by the total number of samples. This number is a helpful reference for comparing various data periods that may have differing numbers of total samples.

TABLE 3: EXCEEDANCE MEDIANS FOR TMDL PERIOD OF DATA AND BMAP PERIOD OF DATA

WBID	WATERBODY NAME	TMDL DATA (1996–2003) EXCEEDANCE MEDIAN (CFU/100mL)	BMAP DATA (2010–14) EXCEEDANCE MEDIAN (CFU/100mL)	PHASE 1 PROGRESS TOWARD TMDL (%)
2204	Terrapin Creek	1,367	920	46%
2235	Newcastle Creek	2,500	1,622	42%
2252	Hogan Creek	5,000	1,622	73%
2256	Deer Creek	2,765	1,376	59%
2280	Big Fishweir Creek	3,000	2,900	4%
2287	Miller Creek	5,000	5,100	-2.2%
2299	Open Creek	1,000	920	13%
2304	Miramar Creek	5,000	2,100	63%
2322	Butcher Pen Creek	2,400	2,850	-22.5%
2326	Goodbys Creek	3,000	840	83%

TABLE 4: FECAL COLIFORM SUMMARY OF RESULTS FOR JANUARY 1, 2007, THROUGH JUNE 30, 2014, PERCENT FREQUENCY EXCEEDANCE IN FECAL COLIFORM FOR THE RECENT VERIFIED PERIOD

WBID	NAME	TOTAL NUMBER OF FECAL COLIFORM DATA POINTS FOR JAN. 1, 2007– JUNE 30, 2014	NUMBER OF EXCEEDANCES	MINIMUM NUMBER OF EXCEEDANCES TO BE CONSIDERED IMPAIRED	% EXCEEDANCE
2204	Terrapin Creek	81	68	13	84%
2235	Newcastle Creek	117	90	17	77%
2252	Hogan Creek	170	143	23	84%
2256	Deer Creek	163	81	22	50%
2280	Big Fishweir Creek	284	255	36	90%
2287	Miller Creek	181	151	24	83%
2299A	Open Creek (Marine Segment)	60	31	10	52%
2299B	Open Creek (Freshwater Segment)	86	59	13	69%
2304	Miramar Creek	99	81	15	82%
2322	Butcher Pen Creek	161	148	22	92%
2326	Goodbys Creek	189	112	25	60%

1.5 WATER QUALITY TRENDS

Information on the locations of monitoring stations can be found by following the department's [Geographic Information System \(GIS\) link](#) and clicking “Map Direct.” Then scroll to the right to find “Water Quality.” Search for stations by name and zoom as needed. If you wish to download GIS shapefiles, GIS layers can be downloaded at this site as well. Click the link and scroll down. The “STORET Stations” layer corresponds with the stations used to provide data for the BMAP.

1.5.1 NEWCASTLE CREEK

Data for the period from 2010 through 2014 indicate that fecal coliform concentrations are slightly decreasing in the Newcastle Creek watershed (**Figure 2**). **Table 5** summarizes the fecal coliform results for all four stations, by year, and shows the decrease in the percent exceedances from 2012 to 2014. One station, 20030655, had only one sample used in this analysis. Stations 21FLJXWQARL5B and 21FLJXWQARL6 had the highest median fecal coliform concentrations of 1,100 and 1,000 CFU/100mL, respectively. Station ARL5B is located near the mouth of the creek, and Station ARL6 is located at Fort Caroline Hills Drive.

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered to be impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration.

Figure 3 shows the cumulative percentage of the fecal coliform results in Newcastle Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

1.5.2 HOGAN CREEK

Fecal coliform concentrations in Hogan Creek increased slightly from 2010 through 2014 (**Figure 4**). Based on all the data collected at four stations in the Hogan Creek watershed, the percentage of exceedances increased from 2011 to 2013; however, there was a decrease in the percent exceedances in 2014, as shown in **Table 6**. One station, 20030774, had only one sample used in this analysis. Station 21FLJXWQHC1A had the highest median concentration of 1,231 CFU/100mL, followed by Stations 21FLJXWQHC2A and 21FLJXWQHC4, with a median concentration of 1,200 CFU/100mL. Station HC1A is located on Broad Street, Station HC2A is located in Confederate Park on Hubbard Street, and Station HC4 is located on 10th Street.

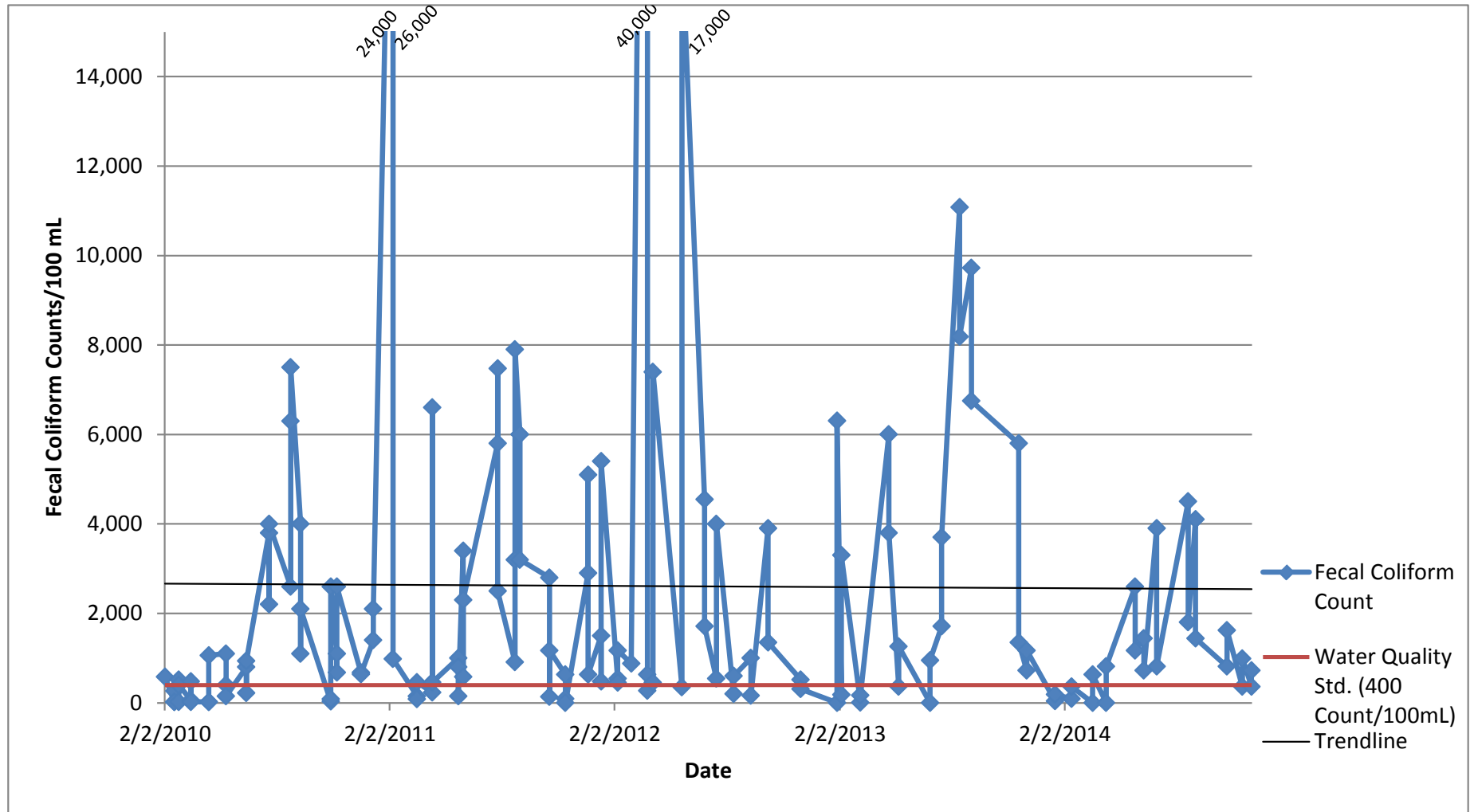


FIGURE 2: FECAL COLIFORM TRENDS IN NEWCASTLE CREEK, 2010–14

TABLE 5: SUMMARY OF NEWCASTLE CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	36	20	7,500	660	1,364	22	61%
2011	35	0	26,000	1,400	3,632	28	80%
2012	26	160	40,000	756	3,668	21	81%
2013	22	1	11,081	1,532	3,297	16	73%
2014	24	1	4,500	811	1,228	16	67%

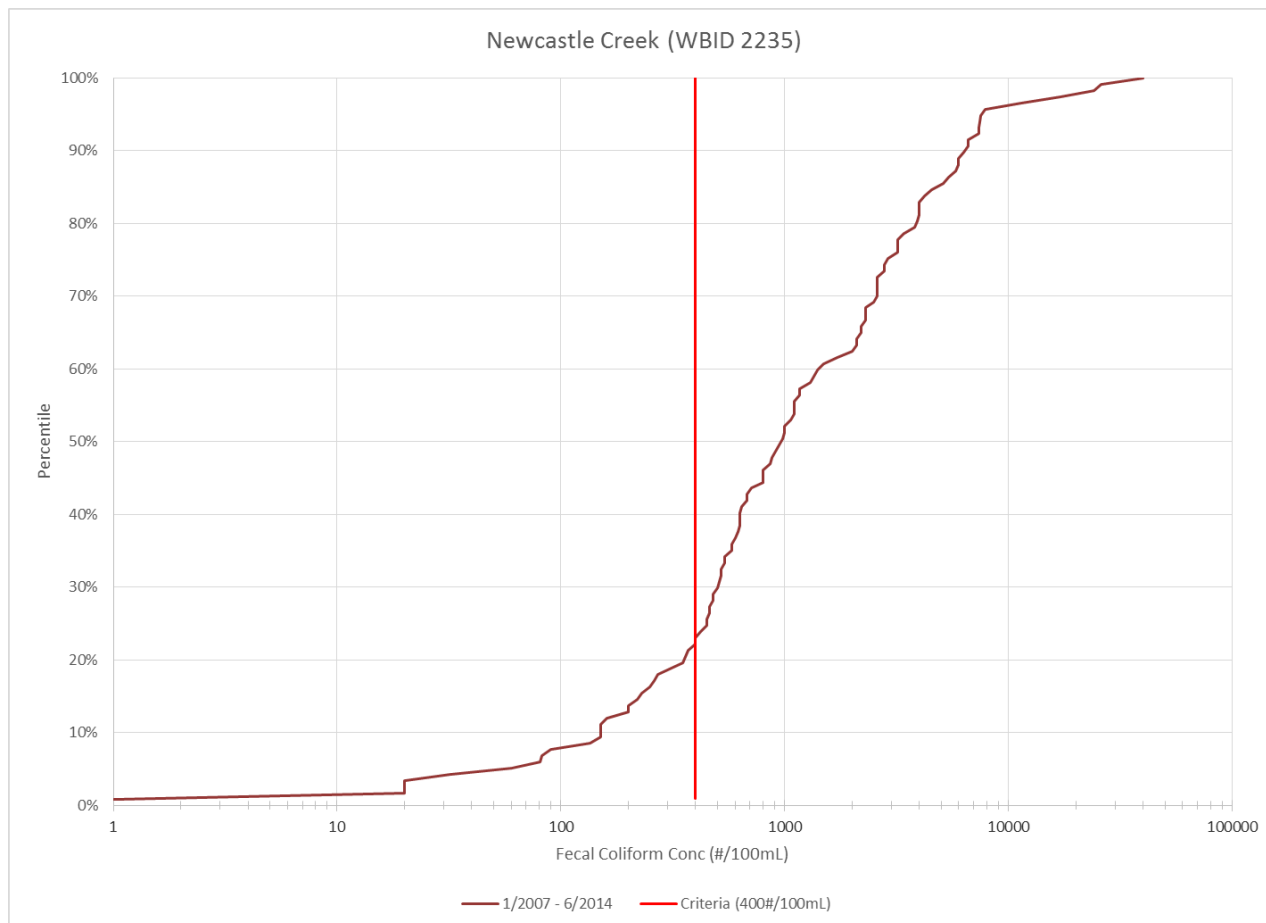


FIGURE 3: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN NEWCASTLE CREEK COMPARED WITH THE WATER QUALITY STANDARD

TABLE 6: SUMMARY OF HOGAN CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	49	200	44,000	940	2,573	45	92%
2011	47	0	33,500	1,351	3,187	31	66%
2012	36	0	93,000	2,750	8,670	31	86%
2013	36	330	44,000	1,532	4,418	35	97%
2014	36	1	21,000	946	2,530	33	92%

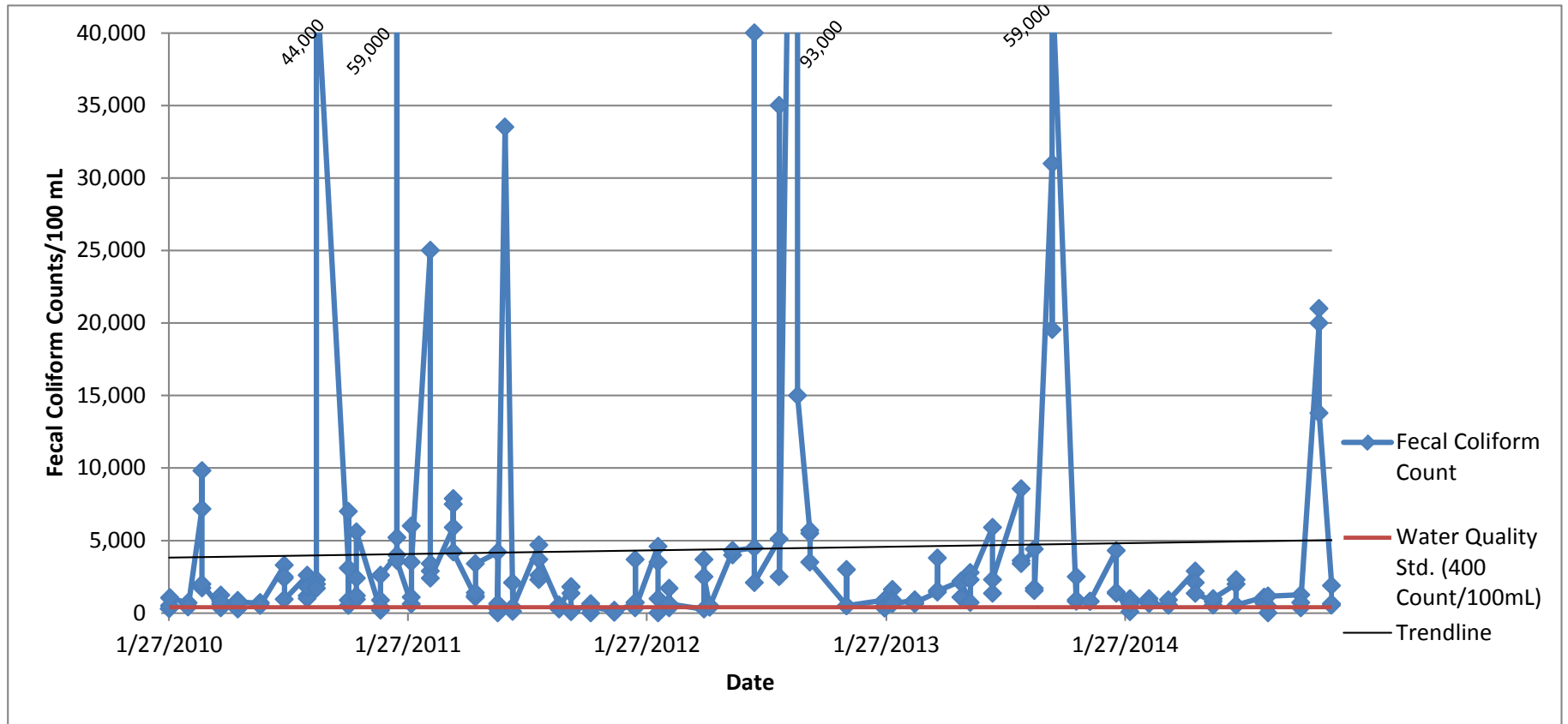


FIGURE 4: FECAL COLIFORM TRENDS IN HOGAN CREEK, 2010-14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100 mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered to be impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 5** shows the cumulative percentage of the fecal coliform results in Hogan Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

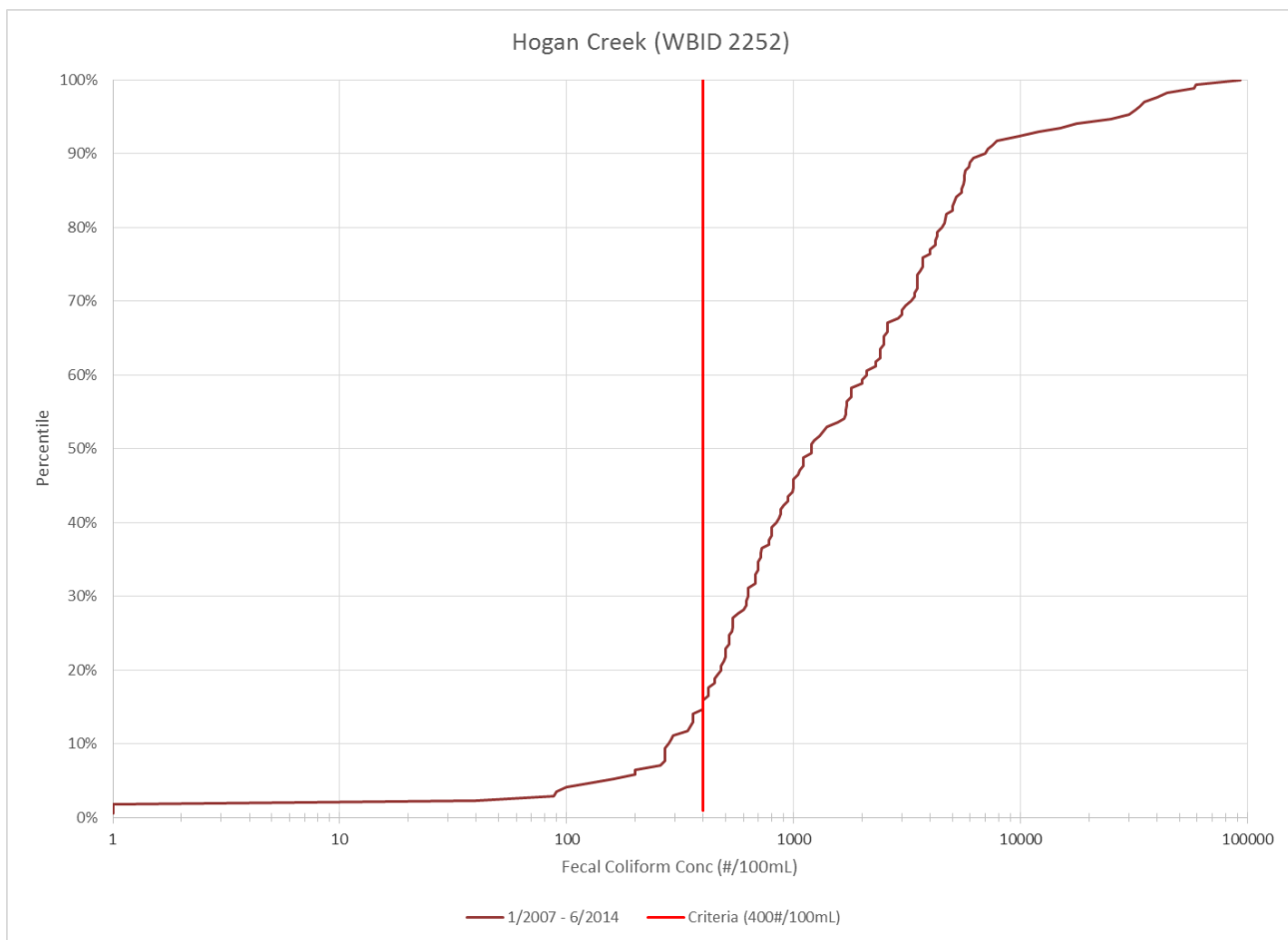


FIGURE 5: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN HOGAN CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.3 BUTCHER PEN CREEK

Butcher Pen Creek is the only tributary included in this BMAP that has not shown improvement compared with the TMDL data period (**Figure 6**). The median value for the 2010 to 2014 period is 8.3% higher than the TMDL median and decreased 67% between 2010 and 2014. Moreover, the medians in the most recent two years are roughly one-half of the TMDL median, and the annual median values showed a downward trend between 2010 and 2014. The median concentrations and percent exceedances remain relatively high, with the lowest median value occurring in 2013 (**Table 7**). The stations with the highest median concentrations are 21FLA 20030829 (4,550 CFU/100mL) and 21FLA 20030955 (4,300 CFU/100mL). Station 21FLA 20030829 is located near the headwaters of Butcher Pen Creek where it intersects Jammes Road, and Station 21FLA 20030955 is located at Ducheneau Drive.

TABLE 7: SUMMARY OF BUTCHER PEN CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	43	330	58,000	3,900	7,298	42	98%
2011	34	220	180,000	3,050	14,632	32	94%
2012	35	150	22,000	2,300	3,439	32	91%
2013	17	150	5,100	1,200	1,856	14	82%
2014	19	90	27,000	1,300	5,473	19	100%

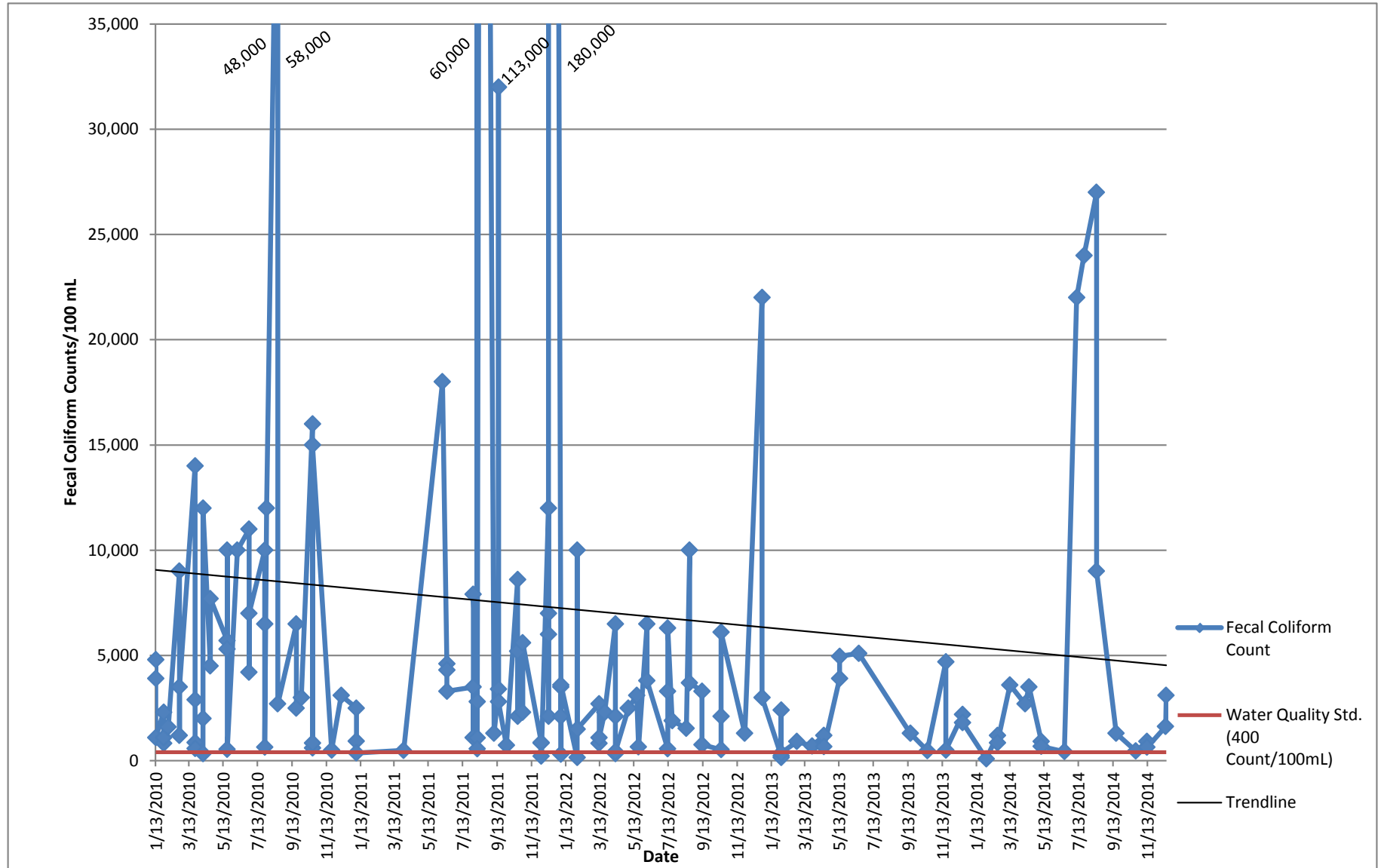


FIGURE 6: FECAL COLIFORM TRENDS IN BUTCHER PEN CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 7** shows the cumulative percentage of the fecal coliform results in Butcher Pen Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

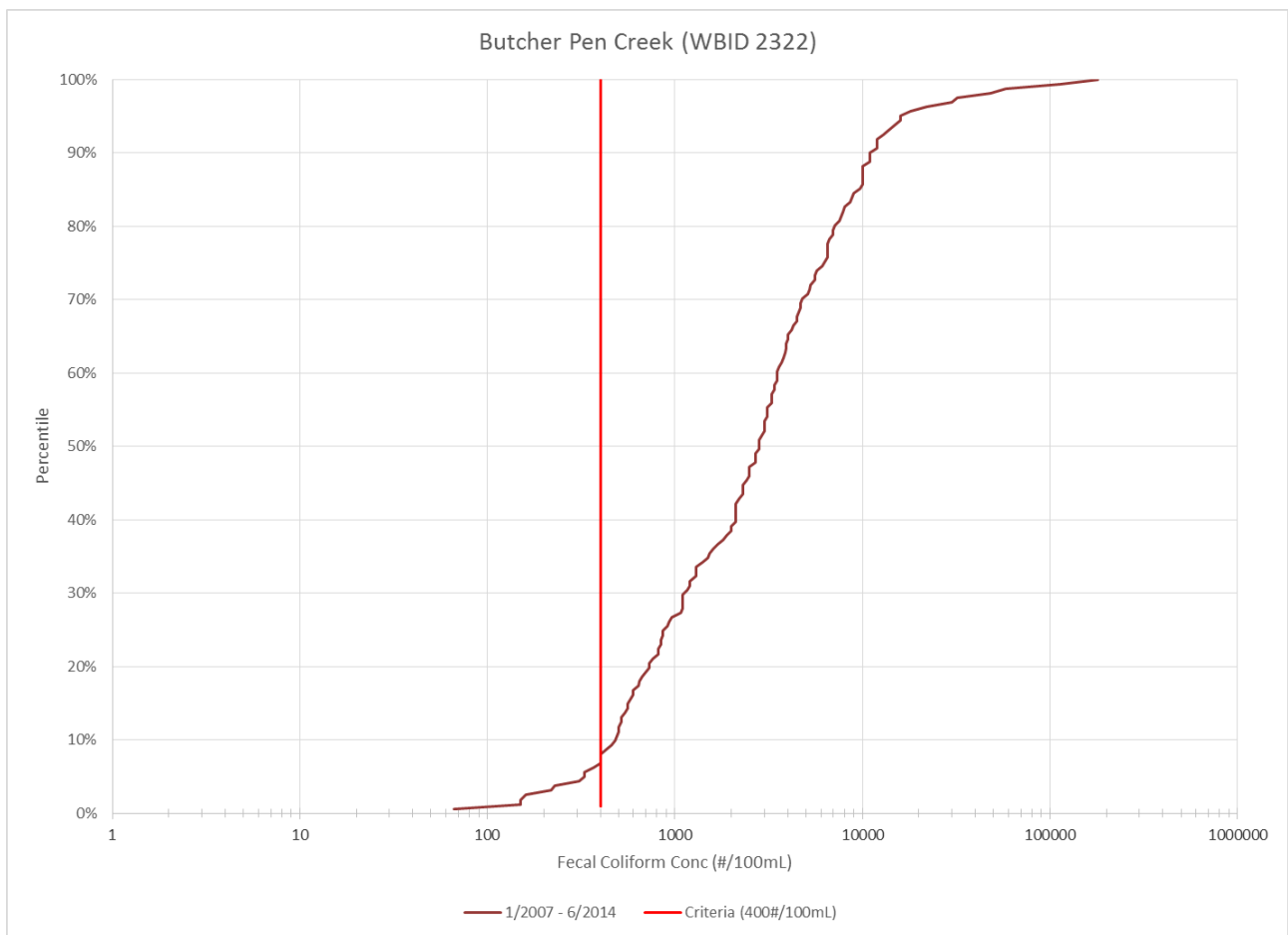


FIGURE 7: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN BUTCHER PEN CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.4 MILLER CREEK

Fecal coliform concentrations in Miller Creek decreased over the data period from 2010 through 2014 (**Figure 8**), based on the data collected at five stations. However, the median concentrations and percent exceedances remain high (**Table 8**). The sampling station with the highest median concentration of 12,613 CFU/100 mL is Station 21FLJXWQSS21, located on the west branch at Camden Avenue. Based on observations of animal tracks along the creek and the inability to find human sources, COJ has determined that the high results in this area are likely from wildlife and feral cats; however, additional investigations are ongoing by the department. In addition, Stations 21FLJXWQSS23 and 21FLJXWQSS1 had high medians of 3,600 and 2,400 CFU/100mL, respectively. Station 21FLJXWQSS23 is located on the east branch at Mayfair Road, and Station 21FLJXWQSS1 is located on Atlantic Boulevard.

TABLE 8: SUMMARY OF MILLER CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	36	40	84,000	7,225	17,066	31	86%
2011	44	0	75,000	5,150	11,777	33	75%
2012	34	0	38,000	3,450	5,189	28	82%
2013	33	180	40,000	3,900	7,387	30	91%
2014	36	180	40,000	4,200	7,419	33	92%

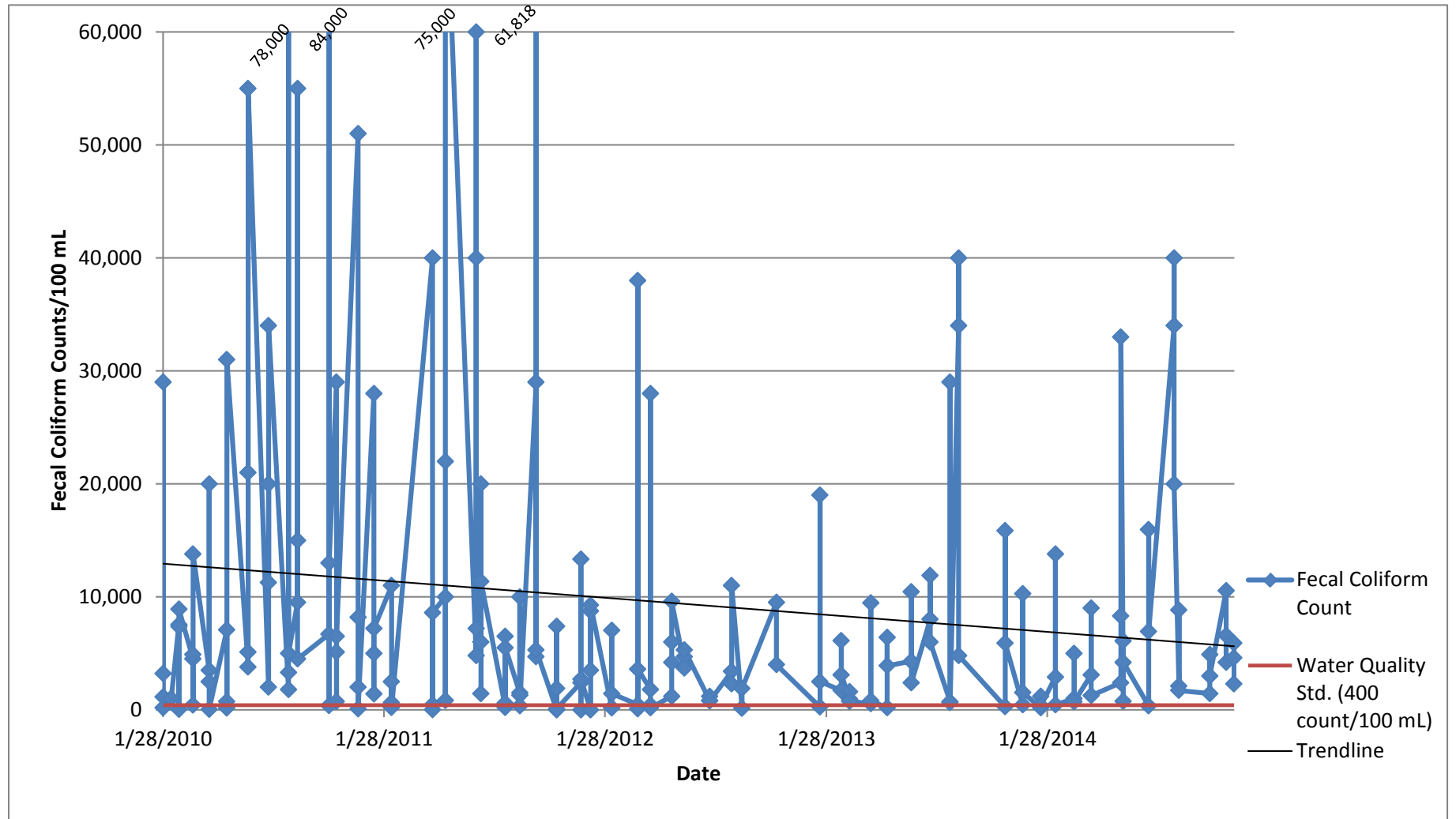


FIGURE 8: FECAL COLIFORM TRENDS IN MILLER CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 9** shows the cumulative percentage of the fecal coliform results in Miller Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

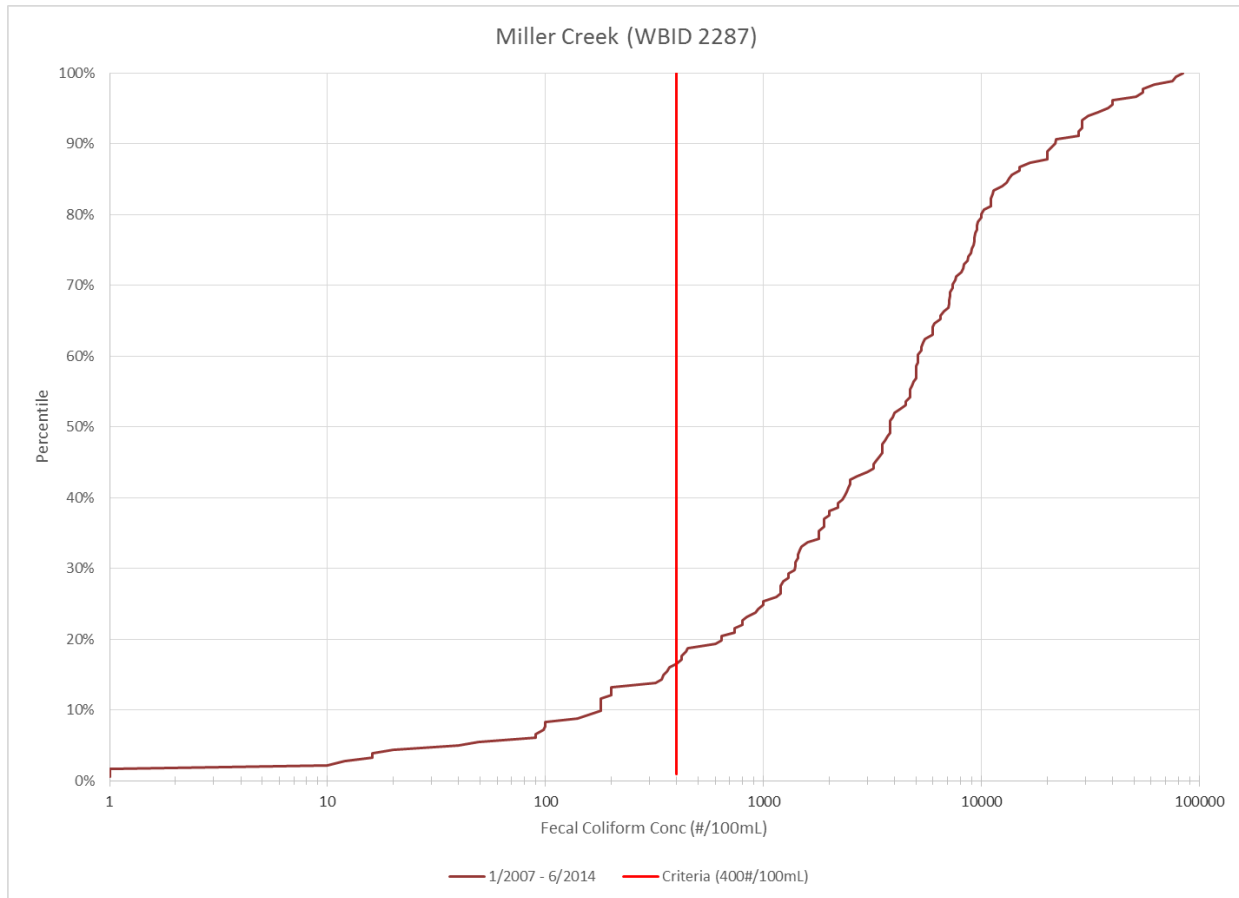


FIGURE 9: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN MILLER CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.5 MIRAMAR CREEK

Between 2010 and 2014, the fecal coliform concentrations in Miramar Creek slightly increased (**Figure 10**) based on the data collected at four stations. As shown in **Table 9**, the percent exceedances and median concentration increased from 2013 to 2014. The station with the highest median concentration was 21FLJXWQSS4 (1,901 CFU/100mL). This is the most downstream station, located on San Jose Boulevard.

TABLE 9: SUMMARY OF MIRAMAR CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	36	0	7,400	520	1,303	20	56%
2011	25	0	22,000	3,700	4,913	23	92%
2012	11	500	5,100	1,400	1,896	11	100%
2013	24	1	3,300	676	1,052	15	63%
2014	24	1	24,000	976	2,732	19	79%

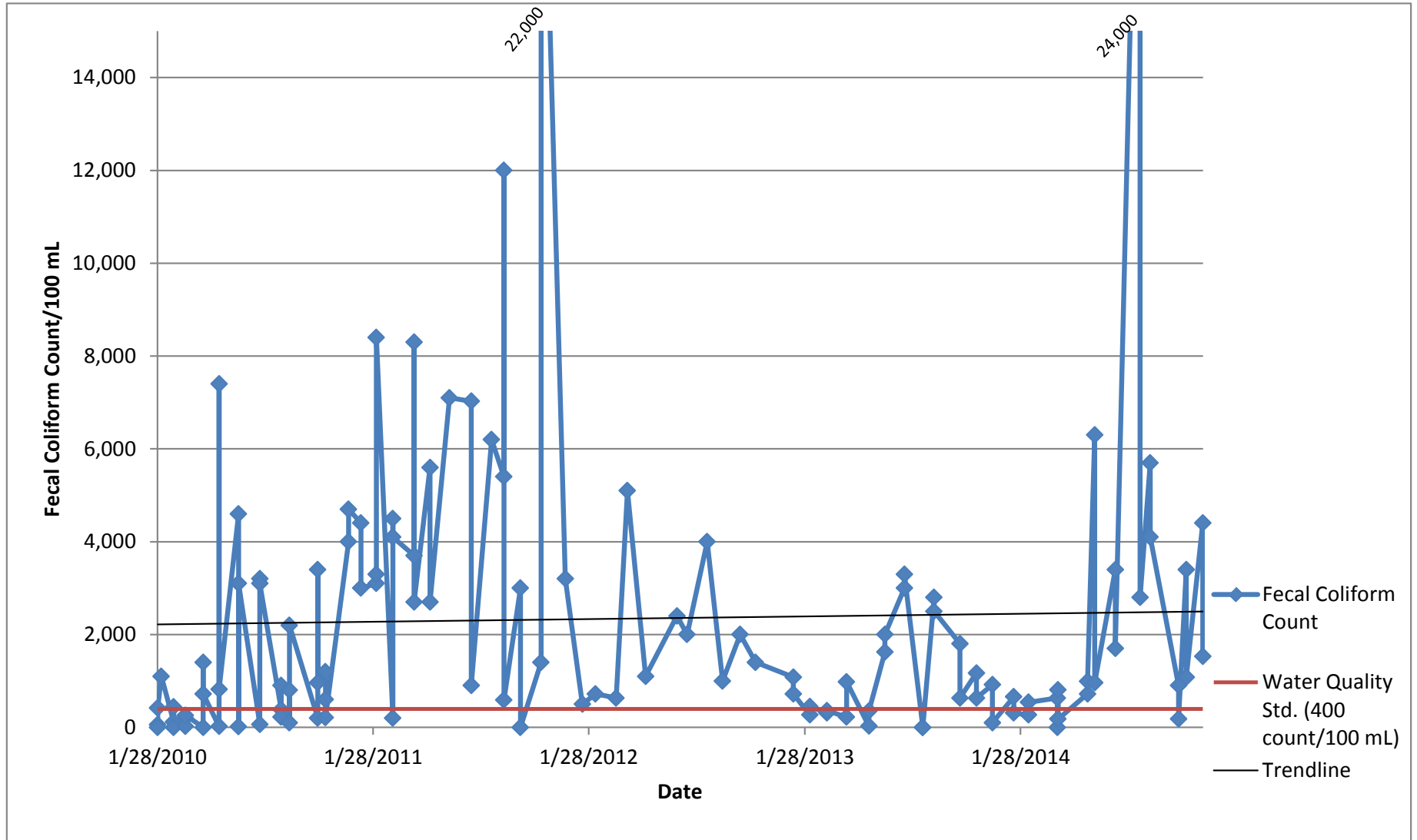


FIGURE 10: FECAL COLIFORM TRENDS IN MIRAMAR CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how the coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 11** shows the cumulative percentage of the fecal coliform results in Miramar Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

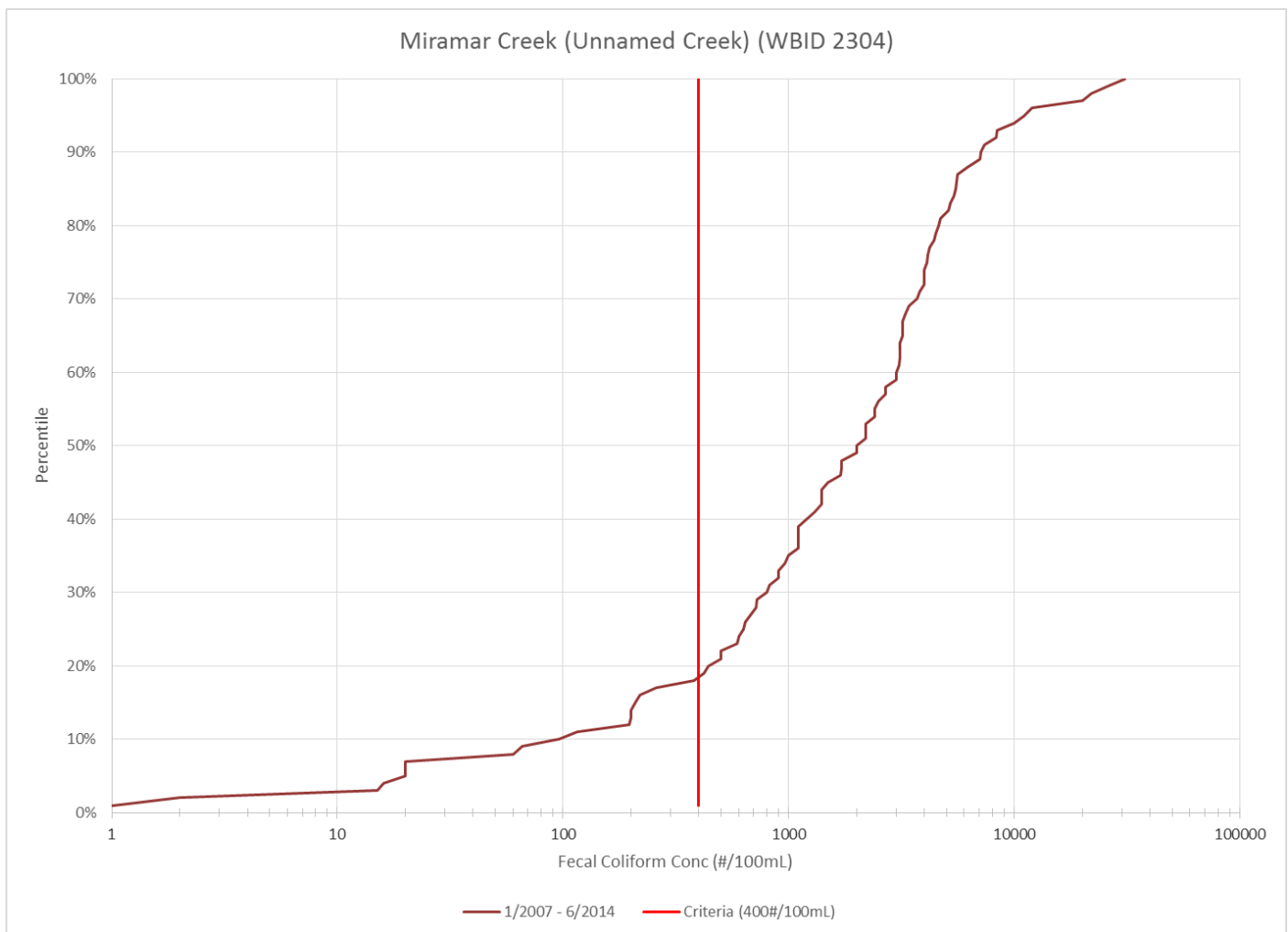


FIGURE 11: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN MIRAMAR CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.6 BIG FISHWEIR CREEK

Fecal coliform concentrations in Big Fishweir Creek decreased slightly from 2010 through 2014 (**Figure 12**), based on the data collected at 10 stations. The percent exceedances decreased from 2013 to 2014, although the rate remains high (**Table 10**). The stations with the highest median concentrations are 21FLA 20030951 (4,400 CFU/100mL), 21FLA 20030953 (2,800 CFU/100mL), and 21FLA 20030952 (2,400 CFU/100mL). Station 21FLA 20030951 is located at Park Street, and Stations 21FLA 20030953 and 21FLA 20030952 are both located on Little Fishweir Creek at Oak Street and Greenwood Avenue, respectively.

TABLE 10: SUMMARY OF BIG FISHWEIR CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	48	210	11,000	2,000	2,793	43	90%
2011	51	0	153,000	3,100	12,278	46	90%
2012	40	45	28,000	3,500	5,259	36	90%
2013	35	90	6,900	2,100	2,880	33	94%
2014	39	160	12,000	2,600	3,052	33	85%

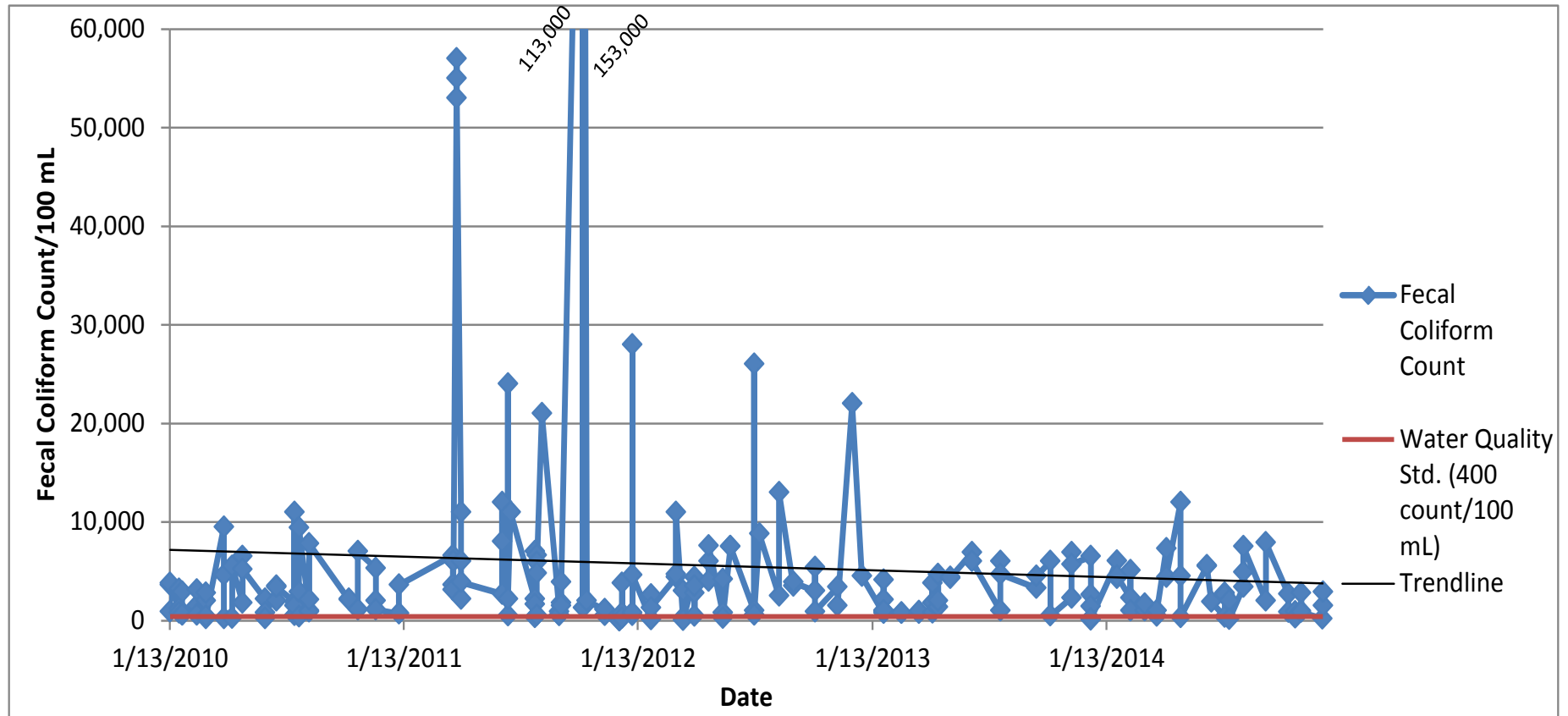


FIGURE 12: FECAL COLIFORM TRENDS IN BIG FISHWEIR CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how the coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 13** shows the cumulative percentage of the fecal coliform results in Big Fishweir Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

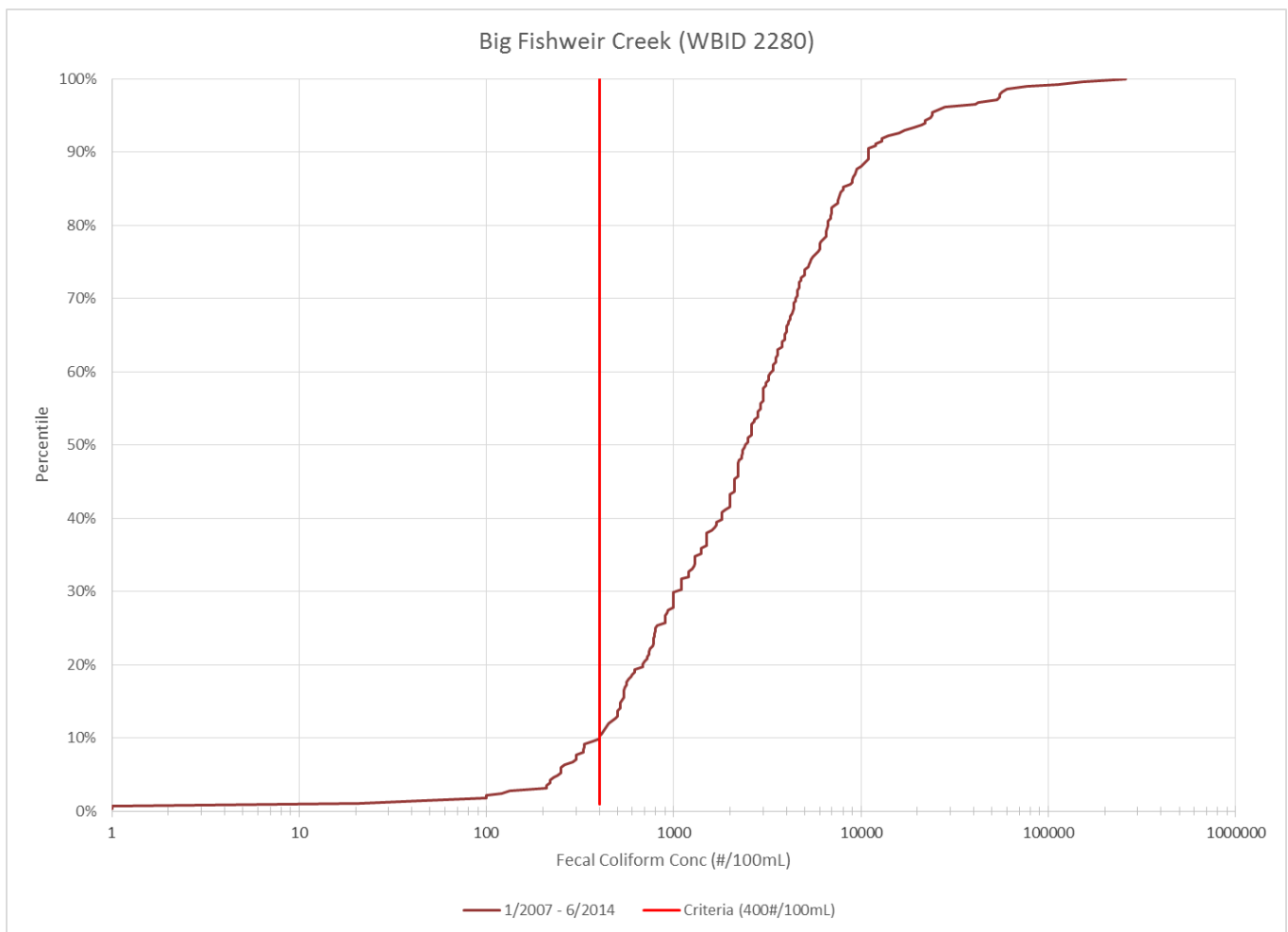


FIGURE 13: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN BIG FISHWEIR CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.7 DEER CREEK

Fecal coliform concentrations in Deer Creek increased between 2010 and 2014 (**Figure 14**) based on the data collected at four stations. However, the median concentrations are generally low (**Table 11**). The station with the highest median concentration is 21FLJXWQDR2S, located on the southwest branch, with 520 CFU/100mL.

TABLE 11: SUMMARY OF DEER CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	49	0	35,000	270	1,865	22	45%
2011	41	0	60,000	480	3,513	21	51%
2012	16	0	48,000	280	3,718	7	44%
2013	15	1	4,000	631	1,127	9	60%
2014	16	1	66,364	586	4,941	9	56%

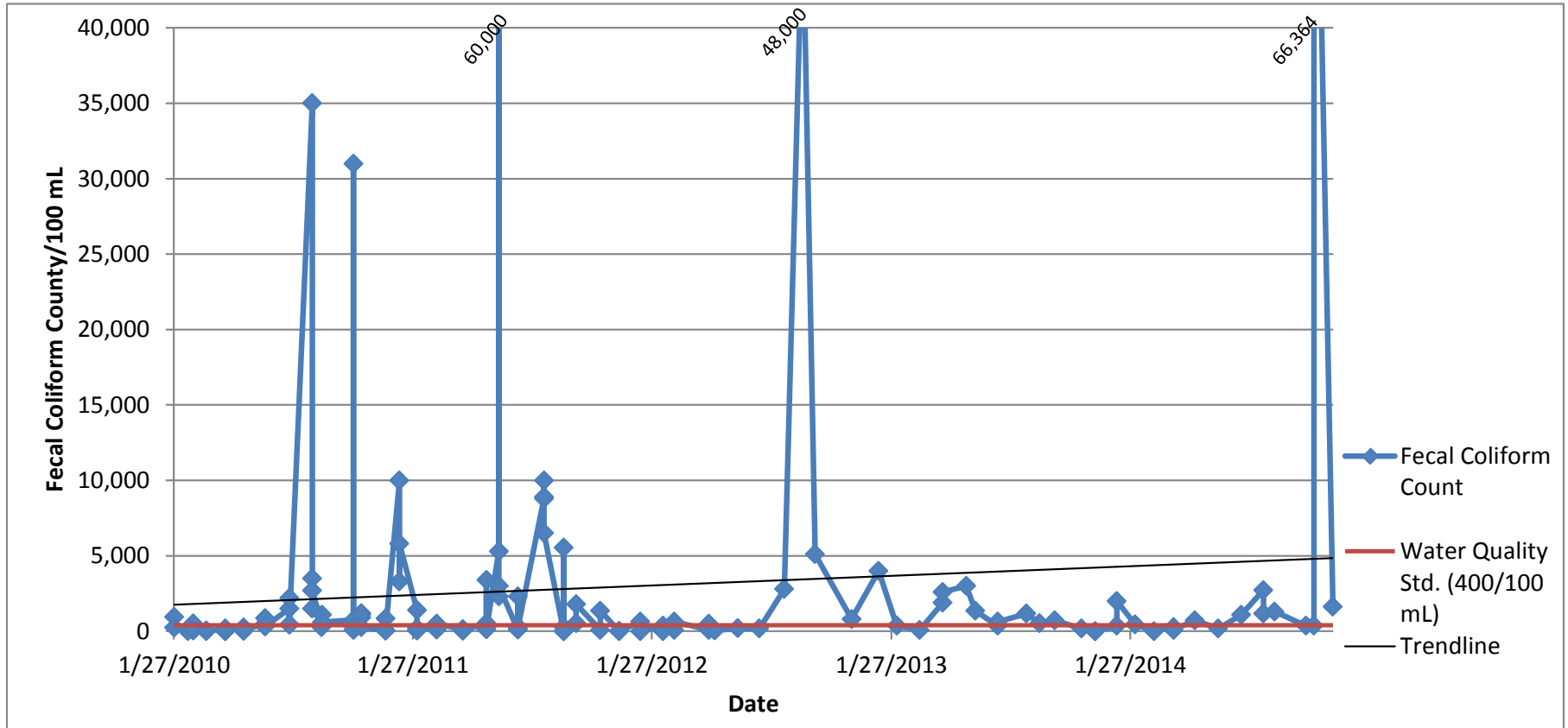


FIGURE 14: FECAL COLIFORM TRENDS IN DEER CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 15** shows the cumulative percentage of the fecal coliform results in Deer Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

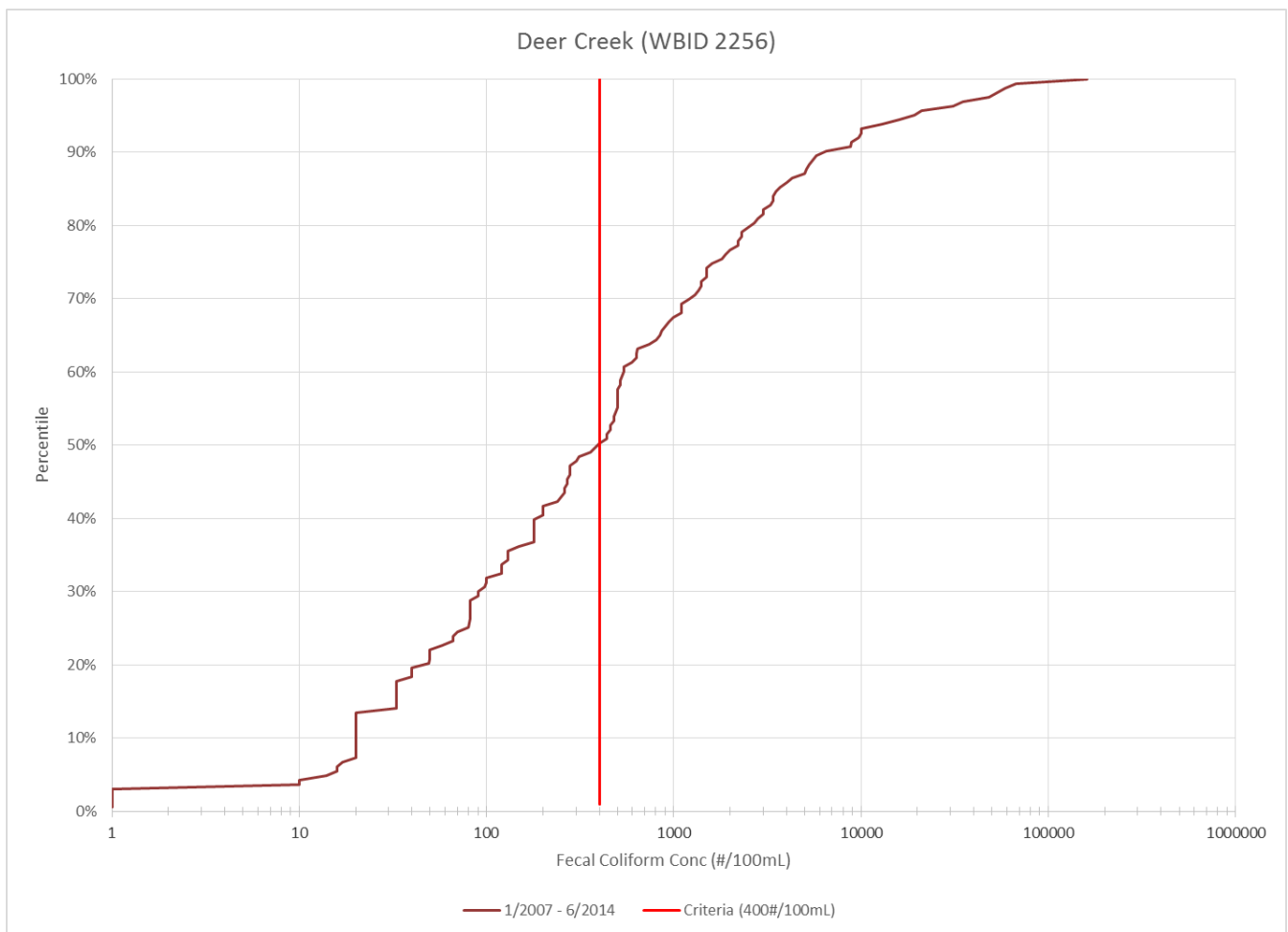


FIGURE 15: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN DEER CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.8 TERRAPIN CREEK

Terrapin Creek fecal coliform concentrations decreased over the period from 2010 through 2014 (**Figure 16**), based on the data collected at five stations. The median concentrations are fairly low for this period, with the lowest median value occurring in 2014 (**Table 12**). The station with the highest median concentration was 21FLA 20030490FLA, located at Blassius Road, with 770 CFU/100mL.

TABLE 12: SUMMARY OF TERRAPIN CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	28	27	4,000	685	1,126	19	68%
2011	17	39	2,500	660	802	12	71%
2012	19	110	4,300	860	1,173	15	79%
2013	15	44	2,000	750	788	12	80%
2014	20	90	5,700	340	684	9	45%

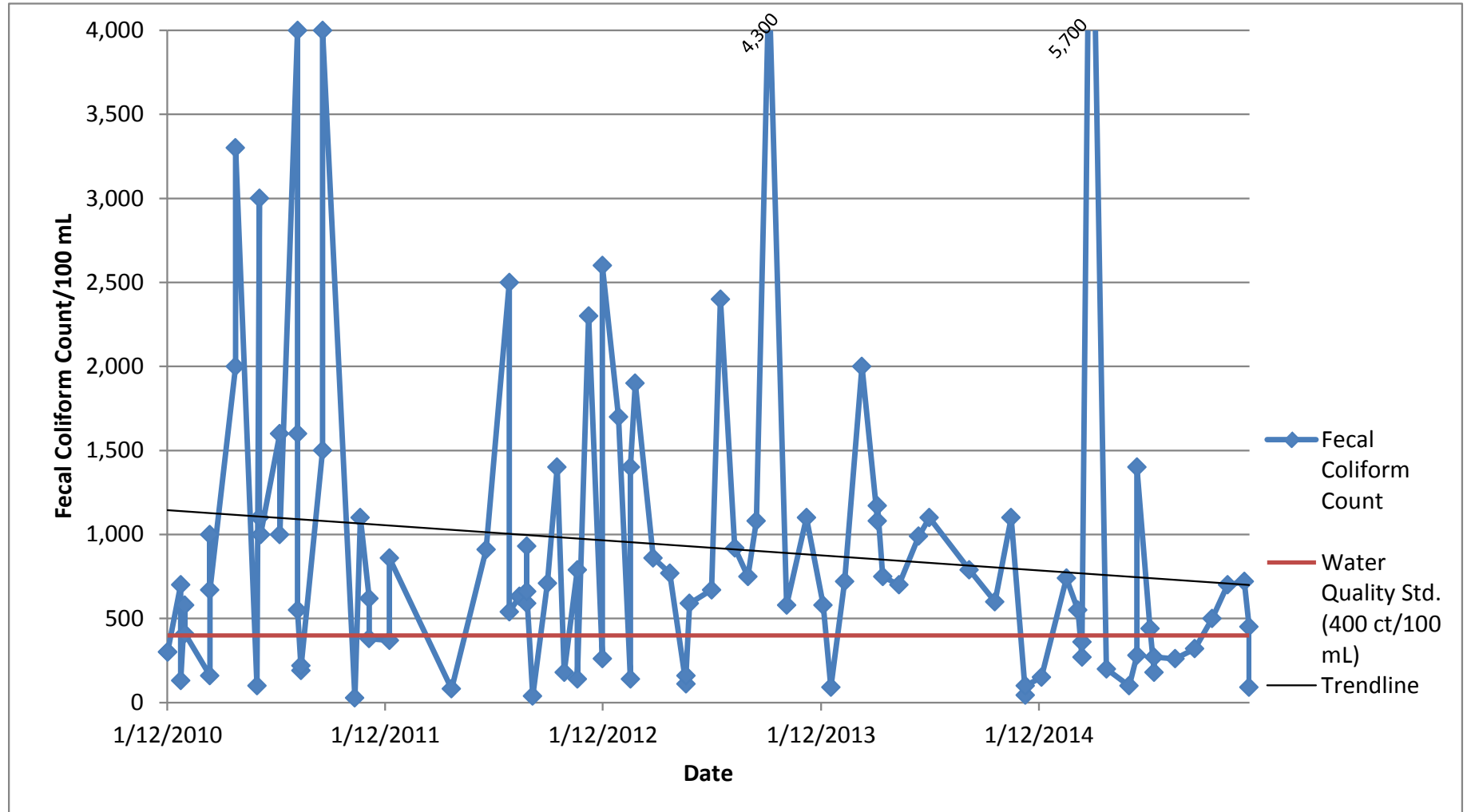


FIGURE 16: FECAL COLIFORM TRENDS IN TERRAPIN CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 17** shows the cumulative percentage of the fecal coliform results in Terrapin Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

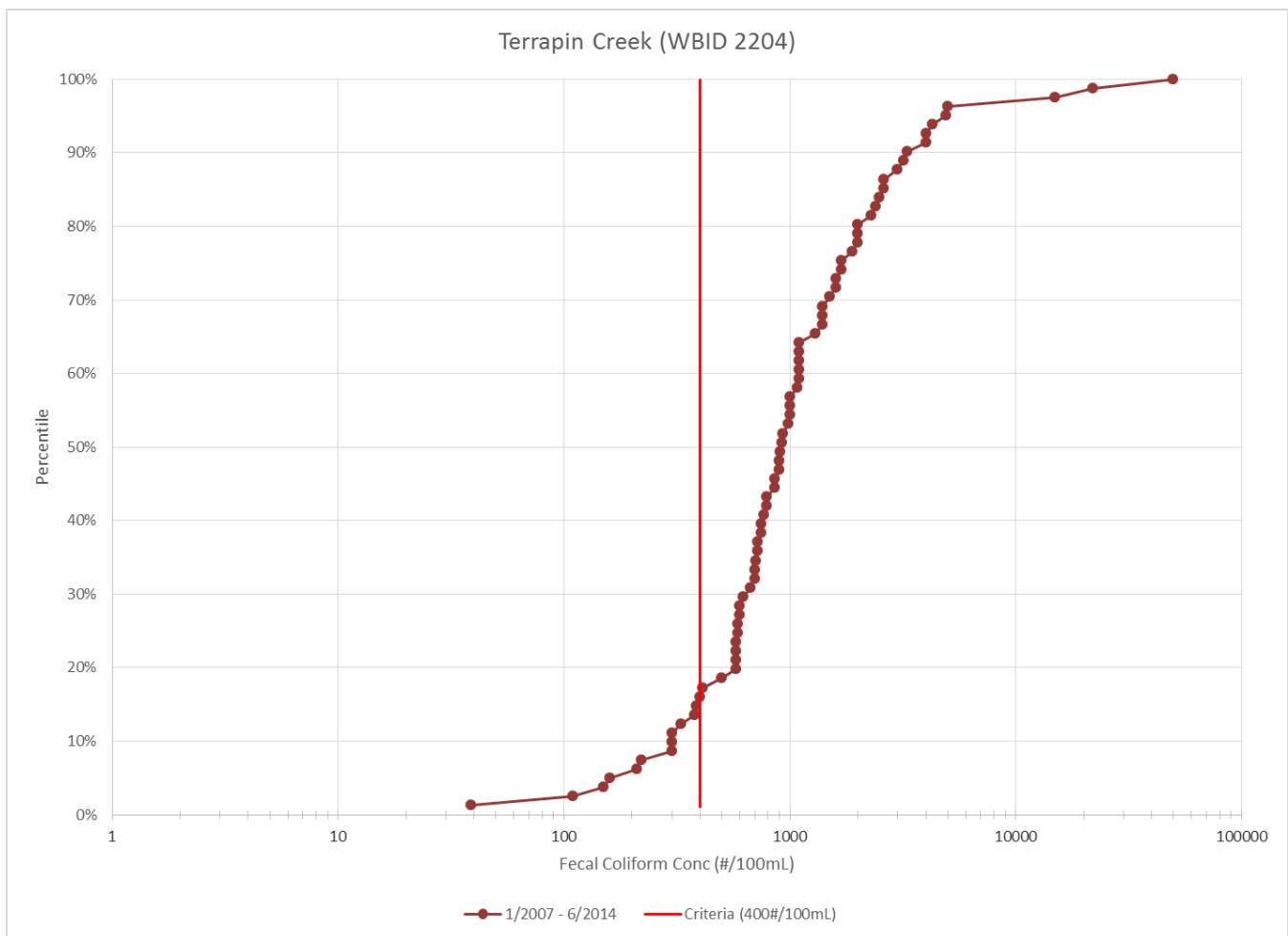


FIGURE 17: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN TERRAPIN CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.9 GOODBYS CREEK

There was an increase in fecal coliforms in Goodbys Creek between 2010 and 2014 (**Figure 18**), based on the data collected at eight stations. However, as shown in **Table 13** the median concentrations were less than 1,000 CFU/100mL in every year, with the lowest in 2014. Station SS319, located at Sanchez Road, has the highest median concentration of 631 CFU/100mL.

TABLE 13: SUMMARY OF GOODBYS CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100mL)	MAXIMUM (#/100mL)	MEDIAN (#/100mL)	MEAN (#/100mL)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	68	0	3,100	440	659	36	53%
2011	20	150	4,600	950	1,322	17	85%
2012	24	99	8,900	520	1,280	15	63%
2013	18	200	1,580	515	553	12	67%
2014	20	1	3,300	305	900	7	35%

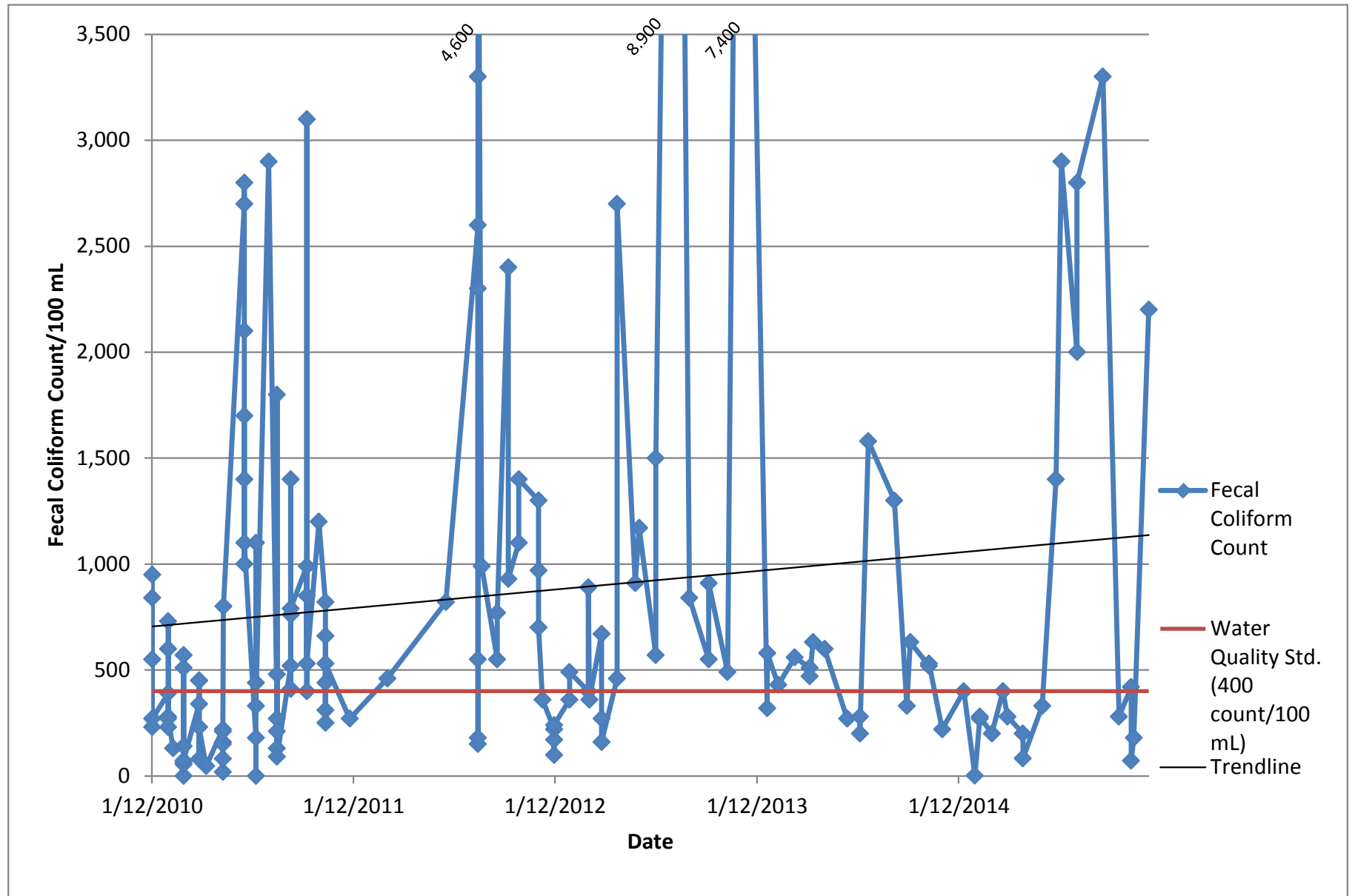


FIGURE 18: FECAL COLIFORM TRENDS IN GOODBYS CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 19** shows the cumulative percentage of the fecal coliform results in Goodbys Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

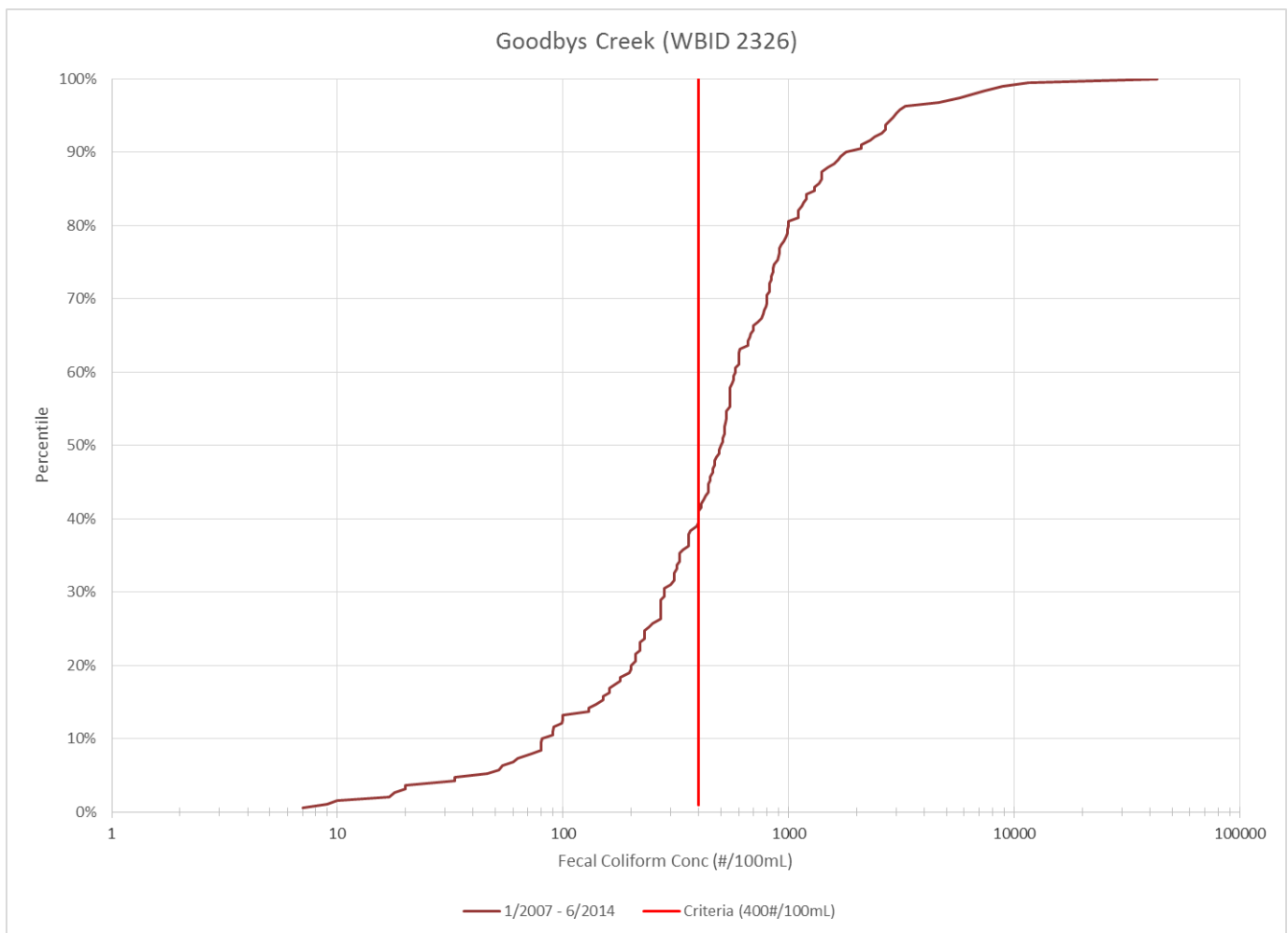


FIGURE 19: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN GOODBYS CREEK COMPARED WITH THE WATER QUALITY STANDARD

1.5.10 OPEN CREEK

Fecal coliform concentrations in Open Creek decreased over the period from 2010 through 2014 (**Figure 20**), based on the data collected at seven stations. The median concentrations during this time were generally low (**Table 14**). Station 21FLA 20030949 had the highest median concentration of 820 CFU/100mL. The station is located at Cross Water Boulevard on the northwestern branch of the creek.

TABLE 14: SUMMARY OF OPEN CREEK FECAL COLIFORM DATA BY YEAR, 2010–14

YEAR	NUMBER	MINIMUM (#/100ML)	MAXIMUM (#/100ML)	MEDIAN (#/100ML)	MEAN (#/100ML)	NUMBER OF EXCEEDANCES	% EXCEEDANCES
2010	48	63	11,000	665	1,897	30	63%
2011	21	190	13,000	600	1,521	15	71%
2012	30	81	4,000	535	852	20	67%
2013	12	90	2,700	355	559	3	25%
2014	16	140	4,200	725	994	13	81%

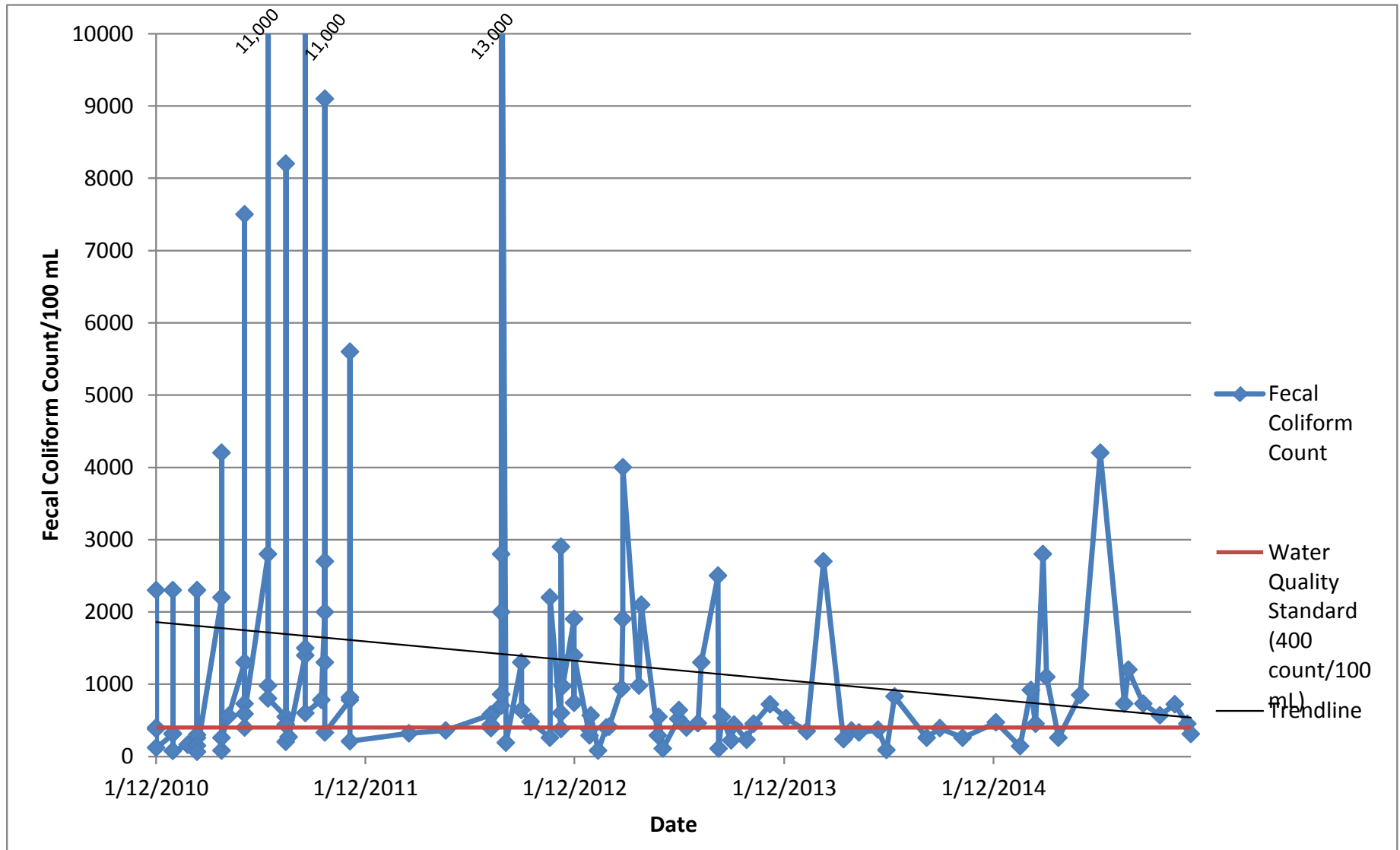


FIGURE 20: FECAL COLIFORM TRENDS IN OPEN CREEK, 2010–14

In reference to water quality standards, the waterbodies are assessed based on the number of exceedances over 400 CFU/100mL. Based on the number of samples taken in a given data period, a limited number of exceedances is allowed before the waterbody is considered impaired. While the charts showing the trends over time are helpful to see how the coliform levels are changing, from a compliance standpoint, the number of exceedances is the primary consideration. **Figure 21** shows the cumulative percentage of the fecal coliform results in Open Creek and how they compare with the standard of 400 CFU/100mL. When the water quality standard is being met, all or most of the results will be to the left of the 400 count line, meaning that most of the samples were at or below the water quality standard.

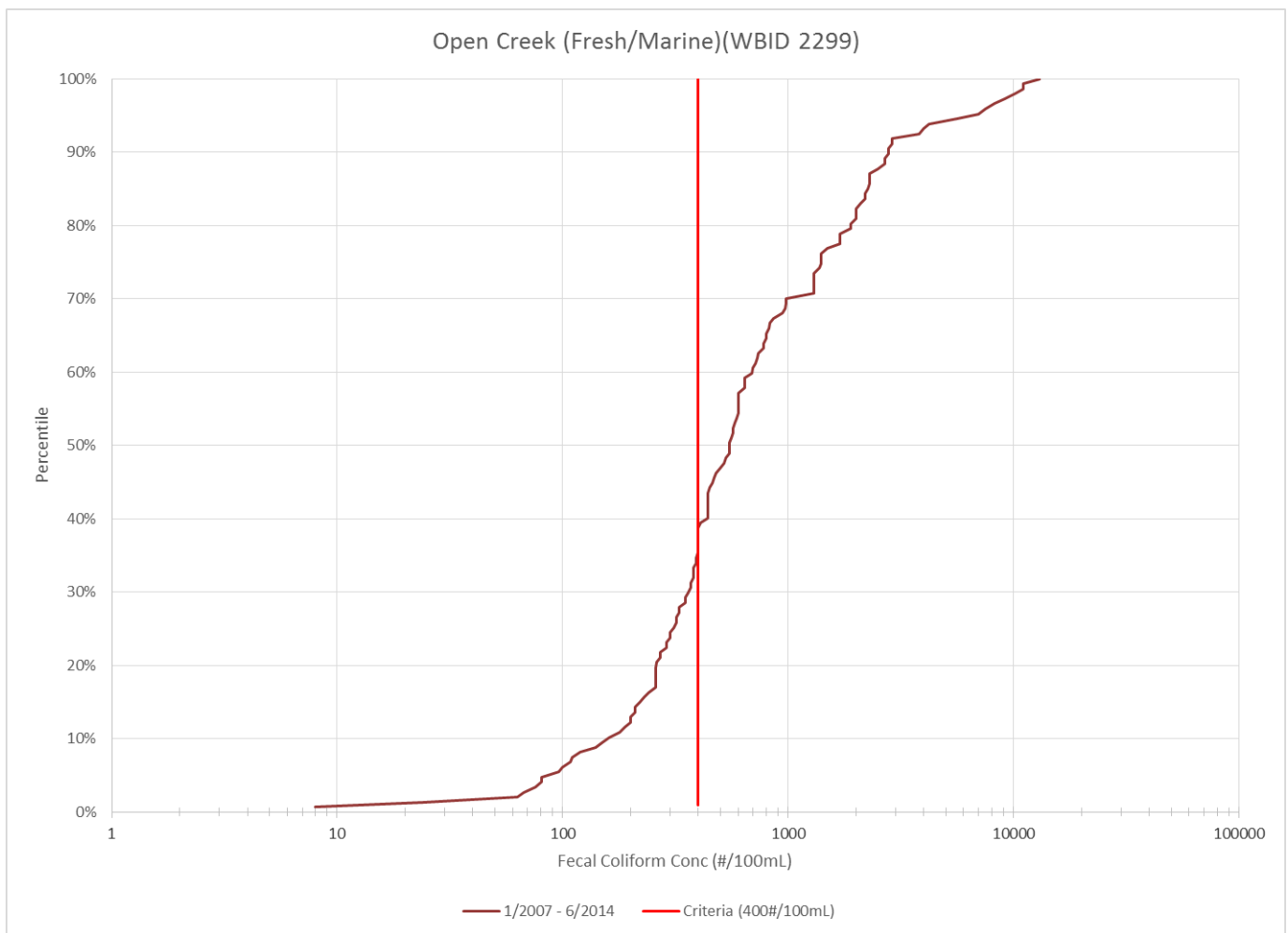


FIGURE 21: CUMULATIVE FREQUENCY OF FECAL COLIFORM RESULTS IN OPEN CREEK COMPARED WITH THE WATER QUALITY STANDARD

SECTION 2. WATER QUALITY MONITORING AND SOURCE ASSESSMENT

2.1 WATER QUALITY MONITORING PLAN

The water quality monitoring network was revised during Phase 1 of BMAP implementation. The current stations in the monitoring network and responsible entity for sampling each station are described below for each WBID. Additional sampling will occur as needed to follow up on fecal coliform results greater than 5,000 CFU/100mL, an indication of human waste. The TAT adopted the sample benchmark of 5,000 CFU/100mL to trigger additional follow-up efforts based on *Watershed Protection Techniques, Vol. 3, No. 1, April 1999, Implications for Watershed Managers*. Sampling will only occur if the monitoring site has at least 10 centimeters of water and the water is flowing normally for that stream.

COJ and the department are responsible for collecting the samples, and JEA is committed to processing up to 32 samples per month through the JEA laboratory for COJ and the department. Through the municipal separate storm sewer system (MS4) agreement, FDOT provides funding to COJ, a portion of which is used for the BMAP monitoring and follow-up sampling.

2.1.1 NEWCASTLE CREEK MONITORING NETWORK

COJ is responsible for monitoring in Newcastle Creek. **Table 15** lists the stations sampled.

TABLE 15: MONITORING STATIONS IN NEWCASTLE CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLJXWQARL6	Trend	Quarterly	Fort Caroline Hills Drive	COJ
21FLJXWQARL5A	Source assessment	Monthly	Berrywood Lane	COJ

2.1.2 HOGAN CREEK MONITORING NETWORK

COJ is responsible for monitoring in Hogan Creek. **Table 16** lists the stations sampled.

TABLE 16: MONITORING STATIONS IN HOGAN CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLJXWQHC3	Trend	Monthly	First Street	COJ
21FLJXWQHC4	Source assessment	Monthly	10 th Street	COJ
21FLJXWQHC1A	Source assessment	Monthly	Broad Street	COJ
21FLJXWQHC2A	Source assessment	Monthly	Hubbard Street (Confederate Park)	COJ

2.1.3 BUTCHER PEN CREEK MONITORING NETWORK

The department is responsible for monitoring in Butcher Pen Creek. **Table 17** lists the stations sampled.

TABLE 17: MONITORING STATIONS IN BUTCHER PEN CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLA 20030082	Trend	Quarterly	Confederate Point Road	Department
21FLA 20030760	Source assessment	Monthly	Wesconnett Boulevard	Department
21FLA 20030829	Source assessment	Monthly	Jammes Road	Department

2.1.4 MILLER CREEK MONITORING NETWORK

COJ is responsible for monitoring in Miller Creek. **Table 18** lists the stations sampled.

TABLE 18: MONITORING STATIONS IN MILLER CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLJXWQSS1	Trend	Quarterly	Atlantic Boulevard	COJ
21FLJXWQSS23	Source assessment	Monthly	Mayfair Road	COJ

2.1.5 MIRAMAR CREEK MONITORING NETWORK

COJ is responsible for monitoring in Miramar Creek. **Table 19** lists the stations sampled.

TABLE 19: MONITORING STATIONS IN MIRAMAR CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLJXWQSS4	Trend	Monthly	San Jose Boulevard	COJ
21FLJXWQSS505	Source assessment	Monthly	Adjacent to JEA Lift Station #S505	COJ
21FLJXWQSS4	Source assessment	Monthly	San Jose Boulevard	COJ

2.1.6 BIG FISHWEIR CREEK MONITORING NETWORK

The department is responsible for monitoring in Big Fishweir Creek. **Table 20** lists the stations sampled.

TABLE 20: MONITORING STATIONS IN BIG FISHWEIR CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLA 20030139	Trend	Quarterly	Hershel Street	Department
21FLA 20030951	Source assessment	Monthly	Park Street – East Crossing	Department
21FLA 20030953	Source assessment	Monthly	Little Fishweir Creek at Oak	Department

2.1.7 DEER CREEK MONITORING NETWORK

COJ is responsible for monitoring in Deer Creek. **Table 21** lists the stations sampled.

TABLE 21: MONITORING STATIONS IN DEER CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLJXWQDR1	Trend	Monthly	Talleyrand Avenue	COJ
21FLJXWQDR2	Source assessment	Monthly	Haines Street	COJ

2.1.8 TERRAPIN CREEK MONITORING NETWORK

The department is responsible for monitoring in Terrapin Creek. **Table 22** lists the stations sampled.

TABLE 22: MONITORING STATIONS IN TERRAPIN CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLA 20030490	Source assessment	Monthly	Terrapin Creek at Blasius Road	Department

2.1.9 GOODBYS CREEK MONITORING NETWORK

The department is responsible for monitoring in Goodbys Creek. **Table 23** lists the stations sampled.

TABLE 23: MONITORING STATIONS IN GOODBYS CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLA 20030594	Trend	Quarterly	Sanchez Road	Department
21FLA 20030891	Source assessment	Monthly	Goodbys Creek above west branch at San Clerc	Department

2.1.10 OPEN CREEK MONITORING NETWORK

The department is responsible for monitoring in Open Creek. **Table 24** lists the stations sampled.

TABLE 24: MONITORING STATIONS IN OPEN CREEK

MONITORING STATION	STATION TYPE	FREQUENCY	LOCATION	RESPONSIBLE ENTITY
21FLA 20030695	Trend	Quarterly	San Pablo Road	Department

2.2 WALK THE WBID AND SOURCE IDENTIFICATION SAMPLING

During 2014, the department and LSJR Tributaries BMAP I stakeholders carried out an intensive effort to evaluate the 10 impaired tributaries. Representatives from the stakeholders in these tributaries participated in the two main components of this effort: (1) Maps on the Table, and (2) Walk the WBID.

For the Maps on the Table exercise, representatives from each entity who had local knowledge of the watersheds gathered to review the maps of each watershed to identify the locations of potential sources and areas that needed further investigation. A meeting was held on April 21, 2014, to discuss the maps for Miller Creek, Hogan Creek, and Butcher Pen Creek. A second meeting was held on May 19, 2014, to review the maps for Big Fishweir Creek, Miramar Creek, and Newcastle Creek. The final meeting was held on June 5, 2014, to discuss the maps for Terrapin Creek, Open Creek, Goodbys Creek, and Deer Creek.

The information from the Maps on the Table exercise was used to assist entity representatives in the field effort, Walk the WBID. The department led walks with entity representatives in each of the 10 watersheds to investigate areas of concern and to identify potential fecal coliform sources. While in the field, the stakeholders looked for the following potential sources:

- Sanitary sewer lift stations and locations of repeat sanitary sewer overflows (SSOs).
- Neighborhoods with older sanitary sewer lines.
- Failing septic system areas; soggy drainfields.
- Tail pipes into ditches.
- Homeless areas and homeless camps.
- Dog walk areas or dog parks.
- Animal kennels and dumped cat litter.
- Bird rookeries.
- Concentrations of geese and Muscovy ducks, and areas where ducks are fed.
- Farm animals, hobby farms, and horses.

- Wild hogs, raccoons, and other wild animals.
- Rotting biological material around dumpsters; open or rusty dumpsters.
- Trash, overflowing dumpsters, illegal garbage disposal, food waste, and used diapers.
- Grease behind restaurants.
- Stormwater blockages such as trash and debris.
- Stormwater conveyances in need of maintenance.
- Overgrown stormwater treatment ponds.
- Areas prone to flooding.
- Ideal conditions for bacteria growth created by low flows, sediment, and shady conditions.

A Walk the WBID exercise was held on April 23, 2014, for Miller Creek, Hogan Creek, and Butcher Pen Creek. A similar exercise was held on May 22, 2014, for Miramar Creek and Newcastle Creek, and one for Open Creek, Terrapin Creek, and Deer Creek was held on June 19, 2014. Another Walk the WBID was held on June 30, 2014, for Big Fishweir Creek. The final walk was held on July 23, 2014, for Goodbys Creek. Detailed notes and photographs were taken of potential sources, and issues needing corrective action were identified for each watershed. The department prepared separate reports; the detailed findings from each walk are available on request.

In addition, the department and COJ collected samples to identify locations with potential human contributions to the impairments. Samples were evaluated using the quantitative polymerase chain reaction (qPCR) method for a human marker to determine whether the bacteria in an area were from a human or other source. Human sources are the main sources that need to be addressed from a human health perspective. The qPCR evaluation was coupled with a sucralose and an acetaminophen analysis. Sucralose is an artificial sweetener that is not found in nature, and so its presence indicates a human source. However, sucralose passes through the wastewater treatment process; thus it can be found in reuse water and treated effluent, as well as in untreated sewage and effluent from OSTDS. Therefore,

acetaminophen was also evaluated because it breaks down during the wastewater treatment process. This analysis helps to determine if the source is potentially from untreated sewage or OSTDS.

The Walk the WBID efforts and source identification sampling that occurred during 2014 are only the first step in a larger assessment project for the tributaries. These efforts helped identify and address issues that could be addressed in the short term, such as the need for trash removal from stormwater ponds or further investigations to determine the sources of water observed discharging to the creek. The efforts also helped the department and stakeholders compile ideas for future long-term implementation efforts, including simple modifications to enhance existing inspection, public education, and maintenance programs. These long-term program modifications for each entity can be found in **Section 3** under the Walk the WBID Follow Up subsections.

Furthermore, the department will collect additional data to represent different hydrologic conditions and to follow up on initial findings when there are indications of human wastewater reaching the creeks. Based on the results of the source identification sampling, as well as the routine BMAP monitoring, the stakeholders will take actions to address the sources identified. These additional follow-up activities and projects will be documented during the second phase of the BMAP.

2.3 WBID BOUNDARY MODIFICATIONS

During the watershed assessments in 2014, the department and stakeholders determined that the boundaries for seven of the BMAP WBIDs needed to be modified to reflect the hydrologic conditions in the field. The department has officially modified the boundaries for the following WBIDs:

- Newcastle Creek.
- Butcher Pen Creek.
- Miller Creek.
- Miramar Creek.
- Big Fishweir Creek.
- Open Creek.
- Goodbys Creek.

In addition, since the TMDLs were adopted, the department determined that several of the BMAP WBIDs should be separated into freshwater and marine segments. This change affected Goodbys Creek (WBID 2326A is the freshwater segment, and WBID 2326B the marine segment), Open Creek (WBID 2299A is the freshwater segment, and WBID 2299B the marine segment), and Big Fishweir Creek (WBID 2280A is the freshwater segment, and WBID 2280B the marine segment). **Table 25** summarizes these changes in WBID numbering.

TABLE 25: WBID NUMBERING CHANGES

WATERBODY NAME	ORIGINAL WBID NUMBER	NEW FRESHWATER SEGMENT WBID NUMBER	NEW MARINE SEGMENT WBID NUMBER
Goodbys Creek	2326	2326A	2326B
Open Creek	2299	2299A	2299B
Big Fishweir Creek	2280	2280A	2280B

Appendix A contains maps showing the new boundaries and WBID splits. Both the freshwater and marine WBIDs are part of the Phase 2 BMAP. It is important to note that since the boundaries for these WBIDs are different from the boundaries in the 2009 BMAP, a direct comparison of the stakeholders' level of effort for different strategies between the Phase 1 and Phase 2 BMAPs cannot be made.

SECTION 3. COUNTYWIDE PROGRAMS IN THE LSJR BASIN

The entities conduct several programs and projects on a countywide level. These activities are summarized below, and waterbody-specific efforts associated with these programs are described in the original BMAP, as well as in annual Progress Reports. This section also describes the actions the stakeholders will take to follow up on findings from the Walk the WBID and source identification sampling. The new management strategies being added to this BMAP are included in each WBID section (see **Section 5** through **Section 13**).

3.1 JEA

3.1.1 COUNTYWIDE PROGRAMS

JEA implements a number of countywide programs, as follows, to address the sanitary sewer system as a source of fecal coliform contamination: (1) Fats, Oil, and Grease (FOG) Reduction Program; (2) SSO Root Cause Program; (3) Pop-Top Program; (4) Non-Destructive Testing and Air Release Valve Programs; (5) Supervisory Control and Data Acquisition; (6) Third Party Education and Enforcement Program; (7) Manhole Monitoring; (8) Force Main Discharge Manholes; and (9) Capacity, Management, Operations, and Maintenance Program.

3.1.2 WALK THE WBID FOLLOW-UP

JEA will continue its participation in the TAT coordination calls and other TAT efforts. It will assist the department in following up on source identification results that indicate a human source in areas with JEA sanitary sewer infrastructure. JEA will also continue to give priority to improving/repairing infrastructure close to surface waterbodies and stormwater conveyances. A significant percentage of inspections, retrofits, and repairs of the sanitary sewer system already occur in the LSJR Tributaries BMAP I and II watersheds. In addition, JEA will address any action items identified as a result of the 2014 Walk the WBID that relate to its jurisdiction.

In BMAP watersheds, JEA will work with COJ and FDOH to develop an inspection program for dumpster areas and behind restaurants, convenience stores, and grocery stores that are regulated under JEA's FOG Program. FDOT will assist with this effort to the extent that potential discharges impact its rights-of-way. If food and grease are found on the ground, in stormwater conveyances, and/or running into creeks, JEA will report this issue to the Department of Business and Professional Regulation (DBPR) or COJ code enforcement. JEA's Industrial Pre-Treatment Inspection Program will help to

report these issues, and the inspector will be trained by the DBPR to identify issues. JEA’s inspector is able to visit between five and 10 restaurants a day throughout Jacksonville.

JEA will continue to run analyses on up to 32 samples for the department’s Northeast District Office. It will also add *Escherichia coli* (*E. coli*) using the Enzyme Substrate Coliform Test (Method SM9223B) and *Enterococcus*, as appropriate, to be included in its 32 sample analyses. **Table 26** summarizes JEA’s Walk the WBID follow-up actions.

TABLE 26: JEA WALK THE WBID FOLLOW-UP ACTIONS

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-162	Participate in TAT Calls and Efforts	Continue participation in TAT coordination calls and other TAT efforts.	Ongoing	Unknown	JEA	Ongoing
JEA-163	Source Identification Follow Up	Assist department in following up on source identification results that indicate human source.	Ongoing	Unknown	JEA	Ongoing
JEA-164	Prioritize Infrastructure Improvements	Give priority to improving/repairing infrastructure close to surface waterbodies and stormwater conveyances.	Ongoing	Unknown	JEA	Ongoing
JEA-165	Walk the WBID Follow Up	Address any action items identified as result of the 2014 Walk the WBID.	Ongoing	Unknown	JEA	Ongoing
JEA-166	Dumpster Inspection Program	Develop inspection program for dumpster areas and behind restaurants, convenience stores, and grocery stores.	Ongoing	Unknown	JEA	Ongoing
JEA-167	Sample Analysis	Continue to run analysis on up to 32 samples for department’s Northeast District Office, and add <i>E. coli</i> and <i>Enterococcus</i> sampling, as appropriate.	Ongoing	Unknown	JEA	Ongoing

3.2 FDOH–DUVAL COUNTY

3.2.1 COUNTYWIDE PROGRAMS

FDOH–Duval County implements a variety of countywide specific improvement programs and restoration activities to address OSTDS as sources of fecal coliform contamination. These include the OSTDS Program to address potential sources; annual training programs for OSTDS contractors, certified plumbers, maintenance entities, and environmental health professionals; application, plan review, and site evaluations for OSTDS new construction, repair, or modification; the designation of OSTDS failure and nuisance areas for transfer to central sewer; and site investigations for complaints received, with enforcement action when sanitary nuisance violations are observed.

3.2.2 WALK THE WBID FOLLOW-UP

FDOH–Duval County will continue to participate in the TAT coordination calls and other TAT efforts. It also will assist the department in following up on source identification results that indicate a human source in areas with septic systems. This support will include providing information on where septic systems are located and contacting owners to request access to inspect the systems, if needed. In addition, FDOH will address any action items identified as a result of the 2014 Walk the WBID that relate to its jurisdiction.

In the BMAP watersheds, FDOH will work with COJ and JEA to develop a process in which all complaints or discovery of food and grease on the ground surface, in stormwater conveyances, and/or running into creeks from dumpster areas and behind restaurants, convenience stores, and grocery stores will be reported to DBPR or COJ code enforcement. FDOT will assist with this effort to the extent that potential discharges impact its rights-of-way. Field staff or supervisors will be trained by the DBPR to identify these issues. **Table 27** summarizes FDOH–Duval County’s Walk the WBID follow-up actions.

TABLE 27: FDOH–DUVAL COUNTY WALK THE WBID FOLLOW-UP ACTIONS

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH-79	Participate in TAT Calls and Efforts	Continue participation in TAT coordination calls and other TAT efforts.	Ongoing	Unknown	FDOH	Ongoing
FDOH-80	Source Identification Follow-Up	Assist department in following up on source identification results that indicate human source.	Ongoing	Unknown	FDOH	Ongoing
FDOH-81	Walk the WBID Follow-Up	Address any action items identified as result of 2014 Walk the WBID.	Ongoing	Unknown	FDOH	Ongoing
FDOH-82	Dumpster Inspection Program	Develop inspection program for dumpster areas and behind restaurants, convenience stores, and grocery stores.	Ongoing	Unknown	FDOH	Ongoing

3.3 FDOT

3.3.1 COUNTYWIDE PROGRAMS

Under Subsection 334.044(15), F.S., and Chapter 14-86, F.A.C., FDOT implements a Drainage Connection Program. The program does not issue water quality permits but requires the entity connecting to an FDOT conveyance to certify that the non-FDOT stormwater discharge is of acceptable water quality. Connecting entities are required to maintain the discharge of acceptable water quality for the duration of the FDOT Drainage Connection Program permit. If a discharge is identified as causing or contributing to a violation of water quality standards, the permittee will be reported to the department,

the St. Johns River Water Management District (SJRWMD), and, if applicable, the local municipality; these entities regulate stormwater quality through state rules, ordinances, and codes.

FDOT also works with COJ on several efforts related to MS4 permits. FDOT participates in the Potential Illicit Connection (PIC) Program in conjunction with COJ. FDOT has instructed staff to be alert for illicit connections during routine maintenance activities and investigates observances found in rights-of-way. Those located outside the rights-of-way are reported to the applicable municipality for further investigation and enforcement action. In June 2014, FDOT started the statewide implementation of mandatory IDDE training for staff and contractors working in its rights-of-way. It maintains a toll-free number to be used for reporting illicit connections.

3.3.2 WALK THE WBID FOLLOW-UP

FDOT will continue its participation in the TAT coordination calls and other TAT efforts. It will also assist the department in following up on source identification results that indicate a human source in areas with FDOT MS4 infrastructure. In addition, FDOT will address any mutually agreed-on action items identified as a result of the 2014 Walk the WBID that relate to its jurisdiction.

In the BMAP watersheds, FDOT will assist COJ, JEA, and FDOH with the development of an inspection program for dumpster areas and behind restaurants, convenience stores, and grocery stores with the potential to discharge into its rights-of-way. If food and grease are found on the ground, in stormwater conveyances, and/or running into creeks, FDOT will report this issue to DBPR, COJ, or COJ code enforcement. Field staff or supervisors will be trained by the DBPR to identify issues. **Table 28** summarizes FDOT's Walk the WBID follow-up actions.

TABLE 28: FDOT WALK THE WBID FOLLOW-UP ACTIONS

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOT-79	Participate in TAT Calls and Efforts	Continue participation in TAT coordination calls and other TAT efforts.	Ongoing	Unknown	FDOT	Ongoing
FDOT-80	Source Identification Follow-Up	Assist department in following up on source identification results that indicate human source discharging into its MS4 or rights-of-way.	Ongoing	Unknown	FDOT	Ongoing
FDOT-81	Walk the WBID Follow-Up	Address any mutually agreed-on action items identified as result of 2014 Walk the WBID.	Ongoing	Unknown	FDOT	Ongoing
FDOT-100	Proactive IDDE Program	Continue to implement mandatory IDDE training for staff and contractors working in FDOT's rights-of-way	Ongoing	Unknown	FDOT	Ongoing

3.4 COJ

3.4.1 COUNTYWIDE PROGRAMS

COJ has established a monitoring plan to evaluate the effectiveness of the Stormwater Management Program and the associated pollutant reduction from MS4 systems to waters of the state. The monitoring plan is a requirement of Part V.B. of the COJ/FDOT National Pollutant Discharge Elimination System (NPDES) MS4 permit and supported by Title 40 of the Code of Federal Regulations (C.F.R.), Part 122.26(d)(2)(iii). In addition to routine monitoring, COJ's Environmental Quality Division (EQD) is part of the TAT and conducts sampling to help identify potential sources of fecal coliform contamination.

The COJ Public Works Department's Streets and Drainage Division is responsible for maintaining its stormwater conveyance systems in Jacksonville. In addition to routine maintenance activities, work orders for maintenance are generated from the Citizen Action Response Effort (CARE) database. COJ also implements the PIC Program. COJ EQD keeps a record of reported PICs in a database, which is used to determine where site visits are necessary. COJ inspectors conduct the site visits and talk to both the people who live on the site, as well as their neighbors, to verify the nature of the issue. If there is a known discharge, the inspector investigates in order to direct the resolution of the discharge to the appropriate entity (COJ, FDOH–Duval County, or the department). If necessary, a sample is collected to determine the nature of the discharge. COJ may assist the individual in remedying the situation and return to ensure that the connection has been removed.

Educational outreach is a vital part of the PIC Program. COJ EQD primarily provides this outreach by distributing materials to the public such as educational pamphlets and informational door hangers, and through a storm drain–stenciling program. COJ also has several continuing public service announcements (PSAs) to address pet waste management and OSTDS maintenance.

3.4.2 WALK THE WBID FOLLOW-UP

COJ will continue its participation in the TAT coordination calls and other TAT efforts. It will assist the department in following up on source identification results that indicate a human source in areas with COJ MS4 infrastructure or otherwise under COJ's jurisdiction. COJ will also continue its BMAP monitoring, with adjustments made as needed, and will follow up on high coliform results per the TAT protocol. In addition, COJ will investigate adding *E. coli* and *Enterococcus*, as appropriate, to its sample analyses. These new analyses will be phased in as funding allows.

In the BMAP watersheds, COJ will work with other stakeholders to incorporate, within existing programs, the inspections for dumpster areas and behind restaurants, convenience stores, and grocery stores. If food and grease are found on the ground, in stormwater conveyances, and/or running into creeks, COJ will report this issue to DBPR or COJ code enforcement. COJ field crews will be trained by the DBPR to identify issues.

COJ will promote community awareness of the waterbodies' health through existing programs such as Keep Jacksonville Beautiful and other environmental organizations. It will also organize community cleanups for the creeks. As part of these cleanups, COJ will inspect the banks of the waterbodies to look for illicit connections. The goal of the cleanups and inspections is to complete a total of 10 WBIDs by the end of the second five-year BMAP iteration. These 10 WBIDs will include waterbodies in the LSJR Tributaries BMAPs I and II. COJ and the department will determine the priority for the BMAP I and II WBIDs. COJ will also explore the option of creating an artistic campaign to raise awareness of the trash thrown into the creeks and will look for opportunities to phase out septic tanks close to the impaired waterbodies.

Stormwater flushing is important to the biology of the creek beds, because poor flushing allows bacteria to regrow in the stream sediments at higher rates. COJ agrees to investigate stormwater projects in each BMAP WBID that may have diverted stormwater away from the tributaries. One example is the regional pond on Deer Creek, where routine overflow is now directed to the LSJR mainstem and only discharges to Deer Creek in extreme storm events. COJ commits to looking for similar projects in the other BMAP WBIDs. It will also make efforts in future designs to keep creeks flowing, wherever possible, without causing flooding.

In addition, COJ will address any action items identified as a result of the 2014 Walk the WBID that relate to its jurisdiction. **Table 29** summarizes COJ's Walk the WBID follow-up actions.

TABLE 29: COJ WALK THE WBID FOLLOW-UP ACTIONS

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
COJ – 284	Participate in TAT Calls and Efforts	Continue participation in TAT coordination calls and other TAT efforts.	Ongoing	Unknown	COJ	Ongoing
COJ – 285	Source Identification Follow-Up	Assist department in following up on source identification results that indicate human source.	Ongoing	Unknown	COJ	Ongoing
COJ – 286	Sample Analysis	Continue BMAP monitoring, with adjustments made as needed, and follow up on high results per TAT protocol. Add <i>E. coli</i> and <i>Enterococcus</i> , as appropriate.	Ongoing	Unknown	COJ	Ongoing
COJ – 287	Dumpster Inspection Program	Develop inspection program for dumpster areas and behind restaurants, convenience stores, and grocery stores.	Ongoing	Unknown	COJ	Ongoing
COJ – 288	Tributary Cleanup and Search for Illicit Connections	Promote community awareness of waterbodies' health, organize annual community cleanups, and inspect for illicit connections. This will occur in 10 WBIDs over the next five years.	Ongoing	Unknown	COJ	Ongoing
COJ – 289	Investigate Rerouted Stormwater	Investigate stormwater projects in each BMAP WBID that may have diverted stormwater away from tributaries.	Ongoing	Unknown	COJ	Ongoing
COJ – 290	Walk the WBID Follow-Up	Address any action items identified as result of the 2014 Walk the WBID.	Ongoing	Unknown	COJ	Ongoing

3.5 FDACS

3.5.1 AGRICULTURAL BEST MANAGEMENT PRACTICE (BMP) IMPLEMENTATION

All agricultural nonpoint sources in the LSJR Tributaries BMAP I area are statutorily required either to implement FDACS-adopted BMPs or to conduct water quality monitoring prescribed by the department or SJRWMD that demonstrates compliance with water quality standards (Paragraph 403.067[7][b], F.S.). If these pollutant sources do not either implement BMPs or conduct monitoring that demonstrates compliance with water quality standards, they may be subject to enforcement by the department or SJRWMD. Under Paragraph 403.067(7)(c), F.S., the filing of a Notice of Intent (NOI) to implement FDACS-adopted, department-verified BMPs in accordance with FDACS rule provides a presumption of compliance with state water quality standards.

Table 30 summarizes agricultural land categories in the LSJR Tributaries I Basin, according to 2009 SJRWMD land use data. Prominent agricultural land uses are improved pasture and rangeland.

TABLE 30: 2009 AGRICULTURAL LAND USES IN THE LSJR TRIBUTARIES I BASIN

- = Empty cell/no data

LAND USE CODE	CODE DESCRIPTION	ACRES
2110	Improved Pasture	56.98
2150	Field Crops	10.89
2310	Feeding Operations	4.06
3300	Rangeland	20.21
-	Total Acres	92.14

3.5.2 AGRICULTURAL BMPs

BMPs are individual or combined practices determined through research, field testing, and expert review to be the most effective and practicable means for improving water quality, taking into account economic and technological considerations. The primary regulatory authority for establishing agricultural BMPs is divided between FDACS's Florida Forest Service (silviculture BMP Program), Division of Aquaculture (Aquaculture Certification Program), and Office of Agricultural Water Policy (OAWP) (all other agricultural BMP programs).

FDACS's OAWP BMPs fall into two categories: structural and management. Structural BMPs involve the installation of structures or changes to the land, usually are more costly, and often require cost-share to be economically feasible. They include water control structures, fencing, and tailwater recovery systems, among other approaches. Management BMPs, such as nutrient and irrigation management, comprise the majority of the practices and often are not readily observable. Nutrient management addresses fertilizer type, amount, placement, and application timing and includes practices such as soil and tissue testing to determine crop nutrient needs, application methods, and setbacks from water resources. Irrigation management is the maintenance, scheduling, and overall efficiency rating of irrigation systems.

[OAWP BMP materials and staff contact information](#) are available online. Printed BMP manuals can be obtained in the local extension office at county agricultural extension centers or by contacting OAWP field staff.

3.5.3 BMP ENROLLMENT

Figure 22 summarizes 2009 SJRWMD agricultural land use data in the BMAP area, the acreage associated with commodity types addressed by OAWP BMP manuals, and the acres enrolled in OAWP BMP programs. All agricultural nonpoint sources in the BMAP area are statutorily required either to

implement FDACS-adopted BMPs or to conduct water quality monitoring that demonstrates compliance with state water quality standards.

According to land use data, 92.14 acres of agricultural lands are located in the LSJR Tributaries I Basin. As of June 30, 2015, one operation is enrolled in the cow/calf BMAP manual and includes about 54.73 acres (**Table 31**). According to the 2009 data, 4.06 acres of feeding operations were located in the LSJR Tributaries I Basin. This operation was previously a dairy that is no longer in operation, and that acreage is now covered under a cow/calf NOI. The remaining 37.41 acres of agricultural lands may be eligible for enrollment in the vegetable/agronomic crops manual and/or the Conservation Plan Rule.

Over the next five years, OAWP will work to identify whether these additional lands should be enrolled in the related FDACS' BMP Program. However, it is unlikely that this acreage will be eligible for enrollment in the FDACS' BMP Program because FDACS and the department undertook a compliance assistance effort for the LSJR Basin beginning in 2013. As part of this effort, letters were sent to all of the unenrolled agricultural landowners in the LSJR Basin by both FDACS and the department. These letters resulted in the enrollment of nearly all eligible landowners. FDACS will continue to determine whether 100% enrollment of eligible acreage has been achieved in the LSJR Basin.

Not all of the acreage listed as agriculture in **Table 31** is included in enrollment figures because the NOIs only document the estimated total number of acres where applicable BMPs are implemented, not the entire land use acreage mapped as agriculture. Land use data can contain nonproduction acres (such as buildings, parking lots, and fallow acres) that will not be counted on the NOIs submitted to OAWP. There also may be acreage that is not appropriate for enrollment in OAWP BMPs, such as lands not in commercial production (defined as operations conducted as a business).

TABLE 31: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE LSJR TRIBUTARIES I BASIN

- = Empty cell/no data

¹ Includes land use codes 2110 and 3300.

2009 SJRWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIS
Pasture/Rangeland ¹	77.19	Cow/Calf	54.73	1
Row/Field/Mixed Crops	10.89	Vegetable/Agronomic Crops	0	0
Feeding Operations	4.06	Conservation Plan Rule	0	0
TOTAL	92.14	-	54.73	1

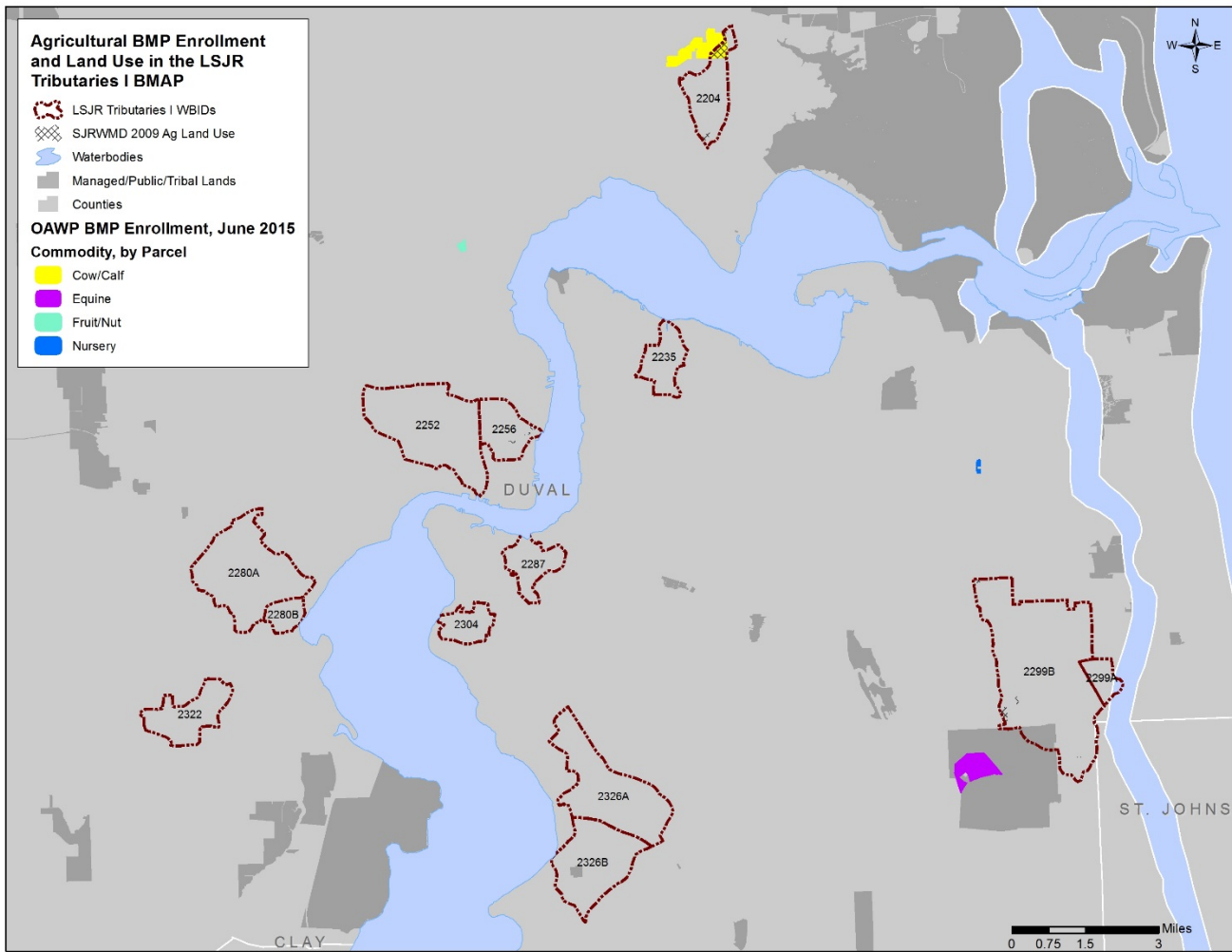


FIGURE 22: OAWP BMP ENROLLMENT IN THE LSJR TRIBUTARIES I BASIN AS OF JUNE 30, 2015

3.5.4 FDACS' OAWP ROLE IN BMP IMPLEMENTATION AND FOLLOW-UP

OAWP works with producers to submit NOIs to implement the BMPs appropriate for their operations. OAWP staff and contractors will continue to identify existing growers, to the greatest extent possible, through grower associations, information on county agricultural exemptions, field staff knowledge, and other means. OAWP will attempt to ensure through letters, emails, workshops, brochures, and/or other means that all producers are aware of their statutory obligation to implement BMPs. Staff/contractors will assist producers in selecting the appropriate BMPs, with emphasis on nutrient management, irrigation management, sediment/erosion control, stormwater management, and record keeping. BMPs that address these topics often also address reducing the potential for fecal coliform loading to streams.

3.5.5 OAWP IMPLEMENTATION ASSURANCE PROGRAM

The OAWP formally established its Implementation Assurance (IA) Program in 2005 in the Suwannee River Basin as part of the multiagency/local stakeholder Suwannee River Partnership. In 2007, OAWP initiated the IA Program in the Lake Okeechobee watershed and launched a standardized follow-up program for the remaining areas of the state in 2013, beginning with the Ridge Citrus and Indian River Citrus BMPs. Because of program-specific needs, the follow-up process for each of these three components was different. In early 2014, the OAWP began to streamline the IA Program to ensure consistency statewide and across commodities and BMP manuals. This effort resulted in a single IA site-visit form, which is currently used by OAWP staff.

The current IA Program consists of two key components—mail-out surveys and site visits. Mail-out surveys are developed by OAWP staff, in conjunction with commodity experts. This component of the IA Program was born out of the recognition that OAWP staff resources are limited; therefore, visits to each of the enrolled producers across the state were not possible within a short/contemporary time frame. All enrolled producers are mailed these surveys and are asked to fill out the surveys and return them to OAWP staff.

Site visits, the second component, are conducted by OAWP field staff and technicians as workload allows. For the visits, field staff and technicians use a standard form (noncommodity or BMP manual specific) that was developed in 2014. This site-visit form focuses on nutrient management, irrigation management, and water resource protection BMPs that are common to all of the adopted BMP manuals. The paper forms are submitted to OAWP staff and compiled into a spreadsheet, and the data are reported annually in reports such as this one. From 2007–14, OAWP conducted over 1,200 site visits. However, it is difficult to compare data collected prior to the implementation of the single IA site-visit form developed in 2014 because of regional differences (*e.g.*, different forms and requested information) in the administration of the IA Program.

In late 2014, the OAWP commenced efforts to revise and restructure its current IA Program, and these efforts are ongoing. The OAWP expects to increase its site visits in the future.

3.5.6 BEYOND BMPs

Under the Florida Watershed Restoration Act, when the department adopts a BMAP that includes agriculture, it is the agricultural producers' responsibility to implement the FDACS-adopted BMPs applicable to them. If additional measures, such as regional treatment projects, are needed, FDACS will

work with the department, SJRWMD, and other appropriate entities to identify appropriate and feasible options.

SECTION 4. NEWCASTLE CREEK (WBID 2235)

4.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 describes the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP phase that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Newcastle Creek watershed.

4.2 JEA ACTIVITIES IN THE NEWCASTLE CREEK WATERSHED

JEA will continue its ongoing programs in the Newcastle Creek watershed.

4.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE NEWCASTLE CREEK WATERSHED

In addition to its ongoing programs, FDOH–Duval County completed an intensive inspection program in the Newcastle Creek watershed and continued to issue annual operating permits for OSTDS (**Table 32**).

TABLE 32: FDOH–DUVAL COUNTY ACTIVITIES IN THE NEWCASTLE CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH – 71	INTENSIVE INSPECTION PROGRAM	INTENSIVE INSPECTIONS BASED ON REPAIR PERMIT APPLICATIONS, WATER QUALITY INFORMATION, AND SITE CONDITIONS	APPROXIMATELY 128 INSPECTIONS PERFORMED IN WBID	\$12,250	FDOH/DEPARTMENT/ SECTION 319 NONPOINT SOURCE MANAGEMENT PROGRAM IMPLEMENTATION GRANT	COMPLETED
FDOH – 77	ANNUAL OPERATING PERMITS	ANNUAL OPERATING PERMITS ISSUED FOR PERFORMANCE-BASED TREATMENT SYSTEMS (PBTS), SYSTEMS LOCATED IN INDUSTRIAL/ MANUFACTURING ZONES (IMZ), AND COMMERCIAL SYSTEMS	NO ANNUAL OPERATING PERMITS ISSUED FOR PBTS/IMZ IN WBID	NOT APPLICABLE	FDOH	ONGOING

4.4 COJ ACTIVITIES IN THE NEWCASTLE CREEK WATERSHED

In addition to its ongoing programs, COJ completed a pipe replacement project on Hermitage Road, continued with its CARE requests, and continued to follow up on high fecal coliform results (**Table 33**).

TABLE 33: COJ ACTIVITIES IN THE NEWCASTLE CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ – 192	3833 Hermitage Road East	Pipe replacement	Hermitage Road	\$17,788	COJ	Completed
COJ – 193	Ditch Hazardous/Contaminated	CARE requests with costs for responses where work order was issued	Ongoing	Unknown	COJ	Ongoing
COJ – 194	Pollution – Water – Illegal Discharge	CARE initiated - incidents reported/found and closed during reporting period	Ongoing	Unknown	COJ	Ongoing
COJ – 195	Septic Tank Inspection	CARE initiated	Ongoing	Unknown	COJ	Ongoing
COJ – 196	Resampling	Conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources	Ongoing	Unknown	COJ	Ongoing
COJ – 275	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	Ongoing	Unknown	COJ	Ongoing

SECTION 5. HOGAN CREEK (WBID 2252)

5.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during the Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in the Phase 2 and are specific to the Hogan Creek watershed.

5.2 JEA ACTIVITIES IN THE HOGAN CREEK WATERSHED

In addition to its ongoing programs, JEA has two sewer improvement projects under way in the Hogan Creek watershed (Table 34).

TABLE 34: JEA ACTIVITIES IN THE HOGAN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-156	Air Release Valve (ARV) Inspection and Rehab	ARV inspection and rehab	Ongoing	Unknown	JEA	Ongoing
JEA-158	State Street and Union Street Sewer Improvements	JEA existing sewer infrastructure in core city downtown area has reached its useful life expectancy; this project will replace deteriorated sewer mains within project boundaries	4,500 linear feet of gravity lines; 1,400 linear feet of 6-inch force main	\$2,276,000	JEA	Ongoing
JE-159	11 th and 12 th Street Connector	Installation of new sewer infrastructure to accommodate stormwater improvements	Not applicable	\$29,000	JEA	Ongoing

5.3 FDOH-DUVAL COUNTY ACTIVITIES IN THE HOGAN CREEK WATERSHED

In addition to its ongoing programs, FDOH completed an intensive inspection program in the Hogan Creek watershed (Table 35).

TABLE 35: FDOH–DUVAL COUNTY ACTIVITIES IN THE HOGAN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH-72	Intensive Inspection Program	Intensive inspections based on repair permit applications, water quality information, and site conditions	Approximately 237 inspections performed to confirm each property is connected to central sewer	\$22,600	FDOH/department/Section 319 Nonpoint Source Management Program Implementation Grant	Complete

5.4 FDOT ACTIVITIES IN THE HOGAN CREEK WATERSHED

In addition to its ongoing programs, FDOT helped to fund the BMAP monitoring and source identification sampling conducted by COJ in Hogan Creek (**Table 36**).

TABLE 36: FDOT ACTIVITIES IN THE HOGAN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	FUNDING SOURCE	PROJECT STATUS
FDOT-71	BMAP Monitoring	FDOT/COJ	Ongoing
FDOT-72	Source Identification Sampling – Conducted when high levels of coliform bacteria results are noted and source identification is necessary	FDOT/COJ	Ongoing

5.5 COJ ACTIVITIES IN THE HOGAN CREEK WATERSHED

In addition to its ongoing programs, COJ completed a pipe replacement project on 8th Street and a storm sewer project on Steele Street at Myrtle Avenue, has a drainage improvement project under construction, has two additional planned stormwater projects, and is continuing with the follow-up on CARE requests (**Table 37**).

TABLE 37: COJ ACTIVITIES IN THE HOGAN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-197	Emerald Necklace and Liberty Ponds	Master stormwater management plan (MSMP) construction schedule subject to funding	Ponds	\$2,153,000	COJ	Planned
COJ-198	1500 8 th Street	Pipe replacement	8 th Street	\$67,954	COJ	Completed
COJ-199	Ditch Hazardous/ Contaminated	CARE requests with costs for responses where work order was issued	Ongoing	Unknown	COJ	Ongoing
COJ-200	Septic Tank Inspections	CARE initiated; transferred to FDOH for enforcement action	Ongoing	Unknown	COJ	Ongoing
COJ-253	1100 4 th Street	Drainage improvement	Drainage	\$92,554	COJ	Construction
COJ-263	1003 15 th Street	Design	Not applicable	\$21,254	COJ	Design
COJ-264	Steele Street at Myrtle Avenue	Storm sewer	Storm sewer	\$15,239	COJ	Completed
COJ-276	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	Ongoing	Unknown	COJ	Ongoing

SECTION 6. BUTCHER PEN CREEK (WBID 2322)

6.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Butcher Pen watershed.

6.2 JEA ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

JEA will continue its ongoing programs in the Butcher Pen Creek watershed.

6.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

In addition to its ongoing programs, FDOH completed an intensive inspection program in the Butcher Pen Creek watershed (Table 38).

TABLE 38: FDOH–DUVAL COUNTY ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH-73	Intensive Inspection Program	Intensive inspections based on repair permit applications, water quality information, and site conditions	Approximately 69 inspections performed in WBID	\$6,600	FDOH/ Department/ Section 319 Nonpoint Source Management Program Implementation Grant	Completed

6.4 FDOT ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

FDOT will continue its ongoing programs in the Butcher Pen Creek watershed.

6.5 COJ ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

In addition to its ongoing programs, COJ completed four stormwater projects, has one project under construction, and is continuing to follow up on CARE requests (Table 39).

TABLE 39: COJ ACTIVITIES IN THE BUTCHER PEN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-201	5000 Block Chadroe Road	Curb/gutter	Chadroe Road	\$13,135	COJ	Completed
COJ-202	Ditch Hazardous/Contaminated	CARE requests with costs for responses where work order was issued	Ongoing	Unknown	COJ	Ongoing
COJ-203	Septic Tank	CARE initiated; transferred to FDOH for enforcement action	Ongoing	Unknown	COJ	Ongoing
COJ-204	Resampling	Resampling effort conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources.	Ongoing	Unknown	COJ	Ongoing
COJ-254	6442 Romily Road	Drainage improvement	Drainage	\$20,208	COJ	Completed
COJ-265	4615 Harlow Boulevard	Storm sewer	Storm sewer	\$80,487	COJ	Construction
COJ-266	Harlow Boulevard at Bambi Lane	Drain line	Drain line	\$74,845	COJ	Completed
COJ-267	4503 ISH Brant Road West and 4465 Ranier Road	Storm sewer	Storm sewer	\$8,595	COJ	Completed
COJ-277	Stormwater Action Team Proactive Maintenance Program	Roadside and outfall ditch regrade, vegetation removal, illegal dumping cleanup, and illicit discharge source removal	Ongoing	Unknown	COJ	Ongoing
COJ-278	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	Ongoing	Unknown	COJ	Ongoing

SECTION 7. MILLER CREEK (WBID 2287)

7.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Miller Creek watershed.

7.2 JEA ACTIVITIES IN THE MILLER CREEK WATERSHED

JEA will continue its ongoing programs in the Miller Creek watershed.

7.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE MILLER CREEK WATERSHED

FDOH will continue its ongoing programs in the Miller Creek watershed.

7.4 FDOT ACTIVITIES IN THE MILLER CREEK WATERSHED

In addition to its ongoing programs, FDOT helps to fund the BMAP monitoring and source identification sampling conducted by COJ in Miller Creek (**Table 40**).

TABLE 40: FDOT ACTIVITIES IN THE MILLER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	FUNDING SOURCE	PROJECT STATUS
FDOT-73	BMAP Monitoring	FDOT/ COJ	Ongoing
FDOT-74	Source Identification Sampling – Conducted when high levels of coliform bacteria results are noted and source identification is necessary	FDOT/ COJ	Ongoing

7.5 COJ ACTIVITIES IN THE MILLER CREEK WATERSHED

In addition to its ongoing programs, COJ completed one stormwater project, is continuing to respond to CARE requests, and is continuing to follow up on high fecal coliform results (**Table 41**).

TABLE 41: COJ ACTIVITIES IN THE MILLER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-205	Ditch Hazardous/ Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-206	Lake or Pond Problem	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-207	Septic Tank Inspections	CARE initiated transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing
COJ-208	Resampling	Conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources	Unknown	Unknown	COJ	Ongoing
COJ-246	3931 Carmichael Avenue	Pipe replacement	Unknown	\$24,271	COJ	Completed

SECTION 8. MIRAMAR CREEK (WBID 2304)

8.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP phase that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Miramar Creek watershed.

8.2 JEA ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

In addition to its ongoing programs, JEA inspects pipes in the Miramar Creek watershed through closed-circuit television (**Table 42**).

TABLE 42: JEA ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-157	Pipe TV Inspection	Inspect existing infrastructure through use of closed-circuit television	651 feet in 2014	Not applicable	JEA	Ongoing

8.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

FDOH will continue its ongoing programs in the Miramar Creek watershed.

8.4 FDOT ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

In addition to its ongoing programs, FDOT helps to fund the BMAP monitoring and source identification sampling conducted by COJ in Miramar Creek (**Table 43**).

TABLE 43: FDOT ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOT-75	BMAP Monitoring	Cost included in countywide MS4 monitoring	FDOT/COJ	Ongoing
FDOT-76	Source Identification Sampling – Conducted when high levels of coliform bacteria results are noted and source identification is necessary	Cost included in countywide MS4 monitoring	FDOT/COJ	Ongoing

8.5 COJ ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

In addition to its ongoing programs, COJ completed three stormwater projects, has an additional project planned, is continuing to follow up on CARE requests, and is continuing to follow up on high fecal coliform results (**Table 44**).

TABLE 44: COJ ACTIVITIES IN THE MIRAMAR CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-209	Conveyance under San Jose Blvd.	MSMP construction schedule subject to funding	San Jose Blvd.	\$150,000	COJ	Planned
COJ-210	Pine Tree Road Drainage	Construction	Pine Tree Road	\$57,309	COJ	Completed
COJ-211	Ditch Hazardous/ Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-212	Septic Tank Inspections	CARE initiated; transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing
COJ-213	Resampling	Conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources	Unknown	Unknown	COJ	Ongoing
COJ-255	2121 Sessions Lane	Drainage improvement	Drainage	\$45,903	COJ	Completed
COJ-256	2120 Sessions Lane	Drainage improvement	Drainage	\$38,165	COJ	Completed
COJ-279	Stormwater Action Team Proactive Maintenance Program	Roadside and outfall ditch regrade, vegetation removal, illegal dumping cleanup, and illicit discharge source removal	Ongoing	Unknown	COJ	Ongoing
COJ-280	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	Ongoing	Unknown	COJ	Ongoing

SECTION 9. BIG FISHWEIR CREEK (WBIDS 2280A AND 2280B)

9.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Big Fishweir Creek watershed.

9.2 JEA ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

In addition to its ongoing programs, JEA has a sewer force main replacement project under way and continues to repair or replace pump station components as needed in the Big Fishweir Creek watershed (Table 45).

TABLE 45: JEA ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-154	Pump Station Class I/II Rebuilding	Repair or replace components of existing pump stations	Not applicable	Not applicable	JEA	Ongoing
JEA-160	Lakeshore Force Main Replacement	Installation of 7,500 linear feet of 16-inch polyvinyl chloride (PVC) force main to replace deteriorating 16-inch ductile iron force main	7,500 linear feet of pipe	\$1,292,301	JEA	Ongoing

9.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

FDOH will continue its ongoing programs in the Big Fishweir Creek watershed.

9.4 FDOT ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

FDOT will continue its ongoing programs in the Big Fishweir Creek watershed.

9.5 COJ ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

In addition to its ongoing programs, COJ completed 15 stormwater projects, has one project under construction, and has two additional projects planned (Table 46).

TABLE 46: COJ ACTIVITIES IN THE BIG FISHWEIR CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-214	In-Line Dry Pond, Widen Downstream Channel	MSMP, construction schedule subject to funding	Dry pond	\$2,500,000	COJ	Planned
COJ-215	5340 Royce Avenue	Pipe replacement	Royce Avenue	\$63,608	COJ	Completed
COJ-216	Poppy Drive Paving Rehabilitation	Construction	Poppy Drive	\$58,357	COJ	Completed
COJ-217	1748 Harksheimer Avenue	Pipe replacement	Harksheimer Avenue	\$49,225	COJ	Completed
COJ-218	Quan Drive Drainage Outfall	Repair concrete ditch lining	Quan Drive	\$12,482	COJ	Completed
COJ-219	4700 Block Astral Street	Curb/gutter	Astral Street	\$9,502	COJ	Completed
COJ-220	College/Talbot	Curb/gutter	College/Talbot	\$31,914	COJ	Completed
COJ-221	Murray Drive/French Street	Curb/gutter	Murray/French	\$11,750	COJ	Completed
COJ-222	Ditch Hazardous/Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-247	1290 Menna Drive	Pipe replacement	Unknown	\$46,349	COJ	Completed
COJ-248	1748 Harkisheimer Drive	Drainage improvement	Outfall improvement	\$49,225	COJ	Completed
COJ-249	Boone Park and Pine Grove	Drainage improvement	Outfall improvement	\$2,502	COJ	Completed
COJ-250	Rensselaer and Hollingsworth	Drainage improvement	Outfall improvement	\$86,710	COJ	Completed
COJ-257	Woodruff Avenue	Drainage improvement	Drainage	\$24,239	COJ	Completed
COJ-268	Kingsbury Street at Lark Street	Cave in	Cave In	\$10,177	COJ	Completed
COJ-269	Plymouth Street	Design	Design	\$8,339	COJ	Design
COJ-270	3900 Richmond Street	Storm sewer	Storm Sewer	\$2,773	COJ	Completed
COJ-271	Rensselaer Avenue at Hollingsworth Street	Construction	Construction	\$56,470	COJ	Completed
COJ-272	Quan Drive	Construction	Construction	\$148,686	COJ	Construction
COJ-281	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	5,288 feet	\$3,637	COJ	Ongoing

SECTION 10. DEER CREEK (WBID 2256)

10.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ON-GOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Deer Creek watershed.

10.2 JEA ACTIVITIES IN THE DEER CREEK WATERSHED

In addition to the ongoing programs, JEA has a new sewer project under way in the Deer Creek watershed (**Table 47**).

TABLE 47: JEA ACTIVITIES IN THE DEER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-161	Lower East Side Drainage Improvements	Installation of new sewer infrastructure to accommodate stormwater improvements	Not applicable	\$429,000	JEA	Ongoing

10.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE DEER CREEK WATERSHED

In addition to its ongoing programs, FDOH completed an intensive inspection program in the Deer Creek watershed and is continuing to issue annual operating permits for systems (**Table 48**).

TABLE 48: FDOH–DUVAL COUNTY ACTIVITIES IN THE DEER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH-74	Intensive Inspection Program	Intensive inspections based on repair permit applications, water quality information, and site conditions	Approximately 148 inspections performed in WBID	\$14,200	FDOH/department/ Section 319 Nonpoint Source Management Program Implementation Grant	Completed
FDOH-78	Annual Operating Permits	Annual operating permits issued for PBTS, systems located in IMZ, and commercial systems	One annual operating permit issued for PBTS/IMZ in WBID	\$350	FDOH	Ongoing

10.4 FDOT ACTIVITIES IN THE DEER CREEK WATERSHED

In addition to its ongoing programs, FDOT helps to fund the BMAP monitoring and source identification sampling conducted by COJ in Deer Creek (**Table 49**).

TABLE 49: FDOT ACTIVITIES IN THE DEER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	FUNDING SOURCE	PROJECT STATUS
FDOT-77	BMAP Monitoring	FDOT/COJ	Ongoing
FDOT-78	Source Identification Sampling – Conducted when high levels of coliform bacteria results are noted and source identification is necessary	FDOT/COJ	Ongoing

10.5 COJ ACTIVITIES IN THE DEER CREEK WATERSHED

In addition to its ongoing programs, COJ completed three stormwater projects and continues to follow up on CARE requests (**Table 50**).

TABLE 50: COJ ACTIVITIES IN THE DEER CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-223	1405 Van Buran Street	Pipe replacement	Van Buran Street	\$88,940	COJ	Completed
COJ-224	Jessie Street	Cured-in-place pipe (CIPP)	Jessie Street	\$237,952	COJ	Completed
COJ-225	Ditch Hazardous/Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-226	Lake or Pond Problem	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-227	Septic Tank Inspections	CARE initiated; transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing
COJ-258	1525 Tallyrand Avenue	Drainage improvement	Drainage	\$38,421	COJ	Completed

SECTION 11. TERRAPIN CREEK (WBID 2204)

11.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Terrapin Creek watershed.

11.2 JEA ACTIVITIES IN THE TERRAPIN CREEK WATERSHED

JEA will continue its ongoing programs in the Terrapin Creek watershed.

11.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE TERRAPIN CREEK WATERSHED

FDOH will continue its ongoing programs in the Terrapin Creek watershed.

11.4 FDOT ACTIVITIES IN THE TERRAPIN CREEK WATERSHED

FDOT will continue its ongoing programs in the Terrapin Creek watershed.

11.5 COJ ACTIVITIES IN THE TERRAPIN CREEK WATERSHED

In addition to its ongoing programs, COJ continued to follow up on CARE requests (Table 51).

TABLE 51: COJ ACTIVITIES IN THE TERRAPIN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ–228	Ditch Hazardous/ Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ–229	Lake or Pond Problem	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ–230	Sewer Drains to Yard/Ditch	CARE initiated; incidents reported/found and closed during reporting period	Unknown	Unknown	COJ	Ongoing
COJ–231	Sewer Overflow	CARE initiated; incidents reported/found and closed during reporting period	Unknown	Unknown	COJ	Ongoing
COJ–232	Septic Tank Inspection	CARE initiated; transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing

SECTION 12. GOODBYS CREEK (WBIDS 2326A AND 2326B)

12.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ONGOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Goodbys Creek watershed.

12.2 JEA ACTIVITIES IN THE GOODBYS CREEK WATERSHED

JEA will continue its ongoing programs in the Goodbys Creek watershed.

12.3 FDOH–DUVAL COUNTY ACTIVITIES IN THE GOODBYS CREEK WATERSHED

FDOH will continue its ongoing programs in the Goodbys Creek watershed.

12.4 FDOT ACTIVITIES IN THE GOODBYS CREEK WATERSHED

FDOT will continue its ongoing programs in the Goodbys Creek watershed.

12.5 COJ ACTIVITIES IN THE GOODBYS CREEK WATERSHED

In addition to its ongoing programs, COJ completed seven stormwater projects, has one project under construction, has an additional project planned, is continuing to follow up on CARE requests, and is continuing to follow up on high fecal coliform results (**Table 52**).

TABLE 52: COJ ACTIVITIES IN THE GOODBYS CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-235	Berm, New Ponds with Managed Aquatic Plant Systems (MAPS), Existing Pond with MAPS, and Borrow Pit with MAPS	MSMP; construction schedule subject to funding	Ponds	\$4,300,000	COJ	Planned
COJ-236	San Clerc/Sanchez Drainage	Construction	Unknown	\$229,524	COJ	Completed
COJ-237	San Clerc Road Drainage Improvement	Drainage improvement	San Clerc Road	\$541	COJ	Completed
COJ-238	Ditch Hazardous/ Contaminated	CARE requests with costs for responses where work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-239	Septic Tank Inspections	CARE initiated; transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing
COJ-240	Resampling	Conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources	Unknown	Unknown	COJ	Ongoing
COJ-251	San Clerc/Sanchez Drainage Improvement	Drainage improvement	Unknown	\$29,524	COJ	Completed
COJ-252	Sanchez Road	Drainage improvement	Unknown	\$62,333	COJ	Completed
COJ-259	9439 San Jose Boulevard	Drainage improvement	Unknown	\$66,195	COJ	Completed
COJ-272	9115 Barnstable Lane	Drain line	Drain line	\$40,006	COJ	Completed
COJ-273	8893 Brierwood Road	Storm sewer	Storm sewer	\$6,034	COJ	Completed
COJ-274	Osprey Court	Construction	Construction	\$89,394	COJ	Construction
COJ-282	Stormwater Action Team Proactive Maintenance Program	Roadside and outfall ditch regrade, vegetation removal, illegal dumping cleanup, and illicit discharge source removal	Ongoing	Unknown	COJ	Ongoing
COJ-283	Outfall Ditch Vegetation Management	Herbicide spraying and litter removal	Ongoing	Unknown	COJ	Ongoing

SECTION 13. OPEN CREEK (WBIDS 2299A AND 2299B)

13.1 PROJECTS ADDED SINCE THE 2009 BMAP AND ON-GOING EFFORTS

Section 3 described the new efforts being added, by entity, for the second phase of the BMAP, as well as the management actions described in the 2009 BMAP project tables. In addition to these efforts, some projects were undertaken during Phase 1 of the BMAP that were not listed in the 2009 BMAP. These additional actions are described here, along with ongoing efforts that will continue in Phase 2 and are specific to the Open Creek watershed.

13.2 JEA ACTIVITIES IN THE OPEN CREEK WATERSHED

In addition to its ongoing programs, JEA continues to repair or replace components in pump stations as needed in the Open Creek watershed (**Table 53**).

TABLE 53: JEA ACTIVITIES IN THE OPEN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
JEA-155	Pump Station Class I/II Rebuilding	Repair or replace components of existing pump stations	Not applicable	Not applicable	JEA	Ongoing

13.3 FDOH-DUVAL COUNTY ACTIVITIES IN THE OPEN CREEK WATERSHED

In addition to its ongoing programs, FDOH completed an intensive inspection program in the Open Creek watershed (**Table 54**).

TABLE 54: FDOH-DUVAL COUNTY ACTIVITIES IN THE OPEN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	ESTIMATED COST	FUNDING SOURCE	PROJECT STATUS
FDOH-76	Intensive Inspection Program	Intensive inspections based on repair permit applications, water quality information, and site conditions	Approximately 65 inspections performed in WBID	\$6,250	FDOH/ Department/ Section 319 Nonpoint Source Management Program Implementation Grant	Completed

13.4 FDOT ACTIVITIES IN THE OPEN CREEK WATERSHED

FDOT will continue its ongoing programs in the Open Creek watershed.

13.5 COJ ACTIVITIES IN THE OPEN CREEK WATERSHED

In addition to its ongoing programs, COJ completed three stormwater projects, has one planned project, continuing to follow up on CARE requests, and is continuing to follow up on high fecal coliform results (Table 55).

TABLE 55: COJ ACTIVITIES IN THE OPEN CREEK WATERSHED

PROJECT NUMBER	PROJECT NAME	PROJECT DESCRIPTION	LEVEL OF EFFORT	TOTAL COST	FUNDING SOURCE	PROJECT STATUS
COJ-241	Conveyance Improvements Under Power Easement Near Deer Chase Place and Danforth Drive	MSMP; construction schedule subject to funding	Conveyance Improvement	\$296,000	COJ	Planned
COJ-242	Ditch Hazardous/Contaminated	CARE requests with costs for responses where a work order was issued	Unknown	Unknown	COJ	Ongoing
COJ-243	Pollution – Water – Illegal Discharge	CARE initiated - incidents reported/found and closed during reporting period	Unknown	Unknown	COJ	Ongoing
COJ-244	Septic Tank Inspections	CARE initiated transferred to FDOH for enforcement action	Unknown	Unknown	COJ	Ongoing
COJ-245	Resampling	Conducted when high levels of fecal coliform bacteria are noted, to attempt to identify sources	Unknown	Unknown	COJ	Ongoing
COJ-260	Washburn Road	Drainage improvement	Unknown	\$6,191	COJ	Completed
COJ-261	Washburn Road Drainage	Drainage improvement	Unknown	\$35,949	COJ	Completed
COJ-262	Washburn Road Drainage Part A	Drainage improvement	Unknown	\$72,692	COJ	Completed

APPENDIX A. WBID BOUNDARY MODIFICATIONS

The following maps show the changes made to the WBID boundaries based on data collected during the 2014 field assessments of these waterbodies. By comparing the solid line with the dashed outline, one can deduce the changes in the WBID lines. Some areas of fill exclude areas of the old WBID because the area excluded does not contribute to the BMAP waterbody, and some areas of fill include more area than the old WBID because the group determined that the watershed was larger than originally represented by the old WBID boundary. Big Fishweir Creek, Goodbys Creek, and Open Creek have been split into freshwater and marine WBIDs for assessment purposes since the adoption of the Phase 1 BMAP. Those changes are also reflected in the maps that follow.

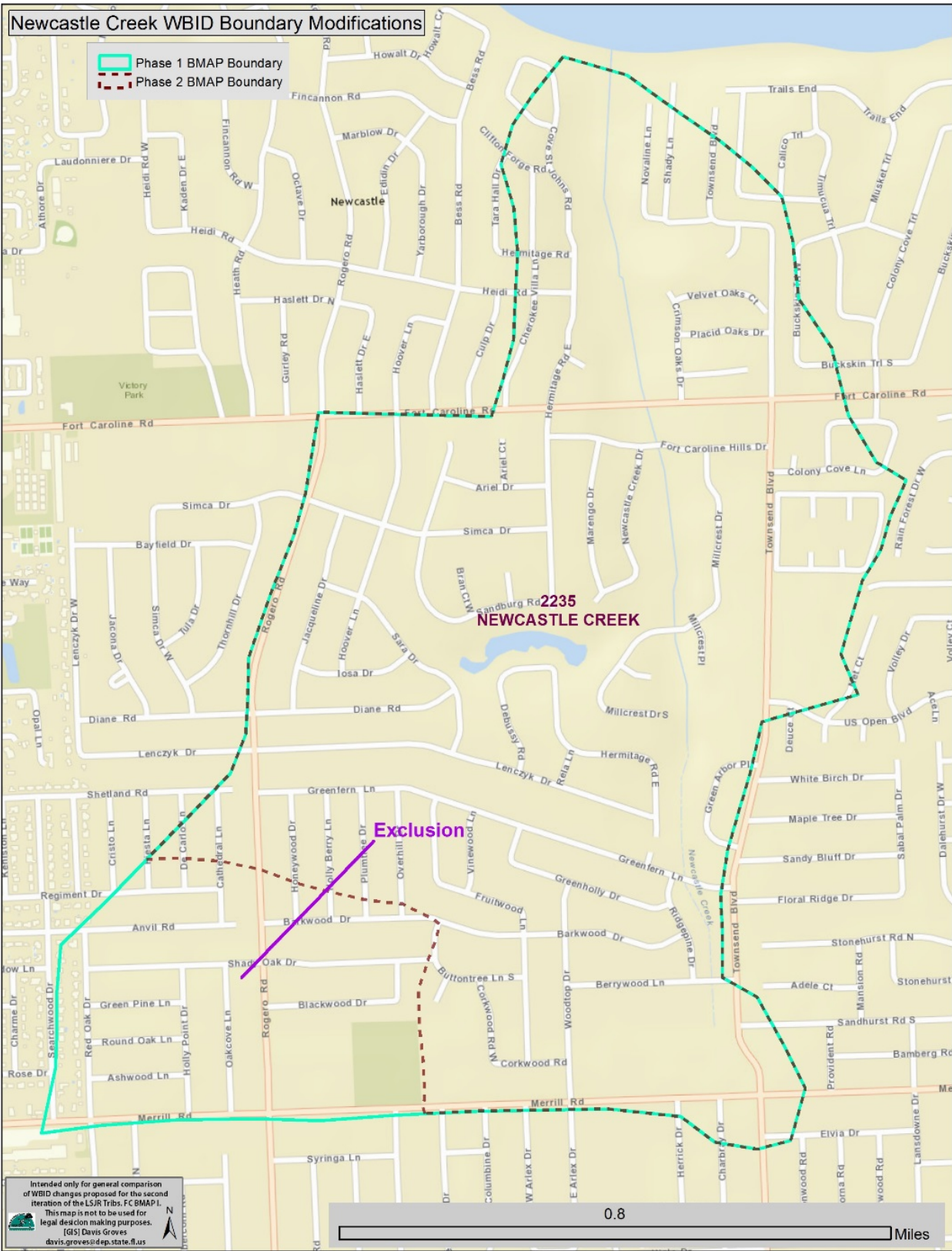


FIGURE A-1: NEWCASTLE CREEK WBID BOUNDARY MODIFICATIONS

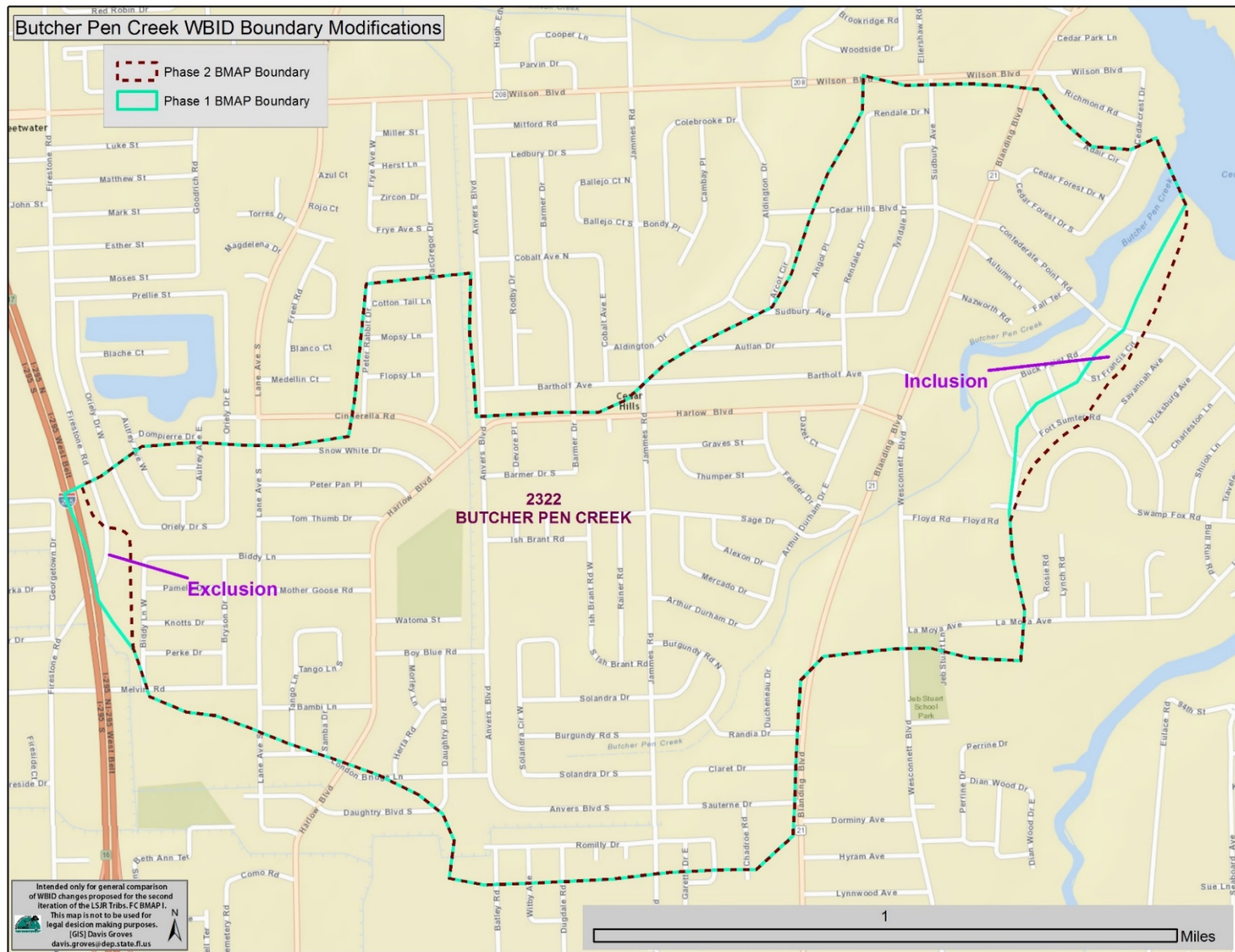


FIGURE A-2: BUTCHER PEN CREEK WBID BOUNDARY MODIFICATIONS

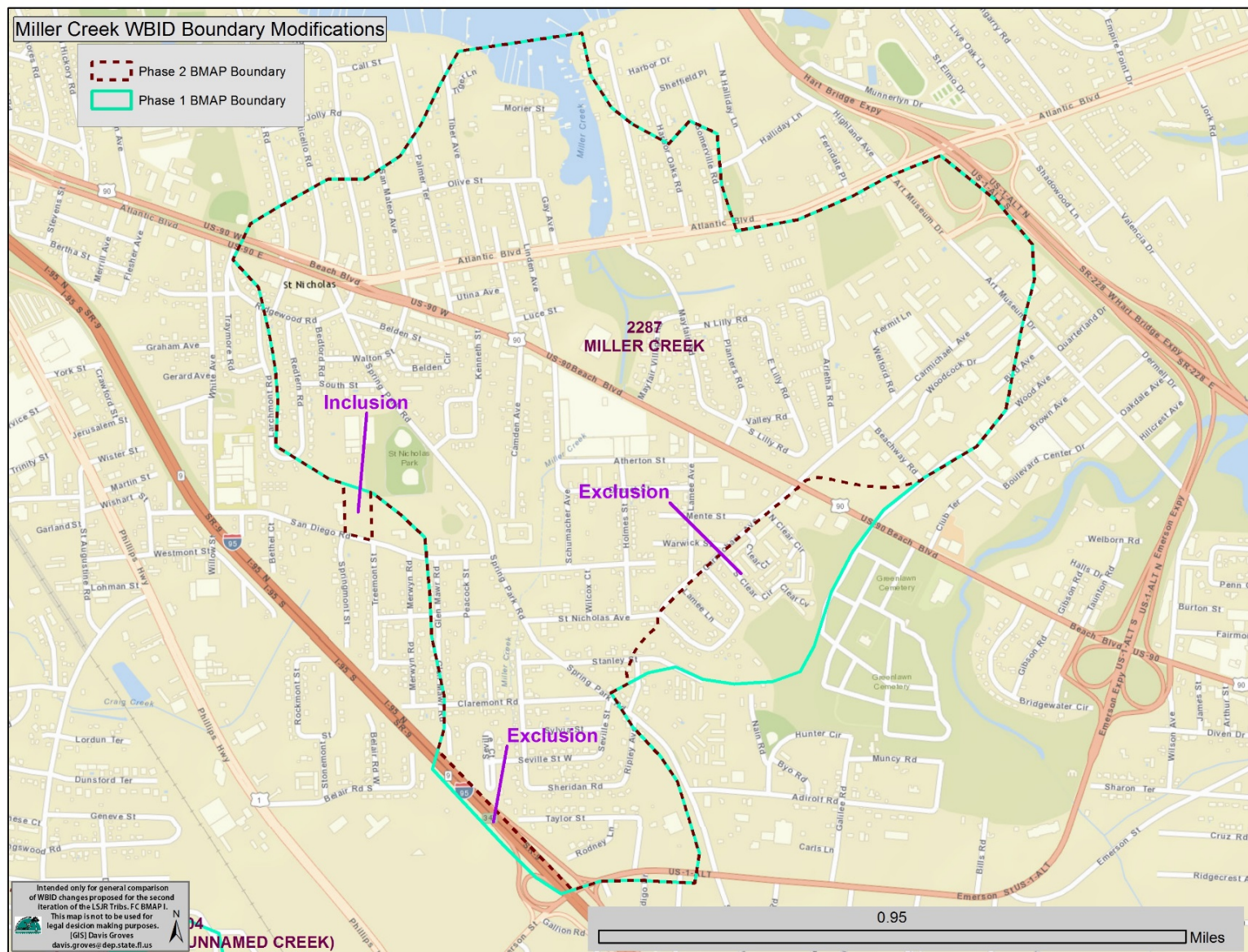


FIGURE A-3: MILLER CREEK WBID BOUNDARY MODIFICATIONS

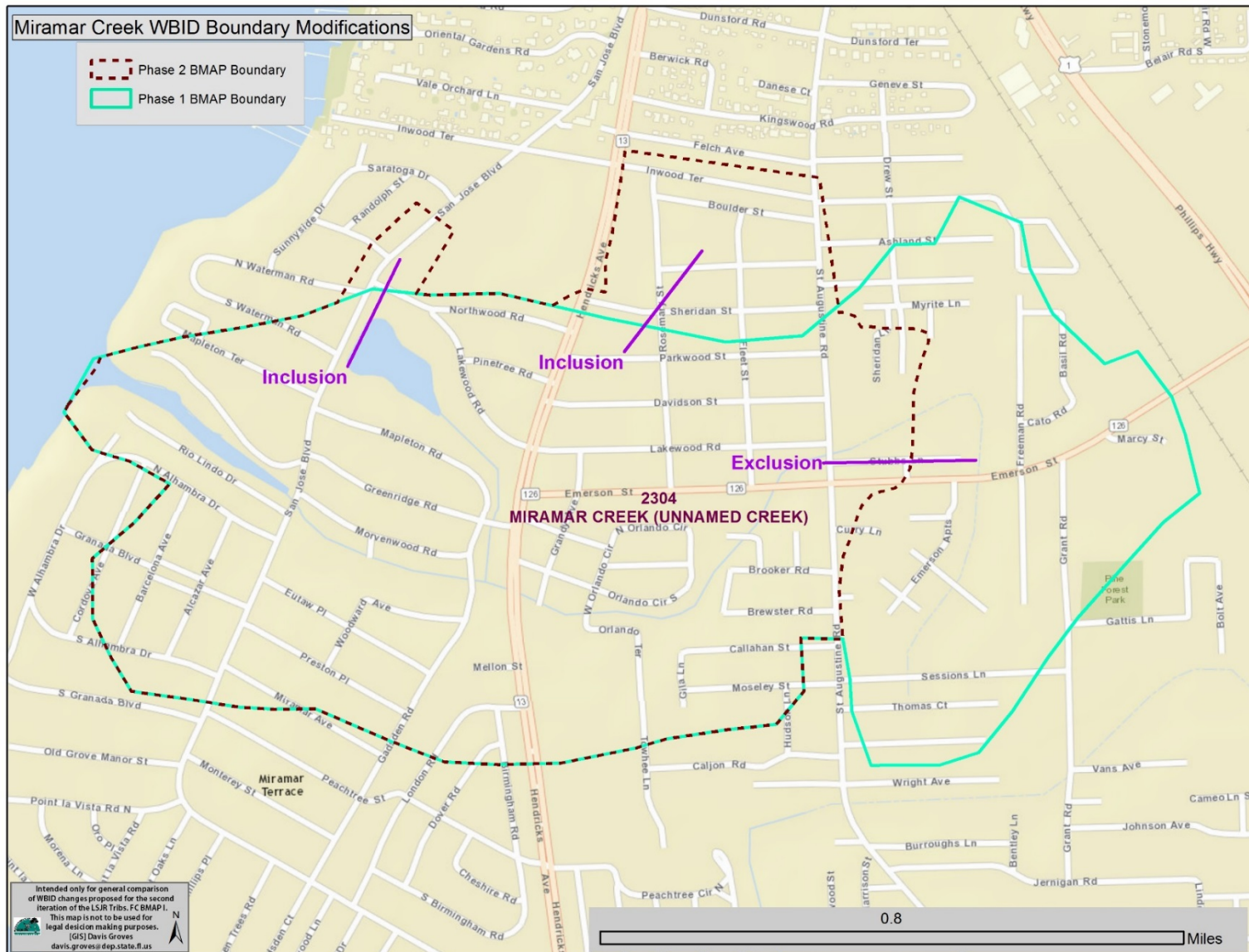


FIGURE A-4: MIRAMAR CREEK WBID BOUNDARY MODIFICATIONS

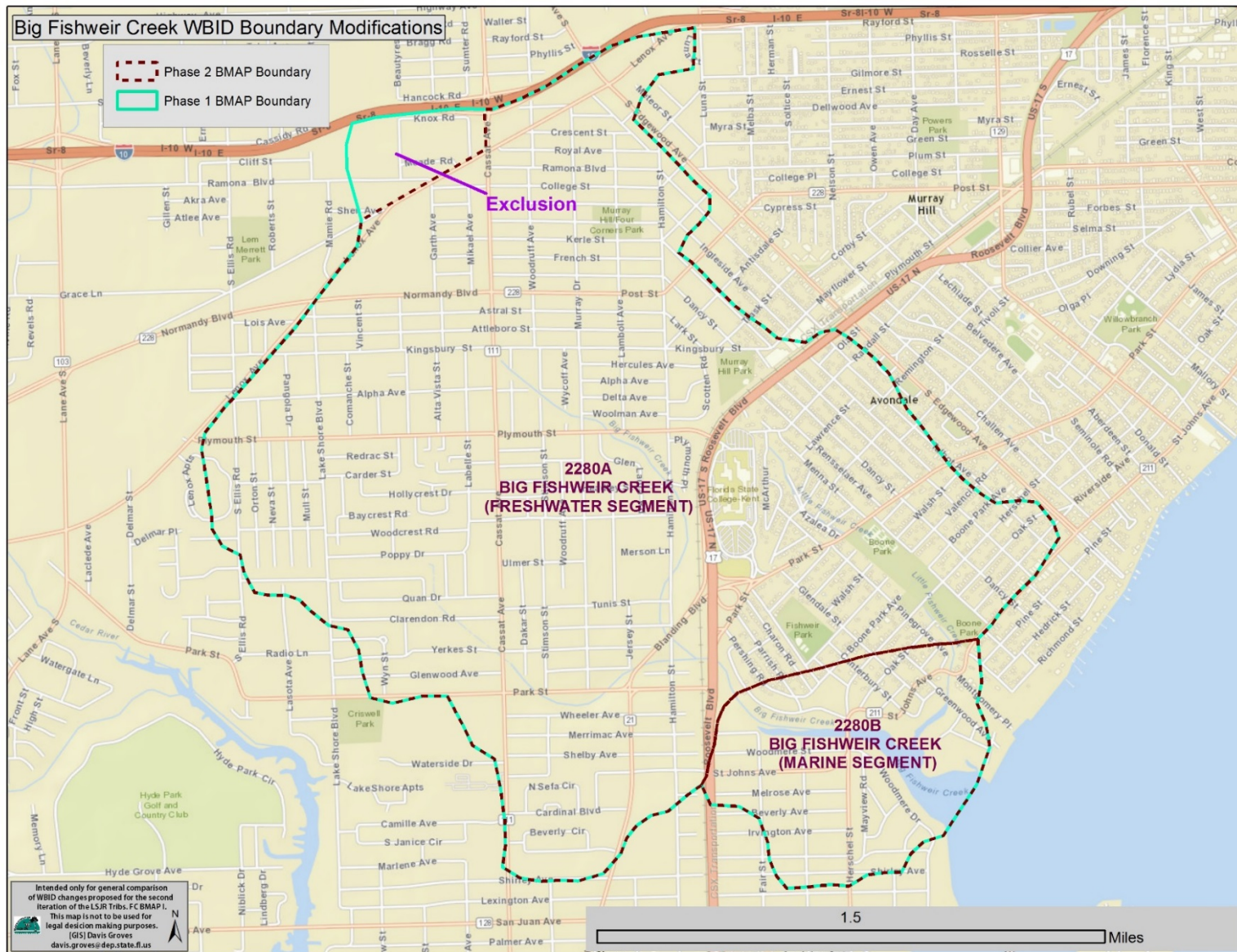


FIGURE A-5: BIG FISHWEIR CREEK (FRESHWATER AND MARINE SEGMENTS) WBID BOUNDARY MODIFICATIONS

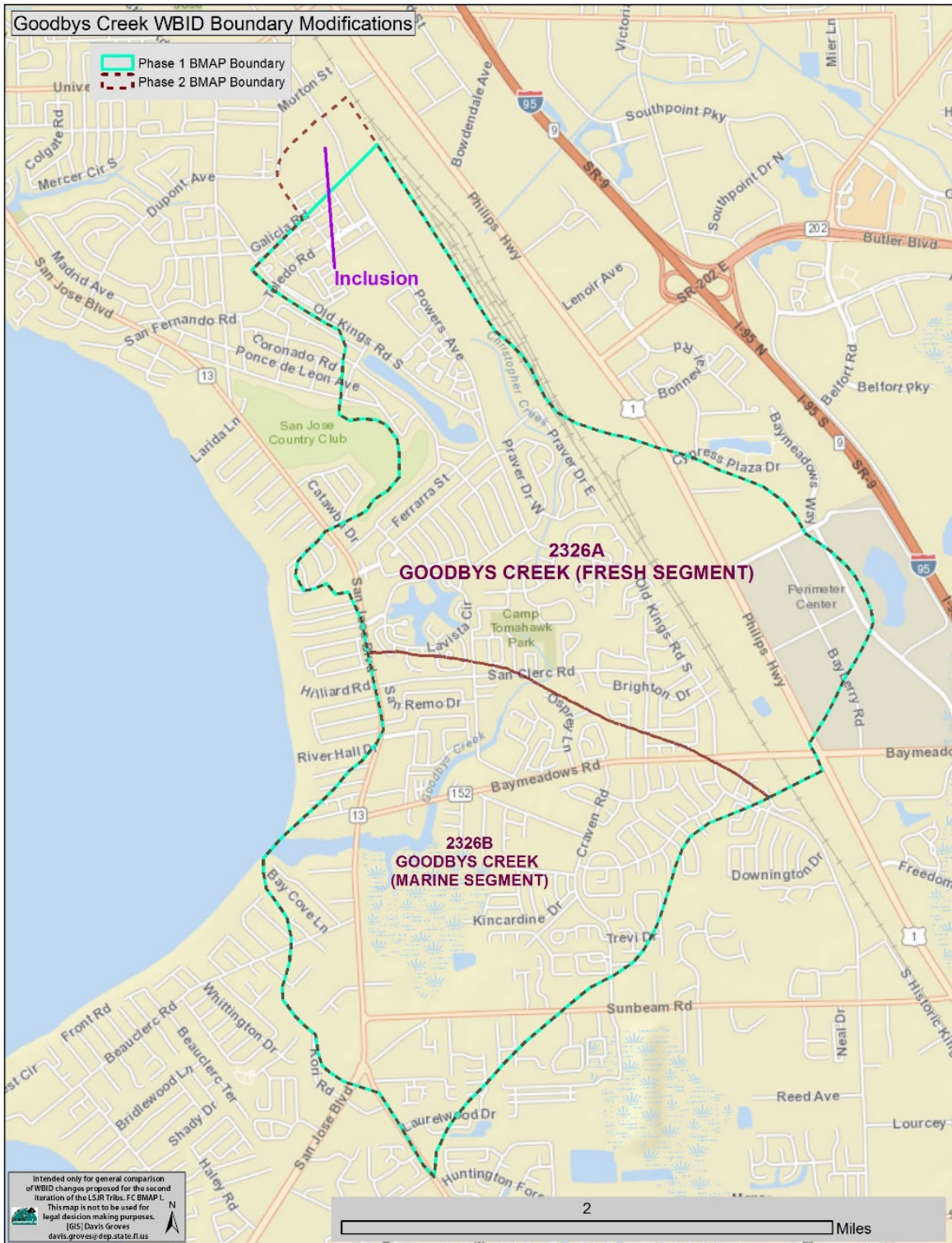


FIGURE A-6: GOODBYS CREEK (FRESHWATER AND MARINE SEGMENTS) WBID BOUNDARY MODIFICATIONS

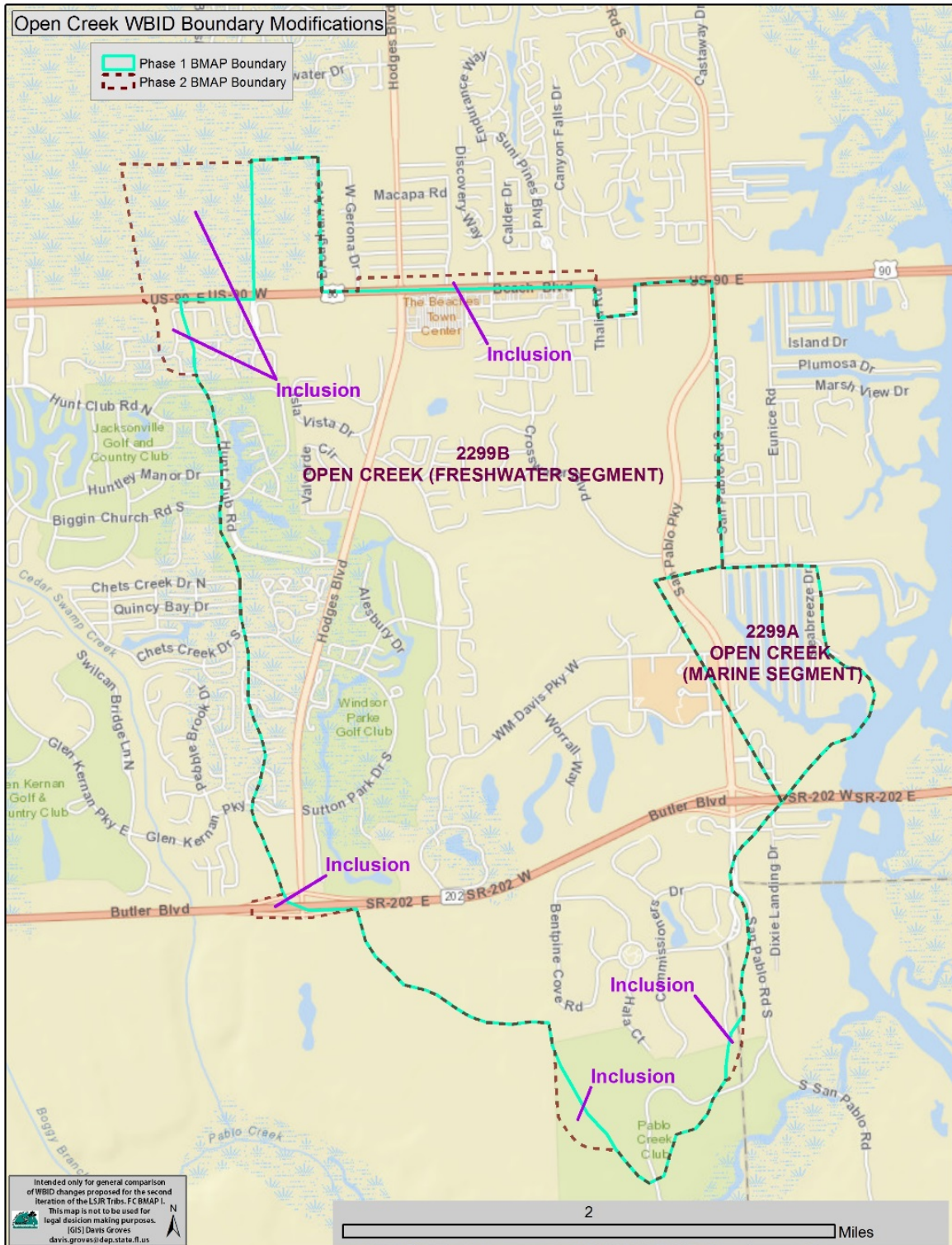


FIGURE A-7: OPEN CREEK (FRESHWATER AND MARINE SEGMENTS) WBID BOUNDARY MODIFICATIONS